# Juneau Access Improvements Project
# Final Supplemental Environmental Impact Statement and Record of Decision

# Errata

**Prepared for:**

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

**State Project Number: 71100**
**Federal Project Number: STP-000S(131)**

**Prepared for:**

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

**July 2018**

# ERRATA
# Juneau Access Improvements Project Final Supplemental Environmental Impact Statement and Record of Decision

## ERRATA

| Page, Section | Reads | Should Read (changes shown) |
|---|---|---|
| *Page ES-2, Section ES-1, para 2* | FHWA intends to issue a new ROD for the project no sooner than 30 days following release of this Final SEIS. | Sentence deleted |
| *Page ES-2, Section ES-2, para 2* | The STIP includes modifications to the Haines Ferry Terminal that are scheduled to be constructed in 2018. | The STIP includes modifications to the Haines Ferry Terminal that are scheduled to be constructed in 2019. |

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# Juneau Access Improvements Project
# Final Supplemental Environmental Impact Statement
# And Record of Decision

## Volume 1

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**June 2018**

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# Juneau Access Improvements Project

Juneau, Alaska
City and Borough of Juneau

# Final Supplemental Environmental Impact Statement

Submitted Pursuant to 42 U.S.C. 4332(2)(c), 16 U.S.C. 3164(e), and 49 U.S.C. 303 by:
U.S. Department of Transportation, Federal Highway Administration (FHWA); and
State of Alaska, Department of Transportation and Public Facilities (DOT&PF)

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

This action complies with Executive Order 11988, Floodplain Management; Executive Order 11990, Protection of Wetlands; Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds; Executive Order 13112, Invasive Species; Executive Order 13175, Consultation and Coordination with Indian Tribal Governments; Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations; and Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency.

Cooperating Agencies
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Department of Agriculture Forest Service
U.S. Coast Guard

D. Lance Mearig, DOT&PF
Date of Approval: 18 Jun 2018

Sandra A. Garcia-Aline, FHWA
Date of Approval: June 18, 2018

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

Tim Haugh
Environmental Program Manager
FHWA, Alaska Division
P.O. Box 21648
Juneau, AK 99802
(907) 586-7418

Greg Lockwood
Project Manager
DOT&PF, Southcoast Region
P.O. Box 112506
Juneau, AK 99811-2506
(907) 465-1828

The Juneau Access Improvements Project would improve public access to and from Juneau in Lynn Canal. Seven build alternatives were evaluated, along with a No Action Alternative. Alternatives include a combination of highway and ferry routes and improved ferry service in Lynn Canal. This Final Supplemental Environmental Impact Statement (SEIS) describes the purpose and need for improved access; alternatives evaluated and eliminated from detailed consideration; the potential direct, indirect, and cumulative environmental and human effects of the project alternatives; and proposed measures to minimize and avoid impacts.

Project information is available online at: www.juneauaccess.alaska.gov

This Final SEIS is combined with the Record of Decision (ROD) pursuant to Public Law 112-141, 126 Stat. 405, Section 1319(b). Therefore, this Final SEIS and ROD concludes the National Environmental Policy Act (NEPA) process.

# Record of Decision
# Juneau Access Improvements Project

State Project Number: 71100
Federal Project Number: STP-000S(131)

## I. Decision

This Record of Decision (ROD) was developed pursuant to 40 Code of Federal Regulations (CFR) 1505.2 and 23 CFR 771.127. The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), has identified a need to improve surface transportation to and from Juneau within the Lynn Canal corridor in Southeast Alaska. The purpose of this improvement was to:

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

The project purpose and need was most recently described in Chapter 1 of the *Juneau Access Improvements Final Supplemental Environmental Impact Statement* (Final SEIS).

The selected alternative for the Juneau Access Improvements (JAI) Project is Alternative 1 – No Action. This alternative is the alternative selected by the State of Alaska. Alternative 1 – No Action includes a continuation of mainline[1] ferry service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs) previously programmed for construction by the Alaska Marine Highway System (AMHS). Alternative 1 – No Action is not a direct continuation of 2018 ferry service; rather, it is a continuation of the current AMHS plan and reflects the most likely AMHS Lynn Canal operations in the absence of any capital improvements specific to the JAI Project. The following assumptions are incorporated in Alternative 1 – No Action:

1. No new roads or ferry terminals in Lynn Canal would be built, and there would be no improvements to existing facilities beyond those already programmed.

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[1] Mainline ferry service consists of larger vessels that travel the length of the system from Bellingham, WA, or Prince Rupert, B.C., in the south to Haines and Skagway in the north. The vessels have overnight accommodations for passengers and crew. “Day boats” have no such accommodations. Day boats typically depart and return to the same port each day.

2. Previously programmed improvements that are part of Alternative 1 – No Action would be:
    a. Use of two Day Boat ACFs. One Day Boat ACF would sail between Auke Bay and Haines, while the other would sail between Haines and Skagway. Travelers going between Auke Bay and Skagway on the Day Boat ACFs would be required to transfer ferries in Haines. Other AMHS ferries that are currently operating as summer day boats in Lynn Canal will be deployed elsewhere in the system or will be laid up.
    b. Programmed improvements to vehicle and passenger staging areas at the Auke Bay and Haines Ferry Terminals to optimize traffic flow on and off the Day Boat ACFs.
    c. Programmed expansion of the Haines Ferry Terminal to include a new double end berth for loading/unloading of the Day Boat ACFs.
3. Mainline ferries would continue to serve northern Lynn Canal.

In compliance with the Amended Judgment in *Southeast Alaska Conservation Council et al. v. FHWA et al.* (Doc. No. 117), Case No. 1:06-cv-009 (D. Alaska), the State of Alaska and FHWA prepared a Supplemental Environmental Impact Statement pursuant to the National Environmental Policy Act (NEPA) of 1969 (as amended), 40 CFR Parts 1500-1508, and FHWA regulations (23 CFR Parts 771, 772, and 777). A Draft SEIS for the JAI Project was approved on September 19, 2014, and circulated for comment until November 25, 2014. DOT&PF and FHWA held Public Hearing sessions on October 14, 2014, in Juneau; October 15, 2014, in Haines; and October 23, 2014, in Skagway.

A Final SEIS (and responses to comments received on the Draft SEIS) was approved on June 18, 2018 and is incorporated by reference here. The Final SEIS has identified Alternative 1 – No Action as the preferred alternative and will be distributed to the public and federal and State agencies beginning on July 16, 2018. For more detailed information on topics presented in this ROD, please refer to the Final SEIS.

## II. Basis for Decision

In its 2006 ROD for the JAI Project, FHWA selected Alternative 2B, East Lynn Canal Highway, for advancement to design and construction. The 2006 FEIS supporting the 2006 ROD was found to be inadequate by the U.S. District Court in *Southeast Alaska Conservation Council et al. v. FHWA et al.*, (Doc. No. 117) Case No. 1:06-cv-009 (without FHWA, the State of Alaska appealed this decision to the 9th Circuit Court of Appeals and lost -- leaving the District Court's injunction in place). In 2014, the DOT&PF and FHWA approved a Draft SEIS identifying Alternative 2B as the preferred alternative, however, during development of the Final SEIS, the State of Alaska selected the no action alternative. That selection was, in part, because of current lower revenue and budget deficits affecting the State's ability to advance a build transportation alternative in Lynn Canal. As a result, DOT&PF and FHWA have identified Alternative 1 – No Action as the preferred alternative in the Final SEIS. The fiscal conditions underpinning the change in preferred alternative are described in detail in Sections 2.5.1 and 2.5.3 of the Final SEIS.

The continued public controversy on the JAI Project contributed to the decision to identify Alternative 1 – No Action as the preferred alternative. This project has a history of division, with disagreement among both elected officials and the public on how to proceed. While the need to improve transportation in Lynn Canal is recognized by most, how best to accomplish that remains unresolved. Feelings are strong on both sides and sentiment has wavered over the years on whether the solution lies in building a road or improving ferry service. More information on the controversy is provided in Sections ES-8 and 2.5.3 of the Final SEIS.

In summary, DOT&PF and FHWA find the following:

- Declining oil prices have caused the need for cuts to State budgets.
- Declining revenues, particularly General Fund revenues, have resulted in substantive cuts to DOT&PF's capital and operating budgets.
- Controversy on the JAI Project is high among the public and disagreement remains among elected officials.

Given the State's budgetary reality, coupled with a high level of controversy, DOT&PF and FHWA have identified Alternative 1 – No Action as the preferred alternative.

## III. Alternatives Considered

The JAI Project SEIS evaluated ways to improve surface transportation to and from Juneau within Lynn Canal. Currently, access to Juneau is possible only by air and water.

Consistent with NEPA, a full range of reasonable alternatives to address the purpose and need was identified and evaluated. Based on reconnaissance engineering studies, including alignment studies and a user benefit analysis, the 2014 Draft SEIS evaluated eight reasonable alternatives: a no build alternative, two primarily highway alternatives, and five marine alternatives. The eight reasonable alternatives are summarized below. All build alternatives include one or more ferry links, and four include one or more new sections of highway. For more information on the alternatives presented here and those dropped from further consideration, please refer to Chapter 2 of the Final SEIS.

### A. Alternative 1: No Action (Selected Alternative)

Alternative 1 – No Action includes a continuation of mainline ferry service in Lynn Canal and incorporates two Day Boat ACFs previously programmed for construction by AMHS (see Figure 2-5 of the Final SEIS). Alternative 1 – No Action is not a direct continuation of 2018 ferry service; rather, it is a continuation of the AMHS's *current plan* and reflects the most likely AMHS Lynn Canal operations in the absence of any capital improvements specific to the JAI Project.

In summer, there would be eight round-trips per week between Juneau and Haines or Skagway. Mainline ferries would make two trips per week, and Day Boat ACFs would make the remaining six trips. In winter, Alternative 1 – No Action would provide four round-trips per week between Juneau and Haines, and four round-trips between Juneau and Skagway.

### B. Alternative 1B: Enhanced Service with Existing Alaska Marine Highway System Assets

Alternative 1B is a Transportation System Management alternative that includes operational improvements that focus specifically on increasing the service provided by the transportation system within Lynn Canal using existing AMHS assets (including programmed improvements and other system enhancements).

### C. Alternative 2B: East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

Alternative 2B consists of a new 50.8-mile-long highway from the end of Glacier Highway at Echo Cove to a point north of the Katzehin River delta. A new ferry terminal would be constructed at the end of the new highway, with shuttle ferry service to both Skagway and Haines from the new terminal.

### D. Alternative 3: West Lynn Canal Highway

Alternative 3 would widen Glacier Highway from Echo Cove to Cascade Point and extend Glacier Highway from Cascade Point to Sawmill Cove in Berners Bay (5.2 miles total). Ferry terminals would be constructed at Sawmill Cove and William Henry Bay, and shuttle ferries would operate between the two terminals. A new 38.9-mile two-lane highway would be constructed from William Henry Bay to Haines, with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road.

### E. Alternatives 4A and 4C: Shuttle Ferry Service from Auke Bay to Haines and Skagway

Each of these alternatives would provide daily summer shuttle service from Auke Bay to Haines and Skagway with two new ferries. Alternative 4A would use Fast Vehicle Ferries (FVFs) between Auke Bay and Haines or Skagway to make two round-trips daily from Auke Bay to Haines and Skagway. Alternative 4C would use the programmed Day Boat ACFs to make one round-trip daily (one between Auke Bay and Haines and one between Auke Bay and Skagway). Mainline ferry service between Auke Bay and Haines/Skagway would continue, with two weekly trips estimated in summer and one in winter. In winter, one of the ferries would provide daily (Alternative 4A) or every other day (Alternative 4C) service to Haines and Skagway. Mainline AMHS service from Auke Bay to Haines/Skagway would continue, with two weekly trips estimated for both summer and winter service. A Haines/Skagway shuttle service would continue. Under Alternative 4A, the Day Boat ACFs would no longer operate in Lynn Canal. Both alternatives include improvements to the Auke Bay Ferry Terminal. Alternative 4C would also require improvements to the Skagway Ferry Terminal.

### F. Alternatives 4B and 4D: Shuttle Ferry Service from Berners Bay to Haines and Skagway

These alternatives would extend Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. Daily summer shuttle service would be provided from this new terminal to Haines and Skagway. In winter, service to Haines and Skagway would be provided from the existing Auke Bay Terminal. Mainline AMHS service from Auke Bay to Haines/Skagway would continue, with two weekly trips estimated for both summer and winter service. Haines/Skagway shuttle service would continue. The difference between the two alternatives is that Alternative 4B would use two new FVFs, while Alternative 4D would use the programmed Day Boat ACFs.

### G. Environmentally Preferred Alternative

Alternative 4C is the Environmentally Preferred Alternative. While Alternatives 1B, 4A, and 4C would have few increases in potential environmental impacts relative to Alternative 1 – No Action, Alternative 4C would have the least. Because of its sailing schedule, use of conventional monohull shuttle ferries, and no roadway component, it would produce less greenhouse gas emissions than any of the other alternatives except Alternative 1 – No Action. Due to its lower speed vessels, Alternatives 1B and 4C would also have a lower potential for impacts to marine mammals than Alternative 4A, as the Day Boat ACFs have a slower travel speed than the FVFs.

Alternative 4C would have no terrestrial impacts and no marine fill or dredge impacts in Lynn Canal. No wetlands would be filled or excavated, no streams would be crossed, and no fish or wildlife habitat would be lost or fragmented. No potential would be created for increased access related problems in currently undeveloped areas.

## IV. Section 4(f)

The proposed action of selecting the no-build alternative would not result in the use of land from any public park, recreation area, wildlife or waterfowl refuge, or significant historic site protected by Section 4(f) of the United States Department of Transportation Act of 1966, as amended.

## V. Measures to Minimize Harm and Mitigation Monitoring Measures

Since Alternative 1 – No Action has been identified as the Selected Alternative and therefore pursuant to 40 CFR 1505(c) the question of whether all practical means to avoid or minimize environmental harm is moot. No mitigation or monitoring measures are required or proposed.

## VI. Comments on the Final EIS

Appendix JJ of the Final SEIS contains public, agency, and interest group comments on the Final SEIS and responses to those comments.

# VII. Conclusion

Based on the information set forth above, and as the State of Alaska has determined not to build the proposed project and to select Alternative 1 – No Action, it is also my decision to select Alternative 1 – No Action as the proposed action for this project.

June 18, 2018

Date

Sandra A. Garcia-Aline, Division Administrator
Federal Highway Administration

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# EXECUTIVE SUMMARY

## ES-1 Introduction

The Juneau Access Improvements (JAI) Project is a proposed action by the Federal Highway Administration (FHWA) and Alaska Department of Transportation and Public Facilities (DOT&PF) to improve surface transportation to and from Juneau, Alaska, within the Lynn Canal corridor. To meet requirements of the National Environmental Policy Act (NEPA)[1], FHWA and DOT&PF prepared a Draft Supplemental Environmental Impact Statement (Draft SEIS), notice of which was published in the *Federal Register* on September 19, 2014, and which was available for public review and comment through November 25, 2014. FHWA and DOT&PF have prepared this Final Supplemental Environmental Impact Statement (Final SEIS) to update the 2006 Final Environmental Impact Statement (EIS), including any updates or changes to regulations, project conditions, analyses, or alternatives that were necessary to address new environmental and engineering information made available since the 2006 Record of Decision (ROD). This Final SEIS also documents and responds to all comments made on the 2014 Draft SEIS.

NEPA requires preparation of an EIS for any proposed action that:

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

In 2006, the FHWA and DOT&PF issued a Final EIS for the JAI Project, and FHWA selected Alternative 2B, the East Lynn Canal Highway, for construction in its 2006 ROD. A 2009 District Court decision ruled that the Final EIS was not valid because it did not consider an alternative that would improve surface transportation in Lynn Canal with existing Alaska Marine Highway System (AMHS) assets. This ruling was upheld by a 2 to 1 decision of a panel of the U.S. Court of Appeals for the Ninth Circuit Court in 2011.

Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] 1502.9) state that agencies shall prepare supplements to either a draft or a final EIS if:

(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

In direct response to the court ruling, FHWA determined that an SEIS should be prepared for the JAI Project and, on January 12, 2012, FHWA issued a Notice of Intent to prepare an SEIS. The 2014 Draft SEIS assessed a new alternative that would improve marine ferry service in Lynn

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

Canal using existing AMHS assets, identified as Alternative 1B. As noted above, it also updated the 2006 Final EIS by reassessing the reasonable alternatives presented in that Final EIS, including any changes to regulations, updated project conditions, updated analyses, or alternative revisions that were necessary to address new environmental and engineering information made available since the 2006 ROD. The basis of the 2014 Draft SEIS was the 2006 Final EIS text in its entirety, with changes made as appropriate throughout the document and highlighted in gray for easy identification by the reader. Similarly, the basis of this Final SEIS is the 2014 Draft SEIS text in its entirety, with substantial changes highlighted in gray.

The 2014 Draft SEIS was an important element of the NEPA process because it provided an opportunity for the general public and interested parties (including governmental entities, regulatory agencies, Tribes, and Native organizations) to comment on the project. The 2014 Draft SEIS identified Alternative 2B, the East Lynn Canal Highway with ferry service between Katzehin and Haines and Skagway, as FHWA's and DOT&PF's preferred alternative. Comments on the 2014 Draft SEIS ranged from simple statements of support or opposition, to complex technical discussions of such issues as project alternatives, study methods, determination and characterization of impacts, and mitigation recommendations. This Final SEIS presents changes to the 2014 Draft SEIS based on updated information and comments made by the general public and interested parties on the Draft SEIS. This Final SEIS identifies Alternative 1 – No Action, as the preferred alternative. FHWA intends to issue a new ROD for the project no sooner than 30 days following release of this Final SEIS.

## ES-2 Proposed Action

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

DOT&PF uses transportation planning and programming documents to guide its development of surface transportation projects. The Statewide Transportation Improvement Program (STIP) is a federally required document that programs federally funded projects. DOT&PF's 2016–2019 STIP (Amendment 3) was approved by FHWA and the Federal Transit Administration on June 28, 2017. Alternative 1 – No Action is consistent with the currently adopted STIP. The STIP includes modifications to the Haines Ferry Terminal that are scheduled to be constructed in 2018. Using State funding, DOT&PF is also constructing two Alaska Class Ferries, one of which is slated to function as a shuttle between Haines and Skagway. The other is planned to run between Auke Bay and Haines (see Chapter 2 for further detail).

DOT&PF has been in the process of updating its Southeast Alaska Transportation Plan (SATP) for several years and released a Draft SATP in June 2014 (DOT&PF, 2014). The 2014 Draft SATP recommended a highway from Juneau to Katzehin with ferry service between Katzehin and Haines and Skagway (i.e., Alternative 2B in this SEIS). The SATP is now being updated to reflect the identification of Alternative 1 – No Action as the JAI Project preferred alternative.

## ES-3 Project Purpose and Need

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

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

Chapter 1 contains detailed information on the purpose and need for the proposed JAI Project.

## ES-4 Alternatives Evaluated in the Final Supplemental Environmental Impact Statement

Following are brief descriptions of the reasonable alternatives evaluated in this Final SEIS. Chapter 2 includes more detailed descriptions of each alternative. Maps of the reasonable alternatives follow Chapter 2 in Figures 2-5 through 2-7a and 2-8 through 2-11.

### ES-4.1 Alternative 1 (Preferred) – No Action

Alternative 1 – No Action reflects the most likely AMHS operations without any of the capital improvements proposed in the JAI Project. Alternative 1 – No Action includes a continuation of mainline AMHS service in Lynn Canal and incorporates the two Day Boat Alaska Class Ferries (Day Boat ACFs) under construction by the AMHS (separately authorized). Other programmed improvements under Alternative 1 – No Action include changes to the vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to accommodate loading and unloading for the Day Boat ACFs. There would be no new roads or ferry terminals constructed under Alternative 1.

### ES-4.2 Alternative 1B – Enhanced Service with Existing AMHS Assets

Alternative 1B includes all of the components of Alternative 1 – No Action, but focuses on enhancing service using existing AMHS assets without major initial capital expenditures. Similar to Alternative 1, Alternative 1B includes: a continuation of mainline AMHS service in Lynn Canal, the two Day Boat ACFs, the programmed improvements to vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals, and expansion of the Haines Ferry Terminal. Unlike Alternative 1, Alternative 1B keeps the *M/V Malaspina* in service as a summer shuttle, after the second Day Boat ACF is brought online, to provide additional capacity in Lynn Canal. Service to other communities would remain the same as Alternative 1 – No Action. Enhanced service included as part of Alternative 1B is a 20 percent reduction in fares for trips in Lynn Canal. There would be no new roads or ferry terminals constructed under Alternative 1B.

### ES-4.3 Alternative 2B: East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

Alternative 2B would widen Glacier Highway from Echo Cove to Cascade Point (2.9 miles) and construct a new highway from Cascade Point to a point just north of the Katzehin River delta (47.9 miles). Shuttle ferry service to Skagway and Haines would be provided from a new terminal at Katzehin using the Day Boat ACFs. The Haines to Skagway shuttle service would continue to operate in the summer using a new conventional monohull ferry. Mainline AMHS service would end at Auke Bay. The Skagway Ferry Terminal would be modified to include a new end berth.

### ES-4.4 Alternative 3: West Lynn Canal Highway

Alternative 3 would widen the Glacier Highway from Echo Cove to Cascade Point (2.9 miles) and construct a new highway from Cascade Point to Sawmill Cove in Berners Bay (2.3 miles). New ferry terminals would be constructed at Sawmill Cove and William Henry Bay, and the Day Boat ACFs would operate as shuttle ferries across Lynn Canal between the two terminals. A new 38.9-mile West Lynn Canal Highway would be constructed from William Henry Bay to Haines with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road. A new conventional monohull ferry would be constructed to provide shuttle service between Haines and Skagway. The Skagway Ferry Terminal would be modified to include a new end berth for the new vessel. Mainline ferry service would end at Auke Bay.

### ES-4.5 Alternatives 4A through 4D

These four build alternatives include continued mainline ferry service in Lynn Canal. The Haines-Skagway shuttle service would be provided by a new conventional monohull ferry. All of these alternatives would require construction of a new double stern berth at Auke Bay.

- **Alternative 4A: FVF Service from Auke Bay** – Alternative 4A would construct two new Fast Vehicle Ferries (FVFs) to provide daily service between Auke Bay, Haines, and Skagway. The Auke Bay Ferry Terminal would be expanded to include a new double end berth. No new roads would be built. The Day Boat ACFs would not operate in Lynn Canal.
- **Alternative 4B: FVF Service from Berners Bay** – Alternative 4B would widen Glacier Highway from Echo Cove to Cascade Point and construct a new highway to Sawmill Cove (5.2 miles total) where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double end berth. The alternative includes two new FVFs, which would be constructed to provide daily service between Sawmill Cove, Haines, and Skagway in the summer and between Auke Bay, Haines, and Skagway in the winter. The Day Boat ACFs would not operate in Lynn Canal.
- **Alternative 4C: Conventional Monohull Service from Auke Bay** – Alternative 4C would use the two Day Boat ACFs to provide daily summer service between Auke Bay, Haines, and Skagway. No new roads would be built. The Skagway Ferry Terminal would be expanded to include a new end berth. The Auke Bay Ferry Terminal would be expanded to include a new double end berth, to accommodate both Day Boat ACFs at once.

- **Alternative 4D: Conventional Monohull Service from Berners Bay** – Alternative 4D would widen Glacier Highway from Echo Cove to Cascade Point and construct a new highway to Sawmill Cove (5.2 miles total), where a new ferry terminal would be constructed. The alternative would use the two Day Boat ACFs to provide daily service between Sawmill Cove, Haines, and Skagway in the summer and between Auke Bay, Haines, and Skagway in the winter. The Skagway Ferry Terminal would be expanded to include a new end berth. The Auke Bay Ferry Terminal would be expanded to include a new double end berth, to accommodate both Day Boat ACFs at once.

### ES-4.6 Alternatives Eliminated from Further Consideration

A variety of potential alternatives for the JAI Project have been identified by the DOT&PF project team, resource agencies, and the public over the course of preliminary engineering studies and environmental review of the project. Many JAI Project alternatives were eliminated from further consideration in previous NEPA documents because they are not technically or financially feasible, are not practical, are similar to other alternatives carried through the environmental analysis, and/or do not meet the purpose of and need for the proposed project.

Other alternatives were removed from detailed consideration because they would adversely affect resources protected under Section 4(f) of the Department of Transportation Act of 1966. FHWA determined that alternatives connecting a road to Skagway and requiring use of land in the Skagway and White Pass District National Historic Landmark, a protected resource under Section 4(f), could not be considered reasonable alternatives.

Additional discussion regarding the elimination of alternatives from further consideration, including some suggestions made in comments on the 2014 Draft SEIS, is provided in Chapter 2, Project Alternatives.

## ES-5 Affected Environment

Chapter 3 of this Final SEIS describes the existing conditions of the environmental resources that could be affected by the JAI Project alternatives. The descriptions of the natural and human environment in Chapter 3 provide a baseline from which FHWA and DOT&PF characterized the potential impacts of the project alternatives.

## ES-6 Environmental Consequences

Chapter 4 of this Final SEIS presents the environmental consequences associated with the reasonable alternatives for the JAI Project. Table ES-1, provided at the end of the Executive Summary, summarizes many of the beneficial and adverse impacts associated with these alternatives. The following paragraphs summarize key elements of those impacts.

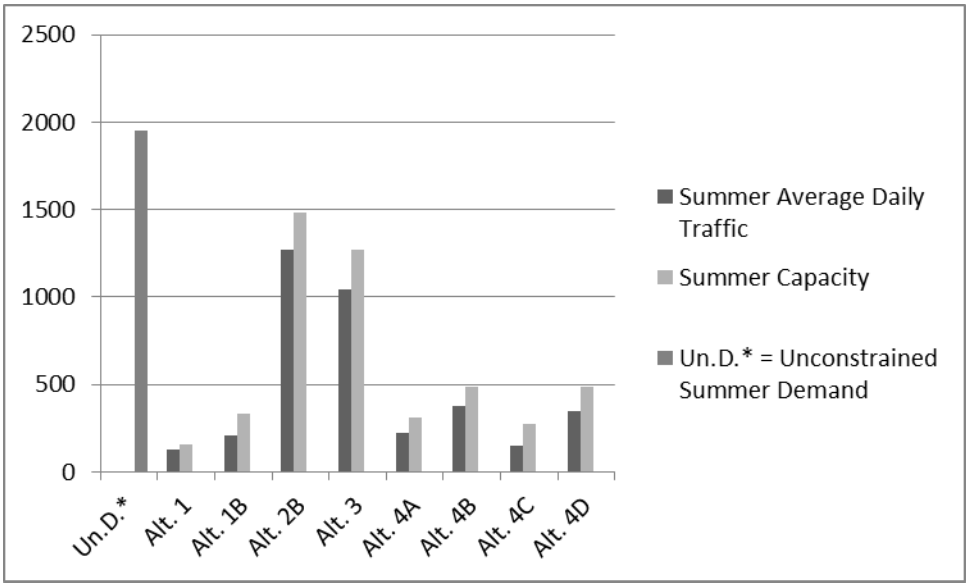
**Transportation –** In order to evaluate the impacts to transportation, FHWA and DOT&PF analyzed each alternative based on its consistency with the currently approved SATP and STIP, the traffic demand it would realize and accommodate, its capacity, the opportunities for travel/traveler flexibility, its travel times, and total costs, as well as cost to the State of Alaska and to the user.

*Consistency with the SATP and STIP*. The 2004 SATP identified a highway from Juneau to Skagway with a ferry from Katzehin to Haines as its proposed improvement. The DOT&PF has been in the process of updating its SATP for several years and it will include Alternative 1 – No Action as the revised proposed improvement. The 2016–2019 STIP does not include any capital improvements for the JAI Project and is consistent with Alternative 1 – No Action.

*Travel Demand and Capacity*. DOT&PF conducted a new traffic forecast analysis for the 2014 Draft SEIS and updated it for this Final SEIS. The analysis predicts potential traffic volumes for each project alternative. The analysis was done in two steps. The first step was to estimate the total unconstrained traffic demand in the Lynn Canal corridor; that is, the number of vehicles that would travel between Juneau and Haines or Skagway if there were no impediments to travel other than availability of a vehicle and the cost of fuel for that vehicle. To calculate the total demand, two methods were used that were most representative of conditions along Lynn Canal. Each methodology was developed independently. The two methods resulted in similar estimates, which provided confidence in the prediction. The analysis indicates that unconstrained summer demand in Lynn Canal is estimated to be about 1,950 vehicles per day (also known as summer average daily traffic [ADT]).

The second step used a travel demand “choice” model to estimate the percentage of the unconstrained demand that would be realized and accommodated by each JAI Project alternative. None of the reasonable alternatives would realize the level of unconstrained demand because they all include ferry links, which place constraints on travel in terms of increased cost and travel time. These increased constraints limit demand. None of the alternatives have been designed to have a capacity that would support the unconstrained demand; rather, the alternatives have been designed to have the capacity to accommodate at least the demand they would realize based on auto travel time and cost, ferry travel time and fares, and delay at ferry terminals. Figure ES-1 is a graph that shows the total 2055 forecast summer demand and capacity for each alternative in relation to the projected unconstrained summer ADT. The forecast summer demand and capacity for each alternative are listed in Table ES-1 for Juneau-Haines and Juneau-Skagway.

**Figure ES-1:**
**2055 Forecast Summer Demand and Capacity in Lynn Canal**
**for JAI Project Alternatives**



*Travel Flexibility and Opportunity.* All the build alternatives, through their provision of a road or additional ferry trips, would increase the opportunity for travel in Lynn Canal and would provide more flexibility for travelers. Travel frequency for each of the alternatives is measured by average number of ferry round trips per week. Comparing summer travel opportunities, Alternatives 1B and 4C would add the fewest number of ferry trips relative to Alternative 1 – No Action, and Alternatives 2B and 3 would add the greatest number of ferry trips (more than five times Alternative 1 – No Action) (see Table ES-1). Alternatives 4A, 4B, and 4D would double the number of ferry trips between Juneau and Haines or Skagway in summer relative to Alternative 1 – No Action.

*Travel Time.* Travel times between Auke Bay and Haines, and Auke Bay and Skagway were determined for each alternative. Travel time was based on an average speed on the highway segments (45 miles per hour); ferry travel times; and delay at ferry terminals associated with wait time or check-in time[2]. All alternatives would have shorter travel times in summer between Auke Bay and Skagway than Alternative 1 – No Action (see Table ES-1). Travel time between Auke Bay and Haines would be the same as Alternative 1 – No Action under Alternatives 1B and 4C, but shorter for all other alternatives. Alternatives 2B, 3, 4A, 4B, and 4D would reduce summer travel times between Auke Bay and Haines by up to 3 hours.

*Total Cost*. The total project life cost less residual value is the summation of all capital and annual operating costs, regardless of who pays, over the lifetime of the project minus any residual value left at the end of 36 years (approximately 6 years of construction and 30 years of operation). All action alternatives would have greater total project life cost less residual value than Alternative 1 – No Action (see Table ES-1, Cost Factors). Of the build alternatives, Alternatives 4C, 4D, and 2B would have the lowest total project life costs less residual value, and Alternatives 4B, 4A and 3 would have the highest, attributable primarily to the maintenance and operations costs of FVFs.

*Maintenance Cost.* With regard to annual maintenance and operating costs, Alternative 1 – No Action would have the lowest cost of all alternatives (see Table ES-1). Alternatives 4A and 4B, with the FVF shuttles, would have the highest maintenance and operating costs, approximately $15.5 to $15.1 million higher, respectively, than Alternative 1 – No Action. Alternatives 1B, 2B, 3, 4C, and 4D would have maintenance and operations costs approximately $2.7 to $8.3 million higher than Alternative 1 – No Action.

*State Cost.* This cost represents the State of Alaska's share of the total project life costs minus the revenue the State collects (see Table ES-1, Purpose and Need Factors). Compared to Alternative 1 – No Action, none of the alternatives except Alternatives 3 and 4D would reduce net State cost over a 36-year period, when taking into consideration construction and refurbishment costs, operating costs, and revenues. Alternatives 3 and 4D would reduce net State cost by approximately 5 to 19 percent, whereas the other alternatives would increase net State cost by approximately 8 to 82 percent. Alternative 4A would be the most costly alternative for the State.

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[2] Due to the frequency of ferry trips with Alternatives 2B and 3, their ferry delay includes wait time based on a quarter of the ferry headway (time between arrivals) rather than check-in time. The wait time assumes half the ferry travelers would arrive randomly and half would schedule their arrival to match the ferry schedule.

*Cost Per Vehicle.* All of the build alternatives would carry more vehicles than Alternative 1 – No Action (see summer demand numbers in Table ES-1). Because Alternatives 2B, 3, 4B, and 4D realize higher traffic volumes than Alternative 1 – No Action, these alternatives would cost the State less than Alternative 1 – No Action on a per vehicle basis, with Alternative 2B having the lowest net State cost per vehicle at approximately $43.

*User Cost.* The out-of-pocket costs for travelers with vehicles in Lynn Canal would be reduced for most alternatives relative to Alternative 1 – No Action. Alternatives 2B and 3 would have the lowest out-of-pocket costs for travelers with vehicles, of all project alternatives (see Table ES-1).

**Socioeconomics** – Improved access in Lynn Canal would allow for better movement of goods and people to and within the northern reaches of Southeast Alaska, resulting in better connections among the economies of Juneau, Haines, Skagway, and Whitehorse.

In the short term, improved access to Juneau is not expected to result in new major economic development in Alaska. Instead, improved access to Juneau would redistribute within the state some of the economic benefits received from one of Alaska’s primary industries, the visitor industry. As access is improved, independent visitors (i.e., non-cruise ship visitors) could shift their travel patterns, perhaps spending more time and money in Southeast Alaska. In addition, improved access would have beneficial effects on other segments of the region’s economy by reducing travel costs for residents and shipping costs for some items.

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

Alternative 2B is projected to cause the greatest influx of independent visitors to Lynn Canal of all the build alternatives; therefore, it would create the largest economic benefits to the region. All the other build alternatives would result in less independent visitor travel than Alternative 2B and therefore would result in less visitor spending. Alternative 3 would provide the largest economic benefit to Haines of all the build alternatives, but essentially no economic benefit to Skagway. Alternatives 4A, 4B, and 4D would provide a small benefit to the region’s economy. Alternatives 1B and 4C would be similar to Alternative 1 – No Action in regard to travel opportunity and flexibility; therefore, they would provide no discernible added economic benefits to Lynn Canal communities.

**Visual Resources** – No impacts to visual resources would result from Alternative 1 – No Action or Alternative 1B. Alternative 2B would be visible at many points in Berners Bay and Lynn Canal, primarily at locations where transportation infrastructure is constructed close to the shore. From the highway, there would be many panoramic views of Lynn Canal with the Chilkat Range in the background.

Most views of the Alternative 3 road from Lynn Canal would be masked by vegetation, except where the highway crosses the Endicott River, the Sullivan River, the Davidson Glacier outwash plain, and the Chilkat River/Inlet. At those locations, Alternative 3 would introduce man-made forms into the natural landscape. The ferry terminals for this alternative would also be visible from views in Berners Bay and William Henry Bay.

Alternatives 4A through 4D would primarily involve improved ferry transportation in Lynn Canal. They would have fewer visual impacts within Lynn Canal than the highway alternatives considered for the project.

**Subsistence –**Alternatives 1 – No Action, 1B, 4A, and 4C are not expected to impact subsistence resources. Alternatives 2B and 3 would provide access to areas used for subsistence harvest activities that previously were accessible only by boat or aircraft. Improved access to these areas could increase competition for subsistence resources from recreational hunting and fishing. Alternatives 4B and 4D would not improve access in Lynn Canal enough to impact subsistence activities.

**Cultural Resources –** The FHWA has met with Lynn Canal Tribal entities since publication of the 2014 Draft SEIS and has reconfirmed its determination that none of the build alternatives would have an adverse effect on properties eligible for inclusion on the National Register of Historic Places.

**Geology –** Alternative 2B, East Lynn Canal Highway, would cross 41 avalanche paths, and Alternative 3, West Lynn Canal Highway, would cross 19 avalanche paths. Alternative 2B incorporates hazard reduction methods that include adjusting the alignment of the highway, constructing barriers and snow sheds, avalanche forecasting and warnings, temporary highway closures, and release of unstable snow with explosives during highway closures. Alternative 3 also would incorporate measures to reduce avalanche impacts, such as avalanche forecasting and warnings, temporary highway closures, and release of unstable snow with explosives during highway closures. The risk of avalanche-associated accidents along any of the highway alternatives would be reduced to the generally accepted standard in North America for safe operation of a highway in avalanche-prone areas. None of the other alternatives would be in avalanche zones.

The potential risks associated with other geologic hazards, such as rockfall and debris flow (potentially affecting Alternatives 2B and 3), karst (potentially affecting Alternative 3), geochemical properties of waste rock (potentially affecting Alternatives 2B and 3), and outburst floods, would be further evaluated in geotechnical and hydrologic studies conducted in support of final design and construction should Alternative 2B or 3 be selected. The risk of rockfall and debris flow hazards would be reduced by mitigation strategies such as avoidance or removal of the rockfall initiation zone; stabilization of the rockfall area with hand scaling, blasting, and rock bolting; or protection from debris flow with catchment ditches.

**Wetlands –** Alternatives 1 – No Action, 1B, 4A, and 4C would not result in the construction of any new highways or ferry terminals; therefore, they would have no direct or indirect effects on wetlands.

Alternative 2B would result in the loss of approximately 61 acres of wetlands and approximately 32 acres of unvegetated intertidal and subtidal areas. This represents a reduction of approximately 9 acres of wetland impacts from what was presented in the 2006 Final EIS, because DOT&PF made design changes to Alternative 2B during the 2008 U.S. Army Corps of Engineers (USACE) permitting process, and during more recent design refinements that minimized impacts to wetlands and reduced the extent of rock side cast areas. All but approximately 1 acre of the wetlands impacted by the Alternative 2B highway alignment would be forested wetlands, which store flood waters, keep sediment from entering nearby waterbodies, and provide wildlife habitat. The largest area of wetland loss, approximately 53 acres of palustrine forested wetlands, would occur between Slate Creek and Sherman Point north of Berners Bay.

Alternative 3 would result in the loss of approximately 26 acres of wetlands, and approximately 12 acres of other aquatic habitat would be would be filled or excavated. Approximately 82 percent of the wetlands impacted by the highway alignment would be forested wetlands.

Alternatives 4B and 4D would result in the loss of approximately 2 acres of wetlands and approximately 3 acres of other waters of the U.S. between Echo Cove and Sawmill Cove.

**Marine and Freshwater Habitats (including Essential Fish Habitat) –** Alternatives 1 – No Action, 1B, 4A, and 4C would have no adverse effect on marine and freshwater habitat or fish and other marine species from construction. Increases in operations under Alternatives 1B, 4A, and 4C would not produce a measurable difference in effects to fish or fish species relative to Alternative 1 – No Action, although the pattern of ferry traffic and noise within the habitat would change.

