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The Appendices are available for review at public libraries in Juneau, Haines, Skagway, Anchorage, Fairbanks, and Whitehorse, Yukon Territory, and at the DOT&PF, Southeast Region office, 6860 Glacier Highway, Juneau 99801-7999.

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# 1.0 INTRODUCTION

## 1.1 PURPOSE OF THE DEIS

The National Environmental Policy Act of 1969 (NEPA) requires a Draft Environmental Impact Statement (DEIS) to be prepared when federal actions are proposed that significantly affect the human environment. A DEIS identifies the probable environmental consequences of each alternative, including ways to mitigate unavoidable impacts. The purpose of this DEIS is to provide the public and state and federal resource agencies a description of the project need and purpose, alternatives, and impacts so informed comments can be made on the proposed action. These comments will then be used to identify a preferred course of action and issuance of applicable permits. This DEIS serves as the NEPA documentation required by the Corps of Engineers (COE) to evaluate the Section 404 and Section 10 permit process for any action that would place fill in waters of the United States. This COE permit process is merged with the NEPA process to enhance coordination and input between agencies. It also will be used by the USDA Forest Service (Forest Service) to evaluate the land transfer special use permit.

## 1.2 ORGANIZATION AND USE OF THE DEIS

This DEIS has been prepared according to regulations of the Federal Highway Administration (FHWA), 23 CFR 771. These regulations prescribe the policies for implementing NEPA, and the regulations of the Council on Environmental Quality (CEQ), 40 CFR parts 1500 through 1508. The organization, format, and content of this document are based in part on FHWA Technical Advisory T6640.8A for preparation of environmental projects and documents.

The Juneau Access Improvement Project DEIS consists of a summary and 10 sections.

- **Section 1 - Introduction**
  Describes the organization and use of this document.

- **Section 2 - Purpose and Need**
  Explains the reason the project is being pursued.

- **Section 3 - Project Alternatives**

  Describes the range of alternatives under consideration; describes and compares the alternatives evaluated and analyzed and those alternatives eliminated from further consideration.

- **Section 4 - Affected Environment**

  This section provides a concise description of the existing social, economic, and environmental setting for the area affected by all alternatives.

- **Section 5 - Environmental Consequences**

  Describes the direct, indirect, and cumulative impacts of the alternatives carried forward for analysis on the resources inventoried in the Affected Environment section and describes the measures proposed to mitigate adverse impacts. This section also discusses the alternatives relationship of local short-term impacts and use of resources, maintenance and enhancement of long-term productivity and irreversible and irretrievable commitment of resources.

- **Section 6 - Section 4(f) Evaluation**

- **Section 7 - Public Involvement**

- **Section 8 - List of Preparers**

- **Section 9 - List of Reviewers**

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# 2.0 PURPOSE AND NEED

## 2.1 PURPOSE

The purpose of this project is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will:

1) Provide the capacity to meet the transportation demand in the corridor.

2) Provide flexibility and improve opportunity for travel.

3) Reduce travel time between the communities.

4) Reduce state costs for transportation in the corridor.

**5)** Reduce user costs for transportation in the corridor.

*The following language is added at the request of the Environmental Protection Agency (EPA).*

*EPA, as a party to the 404/NEPA Merger Agreement and a cooperating agency on this project, does not agree with elements 4 and 5 of the stated purpose. Consequently, they do not concur with the purpose and need for the project under the provisions of the 404/NEPA Merger Agreement. EPA maintains that elements 4 and 5 are important overall goals of the Alaska Department of Transportation and Public Facilities (DOT&PF) and represent potential benefits of certain alternatives, but are not essential in defining the purpose for the proposed project (to improve surface transportation within the Lynn Canal corridor). EPA believes they impose very narrow constraints on the decision-making process that heavily bias alternative selection in favor of the highway alternative. It is EPA's observation that the fiscal costs of the proposed project are ultimately borne by some constituency (be it at the federal, state, local or personal level) and that decisions related to "who pays and how much" should be part of the public discussion of this project. They also believe that elements 4 and 5 of the stated purpose and need do not allow the public the opportunity to provide meaningful input related to the benefits and costs of each project alternative if the decision-making is steered toward selection of the road simply by virtue of the manner in which project purpose is cast.*

*See Section 7.7 for cooperating agencies comments on the preliminary DEIS.*

## 2.2 PROJECT STATUS

Juneau, the state capital and the third largest city in Alaska, does not have direct highway access. As early as the 1920's, a wide array of studies have been undertaken by those interested in a highway linking Juneau with

Haines, Skagway, or Atlin, B.C. In the early 1970's, the Department of Highways, now the Department of Transportation and Public Facilities (DOT&PF), developed plans to construct a highway along the west side of Lynn Canal. When the National Environmental Policy Act (NEPA) was passed in 1971, those plans were put on hold until an environmental evaluation of the project could be completed. In September 1974, the Lynn Canal Environmental Assessment (EA) was prepared. Due to changing transportation priorities in the state, the EA was not finalized nor was design and construction funding pursued. In 1986, DOT&PF issued a Southeast Transportation Plan that identified the East Lynn Canal Highway as the long-term solution for improving access to Juneau. The east side of Lynn Canal became a more viable consideration when the Klondike Highway was constructed in the late 1970's.

## 2.3 EXISTING TRANSPORTATION NETWORK

Access to Juneau is only possible by air and water. Commercial jet aircraft serve Juneau, Seattle, Anchorage, Ketchikan, Sitka, Wrangell and Petersburg. Commuter aircraft serve Haines, Skagway and other communities that do not have the demand or facilities for jet aircraft service. Air freight services are available at the Juneau airport. The state ferry, several commercial cruise lines, small private passenger carriers and freight carriers provide water access. The state ferry is the only public transportation system that provides transportation for both passengers and personal and commercial vehicles.

Haines and Skagway both have direct highway access to the Alaska Highway which connects with the Continental Highway System. The Haines Highway connects with the Alaska Highway at Haines Junction, Yukon Territory, and the Klondike Highway links Skagway to the Alaska Highway near Whitehorse, Yukon Territory.

**Air Service:** Air travel usually takes 30 minutes one way between Juneau and Haines and 45 minutes between Juneau and Skagway. Because of the relatively short travel times and frequent schedule, air travel is generally preferred over the state ferry for business travel.

Air service in the Lynn Canal corridor plays an important role in transporting passengers, freight and mail. However, it is frequently constrained by fog, high winds, or snow storms. Air travel in the corridor can be delayed up to several days in the fall, winter and spring. During these delays, mail service is suspended and emergency medical evacuations from Haines and Skagway must travel by ambulance to Whitehorse, Yukon Territory.

**State Ferry System:** The DOT&PF, through its state ferry system, provides public ferry service between Juneau, Haines and Skagway. During the summer, ferries provide nearly daily service

northbound and southbound between the communities. During the winter, average ferry service decreases to three or four times a week in each direction. In July 1994, the peak travel month, the number of sailings between Juneau, Haines, and Skagway totaled 33 northbound and 34 southbound. In February 1995, statistically the lowest travel month, there were 14 northbound and 14 southbound trips. Five of the six state ferries dedicated to Southeast serve the route. Four are mainline vessels with full accommodations which can carry between 69 and 134 vehicles at one time. One feeder vessel can transport 34 vehicles.

Typically, ferries sail below vehicular capacity between October and April. During the summer most sail fully loaded and are unable to accommodate all reserved space and standby traffic. During the peak travel month of July, most ferries traveling Lynn Canal are full and unaccommodated travelers must arrange to travel on a later ferry or choose not to travel.

Table 2-1 summarizes the annual vehicular traffic volume using the state ferry system in the Lynn Canal corridor (northbound and southbound).

**TABLE 2-1**
**FERRY VEHICLE TRAFFIC (1987-1995)**

| Year | Juneau-Haines Segment | Haines-Skagway Segment |
|---|---|---|
| 1987 | 28,305 | 14,869 |
| 1988 | 29,501 | 16,249 |
| 1989 | 28,865 | 16,181 |
| 1990 | 30,734 | 16,629 |
| 1991 | 32,533 | 16,902 |
| 1992 | 31,041 | 18,522 |
| 1993 | 30,098 | 17,522 |
| 1994 | 29,416 | 17,298 |
| 1995 | 29,269 | 18,416 |
| 1987-1995 Average | 30,094 | 16,954 |

A survey performed for this project indicated that one-third to one-half of all Juneau, Haines and Skagway households have considered traveling Lynn Canal on the state ferry system but did not because of scheduling or reservation problems.

A typical state ferry operates at a speed of approximately 27 kilometers (17 miles) per hour. Including staging, loading, and unloading times at each terminal, the time to travel between Juneau (Auke Bay Ferry Terminal) and Haines (Lutak Ferry Terminal) is approximately 7 hours; traveling on to Skagway adds an additional 2 hours.

Summer and winter ferry schedules are published well in advance. The summer schedule is usually published in January. Most summer reservations are made soon after the schedule is published. By May there is little northbound or southbound space available. For state ferries with no vehicle space available travelers may attempt standby vehicle space by registering at the ticket counter two hours before sailing. This is usually a first-come first-serve basis, but vehicle length is often a deciding factor.

Unscheduled maintenance of state ferries or terminal transfer facilities, and accumulated time delays, periodically cause canceled port calls. Travelers holding reservations for a canceled port call must make other reservations or wait for standby space.

**Cruise Ships:** Many tourists travel to Juneau, Haines, and Skagway on cruise ships. Between May and September of 1996 cruise ships transported more than 469,000 visitors to Juneau, 300,000 visitors to Skagway, and 94,600 visitors to Haines. It is projected the volume of visitors on cruise ships will continue to grow.

**Freight Shipments:** Because of Juneau's location and lack of highway access, all freight coming in and out of the city is shipped by air or sea with most shipped by barge. The state ferries haul wheeled freight vans which reduces available space for other vehicles. Freight is also shipped by private carrier. Most freight shipments come from the south; however, there is a private company that transports vehicles and freight year-round, once a week, between Juneau, Haines, and Skagway.

## 2.4 NEED

The needs for the project draw heavily on information gathered from the following sources:

- In January 1994 DOT&PF interviewed a variety of government agencies, business owners and special interest groups to gauge the effects improved access would have on their operation or business.

- In March 1994 meetings were conducted with a variety of public and government agency groups. These "scoping" meetings were conducted in Juneau, Haines and Skagway to solicit information about the project.

- In July 1994 DOT&PF commissioned the "Household Survey", (McDowell Group, 1994, Appendix C) to better define public perception of the transportation issues that lie between Juneau, Haines and Skagway. Random sample telephone surveys were conducted with 350 Juneau households, 100 Haines households, and 50 households in Skagway.

The need for improving surface access is based upon several factors.

**Accommodate the Travel Demand to and from Juneau**

**Resident Travel Demand:** Research for this document indicates that residents would make three more trips per year among the communities if the transportation system were improved. Respondents to the telephone survey in Juneau used the state ferry between Juneau and Haines/Skagway an average of 1.6 times the prior year. Respondents in Haines and Skagway indicated they had traveled to Juneau by ferry an average 3.8 and 3.4 times, respectively, during the same time period. Given the options of either a highway on the west side of Lynn Canal, a highway on the east side, or providing four daily trips with the existing ferries using the same fare structure, respondents from all three communities indicated they would travel more frequently (Table 2-2).

**TABLE 2-2**

**PREDICTED NUMBER OF ANNUAL SURFACE TRANSPORTATION TRIPS BY RESIDENTS OF JUNEAU, HAINES AND SKAGWAY**

| Telephone Survey Options | Juneau to Haines/Skagway | Haines to Juneau | Skagway to Juneau |
|---|---|---|---|
| Option 1-Existing Marine | 1.6 | 3.8 | 3.4 |
| Option 2-East Lynn Canal | 4.4 | 5.5 | 16.3 |
| Option 3-West Lynn Canal | 4.1 | 10.2 | 6.6 |
| Option 4-Improved Marine | 3.7 | 8.2 | 9.5 |

In addition to travelers that could not be accommodated on a state ferry sailing, the telephone survey found that almost 40 percent of the residents do not attempt to make a ferry reservation because of their own perceived problems with scheduling, cost or space availability.

The survey also found that one-half of the respondents experienced problems obtaining car space on the state ferry to travel between Haines, Skagway and Juneau.

The sailing frequency of the state ferry system typically requires resident travelers to spend at least one night away from their homes. The survey indicated that 57 percent of those polled in Juneau have at least sometimes experienced problems with sailing schedules. Residents polled in Haines and Skagway, with more dependence on travel to Juneau for shopping and services, have at least sometimes experienced schedule problems 82 percent and 62 percent of the time, respectively.

In 1994 DOT&PF recorded the number of travelers whose request for a vehicle reservation to travel between Juneau and Haines/Skagway was denied because of a lack of ferry space. For the first three months of 1994, immediately after the spring/summer state ferry system schedule was published, reservation requests for 1,135 vehicles and 4,825 passengers to travel among the three communities were unable to be accommodated.

Projected annual vehicle traffic volumes are also an indicator of the need for improvements. If there were no limits on schedules or physical barriers today, about 210,000 vehicles per year would travel

among the communities. This is about the same number of vehicles that currently use the Klondike Highway. The state ferry system accommodates about one-seventh of that total or about 30,000 vehicles per year. The estimated annual vehicle trips for each alternative evaluated are shown in Table 2-3.

**TABLE 2-3**

**1996 ESTIMATED ANNUAL TRAFFIC VOLUMES**

| | |
|---|---|
| East Lynn Canal | 210,000 |
| West Lynn Canal | 147,000 |
| Improved Marine | 77,000 |
| Existing Marine | 30,000 |

Another important indicator of traveler demand is the comparison of annual traffic growth rates for highways connected to the Lynn Canal/Taiya Inlet corridor with the annual traffic growth rate in the corridor. Traffic on the Klondike and Haines highways has increased about 2 percent per year for the past nine years. Juneau's main arterial, Egan Drive, has seen traffic volumes increase about 3 percent per year for seven years. Traffic on the Alaska Highway in the Yukon Territory between Whitehorse and Beaver Creek has increased 2 percent per year for many years. Yet the annual traffic growth rate in Lynn Canal on the state ferry system has been flat for the past decade.

**Reduce Travel Cost to User and State**

One of DOT&PF's goals is to minimize travel costs for users and the state. Reduced user costs will promote travel opportunities, economic growth, and cultural diversity. Reduced state costs will save tax dollars or allow allocated monies to be used for other programs.

The state ferry system charges passenger and vehicle fares for travel among the three communities. For example, a family of four traveling between Skagway and Juneau with a 19-foot vehicle would have an out-of-pocket expense exceeding $160 not including meals, refreshments or stateroom. To travel the same 91 miles (Auke Bay to Skagway) by highway, the cost would be about $20 - a difference of $140. These costs do not include the value of a user's time while in transit (9.1 hours using the state ferry system and 2 hours by the East Lynn Highway connection).

Currently, the state subsidy for travel by ferry through the corridor averages $64 per vehicle after considering fare and miscellaneous revenue. The state subsidy for a similar length of land highway in southeast Alaska averages about $7 per vehicle - a difference of $57.

As stated in Section 2.1, EPA does not concur with reducing state and users costs as elements of project need (see EPA letter, Section 7.7). EPA feels that although reducing costs are important overall goals and potential benefits, they are not essential in defining need for the project. They believe costs impose very narrow constraints on the decision-making process that heavily bias alternative selection in favor of a road alternative.

**Improve Transportation to State Capital**

Because Juneau is not connected by highway with the larger population centers of the state, access to the seat of government is perceived to be difficult. Many Alaskans have expressed a desire to move the capitol from Juneau closer to the more populous areas of the state for better access to their seat of government. For example, comments from Fairbanks area residents indicate those who support Juneau as the state capital believe the number one problem with Juneau as the capital is the lack of highway access.

**Improve Transportation**

Throughout this project, input from most people has indicated that improving transportation is an important need for their families and their communities. The 1994 telephone survey revealed:

- Over 70 percent of respondents in Haines and Skagway stated that improving transportation to Juneau is important to their households. In Juneau, over 60 percent stated this to be the case.

- An overwhelming majority, more than three-quarters in each community, stated improving transportation is important to their respective community; and,

- Less than 3 percent of respondents felt transportation improvements were not needed.

In addition to telephone survey data, the March 1994 scoping effort revealed many diverse opinions on how to implement better transportation; yet, the majority of those commenting agreed that transportation improvements are necessary.

The reasons that substantiate why transportation improvements are important to residents are predominately quality of life issues. From a personal perspective, they are based on a reduction in cost of living and ease of travel. From a community perspective the reasons are principally economic development.

Additionally, there are ongoing transportation issues that are vital to the economic well being of the three affected communities.

- The continuing reduction in state revenues has limited DOT&PF's ability to deliver the improved level of ferry transportation service demanded by coastal communities statewide. Without additional financial support service cannot be improved for one area of the system without reducing service for another area. Consequently, Juneau, as the state capital, and Haines and Skagway, as gateways to the interior, could experience negative economic and social consequences if ferry service is improved elsewhere in the state or region. There are clearly not enough vessels in the state ferry system to accommodate all community and traveler demands; and,

- Haines and Skagway residents have expressed concern that continued reductions in state highway maintenance funding could lower their quality of life with extended closures of the Haines Highway and Klondike Highway during the winter. Low volumes of vehicle travel during the winter encourage consideration of closure. Higher volumes of traffic resulting from improved access to Juneau may be viewed as one way to increase the importance and priority of these highways to ensure winter maintenance continues.

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# 3.0 PROJECT ALTERNATIVES

This section describes the range of alternatives evaluated to improve surface transportation access to Juneau. The evaluations are based, in part, on the "Juneau Access Improvements Reconnaissance Engineering Report", (H.W. Lochner, Inc., 1994), "Juneau Access Improvements Technical Alignment Report", (H.W. Lochner, Inc., 1996, Appendix B), and the "Juneau Access Improvements User Benefit Analysis", (H.W. Lochner, Inc., 1996, Appendix A).

This section is divided into the following subsections: 3.1 - Alternatives Not Carried Forward; 3.2 - Alternatives Advanced; 3.3 - Alternative Analysis; 3.4 - Funding Strategies; and 3.5 - Toll and Fare Revenues.

## 3.1 ALTERNATIVES NOT CARRIED FORWARD

Several alternatives identified in the "Juneau Access Improvements Scoping Report", (FPE/Roen-Lochner, 1994) and one suggested by the community of Haines were determined not to be reasonable alternatives after completing engineering, economic or environmental analysis.

### 3.1.1 Alternative 3 (West Lynn Canal Highway)

Alternative 3 would extend Glacier Highway to Sawmill Cove where a ferry terminal would be constructed. A shuttle ferry system would operate between Sawmill Cove and William Henry Bay on the west side of Lynn Canal. From William Henry Bay to Haines a 58 kilometer (36 mile), two lane highway would be constructed, providing access to Haines and the Haines Highway. A shuttle ferry would operate between the Haines and Skagway ferry terminals to provide access to Skagway and the Klondike Highway.

The highway would be a 9.1 meter (30 foot) wide paved surface with two 3.4 meter (11 foot) lanes and 1.2 meter (4 foot) shoulders. The design speed would vary from 50 to 80 kilometers (30 to 50 miles) per hour.

Alternative 3 uses the same highway alignment as Alternative 2 and Alternative 4, options B and D, between the terminus of Glacier Highway at Echo Cove and Sawmill Cove. The Berners Bay shuttle ferry terminal would be constructed adjacent to Sawmill Cove (Figure 3-1). Shuttle ferry service from Berners Bay to William Henry Bay would be provided by two 23 knot vessels making

at least 10 daily roundtrips on an hourly basis from May through September. From October through April the shuttle ferry service would be reduced to one vessel.
Due to the beam sea-conditions in Lynn Canal, the vessels would be similar to a modified SWATH (Small Water Area-Twin Haul) vessel ("Marine Segments Report", Art Anderson Associates, 1996, Appendix B). The SWATH ferry analyzed for this project is 54.6 meters (179 feet) long and 23.4 meters (77 feet) wide with a capacity of 58 vehicles and 400 passengers and crew. The cost would be approximately $19,000,000 for each vessel. At 23 knots, they could maintain an hourly turnaround between Berners Bay and William Henry Bay.

A third vessel would provide service from Haines to Skagway making at least six roundtrips daily during the summer and three or four roundtrips daily in the winter.

**Highway Alignment Details:** Alternative 3 (Figure 3-2) would begin at the end of Glacier Highway at Echo Cove. The alignment would be within the USDA Forest Service (Forest Service) right of way through Goldbelt, Incorporated (Goldbelt) property a distance of 4.5 kilometers (2.8 miles).

From a new ferry terminal at William Henry Bay, the highway alignment would follow the coast north for 8 kilometers (5 miles) to the Endicott River generally along the 25 meter (80 foot) elevation. This section of highway topography consists of fairly steep, timbered slopes. The Endicott River would be bridged across a broad floodplain near the confluence with Lynn Canal. The alignment would continue northwesterly along a beach terrace for 14.5 kilometers (9 miles) to the Sullivan River. This stretch of terrain is moderately steep and dominated by karst topography.

Karst is a geological feature characterized by caves, sinkholes and caverns resulting from erosion and mineral dissolution of limestone and marble bedrock. During the archaeological survey of the corridor, numerous caverns and sinkholes were encountered. An investigating archaeologist could not reach or see the bottom of several sinkholes. The rugged terrain and heavy vegetation made it difficult to determine the number of caverns and sinkholes along the corridor. Karst can be an unstable highway foundation and can present substantial engineering hurdles.

Proceeding north from the Sullivan River the alignment would cross 2.5 kilometers (1.5 miles) of the lowlands and continue north for 4.8 kilometers (3 miles) along moderately steep, forested slopes. The highway alignment would be several hundred meters from the shoreline, screened by trees but allowing periodic views of Sullivan Island.

This section of the alignment would pass a seal haulout 100 meters (330 feet) from shore, 3.2 kilometers (2 miles) north of the Sullivan River. The haulout rock is 200 meters (660 feet) from the highway alignment. The northern boundary of the Tongass National Forest lies 17 kilometers (10.5 miles) due north of the Sullivan River or 2.4 kilometers (1.5 miles) south of Glacier River.

Continuing north, the alignment would cross two small river deltas separated by a 2 kilometer (1.2 mile) steep ridge that would force the alignment close to the shoreline. The deltas are 2.4 kilometers (1.5 miles) wide each, with a few scattered wetlands, none of which the highway alignment would encroach.

The highway alignment would then bear northeast for 3 kilometers (1.9 miles) along steep terrain before reaching the delta area across the front of Davidson Glacier. This area is 7 kilometers (4.4 miles) wide and crosses 4.8 kilometers (3 miles) of the Davidson Glacier terminal moraine. A bridge would cross the active, south branch of the Glacier River.

Following the moraine section, the highway would continue along steeper terrain for 2.4 kilometers (1.5 miles) to Ludaseska Creek. The entire length is within or near avalanche slopes. The alignment would continue along another 4 kilometers (2.4 miles) of steep topography until reaching a small, flat delta created by an unnamed creek. The alignment along the steep slopes of this section would be close to shoreline.

From the beginning of the delta the alignment would cut inland for 2 kilometers (1.2 miles) to cross an unnamed creek and reach the steep, southern shoreline of Pyramid Harbor, then it would follow the shoreline to Green Point, at the north end of Pyramid Harbor. Near Pyramid Harbor, the highway alignment would be adjusted to avoid a fringe of wetlands along the north shoreline.

From Pyramid Harbor the alignment would bridge Chilkat Inlet at Green Point to the Chilkat Peninsula, north of Pyramid Island. The alignment would connect with Mud Bay Road, 2.4 kilometers (1.5 miles) from Haines.

Travelers to Skagway would drive 4 kilometers (2.5 miles) to connect with a shuttle ferry at the Haines Ferry Terminal.

**Ferry Terminals:** Alternative 3 would require construction of two new ferry facilities, one at Berners Bay and one at William Henry Bay, and modification to the Haines and Skagway ferry facilities. The two new terminal buildings would include restrooms, offices, storage and comfortable

waiting for 100 people. The holding areas would have capacity for 108 vehicles. Parking spaces would be provided for employees cars and walk-on passengers.

The Haines and Skagway ferry facilities would be modified to accommodate end-loading vessels. The ticketing operations would remain essentially unchanged. The existing staging area and buildings would be adequate.

Construction costs for Alternative 3 are estimated to be $198,600,000, with annual maintenance and operation costs estimated at $16,600,000. The 58 kilometer (36 mile) highway is projected to serve an annual average traffic of 642 vehicles per day and 1,484 vehicles per day during peak periods, in the year 2025. For more cost information and a comparison of each alternative, refer to Table 3-2 on page 3-23.

**Rationale for not Advancing**

Although a highway along the west side of Lynn Canal was seriously considered in the 1960's and 1970's, there are several reasons why it is no longer practicable:

- Alternative 4 requires less capital cost with comparable travel times; and Alternative 2 requires less maintenance and operational cost with comparable construction cost, lower user cost, comparable travel time between Juneau and Haines, and less travel time between Juneau and Skagway.

- The Klondike Highway from Skagway to the continental highway system provides an alternative routing that did not exist during earlier studies.

- The economic user benefit analysis indicates this alternative only provides marginal benefits.

- Criteria to avoid bald eagle trees would require the previous highway alignment be shifted inland over karst topography, an unreliable highway construction foundation.

- There would be longer periods of winter driving conditions on the west side alignment because it is less exposed to sunlight.

Therefore, Alternative 3 is no longer being pursued as a reasonable alternative. Appropriate resource information and reports on Alternative 3 are presented in Section 4.0, Affected Environment, and in the Appendices.

### 3.1.2 Taku River Valley Highway

Highway access through the Taku River Valley, connecting Juneau with the continental highway system at Atlin, British Columbia, was considered during the reconnaissance study phase ("Juneau Access Improvements Reconnaissance Engineering Report", H.W. Lochner, Inc., 1994). The route would begin at the end of Thane Road, southeast of Juneau, and continue northeast along Taku Inlet, across the Alaska-Canada border, up the Taku River valley, and along the Sloko and Pike River valleys connecting to Canadian Highway 7 south of Atlin. This alternative would require a 211 kilometers (131 miles) long, of which 133 kilometers (82 miles) would be in Canada.

While the Taku corridor has been considered for decades, the British Columbia provincial government does not support the Taku River Valley Highway alternative. A letter from the British Columbia Minister of Transportation and Highways stated, in part, that *"...impacts of such a route present insurmountable obstacles to the extent that we cannot contemplate a development of this nature"* (Charbonneau, 1993). Without support of affected governments in Canada, the highway could not be analyzed in detail and further evaluation of this alternative was not considered prudent. Canadian Native groups also strongly opposed this alternative during the reconnaissance study because of unresolved native land claim in the Taku River Valley. This alternative would require continued ferry service between Juneau, Haines and Skagway. Accordingly, it would have the highest capital and annual maintenance costs of any alternative. This alternative was dropped from further consideration because it cannot be implemented without Canadian government support.

### 3.1.3 East Lynn Canal Rail

In response to public and agency requests during scoping activities, the feasibility of a rail link between Juneau and Skagway along the east side of Lynn Canal was examined. Relative construction costs for a railroad and a highway were determined and compared for a 13.5 kilometer (8.4 mile) section of the corridor. This was determined to be a practicable method to assess the feasibility of constructing the rail alternative. It would also require a shuttle ferry to transport passengers and vehicles between Haines and a terminal located near the Katzehin River.

The section begins near Comet and extends to just north of Eldred Rock (Figure 3-3). The terrain and topography is generally representative of the corridor, ranging from mountainous (most severe) to level (most moderate).

Design standards for the railroad were based on criteria provided by the Alaska Railroad Corporation. The standards include accommodations for passengers and freight, as well as flatbed rail cars to transport private and commercial vehicles.

A comparison of the costs to construct a highway and a railroad is presented in Table 3-1. This comparison only analyzes the embankment portion of the work. Costs for surfacing the railbed, ties and rails, rolling stock, ballast, and maintenance and operation of the railroad were not identified. Similarly, no costs were identified for surfacing, maintenance, or using the highway. This comparison shows the initial cost to construct a railroad is more than two and a half times higher than the highway alternative. The primary difference is attributed to the tunnel construction required to achieve flatter grades and straighter alignment necessary for safe railway travel. Also, the alignment could not avoid all the bald eagle nests along the corridor.

This limited analysis shows that a rail system would function much like a ferry system except it would operate on an expensive to build and maintain railroad bed not required by the ferry system. As a result of the higher costs, impacts to bald eagles, and similarity to a ferry system, the railroad alternative was dropped from further analysis.

**TABLE 3-1**
**HIGHWAY AND RAILROAD COST COMPARISON**

| Item | Unit | Highway | | | Railroad | | |
|---|---|---|---|---|---|---|---|
| | | Quantity | Unit Price | Cost ($1,000) | Quantity | Unit Price | Cost ($1,000) |
| Unclassified Excavation | cubic meter | 505,200 | $3.00 | $1,516 | 396,485 | $3.00 | $1,189 |
| Rock Excavation | cubic meter | 336,800 | $8.00 | $2,694 | 264,335 | $8.00 | $2,115 |
| Tunnels | linear meter | 0 | $16,400 | 0 | 1,350 | $11,500 | 15,525 |
| Bridges | sq meter | 3,195 | $1,200 | $3,834 | 1,620 | $1,800 | $2,916 |
| Subtotal | | | | $8,044 | | | $21,745 |
| Project Engineering | % subtotal | | 4% | $322 | | 4% | $870 |
| Construction Engineering | % subtotal | | 5% | $402 | | 5% | $1,087 |
| Contingencies | % | | 10% | $877 | | 10% | $2,370 |
| **Total Section Cost** | | | | **$9,645** | | | **$26,072** |

### 3.1.4 Goldbelt - Ferry Shuttle Service from Cascade Point

Goldbelt recently developed an overall Master Plan for its Berners Bay holdings at Echo Cove. The plan evaluates land assets, environmental sensitivities, and development opportunities, both near-term and long-term. One of the development opportunities identified by Goldbelt is a high speed

ferry operation from Berners Bay at Cascade Point to Haines and Skagway. The privately-owned ferry system envisioned would use 150 passenger and 40 vehicle capacity ferries, and would supplement existing state ferry system service to Haines and Skagway.

To develop Goldbelt's high speed ferry option, a highway would be built from the end of Glacier Highway at Echo Cove to Cascade Point. An agreement among the Department of Transportation and Public Facilities (DOT&PF), United States Department of Agriculture Forest Service (Forest Service), and Goldbelt provides that access to Cascade Point would be along a Forest Service right-of-way. A special use permit from the Forest Service would be required to use this right-of-way. Goldbelt is preparing an environmental impact statement under the direction of the Forest Service, Juneau Ranger District in order to obtain the special use permit.

This alternative is not being advanced because it is similar to Alternative 4, Option B (Section 3.2.3). Should Alternative 4 be selected, DOT&PF may enter into discussions with Goldbelt to determine how best to implement the option.

### 3.1.5 Haines/Skagway Intertie

A direct highway intertie between Haines and Skagway has been discussed for decades. The Haines Chamber of Commerce and Borough Assembly have passed resolutions supporting construction of Alternative 2 between Echo Cove and the Katzehin River delta and a highway intertie between Haines and Skagway (Figure 3-4). A high speed ferry would connect Haines and the Katzehin Ferry Terminal.

Two options have been proposed for the intertie. The first would extend Lutak Road around Lutak Inlet and up the Ferebee River valley. A 2,440 meter (8,000 foot) tunnel would be constructed through the mountain near Burro Creek to Taiya Inlet where the highway would extend to Dyea Road near Skagway (estimated cost $163,900,000). The second option would extend Lutak Road around Lutak Inlet to Taiya Inlet and then follow the west shoreline to Dyea Road (estimated cost $125,000,000). The estimated capital costs of the intertie, including an upgraded shuttle ferry system, would be in addition to the $177,000,000 construction cost of the highway and the shuttle ferry from Echo Cove to Haines.

The direct highway intertie between Haines and Skagway would adversely impact the Chilkoot Trail and Dyea National Historic Landmark. Federal Highway Administration regulations prohibit the use of national historic landmarks, historic sites and parks unless there is no other prudent and feasible

alternative (Section 4(f) Evaluation (49 U.S.C 303)). Alternatives 1, 2 and 4 are other feasible and prudent alternatives.

Because of the specified regulations and higher capital costs, the intertie between Haines and Skagway alternative is not advanced.

### 3.1.6 East Lynn Canal Shuttle Ferry Service Through Berners Bay

In response to agency comments, the feasibility of operating a shuttle ferry system to avoid the Berners Bay area was investigated.

The feasibility of providing shuttle ferry service from Cascade Point to Slate Creek in lieu of a highway around Berners Bay was evaluated (Figure 3-5).

The capital cost for 16.2 kilometers (10 miles) of highway and two bridges from Cascade Point to Slate Creek is estimated at $35,800,000. The annual maintenance cost of this length of highway is estimated to be $215,500. User cost per vehicle for this section of the highway would be $1.94 without a highway toll and $2.32 with a toll.

The capital cost for a shuttle ferry system that would accommodate predicted traffic volumes is $52,000,000. Two monohull vessels, each with a capacity for 50 vehicles and 250 passengers would travel at 20 knots between the two ports. From May to September the vessel would operate daily, providing one way service every hour for 12 to 18 hours per day depending on seasonal demand.

Annual maintenance and operation cost for the shuttle ferry system would be $6,100,000. Annual fare revenues would be $4,600,000, resulting in net annual state maintenance and operation cost of $1,500,000. One-way user costs per vehicle with an occupancy rate of 2.3 passengers would be $20.35 without a highway toll and $22.52 with a toll.

Rationale for not advancing:

- Capital costs for a shuttle ferry system from Cascade Point to Slate Creek is one and one-half times more than a highway link around Berners Bay valley.

- Annual maintenance costs of a shuttle ferry system would be seven times higher than a highway link.

- Per vehicle user costs on the shuttle ferry would be ten times greater than a highway link.

For the above reasons, greater annual maintenance and operation costs, increased user cost, construction of two ferry terminal in Berners Bay, large wakes generated by the ferries and increased traveler delay in lieu of a highway connection, this alternative is not advanced.

## 3.2 ALTERNATIVES ADVANCED

After completing the engineering and environmental studies, only Alternative 2 and Alternative 4 were determined reasonable build alternatives and have been carried forward in this Draft Environmental Impact Statement (DEIS).

Glacier Highway in Juneau would be extended 8 kilometers (5 miles) to Sawmill Cove for all build alternatives, except Alternative 4, Option A. Glacier Highway runs north from downtown Juneau 66 kilometers (41 miles) to the south end of Echo Cove. The pavement ends about 29 kilometers (18 miles) north of the Auke Bay Ferry Terminal, the remaining 13 kilometers (8 miles) has aggregate surfacing. Paving and/or realignment of the 42 kilometers (26 miles) north of the Auke Bay Ferry Terminal is included within DOT&PF's current Statewide Transportation Improvement Program and is not included in the cost estimates of the advanced alternatives.

### 3.2.1 Alternative 1 (No-Build/Transportation System Management)

This alternative would continue the existing mainline ferry service in Lynn Canal. Service would continue to transport about 95,000 passengers and 30,000 vehicles annually between Haines, Skagway and Juneau. DOT&PF would continue to adjust ferry service to best accommodate all Southeast Region.

DOT&PF is studying options to enhance the efficiency of the existing fleet while maintaining an acceptable level of service to each community. Some of the options being considered would reduce overall travel time throughout the region by decreasing port time and/or reducing service to some communities, while increasing service to others. One primary objective of all scheduling options

considered is to increase service within Lynn Canal, which, historically, is one of the highest demand and revenue generating routes for the ferry system.

The DOT&PF has a new 380-foot vessel, the M/V Kennicott, under construction. This is an "Ocean Class" vessel designed for a number of applications including service as a mainline vessel, in either protected waters or ocean crossings. It will operate at approximately 17 knots and have capacity for 120 vehicles and 750 passengers. The construction schedule calls for the vessel to be operational in 1998. A decision on whether the M/V Kennicott will operate in Southeast Alaska, become a ninth vessel in the fleet or replace an older vessel has not yet been made. Therefore, it is unclear how much additional capacity between Juneau, Haines, and Skagway would be available. The M/V Kennicott will neither meet the traffic projections in Table 3-2 (Alternative 4), nor substantially increase service in Lynn Canal, even if the current fleet remains in service.

One option to improve service in Lynn Canal when the M/V Kennicott comes on line would be to convert the M/V Malaspina to a day boat. Although this option would provide additional daily service and a consistent sailing schedule without reducing service to other communities, it would not be able to accommodate the demand for travel between Juneau, Haines and Skagway.

The annual maintenance and operating cost for the existing Lynn Canal ferry service is approximately $8,400,000. Revenues from user tolls recover approximately $6,500,000 of this cost. The capital cost required for this alternative in 1996 dollars is $95,400,000 over a 20 year economic time period.

### 3.2.2 Alternative 2 (East Lynn Canal Highway)

Alternative 2 would construct a 105 kilometer (65 mile) highway along the east side of Lynn Canal, connecting Juneau and Skagway (Figure 3-6). A shuttle ferry would provide access between a new ferry terminal on the north side of the Katzehin River delta (Katzehin Ferry Terminal) and the existing Haines Ferry Terminal (Figure 3-7). If Alternative 2 is selected, mainline ferry system service would be discontinued between Juneau, Haines and Skagway.

The 9.1 meter (30 foot) wide paved highway would consist of two 3.4 meter (11 foot) lanes and 1.2 meter (4 foot) shoulders. The design speed would vary from 50 to 80 kilometers (30 to 50 miles) per hour depending on terrain. The highway in Alternative 2 would connect the end of Glacier Highway at Echo Cove and in 2nd Avenue Skagway. From 2nd Avenue vehicles would use either State Street, Main Street, or Alaska Street to access the Klondike Highway. Skagway city streets are adequate to accommodate the projected traffic.

For access between Haines and the East Lynn Canal highway a double ended passenger-auto ferry similar to the single car deck ferries used in Puget Sound is proposed. The ferry would shuttle vehicles and passengers between the Katzehin Ferry Terminal and Haines. The ship has a capacity of up to 250 passengers and 48 vehicles. The distance one way would be 11.6 kilometers (7.2 miles), requiring 46 minutes travel time. From May to September, the vessel would operate daily, providing one way service every other hour for 12 to 18 hours per day depending on seasonal demand.

The "Juneau Access Improvements Reconnaissance Engineering Report", (H.W. Lochner, Inc., 1994) was used as a basis to initiate the DEIS scoping and field studies. Based on scoping comments and resource information gathered during field studies, design adjustments were made to the highway alignment. In most cases, these design adjustments are minor shifts in horizontal or vertical alignment to take advantage of terrain features or to avoid bald eagle nesting trees.

The most notable design alignment adjustments made during the Preliminary Draft Environmental Impact Statement (PDEIS) phase are along Echo Cove, around Berners Bay, and behind Gran Point. These areas were analyzed in detail and a discussion of costs, alignment and impacts avoided are discussed in the "Technical Alignment Report", H.W. Lochner, Inc., 1996 (Appendix B) and the "Steller Sea Lion Technical Report", FPE/Roen Engineer, 1996 (Appendix D).

- Along Echo Cove, Goldbelt proposes to construct an access road from the end of Glacier Highway to Cascade Point using Forest Service highway right of way. At the request of the Forest Service, DOT&PF has adjusted the highway alignment to also use the Forest Service right of way.

- The alignment around Berners Bay has been adjusted to lessen impacts on the Antler, Lace and Berners rivers and adjacent wetlands.

- The alignment has been modified through the Gran Point Critical Habitat Area to minimize impacts to Steller sea lions.

**Highway Alignment Details:** Alternative 2 would begin at the end of Glacier Highway at Echo Cove. The highway would be within Forest Service right of way through Goldbelt property a distance of 4.5 kilometers (2.8 miles). The alignment would bear east, away from the shore near Sawmill Creek to minimize effects on wetlands and recreational values in the area and avoid the remnants of a historic sawmill.

The alignment would continue north, above the beach fringe where practicable, for 5 kilometers (3.1 miles) to the head of Berners Bay. Upon reaching the head of the bay, the alignment would continue north 3.2 kilometers (2 miles) where it would curve to the northwest, bridging the Antler River then southwest, bridging the Lace River (Figure 3-8). Upon reaching the west side of Berners Bay, 1.6 kilometers (1 mile) south of Johnson Creek, the highway would turn to the south for 2.9 kilometers (1.8 miles) to an un-named point east of Slate Creek. The alignment would then turn to the northwest to bridge Slate Creek and then to the southwest climbing to an elevation of 60 meters (200 feet). Turning to the northwest, the highway would meet the eastern shore of Lynn Canal 6.5 kilometers (3.5 miles) north of Point St. Mary.

The alignment would then parallel the Lynn Canal coastline for 7 kilometers (4.2 miles) to Point Sherman, bearing northwest along the moderate slopes of a ridge to the east. At Point Sherman, the alignment would continue north for 4 kilometers (2.4 miles) across a fairly flat, knobby area to Independence Lake. Through this section, the alignment would cross Sweeney Creek, the Kensington Mine project and Sherman Creek. This entire section of the highway alignment, from its entrance to Lynn Canal to just beyond Independence Lake, would be set back from the shoreline and generally screened by trees. The slopes are moderate to fairly flat with no avalanche hazards.

Sufficient design analysis has been done to determine that the alignment could cross the Kensington Mine project without adversely affecting mine operations. A detailed engineering analysis of the alignment through the mine area would be initiated should Alternative 2 be selected. Coordination is ongoing between DOT&PF and Coeur Alaska Incorporated, the developers of the Kensington Mine project.

From Independence Lake to the Katzehin River, a distance of 35 kilometers (22 miles), the alignment would follow steep terrain along the base of the Kakuhan Range. Thirty-three of the 58 avalanche

paths mapped along east Lynn Canal are within this section ("Snow Avalanche Report", Mears and Glude, 1996, Appendix B).

Two Steller sea lion haulouts are located between Independence Lake and the Katzehin River ( Met Point and Gran Point). The Met Point haulout is 5.6 kilometers (3.5 miles) northwest of Independence Lake. The alignment along Met Point would be 200 meters (656 feet) from the haulout in a 20 meter (65 foot) through-cut section.

The Gran Point haulout (Figure 3-9) is 8 kilometers (5 miles) south of Katzehin River. The haulout is classified by the National Marine Fisheries Service (NMFS) as a Critical Habitat Area and as such it is necessary to limit potential disturbance. Three alignment options, discussed in Section 5.3.5 were analyzed through the Gran Point Critical Habitat Area.

From the Katzehin River bridge crossing near the mouth of the river the alignment would proceed northwest for 2 kilometers (1.2 miles) across the Katzehin River delta on the east side of an existing landing strip and above mud flats wherever practicable. The proposed ferry terminal would be located at the north end of the Katzehin River delta. A detailed site analysis would be conducted for the shuttle ferry terminal if Alternative 2 is selected.

From the Katzehin River delta the alignment would follow the coastline northwest for 4 kilometers (2.5 miles) to Low Point, at the beginning of Taiya Inlet. The community of Haines would be seen along this section. The highway alignment would turn northeast along Taiya Inlet for 20 kilometers (12.5 miles) to Skagway. Taiya Inlet has the steepest, most rugged terrain of the entire route. The alignment would take advantage of terrain features wherever practicable but extensive cuts and fills would be required. Several viaducts and a combination of partial cuts and structures likely would be used along Taiya Inlet to minimize rock excavation and visual impacts. This section would be the most difficult to construct because of its steepness and lack of access points for construction equipment.

The alignment would cross the northern boundary of the Tongass National Forest 2.8 kilometers (1.7 miles) south of Skagway. The alignment would enter Skagway along the shore, at an elevation of 10 meters (33 feet), tying into the White Pass Dock to avoid the cliff-side paintings known as the Ship Registry (Figure 3-9). The Ship Registry, which dates back to 1918 is included in the National Registry of Historic Places. The exact connection of the alignment into Skagway would be selected after public and agency review of the DEIS if Alternative 2 is selected.

**Ferry Terminals:** Alternative 2 would require a shuttle ferry terminal constructed on the north side of the Katzehin River delta and the Haines Ferry Terminal modified. Costs for ferry terminal construction and modifications are included in the total construction costs shown in Table 3-2.

The Katzehin shuttle ferry terminal would feature an end-loading slip. From the main highway, there would be a two lane access road to the ferry staging area. Although this terminal would not be staffed, facilities including restrooms, vending machines and telephones would be available. The ferry would make 8 to 10 roundtrips per day, beginning in Haines at approximately 6:00 a.m. In the winter, there would be 3 to 5. A few sailings throughout the year may be canceled on short notice whenever winds exceed 80 kilometers (50 miles per hour).

The shuttle ferry terminal may require a breakwater because of exposure to the wave action. Due to the steep slope of the seabed, a floating breakwater may be used. A detailed wave and engineering analysis would be required if Alternative 2 is selected.

The Haines Ferry Terminal and moorage structures would be modified to accommodate the end-loading shuttle ferry. The terminal would also maintain its ability to moor mainline ferries and possibly tour ships. Should additional ferry capacity become necessary, the terminal could be relocated closer to Haines in the vicinity of Kelgaya Point. This would reduce the one way ferry distance from 11.5 kilometers (7 miles) to 3.2 kilometers (2 miles). Time enroute between each port would be reduced from 46 minutes to 13 minutes.

The construction costs for Alternative 2 are estimated at $232,300,000. Annual maintenance and operation costs are estimated at $4,300,000. The 105 kilometer (65 mile) highway is projected to serve an annual average traffic of 918 vehicles per day in the year 2025. For more cost information and a comparison of each alternative, refer to Table 3-2.

### 3.2.3 Alternative 4 (All-Marine)

**Overview:** Alternative 4 consists of four options - A, B, C and D. These options, designed to increase service in Lynn Canal by either augmenting or replacing mainline ferry service, would provide faster and more frequent service from Juneau to Haines and Skagway via the state ferry system (The Marine Segments of the Juneau Access Study, Art Anderson Associates, 1996, Appendix B).

**High-Speed Shuttle Ferry:** The high-speed ferry considered for all options of this alternative is an INCAT 84 meter (275 feet) wavepiercing catamaran (Figure 3-11). Many vessels of the wavepiercer design operate in open seas in Australia, Europe and South America. The vessel travels at an average speed of 46 kilometers (29 miles) per hour with a top speed of 67 kilometers (42 miles) per hour and has a capacity of 105 vehicles and 777 passengers. Other vessel characteristics are shown in Table 3-3.

**TABLE 3-3**
**HIGH SPEED FERRY**
**SHUTTLE FERRY CHARACTERISTICS**

| CHARACTERISTIC | 84M WAVEPIERCER |
|---|---|
| Length | 83.85 Meter (275 feet) |
| Beam | 26 Meter (85 feet) |
| Draft, fully loaded | 3.05 Meter (10 feet) |
| Crew of 23<br>Deck<br>Engine<br>Passenger Service | <br>9<br>4<br>10 |
| Cruise Speed for this service | 25 knots (29 mph) |
| | |

| | |
|---|---|
| Vehicle Capacity | 105 |
| Passenger Capacity | 777 |
| Propulsion | Diesel |
| Approximate fuel rate | 600 gallon/hour |

All Alternative 4 options are projected to serve an annual average daily traffic of 336 vehicles per day to the year 2025.

**Ferry Terminals:** Alternative 4 would require improvements to the Auke Bay, Haines, and Skagway ferry terminals. End-loading facilities would be constructed at each ferry terminal. Existing staging areas would be adequate to support all options.

With options B and D, Glacier Highway would be extended 8 kilometers (5 miles) to a ferry terminal at Berners Bay. The new terminal would be the same as that described in Alternative 3 (Figure 3-1).

### 3.2.3 (a) Option A - Mainline Ferry Service with Shuttle Service from Auke Bay

Overview: Option A would continue mainline ferry service to Haines and Skagway, with one wavepiercing shuttle ferry providing three roundtrips per day from Auke Bay to Haines and two to Skagway from Haines during peak travel periods. **(Figure 3-12).**
Travel time on the shuttle and mainline is estimated to be 7.5 and 11 hours respectively roundtrip between Auke Bay and Skagway, stopping in Haines each direction.

A service schedule for the shuttle ferry between Auke Bay and Skagway is illustrated in Table 3-4. Augmented with existing service, this schedule would accommodate the projected traffic demand for this alternative.

**TABLE 3-4**
**ROUTE SIMULATION MODEL FOR OPTION A**
**SHUTTLE FERRY***

| Depart Auke Bay | Arrive Haines | Depart Haines | Arrive Skagway | Depart Skagway | Arrive Haines | Depart Haines | Arrive Auke Bay |
|---|---|---|---|---|---|---|---|
| MAY - SEPTEMBER | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | 6:00 am | 8:38 am |
| 9:00 am | 11:38 pm | 12:00 pm | 12:38 pm | 1:00 pm | 1:38 pm | 2:00 pm | 4:38 pm |
| 5:00 pm | 7:38 pm | 8:00 pm | 8:38 pm | 9:00 pm | 9:38 pm | 10:00 pm | 12:38 pm |
| 11:00 pm | 1:38 am | - | - | - | - | - | - |
| **OCTOBER - APRIL** | | | | | | | |
| - | - | - | - | - | - | 7:00 am | 9:38 am |
| 10:00 am | 12:38 am | - | - | - | - | - | - |

**During the winter schedule, no wavepiercers are needed between Haines and Skagway. The existing ferry service would accommodate the demand on this link.*

The construction costs for Option A are estimated at $57,600,000 not including existing ferry system rehabilitation work. Maintenance and operation costs are estimated at $19,300,000 annually.

### 3.2.3 (b) Option B - Mainline Ferry Service with Shuttle Service from Berners Bay

Overview: Option B would continue mainline ferry service to Haines and Skagway with one supplemental shuttle ferry operating from a ferry terminal at Berners Bay during the summer season and from the Auke Bay Ferry Terminal during the winter season (Figure 3-13). The vessel would make three trips per day between Auke Bay and Haines and two trips per day between Haines and Skagway, the same service as option A, but with less running time.

The travel time for the shuttle ferry during peak periods from Auke Bay would be less since the distance is shorter between Berners Bay and Skagway. Travel time is estimated to be 6 hours round-trip between Berners Bay and Skagway, stopping in Haines each direction.
A service schedule for the shuttle ferry that would meet the projected demand is illustrated in Table 3-5.

**TABLE 3-5**
**ROUTE SIMULATION MODEL FOR OPTION B**
**SHUTTLE FERRY***

| Depart Berners Bay | Arrive Haines | Depart Haines | Arrive Skagway | Depart Skagway | Arrive Haines | Depart Haines | Arrive Berners Bay |
|---|---|---|---|---|---|---|---|
| **MAY - SEPTEMBER** | | | | | | | |
| - | - | - | - | - | - | 6:00 am | 7:55 am |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8:15 am | 10:10 am | 10:30 am | 11:10 am | 11:30 am | 12:10 pm | 12:30 pm | 2:25 pm |
| 3:00 pm | 4:55 pm | - | - | - | - | 5:20 pm | 7:15 pm |
| 7:35 pm | 9:30 pm | 9:50 pm | 10:30 pm | 10:50 pm | 11:30 pm | - | - |
| **OCTOBER - APRIL** | | | | | | | |
| **Depart Auke Bay** | **Arrive Haines** | **Depart Haines** | **Arrive Skagway** | **Depart Skagway** | **Arrive Haines** | **Depart Haines** | **Arrive Auke Bay** |
| - | - | - | - | - | - | 7:00 am | 9:38 am |
| 10:00 am | 12:38 pm | - | - | - | - | - | - |

**During the winter schedule, no wavepiercers are needed between Haines and Skagway. The existing ferry service would accommodate the demand on this link.*

The construction costs for this option are estimated at $67,700,000 not counting existing ferry system rehabilitation. Maintenance and operation costs are estimated at $17,600,000 annually.

### 3.2.3 (c) Option C - Mainline Ferry Service Ends at Auke Bay with Shuttle Service North from Auke Bay

Overview: Option C discontinues mainline ferry service north of Auke Bay and provides service to Haines and Skagway with two high speed shuttle ferries (Figure 3-14). The two vessels would provide four roundtrips per day from Auke Bay to Haines and three roundtrips per day to Skagway from Haines during peak travel periods.

Roundtrip travel times would be the same as Option A. A service schedule for the shuttle ferry between the Auke Bay, Haines and Skagway ferry terminals to meet projected demand is illustrated in Table 3-6.

**TABLE 3-6**
**ROUTE SIMULATION MODEL FOR OPTION C**
**SHUTTLE FERRY**

| Vessel | Depart Auke Bay | Arrive Haines | Depart Haines | Arrive Skagway | Depart Skagway | Arrive Haines | Depart Haines | Arrive Auke Bay |
|---|---|---|---|---|---|---|---|---|
| **MAY - SEPTEMBER** | | | | | | | | |
| Vessel 1 | - | - | - | - | - | - | 7:00 am | 9:38 am |

| Vessel | Depart Auke Bay | Arrive Haines | Depart Haines | Arrive Skagway | Depart Skagway | Arrive Haines | Depart Haines | Arrive Auke Bay |
|---|---|---|---|---|---|---|---|---|
| Vessel 2 | 6:00 am | 8:38 am | 9:00 am | 9:38 am | 10:00 am | 10:38 am | 11:00 am | 1:38 pm |
| Vessel 1 | 10:00 am | 12:38 pm | 1:00 pm | 1:38 pm | 2:00 pm | 2:38 pm | 3:00 pm | 5:38 pm |
| Vessel 2 | 2:00 pm | 4:38 pm | 5:00 pm | 5:38 pm | 6:00 pm | 6:38 pm | 7:00 pm | 9:38 pm |
| Vessel 1 | 6:00 pm | 8:38 pm | - | - | - | - | - | - |
| **OCTOBER - APRIL** | | | | | | | | |
| Vessel 1 | - | - | - | - | - | - | 7:00 am | 9:38 am |
| Vessel 1 | 10:00 am | 12:38 pm | 1:00 pm | 1:38 pm | 2:00 pm | 2:38 pm | 3:00 pm | 5:38 pm |
| Vessel 1 | 6:00 pm | 8:38 pm | - | - | - | - | - | - |

The construction costs for this alternative are estimated at $107,900,000, with maintenance and operation costs estimated at $17,800,000 annually.

### 3.2.3 (d) Option D - Mainline Ferry Service Ends at Auke Bay with Shuttle Service North from Berners Bay

Overview: Under Option D, Auke Bay would become the northern terminus for mainline ferries. Service to Haines and Skagway would be provided by two shuttle ferries from the Berners Bay Ferry Terminal during the summer season and from Auke Bay during the winter season (Figure 3-15). Passengers and freight continuing north or south during the summer season to and from Haines and Skagway would have to transfer from Auke Bay to Berners Bay to continue their journey. During peak travel periods the two vessels would provide four roundtrips per day from Auke Bay to Haines and three roundtrips per day to Skagway from Haines. Service would be similar to that provided with Option C, but with less running time.

Roundtrip times would be the same as Option B. A service schedule for the shuttle ferry between the Berners Bay, Haines, and Skagway ferry terminals to meet the demand is illustrated in Table 3-7.

**TABLE 3-7**
**ROUTE SIMULATION MODEL FOR OPTION D**
**SHUTTLE FERRY**

| Vessels | Depart Berners Bay | Arrive Haines | Depart Haines | Arrive Skagway | Depart Skagway | Arrive Haines | Depart Haines | Arrive Berners Bay |
|---|---|---|---|---|---|---|---|---|

| MAY - SEPTEMBER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Vessel 1 | | | 6:00 am | 6:46 am | 7:10 am | 9:05 am | 9:30 pm | 11:25 pm |
| Vessel 2 | 7:00 am | 8:55 am | 9:20 am | 10:06 am | 10:30 am | 11:16 am | 11:40 pm | 1:35 pm |
| Vessel 1 | 11:50 am | 1:45 pm | 2:10 pm | 2:56 pm | 3:20 pm | 4:06 pm | 4:30 pm | 6:25 pm |
| Vessel 2 | 2:00 pm | 3:55 pm | - | - | - | - | 4:15 pm | 6:10 pm |
| Vessel 1 | 6:50 pm | 8:45 pm | - | - | - | - | - | - |
| **OCTOBER - APRIL** | | | | | | | | |
| **Vessel No.** | **Depart Auke Bay** | **Arrive Haines** | **Depart Haines** | **Arrive Skagway** | **Depart Skagway** | **Arrive Haines** | **Depart Haines** | **Arrive Auke Bay** |
| | | | | | | | | |
| Vessel 1 | - | - | - | - | - | - | 7:00 am | 9:38 am |
| Vessel 1 | 10:00 am | 12:38 | 1:00 pm | 1:38 pm | 2:00 pm | 2:38 pm | 3:00 pm | 5:38 pm |
| Vessel 1 | 6:00 pm | 8:38 pm | - | - | - | - | - | - |

The construction costs for Option D are estimated at $118,200,000, with maintenance and operation costs estimated at $14,100,000 annually.

The service capacities for each option not including existing mainline service is depicted in Table 3-8. Operation of mainline service is assumed to continue as currently provided.