Under Alternative 2B, a total of approximately 32 acres of unvegetated intertidal and subtidal marine habitat would be filled or dredged for construction of the highway and the Katzehin Ferry Terminal. All anadromous fish streams would be crossed with bridges. Piers for the bridges over the Lace, Antler, and Katzehin rivers would be placed at least 130 feet apart and would not impede fish movement in these rivers.

Alternative 3 would result in impacts to approximately 12 acres of unvegetated intertidal and subtidal habitat, primarily from construction of ferry terminals at Sawmill Cove and William Henry Bay. All anadromous fish streams would be crossed with bridges under Alternative 3, and bridges across the Sullivan, Endicott, and Chilkat rivers would be of similar design to the large bridges of Alternative 2B.

Alternatives 4A through 4D would cause disturbance to less than 1 acre of unvegetated subtidal habitat at the existing Auke Bay Ferry Terminal. Alternatives 4B and 4D would also result in impacts to approximately 3 acres of unvegetated marine habitat from construction of a ferry terminal at Sawmill Cove.

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

**Terrestrial Habitat** – No impacts to terrestrial habitat would occur under Alternative 1 – No Action, 1B, 4A, or 4C. Most of the terrestrial habitat that would be affected by Alternatives 2B and 3 is in the Tongass National Forest. Alternative 2B would remove approximately 400 acres of the approximately 103,500 acres of old-growth forest mapped along the east side of Lynn Canal. Alternative 3 would remove approximately 265 acres of old-growth forest mapped along the east and west sides of Lynn Canal (predominantly the west side, which has approximately 51,960 acres). Alternatives 4B and 4D would reduce the size of the old-growth forest stands in the area by less than 0.04 percent. As part of its management of old-growth habitat, the U.S.

Forest Service (USFS) would adjust the boundaries of small old-growth habitat reserves affected by Alternative 2B, if it were selected.

**Wildlife** – Alternatives 1 – No Action, 1B, 4A, and 4C would have no impacts on terrestrial wildlife. The direct loss of wetland and terrestrial habitat from the build alternatives that include a highway (Alternatives 2B, 3, 4B, and 4D) would have a minor effect on wildlife because that loss would be a small (less than 1 percent) part of the habitat available in the project study area. However, habitat fragmentation caused by the presence of a highway, mortality from vehicle collisions, and the indirect impact of improved access by hunters and trappers resulting from Alternatives 2B and 3 would have a larger impact on wildlife, particularly terrestrial mammals.

Alternative 2B would create a potential barrier between upland habitats and important marine fringe along the east side of Lynn Canal that would fragment animal habitat. It would reduce available habitat for moose and brown bears and increase the potential for mortality from vehicle collisions. To reduce habitat fragmentation impacts, bridges constructed at anadromous fish streams would be designed for wildlife passage beneath the bridge. Large mammal underpasses would be constructed in two other locations at known high-use bear corridors in Berners Bay and near the Katzehin River.

Alternative 3 would have similar but smaller impacts to wildlife than Alternative 2B. Alternative 3 bridges at anadromous fish streams also would be designed for wildlife passage. Alternatives 4B and 4D would involve minor road construction through terrestrial habitats; therefore, their effect on wildlife would be small.

**Bald Eagle –** The U.S. Fish and Wildlife Service (USFWS) and DOT&PF conducted aerial surveys in April 2012 to obtain updated bald eagle nest information for the analysis of alternatives for the JAI Project SEIS. The April 2012 surveys were flown on both sides of Lynn Canal and documented 60 new nests along East Lynn Canal and 21 new nests along West Lynn Canal.

Alternatives 1 – No Action, 1B, 4A, and 4C would have no impacts on bald eagle nests. The alignments of Alternatives 2B, 3, 4B, and 4D have been shifted, where possible, to avoid nests that would be less than 30 feet from project construction work limits. The highway under Alternative 2B would be located within 0.5 mile of 137 bald eagle nests and within 660 feet of 101 of these nests. Alternative 3 would be within 0.5 mile of 79 bald eagle nests, and within 660 feet of 56 of these nests. A total of 16 bald eagle nests are documented within 0.5 mile of the ferry terminal and highway portions under Alternatives 4B and 4D. No communal roosting locations are known to occur along the highway alignments.

A highway on the east or west side of Lynn Canal would involve a persistent source of highway traffic noise that might result in eagle pairs relocating to alternate nest trees within their nesting territory. Individual eagle pairs may abandon their nesting territory and associated hunting perches altogether, especially during summer, when traffic volumes are predicted to peak. Food availability has been identified as a key factor that influences breeding success; therefore, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. This is likely to occur, given that new nests have been constructed along existing highway segments in Southeast Alaska with higher traffic volumes than are predicted under the JAI Project alternatives. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the shoreline of Lynn Canal for breeding. As a result, a highway on either side of Lynn Canal would not affect the overall population of bald eagles in the Lynn Canal area. DOT&PF would coordinate with USFWS to determine if a Disturbance Permit were necessary for annual winter blasting in avalanche areas.

On-the-ground nest surveys would be conducted before clearing would take place to confirm the location of trees with eagle nests. Construction activities in the vicinity of bald eagle nests would be coordinated with the USFWS to determine the need for alignment changes, blasting plan changes, or other measures to avoid impacts to any new nests identified. DOT&PF would apply for permits to disturb bald eagles at nests within 660 feet of the work limits of the alignment and for nests within 0.5 mile of blasting activities. Under alternatives that require widening of 2.9 miles of the existing Glacier Highway (Alternatives 2B, 3, 4A, and 4D), DOT&PF would obtain permits to disturb bald eagles at nests within 660 feet unless no permit is needed due to existing activity that is already tolerated. None of the alternatives are anticipated to require removal of nest trees.

**Threatened and Endangered Species –** There are two species in the project study area that are protected under the Endangered Species Act (ESA): the western population of Steller sea lions (classified as endangered) and the Mexico population of humpback whales (classified as threatened). The eastern population of Steller sea lions, which is most prevalent in the project area, was removed from the threatened and endangered species list in December 2013. Although the eastern population is no longer protected under the ESA, it remains protected under the Marine Mammal Protection Act (MMPA). Individual animals from the endangered western population of Steller sea lions are known to occur in the project area. There are two principal haulouts that are used on an annual basis by Steller sea lions in the project study area: Gran Point and Met Point. These haulout sites are on the east side of Lynn Canal. Gran Point is designated a Critical Habitat Area under the Endangered Species Act. Although Met Point is not used as extensively by Steller sea lions as Gran Point, it also is an important haulout for this species.

On September 8, 2016, NMFS published a final decision that changed the status of humpback whales under the ESA (81 *Federal Register* [FR] 62259), effective October, 11 2016. The decision recognized the existence of 14 humpback whale Distinct Population Segments (DPSs) based on distinct breeding areas in tropical and temperate waters: 5 DPSs were classified under the ESA (4 endangered and 1 threatened), and the other 9 DPSs were delisted. Humpback whales found in southeast Alaska are predominantly members of the Hawaii DPS, which is not listed under the ESA. However, based on a comprehensive photo-identification study, members of the Mexico DPS (ESA-listed as threatened) are known to occur in southeast Alaska. Members of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales.[3] According to Wade et al. (2016)[4], the probability of encountering a humpback whale from the Mexico DPS is 6.1 percent. The remaining 93.9 percent of individuals in southeast Alaska are likely members of the Hawaii

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[3] NMFS (National Marine Fisheries Service). 2016. Occurrence of Endangered Species Act (ESA) Listed Humpback Whales off Alaska. National Marine Fisheries Service, Alaska Region. Revised 12 December 2016.

[4] Wade, P.R., T.J. Quinn II, J. Barlow, C.S. Baker, A.M. Burdin, J. Calambokidis, P.J. Clapham, E. Faclone, J.K.B. Ford, C.M. Gabriele, R. Leduc, D.K. Mattila, L. Rojas-Bracho, J. Straley, B.L. Taylor, J. Urban R., D. Weller, B.H. Witteveen, and M. Yamaguchi. 2016. Estimates of abundance and migratory destination for North Pacific humpback whales in both summer feeding areas and winter mating and calving areas. Paper SC/66b/IA21 submitted to the Scientific Committee of the International Whaling Commission, June 2016, Bled, Slovenia.

DPS[5]. All 14 DPSs of humpback whale remain listed as "depleted" under the MMPA and are on the Alaska State Endangered Species List.[6] There is no designated critical habitat for humpback whales.

Pile driving for construction of ferry terminals under Alternatives 2B, 3, 4B, and 4D and multi-span bridges under Alternatives 2B and 3 could disturb Steller sea lions and/or humpback whales. Vibratory hammers would be used during pile driving to the extent possible to minimize underwater noise. Monitors would also be used during pile driving to ensure that this activity would not occur when Steller sea lions were within 660 feet of pile-driving activities unless a different distance were set in an MMPA authorization.

Under Alternative 2B, noise associated with typical highway construction activities within 1,000 feet of the Gran Point and Met Point haulouts could be heard by Steller sea lions at the haulouts, but only blasting would potentially exceed the NMFS's in-air disturbance threshold. Blasting would be required for two tunnels near the Gran Point haulout, as well as for slope cuts in the vicinity of Gran Point and Met Point. For blasting within 600 feet of a haulout, DOT&PF would record noise levels at the haulout for 10 days of blasting. If noise levels are higher than NMFS's in-air disturbance threshold at the haulouts, DOT&PF would require the use of noise attenuation/mitigation methods to reduce noise levels.

Helicopter use, for construction of Alternative 2B, within 3,000 feet of Gran Point or Met Point would occur at a minimum altitude of 1,500 feet (when weather conditions permit) and a minimum distance of 1,000 feet from each haulout. No flights over the haulouts would be conducted.

Other than Alternative 2B, none of the build alternatives are in proximity to the Gran and Met Point haulouts; however, if another build alternative were selected, the FHWA would consult with the NMFS, as appropriate, on potential impacts to Steller sea lions. All of the build alternatives would increase ferry traffic in one or more areas of Lynn Canal; however, collisions between Steller sea lions and ferries are expected to be minimal, as Steller sea lions would likely avoid such encounters.

The increase in ferry traffic would not be high enough to substantially increase the risk of collisions with humpback whales. The NMFS has raised concerns that Alternatives 3, 4B, and 4D would adversely affect humpback whales due to the ferry traffic in Berners Bay during spring herring and eulachon spawning periods. The FHWA has committed to avoid operating in Berners Bay until May 15 under Alternatives 4B and 4D, after eulachon and herring spawning in April and early May.

## ES-7 Identification of the Preferred Alternative

In its 2006 ROD for the JAI Project, FHWA selected Alternative 2B, East Lynn Canal Highway, for advancement to design and construction. During development of the 2014 Draft SEIS, FHWA and DOT&PF reassessed the reasonable alternatives considered in the 2006 Final EIS, as well as an additional alternative identified as a result of a District Court ruling. This additional

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[5] NMFS 2016. Occurrence of Endangered Species Act (ESA) Listed Humpback Whales off Alaska. National Marine Fisheries Service, Alaska Region. Revised 12 December 2016.

[6] Alaska Department of Fish and Game. < http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.akendangered> Accessed December 29, 2016.

alternative was designed to improve access to Juneau using existing AMHS assets and is identified as Alternative 1B. After careful review and consideration of the updated information and analyses conducted in support of the 2014 Draft SEIS, FHWA and DOT&PF continued to prefer Alternative 2B, and the published 2014 Draft SEIS reflected that preference.

Since the 2014 Draft SEIS was released, however, declining oil prices have caused unprecedented cuts to DOT&PF's capital and operating budgets. The net result is that the current budget deficit has affected the State's ability to advance a build transportation solution in Lynn Canal at this time. As a result, DOT&PF and FHWA have identified Alternative 1 – No Action as the preferred alternative in this Final SEIS. The fiscal conditions underpinning the change in preferred alternative are described in detail in Sections 2.5.1 and 2.5.2.

DOT&PF and FHWA continue to stand by the transportation purpose and need for the JAI Project that was identified and refined over many years with input from the public and agencies, as described in detail in Chapter 1. Both agencies recognize that Alternative 1 – No Action would not solve the existing and future transportation problems in Lynn Canal. Travel costs for users would continue to be high, opportunities for improvement in flexibility or frequency of travel would be limited, travel times would remain long, limited capacity improvement would be made toward satisfying corridor demand, and costs to the State would remain high considering the low number of vehicles served.

The continued public controversy on the JAI Project contributed to the decision to identify Alternative 1 – No Action as the preferred alternative. This project has had a history of division, with disagreement among elected officials and the public on how to proceed. While the need to improve transportation in Lynn Canal is recognized by most, how best to accomplish that remains a question for many. Feelings are strong on both sides, and sentiment has wavered over the years on whether the solution lies in building a road or improving ferry service. More information on the controversy is provided in Sections ES-8 and 2.5.3.

In summary, DOT&PF and FHWA find the following:

- Declining oil prices have caused the need for cuts to State budgets.
- Declining revenues, particularly General Fund revenues, have resulted in substantive cuts to DOT&PF's capital and operating budgets.
- The net result is that the current budget deficit has affected the State's ability to advance a build transportation solution in Lynn Canal at this time.
- Controversy on the JAI Project is high.

Given the State's budgetary reality, coupled with a high level of controversy, DOT&PF and FHWA have identified the No Action Alternative as the Preferred Alternative. All reasonable alternatives evaluated in this Final SEIS have been evaluated to a comparable level of detail[7] and formally remain under consideration.

Alternative 1 – No Action has been identified as the preferred alternative in this Final SEIS. It was noticed in the *Federal Register*, on the JAI Project website, in local newspapers, and to the

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[7] Additional information is known about Alternative 2B (more than the other alternatives) because Alternative 2B was selected as the preferred alternative in the 2006 ROD. Subsequent to that ROD, DOT&PF continued work to acquire permits and approvals necessary for the implementation of Alternative 2B.

Project mail list via postcard mailers. It also was distributed to federal, State, and local governments; Native organizations; and public libraries.

## ES-8 Areas of Controversy

Providing highway access to Juneau is a contentious issue in northern Southeast Alaska.

Much of the controversy surrounding this project, which has persisted for many years, is related to the potential impacts to the natural and social environment associated with alternatives that include substantial road components. Some of the controversy has been related to the basic modal choice reflected in the build alternatives (i.e., ferries versus roads). This has been expressed in numerous resolutions from the local governments of Haines, Skagway, and Juneau and is reflected in their adopted comprehensive plans. The level of controversy is further reflected in the intense interest from the public as expressed in the comments generated for and against the various alternatives through past scoping processes, received at public hearings, submitted on draft versions of the EIS and SEIS, and reflected in surveys. Many residents and environmental advocacy groups (local and national) have expressed environmental concerns (captured in the impacts disclosed in this Final SEIS and in the comments summarized in Appendix JJ, *Responses to Draft Supplemental Environmental Impact Comments*), and lawsuits have been filed based on some of those concerns. The history of the lack of consensus and controversy is summarized in Section 2.5.3 of this Final SEIS.

The 2006 Final EIS addressed issues and concerns raised in comments on the 2005 Supplemental Draft EIS by revising the document where appropriate and by directly responding to individual comments.

The 2014 Draft SEIS addressed issues raised by the public and agencies during scoping for the SEIS in 2012. These issues are outlined in Chapter 7. The FHWA and DOT&PF reviewed all comments on the 2014 Draft SEIS and present responses to those comments in this Final SEIS.

## ES-9 Related Actions and Projects

There are currently no related actions or projects that would affect the JAI Project.

## ES-10 Federal Actions Necessary

If a build alternative were selected for the JAI Project, the following federal permits, consultations, and approvals may be required.

- USFS transportation and utility easement issued under SAFETEA-LU Section 4407 for use of Tongass National Forest lands, and USFS special use permit for any project activities or facilities located outside the Section 4407 easement on Tongass National Forest.
- USACE Section 404 (Clean Water Act) permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit (Rivers and Harbors Act) for dredge, fill, and structures placed below mean high water
- USFWS Bald Eagle Disturbance Permit

- U.S. Coast Guard, Section 9 permits (Rivers and Harbors Act) for bridges over navigable waters not exempted under 23 CFR 650.805 or subject to FHWA advance approval under 33 CFR 115.70, as amended.
- NMFS ESA Section 7 consultation for threatened and endangered species
- NMFS MMPA Incidental Harassment Authorization for marine mammals

## ES-11 Unresolved Issues

In 2008, the DOT&PF received a USACE permit for the alternative selected in the 2006 ROD: Alternative 2B. That permit expired in 2013. As part of the Section 404/10 permitting process, if a build alternative were selected, DOT&PF would submit a new permit application and coordinate with the USACE to develop a compensatory mitigation plan to offset impacts to waters of the U.S.

During development of the 2006 Final EIS, NMFS, ADF&G, and EPA did not concur with FHWA's assessment of the impacts in Berners Bay associated with Alternatives 3, 4B, and 4D. This disagreement involved projected direct impacts to Pacific herring spawning habitat and indirect impacts to Steller sea lions and humpback whales. If one of these three alternatives were selected for the proposed project, further consultation would be necessary.

## ES-12 EIS Availability

This Final SEIS, including appendices, is available free of charge on DVD for viewing electronically. A printed copy of this Final SEIS is available upon request for free. Printed copies of appendices are available for a printing charge. The document is also available for viewing on the project website at www.juneauaccess.alaska.gov. Printed copies of the document and all appendices are available for public review at the following locations:

Juneau Public Library
292 Marine Way
Juneau, Alaska

Mendenhall Valley Public Library
3025 Dimond Park Loop
Juneau, Alaska

Douglas Public Library
1016 3rd Street
Douglas, Alaska

Alaska State Library
395 Whittier Street
Juneau, Alaska

Haines Public Library
111 3rd Avenue
Haines, Alaska

Skagway Public Library
769 State Street
Skagway, Alaska

DOT&PF Southcoast Region
6860 Glacier Highway
Juneau, Alaska

For information on obtaining a CD or bound version of this Final SEIS, contact the DOT&PF project office at (907) 465-1828, or visit the project website at www.juneauaccess.alaska.gov.

## Table ES-1:
## Summary of Estimated Beneficial and Adverse Impacts of Proposed Project Alternatives

| **Factors** | | **Alternative** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **1 – No Action** | **1B** | **2B** | **3** | **4A** | **4B** | **4C** | **4D** |
| **Cost Factors[1]** | | | | | | | | | |
| Initial Construction Costs ($million) | | $0 | $0 | $680 | $596 | $250 | $318 | $78 | $110 |
| Total Project Life Costs, Less Residual Value ($millions) | | $787 | $1,212 | $1,156 | $1,167 | $1,621 | $1,718 | $981 | $1,048 |
| Annual Maintenance and Operations Costs ($millions) | | $18.2 | $26.5 | $20.9 | $22.1 | $33.7 | $33.3 | $22.7 | $24.2 |
| Net Present Value ($millions) Relative to Alternative 1 – No Action | | - | -$135 | -$351 | -$331 | -$202 | -$211 | -$75 | -$26 |
| **Purpose and Need Factors** | | | | | | | | | |
| 2055 Forecasted Summer Demand to/from Skagway (vehicles per day) | | 45 | 100 | 565 | 385 | 100 | 170 | 65 | 155 |
| 2055 Forecasted Summer Demand to/from Haines (vehicles per day) | | 80 | 110 | 705 | 655 | 125 | 205 | 85 | 190 |
| Summer Capacity to/from Skagway (vehicles per day) | | 61 | 171 | 636 | 456 | 149 | 237 | 131 | 237 |
| Summer Capacity to/from Haines (vehicles per day) | | 93 | 160 | 848 | 816 | 162 | 250 | 144 | 250 |
| Summer Travel Time – Auke Bay to Skagway[3] (hours) | | 8.1 | 6.8 | 4.0 | 5.5NB/ 5.1SB | 4.1 | 3.9 | 6.6 | 5.4 |
| Summer Travel Time – Auke Bay to Haines[3] (hours) | | 6.2 | 6.2 | 3.3 | 3.2 | 3.9 | 3.7 | 6.2 | 5.0 |
| Number of Ferry Round trips/Week –to Skagway (summer) | | 8 | 16[4] | 42 | 42 | 16 | 16 | 9 | 16 |
| Number of Ferry Round trips/Week – to Haines (summer) | | 8 | 10 | 56 | 84 | 16 | 16 | 9 | 16 |
| State's Net Project Life Cost, Less Residual Value – ($millions) [5] | | $378 | $577 | $407 | $361 | $688 | $554 | $482 | $308 |
| State's Net Cost Per Vehicle (dollars) | | $279 | $283 | $43 | $46 | $335 | $179 | $313 | $105 |
| Total/Out-of-Pocket User Costs (one way) – Juneau-Haines[6] | Family of 4 in a 19-foot vehicle | $229/ $227 | $183/ $181 | $82/$47 | $91/$60 | $229/ $227 | $166/ $151 | $229/ $227 | $166/$151 |
| | Driver only in a 19-foot vehicle | $132/ $130 | $106/ $104 | $69/$35 | $72/$41 | $132/ $130 | $103/ $88 | $132/ $130 | $103/ $88 |
| | Walk-on passenger (excluding ground transportation)[7] | $39/$39 | $31/$31 | $5/$5 | $8/$8 | $39/$39 | $25/$25 | $39/$39 | $25/$25 |

| **Factors** | | **Alternative** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **1 – No Action** | **1B** | **2B** | **3** | **4A** | **4B** | **4C** | **4D** |
| Total/Out-of-Pocket User Costs (one way) – Juneau-Skagway[6] | Family of 4 in a 19-foot vehicle | $302/ $302 | $242/ $242 | $101/ $68 | $144/ $111 | $302/ $302 | $220/ $207 | $302/ $302 | $220/ $207 |
| | Driver only in a 19-foot vehicle | $169/ $169 | $136/ $136 | $79/$47 | $105/ $73 | $169/ $169 | $131/ $118 | $169/ $169 | $131/ $118 |
| | Walk-on passenger (excluding ground transportation)[7] | $53/$53 | $43/$43 | $9/$9 | $16/$16 | $53/$53 | $36/$36 | $53/$53 | $36/$36 |
| **Traffic-related Employment and Population Impacts** | | | | | | | | | |
| | | | | **Juneau** | | | | | |
| New Local Employment (2055) | | 0 | 15 | 130 | 105 | 15 | 40 | 5 | 35 |
| Population Increase (2055) | | 0 | 23 | 195 | 158 | 23 | 60 | 8 | 53 |
| | | | | **Skagway** | | | | | |
| New Local Employment (2055) | | 0 | 10 | 80 | 50 | 15 | 25 | 5 | 25 |
| Population Increase (2055) | | 0 | 15 | 120 | 75 | 23 | 38 | 8 | 38 |
| | | | | **Haines** | | | | | |
| New Local Employment (2055) | | 0 | 5 | 60 | 15 | 5 | 20 | 0 | 20 |
| Population Increase (2055) | | 0 | 8 | 90 | 23 | 8 | 30 | 0 | 30 |
| **Natural Resources Impacts** | | | | | | | | | |
| Number of Anadromous Streams Crossed | | 0 | 0 | 10 | 11 | 0 | 1 | 0 | 1 |
| Old-growth Forest Habitat Losses (acres) | | 0 | 0 | 412 | 308 | 0 | 38 | 0 | 38 |
| Wetland Habitat Losses (acres) | | 0 | 0 | 61 | 26 | 0 | 2 | 0 | 2 |
| Intertidal/Subtidal Area Losses (acres) | | 0 | 0 | 32 | 12 | <1 | 3 | <1 | 3 |
| Essential Fish Habitat Impacted (acres) | | 0 | 0 | 32 | 12 | <1 | 3 | <1 | 3 |
| Eagle Nests Within 660 Feet | | 0 | 0 | 101 | 56 | 0 | 8 | 0 | 8 |
| Total Eagle Nests within 0.5 mile | | 0 | 0 | 137 | 79 | 0 | 16 | 0 | 16 |

[1] Costs and benefit analysis are presented in Revised Appendix FF, *User Benefit, Life-Cycle Cost, and Total Project Cost Analyses*.

[2] The total project life cost less residual value is the summation of all capital and annual operating costs over the lifetime of the project minus any residual value left at the end of 36 years.

[3] Travel time for Day Boat ACF or FVF or *M/V Malaspina* as a shuttle. In all alternatives except 2B and 3, the mainline ferry would have a travel time of 9.1 hours between Auke Bay and Skagway and 7.2 hours between Auke Bay and Haines.

[4] Six trips per week are made by taking the Day Boat ACF between Auke Bay and Haines and transferring ferries.

[5] This represents the total project life cost less the federal contribution and State revenue.

[6] First number is total user cost and second number is out-of-pocket cost. Total cost is based on fares plus $0.64 per mile for vehicular travel (AAA, 2012). Out-of-pocket cost based on fares and gasoline consumption.

[7] For costs of walk-on passengers including ground transportation, please see Chapter 4.

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- Appendix II (New) – *Alternative 1B Optimized and Alternative 5 Evaluation*

## Volume 4

- Appendix JJ (New) – *Responses to Draft Supplemental Environmental Impact Statement Comments*

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# List of Acronyms and Abbreviations

**-A-**

| | |
|---|---|
| AAAQS | Alaska Ambient Air Quality Standards |
| AAC | Alaska Administrative Code |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACF | Alaska Class Ferry |
| ACMP | Alaska Coastal Management Program |
| ADEC | Alaska Department of Environmental Conservation |
| ADF&G | Alaska Department of Fish and Game |
| ADNR | Alaska Department of Natural Resources |
| ADOLWD | Alaska Department of Labor and Workforce Development |
| ADT | Average Daily Traffic |
| AHI | Avalanche Hazard Index |
| AIDEA | Alaska Industrial Development and Export Authority |
| AMHS | Alaska Marine Highway System |
| AML | Alaska Marine Lines |
| ANCSA | Alaska Native Claims Settlement Act |
| ANHP | Alaska Natural Heritage Program |
| ANILCA | Alaska National Interest Lands Conservation Act |
| AP&T | Alaska Power & Telephone |
| APDES | Alaska Pollutant Discharge Elimination System |
| APE | Area of Potential Effect |
| AS | Alaska Statute |
| AVSP | Alaska Visitors Statistics Program |
| AWQS | ADEC Water Quality Standards |

**-B-**

| | |
|---|---|
| BA | Biological Assessment |
| BBHMD | Berners Bay Historic Mining District |
| B.C. | British Columbia |
| BF | Board Feet |
| BGEPA | Bald and Golden Eagle Protection Act |
| BMP | Best Management Practice |

**-C-**

| | |
|---|---|
| CBJ | City and Borough of Juneau |
| CDP | Census Designated Place |
| CEQ | Council on Environmental Quality |
| CFEC | Commercial Fisheries Entry Commission |
| CFR | Code of Federal Regulations |
| $CH_4$ | Methane |
| CLIA | Cruise Lines International Association |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| $CO_2E$ | $CO_2$ equivalents |

**-D-**

| | |
|---|---|
| dB | Decibels |
| dBA | A-Weighted decibels |
| DOT&PF | Alaska Department of Transportation and Public Facilities |
| DPS | Distinct Population Segment |

**-E-**

| | |
|---|---|
| EFH | Essential Fish Habitat |
| EIA | Energy Information Administration |
| EIS | Environmental Impact Statement |
| EMS | Emergency Medical Services |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ERNS | Emergency Response Notification System |
| ESA | Endangered Species Act |

**-F-**

| | |
|---|---|
| FAST Act | Fixing America’s Surface Transportation Act |
| FC | Fecal Coliform |
| FCRPA | Federal Cave Resources Protection Act |
| FEIS | Final Environmental Impact Statement |
| FERC | Federal Energy Regulatory Commission |
| FHWA | Federal Highway Administration |
| FR | Federal Register |
| FVF | Fast Vehicle Ferry |
| FY | Fiscal Year |

**-G-**

| | |
|---|---|
| g | Gravity |
| GF | State of Alaska General Fund |
| GHG | Greenhouse Gas |
| Goldbelt | Goldbelt, Inc. |
| GPS | Global Positioning System |

**-H-**

| | |
|---|---|
| HCI | Habitat Capability Index |
| HOV | High-Occupancy Vehicle |

**-I-**

| | |
|---|---|
| ILF | In-Lieu Fee |
| ips | Inches Per Second |
| IRA | Inventoried Roadless Area |
| ISA | Initial Site Assessment |
| IWG | Interagency Working Group |

**-J-**

| | |
|---|---|
| JAI | Juneau Access Improvements |
| JIA | Juneau International Airport |

**-L-**

| | |
|---|---|
| $L_{eq}$ | Equivalent Sound Level |
| LOC | Letter of Concurrence |
| LUD | Land Use Designation |
| LUST | Leaking Underground Storage Tank |

**-M-**

| | |
|---|---|
| M&O | Maintenance and Operations |
| M/V | Motor Vessel |
| MAP-21 | Moving Ahead for Progress in the 21st Century Act |
| MBTA | Migratory Bird Treaty Act |
| MIS | Management Indicator Species |
| MMBF | Million Board Feet |
| MMPA | Marine Mammal Protection Act |
| MMT | Million Metric Tons |
| MOA | Municipality of Anchorage |
| MOVES | Motor Vehicle Emissions Simulator |
| MSL | Mean Sea Level |
| $MTCO_2e$ | Metric Tons of $CO_2$ Equivalent |
| $\mu g/m^3$ | Micrograms Per Cubic Meter |

**-N-**

| | |
|---|---|
| NAAQS | National Ambient Air Quality Standards |
| NAC | Noise Abatement Criteria |
| NEPA | National Environmental Policy Act |
| NHL | National Historic Landmark |
| NHP | National Historical Park |
| NHPP | National Highway Performance Program |
| NHS | National Highway System |
| NHTSA | National Highway Traffic Safety Administration |
| NMFS | National Marine Fisheries Service |
| $NO_2$ | Nitrogen Dioxide |
| NOAA | National Oceanic and Atmospheric Administration |
| NOI | Notice of Intent |
| NOx | Nitrogen Oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| NTSB | National Transportation Safety Board |
| NWCA | NorthWest CruiseShip Association |
| NWI | National Wetlands Inventory |

**-O-**

| | |
|---|---|
| $O_3$ | Ozone |
| OG | Old Growth |
| OGR | Old-Growth Reserve |
| OHMP | Office of Habitat Management and Permitting |
| ORV | Off-Road Vehicle |

**-P-**

| | |
|---|---|
| PAR | Preferred Alternative Report |
| PGM | Platinum Group Metals |
| $PM_{10}$ | Particulate Matter with Aerodynamic Diameter Less than or Equal to 10 Microns |
| $PM_{2.5}$ | Particulate Matter with Aerodynamic Diameter Less than or Equal to 2.5 Microns |
| ppb | Part(s) Per Billion |
| ppm | Part(s) Per Million |

**-R-**

| | |
|---|---|
| RMS | Root Mean Square |
| ROD | Record of Decision |
| ROS | Recreational Opportunity Spectrum |
| ROW | Right-Of-Way |
| RV | Recreational Vehicle |

**-S-**

| | |
|---|---|
| SADT | Summer Average Daily Traffic |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users |
| SATP | Southeast Alaska Transportation Plan |
| SEARHC | Southeast Alaska Regional Health Consortium |
| SEIS | Supplemental Environmental Impact Statement |
| SHPO | State Historic Preservation Officer |
| SIO | Scenic Integrity Objective |
| SIP | State Implementation Plan |
| SMAC | Skagway Marine Access Commission |
| $SO_2$ | Sulfur Dioxide |
| SOx | Sulfur Oxides |
| SPLASH | Structure of Populations, Level of Abundance, and Status of Humpbacks |
| STIP | Statewide Transportation Improvement Program |
| SVFD | Skagway Volunteer Fire Department |
| SWPPP | Storm Water Pollution Prevention Plan |

**-T-**

| | |
|---|---|
| TIGER | Transportation Investment Generating Economic Recovery |
| TLMP | 1997 *Tongass Land Management Plan* |
| TLRMP | 2008 *Tongass Land and Resource Management Plan* |

| | |
|---|---|
| TMP | Transportation Management Plan |
| TSC | Transportation System Corridor |
| TSS | Total Suspended Solids |
| TTRA | Tongass Timber Reform Act |
| TUS | Transportation and Utility System |

**-U-**

| | |
|---|---|
| UAS | University of Alaska Southeast |
| USACE | U.S. Army Corps of Engineers |
| USC | U.S. Code |
| USCG | U.S. Coast Guard |
| USFS | U.S. Forest Service |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| UST | Underground Storage Tank |

**-V-**

| | |
|---|---|
| VCU | Value Comparison Unit |
| VMT | Vehicle Miles Traveled |
| VOC | Volatile Organic Compound |
| VQO | Visual Quality Objective |

**-W-**

| | |
|---|---|
| WP&YR | White Pass and Yukon Route |

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# 1. PURPOSE AND NEED

## 1.1 Introduction

This document is a Final[1] Supplemental Environmental Impact Statement (Final SEIS) for the Juneau Access Improvements (JAI) Project. It has been prepared in accordance with the Council on Environmental Quality regulations for implementation of the National Environmental Policy Act (NEPA) of 1969 (Title 40, Code of Federal Regulations [CFR], Part 1502.9) and Federal Highway Administration (FHWA) regulations (23 CFR 771.130).

Currently, access to Juneau, the Alaska state capital, is possible only by air and water. The Alaska Department of Transportation and Public Facilities (DOT&PF) proposes to improve surface transportation to and from Juneau within the Lynn Canal corridor. Figure 1-1 (at end of chapter) identifies the project vicinity and area.

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

Because more than 3 years had passed since release of the 1997 Draft EIS, the adequacy of the environmental document was reevaluated. DOT&PF determined, and FHWA concurred, that there were sufficient changes in project alternatives and potential environmental impacts to warrant preparation of a Supplemental Draft Environmental Impact Statement (Supplemental Draft EIS). A Supplemental Draft EIS was released in January 2005. A Final Environmental Impact Statement (Final EIS) was prepared to address all substantive comments received on the Supplemental Draft EIS. The Final EIS was released in January 2006. It identified Alternative 2B, the East Lynn Canal Highway to Katzehin with ferry shuttles to Haines and Skagway, as the Preferred Alternative. In April 2006, FHWA issued a Record of Decision (ROD) for the Juneau Access Improvements Project stating that DOT&PF and FHWA selected Alternative 2B for design and construction.

On August 16, 2006, a lawsuit was filed in District Court alleging that:

- FHWA violated NEPA by failing to consider reasonable alternatives for improving transportation in Lynn Canal using existing infrastructure without new construction.

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[1] This Final SEIS is based on the 2014 Draft SEIS, and substantive changes since the Draft SEIS have been highlighted in gray for easy identification by the reader.

- FHWA violated NEPA by relying on inaccurate and misleading frequency delay times in predicting traffic demand and by failing to explain its use in light of evidence in the project record that they were inaccurate. FHWA acted arbitrarily by approving Alternative 2B when the project record shows that the delay times used in the Traffic Demand Forecast were inappropriate and FHWA did not explain its decision to use that data.
- FHWA acted arbitrarily in violation of the Endangered Species Act and Administrative Procedure Act by failing to initiate formal consultation when the proposed road may adversely affect designated critical habitat for Steller sea lions.
- FHWA acted arbitrarily by approving Alternative 2B when its own findings show that operation of the road may result in the taking of bald eagles in violation of the Bald Eagle Protection Act.
- U.S. Forest Service (USFS) violated the National Forest Management Act by approving a right-of-way (ROW) crossing designated Old-Growth Habitat without determining that no feasible alternative existed.

On February 13, 2009, the District Court vacated FHWA's ROD concluding that the FHWA violated NEPA by failing to consider an alternative for improved ferry service using existing ferries and terminals (*Southeast Alaska Conservation Council, et al. v. Federal Highway Administration*, 2009 WL 10677763 (D. Alaska 2009)). The Court did not rule on the other claims in the lawsuit, explaining that the plaintiffs could raise other claims with the new NEPA analysis for the project. In addition to vacating FHWA's ROD, this decision:

- Remanded for further consideration the USFS's decision to grant a ROW easement; and
- Enjoined all activities dependent upon the 2006 Final EIS and ROD (permits, construction, etc.).

The DOT&PF appealed the District Court ruling to the U.S. Court of Appeals for the Ninth Circuit, and in May 2011, the three-judge panel upheld the District Court decision that the 2006 Final EIS was not valid because it did not include an alternative that would improve transportation using existing assets (649 F.3d 1050 [9th Cir. 2011]). As a result, the DOT&PF and FHWA initiated preparation of a Draft SEIS in January 2012.

The 2014 Draft SEIS evaluated an alternative that improves marine ferry service in Lynn Canal using existing Alaska Marine Highway System (AMHS) assets, identified as Alternative 1B. It also reassessed the reasonable alternatives presented in the 2006 Final EIS, including any changes to regulations, updated project conditions, updated analyses, or alternative revisions that were necessary to address new environmental and engineering information made available since the 2006 ROD.

This Final SEIS presents changes to the 2014 Draft SEIS based on updated information and comments made by the general public and interested parties (including governmental entities, regulatory agencies, Tribes, and Native organizations) on that document. It will be used by FHWA in development of a new ROD on the project. The most notable change to the 2014 Draft SEIS is FHWA's and DOT&PF's identification of a new preferred alternative. On December 15, 2016, Governor Bill Walker of Alaska announced the State's preference for Alternative 1 – No

Action (State of Alaska, 2016b). FHWA concurred and also identifies Alternative 1 – No Action as the preferred alternative in this Final SEIS.

The basis of this Final SEIS is the 2014 Draft SEIS text in its entirety, with changes made as appropriate throughout the document. These changes reflect modifications to the 2014 Draft SEIS alternatives, identification of Alternative 1 – No Action as the new preferred alternative, updated information on the affected environment, changes in the assessment of impacts, the results of ongoing coordination, comments received on the 2014 Draft SEIS, and responses to those comments. Substantive changes to the Draft SEIS are highlighted for easy identification by the reader.  New, updated, revised, and corrected appendices included in this Final SEIS are:

- Appendix Z – *2017 Update to Appendix D – Technical Alignment Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix G – Visual Resources Technical Report*
- Appendix Z – *2017 Update to Appendix J – Snow Avalanche Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix K – Hydrology and Water Quality Technical Report*
- Appendix Z – *2017  Update to Appendix L – Noise Technical Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix M – Initial Site Assessment Technical Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix N – Essential Fish Habitat Assessment*
- Appendix Z – *2017 Errata to 2014 Update to Appendix O – Wetlands Technical Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix P – Anadromous and Resident Fish Streams Technical Report*
- Appendix Z – *2017 Update to Appendix Q – Wildlife Technical Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix R – Bald Eagle Technical Report*
- Appendix Z – *2017 Errata to 2014 Update to Appendix S – Steller Sea Lion Technical Report*
- Appendix Z – *2017 Update to Appendix T – Air Quality Modeling Memorandum*
- Revised Appendix AA – *Traffic Forecast Report*
- Revised Appendix BB – *Revenues and Expenditures Report for Lynn Canal, Fiscal Years 2005–2015*
- Revised Appendix CC – *Development of Alternative 1B – Enhanced Service with Existing Alaska Marine Highway (AMHS) Assets*
- Revised Appendix DD – *Land Use Technical Report*
- Revised Appendix EE – *Socioeconomic Effects Technical Report*
- Revised Appendix FF – *User Benefit, Life-Cycle Cost, and Total Project Life Cost Analyses*

- Revised Appendix GG – *Marine Segments Technical Report*
- Appendix II (New) –*Alternatives 1B Optimized and Alternative 5 Evaluation*
- Appendix JJ (New) – *Responses to Draft Supplemental Environmental Impact Statement Comments*

The 2006 Supplemental Final EIS, 2006 Final EIS appendices, 2014 Draft SEIS, and 2014 Draft SEIS appendices are on compact disk at local libraries. They can also be viewed on the project website (www.juneauaccess.alaska.gov).