**TABLE 3-8**
**SERVICE CAPACITIES FOR OPTIONS A, B, C, D***

| | **SUPPLEMENTAL SHUTTLE 1 WAVEPIERCER 4A (Auke Bay)** | **SUPPLEMENTAL SHUTTLE 1 WAVEPIERCER 4B (Berners Bay)** | **AUKE BAY 2 WAVEPIERCERS 4C** | **BERNERS BAY 2 WAVEPIERCERS 4D** |
|---|---|---|---|---|
| | | | | |

| | | | | |
|---|---|---|---|---|
| RUNS PER DAY | | | | |
| EACH WAY SUMMER | | | | |
| Juneau-Haines | 3 | 3 | 4 | 4 |
| Haines-Skagway | 2 | 2 | 3 | 3 |
| RUNS PER DAY | | | | |
| EACH WAY WINTER | | | | |
| Juneau-Haines | 1 | 1 | 2 | 2 |
| Haines-Skagway | 0 | 0 | 1 | 1 |
| CAPACITY SUMMER | | | | |
| Juneau-Haines | 422 | 422 | 420 | 420 |
| 2005 Demand | 261 | 261 | 261 | 261 |
| 2025 Demand | 388 | 388 | 388 | 388 |
| CAPACITY SUMMER | | | | |
| Haines-Skagway | 317 | 317 | 315 | 315 |
| 2005 Demand | 200 | 200 | 200 | 200 |
| 2025 Demand | 296 | 296 | 296 | 296 |
| CAPACITY WINTER | | | | |
| Juneau-Haines | 165 | 165 | 210 | 210 |
| 2005 Demand | 80 | 80 | 80 | 80 |
| 2025 Demand | 119 | 119 | 119 | 119 |
| CAPACITY WINTER | | | | |
| Haines-Skagway | 60 | 60 | 105 | 105 |
| 2005 Demand | 45 | 45 | 45 | 45 |
| 2025 | 66 | 66 | 66 | 66 |

**Options A & B do not include existing mainline service capacities.*

## 3.3 ALTERNATIVE ANALYSIS

To assist in comparing alternatives, a "User Benefit Analysis", (H.W. Lochner, Inc., 1996, Appendix A) was prepared. The analysis used the American Association of State Highway and transportation Officials (AASHTO) economic model for transportation improvements. This model is an accepted technique for evaluating economic factors and comparing the relative merits of alternatives by presenting them in terms of net present value (NPV) and their benefit cost (B/C) ratio. The analysis concluded that both alternatives 2 and 4 were economically justified with the highest B/C ratios, and net present values (Table 3-2).

**TABLE 3-2** **ALTERNATIVES COMPARISON - 1996 DATA**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 Option A | Alternative 4 Option B | Alternative 4 Option C | Alternative 4 Option D |
|---|---|---|---|---|---|---|---|
| **TRAVEL TIMES (Hours)** | | | | | | | |
| Auke Bay to Skagway | 9.1 | 2.0 | 4.2 | 4.3 | 3.7 | 4.3 | 3.7 |
| Auke Bay to Haines | 7.1 | 2.8 | 2.8 | 3.3 | 3.3 | 3.3 | 3.3 |
| Skagway to Haines | 3.6 | 1.4 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 |
| **TRAFFIC INFORMATION** | | | | | | | |
| New Highway Length km (mi) | 0 | 104.4 (65.2) | 60 (36) | 0 | 8.0 (5.0) | 0 | 8.0 (5.0) |
| Traffic Volume (AADT 2005) | 87 | 618 | 432 | 226 | 226 | 226 | 226 |
| Traffic Volume (AADT 2025) | 201 a | 918 | 642 | 336 | 336 | 336 | 336 |
| Traffic Volume (July ADT 2025) | 222 a | 2123 | 1484 | 776 | 776 | 776 | 776 |
| Ferry Terminal Modifications | None | H | H/S | AB/H/S | H/S | AB/H/S | H/S |
| New Ferry Terminals | None | K | BB/WH | None | BB | None | BB |
| **CONSTRUCTION COSTS ($ millions)** | | | | | | | |
| Highway | 0 | 213.3 | 115.1 | 0.0 | 5.9 | 0.0 | 5.9 |
| Vessel and Terminal | 95.9 | 17.0 | 83.4 | 153.4 b | 157.7 b | 107.9 | 118.2 |
| **Total Construction Costs** | **95.9** | **232.3** | **198.5** | **153.4** | **163.6** | **107.9** | **124.1** |
| **M&O COSTS ($ millions)** | | | | | | | |
| Annual Highway M&O | 0 | 1.6 | 1.1 | 0 | 0.1 | 0 | 0.1 |
| Annual Marine M&O | 8.4 | 2.7 | 15.5 | 19.3 | 17.6 | 17.8 | 14.0 |
| **Total M&O Costs** | **8.4** | **4.3** | **16.6** | **19.3** | **17.7** | **17.8** | **14.1** |
| **ECONOMIC INFORMATION** | | | | | | | |
| Fare/Toll Revenues ($ millions) | 6.5 | 5.6 | 8.5 | 16.0 | 10.5 | 16.0 | 10.5 |
| Average Family, Direct Cost, | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AB to S ($) | 160 | 20 | 62 | 194 | 162 | 194 | 162 |
| Benefit Cost Ratio | NA | 3.5 (3.1 c) | 1.1 | 1.6 | 2.2 | 1.9 | 2.4 |
| Net Present Value ($ millions) | NA | 397.7 (333.0 c) | 14.1 | 33.1 | 72.5 | 47.9 | 86.8 |

**a. Assumes existing Southeast ferries are reassigned; b. Includes capital cost of Alternative 1 (No-Build); c. Includes toll for highway**

**Notes: AB/Auke Bay; BB/Berners Bay; H/Haines; K/Katzehin; S/Skagway; WH/William Henry Bay**

## 3.4 FUNDING STRATEGIES

The concern raised most often during the public process was the cost to build a highway. To address this concern potential funding sources were identified and analyzed to determine the most reasonable potential financial resources to fund any of the alternatives.

These financial resources exist predominantly at the federal level, but include state, local and private participation as well. From these financial resources a plan was developed to fund each alternative. The plan (Table 3-9) does not adversely affect the funding of any other highway project in Alaska's current Statewide Transportation Improvement Program.

**TABLE 3-9**
**POTENTIAL FUNDING SOURCES**

| POTENTIAL FUNDING SOURCE In Millions | East Lynn Canal Alternative 2 | All Marine Alternative 4 | | | |
|---|---|---|---|---|---|
| | | Option A* | Option B* | Option C | Option D |
| Excess apportionment account | $110 | $110 | $110 | $108 | $110 |
| Supplemental federal allocation | 40 | 40 | 40 | 0 | 8 |
| Revenue bonds | 20 | 0 | 0 | 0 | 0 |
| Forest highway funds | 16 | 1 | 4 | 0 | 4 |
| Reallocated federal highway funds | 15 | 0 | 0 | 0 | 0 |
| Programmed federal highway funds | 13 | 0 | 8 | 0 | 0 |
| Private funds | 10 | 0 | 0 | 0 | 0 |
| Public lands highway funds | 5 | 0 | 0 | 0 | 0 |
| Ferry boat discretionary funds | 2 | 2 | 2 | 0 | 2 |
| State match funds | 1 | 0 | 0 | 0 | 0 |
| **TOTAL** | $232 | $153 | $164 | $108 | $124 |

**Includes cost for existing vessels Capital Improvement Plan (estimated to be $96 million).*

A detailed discussion of all funding sources can be found in "Juneau Access Improvements Financing Strategies", Milton B. Barker, 1996, Appendix A.

### 3.4.1 Description of Funding Sources

- The term excess apportionment account refers to a portion of the federal aid highway funds derived from nationwide gas tax receipts which are apportioned to each state. This account consists of federal monies apportioned annually to each state but which are not allowed to be spent at the direction of Congress. An exception to this restriction applies to Alaska in Title 23 U.S.C., Section 218. Alaska is uniquely allowed by Section 218 to spend any of its apportioned funds, including its excess apportionment account, to reconstruct the Alaska Highway from the Alaska/Canada border near Beaver Creek to Haines Junction and the Haines Cutoff Highway from Haines Junction to the Alaska/Canada border north of Haines. The purpose of Section 218 is to improve surface transportation access between interior and southeast Alaska. By amending Section 218 to extend its southern terminus to Juneau, $110,000,000 in Alaska's excess apportionment account would be eligible for the Juneau Access Project. These funds cannot presently be used for any other purpose and do not compete with funding other transportation needs in Alaska. Section 218 does not require state matching funds.

- Supplemental federal allocation consists of funds directly appropriated by the U.S. Congress to Alaska for use on the Juneau Access Project. They would be requested based on a one-time unique opportunity to improve surface transportation access to the only state capital in the continental United States without land highway access. These funds may or may not require state matching funds.

- Revenue bonds are issued by the state legislature. This study has found that a portion of a toll or fare assessed to use the transportation improvement would fund a bond amount of $20,000,000. This source of funds could be used to match federal funding sources.

- Forest Highway funds are federal funds that are to be spent within the nation's forests for improving access and recreation. Alaska receives almost $8,000,000 per year from this source, and the largest percentage is spent in the Tongass National Forest. The Juneau Access Project is eligible for a portion of these funds. These funds do not require state matching funds.

- Reallocated federal highway funds would be derived from DOT&PF's statewide transportation improvement plan for the National Highway System (NHS). If Alternative 2 were constructed, almost $50,000,000 contained within the plan for ferry system improvements serving Lynn Canal would not be necessary. A portion of these funds ($15,000,000) would be used to help fund the Juneau Access Project. The remainder ($35,000,000) would be available to accelerate other projects or address other statewide transportation funding needs. These funds require state matching funds. This source would not be available for Alternative 4, options A and C.

- Programmed federal highway funds would be allocated from Alaska's regular federal highway program. The $13,000,000 would fund development costs for the project, including about $5,000,000 for the environmental impact statement which has already been included in DOT&PF's plan. These funds require state matching funds.

- Alternative 2 would provide highway access for several private mining ventures north of Juneau. This study has shown that highway access for these mines would provide transportation benefits exceeding $40,000,000. The funding plan includes a portion of this financial benefit as participation from these ventures. This funding participation would only be available for Alternative 2 and would be used to help meet state matching requirements for federal highway funds.

- Public lands highway funds are an additional source of federal funds administered at the discretion of the Federal Highway Administration (FHWA). By federal law preference is to be given to states with large amounts of federal lands. The Juneau Access Project would be eligible for these funds pending application to the FHWA. Based on experience it is reasonable that a small amount of funds ($5,000,000) could be realized for build alternatives. These funds do not require state matching funds.

- Ferry boat discretionary funds are also a federal program. The $2,000,000 proposed would help fund ferry vessels or terminals. While there is considerable competition for these funds nationwide, there is a reasonable expectation of realizing the small amount requested for Alternative 4 or the shuttle ferry in Alternative 2. This source would require state matching funds.

- Matching requirements usually vary from about 10 percent for the regular federal highway program to 20 percent for federal highway funds used for toll facilities. Since private funds

and state revenue bonds can be used to meet the matching requirements, only about $1,000,000 in state general funds would be required.

## 3.5 TOLL AND FARE REVENUES

The state ferry system requires payment of fares for passenger and vehicle use. Statewide, the system recovers about 59 percent of its operating expenses from these fares and other revenue generating operations such as staterooms and food service. The cost to operate the ferry system in state fiscal year 1995 was $71,000,000. Funding to pay for this cost was derived from fare revenues ($42,000,000) and the state general fund ($29,000,000).

There are no toll highways in Alaska and the $59,000,000 annual cost to maintain and operate the state's highway system is paid from state general funds. Although there are no tolls or fares, revenue is generated from highway use through a state motor fuel tax and licensing and registration fees. These revenues total some $54,000,000 annually and are deposited into the state's general fund account.

The economic study for this project found that users of Alternative 2 would pay a highway toll. This is attributed to users currently paying fares to travel on state ferries. For example, the fare (toll) for a vehicle and passenger from Juneau to Haines by ferry is currently $66 (vehicle up to 19 feet in length). Supply and demand economics for Alternative 2 indicate that a toll of $25 for each vehicle entering the corridor could be assessed with minimal affect on anticipated traffic volumes.

Because the state general fund budget has been declining for several years and Alternative 2 would not generate a substantial amount of revenue for the general fund account with gas tax receipts or fees, a $25 flat toll is proposed in the economic analysis of Alternative 2. The toll would pay for highway maintenance, shuttle ferry operations and a portion of the project's capital cost. The $25 toll is a simplified analysis and DOT&PF recognizes that a sliding scale or other more detailed method of assessment may have to be developed. The toll revenues would be apportioned as follows:

Highway maintenance - The annual cost to maintain new and existing highways for Alternative 2 is estimated to be $1,600,000. Traffic projections indicate that 225,000 vehicles would travel

through the corridor in the first year (2005) so $7 of each $25 toll would fund highway maintenance costs.

Shuttle ferry operation - The annual cost to provide shuttle ferry service between Haines and the Katzehin ferry terminal is estimated to be $2,700,000. With this funding plan the $25 toll includes travel on the shuttle ferry. Of the toll, $12 would fund maintenance and operation costs for the shuttle ferry system.

Capital costs - The remaining $6 would provide revenue of over $1,300,000 annually. This revenue would pay for bond debt that may have to be incurred for a portion of the project's capital costs.

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# 4.0 AFFECTED ENVIRONMENT

The information in this section is summarized from the technical reports which describe the affected environment within the Lynn Canal corridor.

## 4.1 SOCIAL AND ECONOMIC ENVIRONMENT

### 4.1.1 Land Use

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 U.S. Department of Agriculture Forest Service (Forest Service). The Klondike Gold Rush National Historic Park in Skagway is administered by the U.S. 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 Department of Natural Resources (DNR) Division of Forestry. Local government lands are managed by the City and Borough of Juneau (CBJ), Haines Borough, City of Haines, and City of Skagway, respectively. Private lands include Native corporation holdings, Native allotments, private commercial, and private residential properties.

**Federal Lands:** Management for the Tongass National Forest is established in the Tongass Land Management Plan (TLMP) of 1979, the 1986 TLMP amendments, the Tongass Timber Reform Act of 1990, and the proposed revisions to TLMP (Tongass Land Management Plan Supplement to the Draft Environmental Impact Statement, 1991). Generally, Forest Service lands are managed according to land use designations (LUDs) described within TLMP. The following LUDs occur within the project area.

- LUD II: Lands are managed in a roadless state to retain wildland character. Allows highways to be built for authorized essential public transportation needs.

- LUD II - Legislated: Same management requirements as LUD II except lands are designated by congress to be managed in perpetuity, pursuant to the Tongass Timber Reform Act of 1990.

- LUD III: Lands managed for a variety of uses. Emphasis on commodities or market resources and their use. Areas usually have high amenity values with high commodity

values. Highways must be located and designed to retain important recreational and scenic qualities.

Most of the land along East Lynn Canal is designated LUD II, including a congressionally designated (LUD II - Legislated) area in Berners Bay (Figure 4-1). Federal lands along West Lynn Canal are primarily LUD III.

The NPS owns several buildings in downtown Skagway and lands north and west of town within the Klondike Gold Rush National Historic Park and Landmark. Management guidance is outlined in the Preliminary Alternatives for the Klondike Gold Rush National Historic Park General Management Plan (NPS, 1993). The NPS objective is to manage the cultural and natural resources of the park for preservation and future public enjoyment.

**State Lands:** Within the project area, the State of Alaska owns the tidelands, submerged lands, and navigable waters to the mean high tide line except those patented to other owners. In addition, the state owns or has filed statehood selections on several parcels within the project area.

State lands along East Lynn Canal include:

- Point Bridget State Park;
- Slate Cove selection including 249 hectares (615 acres);
- selections in two valleys south of the Katzehin River totaling almost 300 hectares (741 acres); and
- some land on the northern boundary of the Tongass National Forest, south of Skagway, which has been selected but not yet conveyed to the City of Skagway.

State lands along West Lynn Canal include:

- Sullivan Island State Marine Park;
- the Haines State Forest;
- Pyramid Island;
- some parcels of shoreline along Mud Bay Road; and
- Chilkat State Park.

Near Haines, the University of Alaska (U of A) owns over a dozen parcels of land, many of which lie along the west side of Lynn Canal. Lands owned by U of A are used for commercial timber

harvest, residential subdivisions, and other commercial ventures. The University has no specific land management plan for these parcels. No lands within the immediate project area are proposed for inclusion in the reconstituted Mental Health Trust.

**Local Government Lands:** CBJ is a unified home rule municipality covering more than 8,029 square kilometers (3,100 square miles). Within the project area, the western boundary of the municipality runs north up Lynn Canal to Eldred Rock and then east to the Canadian border. The only land owned by the CBJ within the project area is 2.4 hectares (5.9 acres) at Echo Cove, developed as a public campground and boat launch. The shore areas are designated resource reserve while the uplands are designated for recreation.

CBJ controls development within the entire borough. The 1988 CBJ Comprehensive Plan is currently being revised. CBJ regional transportation policy encourages 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. The plan specifically calls for the designation of a highway link to Haines and exploration of highway connections to other Southeast communities and Canada. The Juneau Coastal Management Plan, a component of the comprehensive plan, repeats support for access improvements.

The Haines Borough encompasses 6,734 square kilometers (2,600 square miles) along Lynn Canal within the project area, but its land use policies are enforceable only within the two adopted service areas of Mud Bay and Lutak Inlet. Goals of the Haines Borough Comprehensive Plan are to: preserve the rural lifestyle; maintain the natural environment; provide orderly land use and development; provide employment based on available local resources; and improve the quality of local roads. The plan does not mention a highway link to Juneau.

The City of Haines, which lies within the Haines Borough, includes 18.77 square kilometers (7.25 square miles) of land and an additional 18 square kilometers (7 square miles) of tidelands and submerged lands. The portion of the project area within the city limit runs through Third Avenue to the intersection with the Haines Highway. The city manages its lands according to city zoning, policies in the Haines Borough Comprehensive Plan, and the City of Haines Coastal Management Plan 1993 Update. The Coastal Management Plan discusses a highway between Haines and Juneau as an Interior Alaska transportation issue but takes no position.

The City of Skagway contains 1,147 square kilometers (443 square miles) of land. Management guidance is outlined in city ordinances; the Skagway Comprehensive Plan; and the Skagway Coastal

Management Plan, which includes three Areas Meriting Special Attention (AMSA) - the Port of Skagway, Skagway River, and Pullen Creek. The Coastal Management Plan supports improved ferry service but does not discuss a highway link to Juneau. Within the project area, the plan categorizes land use as pedestrian enhancements, marine/fish related commercial use, and marine industrial/uplands staging. All are within the city's waterfront zoning district.

**Private Lands:** Goldbelt, Incorporated (Goldbelt), the largest private land owner in the project area with 603 hectares (1,490 acres) at Echo Cove, is currently developing a long-term strategic land use plan. At Cascade Point, near the northern end of Echo Cove, Goldbelt is evaluating a deep water port which could support a private ferry terminal, nearby mining operations, and commercial fisheries.

Other holdings include Native allotments, private mining claims, and recreational and residential properties. Native allotments are administered by the Tlingit and Haida Central Council's Trust Services and DNR through an agreement with the United States Department of Interior Bureau of Indian Affairs. There are three certified Native allotments found on the west side of Lynn Canal, near Sullivan River.

**Coastal Zone Management:** Three local coastal districts encompass the project area - Juneau, Haines, and Skagway. Each district has an approved coastal plan and enforceable policies, developed in accordance with the Alaska Coastal Management Program (ACMP). The ACMP and district programs contain policies on coastal development, land uses, and activities within their jurisdictions. A district program may elect to delineate geographic AMSAs. These areas are identified as having value to the public warranting special management, planning, protection, or acquisition.

The ACMP and local plans provide management guidance on several land use activities including: coastal development; geophysical hazard areas; recreation; energy facilities; transportation and utilities; fish and seafood processing; timber harvest and processing; mining and mineral processing; subsistence; habitats; air, land and water quality; and historic and archaeological resources.

**Recreation:** The Forest Service classifies and manages recreation using an inventory process called the Recreation Opportunity Spectrum (ROS). The ROS consists of seven recreational classifications which identify, describe, and quantify recreational resources. In descending order of allowable development, the ROS classes include: urban, rural, roaded modified, roaded natural, semi-primitive

motorized, semi-primitive non-motorized, and primitive. Of these, the last four classes are found within the project area.

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 Forest Service, is located 12.8 kilometers (8 miles) north of Echo Cove.

Hiking occurs primarily on trails built and maintained by federal, state, and local government agencies and by a few private, nonprofit groups. These trail systems are generally in road accessible areas within and around the communities of Juneau, Haines, and Skagway. Recreation use within the project area is shown in Figure 4-2.

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 bear, black bear, 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 ("Socioeconomic Effects",Eco-Systems, Resource Management Group, Sheinberg Associates, and McDowell Group, 1994, Appendix C). A 1985 survey found that fishing was twice as popular as any other recreation activity in the region. Less freshwater sport fishing occurs in Lynn Canal than in other areas because the mountainous terrain provides little freshwater fish habitat and access is limited.

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.

**Commercial Fishing:** Commercial fishing has historically been an important element of the economy and lifestyle in Lynn Canal. Commercial fishing use areas are shown on Figure 4-3.

The drift gillnet salmon fishery is the most important commercial fishery in Lynn Canal. The target species are sockeye salmon during the summer and coho and chum salmon in the late summer and early fall. Power trollers and hand trollers use Lynn Canal to a limited extent to fish for kings and cohos. The long line halibut fishery has also been a large contributor to the fishing industry in Juneau and Haines. Lynn Canal supports some shellfish pot fishing, primarily for dungeness and king crab, with minor shrimp pot and trawling fisheries. Within the project area, one commercial shellfish farm is in operation at the southern end of Mud Bay.

**Mining:** The first mining activity in the area began in the early 1800's. The project area is within three mining district subareas: Juneau Goldbelt, West Lynn Canal, and East Lynn Canal Coast Range of the Juneau Mining District. The Juneau Goldbelt subarea is the most productive and two historic mines in the subarea have received renewed interest in recent years. Exploration activities are underway at the Kensington and Jualin mines along East Lynn Canal. The final Environmental Impact Statement (EIS) has been completed for the Kensington Mine located at Comet Landing just north of Point Sherman, but agency permits must still be issued to allow full-scale operation. A supplemental EIS is expected to be completed by early summer 1997. The East Lynn Canal subarea has approximately 375 mining claims (Figure 4-4) within 17 sections ("Land Use and Coastal Zone Technical Report", Figure 3.2-3A, Appendix C).

**Timber:** Throughout Lynn Canal, timbered areas are limited to near the shoreline and major river valleys. Historically, commercial timber harvest has been an important industry in Southeast Alaska but it has been in decline for several years. Within the project corridor, the area north of Sullivan Island on the west side of Lynn Canal holds the greatest potential for timber harvest.

### 4.1.2 Visual Resources

Lynn Canal is known as a great scenic wonder because of its beautiful undisturbed landscapes. Most of the project area has steep slopes, rugged mountains, snowfields, and glaciers. Marine and terrestrial wildlife are also important visual features. The area supports populations of moose, bear, sea lions, seals, porpoises, whales, bald eagles, and other species valued as scenic resources by visitors and residents.

Important landscape resources on the east side of 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. Because viewing the natural landscape is an important part of a recreational experience, changes in views or appearance of the landscape can adversely affect viewers. The entire coastline of Lynn Canal is considered an area of high visual sensitivity.

The Forest Service has inventoried Lynn Canal within the Tongass National Forest and established Visual Quality Objectives (VQO's). These VQO's are categorized as follows (from most protective to least): preservation, retention, partial retention, modification, and maximum modification.

Much of the project area is managed as partial retention but large areas are also classed as 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 is classed as preservation ("Visual Impact Assessment Technical Report", Dames & Moore, 1994, Appendix D).

### 4.1.3 Historical and Archeological Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federally funded projects to consider the effects of proposed actions on properties included on, or eligible for listing on, the National Register of Historic Places (NRHP).

Field surveys were conducted for both sides of Lynn Canal within the project area, from Echo Cove to Skagway on the east side and from William Henry Bay to Haines on the west side during the summer of 1994. The corridor that was studied followed the reconnaissance alignments and spanned a 100-meter (328 foot) width. The survey design was developed in accordance with Forest Service procedures.

The cultural and historical resources considered to be eligible for the NRHP within the project area include nine sites on the east side and four sites on the west side of Lynn Canal. To protect the

resources and comply with the requirements of NHPA and Alaska Statute, the sites are described only in general terms in the following paragraphs.

There are late prehistoric (before European contact) and historic sites along East Lynn Canal. These consist of the traditional village area of the Auk Tlingit, including petroglyphs, which have been determined eligible for the NRHP; a cache pit; and a shallow midden/cache pit/temporary camp. Historic period sites consist of one cabin site, a shipway associated with a sawmill, and three sawmills. The four sites on West Lynn Canal include a late prehistoric petroglyph site, two early historic shell middens, and a pre-World War II cabin.

The Skagway and White Pass Historic District (Figure 4-5), listed in the NRHP in 1962, is the only registered National Historic Landmark (NHL) in the project area. It consists of a log cabin and wharf built in 1887; the Yukon and White Pass Railroad built between 1898 and 1900; and cliff-side paintings east of the White Pass Dock, known as the Ships Registry, dating back to 1918. The historic townsite, which has 152 contributing buildings, does not include a warehouse next to railroad tracks by the White Pass railroad. None of the contributing elements are affected by the proposed action.

### 4.1.4 Social Environment

Five basic elements characterize the social environment within the project area: education, health care and social services, public safety, public utilities, and quality of life. Descriptions of each of these elements in Juneau, Haines, and Skagway are discussed in the following paragraphs. Quality of life is an intangible element of the social character of a community but of vital importance to residents. Quality of life can be considered an individual feeling of satisfaction and well-being. Information on quality of life judgments is from a series of interviews, pubic surveys, public meetings, and from literature review. Interviews were conducted with Juneau, Haines, and Skagway government officials, business owners, service providers, and other community residents.

**Education:** The Juneau School District serves the primary and secondary educational needs within the CBJ. In 1994, the district had an average daily attendance of more than 5,300 students. Over the long-term, enrollment has been increasing steadily. The district has projected enrollment scenarios for the year 2000 with and without increased mining activity. Enrollment is projected to increase more than 12 percent with mine development by the year 2000.

The Haines School District provides primary and secondary education for about 400 students. The district is composed of a complex of buildings downtown and a school at Mosquito Lake located along the Haines Highway.

The Skagway School District serves the primary and secondary needs for over 150 students.

The University of Alaska Southeast is in Juneau and provides post-secondary education at its Auke Lake campus and at the Bill Ray and Marine Technology centers in the downtown area. The Southeast Regional Resource Center, which provides other educational services, operates the Juneau Adult Education and Training Center. No regular, post-secondary education programs exist in Haines or Skagway, although the University of Alaska Fairbanks extension service occasionally offers programs in Haines.

**Health Care and Social Services:** Juneau has an array of health and medical facilities and services to serve its and the area's needs. There is a public hospital, a public health center, an Alaska Native health center, and private practice physicians. Specialized mental health services are offered through a number of agencies, as are special programs for adolescents and senior citizens. The area's only juvenile detention and long-term elderly residential care facilities are in Juneau.

Haines has a medical clinic staffed with two part-time physicians and two full-time nurses. They provide general medical and short-term emergency services. There is a public health nurse funded by the Department of Health and Social Services (DHSS) and a private practice dentist. A public counseling center and paraprofessional counselors provide mental health needs.

Skagway has two physician assistants staffing its clinic. They provide general medical and emergency care and some special services on an outpatient only basis. Public health nurses and dentists routinely visit Skagway.

Patients in need of emergency care are transported from both Haines and Skagway to Juneau by aircraft. When weather conditions do not permit flight, patients must be transported by ambulance to Whitehorse, Yukon Territory or by ferry to Juneau.

Residents in Haines and Skagway rely on Juneau for many of their physical and mental health needs. For example, Haines residents reportedly travel to Juneau for medical purposes on 30 percent of their air trips and 22 percent of ferry trips. Patients who must travel to Juneau for treatment are

commonly deprived of the support of friends and family members. This can hamper long-term treatment and counseling success by limiting family involvement and education.

**Public Safety:** Two law enforcement agencies serve Juneau, the Juneau Police Department (JPD) and the Department of Public Safety, Division of Alaska State Troopers. Since 1986, there has been a gradual reduction in the number of state troopers and a corresponding increase in the number of JPD officers in Juneau. Police protection is now provided almost exclusively by the JPD. There are five fire stations with paid and volunteer fire fighters.

In Haines public safety is provided by the City of Haines Police Department, a state trooper, a fish and wildlife protection officer, a state park ranger, and U.S. Customs and Immigration officers at the Canadian border. The city's volunteer fire department has trained volunteers that serve as fire fighters.

The City of Skagway Police Department, NPS rangers, and U.S. Customs and Immigration officers near the Canadian border provide public safety support. The city's volunteer fire department has both paid and volunteer fire fighters.

**Public Utilities:** The CBJ water supply comes from the Gold Creek and Salmon Creek reservoirs near downtown Juneau and serves about 79 percent of area households. The supply is expected to meet capacity requirements to the year 2010. There are three wastewater treatment plants throughout the borough, serving about 81 percent of the households. Solid waste is incinerated at a private facility and the ash and other wastes are landfilled on-site. The CBJ contracts locally for the bi-monthly collection of household hazardous substances at a contractor-provided site. The hazardous substances are then shipped to an approved disposal site. Electric power is provided by Alaska Electric Light & Power Company (AEL&P). Electric power is generated primarily by the Alaska Power Administration Snettisham hydroelectric project, as well as through the AEL&P Salmon Creek hydroelectric facilities. Current installed capacity is sufficient to satisfy electrical demand in the Juneau area for the next ten years.

The Haines water treatment facility is operating at 80 percent capacity during peak demand and is expected to require expansion in five years. City water serves approximately 96 percent of the households. The wastewater treatment plant is operating at 58 percent capacity and serves approximately 88 percent of city residents. A private contractor collects solid waste and disposes of it in a city landfill. The site has an anticipated life of 20 to 25 years. Hazardous substances are collected through an annual program sponsored by the Department of Environmental Conservation

(DEC). Electricity is supplied by the Haines Light & Power Company, a subsidiary of AEL&P. The system is currently operating at 50 percent capacity.

The Skagway municipal water system serves about 90 percent of the residents. Potable water demands by cruise ships result in water shortages at least once a week during the summer, which affects the community's fire fighting ability. The city is replacing its storage tank to provide additional capacity. This is expected to meet demands to the year 2010. The city's wastewater treatment plant is operating at capacity. The city landfill has an expected life of three years. A solid waste incinerator is being planned to meet future needs. Alaska Power & Telephone (AP&T), a privately owned company, provides electric power and telephone service. There is a wide fluctuation between winter demands and summer tourist season demands.

**Quality of Life:** Residents of Juneau like the community for its mild climate, picturesque setting, recreational opportunities, and low violent crime rates. Many residents perceive these qualities to be tied to Juneau's isolation from the continental highway system. The economy is strong. The cost of living is perceived as high, but the recent introduction of wholesale and discount stores has lowered prices for many goods. A 1994 survey reported that 65 percent of residents believed improved transportation was important to their household and over 75 percent believed it was important to their community ("Household Survey", McDowell Group, 1994, Appendix C).

Haines is one of the state's fastest growing communities with a large influx of retirees from Alaska and the southern 48 states. The housing market is robust and vacancy rates are low. The 1993 Haines Borough Attitudinal Survey reported residents generally cite the rural setting with its scenic and isolated qualities as most appealing.

Skagway is one of Alaska's most popular tourist destinations. It is a popular cruise ship destination and tourists traveling to Skagway via the Klondike Highway make it the largest port of entry in the state. The community values its gold rush history and the tourism it generates. Zoning standards enforce building design, painting schemes, and advertisements to maintain historic integrity.

### 4.1.5 Subsistence

**ANILCA, Section 810:** 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.

Telephone surveys supplemented published subsistence information for the communities of Klukwan, Haines, and Skagway. Klukwan is a Native village located 35 kilometers (22 miles) northwest of Haines. While it is considered beyond the project area for most of the impact assessments, the residents of Klukwan rely on Lynn Canal for subsistence activities. Juneau has a large Native population, most of whom participate in subsistence activities. However, Juneau is not "legally" considered a subsistence community because of its urban setting. The Native community of Hoonah, located south of Lynn Canal on Icy Straits, has not been documented to use the project area for subsistence activities.

Subsistence land use areas for Klukwan, Haines, and Skagway have been mapped ("Land Use and Coastal Zone Technical Report", Eco-Systems, Resource Management Group, Sheinberg Associates, 1995 & 1997, Appendix C) under the Tongass Resource Use Cooperative Survey (TRUCS) a joint project of the Forest Service and the Department of Fish and Game (DF&G).

**Klukwan:** Klukwan may be Alaska's oldest Tlingit settlement. The village is at the confluence of the Tsirku, Klehini, and Chilkat Rivers, 32 kilometers (20 miles) from the mouth of the Chilkat River. 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. That survey found that 100 percent of Klukwan households used subsistence resources and 95 percent of households participated in the harvest of those resources.

Resource harvest for Klukwan is strongly focused on riverine and inland environments for most of the resources harvested. Chinook salmon, sockeye salmon, chum salmon and eulachon were the primary species harvested in the Chilkat River system. In addition, chinook and other salmon, and bottomfish were harvested from the marine environment by rod and reel. Harbor seals were the primary marine mammals harvested. Moose, mountain goat, and bear were harvested along the local roads and rivers. Deer hunting was conducted along Lynn Canal by boat. Figure 4-6 shows areas used for subsistence harvest by Klukwan residents.

**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 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. As with Klukwan, there are no deer harvest areas in the immediate Haines vicinity. Figures 4-6 and 4-7 show areas used for subsistence harvest by Haines residents.

**Skagway:** Skagway is not a traditional subsistence community as defined by ANILCA or designated by the Department of Fish and Game, Board of Fisheries or Board of Game. However, the community was included in the Forest Service's TRUCS subsistence survey, and is included in this evaluation. The 1987 survey found that 96 percent of households used subsistence resources and 68 percent of households participated in harvest activities.

Resource harvest focused near the community for marine fish species and invertebrates and inland for mountain goats. Residences primarily harvest salmon and other species with rod and reel from Taiya Inlet. Trout and char and eulachon were harvested from local rivers. Skagway residents reported no deer harvesting within the project area. Figures 4-6 and 4-8 show areas used for subsistence harvest by Skagway residents.

### 4.1.6 Economic Elements

This following information describes the demographics, basic and support industries, and other economic elements of Juneau, Haines, and Skagway.

**Demographics:** The 1990 U.S. Census estimated the Juneau population at almost 27,000, averaging 2.7 persons per household, with 70 percent of the population 18 years of age or older. The per capita income was almost $20,000; and the median household income was about $48,000 (1990 dollars). The CBJ estimated the 1994 population at almost 29,000. By the year 2020, the population is forecasted to reach over 40,000, without major mining development occurring. Assuming the AJ and Kensington mines open, the population could reach 44,000 by 2020 ("Socioeconomic Effects", Eco-Systems, Resource Management Group, Sheinberg Associates and McDowell Group 1994, Appendix C).

In Haines, the 1990 U.S. Census estimated the population at over 2,000, with an average of 2.6 persons per household with 72 percent 18 years of age or older. The per capita income was over

$16,000 and the median household income was about $36,000 (1990 dollars). The 1994 population was estimated at 2,400; and the population is forecast to reach 3,800 by the year 2020.

The Skagway 1990 U.S. Census estimated the population at almost 700, with an average of 2.4 persons per household with 72 percent of the population 18 years of age or older. The per capita income was almost $18,000; the median household income was almost $38,000. The 1994 population was estimated at 700 and the population is forecast to reach 1,000 by the year 2020.

**Government:** Each community relies heavily on public sector employment. Employment trends generally follow state revenue trends which are dependent on the price of oil. In Juneau, total government employment (federal, state and local) accounted for more than 61 percent of 1993 wages. State government employment accounted for nearly 40 percent of wages. In Haines, government (local, state and federal) accounted for 22 percent of wages in 1993, with the greatest reliance on local government. Government employment in Skagway provided almost 44 percent of wages in 1993.

**Commercial Fishing:** Although Juneau is home to a large fishing fleet, comparable in size to that of Sitka, seafood processing is a small sector of the local economy when compared to government. The commercial fishing industry plays a major role in the economy in Haines, and a very small role in Skagway.

**Mining:** Mining currently plays a relatively minor role in the Juneau economy, but has the potential to greatly affect employment. Proposed mining ventures could provide several hundred positions but development depends on receipt of permits and economics. Mine developments would have limited effect on the Haines and Skagway economies.

**Timber:** Timber is important to local economies in most of Southeast, however, within the project area, timber harvesting and forest products play a minor economic role.

**Tourism**: The Department of Commerce and Economic Development (DOC&ED) Division of Tourism began tracking visitor statistics in 1985. The average annual growth rate between 1985 and 1993 was over 6 percent statewide. Tourism in Juneau grew at virtually the same rate over that period. Visitors to Juneau numbered about 409,000 in the 1993 summer season. Of these, 59 percent arrived by cruise ship and nearly one-third by domestic airline while the remainder arrived by state ferry. An estimated 500 to 600 jobs are created in Juneau because of visitor spending and the annual resulting payroll is around $15,000,000.

The tourism industry is growing at a faster rate in Haines than Juneau. Between 1989 and 1993, the number of visitors averaged 8 percent growth annually. There were over 114,000 visitors during the 1993 summer season. Of these, 39 percent arrived by highway, 30 percent by cruise ship, 16 percent by state ferry, and 15 percent by domestic airline. It is estimated that 50 jobs are created by visitor spending in Haines. The number of cruise ship visitors is expected to continue to grow and should exceed 100,000 visitors in 1997.

The tourism growth rate is highest in Skagway, with 8 percent annual growth from 1985 to 1989 and 11 percent from 1989 to 1993. There were almost 319,000 visitors in the summer of 1993. Of these, 50 percent arrived by cruise ship, 25 percent by domestic airline, 20 percent by highway and 5 percent by state ferry. Cruise ship visitations are expected to continue to increase and should exceed 400,000 visitors in 1997.

## 4.2 PHYSICAL ENVIRONMENT

### 4.2.1 Geology

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 the possibility of earthquakes, increases the potential for liquefaction and sloughing along the face of deltas.

Soils along the valley walls are generally a mixture of glacial, glaciomarine, rockfall, and colluvial material. Some of the valley wall deposits are highly consolidated due to former glaciation, but many deposits, particularly those that postdate the glacial retreat are unconsolidated. Because of the steep slopes, soils on the valley walls tend to be only marginally stable as is indicated by the debris flow scars of varying ages that can be seen throughout Lynn Canal.

Muskeg is present on natural benches and most other gently sloping areas. The organic material can vary from a thin veneer to ten meters (33 feet) in thickness.

Surface water tends to penetrate organic material and unconsolidated soil until it intersects with highly consolidated soil, bedrock or other relatively impermeable material where it then flows along that surface.

Igneous, sedimentary and metamorphic rocks are exposed at different locations along the studied routes. While some areas of rippable rock may exist, blasting would be required in most cases where construction encounters rock. Most of the rock is expected to be of adequate strength and character to allow the large steep cuts necessary if Alternative 2 (East Lynn Canal Highway) is selected.

The geologic hazards in the project area are related to earthquakes, tsunamis, outburst floods, landslides, and avalanches (Figure 4-9).

**Avalanches**: The most common geologic hazard within the project area is avalanches ("Snow Avalanche Report", Mears and Glude, 1996 Appendix B). Steep slopes, heavy snowfall and precipitation, and high winds contribute to this hazard. A snow avalanche study of Alternative 2 identified 58 snow avalanche paths (Figures 4-10 through 4-12) potentially affecting 6.8 kilometers (4.1 miles) of the highway alignment. The paths are described as small, medium, large, and very large. The tally of 19 large and very large paths (33 percent of the total) underscores the severity of the hazard. Some of these paths would reach the highway only once in several decades, whereas others produce large frequent avalanches that may cross the highway more than once in an average winter without mitigation. A detailed snow avalanche study for Alternative 3 was not performed. The May, 1994 Reconnaissance Report identified avalanche zones through aerial photograph interpretations and field observations.

From Echo Cove to a location 5 kilometers (3 miles) past Independence Lake, there are three avalanche paths. One is near Sawmill Cove in Berners Bay and two are north of Independence Lake. The first path north of Independence Lake is the widest on the alignment and is the most frequent producer of large avalanches. The alignment north of these paths to the Katzehin River, a distance of 35 kilometers (21 miles), includes 31 avalanche paths. These are found in three clusters of multiple paths that include large and very large paths: the first is opposite Eldred Rock, the second opposite the Chilkat Islands, and the third opposite the Chilkat Peninsula (Figure 4-11). From the Katzehin River to Skagway there are 24 avalanche paths. These include a cluster of small but steep

paths near Dayebas Creek and three large paths located three kilometers (1.8 miles) north of the creek. The remaining are narrow steep paths that generally reach saltwater.

Because of the need to identify risk areas, the potential avalanche hazard for the highway was calculated by computing an Avalanche Hazard Index (AHI). The AHI is a numerical expression representing damage and loss potential as a result of an interaction between snow avalanches and vehicles on a highway.

AHI calculations weigh projected traffic volumes with avalanche size and avalanche frequency. The calculation results in a numerical value (or index) that can be used to compare the hazard severity of different avalanche paths on a highway alignment. The paths with relatively high hazard may require mitigation. Furthermore, this procedure can be used to compare the avalanche hazard of any of the alternates with other avalanche-prone highways in North America. This method of avalanche hazard evaluation is used on numerous highways in Alaska, Colorado, Wyoming, Idaho, Utah, and in British Columbia.

Table 4-1 shows lengths of the primary avalanche paths crossed by Alternative 2 and the volume of debris and snow that could cover the highway.

**TABLE 4-1**
**PRIMARY AVALANCHE PATHS**

| Avalanche Path | Length T* m (ft) | Volume Total $m^3$ ($yd^3$) |
|---|---|---|
| 2 | 1,130 (3,720) | 18,980 (24,800) |
| 6 | 128 (420) | 2,142 (2,799) |
| 8 | 205 (673) | 3,430 (4,483) |
| 13 | 429 (1,408) | 7,183 (9,388) |
| 14 | 135 (442) | 2,253 (2,944) |
| 19 | 604 (2,100) | 10,710 (14,000) |
| 20 | 40 (131) | 666 (871) |
| 21 | 700 (2,295) | 11,704 (15,297) |
| 25 | 115 (378) | 1,929 (2,521) |
| 40 | 211 (691) | 3,523 (4,604) |
| 43 | 480 (1,575) | 8,032 (10,498) )10,498( ( |
| 49 | 17 (55) | 280 (366) |
| 50 | 17 (55) | 280 (366) |

| Avalanche Path | Length T* m (ft) | Volume Total $m^3$ ($yd^3$) |
|---|---|---|
| 51 | 16 (54) | 275 (359) |
| 55 | 18 (58) | 296 (387) |
| Total | 4,281 (14,055) | 71,683 (93,683) |

** Length may be larger than avalanche path width at the highway due to multiple events in a given year.*

*Length T: Total length of highway, measured along centerline, to be covered in an average year (m, ft).*

*Volume T: Total volume of snow on the highway in an average year ($m^3$, $yd^3$)*

If avalanche mitigation were not used, the Avalanche Hazard Index (AHI) for Alternative 2 would be 369.5. This would rate at the highest hazard level on a five-point international scale [Very High (>100), High (40-100), Medium (10-40), Low (1-10), and Very Low (<1)]. Approximately 10 other highways in North America are open to winter traffic which would have a rating of Very High if mitigation were not used.

Avalanche mitigation proposed by the DOT&PF would be based on a sophisticated monitoring system of selected avalanche areas coupled with an aggressive hazard reduction program involving helicopter and ground launched explosive devices and catchment/retarding structures where appropriate. The criteria for the aggressive hazard reduction include a combination of controlled avalanche releases and highway closures. It is anticipated the highway would be closed during nighttime hours when the avalanche rating is high and controlled releases have not been completed successfully. Avalanche mitigation includes construction and staffing of a new maintenance station near the Kensington Mine facility. This would reduce the amount of time the highway would be closed in winter due to unforeseen avalanches and during controlled avalanche releases. In addition to the new Kensington maintenance station, major releases of avalanches which block the highway would be cleared with crews and equipment from Skagway, Haines and Juneau. Extended closure periods exceeding three days may require implementation of emergency ferry service between the three communities. As a highway closure would rarely exceed three days, the emergency plan will have little impact on ferry schedules.

Other structural control measures, such as avalanche sheds would be considered for locations where warranted, based on experience and results of a long-term monitoring program.

**Earthquakes**: Southeast Alaska is a seismically active region where earthquakes with a magnitude greater than 6.0 on the Richter scale could occur. An earthquake of that magnitude could cause soil liquefaction, uplift or subsidence along fault zones (Figure 4-9), severe structural damage, landslides, tsunamis, avalanches, glacial calving, and changes in stream and groundwater flow. Three fault zones have been mapped that cross the East Lynn Canal route. One is located about 5 kilometers (3 miles) from the mouth of the Lace River, a second extends from Slate Cove to Point Sherman and a third is located 5 kilometers (3 miles) south of Katzehin River. No faults have been identified along the West Lynn Canal route.

**Tsunamis**: While the danger from tsunamis generated in the open ocean is small for all alternatives, the underwater potential for landslides exists. In 1994, an underwater landslide adjacent to the White Pass dock under construction in Skagway, generated a wave that destroyed a portion of a dock facility and substantially damaged the small boat harbor and ferry dock.

**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.

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

**Landslides**: Landslide activity has occurred in several areas along Lynn Canal. Five landslides were identified along the East Lynn alignment and two along the West Lynn alignment (Figure 4-9). The cause of instability is generally related to weathering, slope steepness, vegetation cover, precipitation, seasonal freeze-thaw cycles, and ground or vegetation disturbance.

### 4.2.2 Water Quality and Hydrology

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. There are no known potable water wells along the proposed highway alignments.

The major drainage basins along Lynn Canal are shown in Figure 4-13. There are 62 rivers/streams on the east side of Lynn Canal, of which four drain watershed areas encompassing more than 26,000 hectares (100 square miles). Much of the terrain on the east side is steep and many of the streams are small, draining watersheds of less than 1,300 hectares (5 square miles). There are 27 rivers/streams along West Lynn Canal, of which the Endicott River and Chilkat River drain watershed areas of more than 26,000 hectares (100 square miles). The west side watersheds are generally less steep than those on the east side.

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.

### 4.2.3 Floodplains

The Federal Emergency Management Agency (FEMA) 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 may have extensive 100-year floodplains (Figure 4-13). 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 shows that the highest tide in the project area is 6.9 meters (22.5 feet) above mean lower low water at Chilkat Inlet near Pyramid Island. The coastal floodplain is 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.

### 4.2.4 Wild and Scenic Rivers

The Forest Service has recommended the Katzehin River from its headwaters at Meade Glacier to 3.2 kilometers (2 miles) upstream from tidewater at Chilkoot Inlet be designated as a component of the National Wild and Scenic Rivers System (Figure 4-14). This would classify the upper 16 kilometers (10 miles) of the river as 'Wild' with the lower 3.2 kilometers (2 miles) not designated.

The Katzehin River originates from Meade Glacier at an elevation of 152 meters (500 feet) and flows 19 kilometers (12 miles) to Chilkoot Inlet. There are 3,824 hectares (9,560 acres) within the river corridor. The ecology of the Katzehin River Valley is considered unique because it has climatic and ecologic conditions found only at the extreme north end of the Tongass National Forest. The river is scenic, pristine, and has no evidence of past mining or timber harvest activities.

### 4.2.5 Air Quality

The ambient air quality is very good; carbon monoxide levels are well below maximum allowable levels ("Air Quality Report", FPE/Roen Engineers, 1994).

### 4.2.6 Noise

The project area is undeveloped except where it connects to Juneau, Haines and Skagway. Noise measurements were taken in July 1994 ("Noise Report", FPE/Roen Engineers, 1994) to determine the ambient noise levels for sensitive receivers.

Noise levels were consistently 38 to 40 dBA in Haines on July 15, 1994. Noise levels in Skagway are more complex, with very discontinuous noise levels. While background noise may be recorded within the low to mid-40 dBA range during parts of the day, other times show much higher levels. Noise levels during normal peak traffic times generally were between 66 and 75 dBA.

## 4.3 BIOLOGICAL ENVIRONMENT

### 4.3.1 Wetlands

The Lynn Canal study area contains 11,562 hectares (28,571 acres) of wetlands and special aquatic sites (i.e. mudflats) regulated by the U.S. Army Corps of Engineers (COE) under the authority of the

Clean Water Act. Wetlands for this project are defined using the COE wetlands delineation manual ("Wetlands Technical Report", Dunn Environmental Services, 1997, Appendix D) as follows:

> *"... 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 U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory has mapped wetlands in the project area. The inventory has grouped wetlands into general wetland classes or complexes (Figure 4-15). The predominant wetlands in the project area consist of palustrine forested and scrub shrub wetlands (and combinations) with an area of 5,580 hectares (13,788 acres), and palustrine emergent and emergent/scrub shrub wetlands with an area of 4,009 hectares (9,906 acres). The combination of these classes of wetlands comprise about 83 percent of all wetlands in the project area.

The least common wetlands in the study area consist of 27 hectares (67 acres) of palustrine aquatic bed wetlands, 624 hectares (1,542 acres) of "aquatic bed/emergent wetlands" and estuarine emergent wetlands. Respectively, these wetlands comprise 0.2 percent and 5.4 percent of all wetlands in the project area.

The functional value (productivity) of the wetland complexes was evaluated using the methodology developed for the CBJ. A modification of the WET II technique, developed by the COE to quantitatively evaluate wetlands, was used in the analysis. The modified WET II technique was adapted for local climate, soil, and vegetation. Wetland complexes crossed by the highway alignments were evaluated in the project area and rated from high to moderately low. Values for the wetlands along Lynn Canal were determined for each of these functional values, then summarized (Table 4-2).

The wetlands in and around Berners Bay were identified as potentially high value during the scoping phase of the Draft Environmental Impact Statement (DEIS). The primary wetlands that would fall within the highway alignments that cross Berners Bay have been identified as B-1 through B-6 (Figure 4-15). Three alignments were analyzed to cross Berners Bay. The original reconnaissance alignment would impact three wetlands complexes identified as B-1, B-2, B-3, and B-6. Alignment EIS-A would impact wetlands complexes B-3, B-4, and B-5. Alignment EIS-B would impact B-3,

B-4, B-5, and B-6. Each wetlands complex is discussed in the Wetlands Technical Report, Dunn Environmental Services, 1997, Appendix D.

Wetlands B-1, B-2 and B-6 have the highest rated functional value based on the modified Wet II methodology. They rated high for seven important functions, including surface hydrologic control, riparian support, salmonid habitat, disturbance of sensitive wildlife, regional ecological diversity, ecological replacement cost, and potential recreation use.

Wetlands B-4 and B-5 rated moderately high based on the methodology. Because they are tidally inundated the methodology does not consider such factors as nutrient transformation and exportation and salmonid habitat. However, these wetlands lie within and/or adjacent to an expansive tidal mudflat at the head of Berners Bay. This mudflat continues to form as glacial silts and sands are deposited into Berners Bay estuary by the Antler and Lace rivers.
As the mudflats build up and become vegetated, they provide important habitat for moose, bear and waterfowl. At the lower elevations, the mudflats provide a resting place for harbor seals and pups during low tide. This is especially important for harbor seal pups during the spring when eulachon return to the Anter and Lace Rivers to spawn.

The estuarine wetlands are also important to eulachon and other smelts which spawn in the Berners, Lace, and Antler rivers and juvenile salmon especially chum and pink salmon which migrate from the rivers to the estuaries soon after emerging from the spawning gravels.

A series of forested wetlands along the east side of Lynn Canal from Point Sherman to Comet (East Lynn 4) rated a high value for only one of the functions; the disturbance of sensitive wildlife. The overall values for the seven important functions listed previously rated moderately low.

**TABLE 4-2**
**WETLAND COMPLEX VALUES**

| Wetland | Map Code | Dominant Classes | Modified WET II Value |
|---|---|---|---|
| Berners Bay 1 | B-1 | Palustrine scrub shrub/emergent | High |

| | | | |
|---|---|---|---|
| | | Palustrine forested/scrub shrub | |
| Berners Bay 2 | B-2 | Palustrine emergent<br>Palustrine forested/scrub shrub | High |
| Berners Bay 3 | B-3 | Palustrine forested/scrub shrub<br>Palustrine forested<br>Palustrine emergent | Moderate |
| Berners Bay 4 | B-4 | Eustary flood/eustary emergent | Moderately high |
| Berners Bay 5 | B-5 | Palustrine emergent<br>Palustrine forested/scrub shrub | High |
| Berners Bay 6 | B-6 | Riverine flooded<br>Palustrine scrub shrub | High |
| East Lynn 4 | EL-4 | Palustrine forested | Moderately low |
| East Lynn 5 | EL-5 | Palustrine scrub shrub/emergent | Moderate |
| Slate Creek 6 | SC-6 | Palustrine forested/persisten emergent | Moderately high |
| West Lynn 1 | WL-1 | Palustrine forested | Moderately low |
| West Lynn 2 | WL-2 | Palustrine forested scrub shrub/palustrine scrub shrub/emergent | Moderate |
| West Lynn 3 | WL-3 | Palustrine scrub shrub | Moderate |

### 4.3.2 Vegetation

Western hemlock dominates most of the forested areas within the project vicinity. At mid to high elevations within the forested region, yellow cedar and blueberry are also present. At lower elevations, shrubs consist of blueberry, shield ferns, devils club, and skunk cabbage. Mountain hemlock becomes dominant at the highest elevations, typically from 400 to 915 meters (1,300 to 3,000 feet), and associated shrubs include blueberry, copperbush, and cassiope.

Along floodplains, alluvial fans, and disturbed areas, Sitka spruce is the dominant tree species. Associated plants include blueberries, devils club, and alder. Wetter areas generally consist of scrub timber stands, composed of several conifer species with no one species having a competitive

advantage over another. Blueberry, skunk cabbage, and deer cabbage dominate the understory. Red alder is common along streams, beach fringes, and on recently disturbed soils. Black cottonwood grows on the floodplains of major rivers and recently deglaciated areas. A mixture of Sitka spruce and black cottonwood dominates riparian areas, with an alder and devils club understory. Mosses grow on the ground, on fallen logs, on the lower branches of trees, and in forest openings.

### 4.3.3 Fish and Wildlife Habitat

Habitats within the project area include: old-growth forest, beach fringe, estuary fringe, anadromous fish streams, and marine habitat. Details of these habitats are presented in "Wildlife Technical Report", Dames & Moore, 1997, and "Anadromous Fish Habitat Technical Report", FPE/Roen Engineers, 1994, Appendix D and are summarized below.

**Old Growth Forest:** This is the predominant habitat type in Southeast Alaska. The presence of large trees, decaying logs, lush undergrowth, and multiple canopy layers characterizes an old-growth forest habitat. These characteristics provide unique and critical habitat conditions for many wildlife species, including martens, red squirrels, bald eagles, northern goshawks, and cavity-nesting birds. There is a total of 52,000 hectares (128,525 acres) of old-growth forest in the project area. There are 30,869 hectares (76,279 acres) along East Lynn Canal and 21,131 hectares (52,246 acres) along West Lynn Canal.

**Beach Fringe Habitat:** This habitat is the area within a 150-meter (500 feet) slope distance inland from the mean high tide line. A beach fringe habitat is a transition zone between land and water, salt water and fresh water, and vegetated and non-vegetated conditions. Habitat types within the beach fringe include old-growth forest, muskegs, grasslands, and emergent wetlands. Old-growth forest within the beach fringe receives heavy seasonal use by black bears , brown bears, river otters, bald eagles, mountain goats, marten, and Sitka black-tailed deer. The use of this habitat varies throughout the year depending on species. There are 5,228 hectares (12,918 acres) of beach fringe habitat in the project area. There are 2,643 hectares (6,531 acres) along East Lynn Canal and 2,585 hectares (6,387 acres) along West Lynn Canal.

**Estuary Fringe Habitat:** This habitat comprises the area within a 300 meter (1,000 feet) slope distance inland from the mean high tide line around estuaries in the project area. Estuaries occur where large streams enter protected bays and inlets and are most commonly intertidal mudflats and saltwater marshes. Black bears are the primary users of an estuary fringe habitat. Other species that use this habitat include: brown bear, waterfowl, marten, river otters, and bald eagles . There are

2,894 hectares (7,150 acres) of estuary fringe habitat in the project area. There are 700 hectares (1,728 acres) on the east side and 2,194 hectares (5,422 acres) on the west side.

**Anadromous Fish Streams:** These streams provide both spawning and rearing habitat for fish. A wide mixture of steep and gentle terrains within the project area produce a variety of stream types and habitat. Sensitive areas for anadromous fish habitat along East Lynn Canal are centered within the Berners Bay area, the areas of Sherman and Sweeny creeks, and the Katzehin River. The remaining streams along the east side generally have steep gradients and provide poor fish habitat. There are 11 cataloged anadromous fish streams along the East Lynn Canal and nine anadromous fish streams along the West Lynn Canal. Five new anadromous fish streams were identified during the reconnaissance phase of this project ("Anadromous Fish Habitat Technical Report", FPE/Roen Engineers, 1994, Appendix D).