Except where noted, monetary costs have been updated to 2015 dollars to reflect actual current funding requirements and to allow a comparison of alternatives using the same reference point. The environmental analysis provides a comparison of Alternative 1 – No Action and the build alternatives.

DOT&PF uses transportation planning and programming documents to guide its development of surface transportation projects. The Statewide Transportation Improvement Program (STIP) is a federally required document that focuses on federally funded projects over a 4-year period. DOT&PF's 2016–2019 STIP (Amendment 3) was approved by the FHWA and Federal Transit Administration on June 28, 2017 (DOT&PF, 2017). The JAI Project, specifically Alternative 2B, has been removed from this latest STIP update. Alternative 1 – No Action is consistent with the currently adopted STIP. The STIP includes modifications to the Haines Ferry Terminal, which are scheduled to be constructed in 2019. Using State funding, DOT&PF is also constructing two Alaska Class Ferries, one of which is slated to function as a shuttle between Haines and Skagway. The other is planned to run between Auke Bay and Haines. These vessels are under construction, and their future use relative to the JAI Project alternatives is described in Chapter 2.

The 2004 Southeast Alaska Transportation Plan (SATP) is an approved element of the Alaska Statewide Transportation Plan and was prepared in accordance with 23 USC, Alaska Statute 44.42.050, and other related federal and State regulations. The 2004 SATP (DOT&PF, 2004b) identified a road from Juneau to Skagway, with a shuttle ferry to Haines from Katzehin, as the proposed improvement (i.e., Alternative 2, the preferred alternative in the 2005 Supplemental Draft EIS). DOT&PF has been in the process of updating its SATP for several years and released a Draft SATP in June 2014 (DOT&PF, 2014). The 2014 Draft SATP recommended a highway from Juneau to Katzehin with ferry service between Katzehin and Haines and Skagway (i.e., Alternative 2B, the preferred alternative in the 2014 Draft SEIS). The SATP is now in the process of being updated to change the planned improvement to be Alternative 1 – No Action, consistent with the preferred alternative for this Final EIS.

## 1.2 Project History

Juneau, with a population of slightly more than 31,000 (U.S. Census, 2010b), is the largest community on the North American continent not connected to the continental highway system. The only public surface transportation available is the AMHS, a State-owned ferry system that provides transportation to many of Alaska's southeast coastal communities. AMHS service to and from Juneau connects to the continental highway system in Prince Rupert, British Columbia (B.C.), and Bellingham, Washington, to the south, and in Haines and Skagway to the north. The most commonly used access route to the continental highway system is northbound.

### 1.2.1 Marine Access

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

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

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

In the 1970s, the *M/V Columbia*, *M/V LeConte,* and *M/V Aurora* were added to the fleet. The Lynn Canal corridor gained more service with the addition of the *M/V Columbia*, and the smaller *M/V LeConte* and *M/V Aurora* were dedicated to linking the smaller communities south of Lynn Canal (e.g., Hoonah, Tenakee, and Angoon). During this period, the Auke Bay Ferry Terminal in Juneau was constructed, which reduced the time required to travel between Juneau and Haines and Juneau and Skagway by about 2 hours.

Larger vessels of the AMHS that travel the length of the system from Bellingham or Prince Rupert in the south to Haines and Skagway in the north are called mainline ferries. Smaller vessels that provide service to smaller communities not on the mainline ferry routes are referred to as community link vessels, many of which are termed "day boats" because the vessels return to their port of departure, or home port, each day. The mainline ferry routes are part of the National Highway System (NHS).

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

Prior to 2004, all of the vessels in the AMHS fleet operated continuously on a 24-hour basis throughout the year except for maintenance and lay-up periods. Crews generally worked 6 hours on, 6 hours off, for 1- or 2-week periods. In the summer of 2004, the State introduced its first fast vehicle ferry (FVF), the *FVF Fairweather*, to replace the summer shuttle ferry service. The *FVF Fairweather* has less vehicular capacity than the larger monohulled vessels, but with its increased speed was able to make two daily trips between the three Lynn Canal communities. Subsequent to the 2006 Final EIS, there was some reorganization of ferry routes. During summer 2016, the *FVF Fairweather* operated as a day boat between Juneau/Haines/Skagway 3 days per week, and between Sitka and Juneau on a fourth day. Lynn Canal day boat service was provided by the *M/V LeConte* 2 days per week in summer, and the *M/V LeConte* provided service to other communities the rest of the week. Lynn Canal continued to have mainliner service twice per week in summer and once per week in winter.

### 1.2.2 Highway Access

The first road linking a Lynn Canal community with the continental highway system was the Haines Highway (see Figure 1-2 at end of chapter). During World War II the United States Army constructed the Alaska Highway between Dawson Creek, B.C., and Fairbanks, Alaska. The 150-mile highway spur from Haines Junction to tidewater in Haines was an essential transportation corridor, providing support for construction of the Alaska Highway and adding another route to provide supplies and equipment to western Alaska for the war effort.

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

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

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

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

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

In 1994, work on the JAI Project EIS began. In 1997, a Draft EIS was released; however, a decision was not made regarding a preferred alternative until 2000. Therefore, the 1999 SATP only referenced the Draft EIS and the upcoming decision. In 2000, then-Governor Knowles announced Alternative 2, East Lynn Canal Highway with Katzehin Terminal, was the preferred alternative, but his administration did not actively pursue completion of the EIS. The 2001 addendum to the 1999 SATP reflected this situation, identifying the road as the preferred alternative while addressing interim improvements. In 2002, Governor Murkowski directed that the EIS be completed. The 2004 SATP (the most recently approved Plan) calls for construction of a road between Juneau and Skagway, (as well as a shuttle ferry between Katzehin and Haines). The DOT&PF is in the process of updating its SATP to reflect the continuation of ferry service in Lynn Canal. This is consistent with the identification of Alternative 1 – No Action as the preferred alternative of the JAI Project.

Providing highway access to Juneau is a contentious issue in northern Southeast Alaska. In October 2000, Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road. A September 2002 motion by the City and Borough of Juneau (CBJ) Assembly supporting “completion of the EIS for the identified preferred alternative for the road into Juneau …” passed by a five to four vote. In 1999 a survey conducted for the City of Skagway indicated that 49 percent of Skagway residents opposed a road while 46 percent were in favor of a road. In April 2003, the City Council of Skagway passed a resolution supporting improved ferry service and opposing a road connection by a four to one vote. In January 2003, the Haines Borough Assembly voted unanimously to request that a road to Haines (as opposed to a road to just Skagway) be included in the EIS. In April 2004, the Haines Borough Assembly passed another resolution requesting that the State and federal government focus on enhancing marine transportation within the region. In an October 2004 advisory ballot question regarding transportation in Lynn Canal, 62 percent of Skagway voters chose improved ferry service over a road. Telephone surveys of Haines, Skagway, and Juneau households conducted for the 2005 Supplemental Draft EIS confirmed that residents are divided in their opinions on the value of highway access. For further information, refer to the *Household Survey Report*, Appendix I of the 2005 Supplemental Draft EIS (www.juneauaccess.alaska.gov).

Comments submitted during the review period for the 2005 Supplemental Draft EIS that expressed a preference were approximately 60 percent in support of a highway, with 40 percent preferring a marine alternative. Comments submitted during the 2012 scoping period for the 2014 Draft SEIS and on the Draft SEIS document in fall 2014 indicated both strong support for and strong opposition to the JAI Project. Highway access received support from the CBJ in 2007 and 2009, as evidenced in Assembly Resolutions 2394 and 2463. Resolution 2463 made recommendations for transportation projects to DOT&PF for the 2010–2013 STIP, one of which was extension of the Glacier Highway to MP 91.1 (just north of the Katzehin River delta, which is the proposed location of the Katzehin Ferry Terminal in Alternative 2B). In Assembly Resolution 2784, adopted January 23, 2017, the CBJ affirmed its continuing support for DOT&PF to complete construction of the East Lynn Canal Highway (Alternative 2B). The Haines Borough has indicated its preference for improved ferry service, as evidenced in Assembly Resolution 11-11-316 and in the *Haines Borough 2025 Comprehensive Plan*. The Municipality of Skagway also has a preference for improved ferry service, as shown in the *Municipality of Skagway 2020 Comprehensive Plan*. A summary of community resolutions can be found in Section 2.5.3.

### 1.2.3 Existing Transportation Network

Haines and Skagway, at the north end of Lynn Canal, are linked by road to the continental highway system via the Alaska Highway. The Haines Highway connects Haines with the Alaska Highway at Haines Junction, Yukon Territory. The Klondike Highway links Skagway to the Alaska Highway near Whitehorse, Yukon Territory.

The existing road system in Juneau currently extends approximately 43 miles to the north where Glacier Highway terminates at Cascade Point. No surface transportation facilities extend beyond Cascade Point. The 3 miles of roadway between Echo Cove and Cascade Point were constructed by DOT&PF in 2006 using permits and approvals originally issued to Goldbelt, Inc., a local corporation organized under the Alaska Native Claims Settlement Act that owns land at Cascade Point. The State of Alaska funded construction (but not surfacing) of this extension as part of the Industrial Roads Program. Also known as the Roads to Resources program, these State funds are used to foster industrial development. In this case the goal was to assist Goldbelt and its partner Coeur Alaska, Inc. (Coeur Alaska), the mining company developing the Kensington Gold Project, with their plans to develop a marine facility at Cascade Point (USFS, 1997a). The initial road extension constructed in 2006 was only 20 feet wide and was not accessible to public vehicles, but was available to pedestrians, cyclists, and skiers. In 2009, DOT&PF acquired permits and easements to widen the gravel-surface roadway to 26 feet and make it suitable for public access. These upgrades were completed in 2011 (GovCB, 2011).

The State of Alaska also used Industrial Roads Program funding to upgrade the road from Slate Cove to Jualin Mine. Because the road to Cascade Point does not connect to another community, the NHS designation of Glacier Highway ends at the Auke Bay Ferry Terminal. Due to Juneau's location and lack of highway access, all freight, vehicle, and passenger movement is by air or sea.

Independent of the JAI Project, recent improvements on Glacier Highway include replacing Brotherhood Bridge and constructing a roundabout at Back Loop Road. The 2016–2019 STIP identifies the reconstruction of the highway from Fritz Cove Road to Seaview Avenue. This project started construction in spring 2017.

### 1.2.4 Aircraft Service

Aircraft access to Juneau is provided by commercial jet aircraft primarily from Seattle and Anchorage. The nearest other communities with regular jet service are Petersburg (98 miles south), Sitka (76 miles southwest), Yakutat (163 miles northwest), and Whitehorse (165 miles north). Commuter aircraft serve Juneau as well as Haines, Skagway, and other communities that have neither the demand nor the facilities for jet aircraft service. Two companies offer regularly scheduled commuter service in Lynn Canal (Juneau, Haines, and Skagway). These companies offer approximately 30 round-trips daily in Lynn Canal in the summer, with reduced service in the winter (Wings of Alaska, 2013; Alaska Seaplanes, 2013). They transported approximately 3,600 people between Juneau, Haines, and Skagway in the 12-month period ending in August 2013. Most of the commuter aircraft in use in Lynn Canal can accommodate 5 to 9 passengers and, on average, there are four passengers per flight. The cost of one-way travel in Lynn Canal (e.g., Juneau-Haines or Juneau-Skagway) is approximately $120 to $130.

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

### 1.2.5 AMHS Service

The AMHS is the only public transportation that carries passengers and vehicles in Lynn Canal. Statewide, the ferry system serves 33 ports (AMHS, 2013) in Alaska with a combined population of about 92,000, or 13 percent of Alaska's population (ADOLWD, 2013). The system also has a port in Prince Rupert, B.C., and in Bellingham, Washington.

In 2015, there were six State ferries that served Lynn Canal: one mainline ferry originating from Bellingham (*M/V Columbia)*, two mainline ferries originating from Prince Rupert (*M/V Matanuska* and *M/V Taku*), one mainline ferry that operated as a Lynn Canal shuttle vessel May through September (*M/V Malaspina*), and two day boat ferries (*M/V LeConte* and *FVF Fairweather*). The three mainline ferries and the *M/V Malaspina* have full accommodations and can carry between 69 and 134 vehicles at one time. The *M/V LeConte* can transport 34 vehicles, and the *FVF Fairweather* can transport 36 vehicles. These day boats do not have state room or berth accommodations. About one-third of all vehicular traffic on the statewide ferry system travels through Lynn Canal, and 70 percent of all travel through Lynn Canal embarks or disembarks in Juneau. In the summer of 2015, weekly ferry service in Lynn Canal included mainline ferries from Bellingham and Prince Rupert and shuttle service traveling between Juneau, Haines, and Skagway 6 days per week via the *M/V Malaspina*. The times of arrival and departure for many of the mainline ferries in Juneau, Haines, and Skagway can vary due to tidal restrictions, differing ports of call, and other factors.

### 1.2.6 Private Vessel Service

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

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

## 1.3 AMHS Service History in Lynn Canal

In 2015, AMHS transported approximately 23,500 vehicles and 74,500 passengers through Lynn Canal. Average daily traffic (ADT) is an important planning tool used to evaluate traffic levels on transportation facilities. It is a measure of average daily bi-directional traffic, that is, the number of vehicles passing a given point in either direction. Annual ADT is calculated by dividing annual traffic volumes by 365 days per year.

For AMHS service in Lynn Canal, annual ADT has two distinct counting locations: any point between Juneau and Haines and any point between Haines and Skagway. The annual ADT in Lynn Canal between Juneau and Haines, which includes traffic between Juneau and Skagway, is 76 vehicles, based on a 28-year average (i.e., 1988 through 2015). This equates to about 38 vehicles traveling to or through Haines and about 38 vehicles traveling to or through Juneau. Table 1-1 summarizes the Lynn Canal annual ADT and passenger traffic from 1988 to 2015.

### Table 1-1:
### Lynn Canal AMHS Annual ADT 1988 to 2015
### Auke Bay to Haines, Haines to Auke Bay, Auke Bay to Skagway, and Skagway to Auke Bay (Total for all Routes)

| Year | Round Trips | Traffic Volumes for Year (Vehicles) | Annual Average Daily Traffic | Passenger Traffic |
|---|---|---|---|---|
| 1988 | 266 | 29,513 | 81 | 117,045 |
| 1989 | 240 | 28,871 | 79 | 115,742 |
| 1990 | 256 | 30,734 | 84 | 123,610 |
| 1991 | 290 | 32,605 | 89 | 131,865 |
| 1992 | 283 | 31,044 | 85 | 131,234 |
| 1993 | 245 | 30,098 | 82 | 122,271 |
| 1994 | 262 | 29,322 | 80 | 120,360 |
| 1995 | 270 | 30,349 | 83 | 118,857 |
| 1996 | 270 | 30,998 | 85 | 115,946 |
| 1997 | 287 | 29,158 | 80 | 107,040 |
| 1998 | 285 | 28,083 | 77 | 103,512 |
| 1999 | 298 | 30,131 | 83 | 112,531 |
| 2000 | 308 | 28,889 | 79 | 106,875 |
| 2001 | 285 | 26,662 | 73 | 93,645 |
| 2002 | 324 | 29,202 | 80 | 104,913 |
| 2003 | 325 | 27,967 | 77 | 96,517 |
| 2004 | 388 | 26,971 | 74 | 97,285 |
| 2005 | 403 | 25,492 | 70 | 91,293 |
| 2006 | 398 | 25,258 | 69 | 85,872 |
| 2007 | 434 | 26,377 | 72 | 90,433 |
| 2008 | 391 | 26,527 | 73 | 90,046 |
| 2009 | 340 | 24,703 | 68 | 80,804 |
| 2010 | 329 | 24,841 | 68 | 82,929 |
| 2011 | 344 | 25,082 | 69 | 82,186 |
| 2012 | 296 | 26,115 | 71 | 83,945 |
| 2013 | 323 | 26,372 | 72 | 84,473 |
| 2014 | 308 | 24,956 | 68 | 80,689 |
| 2015 | 297 | 23,543 | 65 | 74,623 |
| Average | 313 | 27,852 | 76 | 101,662 |

Source: AMHS, *Annual Traffic Volume Reports,* 1998-2015 (AMHS, 1998-2015).

While Table 1-1 shows a decline in AMHS passenger traffic from a peak of 131,865 in 1991 to 74,623 in 2015, overall traffic on the principal arterials in Haines, Skagway, and Juneau has increased as has population in these communities. See Section 1.4 for more discussion.

About 60 percent of all ferry traffic in Lynn Canal occurs between May and September. AMHS adjusts for the downturn in volume during the off-season by reducing the number of weekly round-trips. For example, in 2015 weekly trips were reduced from about seven in the summer to about five in the winter.

In 2016, the *FVF Fairweather* provided summer shuttle ferry service in Lynn Canal, traveling between Juneau, Haines, and Skagway 3 days per week. The *M/V LeConte* provided day boat service 2 days per week. A similar schedule for these vessels was set for 2017. All other vessels that provide service in Lynn Canal communities have scheduled but varied arrival and departure times.

The route distance between Auke Bay Ferry Terminal in Juneau and Lutak Inlet in Haines is 76.2 miles. It takes an average of 4.5 hours for a mainline ferry and 2.3 hours for a FVF to transit this distance. The distance between Auke Bay and Skagway is 85.9 miles and requires an average transit time for a mainline ferry, including an intermediate stop in Haines, of 6.5 hours. The FVF takes approximately 2.8 hours to transit between Auke Bay and Skagway with no intermediate stop in Haines. The required check-in time (1 to 2 hours for vehicles with reservations) and off-loading time add to total travel time for ferry travelers. For the mainline ferry, off-loading generally adds 0.6 hour to the travel time. For the FVF, unloading time adds approximately 0.4 hour to the total travel time.

## 1.4 Purpose and Need Statement

The purpose and need for the JAI Project[2] is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will:

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

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[2] In 2008, the U.S. Army Corps of Engineers (USACE), a cooperating agency for this Final SEIS, issued a ROD for its permit of the JAI Project with its own Overall Project Purpose in compliance with Section 404(b)(1) Guidelines. The USACE's overall project purpose was determined to be "…to provide improved surface transportation with increased capacity to meet demand, provide flexibility, improved opportunity for travel, and reduced travel time between the Lynn Canal communities of Juneau, Haines, and Skagway." That overall project purpose was used in the USACE's Section 404 permit analysis.

While both FHWA and USACE develop NEPA documents in general accordance with Council on Environmental Quality regulations defined in 40 CFR 1500, individual federal agency regulations are supplemented and further defined for the FHWA in 23 CFR 771, Environmental Impacts and Related Procedures, and for USACE in 33 CFR parts 320–332, implementing regulations under the Clean Water Act. These regulations further define policies and procedures that are unique to each federal agency's individual authority.

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

The five elements of the project Purpose and Need Statement are interrelated. Convenience and opportunity for travel are important factors in transportation demand, as are travel times and user costs. Transportation improvements to provide increased capacity and opportunity in Lynn Canal affect State and traveler costs. Traveler cost and travel time have a strong effect on demand. Generally, the more expensive the trip and the longer the travel time, the less the actual demand (as opposed to latent demand, which is a term used to describe the demand for travel in unconstrained conditions; i.e., where there is no impediment to typical surface travel). Also, reductions in travel time and/or user cost generally increase State cost.

### 1.4.1 Transportation Demand

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

The Lynn Canal corridor is the largest bottleneck in Alaska's surface transportation system. DOT&PF estimates that the demand to travel through the corridor is approximately 20 times greater than the number of vehicles currently transported by AMHS. As explained in the following sections, indications of unmet demand in Lynn Canal include traffic growth and volume comparisons, telephone surveys, and the traffic forecast analyses.

#### 1.4.1.1 Traffic Growth and Volume Comparisons

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

As shown in Table 1-2, the population of the three Lynn Canal communities grew more than 30 percent from 1988 to 2011. Traffic on adjacent corridors during that same time period showed much lower growth or, on the Haines and Alaska highways and in Lynn Canal, a 10 to 15 percent decline.

Table 1-3 compares AMHS annual ADT for Lynn Canal with the annual ADT of adjacent transportation corridors and the annual ADT of three other highways in Alaska that terminate at a tidewater community. These three communities—Seward, Valdez, and the Kenai Peninsula—all have populations smaller than Juneau.

**Table 1-2:**
**Population and Transportation Growth**

| **Population Growth** | **Percent change[1] from 1988 to 2011** |
|---|---|
| State of Alaska | +36 |
| City and Borough of Juneau | +31 |
| Haines Borough | +34 |
| City of Skagway | +37 |
| **Transportation Growth** | **Percent change from 1988 to 2011** |
| Haines Highway Border Station | -15 |
| Klondike Highway Border Station | +14 |
| Alaska Highway at Champagne[2] (between Haines Junction and Whitehorse) | +4 |
| Alaska Highway near Beaver Creek | -10 |
| AMHS Lynn Canal Service (passengers or vehicles) | -15 |

[1] Percent change rounded up to the nearest percent.

[2] 1988 counts were not available; 1989 counts were used for this table.

**Note:** While 2015 population information is available for the State and the three Lynn Canal communities, traffic counts for the locations reported in this table were available only through 2011. This table, therefore, was not updated because there would be no direct comparison of the 1988–2015 timeframe for population growth and transportation growth.

Source: Population growth from Alaska Department of Labor & Workforce Development, Research and Analysis Section, Demographics Unit statistics (1990), U.S. Census Bureau (1990), and Northern Economics (2012). Transportation growth from DOT&PF Annual Traffic Maps 1998–2002 (2003a) and Yukon Highways and Public Works 2011 Yukon Traffic Count Summary (2012). [3]

The AMHS is the NHS route between Juneau and Haines, the principal surface transportation route for everyone traveling between these two communities. The low annual ADT on this NHS route compared to the annual ADT on other roads in the region indicates that AMHS is not meeting the travel demand in Lynn Canal.

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

As can be seen from Table 1-2 and Table 1-3, neither traffic volume nor population changes can account for the decrease in 2000 to 2015 Lynn Canal AMHS traffic volumes shown in Table 1-1. Rather it is likely the cost of fares relative to the overall economy has affected this AMHS travel. In general, ridership increases during good economic times, as people have more income available for transportation and tourism.

**Table 1-3:**
**Corridor Annual Traffic Volumes and Annual ADT**

| Corridor | Annual Traffic Volume (Vehicles) [1] | Annual Average Daily Traffic |
|---|---|---|
| Alaska Highway between Haines and Whitehorse near Champagne (2015) | 189,800 | 520 |
| Glacier Highway in Juneau near Tee Harbor | 769,400 | 2,108 |
| Glacier Highway end of road in Echo Cove | 39,100 | 107 |
| Egan Drive in Juneau near McDonalds | 9,611,200 | 26,332 |
| Haines Highway east of Haines Airport | 583,600 | 1,599 |
| Dyea Road in Skagway near end of road | 96,700 | 265 |
| Lutak Road in Haines | 172,300 | 472 |
| North Douglas Highway in Juneau past boat launch | 175,900 | 482 |
| Klondike Highway at Skagway River Bridge | 367,790 | 1,008 |
| Sterling Highway west of Seward Highway Junction [2] | 1,123,500 | 3,078 |
| Richardson Highway at Glenn Highway junction [2] | 611,400 | 1,675 |
| Seward Highway south of Sterling Highway Junction [2] | 824,900 | 2,260 |
| AMHS Lynn Canal between Juneau and Haines | 26,372 | 72 |

[1] Annual traffic volumes are rounded.

[2] Highways that terminate at a tidewater community outside the project study area.

Sources: DOT&PF, 2011d; Yukon Highways and Public Works 2011 Yukon Traffic Count Summary (YHPW, 2012); and AMHS, Annual Traffic Volume Reports, 1998-2015 (AMHS, 1998-2015), 2013 DOT&PF Annual Average Daily Traffic (AADT) GIS Map; 2016 personal communication between the Government of Yukon (Knowles) and HDR (Navio).

*Traffic volumes are from 2013 unless specifically noted otherwise.

#### 1.4.1.2 Telephone Surveys

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

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

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

The 2003 (Appendix I of the 2005 Supplemental Draft EIS) survey responses indicated the following:

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

#### 1.4.1.3 Traffic Forecast Analysis

The traffic forecast analysis used the types of travel, origin/destination information, regional growth, and other methods and modeling to determine transportation demand in the Lynn Canal corridor for 2025 through 2055. A summary of the traffic forecast methodology is provided in Section 4.1.5. Further detail on the forecast is provided in Revised Appendix AA, *Traffic Forecast Report*.

The traffic forecast estimated that latent travel demand (also referred to as unconstrained demand) is nearly 20 times greater (1,260 vehicles per day) than the 2015 AMHS usage (annual ADT of 65 vehicles per day).

The analysis also indicated that traffic demand would be relatively constant in the Lynn Canal corridor between 2025 and 2055.

### 1.4.2 Flexibility and Opportunity for Travel

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

The opportunity to travel is restricted in Lynn Canal under the current ferry system. As Table 1-1 in Section 1.3 indicates, there has been an average of about 313 round-trip voyages each year between Juneau and Skagway with intermediate stops in Haines. AMHS provides more service in the summer season, May to September, than in October to April, the winter season. There are usually 9 round-trip voyages per week to Haines and 7 round-trip voyages per week to Skagway during the summer peak season and 4 round-trip voyages per week to both communities during the off-season.[3]

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

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

- Travelers must make reservations for vehicles in advance; travel during peak summer season periods can require making reservations within days of the summer ferry schedule release in the preceding December.
- Changing reservations can be problematic and can include cancellation charges if made within 14 days of a reservation.
- Travelers must plan trips to coincide with ferry schedule departures and arrivals.
- A 1- to 2-hour check-in time is required.
- Trips can be delayed by unforeseen events, including vessel mechanical problems, inclement weather, and last-minute requests to serve an additional port south of Juneau.

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[3] The actual number of sailings per year varies for a variety of reasons, including demand and the availability of ferries. For example, the number of sailings may change due to a ferry being out of service for an extended period of time for maintenance.

- Reservation changes are limited to regular business hours.
- Border crossings are restricted at night but ferry schedules do not always coincide with the operating hours of the U.S. Customs stations, inconveniencing travelers going beyond Haines and Skagway.
- When ferries do not have vehicle space available, travelers may register at the ticket counter 2 hours before sailing for standby vehicle space; however, there is no guarantee of boarding.

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

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

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

The following information was identified in the 2003 survey:

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

### 1.4.3 Travel Time

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

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

**Table 1-4:**
**AMHS Travel Time**

| Route | Vessel Type | Check-in Time (hours)[1] | In-Transit (hours) | Unload Time (hours) | Driving Time (hours)[2] | Total Travel Time (hours) |
|---|---|---|---|---|---|---|
| Auke Bay-Haines | Mainline ferry | 2.0 | 4.5 | 0.6 | 0.1 | 7.2 |
| | FVF | 1.0 | 2.5 | 0.3 | 0.1 | 3.9 |
| Auke Bay-Skagway | Mainline ferry | 2.0 | 6.5 | 0.6 | 0.0 | 9.1 |
| | FVF | 1.0 | 2.7 | 0.3 | 0.0 | 4.1 |

Note: Numbers may not add up exactly due to rounding.

[1] Check-in time is the time that a vehicle must arrive at the dock prior to departure and includes loading. Check-in time for the FVF used in this document is 1 hour. Vehicles must have completed check-in an hour before departure to avoid losing a reservation. Therefore, AMHS recommends 2 hours. The FVF is currently used only occasionally in Lynn Canal in summer due to difficulty in making the Juneau-Haines-Juneau-Skagway run without placing too great a load on its engines.

[2] Driving time from the Haines Ferry Terminal to downtown Haines (Third and Main streets) is added for travel on the Auke Bay-Haines route to provide comparable travel time to the Auke Bay-Skagway route, which ends in downtown Skagway at the Skagway Ferry Terminal.

### 1.4.4 State Costs for Transportation System

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

To maintain and operate the ferry system, AMHS depends on vessel-generated revenues (e.g., fares, restaurant income, staterooms) and State funds appropriated annually by the legislature. Statewide, the system required about $160.8 million to operate in 2015 and generated about $54.8 million in revenues, as shown in Table 1-5. Table 1-5 reveals a general decline in the percentage of expenditures covered by revenue since the early part of this century.

**Table 1-5:**
**AMHS Statewide Expenditures and Revenues**

| Fiscal Year (FY) | Expenditures in $Millions | Revenues in $Millions (Percent of Total) | State General Fund in $Millions (Percent of Total) |
|---|---|---|---|
| FY01 | $81.7 | $37.6 (46%) | $44.1 (54%) |
| FY02 | $79.6 | $39.5 (50%) | $40.1 (50%) |
| FY03 | $85.6 | $41.2 (48%) | $44.4 (52%) |
| FY04 | $89.5 | $44.7 (50%) | $44.8 (50%) |
| FY05 | $101.3 | $46.8 (46%) | $54.4 (54%) |
| FY06 | $135.4 | $51.8 (38%) | $83.7 (62%) |
| FY07 | $143.7 | $49.6 (34%) | $94.2 (66%) |
| FY08 | $143.1 | $48.2 (34%) | $94.9 (66%) |
| FY09 | $141.6 | $47.9 (34%) | $93.7 (66%) |
| FY10 | $140.3 | $47.0 (34%) | $93.3 (66%) |
| FY11 | $158.7 | $48.6 (31%) | $110.1 (69%) |
| FY12 | $171.0 | $54.7 (32%) | $116.4 (68%) |
| FY13 | $172.5 | $53.8 (31%) | $118.6 (69%) |
| FY14 | $166.0 | $51.8 (31%) | $114.3 (69%) |
| FY15 | $160.8 | $54.8 (34%) | $106.0 (66%) |
| Average | $131.4 | $47.9 (38%) | $83.5 (62%) |

Sources: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038 (DOT&PF, 2004a); Lynn Canal Corridor Revenue and Expenditures 2003 and 2004 (DOT&PF, 2005b); *Revenues and Expenditures Report for Lynn Canal, Fiscal Years 2005-2015* (Revised Appendix BB of this Final SEIS).

Note: An additional $12 million is spent annually for U.S. Coast Guard required vessel overhauls.

The cost to operate the AMHS is high in comparison to the cost to operate and maintain Alaska's roads and highways. For comparison, the AMHS provided about 20.9 million vehicle miles of travel at a State cost of about $110.1 million in 2011, or $5.27 per vehicle mile (DOT&PF, 2013a). On State-owned highways, 3.54 billion miles were driven in 2011 and the maintenance costs (including administration) for roads and highways in Alaska that year were about $105 million, which equates to approximately $0.03 per vehicle mile (DOT&PF, 2003b; 2011c). Revenues from a State gas tax on highway vehicles and from vehicle licensing and registration fees (about $84.5 million in 2011) go into the State's General Fund; the State Legislature makes allocations from the General Fund to pay the State's costs, including costs for road, highway, and AMHS maintenance.

Travelers in the Lynn Canal corridor account for about 13 percent of total AMHS revenues. Over fiscal years 2001 through 2015, the cost to operate AMHS in Lynn Canal averaged $16.6 million per year (Table 1-6). This cost included maintenance and operation of the vessels and administrative costs, such as selling tickets, scheduling, and operating the terminals. Revenues from fiscal years 2001 through 2015 from passenger and vehicle tickets and on-ship services averaged $6.1 million. As a result, the State general fund contribution has averaged $10.5 million to provide surface transportation in Lynn Canal. Similar to statewide operations, expenditures for

AMHS service in Lynn Canal have increased in the last decade, but revenues have not generally kept pace, resulting in increased costs to the State.

**Table 1-6:**
**AMHS Lynn Canal Corridor Expenditures and Revenues**

| Fiscal Year (FY) | Expenditures in $Millions | Revenues in $Millions (Percent of Total) | State General Fund in $Millions (Percent of Total) |
|---|---|---|---|
| FY01 | $10.4 | $5.5 (53%) | $4.9 (47%) |
| FY02 | $11.5 | $6.4 (56%) | $5.1 (44%) |
| FY03 | $11.3 | $6.2 (55%) | $5.1 (45%) |
| FY04 | $11.7 | $6.0 (51%) | $5.7 (49%) |
| FY05 | $13.4 | $6.8 (51%) | $6.6 (49%) |
| FY06 | $16.0 | $6.8 (42%) | $9.2 (58%) |
| FY07 | $15.4 | $5.8 (37%) | $9.6 (63%) |
| FY08 | $17.5 | $6.4 (37%) | $11.0 (63%) |
| FY09 | $17.2 | $6.1 (36%) | $11.1 (64%) |
| FY10 | $16.6 | $6.2 (37%) | $10.5 (63%) |
| FY11 | $18.8 | $5.9 (31%) | $12.9 (69%) |
| FY12 | $20.4 | $6.6 (32%) | $13.8 (68%) |
| FY13 | $23.2 | $5.9 (26%) | $17.3 (75%) |
| FY14 | $20.7 | $5.0 (24%) | $15.7 (76%) |
| FY15 | $25.1 | $5.6 (22%) | $19.5 (78%) |
| Average | $16.6 | $6.1 (39%) | $10.5 (61%) |

Sources: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038 (DOT&PF, 2004a); Lynn Canal Corridor Revenue and Expenditures 2003 and 2004 (DOT&PF, 2005b); *Revenues and Expenditures Report for Lynn Canal, Fiscal Years 2005–2015* (Revised Appendix BB of this Final SEIS).

Note: An additional $1.3 million is spent annually for U.S. Coast Guard required overhauls for Lynn Canal vessels.

In comparison to statewide operations, AMHS provided about 1.6 million vehicle miles of travel in Lynn Canal in 2015[4] at an annual cost to the State of $19.5 million, or $11.98 per vehicle mile.

### 1.4.5 User Costs

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

The cost of one-way travel by air between Juneau and Haines is approximately $120 and between Juneau and Skagway is approximately $130. The fares for passage in Lynn Canal on the AMHS are substantially higher than those for other surface transportation modes elsewhere in

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[4] This number was calculated using the AMHS 2015 *Annual Traffic Volume Report*. The number of vehicles traveling between each Lynn Canal port was multiplied by their respective distances and then each value was added to produce a value of 1,628,430 vehicle miles in the 2015 calendar year.

the state. A family of four in a 19-foot vehicle[5] traveling one way between Juneau and Skagway by ferry paid $301.50 in 2015. The fare between Juneau and Haines for the same family was $229. A driver in a 19-foot vehicle would have paid $169 between Juneau and Skagway and $131 between Juneau and Haines. In comparison, if direct highway links existed, the total 2015 cost to a vehicle owner would have been about $55.50 between Juneau and Skagway and $52 between Juneau and Haines. The 2015 out-of-pocket cost to a vehicle owner would have been about $15.50 between Juneau and Skagway and $15 between Juneau and Haines.[6]

Table 1-7 summarizes the projected cost per mile in Lynn Canal for a family of four and a driver traveling by ferry and an equivalent-length highway.

**Table 1-7:**
**Projected Cost per Mile in Lynn Canal by Mode in 2015**

| Route | Family of Four by Ferry Vessel [1] | Driver and Vehicle by Ferry Vessel [1] | Travel by Highway[2] |
|---|---|---|---|
| Auke Bay-Haines | $2.62 | $1.69 | $0.58 |
| Auke Bay-Skagway | $3.25 | $1.82 | $0.58 |

[1] Uses distances of 92.7 miles (Auke Bay-Skagway) and 87.4 miles (Auke Bay-Haines). The ferry costs per mile are based on summer 2015 AMHS published fares.

[2] Based on total vehicle cost for an SUV (AAA, 2015). Cost includes fuel, oil, tires, maintenance, insurance, license, registration, depreciation, and financing.

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

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

[6] Assumes fuel cost at $4.03 per gallon (ADCCED, 2015) and 24.8 miles per gallon (EPA 2015 fleet mix average from EPA, 2016).