**Marine Habitat:** The marine environment encompasses the deep water and coastal marine waters of Lynn Canal. Both resident and migratory populations of marine mammals, birds, and fish occur in this environment. There are several harbor seal haulouts and three Steller sea lion haulouts located in the project area (Figure 4-16). Many intertidal and subtidal species are also abundant.

### 4.3.4 Fish and Wildlife Resources

Anadromous fish in the project area include: king, coho, sockeye, chum, and pink salmon; cutthroat and steelhead trout; Dolly Varden char; and eulachon. In 1988, the American Fisheries Society passed a resolution to place all salmon and trout of Pacific lineage in the genus Oncorhynchus. As a result, both cutthroat and steelhead trout are classified as salmon (Oncorhynchus clarki and Oncorhynchus gaidneri).

Many other fish inhabit Lynn Canal including, Pacific herring, cod, halibut, sable fish, Pacific arrowtooth flounder, and flathead sole. Species of lesser abundance include walleye pollock, starry flounder, rock sole, rockfish species, and capelin. Marine invertebrates include species of shrimp and Dungeness, Tanner, and king crab.
Many wildlife species inhabit the area, including: brown and black bear, moose, Sitka blacktail deer, wolf, mountain goat, mink, marten, land otter, and red squirrel.

Four Management Indicator Species as defined by the Forest Service were selected for detailed evaluation of land-based wildlife. These include brown bear, black bear, marten, and mountain goat. They provide a representation of important game species, that are sensitive to highway development

and disturbance. Habitat capacity models were used to quantify suitability of habitat in the project area. These models are the best known tool for quantifying habitat value for management indicator species. Results of habitat capability models ("Wildlife Technical Report", Dames & Moore, 1997, Appendix D) suggest that areas along Lynn Canal can support almost 200 brown bear, over 500 black bear, 300 marten and 1,000 mountain goat.

Moose have not been designated as a Management Indicator Species and there is no habitat capability model for this species, however, numerous moose occur along the West side of Lynn Canal and a small herd of moose was introduced into the Berners Bay area on the east side. Some moose from the Berners Bay herd are assumed to have migrated to the Katzehin River area.

Marine mammals in the waters of Lynn Canal include: humpback, killer, and minke whales; Dall and harbor porpoises; Steller sea lions; and harbor seals. The humpback whale is listed as an endangered species. The Steller sea lion is listed as a threatened species. Both species are further discussed in Section 4.3.6. Locations of known sea lion and harbor seal haulouts within the project area are noted on Figure 4-16.

A variety of seabirds live within and migrate through the project area. These include various gulls and ducks, scoters, grebes, arctic terns, black oystercatchers, pigeon guillemots, murres, marbled murrelets; and other birds, such as loons and cormorants. Many of these birds reside in Lynn Canal seasonally. Various species of waterfowl are also found in the estuarine areas along the canal.

### 4.3.5 Bald Eagles

The bald eagle is protected under the Bald Eagle Protection Act of 1940, as amended (16 USC, CH 5A, Subchapter II, 668-668d). This act, in part, prohibits taking or disturbing a bald eagle and its nest except for religious or scientific purposes.

Bald eagles are plentiful in the project area with an average frequency of more than one nest per 1.6 kilometers (1 mile). A total of 177 bald eagle nests were documented for the project area between 1970 and 1994. Helicopter and boat surveys conducted in 1994 located 125 nests within the project area (78 east side; 47 west side). It is assumed that the 52 nests not located in the 1994 survey have either been destroyed or the tree is no longer standing.

Nests are generally sited so that an eagle sitting in or near the nest has a clear view of the water in an area that provides good fishing. Most nests are built in large Sitka spruce within 400 meters (1,300 feet) of the beach and near the mouth of a river or stream or on a prominent point of land.

Nests are large, usually about 1.5 meters (5 feet) in diameter, and constructed of intertwined sticks lined with sedges, grasses, and feathers. Nesting eagles will occupy 40 to 50 percent of available nests in any one year. Within the project area in 1994, approximately 50 percent of the nests were occupied in May while around 40 percent were still productive by mid-July. Some nests are occupied every year while others are occupied on a more erratic basis. The more productive nests are thought to be those located closest to reliable food sources ("Bald Eagle Technical Report", Dunn Environmental Services, 1997, Appendix D).

Bald eagles have a reproductive lifespan of about 20 years and can live up to 50 years in captivity. They are present in the project area year-round, although some leave during the winter months to areas where food is more plentiful, such as the Alaska Chilkat Bald Eagle Preserve north of Haines, along the Chilkat and Klehini rivers. Bald eagles are most susceptible to disturbance during the breeding and nesting season. This usually begins in March and can continue through August with family dispersal occurring throughout September.

### 4.3.6 Threatened and Endangered Species

This section describes threatened, endangered, and candidate species of marine wildlife, terrestrial wildlife, and plants. Threatened and endangered species are formally listed by the USFWS or National Marine Fisheries Service (NMFS) under the authority of the Endangered Species Act of 1973 and its amendments. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future through all or a significant portion of its range. A candidate species is a species for which the USFWS or NMFS has sufficient information on biological vulnerability and threat(s) to support proposals as threatened or endangered.

**Plants:** Field surveys conducted in the project area found no threatened, endangered, or candidate plant species growing within areas that would be affected by any of the proposed alternatives.

Endangered, threatened, and candidate species of animals that occur in the project area, and their habitats, are presented in Table 4-3.

**Endangered Species:** Humpback whales are found throughout Lynn Canal and are common sights in some areas throughout the year. In April and May concentrations of adult herring and eulachon bring humpback whales into Berners Bay to feed.

The American peregrine falcon nest in Interior Alaska and is found in Southeast only during spring and fall migration. During migration, these falcons forage in areas of high prey availability, such as seabird rookeries and waterfowl concentration areas. There are no seabird rookeries in the project area but waterfowl is abundant in its bays and inlets.

**TABLE 4-3**
**THREATENED AND ENDANGERED SPECIES**

| Common Name | Scientific Name | Status | Habitat Area |
|---|---|---|---|
| American Peregrine Falcon | *Falco peregrinus anatum* | E | Berners Bay and other bays |
| Humpback Whale | *Megaptera novacangllae* | E | Marine waters of Lynn Canal and Berners Bay |
| Steller Sea Lion | *Enmetopias jubatus* | T | Gran Point haulout and marine waters of Lynn Canal |

*Note: T = Threatened; E = Endangered*

**Threatened Species:** There are no threatened terrestrial species in the project area. Steller sea lions are the only threatened marine species in the project area. In accordance with the Endangered Species Act of 1973, as amended, a Section 7 consultation with NMFS and USFWS regarding threatened and endangered species present in the vicinity of the proposed project is currently in progress. Through early coordination, it was determined that a Steller sea lion haulout at Gran Point would potentially be impacted.

Steller and northern sea lions range from southern California around the Pacific rim to northern Japan and Korea ("Steller Sea Lion Technical Report", FPE/Roen Engineers, 1996, Appendix D). Sea lions use traditional, well-established sites known as "haulouts" or "haul sites" for resting between feeding forays and during migration. Some haulouts are occupied year-round, while others

are used seasonally. There are three area Steller sea lion haulouts within the project area. They are Point St. Mary, Met Point, and Gran Point. The Gran Point haulout located south of the Katzehin River on the east side of Lynn Canal receives sufficient use to be classified as a Critical Habitat Area by the NMFS.

# 5.0 ENVIRONMENTAL CONSEQUENCES

This section discusses the direct impacts and indirect impacts (secondary and cumulative) that result from Alternative 2 and Alternative 4.

## 5.1 SOCIAL AND ECONOMIC IMPACTS

### 5.1.1 Land Use

**Land Ownership and Management:** The USDA Forest Service (Forest Service) would be most affected by virtue of being the largest land holder. The Tongass National Forest lands crossed by Alternative 2 and Alternative 4, options B and D, are designated Land Use Designation (LUD) II and are managed in a roadless state to retain primitive wildland character. Highways may be built on LUD II and are to serve authorized essential activities including transportation needs determined by the State of Alaska (TLUMP, as amended). The State of Alaska has determined that Alternative 2 is an essential transportation corridor.

New accessible areas would possibly be reevaluated and reclassified within the Forest Service Recreation Opportunity Spectrum (ROS). If the Forest Service reevaluates the ROS classes, the semi-primitive non-motorized areas along the coastline would likely be changed to the ROS class of roaded natural with Alternative 2. The coastal area north of the Katzehin River is already classed as roaded natural and would need no change under Alternative 2.

The City and Borough of Juneau (CBJ) has designated the Echo Cove area as an Area Meriting Special Attention (AMSA) to safeguard natural, scenic, and recreational values as development occurs. The CBJ does not have a management plan for the AMSA, but the CBJ Comprehensive Plan and Coastal Management Plan both support highway access to the Echo Cove and Berners Bay area. The Department of Natural Resources (DNR) Juneau State Land Plan has been written to accommodate a highway along Lynn Canal.

Goldbelt, Incorporated (Goldbelt) owns lands along Echo Cove near the south end of Berners Bay. While these lands are generally undeveloped, Goldbelt intends to manage and develop them for commercial, recreational, and tourism uses, and possible residential development. Highway access would facilitate these developments. The Forest Service is currently preparing a Draft Environmental Impact Statement (DEIS) for Goldbelt to construct an access road to their proposed development at Cascade Point along a Forest Service right-of-way.

Both alternatives 2 and 4 would have a negligible impact on land ownership and management.

**Recreation:** Alternative 2 would improve access and provide increased recreational activity along East Lynn Canal, particularly in the Berners Bay and Katzehin River areas. A highway would provide access for activities such as hiking, climbing, sport fishing, hunting, and camping. Some current users would feel the natural and scenic values of the area would be diminished by vehicular traffic and increased recreational activity.

The existing Forest Service Berners Recreation Cabin would be relocated across Berners Bay to near Point Saint Mary. A new day use structure would be constructed to replace the cabin. Other recreational based mitigative measures include trail heads, trails, scenic pullout and day use picnic areas.

Alternative 4, options B and D, would increase recreational activity in Berners Bay but to a much lesser extent than Alternative 2. Under these options, access to the upper bay would still require a boat, kayak, canoe or airplane.

**Resources:** Extension of Glacier Highway under Alternative 2 and Alternative 4, options B and D would require timber clearing within the right-of-way. If Alternative 2 is selected 353 hectares (872 acres) would be cleared within the right-of-way, which would produce a small amount of marketable timber.

Highway access provided by Alternative 2 would benefit the Kensington and Jualin mines and their workers, particularly those who live in Haines and Skagway. Improved access along the east side of Lynn Canal would encourage exploration activities on other patents and claims in the area. Alternative 2 could have additional impacts on wildlife and wetlands should future resource development be determined feasible as a result of improved access. Since Alternative 2 is located within the Tongass National Forest, any potential resource development is subject to the USDA Forest Service management plan for the area.

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Alternative 4, options B and D would require substantially less timber clearing within the right-of-way than for Alternative 2. Accordingly, the impact would be negligible on land and resource use.

**Indirect and Cumulative Impacts:** All of the build alternatives would improve access to Juneau resulting in increased traffic, particularly recreational. Currently, summer traffic in Juneau includes few recreational vehicles (RV's). Alternative 2 would result in an increase in the number of those

vehicles in Juneau as well as in Haines and Skagway. Local comprehensive plans may have to be updated to address the positive and negative impacts of increased traffic.

Alternative 2 and Alternative 4, options B and D would result in increased recreational use, especially in the Berners Bay, Point Sherman, and Katzehin River areas. This increased use would require additional management effort by the Forest Service.

### 5.1.2 Visual Impacts

The visual impacts from alternatives 2 and 4 would result from highway cuts and fills (Figures 5-1 and 5-2), retaining walls, vegetation clearing, highway bridges and ferry terminal facilities. These visual impacts were assessed and are summarized in the following discussion from the "Visual Impact Assessment Technical Report", Dames & Moore, 1994, Appendix D. Key viewpoints are identified below (Table 5-1).

**TABLE 5-1**
**KEY VIEWPOINTS**

| Type of View | Viewpoints |
|---|---|
| Existing View | Cruise ship/tour boat routes<br>State ferry<br>Small boat routes<br>Shoreline use areas and anchorages<br>Forest Service cabins<br>Popular hunting/hiking areas<br>Wilderness areas and parks, trails and campsites<br>Potential Wild River corridors |
| | Communities and existing travel routes<br>- Access roads<br>- Echo Cove/Glacier Highway<br>- Haines/Chilkat Peninsula<br>- Skagway<br>- Scattered homes and smaller settlements |
| Existing Low-Altitude Aerial | Small Plane |
| Potential View | Proposed highway alternatives (roadway and vista points) |

| | |
|---|---|
| | Proposed ferry terminals |
| | Expanded ferry service |

Adverse visual impacts fall into three main categories:

- A highway would create an unnatural horizontal line parallel to the shoreline along steep exposed slopes.

- Major project components (bridges, cuts and fills, and retaining walls) would be located in areas highly visible from surface and aerial viewpoints.

- Project components would be located in highly visible areas on land classified as Retention Visual Quality Objective (VQO) by the Forest Service.

Beneficial visual impacts result from increased viewing opportunities in areas of high visual quality.

The principal project components that would introduce major visual change include:

- Cuts more than 30 meters (100 feet) high; along the steep rock faces.

- Fills more than 10 meters (33 feet) high and more than 200 meters (656 feet) long within 25 meters (82 feet) elevation above the shoreline, where visible to vessels.

- Tree clearing where it introduces linear contrasts to the landscape visible over the remaining tree canopy.

- Ferry terminals in undeveloped areas.

- New vistas and viewing areas along Alternative 2 and 4, B and D.

Alternative 2 and Alternative 4, options B and D would adversely impact existing viewpoints in Table 5-1 since each would require an extension of the Glacier Highway and construction of a ferry terminal. Alternative 2 would have the greatest impact on the visual quality of Berners Bay and East Lynn Canal. A moderate change in the visual quality along the route would result from continuous cuts, fills, and structures which would introduce linear contrast to the landscape. In many areas the

highway would be located in the forest above the beach fringe and would be screened from the water. Alternative 2 would also provide significant and beneficial viewing opportunities for wildlife and physical topography.

High visual impact would occur at Sawmill Cove, Berners Bay, Independence Lake to the Katzehin River delta, Taiya Inlet, and entering Skagway where the cuts and fills can be seen from boats and cruise ships.

Definitions and details on high visual impacts are presented in the "Visual Impact Assessment Technical Report", Dames & Moore, 1994, (Appendix D).

To reduce the adverse visual impact of the highway the following mitigation measures would be considered if Alternative 2 is selected.

- Alignment - Adjust alignment where practical, to be compatible with other resources in unscreened areas of vegetation, taking advantage of ridge lines or rock outcropping that can be notched.

- Grading and Retaining Walls - Round slopes, where possible. Use retaining walls to reduce the extent of cut and fill, to reduce color contrast, and to promote revegetation.

- Clearing - Select and vary clearing in right-of-way as needed, to reduce the linear strip effect of standard clearings. Blend edges with natural openings where feasible and minimize clearing.

- Existing Vegetation - Retain shoreline trees below the highway, where possible, to help buffer views from the water.

- Structure Design - Design bridges and their components with minimal mass to compliment the surrounding natural landscape as much as possible.

- Vegetation and Landscaping - Seed exposed soils with native mixes.

### 5.1.3 Historical and Archeological Resources

Consultation with the State Historic Preservation Officer (SHPO) and the Forest Service has determined cultural resources on or eligible for the National Register of Historic Places (NRHP) would not be adversely impacted should Alternative 2 be selected. This determination is based on the following discussion.

There are three cultural sites eligible for the NRHP that are in proximity to Alternative 2. These include two sawmill sites dating back to the late 1890's and to the early 1900's, and one Tlingit cache pit site thought to be about 400 years old. The older sawmill site and the cache pit site are near each other and would be 65 meters (213 feet) from the highway. The area between the highway and the older sawmill and cache pit is moderately steep and forested.

These sites would not be visible from the highway and there is low potential that highway users would access these sites. The more recent sawmill site is about 90 meters (295 feet) from the proposed highway. This sawmill is associated with the picnic area at Sturgill's Landing, south of Skagway, which is accessible by trail. The Forest Service recently reconstructed the lower Dewey Lake trail to increase capacity for visitors hiking to the area. With increased access the trail provides to Sturgill's Landing, it is unlikely the highway would additionally affect the remaining features of the sawmill.

The highway alignment into Skagway would enter the area from the south, into the Skagway and White Pass District National Historic Landmark (NHL), along the White Pass dock. It would continue on Congress Way through Skagway. The alignment does not adversely affect any contributing elements. The White Pass dock was completely reconstructed in 1995 and the historical Ship Registry cliff-side paintings adjacent to the dock would not be affected or blocked from view by Alternative 2.

### 5.1.4 Social Impacts

The social impacts that would result from improved access to Juneau are discussed below. A detailed assessment of the social impacts can be found in "Socioeconomic Effects", Eco-Systems, Resource Management Group, Sheinberg Associates, and McDowell Group, 1994, Appendix C.

**Education:** Improved access to Juneau provided by alternatives 2 and 4 would increase interaction among school districts and community education and cultural facilities. Alternative 2 would offer more direct benefits than Alternative 4 because it would be more convenient and flexible, less costly, and take less time.

**Health Care and Social Services:** Improved access provided by alternatives 2 and 4 would benefit people traveling from Haines or Skagway to Juneau for medical treatment, as surface transportation time or costs decrease and frequency increases. Both alternatives would provide more immediate transportation for health care users and providers when air transport is not available or warranted. Neither alternative 2 nor 4 would substantially affect health care and/or social services providers in Haines or Skagway.

Overall, alternatives 2 and 4 would provide better access to health care and social services than are now available with the existing transportation system.

**Public Safety:** Public safety needs would increase for Juneau, Haines and Skagway under Alternative 2; and for Juneau under Alternative 4. Alternative 2 would have a low impact on services provided by the Juneau Police Department (JPD) and staffing would have to be increased to patrol and provide emergency response for 48 kilometers (30 miles) of extended rural highway jurisdiction in order to maintain the current level of service. In addition, public safety needs would slightly increase between Auke Bay and Echo Cove due to more traffic under Alternative 2 and Alternative 4, options B and D. The impact on JPD due to more traffic as a result of Alternative 4, options A and C would be negligible.

The JPD jurisdiction extends to the borough boundary even though the highway ends at Echo Cove. Currently there are no regular patrols beyond Mendenhall Valley.

Skagway police and fire services are considered adequate to accommodate additional service demands. Haines police staff would also be able to handle the additional demands, however, more emergency response may be requested for special needs along the expanded highway route in Alternative 2. The Department of Public Safety, Alaska State Troopers jurisdiction would be expanded by about 48 kilometers (30 miles). Alternative 2 offers the opportunity for mutual aid exchanges between Haines and Skagway and to a lesser extent, Juneau.

Public safety services in Haines and Skagway would experience the effects of more frequent and convenient ferry service from Alternative 4, but current staffing levels should be adequate.

**Public Utilities:** There would be a negligible impact resulting from alternatives 2 and 4, on water, wastewater, sewage treatment, solid waste, and electrical services in Juneau, Haines, and Skagway.

**Quality of Life:** The August 1994 "Household Survey", (McDowell Group, 1994; Appendix C) found Juneau residents with positive and negative views on how extending Glacier Highway to Skagway would affect their quality of life. Among the positive impacts expressed were economic growth and enhanced recreational opportunities. Concerns about negative impacts included social changes such as higher crime, increased transient and permanent population, and impacts from more traffic, particularly recreational vehicles. The perception of quality of life impacts resulting from construction of a highway to Juneau varies by community. In Juneau, 23 percent felt their quality of life would be worse, 34 percent better and 41 percent the same. In Haines, 24 percent felt their quality of life would be worse, 38 percent better, and 37 percent the same. In Skagway, eight percent felt their quality of life would be worse, 38 percent better, and 48 percent the same.

While there is a perception that a highway from Juneau to Skagway with shuttle ferry service to Haines would have positive economic benefits; there is concern in Haines that this route would have negative economic impacts on their community.
In Haines, positive perceptions centered on economic growth, better access to health care, and increased tourism and recreational opportunities; negative impacts were social changes similar to those noted for Juneau, and more traffic. Some Haines residents felt that viewing the highway along East Lynn Canal from both the town and Chilkat State Park would detract from their quality of life.

Skagway respondents identified positive impacts that included economic growth, increased tourism and recreational opportunities; negative impacts included social changes and increased competition for local businesses from Juneau. The most substantial concern expressed by many in Skagway, in particular the National Park Service (NPS), was that tour ship companies would reduce sailings from Juneau to Skagway by bussing passengers to Skagway.

Perceived quality of life changes, both negative and positive, would be less under Alternative 4. Some residents perceived improved access would improve their quality of life by providing more frequent ferry service, but respondents in all three communities stated that improved ferry service would have a less positive impact than a direct highway connection. Negative quality of life changes were perceived as increased transient populations and other social changes that included increased traffic and visual intrusions.

**Indirect and Cumulative Impacts:** Improved access would increase the number of visitors to Juneau. Recreation activity centered in and around Juneau would grow, and demand for additional facilities such as RV parks, trails, camp sites, and boat ramps and docks would increase. If the

public and private sectors were successful in keeping up the increased demand, recreation users would benefit by greater opportunities and convenience.

If the growth in recreation visitors were so rapid that the public and private sectors were unable to keep up with the demand for new facilities, competition among recreation users for Juneau's limited facilities would be intense. Crowding would impact the recreation experience, by limiting the number of recreation users and could lead to resource overuse. Adequate planning by local, state and federal governments would be crucial.

### 5.1.5 Subsistence

The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) Section 810 evaluation is intended to determine if a federally-funded project would restrict subsistence uses of lands and resources within the project area. Restriction of use generally means substantial reduction in the opportunity to continue subsistence use of renewable resources. This reduction of opportunities is quantified in the Forest Service Subsistence Management and Use Handbook in three ways:

- Direct impacts on the resource, adverse impacts on habitats, or increased competition for resources;

- Changes in availability of fish and wildlife resources caused by an alteration in migration or location; and

- Limitations on access to harvestable resources, such as by physical or legal barriers.

Much of the project area is used for subsistence activities. These include: salmon and other species fishing; marine invertebrate fishing in Chilkoot Inlet; marine mammal hunting in Taiya Inlet, upper Berners Bay, and along Lynn Canal from Eldred Rock to the Katzehin flats; and mountain goat hunting in the Katzehin and Dyea area. Land-based subsistence activities are primarily confined to the Berners Bay and Katzehin River areas, with other areas having lower habitat quality and restricted access.

While improved access would benefit subsistence users by making access easier and less costly, it would also benefit recreational users for the same reason. East Lynn Canal is generally less important to subsistence users, especially those in Klukwan and Haines, than other areas. Subsistence impacts for all alternatives would be negligible.

### 5.1.6 Economic Impacts

Impacts to the economy in the project area from the proposed action were assessed ("Socioeconomic Effects", Eco-Systems, Resource Management Group, Sheinberg Associates, and McDowell Group, 1994, Appendix C) and are discussed below.

All dollar amounts are stated in 1994 dollars; no adjustment for inflation has been made for future years. Economic impacts of the proposed action would be felt to varying degrees in the construction, timber, commercial fishing, and mining industries. These impacts, and the impacts to the three communities in general, are discussed in the following paragraphs.

**Construction:** Under Alternative 2, construction of the highway and shuttle ferry is estimated to cost $232,300,000. A labor expenditure during construction of about $100,000,000 is expected, which could provide an annual equivalent employment of 200 workers for the construction period.

Juneau is expected to benefit most from such construction jobs, but Haines and Skagway would also likely benefit with increased commerce in support of the construction effort.

Under Alternative 4, costs for vessel(s), highway (where applicable), and terminal construction would range from $61,000,000 to $124,000,000. The highway construction period is estimated to require less than one year and could provide as many as 20 jobs. These jobs would benefit Juneau residents primarily. Vessel construction would have no economic impact on Juneau, Haines, or Skagway as construction would take place outside Alaska.

**Commercial Fishing:** The impacts to commercial fishing activities in Lynn Canal would be negligible under all alternatives. Any adverse impact to commercial fisheries would affect Haines more than Juneau or Skagway, because commercial fishing accounts for the highest percentage of total community income in Haines. Juneau would feel less economic effect, followed by Skagway, which has little reliance on commercial fishing.

Although there would be substantially more sport fishing pressure along the eastern shore of Lynn Canal under Alternative 2, sport anglers primarily target coho and king salmon while the target species for the commercial fleet is chum and sockeye salmon.

Alternative 2 would increase the number of boaters along the east side of Lynn Canal between Katzehin River and Berners Bay. This area is commonly congested during commercial salmon drift gillnet openings. The overall impact to the commercial fishing fleet from this increased congestion would be low.

Construction of a new ferry terminal in Berners Bay under Alternative 4, options B and D would affect fish habitat but this impact would be low. Under options A and C increased competition by sport and subsistence fishing would have a negligible adverse impact on commercial fishing.

The increase in frequency of ferry trips would expand vessel traffic along marine routes. This should not conflict with commercial fishing activities. Regular shuttle ferry service to the Berners Bay Ferry Terminal under Alternative 4, options B and D would have a low impact on the fishing areas at the mouth of Berners Bay and near Pt. Sherman.

**Mining:** Improved access under Alternative 2 would benefit the Kensington and Jualin mines north of Juneau. The primary benefit to the mines would be that mine workers could commute to their homes in Juneau, Haines, and Skagway rather than being housed at the mine facility. The potential for daily transport of workers by highway could reduce camp operation requirements and result in estimated annual savings of about $3,000,000 for Kensington Mine and $700,000 for Jualin Mine. Supplies could be shipped by truck to the mines, rather than by barge, reducing the need for stockpiling and handling.

Alternative 2 would improve access to mining claims in the vicinity of the Kensington and Jualin mines. Development of these claims are dependent on many economic factors. If the Kensington and Jualin mines begin commercial development, other claims in the area may be developed.

Alternative 4 would not impact mining activities in the project area.

**Timber:** Approximately 353 hectares (872 acres) of clearing would be required for the highway right-of-way under Alternative 2. This could produce an estimated 23,600 cubic meters (10,000,000 board-feet) of marketable timber, with a value of over $4,000,000. Lands adjacent to the highway right-of-way are not designated for timber harvest.

Alternative 4 would provide minimal opportunity for economic benefit from timber resources by construction of the highway to the ferry terminal in Berners Bay under options B and D. Around 20 hectares (50 acres) of right-of-way would need to be cleared for the highway and terminal area.

Goldbelt lands would be accessible from the highway, which would encourage land development and associated timber harvest.

**Local Economy:**

***Juneau:*** Alternative 2 would substantially increase the number of independent visitors to Juneau. By the year 2020, these highway-based visitors are projected to spend an additional $8,000,000 and create over 100 jobs. Recirculation of these visitor dollars would create another 100 indirect jobs. Overall, non-resident spending in Juneau would create over 200 new jobs by 2020.

Spending patterns by residents in the project area are expected to shift with improved access, as Haines and Skagway households take advantage of Juneau's larger retail base and Juneau residents take advantage of increased opportunities to travel to Haines and Skagway. The net spending by residents among the three communities would increase in Haines and Skagway and decline slightly in Juneau.

Sales tax revenues would increase at a rate proportional to the increase in nonresident spending in Juneau. By the year 2020, assuming a constant 4 percent tax rate (the existing CBJ 5 percent sales tax returns to four percent in September 1998), an additional $220,000 to $240,000 in annual sales tax revenues would be generated.

By the year 2020, population would be expected to increase less than one percent as a result of Alternative 2.

Alternative 4 is not anticipated to affect the cruise ship visitor market. The independent visitor market would increase, although the amount varies by option. Options C and D, with mainline service ending at Juneau, would substantially increase independent visitation, particularly in personal vehicle visitors. By the year 2020, an estimated 119,000 visitors in personal vehicles would arrive in Juneau, compared with 60,000 without access improvements (Alternative 1). This doubling of visitors in personal vehicles would generate an estimated $4,700,000 in local spending over Alternative 1, creating an additional 65 jobs.

Under options A and B, with continued mainline service to Haines and Skagway, the personal vehicle visitors forecast for Juneau in the year 2020 would increase, from 60,000 (Alternative 1) to 89,000. This would generate an estimated $2,000,000 in spending and generate about 30 additional jobs over Alternative 1.

There would be low beneficial impacts on local government through increased sales tax revenues resulting from additional visitor spending. This spending would generate about $80,000 (Alternative 4, options A and B) to $280,000 (Alternative 4, options C and D) in tax revenues by the year 2020. Under any of the alternatives, infrastructure improvements to accommodate increased tourism would be necessary.

***Haines:*** Under Alternative 2, the non-Alaskan visitor market in Haines would increase but at a substantially lesser rate than in Juneau and Skagway. The cruise ship market in Haines would be unaffected.

Access to Haines from Juneau or Skagway would be by shuttle ferry. Currently about 70,000 visitors in personal vehicles pass through Haines. Upon completion of Alternative 2 this number is expected to grow to over 99,000 by 2005 and over 143,000 by 2020.

Haines residents would take advantage of Juneau's larger and less expensive retail market. Total expenditures by Haines residents in Juneau are expected to increase approximately $500,000 to approximately $3,300,000. Recreational spending in the Haines area by Juneau residents is predicted to increase by $800,000, which would result in a net gain of about $300,000 to Haines in retail sales.

Population is not expected to be affected directly by the proposed alternative. Haines is currently growing as a retirement community and improved access to Juneau's larger retail and service sectors, particularly health care services, would encourage this trend.

The beneficial economic effect on local government is expected to be low. There would be a minimal net increase in local retail expenditures resulting in minimal tax revenues.

Alternative 4 would generally have negligible effect on Haines businesses. The exception would be the tourism market. While cruise ship visits would not be affected, the total visitor market, particularly those traveling by personal vehicle, would increase.

Haines residents are expected to take advantage of access improvements to shop in Juneau's larger and less expensive retail market. The extent of this loss of retail and service dollars would depend on whether local markets become more competitive. This alternative probably would not reduce local shipping costs as could Alternative 2. Spending outside of Haines could increase an estimated $900,000 with Alternative 4, from $2,800,000 to $3,700,000 a year.

This lost spending could be offset by the increased recreational dollars brought into the local economy by Juneau residents' recreational spending. Spending is estimated to increase by $800,000 a year for Alternative 4.

Population change would be negligible, as would be the economic effect on local government in Haines. There would be a small increase in total retail expenditures, and tax revenues would be increased accordingly. Changes in traffic volumes are anticipated to be negligible as well.

***Skagway:*** Alternative 2 is expected to increase the number of independent visitors to Skagway. The cruise ship market would not be reduced. According to cruise ship operators, a visible highway along Lynn Canal would have little or no affect on current cruise itineraries.

Annual non-Alaskan highway visitors in personal vehicles would increase by an estimated 12,000 visitors over Alternative 1. By the year 2020, this number is estimated to reach nearly 187,000 with an increase in spending of more than $650,000. This would generate about nine annual jobs.

Skagway residents are expected to take advantage of the larger retail market in Juneau, which could decrease the amount of personal resident spending in Skagway. Skagway resident spending in Juneau would increase from $900,000 to an estimated $1,700,000 by the year 2020. As with the Haines economy, this shift in spending would be lessened by the ability of local markets to compete successfully with Juneau markets as their transport costs are reduced by access improvements. Juneau residents are expected to spend more recreation dollars in Skagway, which would more than offset any displacement in Skagway resident spending.

As with Haines, local government impacts would be negligible as would the net change in population and demographics. Municipal tax revenues would change little; declining local spending by Skagway residents would be off set by increased Juneau resident and visitor spending.

Under Alternative 4, independent visitors would also increase. By the year 2020, almost 180,000 non-Alaskan visitors in personal vehicles are forecast, compared with over 175,000 under Alternative 1. This would increase visitor spending by an estimated $250,000 and provide an additional one or two jobs. Hence, the economic impact of Alternative 4 on the Skagway economy, population and demographics would be negligible.

## 5.2 PHYSICAL ENVIRONMENT

### 5.2.1 Geology

Alternatives 2 and 4 would result in negligible impacts to soils and geology. Alternative 2 would be subject to geological hazards including landslides and avalanches. Alternative 4 and marine intertidal structures associated with Alternative 2 would be subject to tsunamis. A detailed analysis of the levels of impact on proposed actions from geologic hazards were assessed for each alternative in the "Juneau Access Improvements Reconnaissance Engineering Report", (H.W. Lochner, 1994).

### 5.2.2 Water Quality and Hydrology

Water quality and hydrology impacts of alternatives 2 and 4 were assessed in the "Hydrology and Water Quality Report", (Dames & Moore, 1994) and the "Juneau Access Improvements Reconnaissance Engineering Report", (H.W. Lochner, 1994).

Water quality and hydrology impacts would result from ground disturbance activities. These impacts would increase sediment loads in affected rivers and streams. Although the larger rivers and streams along the east side of Lynn Canal are glacial and carry heavy silt loads there are numerous other clear water streams that also would be affected.

Negligible long-term impacts would occur from surface erosion at bridge abutments and culverts. The highway embankment would pose a partial barrier to shallow groundwater flow and slope runoff. This flow would be redirected through highway drainage ditches and cross-drain structures. Storm water runoff would carry contaminants from vehicle emissions. These contaminants would have a negligible impact on receiving waters because of the relatively low traffic volume and the small highway area compared with the large drainage basins and high annual precipitation.

There would be negligible water quality impacts from staging area runoff and treated sanitary waste water effluent at the Katzehin Ferry Terminal. The current plan for the terminal would provide minimal facilities. Mooring structures would be unlikely to impact shore currents in the small bight where the terminal would be located.

Alternative 2 would cross three large glacial rivers; the Antler, the Lace, and the Katzehin. All three rivers would be bridged. Bridges would be sized to avoid or minimze river bank disturbance. The crossing locations shown in Figures 3-7 and 3-8 should have minimal impact on the downstream transport of glacial sediments. A detailed hydrological study would be prepared for the final

environmental impact statement to determine the specific bridge crossing locations and related components such as flood protection structures.

Alternative 4 would have minor impacts on water quality and hydrology primarily restricted to staging area runoff. Mooring structures would have no impact on currents that circulate counter clockwise into Auke Nu Cove past the Auke Bay Ferry Terminal. The pile supported mooring structure would be located at the eastern end of the staging area.

**Indirect and Cumulative Impacts:** Increased access for fishing and other recreational activities along rivers and streams would impact stream banks and vegetation resulting in some erosion and sedimentation along the areas most heavily used. These impacts would be highest with Alternative 2, negligible with Alternative 4 options B and D, and nonexistent with Alternative 1 and Alternative 4, options A and C.

**Summary of Mitigation Measures:** The following mitigation measures would reduce any adverse water quality and hydrology impacts caused by alternatives 2 and 4.

- Provide vegetation, riprap, or other appropriate measures to protect slopes and prevent erosion in the vicinity of sensitive surface water bodies.

- Size structures and bridge spans to allow for natural sediment and debris accumulation, and to allow for channel shifting.

- Provide stilling basins and other hydraulic controls, as necessary, to minimize erosion and channel disturbance.

- Provide adequate cross drainage along highway alignment, considering runoff, meltwater, and groundwater flow.

- Perform regular bridge and culvert maintenance to prevent drainage channels from accumulating excess sediment and debris.

### 5.2.3 Floodplains

For Alternative 2 flood risks were determined by backwater modeling, which predicted the effect of bridge structures on upstream water levels.

There are no community floodplain development plans for the area subject to Alternative 2. The rivers on the east side of Lynn Canal are located in areas all classified as LUD II within the Tongass National Forest and have negligible potential for incompatible floodplain development.

The Antler, Lace, and Katzehin rivers are navigable and would require a Rivers and Harbors Act, Section 9, bridge permit from the U.S. Coast Guard. The bridges crossing these rivers would be sufficiently high to maintain navigation at all tide and flood stages.

The highway centerline elevation for Alternative 2 would be above the predicted 100-year flood elevation. Bridges would be designed to accommodate the 100-year flood volume, with no more than a 0.3 meter (1 foot) rise in backwater. Culvert crossings would be designed to accommodate flows from a 50-year rainfall event.

Alternative 2 would have a moderate impact on floodplain values. Encroachment into the floodplains would not alter the natural beneficial values or increase the risk of flooding.

Alternative 4 would not impact any floodplain areas.

### 5.2.4 Wild and Scenic Rivers

Alternative 2 would cross the Katzehin River approximately 3.2 kilometers (2 miles) downstream of the lower limit of the Wild designation. Alternative 2, if selected, would have no impact on the eligibility of the Katzehin River for the Wild designation. Recreational use of the river corridor would increase as a result of improved access.

### 5.2.5 Air Quality

The project area is located in an air quality attainment area. An assessment of air quality impacts in the project area ("Air Quality Report", FPE/Roen Engineers, 1994) showed that the maximum predicted carbon monoxide (CO) concentration would occur in the winter in Skagway under Alternative 2, when levels could reach 0.51 parts per million (ppm). The National Ambient Air Quality Standards (NAAQS) for one-hour CO concentrations is 35 ppm; for eight-hour concentrations, the standard is 9 ppm. Under the worst conditions, as modeled, the level of CO

would be far below the maximum allowable concentration. Both alternatives 2 and 4 would have negligible effects on air quality.

According to the State Air Quality Control Plan, the project is located in an "attainment area," and a conformity determination is not required per 40 CFR 51.

### 5.2.6 Noise

The Department of Transportation and Public Facilities (DOT&PF) Noise Policy considers a noise impact to exist if highway traffic noise levels at a receiver exceed 65 dBA or the projected traffic noise levels substantially increase the existing noise levels. As discussed in Section 4.2.6, Skagway is the only sensitive receiver in the project area that exceeds 65 dBA.

Given the noise level in the downtown area as a result of helicopter, train, small plane, and trail activity, the 2 dBA increase in traffic related noise would be imperceptible, and the impact negligible. Noise abatement has not been considered because it would not be practicable along the multiple use water front area.

Six areas were analyzed to determine existing noise levels and estimate the increase that would result from the proposed alternatives. Alternative 2 and Alternative 4, options B and C would have negligible impacts on the campsite at Echo Cove. Alternative 2 would increase the noise level at the National Park Service (NPS) visitors center in Skagway by 2 dBA for a total of 70 dBA. Currently, most noise in Skagway results from activities such as helicopter and small airplane flight-seeing, not highway noise. Helicopter flight-seeing is particularly noisy along the Skagway waterfront adjacent to the NPS visitors center. Given the noise level in the downtown area as a result of helicopter, small plane, and train activity, the increase in noise would be imperceptible, and the impact negligible.

## 5.3 BIOLOGICAL IMPACTS

### 5.3.1 Wetlands

As shown by Figure 5-3, the alignment for Alternative 2 in the "Juneau Access Improvements Reconnaissance Engineering Study", FPE/Roen Engineers, 1994, crossed the Lace and Antler rivers about 3 and 5 kilometers (2 and 3 miles) upstream from their mouth at Berners Bay impacting two

wetlands complexes B-1 and B-2. These wetlands were considered to have the highest functional value of any wetland in the project area. To avoid or minimize the impact on these wetlands additional alignments were analyzed (Figure 5-3) for crossing the Lace and Antler rivers (EIS-A and EIS-B). Additional information and detailed descriptions are contained in the "Wetlands Technical Report", Dunn Environmental Services, 1997, Appendix D.

EIS-A was the first alignment analyzed; it would cross an expansive mudflat and esturine wetland complex identified as B-4 and B-5. Most of the EIS-A alignment is inundated daily during the tidal cycle. The crossing of Berners Bay would consist of a solid fill causeway with bridges 650 meters and 750 meters (2,132 feet and 2,460 feet) long crossing the Antler and Lace river respectively. The mudflats and esturaine wetlands of B-4 and B-5 are important to several species of fish and wildlife. Large concentrations of shorebirds, gulls, and bald eagles forage for eulachon smelt in late April and early May. The mudflats are also important for Pacific herring spawning and for salmon smolts during their outmigration adjustment to saltwater.

In response to state and federal resource agencies concerns with the impact on the mudflats and wetlands B-4 and B-5, alignment EIS-B was developed (Figure 5-3). EIS-B would cross the Antler river at approximately the same location as the reconnaissance alignment, but then curve westerly away from the reconnaissance alignment through an upland area. The alignment as it crosses the Antler River crosses a riverine wetland (B-6), also crossed by the reconnaissance alignment but not specifically identified in the "Juneau Access Improvements Reconnaissance Engineering Report", (H.W. Lochner Inc., 1994). B-6 would be crossed with a pile supported structure. The length of spans and number of piles would be determined during the design phase should Alternative 2 be selected.

EIS-B would cross the Lace river 2.9 kilometers (1.6 miles) upstream of the EIS-A alignment. This alignment would affect the upper fringe of wetland complex B-4. The estuarine emergent portion of B-4 would be crossed by a pile support structure as the alignment approaches the Lace River crossing. The portion of B-4 consisting of forested, scrub shrub would likely be crossed with fill. EIS-B minimizes much of the impacts associated with both the reconnaissance alignment and the EIS-A alignment. EIS-B would avoid wetlands B-1 and B-2, and would not have a substantial impact on eulachon migration or spawning and would only have minor effects on prey species such as: shorebirds, gulls, bald eagles, sea lions, and harbor seals. EIS-B is the preferred alignment for crossing Berners Bay.

The largest wetland complex impacted by Alternative 2 is designated as Berners Bay 3 (B-3). It is located on the west side of the bay between Slate Creek and Lynn Canal. This area is primarily a combination of muskeg and forested wetlands intermixed with uplands. The alignment through B-3 was selected to minimize the amount of wetlands disturbed. If Alternative 2 is selected, detailed survey information may allow for further use of the interspersed uplands. Since this area is extensively forested wetlands, avoiding the wetland with the alignment is not possible. Avoiding wetlands fill with a pile supported structure through B-3 is not considered practicable.
Along Lynn Canal, the route would follow the western fringe of the wetlands and has been adjusted to avoid eagle trees. Eagle nesting trees would continue to dictate the alignment between B-3 and Comet Landing designated as wetland area East Lynn 4. Wetlands in East Lynn 4 provide relatively low functional value except for "Disturbance of Sensitive Wildlife", as defined by the Juneau Wetlands Management Plan.

Alternative 2 would require filling and/or excavating approximately 21.2 hectares (52.4 acres) of wetlands with moderate to high values, as well as filling approximately 34.5 hectares (85.2 acres) of intertidal unvegetated wetlands. This alternative would have a high impact on wetlands (Table 5-2).

Alternative 4, options A and C would require modification of the existing ferry terminal facilities at Auke Bay, Lutak Inlet (Haines), and Skagway. A new loading ramp would be required at the Auke Bay Ferry Terminal. A small amount of wetlands in the high intertidal zone would be impacted. Minor ferry terminal modifications at Haines and Skagway would not impact wetlands. These options would have a negligible impact on wetlands.

Alternative 4, options B and D would require a new ferry terminal in Berners Bay and the existing Glacier Highway to be extended to the terminal. A small quantity of vegetated upper intertidal estuarine wetlands would be filled to construct the loading bridge. All construction seaward of mean high water would be floating or pile supported. These options would have a negligible impact on wetlands.

**TABLE 5-2**
**WETLAND IMPACTS**

| Alternative | Area Affected hectares (acres) | Wetland Functional | Relative Impact |
|---|---|---|---|

| | | Value | |
|---|---|---|---|
| 2 - East Lynn Canal Highway | 55.7 (137.6) | M-H | H |
| 4 - All-Marine | | | |
| A and C - Auke Bay | 0.01 (0.02) | L | L |
| B and D - Berners Bay | 0.01 (0.02) | L | L |

*Note: L = Low; M = Moderate; H = High*

Measures to mitigate wetland impacts include avoidance and minimization. Only Alternative 4, options A and C would avoid wetlands or intertidal fill. Alternative 4, options B and D would require minor amounts of intertidal fill. The following would be used to avoid, minimize, and compensate impacts:

- Field verify the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping to avoid wetlands as much as possible.

- Design fill and ditch slopes at the embankment angle of repose (1.5 horizontal to 1 vertical).

- Use best management practices (BMPs) which contractually require end-dump trailers and limit heavy equipment operation to the highway prism for work in or near wetland areas.

- Use piling or anchor supported designs, rather than fill, for marine facilities.

- Develop bank stabilization projects for the Mendenhall and Chilkat rivers.

### 5.3.2 Vegetation

Alternatives 2 and 4 would result in the permanent loss of vegetation. This vegetation serves as wildlife habitat, provides slope stabilization, and serves as a natural view area along Lynn Canal. Most of this vegetation consists of old-growth forest on moderate to steep slopes. It consists of the following coniferous forest plant series: Western Hemlock, Western Hemlock-Yellow Cedar, Sitka Spruce, Mixed Conifer, Mountain Hemlock, and Sitka Spruce-Black Cottonwood ("Vegetation Report", Dames & Moore, 1994). The types of vegetation impacted consists primarily of forested vegetation.

Along Alternative 2, approximately 300 hectares (742 acres) would be permanently displaced by the highway, and 0.8 hectares (2 acres) would be displaced by the ferry terminal at the Katzehin River delta. Alternative 4, options B and D would require the clearing of about 15.8 hectares (39 acres) of upland vegetation to build a highway to the Berners Bay ferry terminal and an additional 0.8 hectares (2 acres) would be displaced by the ferry terminal.

The permanent loss of vegetation resulting from Alternative 2 would be less than one percent of the available vegetation in the project area. As a result, the permanent loss of vegetation impacted by Alternative 2 would not be a substantial unavoidable adverse impact.

**Indirect and Cumulative Impacts:** Indirect and cumulative impacts to upland vegetation could include blowdowns, slope erosion**,** firewood collection, and impacts from increased recreation. None of these would occur under Alternative 1 and Alternative 4, options A and C.

Impacts from blowdowns and slope erosion would be highest with Alternative 2, due to the length of the road and steepness of the terrain, and minor with Alternative 4, options B and D. Impacts from firewood collection would be highest for Alternative 2 due to increased access for Juneau residents. There is little increased access to firewood for Juneau residents from Alternative 4, options B and D and, therefore, minimal impact. Upland vegetation would be impacted from increased recreation such as trail and campsite building, stream side trampling from fishing activities, and firewood collection.

### 5.3.3 Fish and Wildlife Resources

The following is a discussion of the potential impacts associated with alternatives 2 and 4 on fish and wildlife resources.

**Fish**: Alternative 2 would cross five anadromous fish streams, which are currently only accessible by boat or plane. The most productive are the Antler and Lace rivers in Berners Bay and the Katzehin River. All three have substantial runs of salmon and during the spring are particularly important for eulachon spawning.

Eulachon, especially in the Antler River, are an important food source for many species of shorebirds, gulls, bald eagles, sea lions, harbor seals, and humpback whales. Concentrations of these prey species are found in large numbers between late April and mid May in upper Berners Bay during spawning migrations (Figures 5-4 through 5-7). The alignment for Alternative 2 has been

adjusted to cross the Antler and Lace rivers upstream of the areas of highest predator concentrations. Bridges would be sited to avoid bank encroachment that could affect eulachon migration.

Pacific herring spawn in the project area from Point Bridget to Point Sherman (Figure 4-16) along rocky shores and vegetated flats. Herring are another prey species important to shorebirds, gulls, bald eagles, sea lions, harbor seals, and humpback whales. Alternative 2 should have no impact on herring. A ferry terminal at Sawmill Cove could impact some habitat suitable for herring spawning but this impact should be minor through the use of pile support structures and minimizing intertidal fills.

All anadromous fish streams crossed by Alternative 2 or Alternative 4, options B and D would be bridged. Bridge abutments would likely require some rip-rap protection which would be designed to minimize in-stream and streambank disturbance.

**Wildlife**: The impacts to wildlife would result from the loss, degradation, or, modification of habitat. Habitat studies found that Alternative 2 would impact approximately 341 hectares (844 acres) of terrestrial habitat. Approximately 166 hectares (411 acres) of old-growth forest would be permanently cleared. This accounts for one half of one percent of the old-growth along East Lynn Canal. Approximately 152 hectares (375 acres) of beach fringe and 23 hectares (58 acres) of estuary fringe habitat would be permanently lost.

The effects on habitat are an important indicator of the impact on wildlife. The wildlife habitat effects were modeled to assess the impacts on four indicator species, brown bear, black bear, marten, and mountain goat in accordance with the Forest Service procedures described in "Wildlife Technical Report", Dames & Moore, 1997, Appendix D. These procedures were used in response to state and federal resource agency scoping comments. The results (Table 5-3 and 5-4) showed that the potential habitat capability for both brown bear and marten would be substantially reduced within 3.2 kilometers (2 miles) of the highway under Alternative 2 and Alternative 4, options B and D.

**TABLE 5-3**
**ALTERNATIVE 2 REDUCTIONS IN HABITAT CAPABILITY**

| Species | Current Habitat Capability | Reduction within 3.2 Kilometers (2 Miles) of Highway | |
|---|---|---|---|
| | | Habitat Capability Impact | Percent Reduction |
| Brown bear | 99 | 29 | 29% |

| | | | |
|---|---|---|---|
| Black bear | 357 | 26 | 7% |
| Marten | 197 | 74 | 38% |
| Mountain goat | 932 | 6 | 1% |

*The criteria for habitat impacts vary for each species as follows:*
*brown bear = 60 percent reduction within 1.6 kilometers (1 mile) of highway and 30 percent reduction within 8.0 kilometers (5 miles); black bear = 20 percent reduction within 3.2 kilometers (2 miles) of highway; marten = 80 percent reduction within 3.2 kilometers (2 miles) of highway; mountain goat = 20 percent reduction within 3.2 kilometers (2 miles) of highway*

**TABLE 5-4**
**ALTERNATIVE 4, OPTIONS B AND D REDUCTIONS IN HABITAT CAPABILITY**

| Species | Current Habitat Capability | Reduction within 3.2 Kilometers (2 Miles) of Highway | |
|---|---|---|---|
| | | Habitat Capability Impacts | Percent Reduction |
| Brown bear | 14 | 4 | 28% |
| Black bear | 54 | 4 | 7% |
| Marten | 45 | 14 | 31% |
| Mountain goat | 78 | 1 | 1% |

*The criteria for habitat impacts vary for each species as follows:*
*BBrown bear = 60 percent reduction within 1.6 kilometers (1 mile) of highway and 30 percent reduction within 5 miles; Black bear = 20 percent reduction within 3.2 kilometers (2 miles) of highway; marten = 80 percent reduction within 3.2 kilometers (2 miles) of highway; mountain goat = 20 percent reduction within 3.2 kilometers (2 miles) of highway*

Although the habitat capability model is a qualitative measurement of habitat and not an actual measure of the number of animals present, it does indicate that Alternative 2 would have a substantial impact on potential brown bear and marten habitat in the project area due to a reduction in habitat capability.

There are several important wildlife species not used in the Forest Service model. The effects of habitat changes on these species caused by Alternative 2 and Alternative 4, options B and D were

evaluated qualitatively based on field observations and/or best professional judgement and are discussed below.

Moose are the largest species found in the project area. The beach fringe and estuary habitats of upper Berners Bay and the Berners, Lace and Antler rivers are extremely important for moose during the wintering and calving periods. The alignment for Alternative 2 and Alternative 4, options B and D would be located along the seaward limit of this habitat. The usual deep snowfall in this area would force moose to the highway where they would be susceptible to vehicular collisions. Because this moose population is small and isolated, an increase in human-induced mortality would adversely affect the population. The primary impact on moose would be from moose/vehicle collisions and poaching, rather than loss of habitat.

Although the loss of old growth forest habitat is small by percentage of the total in the project area, Alternative 2 and Alternative 4, options B and D would fragment the remaining old growth forest habitat and increase forest edges. Fragmented habitat exposes more nests of forest birds to predators, such as corvids (i.e., crows, ravens, and jays). Corvids are edge species whose numbers would grow in proportion to the increased amount of edge. Marbled murrelets nest in old growth forest habitat. Although all old growth stands along East Lynn Canal are assumed to provide suitable nesting habitat, no marbled murrelet nesting has been documented.

Old growth forest also provides nesting habitat for northern goshawks, a species of concern. There are two known goshawk nests within the project area. Neither nest is directly impacted by Alternative 2 or Alternative 4, options B and D.

Harlequin ducks, olive-sided fly catchers and spotted frogs habitat is also found in the project area. Neither Alternative 2 nor Alternative 4, options B and D would substantially impact the habitat of these species.

The highway and ferry terminal proposed in Alternative 4, options B and D, would require clearing 18 hectares (44 acres) of terrestrial and aquatic habitat. This would include about 14 hectares (34 acres) of old-growth forest, 2 hectares (5 acres) of beach fringe habitat, and 2 hectares (5 acres) of estuary fringe habitat. This clearing would have negligible impacts on wildlife species in Alternative 4, options B and D.

Trumpeter swans are found in Berners Bay. The alignment for Alternative 2 would not adversely affect trumpeter swans. If Alternative 2 were selected a detailed swan survey would be conducted

and the alignment modified as necessary to maximize the distance between high use areas and the highway.

Lynx are rare in Southeast Alaska and impacts resulting from Alternative 2 are likely to be low. Impacts on the Alexander Archipelago wolf which is found within the project area should also be minimal. However, increased use of the area could adversely impact the wolves and as such should be monitored.

Measures to reduce the impact of alternatives 2 and 4 on fish and wildlife resources involve design, avoidance, and mitigation as summarized below:

- Span the two large rivers with bridges. Piers that support the bridges would consist of six to eight steel piling piers spaced 40 meters (130 feet) apart.

- Use over sized culverts or a bridge to cross smaller streams.

- Retain native vegetation as much as possible in the right-of-way to preserve habitat and provide buffers.

- Replant disturbed areas with native vegetation where practicable to reduce impacts, to provide a buffer of low-growing plants immediately next to the highway and to minimize wildlife road kills.

- Establish a monitoring study among DOT&PF, DF&G and Forest Service to assess long-term wildlife impacts should Alternative 2 be selected.

**Indirect and Cumulative Impacts:** The indirect and cumulative impacts for each alternative are discussed below.

**Alternative 2:** The Forest Service is currently evaluating three proposed developments in the vicinity of Berners Bay, (the re-opening of Kensington Mine, Goldbelt's Cascade Point Development and Access Road and the Lace River Hydro electric project). Each of these potential projects would impact the fish and wildlife resources of Berners Bay in varying degrees. When the impacts of these projects are considered with the impacts of Alternative 2, the cumulative impact to brown bear and Marten would be substantial (Dunn Environmental, 1997, for U.S. Forest Service). The range for brown bear would be restricted as the available carrying capacity of the area is reduced. Although

Marten are more tolerant to human intrusion than brown bear, their populations also tend to decline adjacent to human development.

Increased fish and wildlife management in Berners Bay and Lynn Canal would be required to prevent decline and harassment of fish, wildlife, and waterfowl. Meeting this increased management requirement would have an impact on state agency budgets. Increased access to anadromous fish streams could also increase competition among commercial, subsistence, and sport fishermen. Potential secondary development in the Sawmill Creek, Slate Creek, and Katzehin River areas would affect natural fisheries production in those systems. The greatest impact would be on smaller streams such as Sawmill Creek and Slate Creek.

Although non-consumptive users of wildlife would have many more opportunities to view wildlife, by virtue of increased access, consumptive users would find populations of most game animals decreased, compared with the existing condition. Increased use of the area along the highway could result in displacement of some species.

Improved access may result in increased demand for recreation facilities. If recreation development occurs, habitat would be lost in the development, and wildlife would be displaced as a result. Demand for hunting opportunities would increase, and if allowed, could impact wildlife populations. Any further restriction on hunting in the Berners Bay and Katzehin River areas would likely impact local guides.

**Alternative 4:** Because Alternative 4, options B and D provide little additional access, these options would have low to negligible adverse impact on fish and wildlife resources. Alternative 4, options B and D would have low to negligible impacts on the fish and wildlife within the project area.

Forest Service land use plans and Forest Service and DF&G management of resources in the area would affect the extent of indirect and cumulative impacts.

**Mitigation:** To assess the long-term impacts on wildlife a monitoring program would be conducted if Alternative 2 is selected. Bridge structures would be lengthened where practicable to allow mitigation paths. Moose browse improvements would be implemented in cooperation with DF&G and Forest Service. Hunting and fishing restrictions can be used to manage fish and wildlife resources as they are in other more accessible areas.

### 5.3.4 Bald Eagles

Helicopter surveys in 1994 located 73 bald eagle nests between the end of the Glacier Highway and Skagway (Figure 5-8). The nesting period is the most critical life stage for bald eagles. Disruption of breeding, nest selection, feeding, and nurturing activities can all contribute to productivity loss ("Bald Eagle Technical Report", Dunn Environmental Services, 1997, Appendix D). Eggs and immature eagles are most susceptible to life-threatening activities. Chronic impacts can occur from loss of suitable nesting sites, secondary impacts of development in the vicinity of a substantial number of nests, and disturbance or elimination of critical food sources. Alternative 2 and Alternative 4, options B and D would be designed to minimize short-term and chronic impacts to the nests.