M:\Data\ADOT\Juneau_Access\Figures\FEIS_Janurary_2006\Figure_01-01_Project_Area.mxd

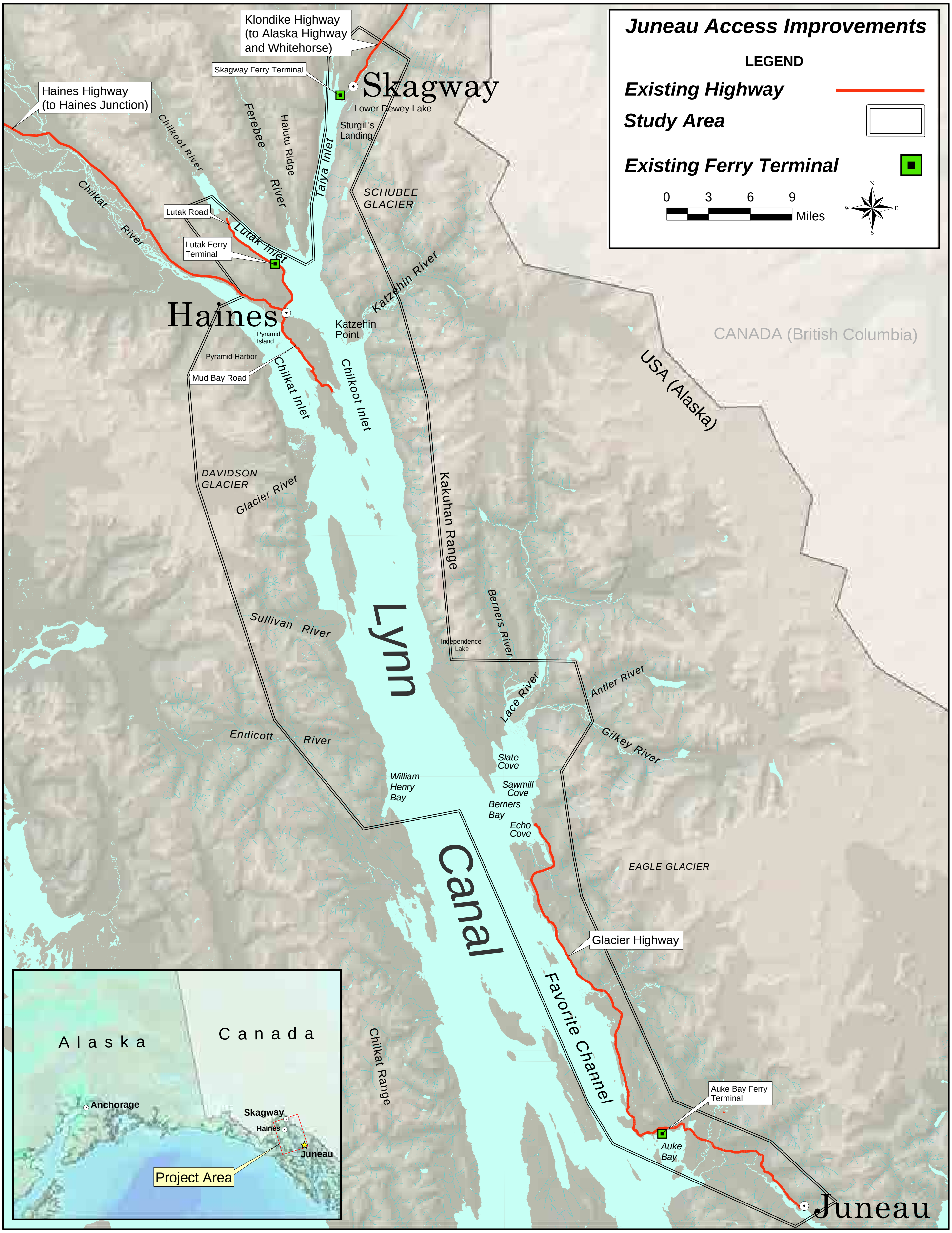

**Figure 1-1**
**Project Area**

Document Path: Z:\07072 DOT&PF\174682 JAI SEIS\GIS\Map_Docs\Final\SEIS\Ch1\Fig1-2 Continental Hwy Sy.mxd

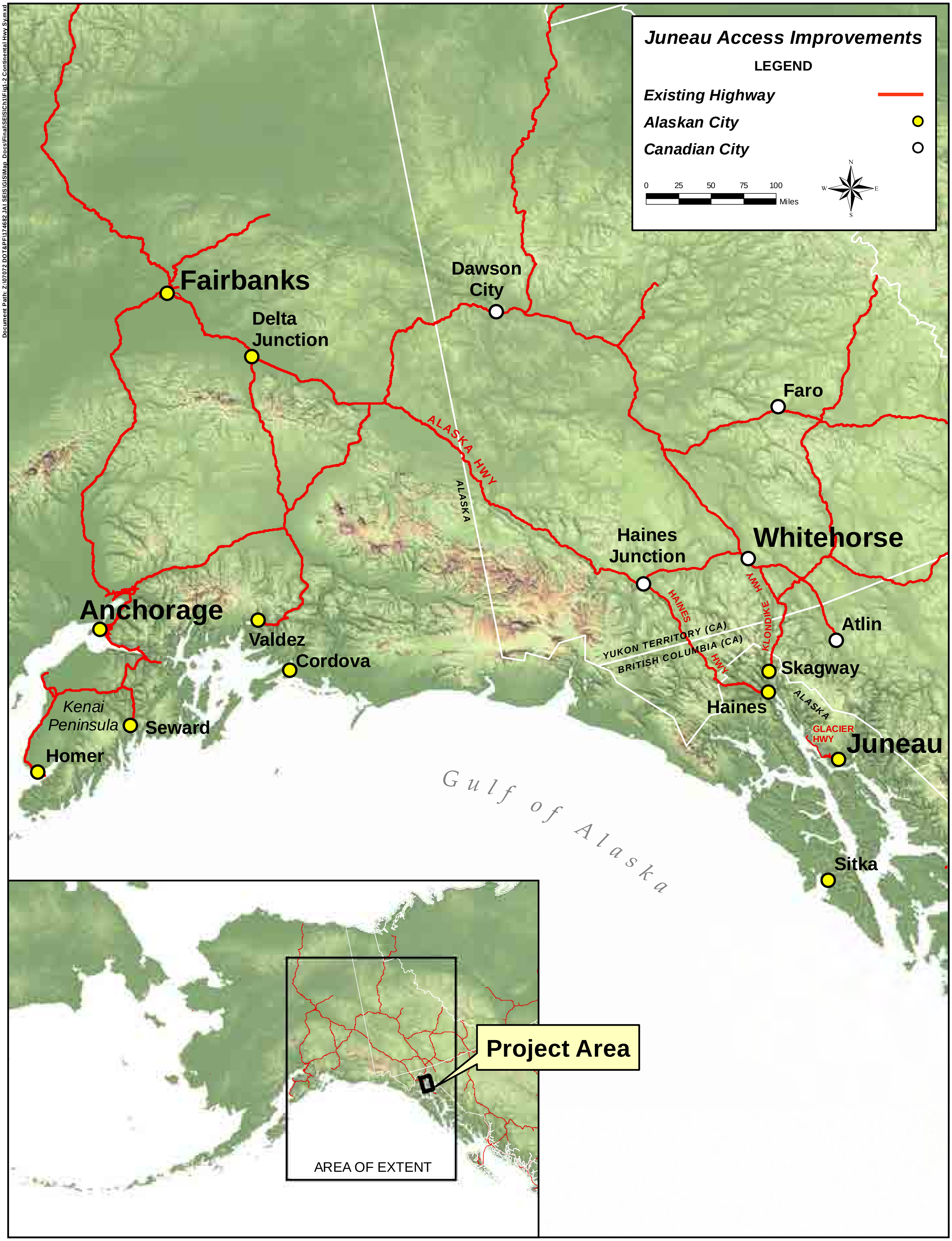

Figure 1-2
Continental Highway System

# 2 PROJECT ALTERNATIVES

This chapter describes the reasonable alternatives evaluated in this Final[1] Supplemental Environmental Impact Statement (SEIS) and provides information on the screening process used to select these alternatives. The chapter is divided into five sections: Alternative Screening, Alternatives Determined Not Reasonable, Reasonable Alternatives, Identification of the Preferred Alternative, and Funding Considerations.

## 2.1 Alternative Screening

Alternatives for the 2005 Supplemental Draft EIS were screened in fall 2003 after the scoping process. The alternative screening process used specific criteria to evaluate alternatives and determine the range of reasonable alternatives. The list of alternatives to be screened was derived from the following Juneau Access Improvements (JAI) Project documents:

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

Alternatives were screened using four criteria.

- Criterion I – Cost/Technical Feasibility and Common Sense. Using professional judgment and cost data from previous analyses, the alternatives were screened to determine if they would be economically and/or technically feasible or go against common sense.
- Criterion II – Appropriateness and Unnecessary Variations. Alternatives were screened to determine if certain variations were unnecessary to consider a full spectrum of alternatives.
- Criterion III – Purpose and Need. To be reasonable, an alternative must at least partially meet a majority (three or more) of the five Purpose and Need elements. Alternatives were screened with regard to the Purpose and Need elements as follows:
    - Element 1 – Meet Future Capacity Needs. An alternative should provide sufficient capacity to meet the projected traffic demand for that mode.
    - Element 2 – Provide Flexibility and Opportunity for Travel. An alternative should provide for more round-trips per day from Juneau to Haines and Skagway than the No Action Alternative.
    - Element 3 – Reduce Travel Time. An alternative should have a quicker one-way travel time between Juneau and Haines/Skagway than the travel time of the No Action Alternative.
    - Element 4 – Reduce State Annual Costs for Transportation in Lynn Canal. An alternative should have estimated annual maintenance and operations (M&O) costs that are less than the 1997 M&O estimated costs for the No Action Alternative. (The 2004 No Action Alternative M&O cost estimates were unknown at the time of this screening.)

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[1] This SEIS is based on the 2014 Draft SEIS and substantive changes have been highlighted in gray for easy identification by the reader.

  - Element 5 – Reduce User Cost. An alternative should have a lower one-way travel cost between Juneau and Haines/Skagway than the current cost under the No Action Alternative. (The No Action Alternative costs were estimated from the Summer 2003 Alaska Marine Highway System (AMHS) ferry schedule.)
- Criterion IV – Environmental Factors. This screening process used information regarding specific social environment, physical environment, and biological environment impacts to determine if an alternative has an impact so great that it should not be considered reasonable. These environmental impact factors included cultural resources, lands protected by Section 4(f) of the 1966 Department of Transportation Act, Congressionally designated wilderness, Wild and Scenic Rivers, bald eagle nest trees, threatened and endangered species, and special aquatic sites.

A detailed discussion of the 2003 screening process and figures depicting the screened alternatives presented can be found in the *Alternative Screening Report* (Appendix A) of the 2005 Supplemental Draft EIS.

## 2.2 Alternatives Determined Not Reasonable

### 2.2.1 Taku River Valley Highway

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

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

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

### 2.2.2 Goldbelt – Ferry Shuttle Service from Cascade Point

The *Echo Cove Master Plan* (Goldbelt, 1996) identified a development opportunity to construct a highway from the end of Glacier Highway at Echo Cove to Cascade Point. A ferry terminal would be constructed at Cascade Point, and a private high-speed ferry would operate between Cascade Point and Haines/Skagway. This alternative would be a private-sector action that could not be compelled by the State of Alaska in terms of assuring its construction, continuation, or level of service. Therefore, the State could not rely on it as a long-term transportation solution on this National Highway System (NHS) route. Goldbelt is no longer pursuing the development of a private vehicle ferry to Haines and Skagway; however, the Glacier Highway has been extended 3 miles to Cascade Point (see Section 1.2.3). Potential development of private ferry service in Lynn Canal is not a reasonable alternative.

### 2.2.3 Haines-Skagway Intertie

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

The purpose and need for the JAI Project is to improve transportation to and from Juneau in Lynn Canal. An alternative that has a very costly road component connecting Haines and Skagway would be primarily a Haines-Skagway access improvement project, not a Juneau access improvement project. The Haines-Skagway intertie is not considered a reasonable alternative for the JAI Project because it addresses a different purpose and need.

### 2.2.4 East Lynn Canal Highway with Bridge to Haines

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

Water depths, bridge span lengths, and the need to accommodate large-vessel passage (including cruise ships) at this location dictate a high-clearance suspension bridge or a floating structure with an opening span. Construction costs associated with a structure of this magnitude were estimated in the *Reconnaissance Engineering Report* to be approximately $190 million. More detailed estimates for recent bridge projects, when applied to this distance (ignoring the much greater depth), indicate a cost of close to $250 million. This additional cost would be prohibitive, adding substantially to the cost of any East Lynn Canal Highway alternative. On the basis of cost, this alternative was dropped from further consideration.

### 2.2.5 East Lynn Canal Rail

This alternative would construct a railroad connection from the northern end of Glacier Highway to Skagway. A ferry terminal would be constructed near Katz Point north of the Katzehin River delta, and a new shuttle ferry would run between Katzehin and the Lutak Ferry Terminal in Haines.

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

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

### 2.2.6 East Lynn Canal Highway to Katzehin with Berners Bay Shuttle Ferry (*Preferred Alternative Report* Proposal 5B)

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

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

- Proposal 5A (now designated as Alternative 2A), which proposed shuttle service across Berners Bay
- Proposal 5D (now designated as Alternative 2B) which proposed a terminal at Katzehin with shuttles to both Haines and Skagway

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

### 2.2.7 East Lynn Canal Highway from Katzehin to Skagway (*Preferred Alternative Report* Proposal 5C)

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

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

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

### 2.2.8 Original Marine Alternative 4, Options A through D

The original marine options in the 1997 Draft EIS were based on improving service in Lynn Canal with the marine technology prevalent in the mid-1990s. All four options utilized the same vessel, the high-speed Wavepiercer catamaran, capable of carrying 105 vehicles. The differences between options were summer starting points (Auke Bay versus Berners Bay) and additional versus supplemental service. The latter difference is primarily an operations issue. Typically, AMHS operational changes occur at the discretion of the AMHS from season to season and are not a federal action subject to the National Environmental Policy Act (NEPA). However, because the number of vessels required for Lynn Canal service is dependent on whether mainline ferries continue in the corridor, this potential change in operation was captured in two marine options in the 1997 Draft EIS.

Based on 1997 Draft EIS comments, 2003 scoping comments, and AMHS experience and direction in following years, the original marine options were modified for the 2005 Supplemental Draft EIS and 2006 Final EIS. The new marine alternatives introduced in the 2005 Supplemental Draft EIS and 2006 Final EIS retained the different potential summer supplemental service locations (Auke Bay versus Berners Bay), but dropped the issue of mainline service level in favor of analyzing high-speed shuttle ferries versus conventional-speed shuttles. This approach reflected several developments at the time:

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

As with the highway alternative alignment adjustments that occur to reduce impacts or utilize new information, new Alternatives 4A through 4D (see Sections 2.3.5 through 2.3.9) replace the original marine options from the 1997 Draft EIS. The original marine options are variations that are no longer relevant, and therefore were dropped from further consideration.

### 2.2.9 Alternatives Determined Not Reasonable After Publication of the 2005 Supplemental Draft EIS

Alternatives 2, 2A, and 2C were evaluated as reasonable in the 2005 Supplemental Draft EIS but were dropped from consideration in the 2006 Final EIS after the Federal Highway Administration (FHWA) determined they would take Section 4(f) protected lands within the Skagway and White Pass District National Historic Landmark (NHL). The NHL includes natural areas that were determined by the National Park Service (NPS) to be contributing factors of the historic landmark designation, which led to FHWA’s determination that the natural areas are protected under Section 4(f). The alignments of Alternatives 2, 2A, and 2C could not be shifted to avoid the natural areas of the NHL (see Chapter 6 for more information on the Section 4(f) applicability determination). The original alternative screening criteria included Section 4(f) impacts because DOT&PF and FHWA recognized that, given the project purpose and need and the existence of reasonable alternatives without 4(f) impacts, a 4(f) impact could render an alternative unconstructable. Based on the Section 4(f) applicability determination, these alternatives were determined to be not reasonable.

**East Lynn Canal Highway with Katzehin Ferry Terminal (2005 Supplemental Draft EIS Alternative 2) –** This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway (Figure 2-2; note that a 3-mile segment of roadway from Echo Cove to Cascade Point has since been constructed [see Section 1.2.3]). A ferry terminal would be constructed north of the Katzehin River delta, and operation of the Haines-Skagway shuttle would change to shuttle service between Katzehin and the Lutak Ferry Terminal in Haines. Mainline ferry service would end at Auke Bay in Juneau, and the existing Haines-Skagway shuttle service would be discontinued. The *FVF Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

**East Lynn Canal Highway with Berners Bay Shuttle (2005 Supplemental Draft EIS Alternative 2A) –** This alternative would construct a 5.2-mile-long highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay (Figure 2-3; note that a 3-mile segment of roadway from Echo Cove to Cascade Point has since been constructed [see Section 1.2.3]). A ferry terminal would be constructed at both Sawmill Cove and Slate Cove, with shuttle ferries operating between them. A 52.9-mile-long highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed at Katzehin, and the Haines-Skagway shuttle would operate between the Katzehin and Lutak Ferry Terminals. Mainline ferry service would end at Auke Bay, and the Haines-Skagway shuttle service would be discontinued. The *FVF Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway, the shuttle ferry service across Berners Bay, and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

**East Lynn Canal Highway with Shuttle to Haines from Skagway (2005 Supplemental Draft EIS Alternative 2C) –** This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway (Figure 2-4; note that a 3-mile segment of roadway from Echo Cove to Cascade Point has since been constructed [see Section 1.2.3]). A Haines-Skagway shuttle would continue to provide service to Haines. Mainline ferry service would end at Auke Bay, and no new terminals would be constructed. The *FVF Fairweather* would be redeployed on other AMHS routes. The highway between Auke Bay and Skagway and the shuttle ferry service between Skagway and Haines would become the NHS routes in Lynn Canal.

## 2.3 Reasonable Alternatives

The remaining alternatives carried forward from the 2006 Final EIS at least partially meet a majority of the Purpose and Need elements screening criteria; pass the cost, common sense, and appropriateness tests; and have no known environmental impacts that would render them unreasonable alternatives. In compliance with NEPA requirements, a No Action Alternative is included in the range of alternatives to be evaluated.

Since the 2006 Final EIS was published, there have been other changes that have resulted in changes to the reasonable alternatives. These changes include:

- Between 2006 and 2012, the *FVF Fairweather* did not operate in Lynn Canal on a regular schedule. It was, however, used in Lynn Canal in summer to support special events, roughly one or two times per month, May through September. This operating environment was in place during the development of the alternatives considered in the 2014 Draft SEIS. In 2015, the *FVF Fairweather* operated in Lynn Canal 3 days per week in summer.
- In 2006, the AMHS planned to have the *M/V Aurora* start Haines-Skagway shuttle service in 2007; however, when the *FVF Fairweather* was moved to the Sitka route, the *M/V Malaspina* was made a summer day boat in Lynn Canal and provided excess capacity between Haines and Skagway. The *M/V Aurora* was deployed to Prince William Sound.
- Two new Day Boat ACFs were planned and programmed as additions to the AMHS fleet and are currently under construction. Acquisition and deployment of these ferries are State actions independent from the JAI Project. They represent a change in the programmed assets available in Lynn Canal. The reasonable alternatives have been updated to incorporate the Day Boat ACFs where appropriate.
- In 2009, the U.S. District Court ruled that the 2006 JAI Project Final EIS was not valid because it did not consider an alternative that would improve surface transportation in Lynn Canal by utilizing existing AMHS assets. The DOT&PF appealed the District Court ruling to the U.S. Court of Appeals for the 9th Circuit, and in May 2011, the three-judge panel upheld previous Court decisions because the 2006 Final EIS did not include an alternative that would improve transportation using existing assets.

  As a result of these legal proceedings, DOT&PF and FHWA initiated preparation of the 2014 Draft SEIS to include an alternative that satisfies the Court order. The new alternative, "Alternative 1B - Enhanced Service with Existing Alaska Marine Highway System Assets," is a Transportation System Management alternative that includes improvements that rely on existing ferry assets and explores other system enhancements. Alternative 1B and its development are described in Section 2.3.2. Its impacts are assessed in Chapter 4.

All reasonable build alternatives include at least one ferry link. The parameters of the marine segments control the capacity and flexibility provided by the alternatives, and the marine segments have a large effect on travel time and costs. Capacity needs to be based on demand, but demand is affected by the type of service, and varies throughout the year[2]. To best meet the

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[2] Each of the reasonable alternatives satisfies the purpose and need to varying degrees in that each provides greater capacity than Alternative 1 - No Action and each has been designed to accommodate the demand that would occur

Purpose and Need elements while not inflating costs, the marine portions of each alternative have been designed to meet the projected average summer demand (not peak demand) for each alternative, while providing for greater trip frequency than the No Action Alternative. Larger vessels, more vessels, and longer operating schedules could provide greater capacity and flexibility, but at a greater cost. To address capacity and cost equitably, ferry service for each marine segment that does not use the Day Boat ACFs is based on the projected 2055 average summer daily traffic for the marine segment(s) of that alternative. To provide reasonable frequency of service with the least cost to the State, summer ferry service is generally provided for 14 to 16 hours each day, with less-frequent service in the winter. For the projected 2055 average summer daily traffic, see the *Traffic Forecast Report* (Revised Appendix AA). See the *Marine Segments Technical Report* (Revised Appendix GG) for more details on potential crewing for ferry segments of alternatives. Table 2-1 lists the reasonable alternatives and their numeric designations.

**Table 2-1:**
**Reasonable Alternatives Evaluated in the Final SEIS**

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

The following descriptions of the reasonable alternatives include information on key parameters for the project purpose and need: capacity, travel time, travel frequency, and cost (design, construction, maintenance, operation, and total project life cost). All travel times between Juneau and Haines and Juneau and Skagway presented in this discussion were calculated from Auke Bay in order to provide a consistent measure of travel time for each alternative. The travel time ending point in Haines is downtown Haines (the intersection of Third Avenue and Main Street) and the ending point in Skagway is the Skagway Ferry Terminal.

The alternative descriptions and cost estimates include all construction required for implementation of the alternatives. No improvements to connecting facilities would be required, although construction and operation of a build alternative could accelerate the scheduling of improvements to adjacent facilities. Initial construction costs have been updated based on 2016 estimates. All maintenance, operation, and total project life cost[3] values are expressed in 2016 dollars.

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given differences in attributes such as cost, travel time, and convenience. There is an underlying latent demand for travel in the corridor (unconstrained demand) and more or less of that demand will be realized with each alternative, depending on the attributes of that alternative.

[3] The total project life cost is the summation of the annual expenses and revenues over the lifetime of the facility.

### 2.3.1 Alternative 1 – No Action (Preferred Alternative)

Alternative 1 – No Action includes a continuation of mainline[4] ferry service in Lynn Canal and incorporates two Day Boat ACFs previously programmed for construction by AMHS. See Figure 2-5. Alternative 1 – No Action is not a direct continuation of 2017 ferry service. Rather, it is a continuation of the AMHS's *current plan* and reflects the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project. The following assumptions are incorporated in Alternative 1 – No Action:

1. No new roads or ferry terminals in Lynn Canal would be built, and there would be no improvements to existing facilities beyond those already programmed.
2. Previously programmed improvements[5] that are part of Alternative 1 – No Action would be:
   a. Use of two Day Boat ACFs. One Day Boat ACF would sail between Auke Bay and Haines, while the other would sail between Haines and Skagway. Travelers going between Auke Bay and Skagway on the Day Boat ACFs would be required to transfer ferries in Haines. Other AMHS ferries that are currently operating as summer day boats in Lynn Canal will be deployed elsewhere in the system.
   b. Programmed improvements to vehicle and passenger staging areas at the Auke Bay and Haines Ferry Terminals to optimize traffic flow on and off the Day Boat ACFs.
   c. Programmed expansion of the Haines Ferry Terminal to include a new double bow berth[6] for bow loading/unloading of the Day Boat ACFs.
3. Mainline ferries would continue to serve northern Lynn Canal.
4. The AMHS would continue to be the NHS route between Juneau and Haines/Skagway.

**Capacity** – Alternative 1 traffic capacity would be determined by the combination of mainline and Day Boat ACF sailings.[7] Mainline vessel capacity ranges from 80 to 134 vehicles one way, with an assumed two round trips per week in summer and one round trip in winter traveling Auke Bay-Haines-Skagway-Haines-Auke Bay. Summer mainline ferry service would be provided by one *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week[8,9,10,11]. Winter mainline ferry service would be provided by

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[4] Mainline ferry service consists of larger vessels that travel the length of the system from Bellingham, WA or Prince Rupert, B.C., in the south to Haines and Skagway in the north. The vessels have overnight accommodations for passengers and crew. Smaller vessels that are referred to as “day boats” connect smaller communities with each other and with the mainline routes.

[5] Unless otherwise specified, all three of the programmed improvements are assumed to be part of the other alternatives under consideration.

[6] A berth is a space for a ferry to dock at a terminal. Berths can have different configurations depending on the location of the ferry vehicle door to be used. For efficient operations, Haines needs to accommodate loading/unloading from the ACF's bow doors.

[7] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

[8] Since the 2014 Draft SEIS was published, the reported AMHS capacities of several ferries in the AMHS fleet had changed slightly (http://www.dot.state.ak.us/amhs). For consistency with the 2014 Draft SEIS, the capacity numbers in the 2014 Draft SEIS were retained for this Final SEIS. The traffic analysis relied on capacities reported in the 2014 Draft SEIS.

[9] AMHS. 2015. Our Fleet: M/V Matanuska. http://www.dot.state.ak.us/amhs/fleet/matanuska.shtml.

[10] AMHS. 2015. Our Fleet: M/V Malaspina. http://www.dot.state.ak.us/amhs/fleet/malaspina.shtml.

[11] AMHS. 2015. Our Fleet: M/V Columbia. http://www.dot.state.ak.us/amhs/fleet/columbia.shtml.

a *Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainline ferry capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. The one-way capacity of the Day Boat ACFs would be 53 vehicles each. The capacity of the Day Boat ACFs has been apportioned based on the percentage of traffic demand in Lynn Canal to Haines and Skagway. Table 2-2 presents the capacity of Alternative 1 – No Action based on these assumptions.

**Table 2-2:**
**Daily Traffic Capacity for Alternative 1**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 93 |
| Winter | 42 |
| **Auke Bay-Skagway**[1] | |
| Summer | 61 |
| Winter | 28 |

[1] Traffic between Auke Bay and Skagway on the Day Boat ACFs is required to transfer ferries in Haines.

**Travel Time** – The one-way trip times for Alternative 1 are shown in Table 2-3. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of waiting time, check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. Check-in time for the mainline ferry is 2 hours, and it is 1 hour for a Day Boat ACF.

**Table 2-3:**
**Travel Times for Alternative 1 – No Action**

| Route | | Travel Time (hours) | |
|---|---|---|---|
| | | Via Mainline Ferry | Via Day Boat ACF |
| Auke Bay-Haines | Drive Time | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 7.1 | 6.1 |
| | Total | 7.2 | 6.2 |
| Auke Bay-Skagway | Drive Time | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 9.1 | 8.1 |
| | Total | 9.1 | 8.1 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

**Travel Frequency** – The opportunity to travel between Auke Bay and Haines or Skagway would depend on the frequency of mainline ferry and Day Boat ACF service. The travel frequency for Alternative 1 is shown in Table 2-4.

**Table 2-4:**
**Travel Frequency for Alternative 1 – No Action**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 1.2 | 8 |
| Winter | 0.7 | 4 |
| **Auke Bay-Skagway** | | |
| Summer | 1.2 | 8 |
| Winter | 0.7 | 4 |

**Cost** –The annual M&O costs would be $18.2[12] million: $7.3 million for mainline ferry service, $6.4 million for Day Boat ACF service between Auke Bay and Haines, and $4.5 million for Haines-Skagway shuttle service.[13] The estimated total project life cost less residual value is $787 million. The ferry fares[14] for Alternative 1 – No Action are shown in Table 2-5.

**Table 2-5:**
**Ferry Fares for Alternative 1 – No Action**

| Route | Auke Bay-Haines | Auke Bay-Skagway |
|---|---|---|
| Adult Ferry Passenger | $39.00 | $53.00 |
| 19-foot Vehicle | $90.00 | $116.00 |

The net State cost per vehicle would be $279.

Alternative 1 – No Action includes some approved projects that have not yet been constructed as of the printing of this Final SEIS. These improvements are for the AMHS as a whole, are a State action independent of the JAI Project, and will occur regardless of any action that may result from the JAI Project. As such, the costs of these independent actions are not attributed to Alternative 1 – No Action or any JAI Project alternative.

### 2.3.2 Alternative 1B – Enhanced Service with Existing Alaska Marine Highway System Assets

Alternative 1B is a Transportation System Management alternative that includes operational improvements that focus specifically on increasing the service provided by the transportation system (including programmed improvements and other system enhancements) within Lynn

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[12] Revised total is due to (1) updating costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

[13] Due to rounding, numbers may not add up precisely to the total.

[14] The methodology used to calculate the fares is documented in Appendix A of the *Traffic Forecast Report* (Revised Appendix AA of this Final SEIS).

Canal using existing AMHS assets. This alternative was not evaluated in the 2006 Final EIS, but was developed in response to the 2009 U.S. District Court order (see Section 2.3). Figure 2-6 illustrates Alternative 1B.

**Development of Alternative 1B**[15] – In keeping with the Court order, DOT&PF and FHWA developed Alternative 1B based on the following objectives:

- Rely on existing ferry assets and terminals, without new construction
- Consider reassigning mainline vessels
- Provide additional capacity as compared to Alternative 1 – No Action
- Adjust schedules and increase frequency as compared to Alternative 1 – No Action
- Reduce travel time as compared to Alternative 1 – No Action
- Include system enhancements

The process began by coordinating with AMHS staff to review existing ferry assets and terminals and to consider and evaluate the following three components for Alternative 1B:

- Existing AMHS assets reasonably available and feasible for use in Lynn Canal
- Programmed AMHS assets (i.e., AMHS programmed improvements that will be implemented regardless of the outcome of the JAI Project)
- Enhancements that could be employed as part of Alternative 1B that do not involve capital investments

The resulting alternative was presented to agencies and the general public during the JAI Project Draft SEIS 2012 scoping period. Following the scoping period, Alternative 1B was modified for analysis in the 2014 Draft SEIS to reflect the following events:

- In 2006, AMHS began the process toward building a new class of ferry to provide day boat shuttle service in the southeast part of the ferry system. As the design developed over time, the length of the vessel, designated as an ACF, grew to 350 feet, and crew quarters and a full dining facility were added. With these changes, the vessel was no longer a day boat shuttle ferry. The cost of this 350-foot ACF was estimated at $170 million. In December 2012, the Governor announced that the AMHS would pursue plans to build two smaller, less-costly State-funded ACFs instead of one large ACF. The smaller ACFs are referred to as Day Boat ACFs. Both ferries will have a capacity of approximately 300 passengers and 53 vehicles. This change in direction in the ACF program was made to develop vessels that better meet AMHS needs in Southeast Alaska and was a State action independent from the JAI Project. This decision meant that two new programmed ferries would be available for use in Alternative 1B, instead of just one[16].

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[15] The following three paragraphs and associated bullets were initially located in Section 2.2.10 of the 2014 Draft SEIS and have been added as needed (revisions to the 2014 Draft SEIS text are shaded gray).

[16] This decision also required Alternative 1 – No Action to be modified to reflect the availability of two new ferries instead of one. Other changes that occur in Alternative 1 – No Action as a result of this decision include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs, and the expansion of the Haines Ferry Terminal to include a new double bow berth.

- In March 2013, litigation regarding recurrent problems with the engines of the *FVFs Fairweather* and *Chenega* was resolved[17]. Essentially the engines had not been designed to run at the speeds needed to make the two runs between Juneau and Haines/Skagway in a 12-hour window as needed for day boat service in Lynn Canal. Having a FVF make only one round trip per day in Lynn Canal was considered unreasonable since there are other vessels that can also make one trip per day and the *FVF Fairweather* was needed for same time of day service to Sitka[18]. Extending the operating day beyond 12 hours and maintaining daily service is not possible without crew quarters[19]. Based on this development, DOT&PF and FHWA determined that their earlier consideration to use the *FVF Fairweather* as part of Alternative 1B needed to be revised.
- During scoping in 2012, many commenters expressed concern over the loss of fast ferry service to Sitka and Petersburg that would result from using the *FVF Fairweather* in Lynn Canal. Many believed that the use of the *FVF Fairweather* would improve service in Lynn Canal at the expense of other routes in Southeast Alaska. This, in combination with the engine problems identified in the second bullet above, contributed to removing the *FVF Fairweather* from Alternative 1B.

Since the 2014 Draft SEIS was published, AMHS has made several changes that affect Alternative 1B and require reconsideration of the alternative's composition, including the following:

- Due to funding levels, AMHS has taken the *M/V Taku* out of service; it has been retired and sold.
- AMHS has placed the *FVF Chenega* in long-term layup. The *FVF Chenega* could return to AMHS service if AMHS determines there is a need for it and they have the funding to operate it. Returning the *FVF Chenega* to service from long-term storage would require an up-front refurbishment. Given that the *FVF Chenega* is currently laid up, it could be deployed without decreasing service elsewhere in the AMHS system.
- DOT&PF is currently in the process of replacing the *M/V Tustumena*. The *M/V Tustumena* was built in 1964 and serves the communities of Southcentral Alaska, Kodiak Island, and Southwest Alaska. The *M/V Tustumena* is in poor condition and is past its useful life. It is one of two ocean-class vessels in the AMHS fleet. Because of its size and design, it is the only AMHS vessel that is capable of serving all 13 ports of call between Homer and Unalaska. The replacement vessel is designed to meet these needs

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[17] In 2010, the State sued the engine manufacturer and the contractor responsible for the design and construction of the two FVFs based on recurrent problems with the ferries' diesel engines.

[18] At the time the Draft SEIS was prepared, the *FVF Fairweather's* primary purpose was to service Sitka. Since then, the AMHS schedule has changed. AMHS is currently operating the *FVF Fairweather* in Lynn Canal 3 days per week and servicing Sitka one day per week.

[19] According to USCG rest requirements, to have a replacement crew on board, crew quarters must be available to ensure adequate crew rest. The FVFs do not have crew accommodations that would permit this, so crews would have to change while the ferry is docked. In addition, certain activities, such as maintenance, fueling, refilling potable water tanks, and emptying sewage holding tanks, have to be done on a daily basis. Currently, in Lynn Canal, Auke Bay is the only terminal where all of these activities can be performed. In Skagway, ferries can refuel and refill water. DOT&PF plans to improve the Skagway Ferry Terminal so it can handle sewage. To perform all of these activities in Haines, and some services in Skagway, the terminals would need to be upgraded, which would require up-front capital investment (not in keeping with the directive from the court).

and has slightly more capacity. The project is in the current STIP with construction scheduled to start in 2018.

- Between 2005 and 2012, AMHS had planned to retire the *M/V Malaspina* and replace it with a new ferry (now the Day Boat ACF). AMHS has reconsidered its decision to retire the *M/V Malaspina* and now plans to keep it as part of its fleet, using it during shoulder seasons as a backup vessel, but laying it up during summers. It remains an existing asset that could be deployed as part of Alternative 1B during the summer.
- AMHS made substantial improvements to its online reservation system, including enhancing the reservation website to make it easier to use. As a result, Alternative 1B no longer includes additional enhancements to the reservation system. In addition, as the majority of AMHS reservations are now made through the website rather than through the reservation call center, having the reservation call center operate with extended hours is not likely to result in additional reservations or better customer service. As a result, Alternative 1B no longer includes extending the reservation call center hours by four per day.

In addition, comments on the 2014 Draft SEIS indicated that many people were concerned about capacity on the Auke Bay-Haines route. Also, commenters suggested operational improvements that DOT&PF and FHWA have partially incorporated into Alternative 1B. One key change to Alternative 1B was an increase in the Day Boat ACF sailings between Auke Bay and Haines from six round trips per week to seven round trips. In addition, the routing of the *M/V Malaspina* was modified to provide additional service to Haines. As proposed in this Final SEIS, the *M/V Malaspina* would sail between Skagway and Auke Bay 5 days per week; on the sixth day, it would sail Skagway-Haines-Auke Bay-Skagway, and on the seventh day is would sail the reverse (Skagway-Auke Bay-Haines-Skagway).

For information about how Alternative 1B was developed, see Revised Appendix CC, *Development of Alternative 1B – Enhanced Service with Existing Alaska Marine Highway System (AMHS) Assets*, of this Final SEIS. It reflects the current status and availability of ferries (existing assets) in the AMHS fleet.

Alternative 1B would incorporate all of the programmed improvements described under Alternative 1 and, as with Alternative 1, no new roads or terminals would be built.

Alternative 1B would provide an increase in summer capacity and number of sailings in Lynn Canal by using the two Day Boat ACFs in addition to the *M/V Malaspina* (rather than removing the *M/V Malaspina* from summer service in Lynn Canal, as is assumed under Alternative 1 – No Action). Alternative 1B would include a continuation of mainline ferry service in Lynn Canal. Fares would be reduced 20 percent for Day Boat ACF and *M/V Malaspina* trips in Lynn Canal to increase ridership.

Mainline service would include two round trips per week in summer and one per week in winter, with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During summer, the *M/V Malaspina* would make one round trip per day, 5 days per week on a Skagway-Auke Bay-Skagway route. On the sixth day, the *M/V Malaspina* would sail on the Skagway-Auke Bay-Haines-Skagway route, and on the seventh day, it would sail that route in reverse (Skagway-Haines-Auke Bay-Skagway). One Day Boat ACF would make one round trip between Auke Bay and Haines 7 days per week. The other Day Boat ACF would make two round trips per day between Haines and Skagway 6 days per week; it would not sail on the seventh day because the mainliner would be on a similar schedule. In winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week.

Under Alternative 1B, the AMHS would continue to be the NHS route between Juneau and Haines/Skagway.

**Capacity** – Alternative 1B summer traffic capacity[20] would be determined by a combination of Day Boat ACF, mainline ferry, and *M/V Malaspina*[21] sailings. Mainline vessel capacity ranges from 80 to 134 vehicles one way, with an assumed minimum of two round trips per week in summer and one round trip in winter traveling Auke Bay-Haines-Skagway-Haines-Auke Bay. In the summer, it is assumed that there would be one *M/V Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter mainline ferry service is assumed to be provided by an *M/V Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainliner capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. The one-way capacity of a Day Boat ACF would be 53 vehicles. In the summer, Skagway bound traffic is expected to use the *M/V Malaspina*, leaving the Auke Bay-Haines Day Boat ACF entirely available for Haines bound traffic. In the winter, there would be no direct Auke Bay-Skagway service so the capacity of the Auke Bay-Haines Day Boat ACF is apportioned based on the percentage of traffic demand in Lynn Canal to/from Haines and Skagway. Table 2-6 presents the capacity of Alternative 1B based on these assumptions.

**Table 2-6:**
**Daily Traffic Capacity for Alternative 1B**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 160 |
| Winter | 42 |
| **Auke Bay-Skagway**[1] | |
| Summer | 171 |
| Winter | 28 |

[1]For the purposes of calculating capacity, the capacity of the *M/V Malaspina* and the mainline ferry was used in summer. In winter, the *M/V Malaspina* does not operate, so the capacity of the mainline ferry and Day Boat ACF was used.

**Travel Time** – The one-way trip times for Alternative 1B are shown in Table 2-7. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of waiting time, check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. The check-in time for the mainline ferry is 2 hours, and it is 1 hour for a Day Boat ACF and the *M/V Malaspina*.

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[20] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

[21] The *M/V Malaspina* is considered a mainline ferry because it has overnight passenger and crew quarters. It belongs to the *Matanuska/Malaspina* class ferry. These ferries are virtually identical and are considered interchangeable. In the summer, it is anticipated the *M/V Malaspina* would be used as a day boat while the *M/V Matanuska* would be used as a mainline ferry. In the winter, both ferries would be used as mainline ferries.

**Table 2-7:**
**Travel Times for Alternative 1B**

| Route | | Travel Time (hours) | | |
|---|---|---|---|---|
| | | Via Mainline Ferry | Via Day Boat ACF | Via *M/V Malaspina* |
| Auke Bay-Haines | Drive Time | 0.1 | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 7.1 | 6.1 | 6.3 |
| | Total | 7.2 | 6.2 | 6.4 |
| Auke Bay-Skagway | Drive Time | 0 | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 9.1 | 8.1 | 6.8 |
| | Total | 9.1 | 8.1 | 6.8 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street). The *M/V Malaspina* times shown between Auke Bay and Skagway are for the most common routing and fastest time.

**Travel Frequency** – The opportunity to travel between Auke Bay and Haines or Skagway would depend on the frequency of mainline ferry, Day Boat ACF, and *M/V Malaspina* service. The round-trip travel frequency for Alternative 1B is shown in Table 2-8.