A Memorandum of Understanding (MOU) between the USFWS and the Forest Service prohibits construction within 100 meters (328 feet) of a nest. Generally, activities and operations over 100 meters (328 feet) from a nest will not adversely impact its existence or productivity. The MOU also provides for an evaluation of nest sites and proposed highway alignments on a case-by-case basis. This evaluation was completed for each alternative. It determined the potential impacts on bald eagles and estimated costs of avoidance and mitigation. The following steps were taken to address the impacts on nests for each alternative:

- All nests within 800 meters (2,624 feet) of Alternative 2 and Alternative 4, options B and D were identified.

- All identified nests within 100 meters (328 feet) of the proposed highway alignment and ferry terminal sites were plotted on topographic maps.

- Where possible, the highway was realigned to avoid nests by 100 meters (328 feet).

- Each nest site was reviewed by USFWS to determine the best feasible avoidance alignment.

The USFWS has accepted parameters for highway construction activities in the vicinity of bald eagle nests after many years of monitoring and evaluating highway construction activities. These parameters are outlined below:

- No construction activities are allowed within 100 meters (328 feet) of nests during the nest selection period from March 1 to May 31.

- If a nest is not selected by June 1, construction activities may proceed.

- If a nest is occupied by an active pair of eagles on June 1, all work within 100 meters (328 feet) of the nest, and blasting within 800 meters (2,624 feet) of the nest, are curtailed during the nesting period, usually until August 31.

- In certain situations, limited blasting may be done within 800 meters (2,624 feet), depending upon such factors as acclimation of the nesting eagles, terrain shielding, blasting loads, and monitoring disturbances.

The following steps have been taken for Alternative 2 and Alternative 4, options B and D.

1. All bald eagle nests within 800 meters (2,624 feet) of the reconnaissance alternatives were located, with an accuracy of approximately 3 meters.

2. All nests within 100 meters (328 feet) of the reconnaissance work area (road prism or ferry terminal construction site) were identified and plotted on the design topographic maps.

3. Alignment(s) were redesigned to avoid each nest (identified in #2) by 100 meters (328 feet) or more, where practicable.

4. Each nest site has been reviewed with USFWS on a case-by-case basis, and the most feasible avoidance alignment chosen.

5. Costs were compiled for avoidance alignments, where applicable.

Probable impacts to bald eagles from each alternative were analyzed using the above criteria and the results are presented below.

The highway alignment in Alternative 2 was revised in order to avoid 47 nests which were within 100 meters (328 feet). It was not practicable to avoid 11 nests by 100 meters (328 feet) because avoidance would have caused a greater impact. Each of these 11 nests materially similar to productive nest sites near other Alaska highways. Fifteen nests are located more than 100 meters (328 feet) from the original highway alignment.

Alternative 2 would have a moderate impact on bald eagles because over 10 percent of the nest sites along this corridor would be within the 100 meter (328 foot) criterion, and construction would likely induce short term productivity loss.

Alternative 4, options B and D would pass one bald eagle nest at a distance of 350 meters (1,148 feet), and another nest would be 600 meters (1,968 feet) from the proposed ferry terminal site in Berners Bay.

Over the long-term, Alternative 2 would cause a cumulative moderate impact on bald eagle productivity. When combined with the indirect impacts of disturbance, this would most likely constitute a substantial unavoidable adverse impact on bald eagles along the highway. Since Alternative 4, options B and D have the potential to affect only two nests and both are over 300 meters (984 feet) away, the impact on bald eagles would be negligible.

The USFWS estimates that in any one year five percent of nest sites will change, either from the nests being destroyed by natural events, or by new nests being constructed. Nests have an average life of approximately 20 years. In the East Lynn Canal study area, about four nest sites can be expected to change yearly. In addition, the USFWS estimated bald eagles actively use about 40 to 50 percent of all nest sites each year. Additional surveys would be done to determine the location of any nests missed by the 1994 surveys, newly constructed nests, and nests no longer in existence. Measures to reduce the impact of the proposed alternatives on bald eagles are summarized as follows:

- The highway alignment has been developed to avoid known nests to the extent practical.

- No construction would occur within 100 meters (328 feet) of a nest from March 1 through May 31. If a nest is not active on June 1, construction activities may proceed.

- If a nest has been selected, and has an active pair of eagles on June 1, all activities within 100 meters (328 feet) of the nest, and blasting within 800 meters (2,624 feet) of the nest would be curtailed during the nesting period, unless a specific mitigation plan has been developed in agreement with the USFWS and the Forest Service. All allowed activities would be monitored and work suspended if monitoring identified a nesting disturbance.

- Additional surveys to locate Bald Eagle nests would be made on the selected alternative during the design phase, and again immediately before construction, to ensure changes in nest locations are taken into account.

**Indirect and Cumulative Impacts:** If Alternative 2 is selected, all bald eagle nest trees would remain standing with a vegetative screen between the nest and highway. Because of the magnitude of the construction activity involved, it is probable that a nest(s) would be lost. The trees inland from the shore are vulnerable to windthrow (blow down). Clearing the highway corridor would increase the vulnerability of some nest trees to exposure from high winds. Some nests located near the clearing may be lost over the years. A tree lost due to an indirect impact, could result in a violation of the Bald Eagle Protection Act.

### 5.3.5 Threatened and Endangered Species

As discussed in Section 4.3.6, there are two endangered species, humpback whales and American Peregrine Falcons, and one threatened species, Steller sea lions, in the project area (Table 4-3).

Humpback whales: May be affected by the location and design of the crossing used through the Berners Bay River system for Alternative 2 because it could impact their food source of adult herring and eulachon. Due to the potential impact, the Berners Bay crossing has been shifted so that rivers are completely bridged (Section 5.3.3).

American Peregrine Falcons: Migrate through the project area, however, they would not be impacted by the project.

**Steller Sea Lions:** May be affected by Alternative 2 which would pass through the Gran Point Critical Habitat Area. Accordingly, a section 7 consultation with NMFS regarding threatened and endangered species is in progress.

To evaluate disturbance factors to sea lions resulting from Alternative 2, both construction and chronic factors must be considered.

Construction factors are those that occur during construction of the project. They include noise disturbance from blasting and other construction activities within sight or hearing distance of the haulout. These impacts are generally short-term and can be minimized by restricting construction activity to time periods when the sea lions are not present. Another factor for scheduling construction of a highway through the Gran Point Critical Habitat Area is the presence of three bald eagle nesting trees which, if occupied, will impact construction scheduling.

Chronic disturbance after construction, is considered to occur from direct line of sight, waterborne noise, and highway noise.

Direct line of site between the haulout and the highway will not be possible. The alignment is 90 meters (295 feet) behind and 40 meters (130 feet) above the haulout area. A combination of retaining walls, bridges, steep through cut backslopes, and steep foreslopes will screen the haulout and make it extremely difficult to access the site from Alternative 2 (see Section 3.2.2).

To minimize waterborne noise and access to the site, no boat launch facilities will be constructed near Gran Point or Met Point and watercraft access is restricted in the vicinity of these sites by current regulations.

Research has shown that human hearing is more sensitive than sea lions in lower frequency ranges. However, in middle frequency ranges, sea lions can detect sounds with the same sensitivity as humans, and sea lions can detect sound at a higher frequency than humans. Consequently, humans are more sensitive to airborne sounds than sea lions especially at lower frequency ranges. Based on this research it was determined that a weighted

noise scale, dBA, used to simulate human hearing ranges could be used to approximate sea lion hearing ("Steller Sea Lion Technical Report, FPE/Roen Engineers, 1996, Appendix D).

A noise impact analysis ("Noise Technical Report", FPE/Roen Engineers, 1994) evaluated the potential noise impact at the Gran Point Steller sea lion haulout. The analysis was based in part on the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model, 1980. The current estimated background noise level at the haulout site on a calm day is 47 dBA.

The analysis found that potential highway noise generated 100 meters (328 feet) from the haulout would increase noise levels 1 dBA at the haulout. This increase in noise would be imperceptible, and the noise impact would be negligible.

There is substantial evidence that suggests Steller sea lions can adapt to noise and human presence. Information from the Canadian Department of Fisheries and Oceans (DFO) indicates that Steller and California sea lions have been hauling out since 1978 on the Steveston jetty which is adjacent to the middle arm of the Fraser River near its mouth on the Strait of Georgia in British Columbia. The jetty is within 500 meters (1,640 feet) of the main shipping channel. Similarly at Race Rocks in Juan de Fuca Strait, British Columbia, up to 800 Steller and California sea lions haul out near a busy shipping lane. According to the DFO, this haulout area has been heavily used during the past two decades with no major disturbance to the sea lions, even though there has been increasing shipping activity. Similarly, at Port Gardiner, Washington, over 500 California sea lions use log booms as haulout sites. Include sea lion cave rookery in Oregon which is accessible for observation by thousands of tourists without adverse effect.

NMFS has identified human access to the haulout and "line of sight" between the haulout and the highway as a most substantial issue with Alternative 2.

Three alignment options were analyzed through the Gran Point Critical Habitat Area to ensure public access would be blocked and potential disturbance would be held to a minimum.

- Alignment 1 (Figure 3-9), the preferred alignment, would consist of a combination of low bench cuts, retaining walls and bridge structures that would minimize the highway footprint, block public access to the haulout, and provide a visual barrier. Bridge structures totaling 450 meters (1,475 feet) in length would be used in four locations. These would be either full bridge structures or a combination of a partial bench cut and half bridge structure. Five sections of retaining walls totaling 350 meters (1,150 feet) would be used to minimize embankment fill. Adjacent to the haulout the highway alignment is behind the large bedrock formation that forms Gran Point and is inland as far as practicable to shield the haulout from the highway. In areas without structures, slopes to shore would be kept steep to deny access to the haulout. Some areas would be screened to block the view of the haulout from the highway. The cost estimate for this alignment is $8,200,000.

- Alignment 2 would bypass the Critical Habitat Area with a 2,500 meter (8,200 foot) tunnel. The tunnel would be 51 meters (167 feet) above and 250 meters (820 feet) into the mountain from the haulout. The south portal of the tunnel would be 1,085 meters (3,560 feet) from the haulout site and the north portal 1,415 meters (4,640 feet) from the haulout. Both tunnel portals would be outside the Critical Habitat Area and screened from view from the haulout site by ridge lines. The tunnel would require ventilation, lighting, fire suppression and a power generator. The cost estimate for this alignment is $40,000,000. Maintenance and operation costs would increase $410,000 annually with this option.

- Alignment 3 would consist of an 800 meter (2,625 foot) tunnel located above the haulout site, with bench cut and fill construction through the rest of the Critical Habitat Area north and south of the tunnel. Immediately north and south of the tunnel, the highway would be located in rock cuts with shielding by back slopes to reduce disturbance to the haulout site. The tunnel would require ventilation, lighting, fire suppression and a power generator. The cost estimate for this alignment is $16,700,000. Maintenance and operation costs would increase $130,000 annually with this option.

Tunnels are not considered a practicable option through the Critical Habitat Area. The capital costs are two to five times more expensive to construct than the preferred alignment and the annual maintenance cost is twelve times more expensive.

Based on the location of the highway under alignment 1 and the use of natural and structural barriers, highway noise would have a negligible impact on the use of the haulout by Steller sea lions. Alignments 2 and 3 would have a negligible increase in noise at the haulout, and no impact on the Steller sea lions at the haulout.

Similar to humpback whales, Steller sea lions feed on adult herring and eulachon in Berners Bay. As discussed in Section 5.3.3, Alternative 2 river crossings have been modified to lessen impact on this food source.

Alternative 4 would have negligible impacts on Steller sea lions and humpback whales.

**Indirect and Cumulative Impacts:**

For Alternative 2 the greatest potential for impacting Steller sea lions would result from people approaching the haulout. In addition, with improved access to the Katzehin River delta, more recreational boaters and sea kayakers may approach the haulout. Under both alternatives 2 and 4, increased tourism to Haines would likely generate more sight seeing charters to Gran Point. However, harassment of Steller sea lions is a violation of the Threatened and Endangered Species Act and the Marine Mammal Protection Act.

**Mitigative Measures:**

In Southeast Alaska, Steller sea lions shift from inside waters in the winter to more exposed, outside waters in the summer breeding season. A similar seasonal movement has been documented in British Columbia and Washington. If Alternative 2 is selected, construction adjacent to the Critical Habitat Area would be scheduled when sea lions are absent.

If Alternative 2 is selected, DOT&PF would help fund biological research for Steller sea lions at the Gran Point and Met Point sites. In addition to information gathered to date, studies would be performed during and after construction for a period of up to ten years.

Mitigation measures regarding the Steller sea lion haulout involve the use of special design features and avoidance as described below.

- Construction activities within the Gran Point Critical Habitat Area would be coordinated with the NMFS.
- Landing sites used to support construction would be located out of visual range of the haulout site.
- Access from the highway to the haulout site would be prevented.

**Coordination with NMFS**

Based on initial coordination between the NMFS and DOT&PF a biological opinion will be requested.

## 5.4 OTHER IMPACTS

### 5.4.1 Farmlands

There are no prime or unique farmlands in the State of Alaska and the project area does not appear on the USDA Soil Conservation Service's list of farmlands of state or local importance ("Farmlands Technical Memoranda", FPE/Roen Engineers, 1994).

### 5.4.2 Relocation Impacts

There are no residences, farms, churches, or nonprofit organizations located within the project area. Several mine support buildings near Comet would have to be relocated for Alternative 2. Impacts due to relocation are negligible.

### 5.4.3 Joint Development

Several joint development recreational opportunities would be available should Alternative 2 be selected. They would be developed in coordination with the Forest Service and DNR to enhance recreation use in the project area. Many of the facilities would be constructed by DOT&PF and maintained by the Forest Service.

Waysides to provide recreation access parking and scenic viewpoints would be designed and constructed by DOT&PF in conjunction with Alternative 2. The following sites have been identified for potential development in conjunction with the alternative through coordination with the Forest Service (Figure 5-9). All sites are within the Tongass National Forest:

- Sawmill Creek - day use picnic area.
- Forest Service Berners Bay cabin - day use picnic area (this cabin would be relocated from Sawmill Cove to Pt. St. Mary's).
- Antler River bluff - scenic overlook with educational signs on habitat and area geology.
- Slate Creek - day use picnic area; trail to relocated Forest Service Berners Bay cabin.
- "Sandy Beach" - access trail; trailhead could be from Slate Creek wayside, depending on proximity to highway alignment.
- Eldred Rock - scenic overlook and day use area.
- Yeldagalga Creek - scenic overlook and day use area.
- Valley south of Katzehin River - day use, possible hiking trails and access to new or relocated Katzehin River recreational cabin.
- Katzehin River flats - possible campground, day use area and trailhead. Area expected to attract many users.
- Dayebas Creek - day use picnic area.
- Long Falls - day use picnic area and scenic overlook.
- Kasidaya Creek - day use picnic area.

Under Alternative 2, the typical highway section would include 1.2 meters (4 feet) of paved shoulders suitable for bicyclist and pedestrian use. The vehicle traffic volumes would be compatible with bicycles on the highway/shoulder. The shuttle ferry between Haines and Katzehin would accommodate bicycles and pedestrians. Ground transportation for ferry pedestrians would be provided by private or public carrier as economics dictate.

Alternative 4, options B and D would include 1.2 meters (4 feet) of paved shoulders suitable for pedestrian and bicyclist use on the 8 kilometers (5 miles) extension of Glacier Highway to the new ferry terminal in Berners Bay. This alternative also would provide ferry service directly to Haines and Skagway for bicyclists and pedestrians. Ground transportation for ferry pedestrians would be provided by private or public carrier as economics dictate.

Alternative 4, options A and C would provide ferry service directly to Haines and Skagway for bicyclists and pedestrians. Ground transportation for ferry pedestrians would be provided by private or public carrier as economics dictate.

### 5.4.4 Permits

In 1992, the Corps Of Engineers (COE), FHWA, and DOT&PF signed a three-party accord to streamline (merge) the COE 404 permit process with the National Environmental Policy Act of 1969 (NEPA) process in the State of Alaska. By 1996, the accord had been expanded to include state and federal resource agencies (U.S. Fish and Wildlife Services (USF&WS) has not signed the accord).

Although this DEIS began before the merger process was finalized, the "Interagency Working Agreement" approved in March 1997 is being followed to the extent practicable.

Permits required for each alternative are as follows:

**Alternative 2 - East Lynn Canal Highway**
United States Army Corps of Engineers, Section 404, Clean Water Act
United States Army Corps of Engineers, Section 10, Rivers and Harbors Act.
United States Coast Guard, Section 9, Rivers and Harbors Act
Alaska Department of Fish and Game, Title 16, Anadromous Fish Stream Permit.
Department of Environmental Conservation, Section 401, Clean Water Act.
Office of the Governor Alaska Division of Governmental Coordination, Coastal Consistency Determination.

**Alternative 4 - Options A and C**
United States Army Corps of Engineers, Section 404, Clean Water Act
United States Army Corps of Engineers, Section 10, Rivers and Harbors Act
Alaska Department of Environmental Conservation, Section 401, Clean Water Act
Office of the Governor Alaska Division of Governmental Coordination, Coastal Consistency Determination.

**Alternative 4 - Options B and D**
United States Army Corps of Engineers, Section 404, Clean Water Act
United States Army Corps of Engineers, Section 10, Rivers and Harbors Act
Alaska Department of Environmental Conservation, Section 401, Clean Water Act
Office of the Governor Alaska Division of Governmental Coordination, Coastal Consistency Determination.

### 5.4.5 Coastal Barriers

There are no coastal barriers in the project area.

### 5.4.6 Coastal Zone Impacts

Activities that occur within the Alaska Coastal Boundary, as designated by the Alaska Coastal Management Act of 1977, are subject to review to determine if such activities are consistent with approved local district coastal management plans and with the standards of the Alaska Coastal Management Program (ACMP). Each of the proposed alternatives appears to be consistent with the ACMP. The Final EIS and U.S. Army Corps of Engineers Section 10 and 404 permit would require formal project review by the Local Coastal Districts in Juneau, Haines, and Skagway, and a final coastal consistency determination from the Office of the Governor Division of Governmental Coordination.

### 5.4.7 Hazardous Waste

An Initial Site Assessment was completed in accordance with the American Association of State Highway and Transportation Official's "*Hazardous Waste Guide for Project Development*". None of the alternatives impact any known hazardous waste site.

### 5.4.8 Energy

State ferries traveling on the waters of Lynn Canal currently consume the only energy for public transportation in the project area. Energy is also being consumed at the ferry terminals in Juneau, Haines, and Skagway but these uses are not altered by the project and do not affect usage within the project area. The energy analysis incorporates efficient energy use practices in construction and operation of transportation facilities. It also analyzes fuel requirements to operate ferries and personal vehicles for each alternative.

As shown in Table 5-5 the estimated energy use would be reduced under Alternative 2 from that currently used by the state ferry system in Lynn Canal. Under Alternative 4 energy use would be highest. The gas-turbine engines used in high-speed ferries require substantial amounts of fuel. The wavepiercing catamaran analyzed for Alternative 4 burns 3.4 tonnes per hour (3.3 tons/hour). Alternative 2 and the No-Build Alternative would consume the least amount of energy.

**TABLE 5-5**
**ESTIMATED ANNUAL OPERATIONAL ENERGY USAGE (YEAR 2025)**

| ALTERNATIVE | FUEL: million liters (million gallons) | | |
|---|---|---|---|
| | Ferry | Vehicle | Total |
| Alternative 1 - No-build (existing) | 4.3 (1.1) | 0 | 4.3 (1.1) |
| Alternative 2 - East Lynn Canal Highway | 0.5 (0.1) | 3.4 (0.9) | 3.9 (1.0) |

| | | | |
|---|---|---|---|
| Alternative 4A - Continue mainline, Auke Bay shuttle service | 14.4 (3.8) | 0 | 14.4 (3.8) |
| Alternative 4B - Continue mainline, Berners Bay shuttle service | 12.9 (3.4) | 0.4 (0.1) | 13.3 (3.5) |
| Alternative 4C - End mainline, Auke Bay Shuttle service | 18.5 (4.9) | 0 | 18.5 (4.9) |
| Alternative 4D - End mainline, Berners Bay Shuttle service | 15.9 (4.2) | 0.4 (0.1) | 16.3 (4.3) |

### 5.4.9 Construction Impacts

Highway and ferry terminal construction activities for Alternative 2 and Alternative 4, options B and D would result in short-term temporary disruptions to the human and natural environment around the site. These impacts would be mitigated through design considerations, and contractual requirements imposed on contractors.

Construction of these alternatives would include clearing and grubbing, excavation and embankment for the roadbeds and stormwater drainage features. The marine portion of these alternatives would involve construction of a ferry terminal either in Berners Bay or north of the Katzehin River delta. The shuttle ferries would be constructed outside Alaska.

Commercial and recreational uses in Berners Bay and the Antler, Lace and Katzehin rivers for Alternative 2; and in Berners Bay and the Antler and Lace rivers for Alternative 4, options B and D would be impacted during bridge and ferry terminal construction. Construction would be done to minimize disruption on navigation. All U.S. Coast Guard (USCG) and Occupational Safety and Health Regulations would be complied with, and public notices would be used to inform boaters of necessary navigation restrictions.

Water quality would be a concern when constructing bridge piers and placing the approach embankments on and adjacent to affected wetlands. Best Management Practices (BMPs) for work in wetlands and waters of the United States would be followed, including temporary erosion and pollution control, and restrictions on heavy equipment constructing the highway prism in wetlands. Activities outside of the highway prism, including waste disposal, construction camps, staging areas, and barge landings would be conducted on non-wetland sites. Excess rock excavation would be disposed of in deep water off the end of avalanche chutes and steep underwater inclines when possible. Deep water disposal areas would be identified with resource agencies if Alternative 2 is selected as the preferred alternative. Siltation, temporary stream diversions, noise, vibration, blasting, erosion, and water quality degradation would be mitigated by timing construction to avoid critical fish migration and spawning periods and through the use of BMPs. The impacts of Alternative 2 on fish resources would be moderate during construction, low during operation and concentrated mainly in the Berners

Bay and Katzehin River delta areas. The impacts of Alternative 4, options B and D would be low during construction and very low during operation and concentrated in the Berners Bay area north of Echo Cove. Impacts on fish resources in most other areas would be negligible. Appropriate construction techniques (isolation of work areas from water, clean fill material, containment dikes, silt fences, curtains, and other BMPs) would be used to mitigate potential water quality impacts. Construction periods would be timed to avoid critical stages of fish and marine invertebrates life cycles.

During construction snowmelt and rainfall runoff from staging areas and highway surfaces would be controlled to help remove oil, grease, other petroleum products and suspended sediments. Runoff from the highway would also be controlled and filtered. With proper construction techniques, temporary and limited impacts on the environment would be minor.

An oil spill prevention plan would be required to minimize the increased risk of spills from heavy equipment in the Berners Bay area. Materials including absorbent pads and booms would be required on site to contain and clean up any fuel spilled during construction. In addition, the contractor would be required to develop and implement a hazardous materials control plan which would address accidental spills, fueling activities, and related concerns.

Noise levels would increase throughout the project corridor during construction. Due to the lack of critical noise receptors (residences, schools, churches, etc.) in the project area, human impacts associated with the noise are considered to be minor and temporary. However, construction noise could adversely impact wildlife. Wildlife sensitive to noise including eagles, seals, and bears, would likely avoid the areas adjacent to construction activity. The highway would be located as far as possible from eagle nests to minimize impacts. Bears, being somewhat migratory, would tend to move away from active construction areas. When the disruption of construction has ended, bears would most likely return, resulting in a short-term impact.

Blasting would be required to construct the highway in rock excavation areas. Noise associated with blasting would be minor due to the temporary nature of the activity. Related to the noise from blasting is the impact of the attendant shock waves on fish. These impacts would be largely mitigated by timing construction to avoid sensitive periods for fish streams or sizing blasts to prevent adverse effects.. No in-water blasting would be performed. A blasting plan would be developed for areas near critical fish habitat.

Alternative 2 may require construction camps. Design plans for each camp's wastewater and drinking systems would be prepared by the contractor or DOT&PF and approved by Department of Environmental Conservation (DEC) prior to construction.

For Alternative 2 energy would be used to construct the highway from Echo Cove to Skagway, the new shuttle ferry and the new terminal at the Katzehin River delta. For Alternative 4, options B and D energy would be used to construct the highway from Echo Cove 8 kilometers (5 miles) into Berners Bay, the new ferry terminal at Berners Bay and the new ferry. Alternative 2 would require the most energy during construction.

At ferry terminals, construction related impacts would result from pile driving to support the new terminal and docking areas. These short-term impacts would increase water turbidity and noise levels.

In-water construction would be timed in accordance with DF&G and COE permits.

Fill would be minimized and pilings would be used whenever possible to construct the proposed ferry terminal sites. Minor short-term impacts would result from filling activities during construction. Although neither the Berners Bay nor Katzehin ferry terminal sites are near anadromous fish streams, fish do migrate and rear along the shoreline.
Construction would cause minor short-term water quality impacts from possible fill in the intertidal area. BMPs would be followed, and operation of equipment in wetlands would be limited. These alternatives would have minor short-term wetland impacts.

Requirements of the United States Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES) for construction activities would be followed. A Stormwater Pollution Prevention Plan (SWPPP) and a hazardous material control plan would be prepared before construction, to plan for spills and to minimize water pollution. In-water construction would be timed to avoid critical fish activities such as spawning and incubation of eggs.

Construction impacts on vegetation would be minimized and mitigated with the following design and construction practices:

- The width of the construction corridor would be minimized to the extent practical to reduce the amount of vegetation cleared for this project.

- Areas cleared of vegetation would be limited to the extent practical.

- Construction areas along the proposed corridor which are not needed during the operational phase would be revegetated as soon as possible to prevent invasive (and non-native) vegetation from becoming established. Species consistent with naturally occurring plant species in the area would be used to reestablish previous plant communities.

Construction impacts on fish resources would be minimized by using the following mitigation measures:

- In-stream construction work would be timed to avoid periods when eggs are in the gravel or adult fish are present.

- Construction work would be timed to avoid sensitive migrating species.

- Construction activities would conform to NPDES permit requirements, which would include plans for erosion control, fuel handling and other construction related activities.

In 1992, DOT&PF developed a storm water manual which defines BMPs to avoid or minimize water quality impacts from design and construction of transportation facilities. The following are mitigation measures from this manual which would reduce impacts to water quality and hydrology in the project area during construction.

- An erosion control plan would be prepared for construction activities. Erosion control and stormwater management systems would be designed and constructed in accordance with the DOT&PF stormwater manual and NPDES permit requirements.

- Channel bank and bed disturbance would be minimized. Any channel banks and beds disturbed after construction would be restored.

- Revegetation, riprap and other appropriate measures would be applied to slopes and other exposed soil areas in the vicinity of sensitive surface water bodies and floodplains.

For Alternative 4, options A and C, special attention would be necessary to minimize water quality impacts for the minor amount of construction required at Auke Nu Cove. Energy would be used primarily to construct the shuttle ferries outside of Alaska.

### 5.4.10 Local, Short-term Uses Versus Long-term Productivity

For this discussion, short-term is defined as the time during construction phase and revegetation period (5-10 years), and long-term is the estimated design life of the proposed project.

Improving surface transportation access to Juneau is consistent with DNR's Juneau State Land Plan, the CBJ Comprehensive and Coastal District Plans, and the district and ACMP policies. The Juneau State Land Plan was written to accommodate a highway along Lynn Canal. The CBJ Comprehensive Plan and the Coastal Management Policies both support highway access to the Echo Cove and Berners Bay area.

Implementation of the proposed project would result in both short and long-term impacts on the environment. An assessment of the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity for each of the proposed alternatives is presented below.

The short-term impacts associated with Alternative 2, as described earlier in this chapter, are primarily related to construction. Improving access would provide short-term benefits to the local economies and labor forces of Juneau, Haines, and Skagway. Improving access also would increase long-distance travel, tourism, and commerce. Trade between the United States and Canada would expand, thereby strengthening the long-term productivity of Juneau, Haines, and Skagway.

Under Alternative 4, the short-term impacts would result from the labor, energy, construction materials, and equipment used to improve or build new ferry terminals, highways, and ferries. As with Alternative 2, improving the state ferry system would increase long-distance travel, tourism, and commerce, although not to the same extent because of system constraints. These constraints include user cost, time required, and frequency of travel.

Studies prepared for this DEIS indicate that construction of any alternative would not irreparably harm and would enhance the long-term productivity in the region. The local, short-term impacts and resources used by the proposed alternatives are consistent with the maintenance and enhancement of long-term productivity for the project area and for the State of Alaska.