**Table 2-8:**
**Travel Frequency for Alternative 1B**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 1.4 | 10 |
| Winter | 0.7 | 4 |
| **Auke Bay-Skagway** | | |
| Summer | 2.3 | 16 |
| Winter | 0.7 | 4 |

**Cost** – Alternative 1B would have no final design or construction cost. The annual M&O costs within Lynn Canal would be $26.5[22] million: $7.3 million for mainline ferry service, $6.7 million for Day Boat ACF service between Auke Bay and Haines, $4.5 million for Day Boat ACF service between Haines and Skagway, and $8.0 million for *M/V Malaspina* summer shuttle service. [23] The estimated total project life cost less residual value is $1.2 billion. The ferry fares under Alternative 1B are shown in Table 2-9.

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[22] Revised total is due to (1) updating costs to 2015 dollars, (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs, and (3) changes made to the alternative.

[23] Due to rounding, numbers may not add up precisely to the total.

**Table 2-9:**
**Ferry Fares for Alternative 1B**

| Route | Auke Bay-Haines | Auke Bay-Skagway |
|---|---|---|
| Adult Ferry Passenger | $31.00 | $42.50 |
| 19-foot Vehicle | $72.00 | $93.00 |

The net State cost per vehicle would be $283.

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

Alternative 2B would construct the East Lynn Canal Highway from Echo Cove to a new ferry terminal 2 miles north of the Katzehin River, with ferry service connecting Katzehin to Haines and Skagway (Figure 2-7a). The highway would be 50.8 miles long, including 47.9 miles of new highway and widening of 2.9 miles of the existing Glacier Highway from Echo Cove to Cascade Point. The highway would have a 30-foot pavement width, with two 11-foot-wide vehicle lanes and 4-foot shoulders (Figure 2-7b). The minimum design speed would be 40 miles per hour (mph)[24]. DOT&PF has revised the roadway typical section from what was presented in the 2006 Final EIS by increasing the thickness of selected material below the pavement and base structure from 12 inches to 24 inches, and by increasing the ditch width from 8 feet to 10 feet. The increase in thickness of the selected material is needed to minimize the effects of frost and preserve the integrity of the road structure. The increased ditch width is needed to accommodate subsurface drainage from the thicker selected material and provide more capacity for drainage and snow storage.

The design would meet American Association of State Highway and Transportation Officials (AASHTO) standards for a rural arterial except for the 4-foot shoulder width, which would be an exception to the 6-foot AASHTO recommended shoulder width (see the *Technical Alignment Report* [Addendum to Appendix D of the 2006 Final EIS[25]] and the *2017 Update to Appendix D – Technical Alignment Report* in Appendix Z for further information).

Ferry service between Katzehin and Haines/Skagway would use the Day Boat ACFs. Haines-Skagway shuttle service would continue to operate in the summer using a new conventional monohull ferry. Mainline ferry service would end at Auke Bay and no longer operate in Lynn Canal. The Skagway Ferry Terminal would be modified to include a new end berth to accommodate the new Katzehin-Skagway Day Boat ACF. The highway from Auke Bay to Katzehin and the ferry service between Katzehin and Haines/Skagway would become the NHS routes in Lynn Canal.

**Capacity** – The capacity of this alternative would depend on the shuttle ferry system at Katzehin[26]. Summer service would consist of three ferries; two Day Boat ACFs that would sail

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

[25] The Addendum was included as part of Appendix W of the 2006 Final EIS.

[26] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

between Katzehin and Haines/Skagway and a third shuttle ferry that would sail between Haines and Skagway. The Day Boat ACFs would have a 53-vehicle capacity, and the Haines-Skagway ferry would have an 18-vehicle capacity. The Haines-Skagway shuttle is sized to meet the projected increased traffic resulting from improved service in addition to existing traffic levels. The sizing of the shuttle is addressed in Revised Appendix GG, *Marine Segments Technical Report*, Chapter 4, and Attachment C. During winter, no direct Haines-Skagway shuttle would operate: one vessel would operate between Skagway and Katzehin and the second vessel would operate between Haines and Katzehin. Haines-Skagway travelers would need to ride one ferry to the Katzehin Ferry Terminal and then transfer to the other ferry. The daily traffic volumes that would be accommodated by Alternative 2B are provided in Table 2-10.

**Table 2-10:**
**Daily Traffic Capacity for Alternative 2B**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 848 |
| Winter | 636 |
| **Auke Bay-Skagway** | |
| Summer | 636 |
| Winter | 424 |

**Travel Time –** The one-way trip times for Alternative 2B are provided in Table 2-11. Times shown in the table include ferry time and driving time. Ferry time consists of waiting time, loading time, transit time, and unloading time. The travel times for the ferries to and from Katzehin and between Haines and Skagway do not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis. An average waiting time is included in the travel time to account for a portion of drivers assumed to arrive well ahead of the loading schedule.

**Table 2-11:**
**Travel Times for Alternative 2B**

| Route | | Travel Time (hours) |
|---|---|---|
| Auke Bay-Haines | Drive Time | 1.8 |
| | Ferry Time (including waiting, loading, transit, and unloading) | 1.5 |
| | Total | 3.3 |
| Auke Bay-Skagway | Drive Time | 1.7 |
| | Ferry Time (including waiting, loading, transit, and unloading) | 2.3 |
| | Total | 4.0 |

Note: For consistency, the travel times for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

**Travel Frequency –** Under Alternative 2B, flexibility and opportunity for travel would be a function of the frequency of Day Boat ACF service to and from the Katzehin Ferry Terminal. During the summer, the ferries to/from Katzehin would operate approximately 15 hours per day.

During the winter, the ferry to/from Haines would operate approximately 11 hours per day, and the ferry to/from Skagway would operate about 10 hours a day. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzehin and transfer ferries. Winter travel would be periodically limited by road closures for avalanche control; however, one or more ferries would be available to transport vehicles and passengers in Lynn Canal on days when the highway was closed. Trip frequency for Alternative 2B is provided in Table 2-12.

**Table 2-12:**
**Travel Frequency for Alternative 2B**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 8 | 56 |
| Winter | 6 | 42 |
| **Auke Bay-Skagway** | | |
| Summer | 6 | 42 |
| Winter | 4 | 28 |

**Cost –** Total final design and construction costs for Alternative 2B would be approximately $680.2 million, including $619.5 million for highway design and construction, approximately $24.7 million for vessel acquisition, approximately $26.4 million for the Katzehin Ferry Terminal improvements, and approximately $9.6 million for the Skagway Ferry Terminal improvements. Annual M&O costs are estimated to be approximately $20.9 million: $2.4 million for the highway (including avalanche control costs) and $18.5 million for the shuttle ferry operations. The estimated total project life cost less residual value is $1.2 billion. The ferry fares for Alternative 2B are shown in Table 2-13.

**Table 2-13:**
**Ferry Fares for Alternative 2B**

| Route | Katzehin-Haines | Katzehin-Skagway |
|---|---|---|
| Adult Ferry Passenger | $5.00 | $8.50 |
| 19-foot Vehicle | $16.00 | $25.00 |

The net State cost per vehicle would be $43.

**Alignment –** The Alternative 2B road alignment is a refinement of the 2006 Final EIS alignment and was designed to further reduce impacts to wetland habitats and to avoid and/or minimize impacts to bald eagle nest trees. It also reflects design changes based on additional geotechnical survey information. Alternative 2B would begin at Echo Cove and would involve widening Glacier Highway to Cascade Point (see Section 1.2.3). From there, the highway would generally parallel the shoreline to a point north of the Katzehin River, where a ferry terminal would be built. The route would generally be set back from the shoreline except at a few locations where topography would allow the highway to be located well inland. In some locations, topography requires placement of the alignment at the edge of tidelands. Wherever possible in these locations, the edge of the construction area would be positioned above the high tide line to minimize marine impacts as well as reduce visual impacts. Segment details are provided in the subsections below. A more detailed description of the current alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *2017 Update to Appendix D ‑ Technical Alignment Report* (in Appendix Z).

#### 2.3.3.1 Echo Cove to Antler River

Along the eastern shore of Berners Bay the highway would generally be located inland from the shore to avoid disturbing trees with eagle nests and filling beach areas. Up to Cascade Creek, the highway location would use the Cascade Point Road, widening and making grade improvements as necessary. The highway would avoid the U.S. Forest Service Berners Bay cabin by passing approximately 1,000 feet east of the cabin site and approximately 500 vertical feet above it. Beyond the cabin, highway construction would involve short stretches of exposed rock cuts, with some cuts up to 150 feet high.

#### 2.3.3.2 Head of Berners Bay

The Antler, Gilkey, Lace, and Berners rivers form a large delta at the head of Berners Bay. The bridge over the Antler River would be approximately 2,800 feet long, and the bridge over the Lace River would be approximately 2,900 feet long. Both bridges would be constructed with enough clearance to permit airboats, the largest craft currently navigating these rivers, to pass under them.

The highway through this part of Berners Bay would be set back from the ocean shoreline to avoid the intertidal habitat at the head of the bay, minimize impacts to wetlands, and reduce the lengths of the river crossings.

#### 2.3.3.3 Lace River to Comet Landing

The highway from the west side of the Lace River to the beach near Independence Lake would cross a combination of heavily wooded uplands and forested wetlands. From Slate Cove to Point Sherman the highway would move inland to cross the Point Saint Mary peninsula and to avoid trees containing eagle nests near the shore. This segment would require fill hauled from other sections, as few rock cuts would be required.

The highway west of the Lace River would intersect the existing unpaved road (known as Jualin Road) that runs from Slate Cove to the Jualin Mine. This is a public road. Two “T” intersections would be created, separated by a short segment where the two roads would be on a common alignment. Jualin Road would have stop signs at both intersections because of its lower traffic volume.

A combination maintenance station and rest stop would be located at Comet Landing at the existing Kensington mine facilities. Coeur Alaska, Inc. has moved its mine operations to the Jualin Mine area and has agreed to negotiate the use of its Comet facility.

#### 2.3.3.4 Independence Lake to Katzehin River

North of Comet Landing, the highway would be located close to the shore to avoid the trees with eagle nests on the hillsides, to mitigate avalanche zones, and to pass below steep cliffs. At avalanche zones with relatively high hazard indices, including north of Independence Lake and south of Yeldagalga Creek, the highway would be constructed on intertidal areas. Three avalanche shed structures would be built to protect the highway at high avalanche hazard areas. At any location where highway construction would be near or below the high-tide line, riprap slope protection would be constructed.

Near Met Point and Gran Point the highway would be located uphill of the shoreline to avoid sea lion haulouts at these areas. The highway would be notched into the existing terrain, resulting in a natural screen between the haulouts and the highway. At two locations in the vicinity of Gran Point, the highway would be routed through two tunnels to avoid cliff hazards.

#### 2.3.3.5 Katzehin River Area

The highway approach to the Katzehin River would be located close to the shore to avoid steep cliffs above the high-tide line. Riprap slope protection would be used to protect the highway from erosion. The bridge across the Katzehin River would be approximately 2,600 feet long and set high enough to allow airboats to pass underneath. The highway would pass inland, behind the intertidal flats north of the Katzehin River, to the location of the proposed Katzehin Ferry Terminal. This location would provide some southern wave protection, have access to deep water, and have suitable depths for a terminal area and breakwater. Rubble-mound breakwaters would be sited to the north and south of a dredged mooring basin to provide protection from predominate northerly and southerly waves. Dredged material would be incorporated into the fill for terminal parking. The terminal would include a single end berth connected by a transfer bridge to the parking and staging area.

### 2.3.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 would widen Glacier Highway from Echo Cove to Cascade Point (see Section 1.2.3) and extend Glacier Highway from Cascade Point to Sawmill Cove in Berners Bay (5.2 miles total). New ferry terminals would be constructed at Sawmill Cove in Berners Bay and at William Henry Bay on the west shore of Lynn Canal. A new West Lynn Canal Highway (38.9 miles) would be constructed from the William Henry Bay Ferry Terminal to Haines with a bridge across the Chilkat River/Inlet (Figure 2-8). The highway would connect to the existing Mud Bay Road at Haines. The highway design features for this alternative would be the same as those described for Alternative 2B in terms of design speed and typical section.

The Day Boat ACFs would operate between the Sawmill Cove Ferry Terminal and the William Henry Bay Ferry Terminal. A new conventional monohull ferry would be constructed as part of this alternative to operate between Haines and Skagway in place of the Day Boat ACF that would be deployed between Sawmill Cove and William Henry Bay. The Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Haines-Skagway shuttle ferry. Mainline ferry service would end at Auke Bay in Juneau. The highway from Auke Bay to Sawmill Cove, the ferry between Sawmill Cove and William Henry Bay, the West Lynn Canal Highway from William Henry Bay to Haines, and the ferry between Haines and Skagway would be designated as the NHS routes in Lynn Canal.

> Note: Alternative 3 originally was considered reasonable after scoping in 1994, but after detailed study was determined to be not reasonable in 1996. A user benefit analysis indicated that this alternative would have only marginal benefits. Although there was little controversy associated with dropping this alternative in 1996 and little interest expressed in this alternative in the 1997 Draft EIS comments, both resource agencies and

> the public expressed interest in this alternative during 2003 scoping. This alternative met four of the five Purpose and Need elements as defined during screening and was therefore included in the range of reasonable alternatives in the 2006 Final EIS.

**Capacity –** Under Alternative 3, traffic capacity would be determined by the ferry system between Sawmill Cove and William Henry Bay. The Sawmill Cove-William Henry Bay route would use the Day Boat ACFs (53-vehicle capacity), with both vessels operating in the summer and one in the winter. For purposes of calculating capacity to/from Haines and Skagway, the capacities of the Day Boat ACFs have been apportioned based on the percentage of total traffic demand in Lynn Canal to Haines and Skagway. The Haines-Skagway route would use a new ferry with a 40-vehicle capacity. The Haines-Skagway shuttle is sized to meet the projected increased traffic resulting from improved service, in addition to existing traffic levels. The sizing of the shuttle is addressed in Revised Appendix GG, *Marine Segments Technical Report*, Chapter 4, and Attachment C. During winter, the Haines-Skagway shuttle would continue to operate, but only one ferry (instead of two) would sail between Sawmill Cove and William Henry Bay. The daily traffic volumes that would be accommodated by Alternative 3 are provided in Table 2-14.

**Table 2-14:**
**Daily Traffic Capacity for Alternative 3**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 816 |
| Winter | 273 |
| **Auke Bay-Skagway** | |
| Summer | 456 |
| Winter | 151 |

**Travel Time –** The one-way trip times for Alternative 3 are provided in Table 2-15. Times shown in the table include ferry time and driving time. Ferry time consists of waiting time, loading time, transit time, and unloading time. The travel times for the shuttle ferries between Sawmill Cove and William Henry Bay and between Haines and Skagway do not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis; therefore, waiting time is included to account for drivers who arrive ahead of scheduled loading times.

**Table 2-15:**
**Travel Times for Alternative 3**

| Route | | Travel Time (hours) |
|---|---|---|
| Auke Bay-Haines | Drive Time | 1.6 |
| | Ferry Time (including waiting, loading, transit, and unloading) | 1.6 |
| | Total | 3.2 |
| Auke Bay-Skagway[1] | Drive Time | 1.7 |
| | Ferry Time (including waiting, loading, transit, and unloading) | 3.8 NB / 3.4 SB[1] |
| | Total | 5.5 NB / 5.1 SB[1] |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

[1] Times shown are based on average of ferry wait times. The average wait time differs northbound (NB) to southbound (SB). The Sawmill Cove-William Henry Bay ferry and the Haines-Skagway ferry would operate at different frequencies, so travelers would have to wait varying times for the second ferry connection. The NB wait time varies between 26 and 86 minutes, while the SB wait times vary between 0 and 83 minutes.

**Travel Frequency** – Under Alternative 3, flexibility and opportunity for travel would be determined by the shuttle ferry system. The two Sawmill Cove/William Henry Bay shuttles would operate 17 hours per day in the summer, and a single shuttle would operate 9 hours per day in the winter. The Haines-Skagway shuttle would operate 15 hours per day in summer and 10 hours per day in winter. Winter travel would also be limited by road closures for avalanche control; however, one or more ferries would be available to transport vehicles and passengers in Lynn Canal on days when the highway was closed due weather or roadway conditions. The estimated trip frequency for Alternative 3 is provided in Table 2-16.

**Table 2-16:**
**Travel Frequency for Alternative 3**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 12 | 84 |
| Winter | 4 | 28 |
| **Auke Bay-Skagway** | | |
| Summer | 6[1] | 42 |
| Winter | 4 | 28 |

[1] The Sawmill Cove-William Henry Bay ferry frequency is such that people travelling from Juneau to Skagway cannot make the connection on the first ferry of the day from Haines to Skagway. They can make this connection on the remaining five sailings each day. Southbound traffic can complete the connection using all six sailings between Haines and Skagway. Therefore, the effective number of round trips per day for Juneau-Skagway traffic is 5.5.

**Cost** – Total final design and construction costs for Alternative 3 would be approximately $595.6 million, including $487.3 million for highway design and construction, approximately $53.7 million for vessel acquisition, and approximately $54.6 million for ferry terminal development. Annual M&O costs are estimated to be approximately $22.1 million: $2.2 million for the highway (including avalanche control costs) and $19.9 million for the shuttle ferry systems. The estimated total project life cost less residual value is $1.2 billion. The ferry fares for Alternative 3 are shown in Table 2-17.

**Table 2-17:**
**Ferry Fares for Alternative 3**

| Route | Sawmill Cove-William Henry Bay | Haines-Skagway |
|---|---|---|
| Adult Ferry Passenger | $7.50 | $8.00 |
| 19-foot Vehicle | $21.00 | $23.00 |

The net State cost per vehicle would be $46.

**Alignment** – Alternative 3 would begin on the eastern side of Lynn Canal with the extension of Glacier Highway to a new ferry terminal at Berners Bay. The West Lynn Canal Highway would follow the western shoreline of Lynn Canal and the Chilkat Inlet, from William Henry Bay to Haines (Mud Bay Road). Wherever possible, the highway would be located sufficiently inland to avoid impacts to the beach fringe and to reduce visual effects. The terrain is generally conducive to this, but at some locations a combination of trees with eagle nests, avalanche zones, steep terrain, caves, and/or other geological features would force the highway to be located close to the beach, and in a few locations highway fill would be placed below the high-tide line and protected with riprap. Segment details are provided in the subsections below. A more detailed description of the current alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

### 2.3.4.1 Echo Cove to Sawmill Cove

Alternative 3 would involve widening 2.9 miles of Glacier Highway between Echo Cove and Cascade Point and extending the highway an additional 2.3 miles from Cascade Point to a new ferry terminal at Sawmill Cove in Berners Bay. The new ferry terminal at Sawmill Cove would be a twin-berth facility used to overnight the two Day Boat ACFs side by side. Each of the berths would be connected by a separate transfer bridge to the parking and staging area on shore. Dredging would be required in Sawmill Cove to provide adequate depth for mooring and turning, and intertidal fill would be required.

### 2.3.4.2 William Henry Bay

A ferry terminal would be constructed at William Henry Bay for Day Boat ACF service across Lynn Canal. The William Henry Bay Ferry Terminal would be somewhat protected from southeast winds but exposed to severe northerly storms; therefore, vessels would return to the Sawmill Cove Ferry Terminal to overnight. At the William Henry Bay Ferry Terminal, a pile-supported access trestle would be used to reach adequate water depths for vessel berthing. A single berth would be built, with a transfer bridge connecting the berth and the pile-supported approach trestle. No dredging would be required, but fill would be placed in the intertidal area for the parking and staging area.

#### 2.3.4.3 Endicott River Area

The highway from the William Henry Bay Ferry Terminal to the Endicott River area would be located on a wide bench at about 100–150 feet above the beach for most of the segment. The highway would descend off the bench onto a 1,100-foot-long bridge across the Endicott River. The bridge elevation would be set to provide sufficient clearance for airboats. The highway would be elevated on a fill embankment across the brush-covered gravels that form the Endicott River alluvial fan. From the Endicott River crossing to the Sullivan River crossing, wide, timber-covered benches are frequent, but at two locations the highway would drop onto the beach to avoid trees with eagle nests, important geological features, and stretches of steep terrain. Riprap armor would be placed at these locations to protect the highway fill from wave erosion, and the road surface would be placed to avoid high tides and storm surges.

#### 2.3.4.4 Sullivan River Area

In the area of the Sullivan River, the highway would cross a wide plateau to the south of the river before dropping down to the river floodplain. A 600-foot-long bridge over the Sullivan River would be built to the north bank of the river. The bridge would be set high enough to allow airboats to pass underneath. From the Sullivan River north to the Glacier River, the highway would be located 100–300 feet above sea level, except at two locations where it would be located just inside the beach fringe to avoid steep cliffs. The high avalanche hazard zones opposite the middle of Sullivan Island would be mitigated by a combination of bridges and elevated fills with large culverts.

#### 2.3.4.5 Glacier River Area

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

#### 2.3.4.6 Davidson Glacier to Pyramid Harbor

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

#### 2.3.4.7 Chilkat River Area

The 2.0-mile Chilkat River crossing would extend from Green Point to Mud Bay Road. The bridge abutment on the west side would start approximately 500 feet from the shore of the

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

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

A more detailed description of the alignment, the ferry terminal layouts, and the design criteria for this alternative can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

### 2.3.5 Alternatives 4A through 4D

Alternatives 4A through 4D would include continued mainline ferry service in Lynn Canal, and the AMHS would continue to be the NHS route between Juneau and Haines/Skagway.[27] These alternatives are based on a minimum of two mainline ferry trips per week in the summer and one per week in the winter. In Alternatives 4A and 4B, the Haines-Skagway ferry service would be provided by a new conventional monohull ferry because the Day Boat ACFs programmed under Alternative 1 – No Action are too large for the demand on this route. In Alternatives 4C and 4D, the Haines-Skagway ferry service would be provided by a new conventional monohull ferry because the Day Boat ACFs programmed under Alternative 1 – No Action are needed for service between Auke Bay and Haines/Skagway. All of these alternatives would require construction of a new double end berth at Auke Bay.

Alternatives 4A through 4D would provide faster and/or more frequent service with greater capacity than Alternative 1 – No Action while minimizing operating costs. Various combinations of the following are proposed to reduce travel times: faster boats, shorter summer routes, and port-to-port operations (travel to one port, then return to origin). Crew shifts with minimal overtime would reduce operating costs.

These four alternatives partially met three or more of the five Purpose and Need elements as defined for screening and therefore were included in the range of reasonable alternatives in the 2006 Final EIS and have been carried forward in this Final SEIS.

> Note: Alternative 4 was originally identified as the AMHS Alternative in the 1994 *Reconnaissance Engineering Report*. It was designated as the All Marine Alternative in the 1997 Draft EIS even though it included two options with a 5-mile road extension. As described in Section 2.2.8, the original marine alternative options have been modified to reflect recent AMHS experience and planning.

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[27] AMHS experimented with turning some mainliners around in Auke Bay and moving Lynn Canal corridor through-traffic on another vessel, with poor results. For this reason and scheduling concerns, it is likely that as long as there are mainliner ferries, there will be mainline service in Lynn Canal absent a highway connection.

### 2.3.6 Alternative 4A – Fast Vehicle Ferry Service from Auke Bay

Alternative 4A would construct two new FVFs to provide daily summer service between Auke Bay and Haines and between Auke Bay and Skagway. Figure 2-9 illustrates this alternative. No new roads would be built for this alternative. The Auke Bay Ferry Terminal would be expanded to include a double end berth. A new conventional monohull ferry would be constructed for use between Haines and Skagway (the Day Boat ACFs programmed under Alternative 1 – No Action would not be used on this route because they are considered much too large for the demand on this route). Mainline ferry service between Auke Bay and Haines/Skagway would continue, with a minimum of two weekly trips estimated in the summer and one in the winter. The Day Boat ACFs would no longer operate in Lynn Canal.

**Capacity –** Under Alternative 4A, traffic capacity would be determined by the combination of FVF and mainline ferry sailings[28]. Alternative 4A would have two high-speed ferries, each with a 31-vehicle capacity, providing service to Haines and Skagway. Mainline vessel capacity ranges from 80 to 134 vehicles one way. In the summer, it is assumed that there would be one *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter mainline ferry service is assumed to be provided by a *Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainline capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. The daily traffic volumes that would be accommodated by Alternative 4A are provided in Table 2-18.

**Table 2-18:**
**Daily Traffic Capacity for Alternative 4A**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 162 |
| Winter | 77 |
| **Auke Bay-Skagway** | |
| Summer | 149 |
| Winter | 72 |

**Travel Time –** The one-way trip times for Alternative 4A are provided in Table 2-19. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of waiting time, check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. The check-in time for the mainline ferry is 2 hours and is 1 hour for an FVF.

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[28] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

**Table 2-19:**
**Travel Times for Alternative 4A**

| Route | | Travel Time (hours) | |
|---|---|---|---|
| | | Via Mainline Ferry | Via FVF |
| Auke Bay-Haines | Drive Time | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 7.1 | 3.8 |
| | Total | 7.2 | 3.9 |
| Auke Bay-Skagway (via Haines) | Drive Time | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 9.1 | 4.1 |
| | Total | 9.1 | 4.1 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

**Travel Frequency –** Under Alternative 4A, flexibility and opportunity for travel would be a function of the frequency of mainline ferry and FVF service. The trip frequency is provided in Table 2-20.

**Table 2-20:**
**Travel Frequency for Alternative 4A**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 2.3 | 16 |
| Winter | 1.1 | 8 |
| **Auke Bay-Skagway** | | |
| Summer | 2.3 | 16 |
| Winter | 1.1 | 8 |

**Cost –** Total final design and construction costs for Alternative 4A would be approximately $250.2 million, including approximately $206.1 million for vessel acquisition and approximately $44.1 million for ferry terminal construction at Auke Bay. Annual M&O costs are estimated to be approximately $33.7[29] million: $7.3 million for mainline ferry service, $24.1 million for Lynn Canal shuttle service, and $2.3 million for the Haines-Skagway shuttle. The estimated total project life cost less residual value is $1.6 billion. The ferry fares for Alternative 4A are shown in Table 2-21.

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[29] Revised total is due to 1) updating costs to 2015 dollars and 2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Table 2-21:**
**Ferry Fares for Alternative 4A**

| Route | Auke Bay - Haines | Auke Bay - Skagway |
|---|---|---|
| Adult Ferry Passenger | $39.00 | $53.00 |
| 19-foot Vehicle | $90.00 | $116.00 |

The net State cost per vehicle would be $335.

**Design Details –** The only construction for this alternative, other than for new vessels, would be the reconstruction of the west end of the Auke Bay Ferry Terminal to create two new end berths. Terminal layout details for the Auke Bay modifications can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

### 2.3.7 Alternative 4B – Fast Vehicle Ferry Service from Berners Bay

Alternative 4B would widen and extend Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay (5.2 miles total) using the same design standards described in Alternative 2B (Figures 2-10 and 2-11). A new ferry terminal would be constructed at Sawmill Cove in Berners Bay with two end berths to accommodate both FVFs at the same time. The Auke Bay Ferry Terminal would be expanded to include a double end berth. This alternative would construct two new FVFs to provide service between Sawmill Cove and Haines/Skagway in the summer[30] and between Auke Bay and Haines/Skagway in the winter[31]. Mainline ferry service between Auke Bay and Haines/Skagway would continue, with two weekly trips estimated in the summer and one in the winter. The Day Boat ACFs would no longer operate in Lynn Canal. A new conventional monohull ferry would be constructed for use between Haines and Skagway.

**Capacity –** Under Alternative 4B, traffic capacity would be determined by the combination of FVF and mainline ferry sailings[32]. Alternative 4B would have two FVFs, each with a 53-vehicle capacity providing service between Sawmill Cove and Haines and Skagway. In the winter, the ferry would make two round trips a day from Auke Bay: one to Haines and one to Skagway. Mainline vessel capacity ranges from 80 to 134 vehicles one way. In the summer, it is assumed that there would be one *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter mainline ferry service is assumed to be provided by a *Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainline capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. This combination of vessels would be able to accommodate the daily traffic volumes listed in Table 2-22.

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[30] Due to environmental concerns in Berners Bay during the spring (herring and eulachon spawning, as well as humpback whale and Steller sea lion concentrations), the summer schedule under Alternatives 4B (and 4D) would run from May 15 to September 30.

[31] Due to environmental concerns in Berners Bay during the spring (herring and eulachon spawning as well as humpback whale and Steller sea lion concentrations), winter operation logistics, and lower winter travel demand, the winter schedule would operate from Auke Bay.

[32] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

**Table 2-22:**
**Daily Traffic Capacity for Alternative 4B**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer (via Sawmill Cove) | 250 |
| Winter (via) Auke Bay) | 121 |
| **Auke Bay-Skagway** | |
| Summer (via Sawmill Cove) | 237 |
| Winter (via Auke Bay) | 116 |

**Travel Time –** The one-way trip times for Alternative 4B are shown in Table 2-23. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of waiting time, check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. The check-in time for the mainline ferry is 2 hours and is 1 hour for a FVF. Mainline ferry travel time and the winter FVF travel times from Auke Bay would be the same as in Alternative 4A.

**Table 2-23:**
**Travel Times for Alternative 4B**

| Route | | Travel Time (hours) | | |
|---|---|---|---|---|
| | | Via FVF summer[1] | Via FVF winter[1] | Via Mainliner |
| Auke Bay - Haines[1] | Drive Time | 0.8 | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 2.9 | 3.9 | 7.1 |
| | Total | 3.7 | 4.0 | 7.2 |
| Auke Bay - Skagway[1] | Drive Time | 0.7 | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 3.2 | 4.2 | 9.1 |
| | Total | 3.9 | 4.2 | 9.1 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

[1] Alternative 4B would include FVF service from Sawmill Cove Ferry Terminal in summer and from Auke Bay Ferry Terminal in winter, with differing travel times.

**Travel Frequency –** Under Alternative 4B, flexibility and opportunity for travel between Auke Bay and Haines or Skagway would be determined by the combined frequency of mainline ferry and FVF service. Two FVFs would operate in summer from Sawmill Cove Ferry Terminal; the shorter distance between ferry terminals allows for two round trips per day. In winter, a single FVF would make two round trips a day from Auke Bay: one to Haines and one to Skagway. This schedule would result in the travel frequency provided in Table 2-24.

**Table 2-24:**
**Travel Frequency for Alternative 4B**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer (via Sawmill Cove) | 2.3 | 16 |
| Winter (via Auke Bay) | 1.1 | 8 |
| **Auke Bay-Skagway** | | |
| Summer (via Sawmill Cove) | 2.3 | 16 |
| Winter (via Auke Bay) | 1.1 | 8 |

**Cost –** Total final design and construction costs for Alternative 4B would be approximately $317.6 million, including $10.2 million for highway design and construction, approximately $241.6 million for vessel acquisition, and approximately $65.8 million for ferry terminal design and construction at Auke Bay and Sawmill Cove. Annual M&O costs would be $33.3 million[33]: $7.3 million for mainline service, $23.5 million for Lynn Canal shuttle service, $2.4 million for the Haines-Skagway shuttle, and $18,000 for highway maintenance. The estimated total project life cost less residual value is $1.7 billion. The ferry fares for Alternative 4B are shown in Table 2-25.

**Table 2-25:**
**Ferry Fares for Alternative 4B**

| Route | Summer | | Winter | |
|---|---|---|---|---|
| | Sawmill Cove - Haines | Sawmill Cove - Skagway | Auke Bay - Haines | Auke Bay-Skagway |
| Adult Ferry Passenger | $25.00 | $35.50 | $39.00 | $53.00 |
| 19-foot Vehicle | $57.00 | $77.00 | $90.00 | $116.00 |

The net State cost per vehicle would be $179.

**Alignment –** Alternative 4B would begin just north of the Echo Cove boat launch. It would follow the same alignment as described for Alternative 3 from Echo Cove north to a new ferry terminal at Sawmill Cove. This would involve construction of 2.3 miles of new highway and widening of 2.9 miles of existing road. (5.2 miles total). The Sawmill Cove Ferry Terminal would have two end berths with two support floats and two steel transfer bridges. Dredging at the terminal site would be required to provide adequate depth. A detailed description of the alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

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[33] Revised total is due to (1) updating costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

### 2.3.8 Alternative 4C – Conventional Monohull Service from Auke Bay

This alternative would use the two Day Boat ACFs to operate between Auke Bay and Haines/Skagway (Figure 2-9). The Auke Bay Ferry Terminal would be expanded to include a new double end berth, to accommodate both Day Boat ACFs at once. A new conventional monohull ferry would be constructed for shuttling between Haines and Skagway. The Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Day Boat ACF. Mainline ferry service between Auke Bay and Haines/Skagway would continue, with two weekly trips estimated in the summer and one in the winter. No new road construction would occur.

**Capacity –** Under Alternative 4C, traffic capacity would be determined by the combination of Day Boat ACF and mainline ferry sailings.[34] Each of the two Day Boat ACFs would have a capacity of 53 vehicles. In the summer, each Day Boat ACF would make one trip per day, with one vessel making a round trip to Haines and the other making a round trip to Skagway. In winter, a single vessel would operate, alternating between a round trip to Haines one day and to Skagway the next. Mainline vessel capacity ranges from 80 to 134 vehicles one way. In the summer, it is assumed that there would be one *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter service is assumed to be provided by a *Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainline capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. Alternative 4C would accommodate the traffic volumes provided in Table 2-26.

**Table 2-26:**
**Daily Traffic Capacity for Alternative 4C**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer | 144 |
| Winter | 68 |
| **Auke Bay-Skagway** | |
| Summer | 131 |
| Winter | 63 |

**Travel Time –** The one-way trip times for Alternative 4C are provided in Table 2-27. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. The check-in time for the mainline ferry is 2 hours and is 1 hour for a Day Boat ACF.

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[34] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

**Table 2-27:**
**Travel Times for Alternative 4C**

| Route | | Travel Time (hours) | |
|---|---|---|---|
| | | Via Mainline Ferry | Via Day Boat ACF |
| Auke Bay-Haines | Drive Time | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 7.1 | 6.1 |
| | Total | 7.2 | 6.2 |
| Auke Bay-Skagway | Drive Time | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 9.1 | 6.6 |
| | Total | 9.1 | 6.6 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

**Travel Frequency –** Under Alternative 4C, flexibility and opportunity for travel would be a function of the frequency of mainline ferry and Day Boat ACF service. The two Day Boat ACFs would each make one trip per day during the summer (one between Auke Bay and Haines and the other between Auke Bay and Skagway). In winter, a single Day Boat ACF would alternate daily trips to Haines and Skagway; mainline ferry service would continue at one trip per week. Trip frequency for Alternative 4C is provided in Table 2-28.

**Table 2-28:**
**Travel Frequency for Alternative 4C**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer | 1.3 | 9 |
| Winter | 0.6 | 4.5 |
| **Auke Bay-Skagway** | | |
| Summer | 1.3 | 9 |
| Winter | 0.6 | 4.5 |

**Cost –** Total final design and construction costs for Alternative 4C would be approximately $78.4 million, including approximately $24.7 million for vessel acquisition and approximately $53.7 million for ferry terminal construction at Auke Bay and Skagway. Annual M&O costs are estimated to be approximately $22.7[35] million: $7.3 million for mainline ferry service, $13.1 million for Lynn Canal shuttle service, and $2.3 million for the Haines-Skagway shuttle. The estimated total project life cost less residual value is $981 million. The ferry fares for Alternative 4C are shown in Table 2-29.

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[35] Revised total is due to (1) updating costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Table 2-29:**
**Ferry Fares for Alternative 4C**

| Route | Auke Bay-Haines | Auke Bay-Skagway |
|---|---|---|
| Adult Ferry Passenger | $39.00 | $53.00 |
| 19-foot Vehicle | $90.00 | $116.00 |

The net State cost per vehicle would be $313.

**Design Details –** The only construction required for this alternative, other than new Haines-Skagway ferry and modification of the Skagway Ferry Terminal, would be the reconstruction of the west end of the Auke Bay Ferry Terminal to create two new end berths. The terminal layout details for the Auke Bay modifications can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

### 2.3.9 Alternative 4D – Conventional Monohull Service from Berners Bay

Alternative 4D would widen the existing Glacier Highway from Echo Cove to Cascade Point and extend it from Cascade Point to Sawmill Cove in Berners Bay (5.2 miles total) using the same design standards described in Alternative 2B (Figures 2-10 and 2-11). A new ferry terminal would be constructed at Sawmill Cove in Berners Bay with a double end berth, to accommodate both Day Boat ACFs at once. The Day Boat ACFs would provide service between Sawmill Cove and Haines/Skagway in summer[36] and between Auke Bay and Haines/Skagway in winter. The Auke Bay Ferry Terminal also would be expanded to include a new double end berth. A new conventional monohull ferry would be constructed for use between Haines and Skagway. The Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Day Boat ACF. Mainline service from Auke Bay to Haines-Skagway would continue, with two weekly trips estimated in the summer and one in the winter.

**Capacity –** Under Alternative 4D, traffic capacity would be determined by the combination of Day Boat ACF and mainline ferry sailings.[37] Each of the Day Boat ACFs in Alternative 4D would have a capacity of 53 vehicles. In the summer, the Day Boat ACFs would be used to make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. In winter, a single Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and a round trip to Skagway the next day. Mainline vessel capacity ranges from 80 to 134 vehicles one way. In the summer, it is assumed that there would be one *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter service is assumed to be provided by a *Matanuska/Malaspina* class ferry. For the purposes of determining available capacity, mainline capacity has been apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage. The daily traffic volumes that would be accommodated by Alternative 4D are provided in Table 2-30.

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[36] Due to environmental concerns in Berners Bay during the spring (herring and eulachon spawning, as well as humpback whale and Steller sea lion concentrations), the summer schedule under Alternatives 4B (and 4D) would run from May 15 to September 30.

[37] To compare alternatives that have both road and ferry segments, this analysis focuses on automobile capacity of the ferries. Ferries also transport walk-on passengers.

**Table 2-30:**
**Daily Traffic Capacity for Alternative 4D**

| Route | Number of Vehicles |
|---|---|
| **Auke Bay-Haines** | |
| Summer (via Sawmill Cove) | 250 |
| Winter (via Auke Bay) | 68 |
| **Auke Bay-Skagway** | |
| Summer (via Sawmill Cove) | 237 |
| Winter (via Sawmill Cove) | 63 |

**Travel Time –** The one-way travel times are provided in Table 2-31. Times shown in the table include ferry time and driving time (if appropriate). Ferry time consists of check-in and loading time, transit time, and unloading time. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. The check-in time for the mainline ferry is 2 hours and is 1 hour for a Day Boat ACF. Mainline ferry travel time and the winter Day Boat ACF travel times from Auke Bay would be the same as in Alternative 4C.

**Table 2-31:**
**Travel Times for Alternative 4D**

| Route | | Travel Time (hours) | | |
|---|---|---|---|---|
| | | Via ACF summer[1] | Via ACF winter[1] | Via Mainliner |
| Auke Bay - Haines[1] | Drive Time | 0.8 | 0.1 | 0.1 |
| | Ferry Time (including check-in, transit, and unloading) | 4.2 | 6.1 | 7.1 |
| | Total | 5.0 | 6.2 | 7.2 |
| Auke Bay - Skagway[1] | Drive Time | 0.7 | 0 | 0 |
| | Ferry Time (including check-in, transit, and unloading) | 4.7 | 6.6 | 9.1 |
| | Total | 5.4 | 6.6 | 9.1 |

Note: For consistency and to allow direct comparisons between alternatives, the travel time measures for each alternative start at Auke Bay, and the end point is either the Skagway Ferry Terminal or downtown Haines (Third Avenue and Main Street).

[1] Alternative 4D would include Day Boat ACF service from Sawmill Cove Ferry Terminal in summer and from Auke Bay Ferry Terminal in winter, with differing travel times.

**Travel Frequency –** Under Alternative 4D, flexibility and opportunity for travel would be a function of the frequency of mainline ferry and Day Boat ACF service. In the summer, the two Day Boat ACFs would make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. In winter, a single Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and to Skagway the next day. Trip frequency is provided in Table 2-32.

**Table 2-32:**
**Travel Frequency for Alternative 4D**

| Route | Round Trips per Day | Round Trips per Week |
|---|---|---|
| **Auke Bay-Haines** | | |
| Summer (via Sawmill Cove) | 2.3 | 16 |
| Winter (via Auke Bay) | 0.6 | 4.5 |
| **Auke Bay-Skagway** | | |
| Summer (via Sawmill Cove) | 2.3 | 16 |
| Winter (via Auke Bay) | 0.6 | 4.5 |

**Cost –** Total final design and construction costs for Alternative 4D would be approximately $110.3 million, including $10.2 million for highway design and construction, approximately $24.7 million for vessel acquisition, and approximately $75.4 million for ferry terminal design and construction at Auke Bay, Skagway, and Sawmill Cove. Annual M&O costs would be $24.2[38] million: $7.3 million for mainline service, $14.5 million for Lynn Canal shuttle service, $2.4 million for the Haines-Skagway shuttle, and $18,000 for highway maintenance. The estimated total project life cost less residual value is $1.0 billion. The ferry fares for Alternative 4D are shown in Table 2-33.

**Table 2-33:**
**Ferry Fares for Alternative 4D**

| Route | Summer | | Winter | |
|---|---|---|---|---|
| | Sawmill Cove - Haines | Sawmill Cove - Skagway | Auke Bay - Haines | Auke Bay - Skagway |
| Adult Ferry Passenger | $25.00 | $35.50 | $39.00 | $53.00 |
| 19-foot Vehicle | $57.00 | $77.00 | $90.00 | $116.00 |

The net State cost per vehicle would be $105.

**Alignment –** The roadway alignment and terminal details for Alternative 4D are identical to those of Alternative 4B. Road construction would begin at the end of Glacier Highway just north of the Echo Cove boat launch. The alignment would follow the same alignment as Alternative 3 from Echo Cove north to a new ferry terminal at Sawmill Cove in Berners Bay. This would involve construction of 2.3 miles of new highway and widening of 2.9 miles of existing road (5.2 miles total). The Sawmill Cove Ferry Terminal would have two end berths with two support floats and two steel transfer bridges. Dredging would be required to provide adequate depth.

A detailed description of the roadway alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *2017 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

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[38] Revised total is due to (1) updating costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

## 2.4 Alternatives Suggested in Comments Received on the 2014 Draft SEIS

Comments on the 2014 Draft SEIS included multiple suggestions related to alternatives, including suggestions to evaluate new alternatives, variations on reasonable alternatives, and variations on alternatives previously considered not reasonable. Sections 2.4.1 and 2.4.2 discuss two proposed alternatives labeled by their proponent as “Alternative 1B Optimized” and “Alternative 5” (DOT&PF has retained this labeling solely for convenience). DOT&PF and FHWA gave these alternatives a hard look by forecasting the travel demand and developing capital and operating costs for each (see Appendix II, *Alternative 1B Optimized and Alternative 5 Evaluation*). Section 2.4.3 discusses other alternatives and variations on alternatives suggested in comments that were clearly not reasonable, were duplicative of alternatives already in the JAI Project SEIS, or were determined not reasonable in previous alternative development and screening efforts.

### 2.4.1 Enhanced Service with Existing AMHS Assets

An alternative developed by the Skagway Marine Access Commission (SMAC) and labeled “Alternative 1B Optimized” was submitted in association with their comments on the 2014 Draft SEIS. This is a ferry alternative that would use only existing AMHS ferries and terminals, with suggested modifications to vessels used and routes run to “optimize” (in SMAC’s opinion) Alternative 1B as presented in the 2014 Draft SEIS.

In summer, SMAC’s alternative would consist of one Day Boat[39] Alaska Class Ferry (ACF) sailing between Auke Bay and Haines daily. The second Day Boat ACF would sail between Skagway and Auke Bay daily. The *M/V Malaspina* would sail daily on the following route: Haines-Skagway-Haines-Auke Bay-Haines. In winter, one Day Boat ACF would sail between Auke Bay and Haines 5 days per week. The second Day Boat ACF would sail between Haines and Skagway 5 days per week, making two trips each day it sails. The *M/V Malaspina* would not sail in Lynn Canal in winter. Under this scenario, mainline ferry service would not continue in Lynn Canal.

DOT&PF and FHWA have examined this proposal and have determined that it is not a reasonable alternative for the following reasons. First, the Day Boat ACF could not make a daily Auke Bay-Skagway run and meet United States Coast Guard (USCG) work/rest requirements. Without modification of the vessel or the loading and unloading facility at the Skagway Ferry Terminal to decrease the Day Boat ACF operating day, it would not be compliant with the USCG requirements.

Second, discontinuing mainline ferry service within Lynn Canal would create capacity problems at Auke Bay. During summer, on the 2 days per week that the mainliner sails, the amount of transferring traffic plus local traffic demand to/from Skagway would be greater than the capacity of Auke Bay-Skagway Day Boat ACF proposed in SMAC’s alternative.

Third, there would be insufficient berth space and vehicle staging areas in Auke Bay to have the mainline vessel in port while accommodating all the transferring vehicles without vessel and vehicle congestion and delays. To fully clear northbound and southbound connecting travelers onto the mainline vessel, the mainliner would need to remain docked in Auke Bay long enough

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[39] A day boat shuttle ferry is home ported in one community and normally returns to that community each night for overnight moorage. A day boat shuttle ferry does not include crew or passenger staterooms (DOT&PF, 2012d).

for the two Day Boat ACFs and the *M/V Malaspina* to come and go. Moreover, the staging area at Auke Bay would be insufficient to accommodate all the disembarking and embarking vehicles. The existing space is limited and was not designed or sized to handle the transfers of the volumes expected. A detailed analysis of SMAC's Alternative 1B Optimized is found in Appendix II, *Alternative 1B Optimized and Alternative 5 Evaluation*.

### 2.4.2 All Day Boat ACF Alternative

An alternative developed by SMAC and labeled as "Alternative 5" was submitted in association with their comments on the 2014 Draft SEIS. Alternative 5 is a ferry alternative that builds upon Alternative 4C from the 2014 Draft SEIS. It relies on using three Day Boat ACF vessels in Lynn Canal (the two programmed vessels currently under construction and a new vessel that would be built under this scenario), plus the terminal improvements identified in Alternative 4C. This proposal would eliminate mainline ferry service in Lynn Canal.

In summer, SMAC's Alternative 5 would consist of (1) a Day Boat ACF sailing between Haines and Auke Bay daily, (2) a second Day Boat ACF sailing between Skagway and Auke Bay daily, and (3) a third Day Boat ACF sailing between Auke Bay and Haines 4 days per week and between Auke Bay and Skagway 3 days per week. The Haines-Skagway shuttle from the *Southeast Alaska Transportation Plan* (SATP) would make two round trips per day. In winter, one Day Boat ACF would sail between Haines and Auke Bay 5 days per week, and a second Day Boat ACF would make two round trips between Haines and Skagway on the days the first Day Boat ACF sails. The third Day Boat ACF and the Haines-Skagway shuttle would not sail in Lynn Canal in winter.

DOT&PF and FHWA have examined this alternative and have determined that it is a variation of existing alternatives and therefore would be an unnecessary addition to the range of reasonable alternatives. It would attract fewer trips than Alternative 1B, provides similar capacity to Haines (and less to Skagway), and would have similar travel time as other alternatives studied (Alternatives 1 – No Action, 1B, and 4C). It fits within the range of capital and operational costs (not the cheapest and not the most expensive of the ferry options). In short, it is not unique enough to constitute something outside the range of alternatives already studied. Further, sufficient information has been generated to confirm it is inferior to other alternatives already in the JAI Project SEIS.

Additionally, during summer, discontinuing mainline ferry service within Lynn Canal could create capacity issues that may prevent some travelers from reaching their final destination via a direct ferry connection. Vehicles traveling through Juneau in either direction on mainline vessels would be required to transfer from the Lynn Canal vessels to the mainline vessel at Auke Bay. Mainline vessels hold between 88 and 134 vehicles. Depending on how many vehicles were passing through Juneau, there could be insufficient capacity on the days the mainliner arrives when local traffic would be added to the demand generated by these mainline vessels. Some Lynn Canal travelers would likely have to use the Haines-Skagway shuttle and travel via Haines or Skagway to reach their final destination, which increases their travel time and potentially their costs (if they need to stay overnight).

A detailed analysis of SMAC's Alternative 5 is found in Appendix II, *Alternative 1B Optimized and Alternative 5 Evaluation*.

### 2.4.3 Other Suggestions Regarding Alternatives

Some comments on the 2014 Draft SEIS included suggestions for apparently new alternatives, as well as alignment or operational variations for alternatives that were evaluated in the 2014 Draft SEIS. In some cases, the suggestions proposed changes to alternatives already determined not reasonable. It is important to note that an EIS is required to evaluate a full range of alternatives, but is not required to examine every possible variation in a theoretically infinite set of variations. The suggested variations did not improve upon the alternatives already evaluated in a meaningful way or provide a better solution to addressing the purpose and need for the project. The following paragraphs describe examples of those suggestions and DOT&PF's and FHWA's consideration of those suggestions. All comments received on the 2014 Draft SEIS and responses appear in Appendix JJ, *Responses to Draft Supplemental Environmental Impact Statement Comments*.

#### 2.4.3.1 New Alternatives Suggested

Some commenters suggested ways to make Alternative 2B into an all-road alternative that could avoid the Skagway and White Pass District National Historic Landmark, or suggested various means that would avoid avalanche-prone or difficult terrain.

Suggestions to analyze a long tunnel through the mountains (e.g., Juneau or Berners Bay to Skagway) or a floating road (see also Section 2.2.4) were dismissed based on their failure to meet screening criterion I, which was cost/technical feasibility and common sense (for more information on the screening criterion, see Section 2.1). The cost of dozens of miles of tunnel or floating road would be prohibitively high, and the extensive structural elements required would not be feasible.

A road route up the Katzehin River valley and a northern tributary to intersect the Klondike Highway was suggested, without routing detail. The valleys in question are narrow and steep-sided, terminating in high peaks and icefields. A surface route would not be feasible over the highest terrain (6,000+ feet) due to grade, snowpack, and unavoidable glaciers. The route would likely require a tunnel beginning at approximately 2,500 feet in elevation under the peaks and icefields and extending more than 5 miles long. This suggestion did not meet screening criterion I (Cost/Technical Feasibility and Common Sense) as professional judgment regarding technical feasibility and cost as well as a common sense approach to this route indicate this would not be a reasonable alternative. Because the route would not specifically improve travel in Lynn Canal (completely bypassing the communities of Haines and Skagway), it would not meet the purpose and need.

#### 2.4.3.2 Suggested Variations on Reasonable Alternatives

Commenters suggested variations to alternatives already determined reasonable. DOT&PF and FHWA considered these suggestions to determine if they were reasonable. Examples of the kinds of suggestions received are described below.

Some commenters suggested that, for safety and to avoid difficult terrain, the road options (Alternatives 2B and 3) be summer-only roads, with ferry service between Juneau and Haines/Skagway in winter. This suggestion is basically a combination of Alternative 2B or 3 and Alternative 1 - No Action. Such an alternative would minimize the need for (and cost of) snow sheds and avalanche control measures on the East or West Lynn Canal's highway components because they would not be operated in winter. However, DOT&PF has examined the maintenance issues and risk associated with avalanches, and has included avalanche risk mitigation in its highway design and operating plans for Alternatives 2B and 3. With mitigation, including the ability to employ ferries if the East or West Lynn Canal Highways were to be closed for avalanche mitigation or other weather-related concerns, DOT&PF has designed the roads proposed under Alternatives 2B and 3 (and is committed to implementing avalanche control measures) so that those roads would be well within safety standards for roads in mountainous avalanche terrain, similar to other highways in Alaska. Having invested in a highway, were Alternative 2B or 3 to be built, it would not make sense for DOT&PF to close the road and revert to the existing ferry service in winter[40] (not meeting the purpose and need for half the year). The year-round road would serve the traveling public better (more frequent service and less time and cost of travel). For these reasons, this option was did not pass screening criterion II (Appropriateness and Unnecessary Variations) because it was determined to be an unnecessary variation and not appropriate. This option does not satisfy the JAI Project's purpose and need, and therefore is not reasonable.

In a variation on Alternative 2B, some commenters suggested that it might be possible to avoid construction of a large bridge over the Katzehin River by placing the Katzehin Ferry Terminal south of the river. As part of the alternatives development process, FHWA and DOT&PF had previously investigated locations for a ferry terminal at the north end of the East Lynn Canal Highway and determined that the area south of the Katzehin River was not suitable because of upland terrain, exposure to storm wind and waves, and the likely need for continual dredging of material carried by the river to keep the terminal area safe for ferry operations. For these reasons, changing the location of the ferry terminal did not meet screening criterion II (Appropriateness and Unnecessary Variations) because it is not considered appropriate and is an unnecessary variation. As a result, these suggestions are not reasonable. These variations also did not meet screening criterion I (Cost/Technical Feasibility and Common Sense) because of the costs associated with initial construction and the likely need for continual maintenance dredging.

Variations on Alternative 3 included suggestions for different ferry terminal locations on the east and west sides of Lynn Canal. For example, the existing Auke Bay Ferry Terminal could be used instead of the proposed Sawmill Cove Ferry Terminal on the east side, and St. James Bay/Boat Harbor could be used instead of William Henry Bay on the west side.

Potential ferry terminal sites on the east side of Lynn Canal were evaluated during the original alternatives screening based on basin characteristics and exposure to weather. The distance from Auke Bay to a terminal in William Henry Bay or St. James Bay/Boat Harbor on the west side of Lynn Canal would be much greater than the route proposed under Alternative 3. The longer route would increase the duration of the ferry run, resulting in reduced frequency of service; longer overall travel time; reduction in traffic volume, resulting in an inferior alternative to alternatives evaluated in the EIS. Therefore these suggestions did not meet screening criterion II (Appropriateness and Unnecessary Variations) as they are considered an unnecessary variation on the terminal site evaluated under Alternative 3.

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[40] DOT&PF anticipates some winter closures for avalanche control and snow removal. For example, DOT&PF estimates the road associated with Alternative 2B would be closed for an average of 12 days per year (see *2017 Update to Appendix J – Snow Avalanche Report*) compared to the suggestion of closing the road for the entire winter.

Cascade Point was another suggested east side ferry terminal site instead of Sawmill Cove. DOT&PF had previously considered this suggestion during the original alternatives development process and disclosed that if Alternative 3, 4B, or 4D were selected, Cascade Point would be further investigated regarding its suitability and availability for the terminal in this Final SEIS (see Appendix A, *Alternative Screening Report,* of the 2005 Supplemental Draft EIS).

Several commenters suggested eliminating mainliner ferries in Lynn Canal. This concept was carefully reviewed and determined not reasonable because the capacity provided by the mainliner would be required to meet the projected traffic demand for the primary ferry alternatives. Eliminating mainliner ferries in Lynn Canal would also inconvenience passengers by requiring them to change ferries, which would increase their travel time. Appendix II, *Alternative 1B Optimized and Alternative 5 Evaluation*, provides information on the logistical and capacity problems related to discontinuing mainliner service in Lynn Canal in conjunction with ferry alternatives. Another suggestion was to run one Day Boat ACF shuttle ferry on a Juneau-Haines-Skagway-Haines-Juneau run and the other on an opposite schedule, starting in Skagway. This would not be possible, given the time each round trip would take. The Day Boat ACF vessels will not include crew's quarters; AMHS assumes crew members would return home at the end of their shifts. Therefore, these alternatives are not reasonable because they are not technically feasible based on criterion I (Cost/Technical Feasibility and Common Sense).

Commenters suggested different ferry operation scenarios, including a hub-and-spoke system of ferries in Lynn Canal. This suggestion was not well defined, but was compared to the Inter-Island Ferry Authority operation at Prince of Wales Island. The ferry alternatives proposed for the JAI Project, Alternatives 1B and 4A through 4D, are essentially a hub and spoke system, with Juneau being the hub and Haines and Skagway being the spokes. Under Alternatives 1B and 4A through 4D, AMHS would provide daily ferry service to and from the hub connecting to the spokes. Because alternatives already evaluated in the JAI Project SEIS employed a hub and spoke system, these suggestions were determined not reasonable because they were unnecessary variations of alternatives already examined (i.e., did not meet screening criterion II: Appropriateness and Unnecessary Variations).

#### 2.4.3.3 Suggested Alternatives Previously Determined Not Reasonable

Commenters suggested several alternatives that FHWA and DOT&PF had previously considered and determined not reasonable. DOT&PF and FHWA reviewed the suggestions from the commenters and considered whether any new information was provided that would make these alternatives reasonable. The suggestions include:

- A road to Atlin, B.C., via the Taku River valley south of Juneau. This route would not address the purpose and need and was not favored by the government of Canada. See Section 2.2.1.
- A road from Juneau to Skagway. Originally proposed in Alternatives 2, 2A, and 2C, FHWA determined these to be not reasonable because of impacts to property at Skagway protected under Section 4(f) of the U.S. Department of Transportation Act. Section 4(f) requires avoidance of Section 4(f) property if a feasible and prudent alternative is available. See Section 2.2.9 and Chapter 6.
- Alternative modes to roads and ferries, such as railroad service to Juneau. Rail access was considered previously and rejected. See Section 2.2.5.

- A bridge across Lynn Canal from the Katzehin River Delta to Haines. The structure was previously determined to be cost prohibitive. See Section 2.2.4.
- An alternative that would include a road between Haines and Skagway as a stand-alone road or as part of a system from Juneau through Haines to Skagway. The Haines-Skagway road would not fully support the purpose and need for the project, as is more fully described in Section 2.2.3.

#### 2.4.3.4 Suggestions That Would Not Meet Purpose and Need

Commenters provided multiple suggestions that were not stand-alone alternatives or were not related directly to the purpose and need for this project. Examples include:

- Commenters suggested road alternatives leading farther south on the west side of Lynn Canal to other communities. These suggested road connections might have value as part of a regional transportation plan that would improve access to the suggested communities; however, they would not improve surface transportation to and from Juneau. These proposed connections would solve different problems and, therefore, are not addressed in detail in this Final SEIS.
- Commenters suggested better, cheaper air travel to and from Juneau. This suggestion did not specify how cheaper air travel might be accomplished, but it is not a reasonable alternative because it would not meet the purpose and need for the project, which is focused on the need for improved surface transportation.
- Commenters suggested changes to AMHS operations, some of which were related only tangentially to the JAI Project. For example, some commenters suggested discontinuing service to Washington state for cost savings and using the money saved to improve the rest of the ferry system. In another example, a commenter suggested building a parking garage for paid parking at the Auke Bay Ferry Terminal and using the revenues generated to support the AMHS.

The JAI Project identifies transportation problems in a specific corridor, and the needs are specific to surface transportation within that corridor, as indicated by the statement of purpose and need in Chapter 1. Suggested options like the ones in this section, which include roads to other places, different modes of travel, and far-reaching or overarching operational suggestions, do not address the purpose and need for this project and are outside the purview of the JAI Project SEIS.

## 2.5 Identification of the Preferred Alternative

Governor Walker announced on December 15, 2017, that the “No Build Alternative” is the State’s Preferred Alternative due to Alaska’s current fiscal challenges (State of Alaska, 2016b). FHWA agreed that this was a prudent course of action. This section describes the background circumstances leading to the identification of the preferred alternative. The primary reason for the change in preferred alternatives was the plight of Alaska’s economy and its effect on the State government’s overall budgetary health (see additional discussion in Section 2.5.2). This fiscal environment, in turn, has affected DOT&PF’s budget and its ability to advance a build transportation solution in Lynn Canal.

Controversy regarding the JAI Project was also a contributing factor. Much of the controversy surrounding this project, which has persisted for many years, is related to the potential impacts to the natural and social environment associated with alternatives with substantial road components. Some of the controversy has been related to the basic modal choice reflected in the build alternatives (i.e., ferries versus roads). This has been expressed in numerous resolutions from the local governments of Haines, Skagway, and Juneau and is reflected in their adopted comprehensive plans. In general, Haines and Skagway local governments have been in favor of improved ferry options due to concerns with economic and social changes in their communities. Conversely, Juneau's government has supported the alternatives with large road components.

The level of controversy is further reflected in the intense interest from the public as expressed in the comments generated for and against the various alternatives through past scoping processes and public hearings, submitted on draft versions of the EIS, and reflected in surveys. Many residents and environmental advocacy groups (local and national) have expressed environmental concerns (captured in the impacts disclosed in this Final SEIS and in the comments summarized in Appendix JJ, *Responses to Draft Supplemental Environmental Impact Statement Comments*), and some groups have filed lawsuits based on those concerns. The history of the lack of consensus and controversy is summarized in Section 2.5.3. It should be noted that the FHWA has not identified any environmental impacts at this time that would preclude selection of a build alternative. In addition, there is nothing about the type or level of controversy on its own that would prevent FHWA from selecting a build alternative.

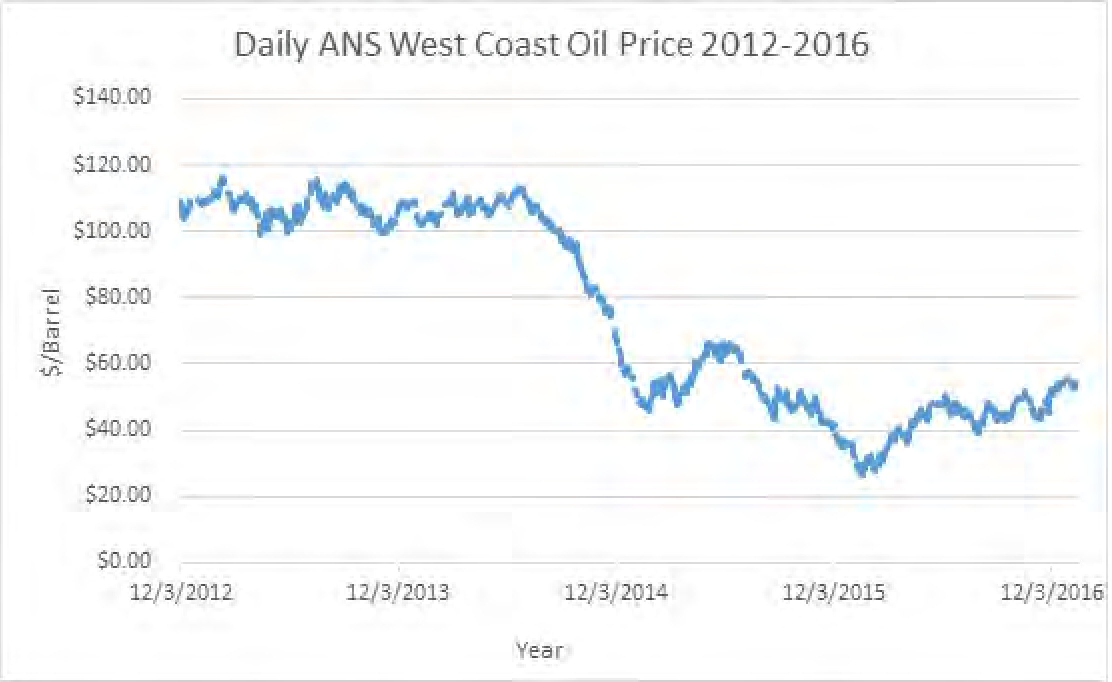
DOT&PF and FHWA have identified Alternative 1 – No Action as the preferred alternative. Both agencies recognize that this alternative will not solve the existing and future transportation problems in Lynn Canal. DOT&PF and FHWA continue to stand by the transportation purpose and need identified and refined over many years with input from the public and agencies, as defined in detail in Chapter 1.

All build alternatives would address the identified transportation problems in Lynn Canal. Alternative 1 – No Action provides only incremental improvement to Lynn Canal transportation challenges. However, travel costs for users will continue to be high; there will be limited opportunities for improvement in flexibility or frequency of when travel can occur; travel times will remain long; limited capacity improvement will be made toward satisfying corridor demand; and costs to the State will remain high considering the low number of vehicles served.

### 2.5.1 Alaska's Economic Conditions

Historically, Alaska's State budget has been heavily reliant on oil taxes/royalties to fund State government. According to the Institute of Social and Economic Research (ISER), between 2005 and 2014, oil revenues averaged 90 percent of Alaska's unrestricted general fund revenues (Knapp, 2015). The following graph (Graph 2-1) depicts the steep decline in oil prices, which has had a detrimental effect on the Alaska economy. While the JAI Project SEIS was in development, oil prices dropped precipitously, going from a high of more than $116 per barrel in February 2013 to a low of just over $26 per barrel in January 2016. While prices stabilized in the $40 to $50 per barrel range in 2016, this represents a price drop of more than 50 percent from the price levels that were experienced earlier in the decade.

**Graph 2-1: Daily West Coast Oil Price, 2012-2016**

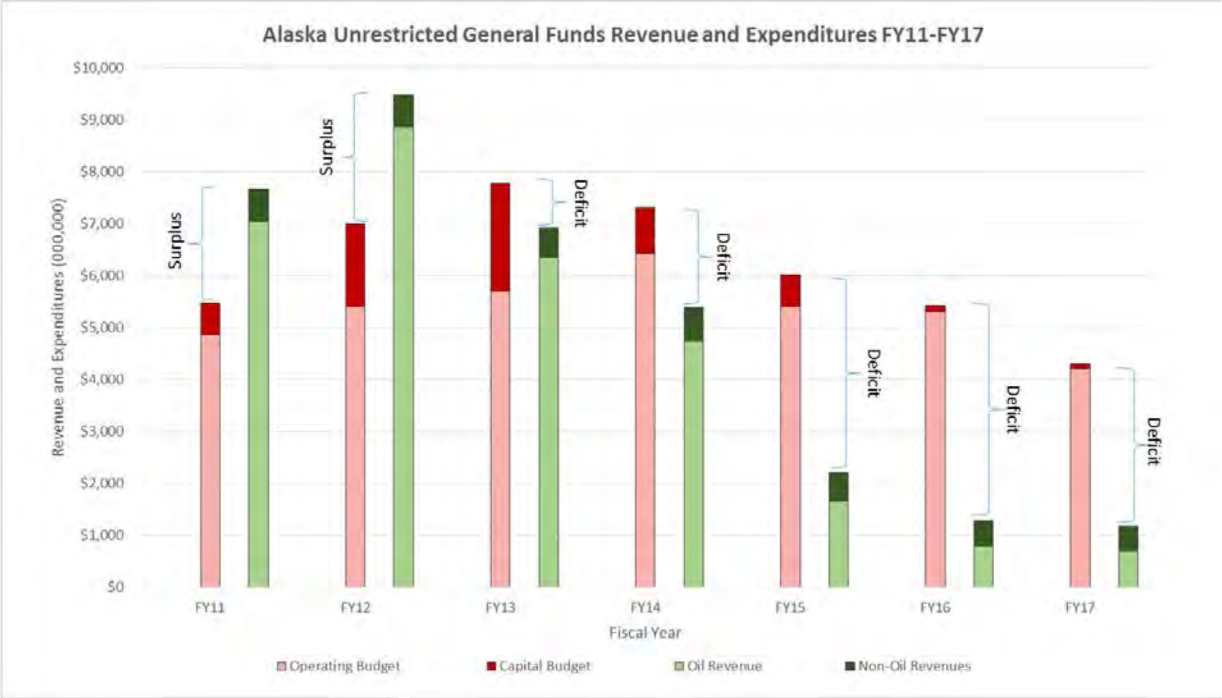


Source: State of Alaska, 2017b

Compounding matters, during that same timeframe, North Slope Oil production also declined. When the Draft SEIS was started in 2012, more than 212.7 million barrels per year were shipped through the Trans-Alaska Pipeline. By 2015 that number had declined to 185.5 million barrels—a 13 percent reduction (Alyeska Pipeline, 2017).

The drop in oil prices and declining production had a substantial impact on the State budget since the publication of the 2014 Draft SEIS. The impact is reflected in the following graph (Graph 2-2). Graph 2-2 shows that as the price of oil fell, Alaska’s unrestricted general fund revenue fell commensurately. ISER reports that between 2012 and 2015 there was a $7.2 billion drop in oil revenues per year (an 81 percent decline; Knapp, 2015). Graph 2-2 also depicts the reliance on oil revenues for funding State government, which historically contributed approximately 90 percent until mid-2014. As a result of declining revenues, the Governor and Legislature have made major cuts to State capital and operating budgets.

**Graph 2-2: Alaska Unrestricted General Funds Revenues and Expenditures, Fiscal Years 2011-2017**



Source: Alaska Division of Legislative Finance, 2017

The State of Alaska started deficit spending in 2013, and that trend accelerated in 2014 with the collapse of oil prices. Graph 2-2 also depicts the cuts to Alaska's capital and operating budgets. Capital budgets, in particular, have been reduced, going from more than $2 billion in Fiscal Year (FY) 2013 to $96 million in FY 2017.

Despite cuts of $3.5 billion from the overall State budget between 2013 and 2017, the deficit still hovered around $3 billion per year in 2016 and 2017. Of note, during the preparation of the Draft SEIS in 2011 through 2013, the Alaska economy and budget were strong, and capital and operating budgets were growing and fully funded. In other words, data available at that time did not hint at the serious budgetary problems the JAI Project would be facing.

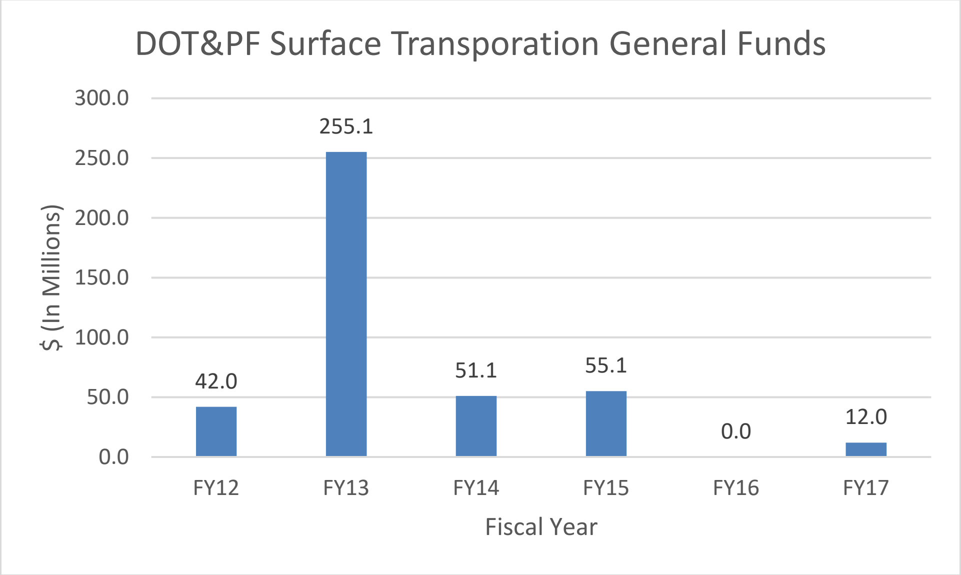
### 2.5.2 DOT&PF Surface Transportation Funding Sources

Alaska's current fiscal situation has affected all State spending, which includes funding for both capital surface transportation projects and DOT&PF's operating budget. DOT&PF's surface transportation program (capital and operating) has three primary sources of funding: (1) State General Funds (allocated through the State Capital Budget process); (2) Federal-aid Highway funds (generally require a 9 percent State match, which in Alaska is funded through State General Funds); and (3) General Obligation Bonds (paid back through State general funds over time). Federal-aid Highway funds cannot be used for operations. Each of these funding sources relies on State General Fund Dollars. With declining State monies available, substantial cuts have been made to both DOT&PF's capital and operating budgets.

***General Funds.*** DOT&PF's General Funds are comprised of both capital funds and routine operating and maintenance funds.

Capital Budget. The following graph (Graph 2-3) shows General Fund contributions to DOT&PF's surface transportation capital program, which do not include State match for Federal-aid Highway funds. While the Draft SEIS was being prepared in 2012 and 2013, the State's General Fund was contributing in excess of $42 million to DOT&PF's surface transportation capital program each year. State General Fund contributions to the capital program are down to $12 million in FY 2017. That is a reduction of $30 million in DOT&PF's capital program as compared to FY 2012 (DOT&PF, 2017).

**Graph 2-3: DOT&PF Surface Transportation General Funds**



Note: Totals include named projects, Roads to Resources, and AMHS overhaul/maintenance.
In FY 13, the Legislature funded a number of construction projects, including one ACF.

Alaska's Office of Management and Budget (OMB) reported in June 2016 that the State's main savings account would only last one more year without a balanced, sustainable fiscal plan, compelling Governor Walker to "conserve cash and avoid incurring additional debt" (State of Alaska, 2016a). The Governor suspended $100 million in DOT&PF State-funded transportation projects that were relying on General Fund dollars from previous capital budgets.[41] He also cut projects like Knik Arm Crossing—a major project that was proposed to be partially funded with State General Funds, State bonds, and U.S. Department of Transportation sources, including Federal-aid Highway funding and a direct loan through the Transportation Infrastructure Finance and Innovation Act. Even though that project had a large amount of federal dollars planned for its construction, due to its size, the contributing amount of State money was considered unaffordable, given the State's budget problems.

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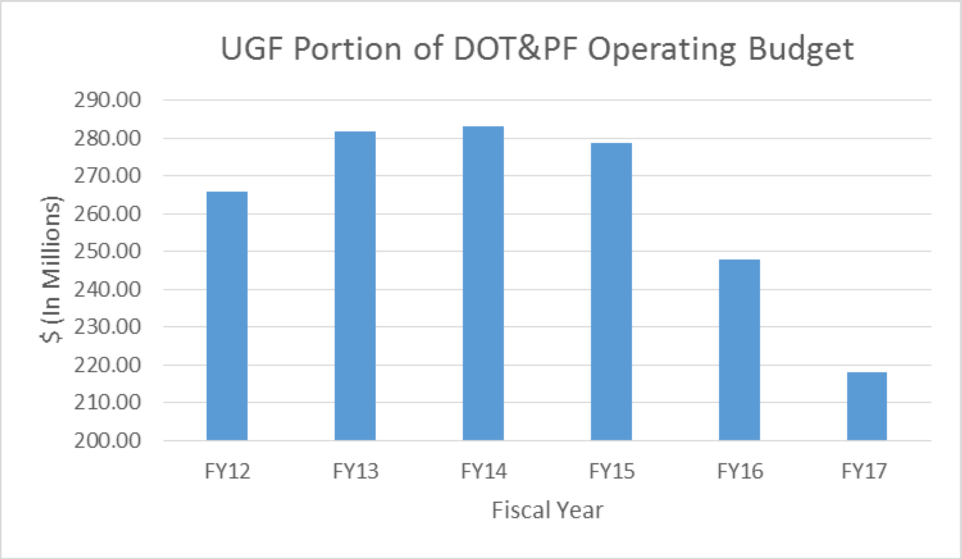
[41] Anchorage: U-Med District Northern Access; Matanuska-Susitna: Fairview Loop Road Reconstruction; Fairbanks: University Avenue Widening; Southeast: Kake-Petersburg Road

Operating Budget. DOT&PF's operating budget has seen similar cuts. The following graph (Graph 2-4) shows General Fund cuts to DOT&PF's operating budget.

**Graph 2-4: Unrestricted General Fund Portion of DOT&PF's Operating Budget**

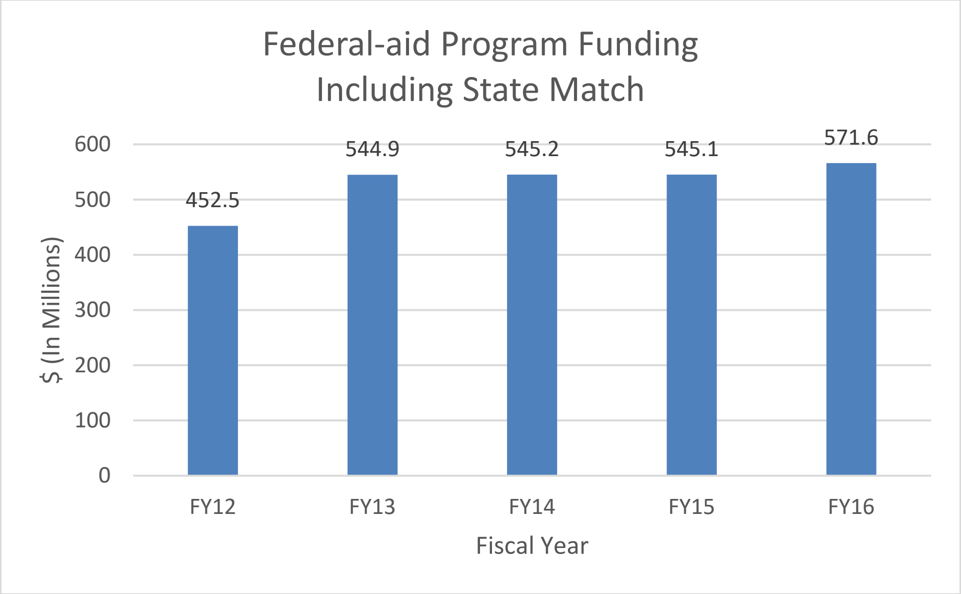


Source: State of Alaska, 2016d

DOT&PF's operating budget was cut from levels that hovered around $280 million in 2013 through 2015 to less than $250 million in 2016. In December 2016, the Governor announced additional cuts, indicating that DOT&PF's Unrestricted General Fund budget for operations would be reduced from the $278 million level funded in FY 2015 to $218 million in FY 2017 (a 22 percent reduction). These cuts required reducing equipment operators statewide by 10 percent, reducing hours of operation at hub airports, and cutting AMHS service (State of Alaska, 2016c). This reality also contributed to the selection of Alternative 1 – No Action as the preferred alternative.