### 5.4.11 Irreversible and Irretrievable Commitments of Resources

Resources committed to the proposed project would be material and nonmaterial, including financial. Irreversible commitment of resources for this discussion has been interpreted to mean that those resources once committed to the proposed project would continue to be committed and production or use of those resources for other purposes would be lost throughout the life of the project. Irretrievable commitment of resources has been interpreted to mean that those resources used, consumed, destroyed, or degraded during design, construction, operation, and maintenance of the proposed project could not be retrieved or replaced for the life of the project or beyond.

Alternatives 2 and 4 would irreversibly and irretrievably commit resources. The commitment of resources for the proposed project are described below.

The improved access, increased travel, commerce and trade opportunities, and improved efficiency in state and user spending on surface transportation in the Lynn Canal corridor are anticipated to outweigh the resources committed to the project.

- Land use for a highway or a ferry terminal is considered an irreversible commitment during the life of the project. The extensive earth and rock work required to construct highways would be irreversible for all practical purposes. If a greater need for the land became apparent, or if the highway or ferry terminal were no longer needed, the land could be converted to another use. Conversion of a ferry terminal to another use is much more feasible than conversion of a highway to another use.

- Substantial amounts of labor, fossil fuels, and natural resources would be used to fabricate and prepare construction materials for the new ferries and to construct the highway and ferry terminals. The labor and materials are irretrievable. However, the labor and materials are readily available and their use for any of the build alternatives would have negligible effect on their continued availability.

- Vegetation would need to be cleared for the highway right-of-way and new terminal areas. Some of the vegetation lost would be irreversible, however, outside of the paved areas vegetation re-growth would occur in the short-term.

- Some wildlife habitat would be lost due to construction of the highway and ferry terminals. No distinct habitat areas would be lost, and similar habitat areas in the vicinity are available.

- Highway and ferry terminal construction would require a substantial one-time expenditure of both state and federal funds. Highway maintenance, and the continued maintenance and operation of long-distance or shuttle ferries, would require long-term commitments of state funds and user fees. These would be irretrievable commitments of public funds. Capital expenditures and user fees to construct ferries would be partially reversible should another mode of transportation be considered preferable in the future. Ferries could be sold or their use transferred to other portions of the state ferry system.

- Economic activity, created indirectly by the highway and/or additional ferries providing access improvements, would generate revenues in the form of local, state and federal taxes.

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## 6.0 SECTION 4(f) EVALUATION

Section 4(f) of the Department of Transportation Act of 1966 as amended by 49 U.S.C 303 was created to protect the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Federally funded transportation programs and projects requiring the use of any of these lands are allowable only if there is no other prudent and feasible alternative. The project must include all possible planning to minimize harm to these areas. Federally funded projects that may affect areas protected under Section 4(f) require an evaluation to document the effects, alternatives and means of minimizing the impacts. There are no properties which require Section 4(f) evaluations for the Juneau Access Improvements Project.

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## 7.0 PUBLIC INVOLVEMENT

According to requirements set by National Environmental Policy Act (NEPA) and Council on Environmental Quality(CEQ) regulations for implementing NEPA, a consultation and coordination program was developed and implemented for the Juneau Access Improvements Project. The purpose of the program was to ensure that the public and federal, state, and local agencies were contacted, consulted, and given an adequate opportunity to be involved in the environmental analysis and Draft Environmental Impact Statement (DEIS) process.

## 7.1 NOTICE OF INTENT

A Notice of Intent (NOI) was published in Volume 59 #28 of the Federal Register on February 10, 1994 notifying of the intent to prepare a DEIS. The purpose of the NOI was to notify persons or agencies interested in, or affected by, a proposed federal action and to seek information and/or participation in scoping.

## 7.2 PUBLIC AND AGENCY SCOPING PROCESS

Public and agency involvement has been an ongoing activity throughout the project and an integral part of the development and evaluation of alternatives. The overall goal has been to develop consensus through communication. To meet this goal, the program was developed to satisfy the following objectives:

- Inform the public and local, state and federal agencies about the need for the project;
- Identify and consider values and concerns of the public and agencies;
- Ensure all reasonable alternatives were identified and evaluated;
- Inform the public and agencies regarding potential impacts associated with each of the alternatives under consideration;
- Integrate public input and agency policy into the decision-making process; and,
- Establish and maintain credibility of the engineering performed to determine the characteristics of each alternative and the environmental program used to assess potential impacts.

Coordination with the public and agencies began during the Reconnaissance Engineering Study (H.W. Lochner, 1994) that was conducted from April 1993 through May 1994. Efforts during that period focused on sharing information about the project and identifying key issues for consideration during the reconnaissance phase. Coordination with agencies included informal communication with agency representatives on a one-to-one basis. A process to exchange information with citizens in the project area (Juneau, Haines, and Skagway) was also initiated that included the publication of three project newsletters and community meetings in each

city. Display advertisements and news releases in local newspapers and on radio and television were used to provide data about key activities as results became available.

## 7.3 CITIZEN PARTICIPATION

The program to exchange information with citizens of Juneau, Haines, and Skagway started during the Reconnaissance Engineering Study was expanded during the DEIS. An early activity was the publication and distribution of a project newsletter in March 1994 that summarized the results of the study, described the DEIS process, identified issues (known at the time) that would be addressed in the DEIS, and advertised public scoping meetings.

The public scoping meetings were held in Juneau, Haines, and Skagway in March 1994. In addition to the project newsletter, meeting notices were published in local newspapers during the preceding month. Individual notices were also sent to approximately 200 persons on the mailing list.

The meetings included an open house from 4:00 p.m. to 8:30 p.m. with presentations about the project at 5:00 p.m. and 7:00 p.m. The community, date, location and number of attendees for each of the meetings is listed in Table 7-1.

**TABLE 7-1**
**PUBLIC SCOPING MEETINGS**

| Community | Date | Location | Attendees |
|---|---|---|---|
| Juneau | March 24, 1994 | Centennial Hall | 60 |
| Haines | March 21, 1994 | City Council Chambers | 33 |
| Skagway | March 22, 1994 | Skagway City School | 19 |

Each person was asked to sign a register and given an information packet. The packet included a project description, documentation of the purpose and need, information about the alternatives being considered, a discussion of what studies had been done to date and what were planned, and an overview of known environmental and socioeconomic issues. It also included a self-addressed comment form. Comments

received in response to these scoping meetings and the hand-out material are included in the August 1994 Scoping Report (FPE/Roen Engineers).

Other specific formal meetings and radio public involvement are listed in Table 7-2.

In November 1994, a public information office was opened in the Mendenhall Mall in Juneau. The office is open three days (Wednesday, Thursday and Friday) from 2:00 p.m. to 6:00 p.m., with extended hours during Thanksgiving and Christmas holidays.

## 7.4 LOCAL GOVERNMENT

In early 1997, a series of project briefings were given to community leaders on civic organizations and the Borough Assembly in Juneau. This briefing was given to the Haines City Assembly in April 1997. Also held in April was a town meeting in Skagway.

The Haines Borough Assembly and the Haines City Council have been the most outspoken local government on the Juneau Access Improvements project. On March 18, 1997, the Haines Borough Assembly passed Resolution No. 418, opposing the construction of an East Lynn Canal road that bypasses Haines. The Borough does support an East Lynn Canal highway that ends at the Katzehin River with a shuttle ferry to Haines and Skagway. They also support the all marine alternatives (Alternative 4). On June 19, 1996 the City Council of Haines passed Resolution 95/96-32 which also supports the Haines-Skagway Highway intertie.

**TABLE 7-2**
**MEETINGS AND RADIO PROGRAMS**

| Date | Location | Audience | Topic |
|---|---|---|---|
| August 1993 | Juneau | Glacier Valley Rotary Club | Discussed the Reconnaissance Report. |
| November 1993 | Whitehorse, Canada | Sister Cities Meeting; approximately 50 people present; elected representatives, members of the public, and city employees attended meeting | Discussed the Reconnaissance Report Study (just beginning). |
| November 1993 | Juneau | Sister Cities Meeting; approximately 50 people present; elected representatives, members of the public, and city employees attended meeting | Discussed the Reconnaissance Report (study being finalized). |

| | | | |
|---|---|---|---|
| April 1994 | Juneau | Public meeting; 1 hour presentation with 30 people present | Discussed proposed alternatives. |
| April 1994 | Haines | Public meeting; 1 hour presentation with 20 people present | Discussed proposed alternatives. |
| April 1994 | Skagway | Public meeting; 1 hour presentation with 15 people present | Discussed proposed alternatives. |
| August 1994 | Juneau | KJNO radio action line;<br>2 hour interactive radio talk show | Discussed the engineering information and EIS process. |
| September 1994 | Juneau | Alaska Committee Presentation;<br>approximately 50 people present;<br>many diversified groups attended | Discussed the project and EIS process. |
| November 1994 | Juneau | Sister Cities Meeting;<br>Several members of Borough Assembly, Whitehorse Government, employees from the cities, and approximately 25-40 members of the public | Discussed the project and EIS process.` |
| April 1995 | Juneau | KINY radio, morning show;<br>1 hour interactive question/answer show | Discussed the EIS process, schedule and issues. |
| September 1995 | Juneau | Rotary Club Meeting;<br>1 hour presentation with approximately 100 people present | Discussed costs and benefits and the road alignments. |
| June 1996 | Haines | Haines Chamber of Commerce meeting, approximately 50 people in attendance | Discussed the EIS process and issues |
| July 1996 | Juneau | KJUD television “Juneau Live” ½ hour presentation | Discussed highway alignment and alternatives. |

Other forms of public involvement for the project include:

- A Public involvement office was opened in Juneau and maintained to provide citizens the opportunity to learn and express opinions about the project alternatives and issues. The office was staffed three

days per week, four hours per day, and has been in operation through the DEIS. Through December, 1996, over 2,000 visitors have used this facility.

- Meetings with individuals or groups, radio talk shows, and display advertisements were used to explain the project and present results of the study as they became available throughout the course of the project.

- A newspaper insert was prepared and distributed in local newspapers in July 1994 that explained the options being explored and discussed some of the funding requirements and opportunities.

- A second newspaper publication was mailed to all resident boxholders in Juneau, Haines, and Skagway in September 1994. The publication described the results of the public scoping meetings, further defined the alternatives for evaluating in the DEIS, and established a schedule for the remainder of the EIS process.

- A second newsletter insert was prepared and distributed to those on the project mailing list in September 1994. The newsletter summarized the results of a public opinion survey conducted for the project in Juneau, Haines, and Skagway and described some of the techniques used during the environmental studies.

- A third newspaper publication was mailed in December 1995. The publication described the cost estimate refinement, the Steller sea lion protection methods, and calculation of user benefits.

## 7.5 SUMMARY OF SCOPING MEETING COMMENTS

The following information summarizes the comments of Juneau, Haines, and Skagway residents during the March 1994 scoping meetings.

### 7.5.1 Juneau Comments

**Purpose and Need Issues:** Reactions from Juneau residents were mixed regarding the Juneau Access Improvements Project. Many residents favored increased highway access for Juneau citing limitations and inconvenience regarding travel on state ferries, especially during peak tourist months. There were also many comments opposing construction of a highway; stating that the ferry service was the preferred mode of transportation and cost estimates to construct the highway were too high to justify it being built. Other comments questioned the cost benefits of constructing the highway versus time saved by driving.

**Alternatives Issues:** Many Juneau residents opposed to the highway preferred improvements to the state ferry system. Suggestions included faster ferries and increased service. Construction costs and environmental impacts were cited as reasons for objection to highway improvements. Some comments were made in favor

of each of the highway alternatives in anticipation of tourism and trade possibilities. There were also frequent comments proposing a light rail system along the Lynn Canal.

**Environmental Issues:** Concerns were expressed about the construction, and maintenance and operation of a highway over recommended Wild and Scenic Rivers along Lynn Canal along with possible adverse effects on fish and wildlife habitat including bear, moose, and goats. Other comments expressed concern over protecting the visual resources.

**Socioeconomic Issues:** Comments from Juneau residents both favored and opposed growth and development in their community as related to a highway between Juneau and Haines or Skagway. Construction, maintenance, and operation costs were again mentioned as being too expensive and as possibly detracting from state-funded social programs.

### 7.5.2 Haines Comments

**Purpose and Need Issues:** Based on comments, there was general agreement among Haines residents regarding the need to improve access. Residents cited the need for better ferry service to their community, including faster ferries and increased service during the peak tourist season. Some comments indicated opposition to the highway alternative between Juneau and Skagway for reasons including the loss of Haines' remote character and the expense of highway construction, operation, and maintenance.

**Alternatives Issues:** Comments from Haines residents included a desire for more dockings, faster turn-arounds, faster and smaller boats, and the specific addition of a Friday ferry schedule. There were comments stating the boat types used for estimating costs in the alternatives presented during scoping were too large for the community's needs. It was also suggested to deduct fare revenue from operational costs. Only two of the 72 comments received regarding alternatives favored a highway.

**Environmental Issues:** Environmental concerns advocated maintaining the ferry routes to avoid disturbing the land for highway construction. Other specific concerns included the disappearance of game near the highway and impacts on eagles, goats, and seals. Also mentioned was the effect of bridge construction and operation on gillnet fishing.

**Socioeconomic Issues:** Comments stated that improved access could result in a potential increase in crime, higher living costs, and a drop in the tourism industry. In addition, private business owners currently operating shuttle boats expressed concern over losing their market to larger state operated ferries.

### 7.5.3 Skagway Comments

**Purpose and Need Issues:** There was agreement among Skagway residents that there is a need to improve the state ferry system. Many comments opposed a highway between Skagway and Juneau because of the high costs for construction, maintenance and operation.

**Alternatives Issues:** Skagway residents were largely in favor of improvements to the ferry system alternatives and opposed to the highway alternatives.

**Environmental Issues:** There was a tremendous amount of concern regarding negative highway and construction impacts to wildlife, visual resources, and historical sites.

**Socioeconomic Issues:** Skagway residents were concerned there would be negative economic impacts to either Skagway or Haines if the highway was built to only one of these communities.

## 7.6 AGENCY COORDINATION

In March 1994, two agency scoping meetings were held in Juneau to discuss the project, determine appropriate study methodologies, and establish the process for future coordination. The first meeting was with cooperating agency representatives and the second with other agencies wanting to participate in the project.

A third scoping meeting was held in Juneau with agency representatives and interested citizens. At that time, results of the DEIS studies were discussed and information provided regarding the alternatives and considerations that should be included in the DEIS.

The U.S. Department of Commerce -National Oceanic and Atmospheric Administration , U.S. Environmental Protection Agency, U. S. Fish and Wildlife Service, U. S. Forest Service, U.S. Department of the Interior - Bureau of Mines and National Park Service, U.S. Department of Transportation - Federal Highway Administration, and the Department of Commerce and Economic Development agreed to become cooperating agencies for the project.

Many agencies wrote to identify concerns and ask that specific information be collected and specific impact studies be performed. These letters, as well as a description of the resulting DEIS studies, are included in the Scoping Report. Additionally, minutes of the three agency scoping meetings as well as documentation of the agency scoping process is available as part of the project planning record.

At the third scoping meeting, results of the DEIS studies were discussed and information provided regarding the alternatives and considerations that should be included in the DEIS. The minutes of this meeting, as well as documentation of the entire agency scoping process, are available as part of the project record.

Coordination with agencies has been ongoing during development of the DEIS, in particular with U.S. Fish and Wildlife Service (USF&WS), Migratory Bird Management-Raptors Section; National Marine Fisheries

Service (NMFS), Protected Resource Management; U.S. Forest Service (USFS) and State Historic Preservation Officer (SHPO) archaeologist; COE; Regulatory Office Juneau; and Environmental Protection Agency (EPA), Alaska Operations Office.

## 7.7 COOPERATING AGENCY REVIEW

In late February 1997, cooperating agencies were requested to review the preliminary DEIS. Their comments and DOT&PF responses follow:

## 8.0 LIST OF PREPARERS

| Name and Education | DEIS Responsibility | Professional Experience |
|---|---|---|
| Bill Ballard<br>Under graduate studies<br>Fisheries Biology | Supervision and project management | DOT&PF, Regional Environmental Coordinator, 16 years experience. |
| Jack Beedle<br>BS Civil Engineering | DEIS and Technical Appendix Review | DOT&PF, Design Group Chief, 20 years engineering experience. |
| Pat Kemp<br>BS Civil Engineering | Review and engineering supervision | DOT&PF, Preconstruction Engineer, 21 years engineering experience. |
| Tracy Moore<br>BS Civil Engineering | Engineering Analysis | DOT&PF, Engineering Manager, 25 years highway experience. |
| Vanessa Artman<br>MS Wildlife Science<br>BA Biology | Wildlife habitat | Wildlife biologist, Dames & Moore, four years environmental analysis experience. |
| David Bjerklie<br>MS Civil Engineering<br>MS Hydrology<br>BS Marine Biology | Water quality and hydrology, floodplains | Senior Hydrologist, Dames & Moore, 10 years hydrogeology experience. |
| John Buttenob<br>BS Civil Engineering | Traffic projections; engineering economic analysis; alignment engineering. | Transportation Engineer, H.W. Lochner, five years in traffic and road design engineering experience. |
| James Calvin<br>MS Mineral Economics<br>BS Geology | Economics Analysis | Senior Analyst, McDowell Group, eight years economic research and analysis experience. |
| Arthur Dunn<br>BS Earth Science | Office manager, lead investigator wetlands and bald eagle studies; senior review | Dunn Environmental Services, Juneau, 11 years environmental documentation and wetland permitting experience. |
| A. David Every<br>PhD Botany<br>MS Botany | Senior review of vegetation and wildlife reports, conducted rare plant survey. | Manager, Terrestrial Ecology, Dames & Moore, 18 years botany, wetland evaluations, resource |

| Name and Education | DEIS Responsibility | Professional Experience |
|---|---|---|
| BS Zoology | | inventories, terrestrial ecology, project management and environmental impact assessment experience. |
| Ginny Fay<br>MA Economics<br>BS Zoology | Land use and coastal zones; subsistence; socioeconomic; commercial fisheries; public safety and public utilities. | Principal, ECO-Systems, 16 years biologist and economist, and two years environmental assessments experience. |
| Donna Frostholm<br>BS Biology | Upland vegetation; rare plant survey. | Vegetation Biologist, Dames & Moore, Six years wetland and vegetation studies experience. |
| Tony Leonard, P.E.<br>B.S. Civil Engineering | FPE/Roen Lochner Joint Venture project manager; engineering, cost estimates, public involvement | Manager, Northwest Operations, H.W. Lochner, 18 years engineering and construction experience. |
| Tracey Preston<br>MS Environmental Engineering<br>BS Civil Engineering | Hazardous waste, air quality, noise. | Environmental Analyst, FPE/ Roen Engineers, Inc, 4 years private sector experience. |
| Rick Reed<br>BS Fisheries Biology | Biological assessment of Steller sea lions; senior reviewed fish and wildlife | 23 years experience DF&G, including 18 years Regional Supervisor, Habitat Division, Southeast Region. |
| Sally Rue<br>BA Urban Studies<br>MRP Regional Planning | Socioeconomic task leader, Land use and coastal zones; socioeconomic technical reports; public involvement | Principal, Resource Management Group, 17 years land use planning, natural resource management and public involvement experience. |
| Barbara Sheinberg<br>BS Geology | Land use and coastal zones, socioeconomics, relocation | Principal, Sheinberg Associates. 16 years geology, natural resource and land use planning experience. |
| Greg Waddell | Land use, economics, review | Manager, Land Use and General Planning, Dames & Moore, 15 years land use planning, environmental |

| Name and Education | DEIS Responsibility | Professional Experience |
|---|---|---|
| | | compliance and permitting experience. |
| Michael Yarborough | Lead investigator for archaeological survey; eligibility determinations; SHPO coordination | Cultural Resource Consultants, Inc. |

## 9.0 LIST OF REVIEWERS

The Federal, state and local agencies and organizations receiving copies of the Draft Environmental Impact Statement (DEIS) for review are listed below.

## 9.1 FEDERAL AGENCIES

Army Corps of Engineers, Alaska District
- Enforcement
- Floodplain Management
- Regulatory Functions Branch

United States Department of Agriculture
- Soil Conservation Service
- Forest Service, Southeast Region Office
- Forest Service, Juneau Ranger District
- Forest Service, Chatham Ranger District

United States Coast Guard

United States Department of Commerce
- National Marine Fisheries Service

United States Environmental Protection Agency
- Alaska Operation Office
- Seattle, Washington
- Washington, D.C.

United States Department of the Interior
- Environmental Review Program, Washington, D.C.
- Fish and Wildlife Service, Subsistence Management
- Fish and Wildlife, Enhancement
- Bureau of Indian Affairs
- Bureau of Mines
- National Park Service
  - Alaska Area Office
  - Skagway-White Horse Railroad National Monument
  - Klondike Gold Rush National Historical Park
  - Endicott Wilderness Area
- Office of the Secretary, Anchorage, Alaska

## 9.2 STATE AGENCIES

Alaska Railroad Corporation
Alaska Industrial Development and Export Authority
Alaska Department of Commerce and Economic Development
Alaska Department of Community and Regional Affairs
Alaska Department of Environmental Conservation
Alaska Department of Fish and Game
- Commercial Fisheries Division
- Habitat and Restoration Division
- Subsistence Division
- Wildlife Conservation Division

Alaska Department of Natural Resources
- Division of Forestry
- Division of Lands
- Division of Mining
- Navigability
- Division of Parks and Outdoor Recreation
  - Chilkat State Park
- State Historic Preservation Office

Alaska Department of Public Safety
- Division of Fish and Wildlife Protection
- Highway Safety Planning Agency

Alaska Department of Transportation and Public Facilities
- Alaska Marine Highway System
- Southeast Region Design and Construction

Office of the Governor
- Division of Governmental Coordination

## 9.3 LOCAL GOVERNMENTS

City of Haines
- Mayor
- City Administrator
- Planning Department

Haines Borough
- Mayor
- Planning and Zoning Commission

City and Borough of Juneau
- Mayor
- City Manager
- Community Development

City of Skagway
- Mayor
- City Manager
- Planning Department

## 9.4 OTHER AGENCIES AND ORGANIZATIONS

Alaska Center for the Environment
Alaska Conservation Society
Alaska Federation of Natives, Inc.
Alaska Historical Society
Alaska Miners Association
Alaska Wilderness Recreation and Tourism Association
Alaska Visitors Association
Alaskans for Juneau
Chilkat Indian Village
Friends of Berners Bay
Haines Chamber of Commerce
Haines Public Library
Haines Sportsmen Club
Haines Visitor Bureau
Haines Water Taxi
Inland Boatmans Union
Juneau Audubon Society
Juneau Chamber of Commerce
Juneau Convention & Visitors Bureau
Juneau Economic Development Council
Juneau Kayak Club
Juneau League of Women Voters
Juneau Public Library

Juneau School District
Klukwan, Inc.
Lutak Planning Service Area Board
Lynn Canal Conservation, Inc.
Mud Bay Planning Service Area Board
SEAK Tourism Council
Sierra Club - Juneau Group
Skagway Chamber of Commerce
Skagway Convention and Visitors Bureau
Skagway Economic Development Commission
Skagway Public Library
Southeast Alaska Conservation Council
Southeast Conference
Southeast Fisheries Coalition
Southeast Seiners Association
Taku Conservation Society
Territorial Sportsmen
Thane Neighborhood Association
United Fisherman of Alaska
United Southeast Alaska Gillnetters
White Pass Alaska

## 10.0 REFERENCES


Art Anderson Associates, 1995. AMHS Fast Passenger Vehicle Ferry Optimization Study. Prepared by Art Anderson Associates, Seattle, WA, for FPE/Roen-Lochner Joint Venture and Department of Transportation and Public Facilities (DOT&PF).

Art Anderson Associates, 1996. The Marine Segments of the Juneau Access Study. Prepared by Art Anderson Associates, Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF. June 1996.

Barker, Milton B., 1996. Juneau Access Improvements Financing Strategies. Prepared by Milton B. Barker, Juneau, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Charbonneau, Art, 1993. Correspondence on permission to do studies for construction of an all weather road through British Columbia to Juneau, Alaska to Commissioner B.A. Campbell from Art Charbonneau, Minister of Highways. June 16, 1993.

Dames & Moore, 1994. Biological Evaluation for Threatened, Endangered, Candidate, and Sensitive Wildlife Species. Prepared by Dames & Moore, Inc., Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Dames & Moore, 1994. Hydrology and Water Quality Report. Prepared by Dames & Moore, Inc., Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Dames & Moore, 1994. Preliminary Karst Vulnerability Assessment, West Lynn Canal Alternative. Prepared by Dames & Moore, Inc., Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Dames & Moore, 1994. Vegetation Report. Prepared by Dames & Moore, Inc., Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Dames & Moore, 1994. Visual Report. Prepared by Dames & Moore, Inc., San Francisco, CA, for FPE/Roen-Lochner Joint Venture and updated by DOT&PF, 1997.

Dames & Moore, 1997. Wildlife Technical Report. Prepared by Dames & Moore, Inc., Seattle, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

DOT&PF, 1986. Southeast Alaska Transportation Plan Record of Community Response. Prepared by Acres International Corporation for DOT&PF.

DOT &PF, 1996. Auke Bay Ferry Terminal Upgrade. Prepared by D.E. Mayer & Associates for U.S. Department of Transportation Federal Highway Administration and DOT&PF.

Dunn Environmental Services, 1997. Bald Eagle Technical Report. Prepared by Dunn Environmental Services, Juneau, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Dunn Environmental Services, 1997. Wetlands Technical Report. Prepared by Dunn Environmental Services, Juneau, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Eco-Systems, Resource Management Group, Sheinberg Associates, 1995 & 1997. Land Use and Coastal Zone Technical Report. Prepared by Eco-Systems, Resource Management Group, Sheinberg Associates, for FPE/Roen-Lochner Joint Venture and DOT&PF.

Eco-Systems, Resource Management Group, Sheinberg Associates, and McDowell Group, 1994. The Socioeconomic Effects of Juneau Access Improvements. Prepared by Eco-Systems, Resource Management Group, Sheinberg Associates, and McDowell Group for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Archaeological Survey on the West Coast of Lynn Canal: William Henry Bay to Pyramid Island. Prepared by Northern Land Use Research, Inc., Fairbanks, AK, for FPE/Roen-Lochner Jont Venture and DOT&PF.

FPE/Roen Engineers, 1994. Air Quality Report. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Anadromous Fish & Stream Habitat. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1996. Biological Assessment Report on Steller Sea Lions. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Initial Site Assessment Technical Memorandum. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Joint Development Technical Memorandum. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Marine Habitat & Ferry Terminal Site Investigations Technical Report. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Noise Technical Report. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen Engineers, 1994. Wild and Scenic Rivers Technical Memorandum. Prepared by FPE/Roen Engineers, Inc., Fairbanks, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

FPE/Roen-Lochner Joint Venture, 1994. Juneau Access Improvements Scoping Report. Prepared by FPE/Roen-Lochner Joint Venture for DOT&PF.

H.W. Lochner, Inc., 1994. Floodplains Report. Prepared by H.W. Lochner, Inc., Bellevue, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

H.W. Lochner, Inc., 1994. Juneau Access Improvements Reconnaissance Engineering Report. Prepared by H.W. Lochner, Inc., Bellevue, WA, for DOT&PF.

H.W. Lochner, Inc., 1996. Juneau Access Improvements Traffic Forecast Analysis. Prepared by H.W. Lochner, Inc., Bellevue, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

H.W. Lochner, Inc., 1996. Juneau Access Improvements User Benefit Analysis. Prepared by H.W. Lochner, Inc., Bellevue, WA, for FPE/Roen-Lochner Joint Venture and DOT&PF.

H.W. Lochner, Inc., 1996. Juneau Access Improvements Technical Alignment Report. Prepared by H.W. Lochner for DOT&PF.

Johnson, Edwin E., 1995. Cost Estimate for the Juneau Access. Prepared by Edwin E. Johnson for DOT&PF.

Mears, A.I. and Glude, Bill. 1996. Snow Avalanche Technical Report Environmental Impact Statement Considerations Juneau Access Route E.I. S. Prepared by Arthur I. Mears, P.E., Inc., Gunnison, CO, and Alaska Environmental Solutions, Juneau, AK, for FPE/Roen-Lochner Joint Venture and DOT&PF.

McDowell Group, 1994. Juneau Access Household Survey. Prepared by McDowell Group, Juneau Alaska for DOT&PF.

Minch Ritter Voelckers Architecture Planning Interior Design, 1996. Echo Cove Master Plan. For Goldbelt, Inc.

Sheinberg Associates, 1994. Displacement Report. Prepared by Sheinberg Associates, Juneau, AK for FPE/Roen-Lochner Joint Venture and DOT&PF.

Yarborough, Michael R., 1994. Archaeological Literature Review, Research Design, and Inventory Plan for the Juneau Access Improvements Environmental Impact Statement. Prepared by Cultural Resource Consultants for FPE/Roen Engineers and DOT&PF.