***Federal-aid Highway Funds.*** The following graph (Graph 2-5) shows that Federal Highway funding in Alaska has remained relatively stable over the last several years.

**Graph 2-5: Federal-aid Program Funding**



Note: Federal-aid Program funding includes the Core Highway Program and the Ferry Boat Program. The Core Highway Program consists of the National Highway Performance Program, Surface Transportation Block Grant Program, Transportation Alternatives Program, Congestion Mitigation and Air Quality, PM 2.5 Congestion Mitigation and Air Quality, Recreational Trails Program, Metropolitan Planning Funds, Highway Safety Improvement Program (Flexible, Rural, Rail and Penalty), Statewide Planning, Statewide Research, and National Highway Freight Program. The State match for the core highway program is approximately 9 percent and for the Ferry Boat program is approximately 20 percent. See www.fhwa.dot.gov/resources/legsregs/ for funding levels and www.fhwa.dot.gov/specialfunding/fbp/ for Ferry Boat Program funding information.

Between 2012 and 2015, Federal-aid Highway funding/State match ranged between $452.5 million and $545.1 million, and increased to $571.6 million in 2016. The increase in FY 2016 is due to funding provided under the passage of the Fixing America's Surface Transportation Act. The increase of $119.1 million between 2012 and 2016 represents a 26.3 percent increase over that 5-year period.

***General Obligation Funds.*** The third primary source of surface transportation funding is General Obligation Bonds. The most recent bond package was passed by voters in 2013. That State-funded bond package totaled $254 million. The Governor suspended the issuance of $153 million in General Obligation Bonds from the 2013 voter-approved package, cancelling four highway projects[42] (State of Alaska, 2016a).

The net result is that the current budget deficit has affected the State's ability to advance a build transportation solution in Lynn Canal at this time. Given the State's budgetary reality, Alternative 1 – No Action is a prudent State direction from a fiscal standpoint.

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[42] These projects include Glenn Highway, Hiland Road to Artillery Road Reconstruction (Anchorage); Old Steese Highway to McGrath Road Reconstruction and Extension (Fairbanks); Wendell Street Bridge Replacement (Fairbanks); and Knik-Goose Bay Road Reconstruction (Matanuska-Susitna Borough).

### 2.5.3 Controversy

The continued controversy on the JAI Project contributed to the decision to identify Alternative 1 – No Action as the preferred alternative. This project has had a history of division, with elected officials and the public split on how to proceed. The one thing all parties have agreed on is that there is a need to improve transportation in Lynn Canal; the question has been how to accomplish that. Feelings are strong on both sides, and the sentiment has wavered back and forth over the years on whether to build a road or to improve ferry service to improve transportation in Lynn Canal. The following project history provides a flavor of the controversy associated with the JAI Project and documents the lack of consensus on a course forward.

- February 1994. The City and Borough of Juneau (CBJ) Assembly adopted a resolution indicating that “the City and Borough of Juneau strongly supports improvements to the transportation system in the Lynn Canal corridor” (CBJ, 1994).
- March 18, 1997. The Haines Borough adopted a resolution opposing the construction of the “East Lynn Canal Road,” supporting the other alternatives that did not bypass Haines (Haines Borough, 1997).
- June 1997. DOT&PF and FHWA issued a Draft EIS for the JAI Project. The 1997 Draft EIS did not identify a preferred alternative. The public comment period ran from June 23 to December 15, 1997. As documentation of the interest and controversy, approximately 3,000 public comments were received on the 1997 Draft EIS for and against road and ferry alternatives (see Appendix V of the 2006 Final EIS).
- November 11, 1997. The Haines Chamber of Commerce passed a resolution opposing construction of the East Lynn Canal Road and other road options and supporting improved ferry service (Haines Chamber of Commerce, 1997).
- December 8, 1997. The CBJ passed a resolution supporting improved access to Juneau. The resolution supported improvements to the ferry system in Lynn Canal in the short term, and encourage consideration of road access from Juneau to Skagway in the long term (CBJ, 2007b).
- 1999. A survey conducted for the City of Skagway “indicated that 49 percent of Skagway residents oppose a road while 46 percent were in favor of a road” (DOT&PF, 2006).
- January 2000. “Governor Knowles declared Alternative 2 the state’s preferred alternative. At the same time, Governor Knowles stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued. In February 2000, the DOT&PF Commissioner confirmed the state’s selection of Alternative 2 as the preferred alternative to FHWA, along with a plan to continue obtaining specific data that would be crucial to restarting the EIS at a later date” (DOT&PF 2006).
- January 2000. Governor Knowles decided to advance construction of fast ferries. According to the *Juneau Empire*, “In January 2000, Knowles chose fast ferries as the solution to transportation problems in the upper Lynn Canal. He later vetoed $1.5 million appropriated by the Legislature to complete the EIS on Juneau access, which already had cost $5.1 million” (McAllister, 2001).

- March 12, 2000. Regarding Knowles' decision to move forward with a fast ferry alternative, the *Peninsula Clarion* reported, that "environmentalists hailed the decision to keep cars out of the Berners Bay watershed, a haven for wildlife, kayakers and campers. Civic leaders in Skagway and Haines did too, because they see the road as a threat to local business." The article quoted State Senator Robin Taylor as stating, "Fast ferries are a cruel joke." The *Peninsula Clarion* also reported that Representative Bill Hudson was frustrated that the State spent millions exploring the road when it had no chance of being built, and he was particularly incensed that DOT&PF was not considering building parts of the road to shorten the water miles to Haines and Skagway (Joling, 2000).
- October 2000. The 2006 FEIS reported, "Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road" (2006 Final EIS).
- September 2002. A CBJ Assembly passed a resolution in support of "completion of the EIS for the identified preferred alternative for the road into Juneau …;" it passed by a 5 to 4 vote (2006 Final EIS).
- December 2002. Governor Murkowski "directed DOT&PF to aggressively pursue completion of the Juneau Access Improvements Project EIS. In February 2003, the DOT&PF Commissioner, after reviewing the Draft EIS and the reevaluation that called for a Supplemental Draft EIS, stated that Alternative 2 continued to be the state's preferred alternative. After careful scrutiny of all the studies prepared for the Supplemental Draft EIS, DOT&PF continued to prefer Alternative 2 because of its ability to best meet the purpose of and need for the proposed project, and identified it as the preliminary preferred alternative in the Supplemental Draft EIS" (2006 Final EIS).
- January 2003. The Haines Borough Assembly voted unanimously to request that a road to Haines (as opposed to a road to just Skagway) be included in the EIS (2006 Final EIS).
- March 26, 2003. According to the *Juneau Empire*, "After spending more than three years in project purgatory, the environmental study that could result in the construction of a road linking Juneau and Skagway or enhanced ferry service in upper Lynn Canal has been resurrected by the state Department of Transportation." The article reported that "Plans to build a road have been divisive in Juneau, Haines and Skagway, and many opponents have argued that road construction near Berners Bay cannot be done in an environmentally sound way" (Inklebarger, 2003).
- April 2003. The City Council of Skagway passed a resolution supporting improved ferry service and opposing a road connection by a 4 to 1 vote (2006 Final EIS).
- July/August 2003. As part of the EIS process, surveys were conducted in Juneau, Haines, Skagway, and Whitehorse (McDowell, 2003).
    - When asked about the importance of improving transportation in and out of Juneau, 78 percent of Juneau residents, 87 percent of Haines residents, and 83 percent of Skagway residents stated it was either important or very important.
    - When asked to choose between improved ferry service, an East Lynn Canal road, and a West Lynn Canal road, residents of the three communities showed very different preferences. Among Juneau residents, the top two alternatives were

improved ferry service and an East Lynn Canal road, each chosen by 36 percent of respondents; 53 percent of Haines residents preferred improved ferry service to either road alternative, while 33 percent chose the West Lynn Canal alternative; and 53 percent of Skagway residents preferred improved ferry service. The East Lynn Canal alternative was selected by 38 percent of residents.

- April 2004. The Haines Borough Assembly adopted a resolution requesting that the State and federal governments focus on enhancing marine transportation within the region (2006 Final EIS).
- October 2004. In an October 2004 advisory ballot, Skagway residents voted 62 to 38 percent in favor of improved ferry service over a road (2006 Final EIS; Inklebarger, 2004).
- January 15, 2004. The Skagway City Council passed a resolution “Supporting Ferry Service between Juneau and the Upper Lynn Canal and Opposing the Construction of any Road Linking Juneau to Skagway or Haines” (Municipality of Skagway, 2004b).
- January 2005. DOT&PF and FHWA released a Supplemental Draft EIS for public comment, accepting comments until March 2005. The Supplemental Draft EIS identified Alternative 2 as the preferred alternative for the JAI Project.
- March 2005. DOT&PF received a total of 1,373 written submissions during the public review period and oral testimony from a total of 227 individuals who attended the four public hearings held in Juneau, Haines, and Skagway. Approximately 11,000 comments were identified (2005 Supplemental Draft EIS). Comments submitted during the review period for the Supplemental Draft EIS that expressed a preference regarding alternatives were approximately 60 percent in support of a highway, with 40 percent preferring a marine alternative. During the Supplemental Draft EIS review period, both branches of the Alaska Legislature submitted resolutions in support of Alternative 2, the East Lynn Canal Highway with Katzehin Terminal (2006 Final EIS).
- January 2006. FHWA issued a Final EIS for the JAI Project. Alternative 2B (East Lynn Canal Highway to Katzehin, with shuttles to Haines and Skagway) was identified as the preferred alternative (2006 Final EIS).
- April 2006. FHWA signed the Record of Decision (ROD) for the JAI Project. Alternative 2B (East Lynn Canal Highway to Katzehin, with shuttles to Haines and Skagway) was the selected alternative (2006 ROD).
- August 16, 2006. A lawsuit was filed in District Court alleging, among other items, that FHWA violated NEPA by failing to consider reasonable alternatives for improving transportation in Lynn Canal that use existing infrastructure without new construction.
- October 29, 2007. Governor Sarah Palin’s office issued a statement urging people to contact their legislators to support an East Lynn Canal Highway (included as a “whereas” statement in Haines Borough, 2007b).
- November 2007. The Haines Borough Assembly adopted a resolution reaffirming its support for their earlier resolution (04-04-042) expressing a “preference for improved ferry service rather than an East Lynn Canal Highway” (Haines Borough, 2007b).

- February 13, 2009. The District Court vacated FHWA's ROD, concluding that FHWA violated NEPA by failing to consider an alternative for improved ferry service using existing ferries and terminals (*Southeast Alaska Conservation Council, et al. v. Federal Highway Administration*, 2009 WL 10677763 [D. Alaska, 2009]).
- February 2009. The *Municipality of Skagway 2020 Comprehensive Plan* was adopted and included a policy that stated, "Support the AMHS and private ferry service (for public use) to and from Skagway. Support regular day boat ferry service in Lynn Canal and continue to improve AMHS ferry service and scheduling" (Municipality of Skagway, 2009:55).
- January 2011. The Haines Borough Assembly passed a resolution that reaffirmed two earlier resolutions and expressed "their continued preference for improved ferry service rather than an East Lynn Canal Highway" (Haines Borough, 2011).
- May 2011.The State of Alaska appealed the District Court ruling to the U.S. Court of Appeals for the Ninth Circuit and in May 2011, the three-judge panel ruled 2 to 1 to uphold the District Court decision that the 2006 Final EIS was not valid because it did not include an alternative that would improve transportation using existing assets (649 F.3d 1050 [9th Cir. 2011]).
- January 2012. In response to the Court ruling, FHWA determined that an SEIS should be prepared for the JAI Project. FHWA began this process by publishing a Notice of Intent (NOI) in the *Federal Register* on January 12, 2012, to formally announce the initiation of the JAI SEIS (*Federal Register*, Volume 77, Number 8, 2012; 2012 SEIS *Scoping Summary Report*).
- November 2013. CBJ adopted an update to the comprehensive plan that included the following policy: "Support development of a Lynn Canal Highway, as this facility is important to provide improved transportation to the Capital City for Alaska's citizens, Alaska's legislators, and for the economic well-being of Juneau and the Southeast Region" (CBJ, 2013:108).
- March 2014. Haines Mayor Stephanie Scott sent a letter to the Senate and House Transportation Committees expressing the Borough's preference for improved ferry service over a hard link. (Haines Borough, 2014).
- September 2014. DOT&PF and FHWA released a Draft SEIS. The comment period ended November 25, 2014. More than 42,200 communications were received. The project garnered attention from national environmental groups, which were able to generate more than 41,000 form letters from across the country. Comments were received, both for and against nearly every alternative, with the most attention paid to Alternative 2B (the DOT&PF's preferred alternative identified in the Draft SEIS).
- December 2016. Governor Bill Walker articulated the State's fiscal circumstances in a press release dated December 15, 2016, announcing that he preferred Alternative 1 – No Action and that the JAI Project was being cut from the budget. He stated, "I am a builder by background and understand the importance of construction projects, but I am very concerned with our current multi-billion dollar fiscal crisis and must prioritize the need for fiscal resolution" He added that he "made this difficult decision after reviewing all

litigation and all federal regulatory decisions on this project to date" (State of Alaska, 2016d).

- December 2016. Governor Walker's announcement generated its own controversy. Senator Dennis Egan stated, "I've supported this project since statehood. I'm very disappointed my three largest communities will lose the benefit from improved transportation, commerce and tourism" (Alaska Senate Democratic Caucus, 2016)
- January 23, 2017. The CBJ Assembly adopted Resolution 2784, "A Resolution Affirming the City and Borough of Juneau's Continuing Support of the Juneau Access Project." Adopted as amended. (CBJ, 2017)

As can be seen by the history of the JAI Project, controversy has remained high throughout its lifetime. There is no consensus among the communities of Juneau, Haines, and Skagway (in their plans or by their elected officials) as to which build alternative best meets the region's needs.

### 2.5.4 Summary

In summary, DOT&PF and FHWA find the following:

- Declining oil prices have caused the need for cuts to State budgets;
- Declining revenues, particularly General Fund revenues, have resulted in substantive cuts to DOT&PF's capital and operating budgets;
- The net result of the current budget shortfalls is that the State cannot afford a high-cost, build transportation project in Lynn Canal at this time; and
- Controversy on the JAI Project is high.

Given the State's budgetary reality, coupled with a high level of controversy, DOT&PF and FHWA have identified Alternative 1 – No Action as the preferred alternative.

## 2.6 Funding Considerations

Because DOT&PF and FHWA intend to select Alternative 1 – No Action in the ROD, no capital funding is necessary. Fares on marine links, along with State general funds, would continue to fund M&O for the ferry links on Alternative 1 – No Action.

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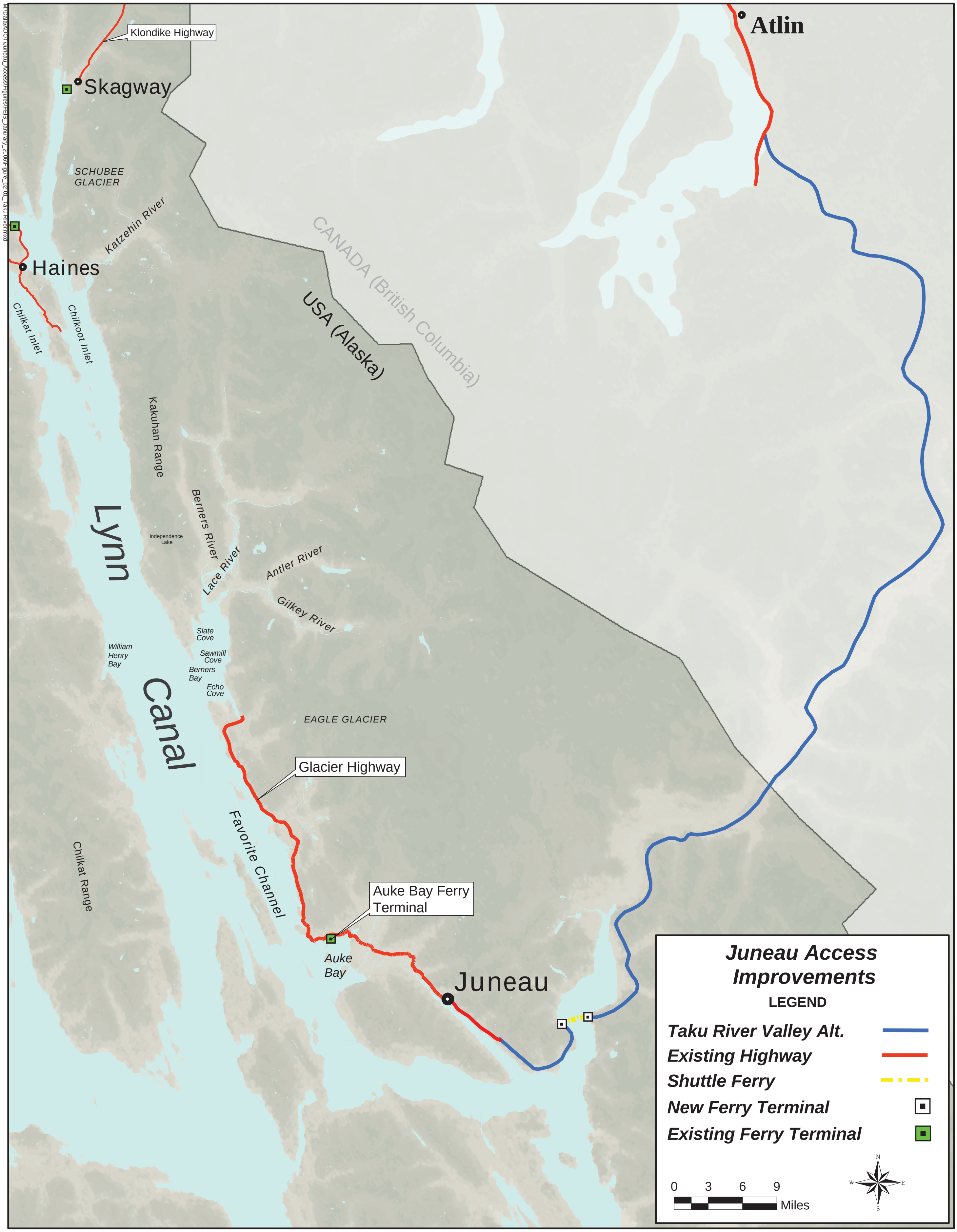

Figure 2-1
Taku River Valley Highway Alternative

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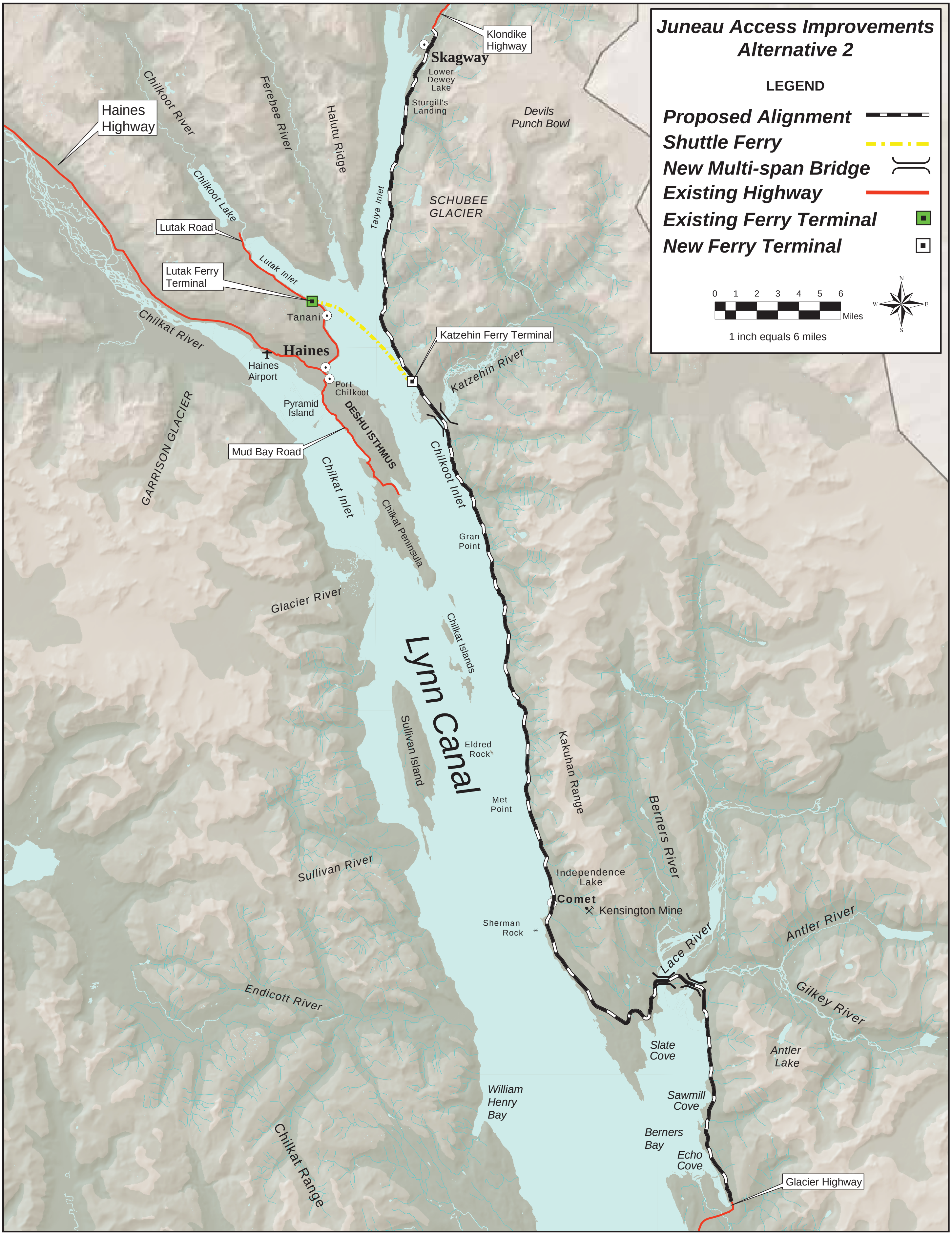

Figure 2-2
Alternative 2 : East Lynn Canal Highway with Katzehin Ferry Terminal

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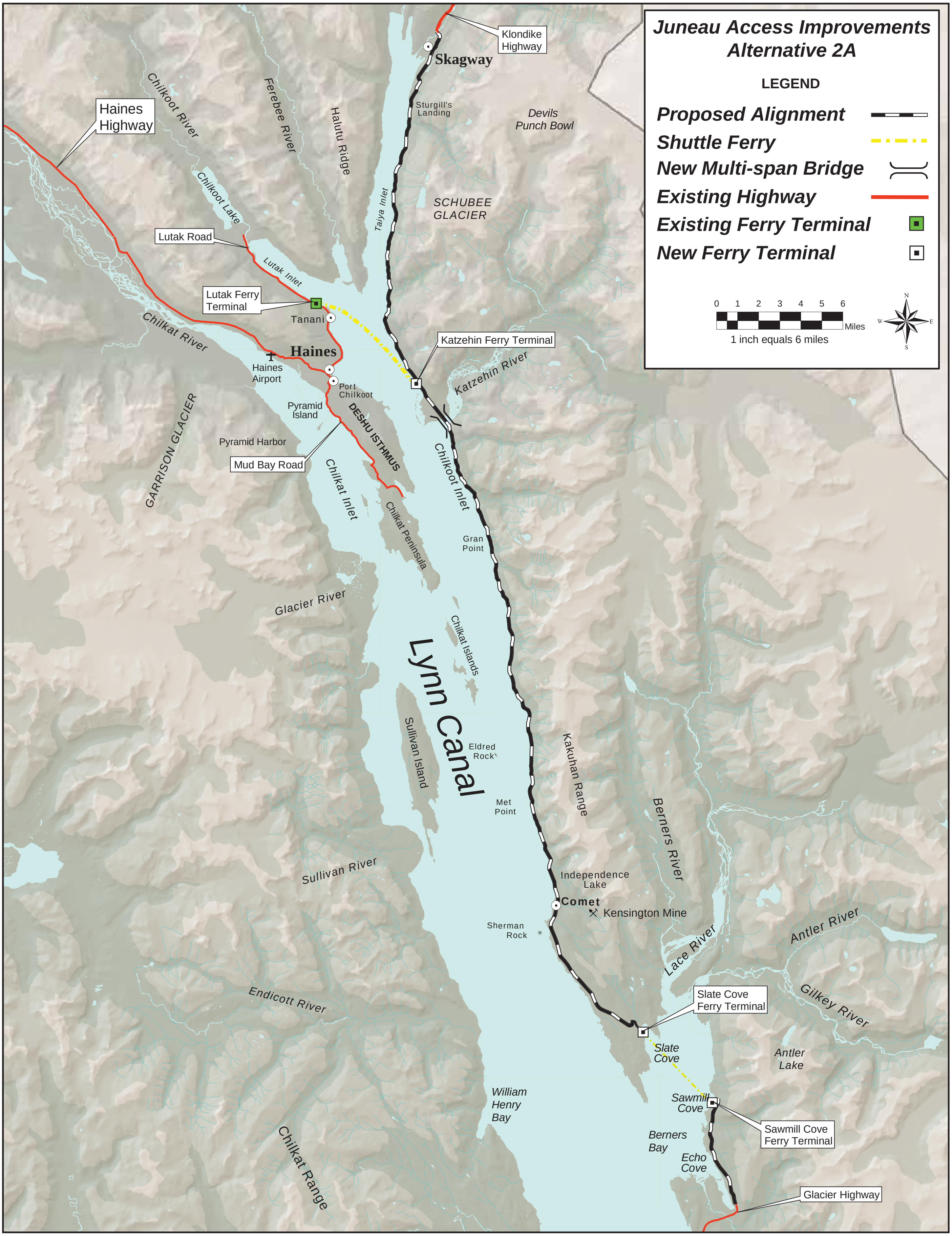

Figure 2-3

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

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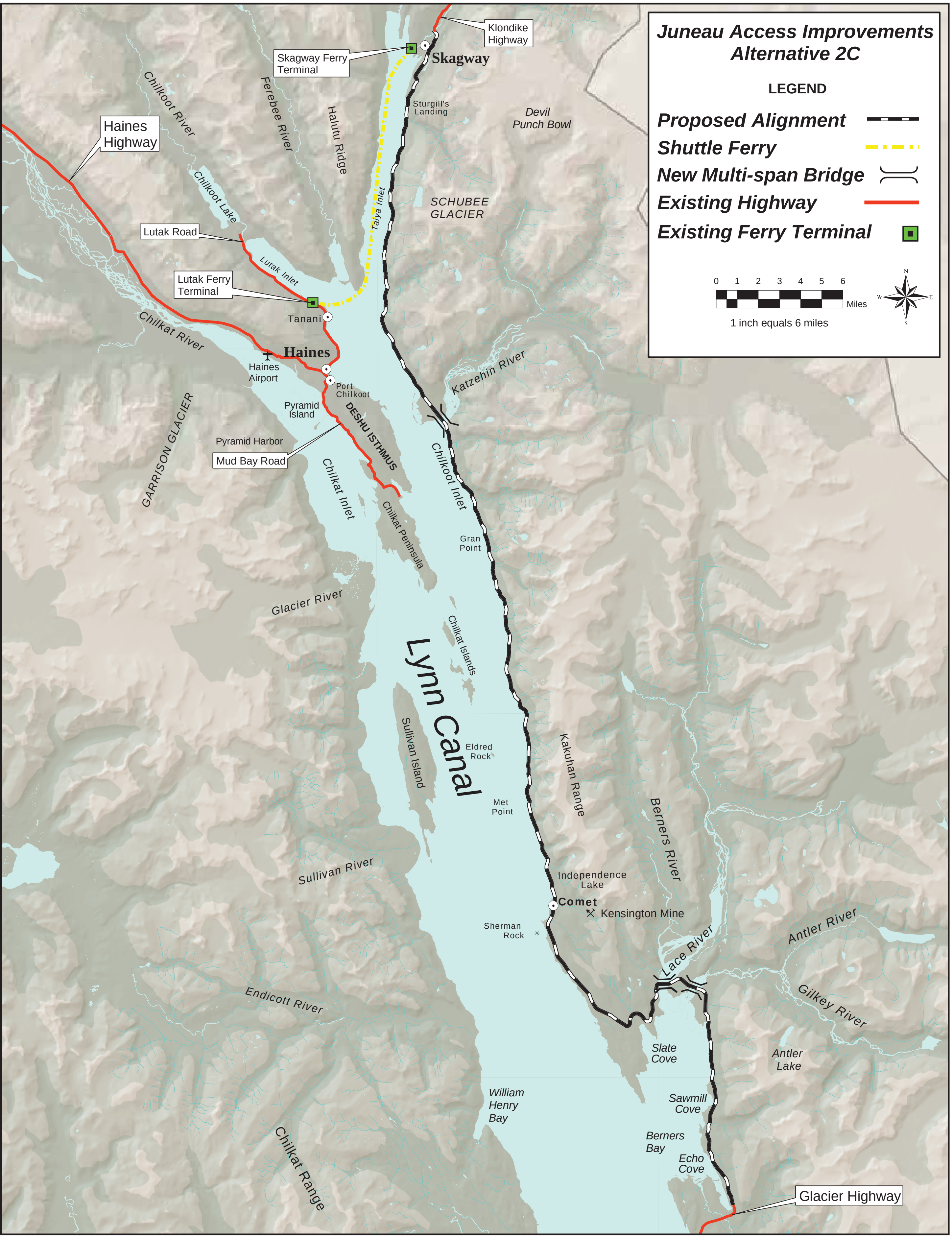

Figure 2-4
Alternative 2C: East Lynn Canal Highway with Haines/Skagway Shuttle

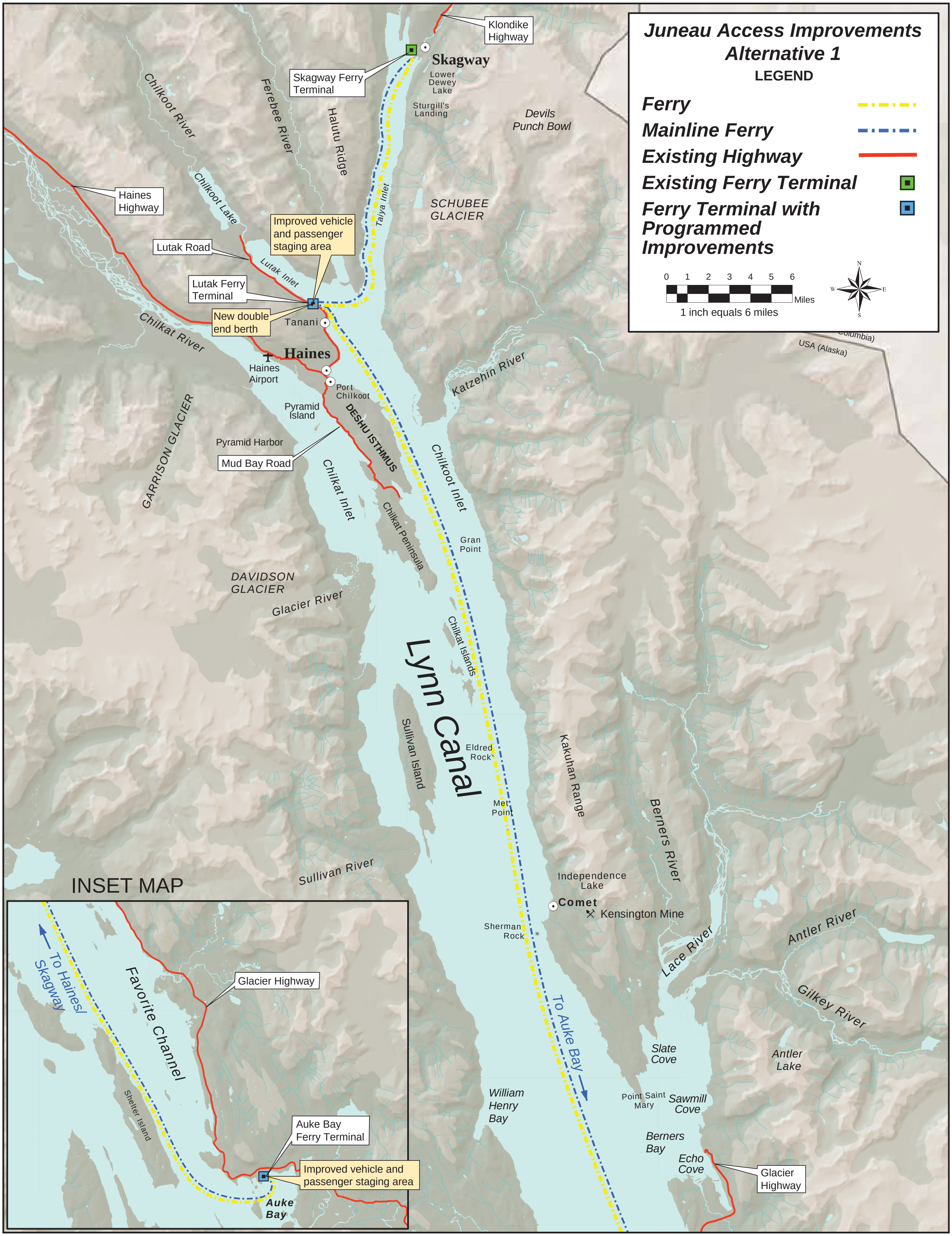

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**Figure 2-5**
**Alternative 1: No Action Alternative**

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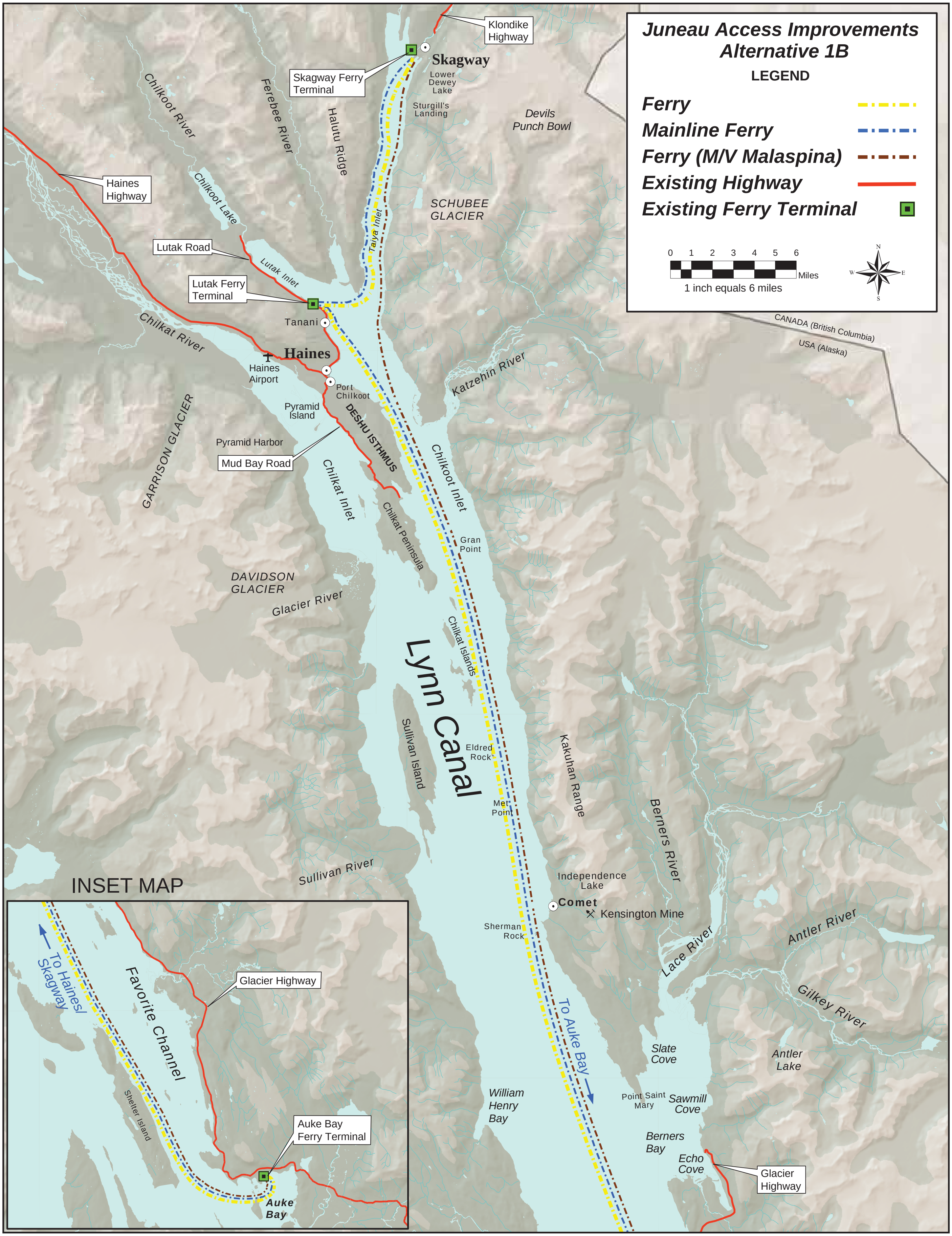

Figure 2-6

Alternative 1B: Enhanced Service with Existing AMHS Assets

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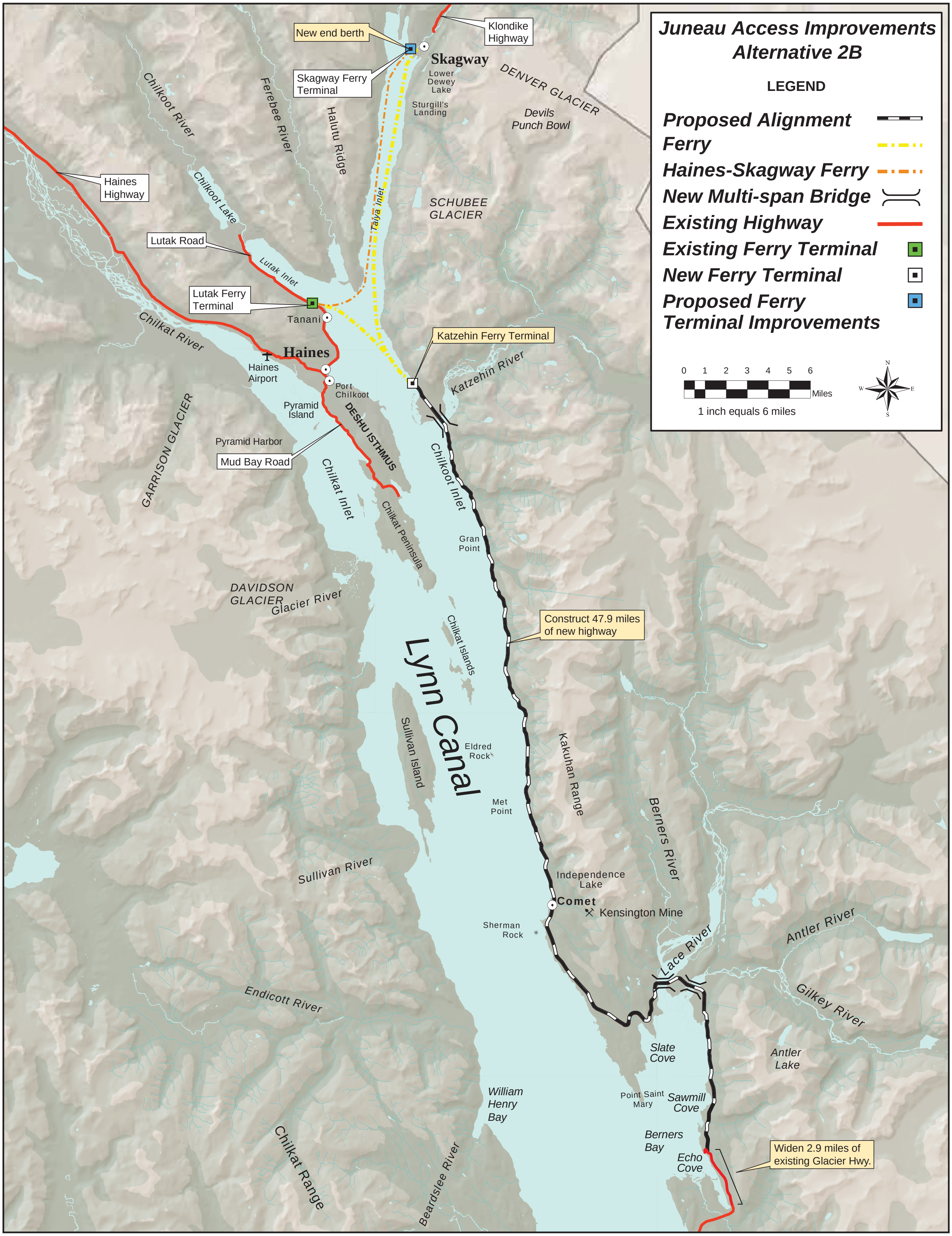
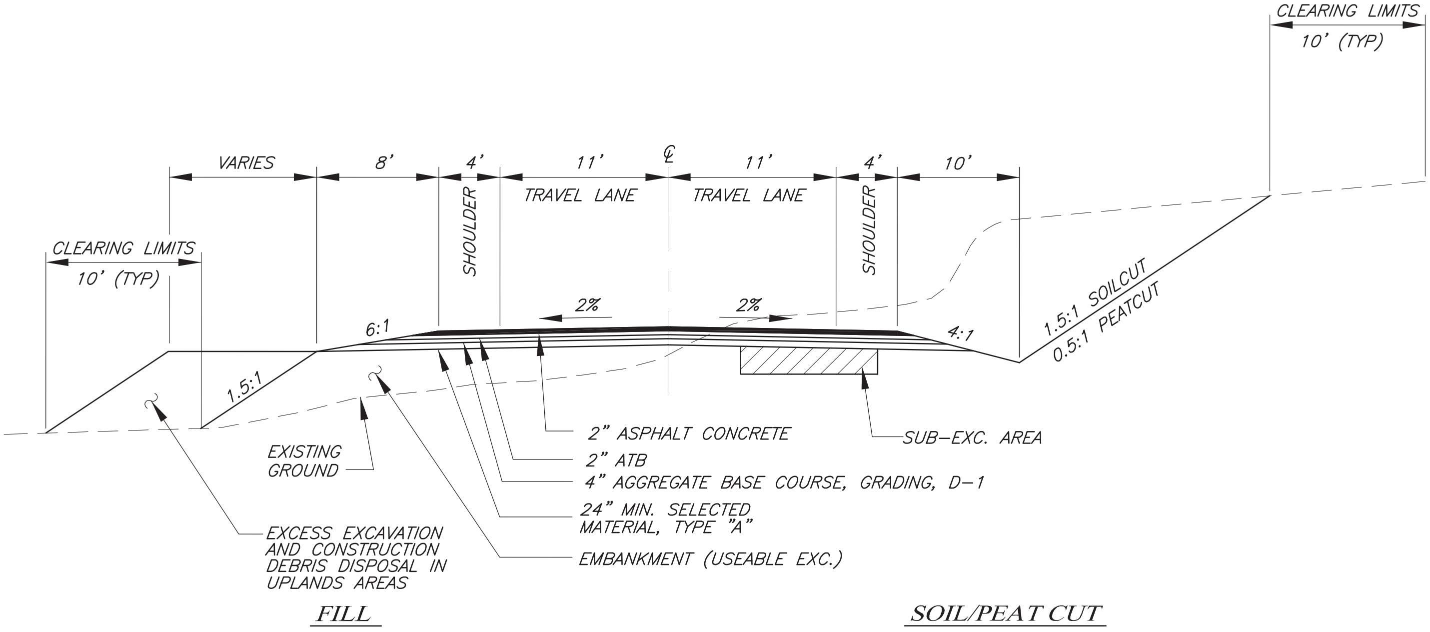


Figure 2-7a
Alternative 2B: East Lynn Canal Highway to Katzehin Ferry Terminal with Shuttles to Haines & Skagway

**Juneau Access Improvements**
**Typical Roadway Section**

**Cut and Fill Typical**
**Both Sides of Roadway**



## TYPICAL ROADWAY SECTION

CUT AND FILL TYPICAL BOTH SIDES OF ROADWAY

**Figure 2-7b**
**Typical Roadway Section**

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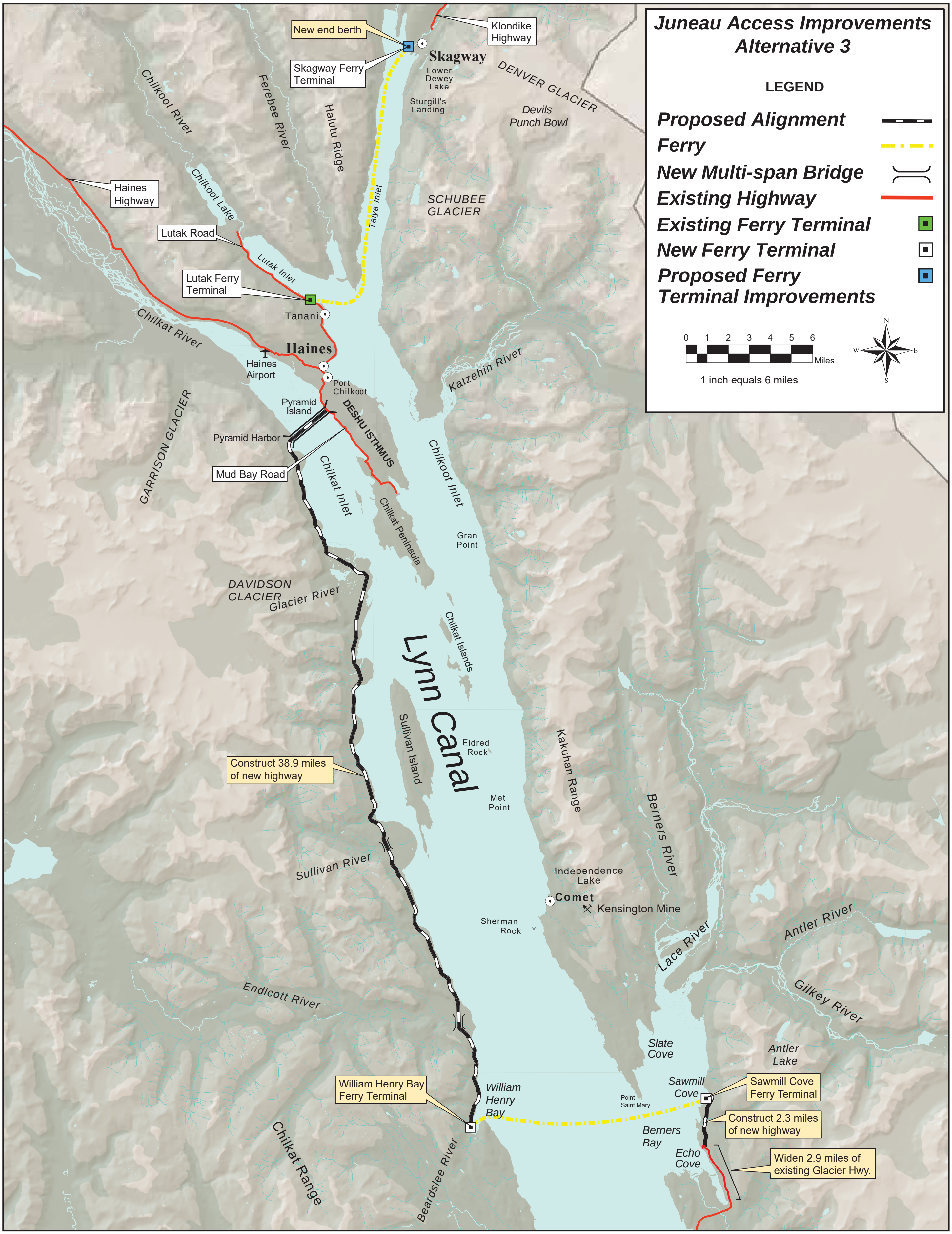

Figure 2-8
Alternative 3: West Lynn Canal Highway

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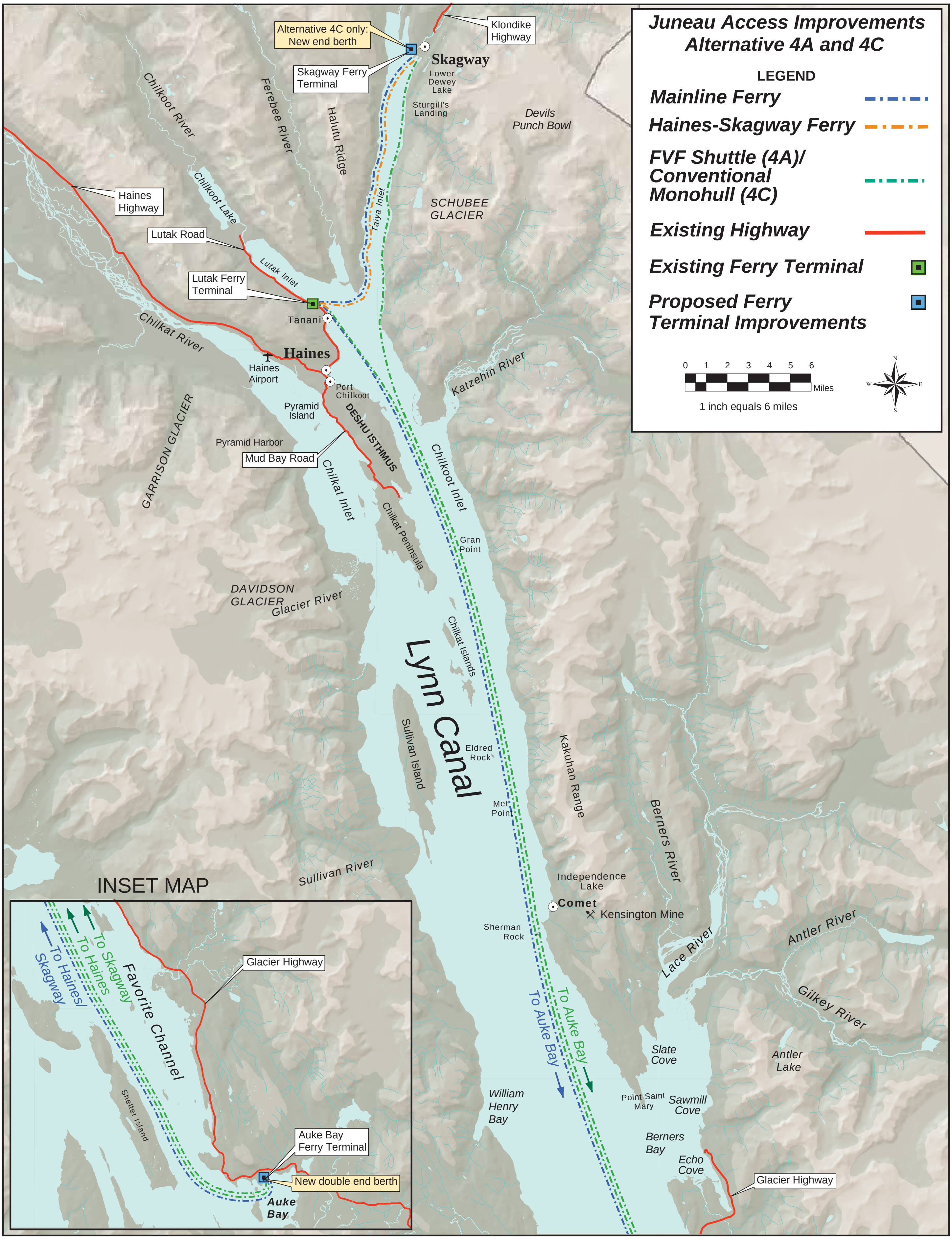

Figure 2-9
Alternative 4A: Fast Vehicle Ferry (FVF) and Alternative 4C: Conventional Monohull Shuttle Service from Auke Bay

M:\Data\ADOT\Juneau_Access\Figures\FEIS_Janurary_2006\Figure_02-10_Alt4B_4DSummer.mxd

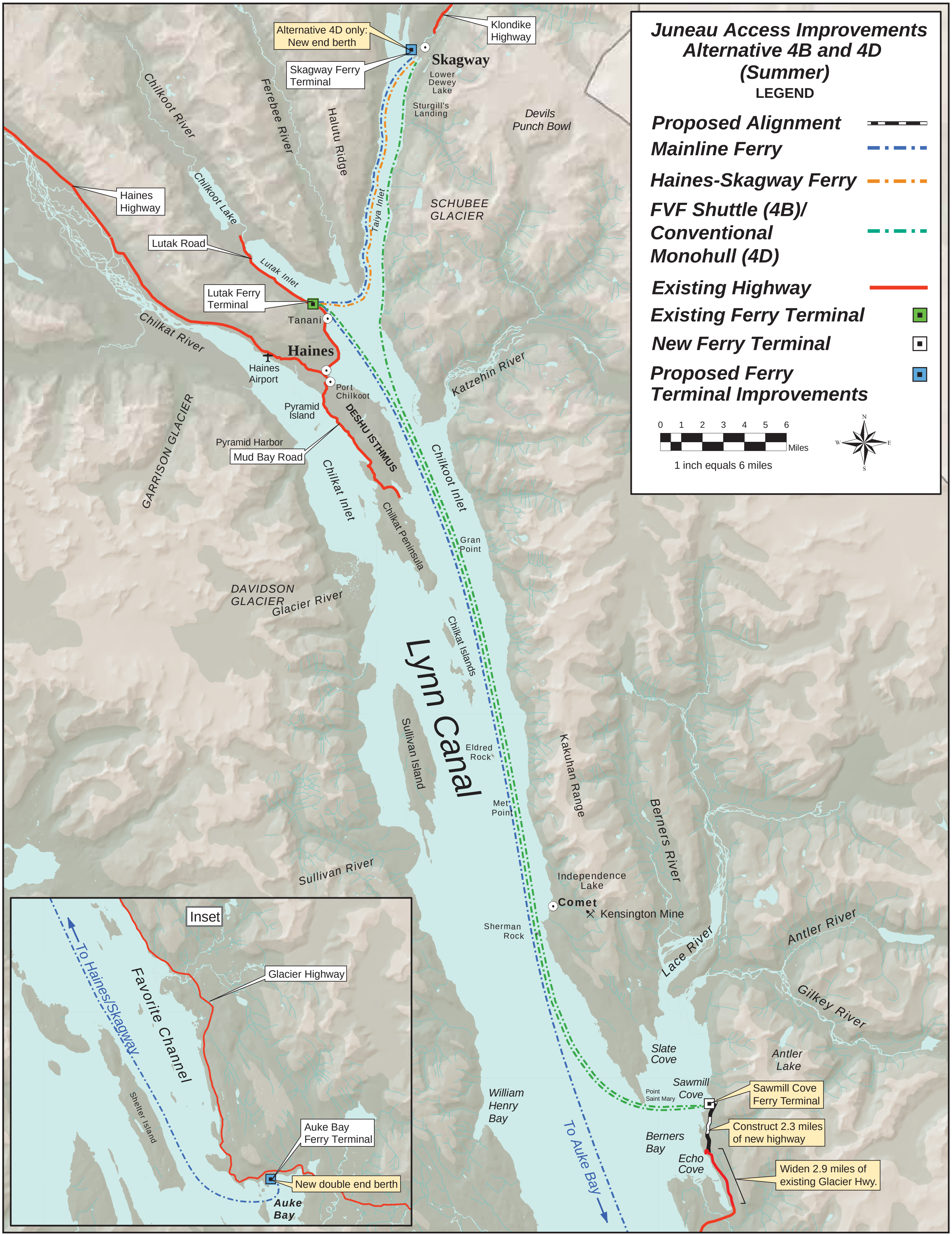

Figure 2-10

Alternative 4B: Fast Vehicle Ferry (FVF) and Alternative 4D: Conventional Monohull Shuttle Service from Berners Bay (Summer)

M:\Data\ADOT\Juneau_Access\Figures\FEIS_Janurary_2006\Figure_02-11_Alt4B_4DWinter.mxd

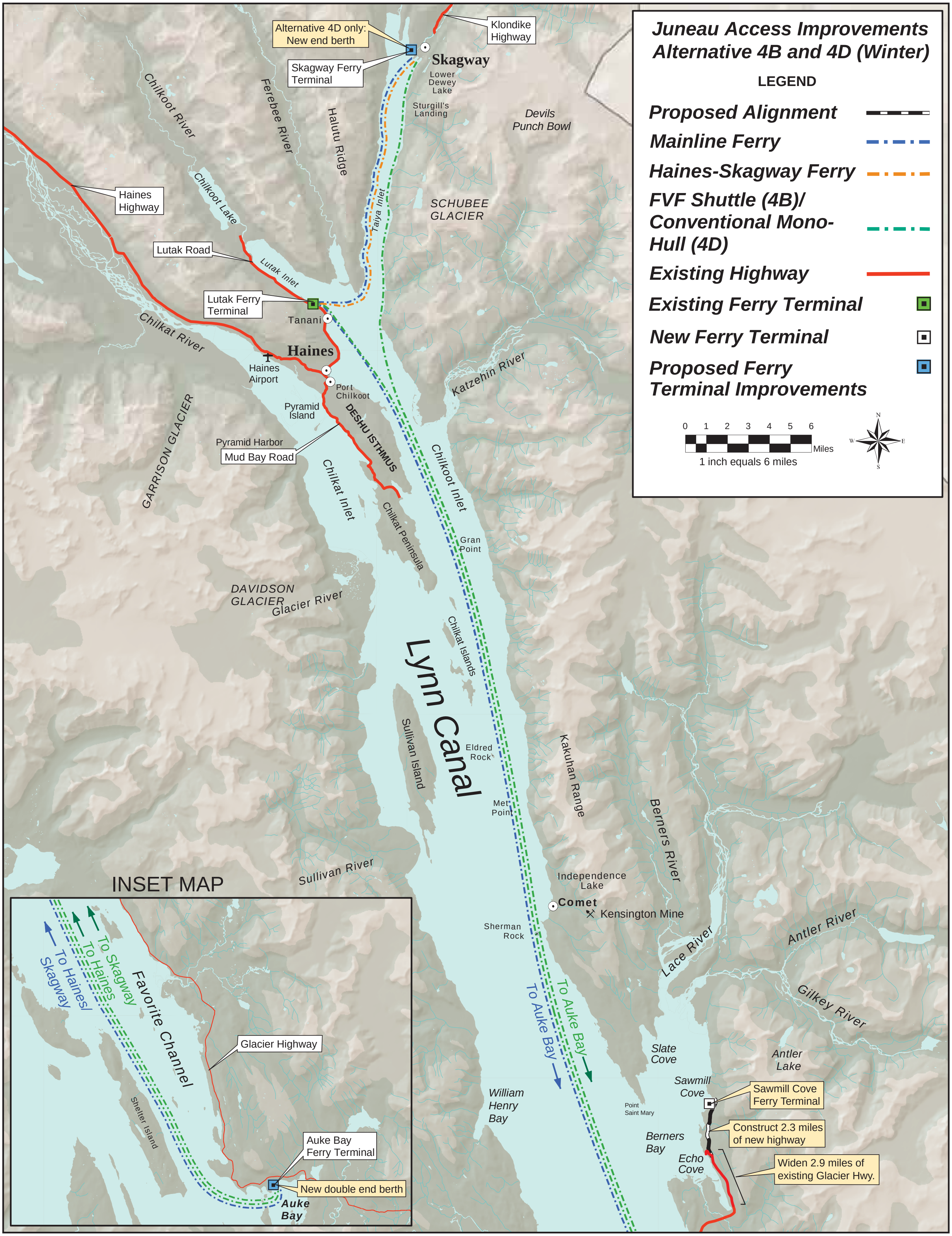

**Figure 2-11**
**Alternative 4B: Fast Vehicle Ferry (FVF) and Alternative 4D: Conventional Monohull Shuttle Service from Auke Bay (Winter)**

# 3 AFFECTED ENVIRONMENT

## 3.1 Social and Economic Environment

### 3.1.1 Land Use

The Alaska Department of Transportation and Public Facilities (DOT&PF) updated the 2004 *Land Use and Coastal Management Technical Report*, presented as Appendix F in the 2005 Supplemental Draft Environmental Impact Statement (Supplemental Draft EIS), and its addendum, presented in Appendix W of the 2006 Final Environmental Impact Statement (Final EIS). The *Land Use Technical Report*, Revised[1] Appendix DD of this Final Supplemental Environmental Impact Statement (SEIS), presents new information from the 2016 *Tongass Land and Resource Management Plan* (TLRMP), Alaska Department of Fish and Game (ADF&G), City and Borough of Juneau (CBJ), Municipality of Skagway Borough, Haines Borough, National Oceanic and Atmospheric Administration, interviews conducted by Northern Economics, Inc., and personal communications with agency representatives. Additional contacts were made with federal, State, and local officials and private parties to update planning, land management, and land use information.

The project area includes federal, State, local, and private lands. Most of the federal lands are within the Tongass National Forest and are managed by the U.S. Forest Service (USFS). The other federal land in the study area is Klondike Gold Rush National Historical Park (NHP) in downtown Skagway, which is administered by the National Park Service (NPS). The principal discussion on Klondike Gold Rush NHP is provided in Section 3.1.1.2.

A majority of the State lands in the project area are within the Haines State Forest along West Lynn Canal and are managed by the Alaska Department of Natural Resources (ADNR) Division of Forestry. Local government lands are managed by the CBJ, Haines Borough, and the Municipality of Skagway Borough. Private lands include Native corporation holdings, Native allotments, private commercial, and private residential properties. Important changes in the project study area since preparation of the 2006 Final EIS are that the City of Skagway is now the Municipality of Skagway Borough, and the Kensington Mine is in production.

Figures 3-1 and 3-2 (all Chapter 3 figures are at the end of the chapter) depict land ownership on the northern and southern ends of Lynn Canal, respectively. Primary landowners and managers in the study area are described further in the following subsections.

#### 3.1.1.1 United States Forest Service

Most of the lands in the study area are managed by the USFS as part of the Tongass National Forest. Management direction for these lands is set forth in the 2016 TLRMP (USFS, 2016a). The 2016 TLRMP updated the 1997 *Tongass Land and Resource Management Plan* (USFS, 1997b; referred to as the TLMP in the 2006 Final EIS) and the 2008 TLRMP (USFS 2008b), which was referenced in the 2014 Draft SEIS. It guides natural resource decision making in the Tongass National Forest by establishing management standards and guidelines for a variety of

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[1] This SEIS is based on the 2014 Draft SEIS and substantive changes have been highlighted in gray for easy identification by the reader.

activities, based on Land Use Designations (LUDs)[2]. Figure 3-3 identifies LUDs within the study area.

Two main LUD categories were established in the TLRMP: Non-Development (which maintains old-growth forest habitat) and Development. Each LUD category consists of subcategories of LUD designations, which are described below. (Note that not all of these LUDs occur in the Lynn Canal corridor.)

**Non-Development LUDs**

- Wilderness LUD Group
    - Wilderness – Preserve essentially unmodified areas to provide opportunities for solitude and primitive recreation. Roads and trails for motorized access are "not permitted except where authorized by the ANILCA [Alaska National Interest Lands Conservation Act] and to access surrounded state and private land and valid mining claims subject to stipulations to protect Wilderness resources and values" (USFS, 2016a, p. 3-20).
    - Wilderness National Monument – Manage monuments to provide opportunities for solitude and primitive recreation. Limit motorized access.
    - Non-Wilderness National Monument – Facilitate the development of mineral resources in a manner compatible with the National Monument purposes.
- Natural Setting LUD Group
    - LUD II – Maintain the wildland characteristics of these Congressionally designated roadless areas; permit fish and wildlife improvements and primitive recreation facilities; and permit roads for access for transportation needs identified by the State.
    - Old-Growth Habitat – Maintain old-growth forests in a natural or near-natural condition for wildlife and fish habitat. "New road construction is generally inconsistent with Old-growth Habitat LUD objectives, but new roads may be constructed if no feasible alternative is available." (USFS, 2016a, p. 3-62)
    - Research Natural Areas – Manage areas for research and education and/or to maintain natural diversity of National Forest System lands.
    - Remote Recreation – Provide for recreation in remote natural settings outside Wilderness, where opportunities for solitude and self-reliance are high.
    - Semi-Remote Recreation – Provide for recreation and tourism in natural-appearing settings, where opportunities for solitude and self-reliance are moderate to high.
    - Enacted Municipal Watersheds – Manage municipal watersheds to meet State water quality standards for domestic water supply.
    - Special Interest Areas – Preserve areas with unique archaeological, historical, scenic, geological, botanical, or zoological values.
    - Wild, Scenic, and Recreational Rivers – Maintain and enhance the outstandingly remarkable values of river segments, which qualify a river to be classified as a Wild, Scenic, or Recreational River.

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[2] An LUD is a management prescription allocated to specific areas of National Forest System land.

### Development LUDs

- Modified Landscapes – Provide for natural-appearing landscapes while allowing timber harvest and a mix of resource activities, including mineral development.
- Scenic Viewsheds – Maintain scenic quality in areas viewed from popular land and marine travel routes and recreation areas, while permitting timber harvest.
- Experimental Forest – Provide opportunities for forest practices research and demonstration.
- Timber Production – Manage the area for industrial wood production. Promote conditions favorable for timber resources and for maximum long-term timber production.

In addition to the LUDs, the 2016 TLRMP provided Standards and Guidelines for Transportation Systems Corridors (TSCs). The plan direction for TSCs is to facilitate the availability of National Forest land for the development of existing and future TSCs, such as those identified by the State of Alaska in the Southeast Alaska Transportation Plan (2004) and in applicable laws (e.g., Section 4407 of Public Law 109-59, and Title XI of ANILCA, Public Law 96-487) (USFS, 2016a, p. 5-11). See also Section 3.1.1.3 regarding Section 4407 easements. The TSC concept of the 2016 TLRMP replaced the Transportation Utility System (TUS) Overlay LUD concept of the 2008 TLRMP. According to the 2016 TLRMP, the Standards and Guidelines for TSCs are management prescriptions that take precedence within any LUD where a TSC has been identified (either an existing major transportation development, or one proposed).

Note: In awareness and anticipation of the Juneau Access Improvements (JAI) Project, the 2008 TLRMP, which was referenced in the JAI 2014 Draft SEIS, and its predecessor, the 1997 TLMP, which is referenced in the 2006 Final EIS, designated the two possible road corridors (one on the east side and one on the west side of Lynn Canal) as TUS LUDs (USFS, 2008b, p. 3-128). These corridors were formally granted to the State by law and are represented in the 2016 TLRMP Land Use Designations map as “State of Alaska ROW (PL 109-59) and Final Southeast Alaska Transportation Plan (2004).” As noted in Section 1.1 of this Final SEIS, the 2006 lawsuit against the JAI Project alleged the USFS violated the National Forest Management Act by approving a right-of-way (ROW) crossing designated old-growth habitat without determining that no feasible alternative existed. The lawsuit was based on TUS LUD and Old-Growth Habitat LUD Standards and Guidelines in the 2008 TLRMP. Detailed information is provided in the paragraphs below to clarify the purpose of old-growth habitat within the Tongass National Forest, which was an important element of the 2008 TLRMP and remains important in the 2016 TLRMP. These paragraphs clarify why no analysis regarding other feasible alternatives is required.

The 2016 TLRMP preserves a large acreage of old-growth forest habitat by designation of Non-Development LUDs. These LUDs function as medium or large old-growth reserves (OGRs). Smaller amounts of old-growth forest habitat that meet specific criteria for size, spacing, and composition[3] are preserved in the form of small reserves designated as Old-Growth Habitat LUDs.

The Old-Growth Habitat LUD management prescription states that “new road construction is generally inconsistent with Old-Growth Habitat LUD objectives, but new roads may be constructed if no feasible alternative is available” (USFS, 2016a, p. 3-62). The prescription

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[3] Specific requirements are discussed in Appendix D to the 2016 TLRMP Final EIS (USFS, 2016b, p. D-8) and in Appendix K of the 2016 TLRMP itself (USFS, 2016a, p. K-3).

indicates that the USFS generally must perform transportation analysis “to determine if other feasible routes avoiding this LUD exist during the project environmental analysis process” (USFS, 2016a, p. 3-62).

The 2016 TLRMP indicates how the USFS is to manage TSCs; the plan provides TSC Standards and Guidelines for Forest Health, Recreation and Tourism, Scenery, Timber, Wildlife, and other resources. According to the USFS, in its Final EIS on the 2016 TLRMP (USFS 2016b):

> *TSC plan components (e.g., Standards and Guidelines in the Forest Plan) would take precedence over other Forest-wide and LUD-specific standards and guidelines (subject to applicable laws) where TSC are proposed or exist.* (USFS 2016b, p. 3-313)

The easements granted to the State in Section 4407 of Public Law 109-59, as amended, are acknowledged in the TLRMP as an example of what makes a TSC. The law granted these easements on the Tongass National Forest regardless of underlying management direction. Therefore, in combination with the precedence language quoted above, 4407 easements that are TSCs would not be subject to  the Old-Growth Habitat LUD Standards and Guidelines that discourage roads once a State highway is proposed (i.e., becomes a TSC). The Standards and Guidelines that state “new road construction is generally inconsistent” and that the USFS must perform transportation analysis regarding feasible avoidance routes are applicable only to proposed road development that does not qualify as a TSC (e.g., roads that are not “major roads,” or roads proposed by the USFS).

**LUDs on East Side of Lynn Canal** –The northwest side of Berners Bay has two areas designated as Old-Growth Habitat, located both east and west of Slate Cove; an additional area of Old-Growth Habitat occurs about midway between Comet and Met Point. These Old-Growth Habitat LUDs were enlarged as part of the 2004 USFS Kensington Gold Project Record of Decision (ROD; USFS, 2004). Figure 3-3 includes the new Old-Growth Habitat LUD boundaries.

The upper 10 miles of the Katzehin River are designated as a Wild River; the lower 2 miles of the river adjacent to Lynn Canal, however, are not designated as Wild in recognition of the potential for a future transportation corridor in this area. Also, there is an unpaved landing strip approximately 0.25 mile north of the river mouth.

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

Much of the area around the east side of Berners Bay is designated LUD II and Semi-Remote Recreation. The congressionally designated LUD II permits roads only for access for authorized uses, for transportation needs identified by the State, or for vital linkages. In 1994, the State of Alaska sent a letter to the USFS identifying a highway along the east side of Lynn Canal between Juneau and Skagway as a State transportation need (Hickel, 1994). The USFS included the highway alignment as a transportation corridor in the 1997 TLMP, in the 2008 TLRMP as

TUS LUD, and in the 2016 TLRMP as a State of Alaska ROW based on its status as a congressionally granted transportation and utility easement.

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

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

The USFS identified a transportation corridor on the west side of Lynn Canal during preparation of the 1997 TLMP. That corridor was included in the adopted 1997 TLMP and in the 2008 TLRMP, and continues to be recognized in the 2016 TLRMP as a State of Alaska ROW based on it being a congressionally granted transportation and utility easement.

### Roadless Areas as a Resource

The Roadless Area Conservation Rule (aka Roadless Rule; 36 Code of Federal Regulations [CFR] 294) applies to the National Forest System nationwide, including Tongass National Forest. Revised Appendix DD of this Final SEIS (*Land Use Technical Report*, Sections 3.1.2 and 4.4) provides additional information on this topic.

In accordance with the Roadless Rule, the USFS reviews all proposals for new roads or timber removal in any Inventoried Roadless Area (IRA) to ensure the USFS is “doing all we can to protect roadless area characteristics” (Tidwell, 2012). IRAs on federal lands have multiple characteristics and are a resource potentially available for future designation as wilderness under the Wilderness Act of 1964. Figure 3-4 is a map of the IRAs in the project area. The Roadless Rule defines “Roadless Area Characteristics” as:

> Resources or features that are often present in and characterize inventoried roadless areas, including:
>
> 1. High quality or undisturbed soil, water, and air;
> 2. Sources of public drinking water;
> 3. Diversity of plant and animal communities;
> 4. Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;
> 5. Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation;
> 6. Reference landscapes;
> 7. Natural appearing landscapes with high scenic quality;

8. Traditional cultural properties and sacred sites; and
9. Other locally identified unique characteristics.

[36 CFR 294 11]

The Tongass National Forest has more than 100 IRAs totaling approximately 9.5 million acres, or 57 percent of the 16.8-million-acre national forest. More than 90 percent of the forest is “roadless” if areas already designated as part of the National Wilderness Preservation System are included (USFS, 2008a, p. 3-445). There are four large IRAs in the project area that together total about 1.6 million acres. As shown in Figure 3-4, IRAs 301 and 305 are located on the east side of Lynn Canal, and IRAs 303 and 304 are located on the west side of Lynn Canal. The IRAs are as follows:

- IRA 301, Skagway-Juneau Icefield: 1.2 million acres
- IRA 303, Sullivan: 66,143 acres
- IRA 304, Chilkat-West Lynn Canal: 198,109 acres
- IRA 305, Juneau Urban: 94,800 acres

Alternatives 2B, 3, 4B, and 4D are in IRA 301 (Juneau-Skagway Icefield) and 305 (Juneau Urban). Alternative 3 is also in IRAs 303 (Sullivan) and 304 (Chilkat). The Roadless Rule prohibits road construction in inventoried roadless areas, unless road construction is conducted under an exempted circumstance, including when a road is “provided for by statute or treaty” [36 CFR 294.12(b)(3)]. In this case, Congress granted transportation and utility easements to the State of Alaska for each side of Lynn Canal (“4407 easements”—see Section 3.1.1.3). Because the JAI Project easement was granted by statute, the State of Alaska believes that an analysis of other “reasonable and prudent” alternatives need not be conducted prior to the USFS issuance of the Section 4407 easement.

Following are brief descriptions of the IRAs in the project area (USFS, 2003). Each IRA listed is affected by Section 4407 planning easements. Where discussion indicates management of the IRA under various LUDs, management is also subject to TSC plan direction. As quoted above under the Development LUDs heading, the TSC plan direction would apply and take precedence over the underlying LUD management if a major road were formally proposed within a Section 4407 planning easement (USFS 2016b, p. 3-313).

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

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

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

IRA 301 is managed under eight LUDs: Modified Landscape, Minerals, Remote Recreation, Semi-Remote Recreation, LUD II, Wild River, Research Natural Area, and Old-Growth Habitat. The Minerals LUD is secondary, overlying the other land uses. The TSC plan direction is also secondary, with land managed per the LUD until such time as a transportation project is formally proposed in the LUD. The Modified Landscape LUD, a Development LUD, covers 2 percent of the IRA, with the remaining 98 percent managed as Non-Development LUDs.

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

IRA 303 covers 66,143 acres, including 30 miles of shoreline on the west side of Lynn Canal. There are 17,135 acres of forestland in IRA 303, of which 75 percent is productive old-growth forest. The productive old-growth includes 5,693 acres of high volume, coarse canopy old-growth.

IRA 303 is managed under four LUDs: Modified Landscape, Scenic Viewshed, Minerals, and Semi-Remote Recreation. The Minerals LUD and TSC are secondary, with land managed per the LUD that they overlie until such time as the secondary land use is implemented. The Development LUDs, Modified Landscape, and Scenic Viewshed cover 22 percent of IRA 303. The remaining 78 percent is designated as a Non-Development LUD, Semi-Remote Recreation.

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

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

IRA 304 covers 198,109 acres, of which 58 percent is productive old-growth forest.

This old-growth forest LUD includes 23,789 acres of high volume, coarse canopy old-growth forest. The area is managed under four LUDs: Scenic Viewshed, Timber Production, Semi-Remote Recreation, and Old-Growth Habitat. The TSC is secondary, with land managed per the LUD it overlies until such time as a transportation project is formally proposed. The Development LUDs, Timber Production, and Scenic Viewshed cover 23 percent of IRA 304. The remaining 77 percent is designated as Non-Development LUDs (Semi-Remote Recreation and Old-Growth Habitat).

IRA 304 is largely unmodified and maintains its natural integrity and apparent naturalness very well. There is a very high opportunity for solitude and an outstanding opportunity for primitive recreation. The primary ROS classes for IRA 304 are Primitive and Semi-Primitive Non-

Motorized, which cover 48 and 44 percent, respectively, of the IRA. Along the shoreline of Lynn Canal there is an increased potential for seeing or hearing others, including small planes, ferries, small boats, or cruise ships. The Wilderness Attribute Rating System for IRA 304 is 25 out of 28 possible points for its natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

**IRA 305 – Juneau Urban** – This IRA, on the east side of Lynn Canal, borders the east side of the community of Juneau from approximately Auke Bay to the north end of Echo Cove–a few miles north of the end of Glacier Highway. Near the shoreline, it abuts IRA 301. Glacier Highway and other local roads provide access to IRA 305 except at the IRA's far north end, which is accessible by boat or on foot.

IRA 305 encompasses 94,800 acres, with only 1 mile of saltwater shoreline. It includes approximately 57,013 acres mapped as forestland, of which 34,883 acres (61 percent) are productive old-growth forest.

IRA 305 has high natural integrity and most of it has a natural appearance, despite many modifications, heavy recreational use, and proximity of air and road activity based in Juneau. Its opportunity for solitude is limited by the sound of frequent air traffic and noise of the Juneau road system, and by the heavy recreational use. There is high opportunity for primitive recreation. The primary ROS classes are Semi-Primitive Non-Motorized and Primitive, covering 41 and 39 percent of IRA 305, respectively. The Wilderness Attribute Rating System for IRA 305 is 21 out of 28 possible points for natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

IRA 305 is managed under six LUDs: Semi-Remote Recreation, Minerals, Scenic Viewshed, Remote Recreation, Special Interest Area (the Mendenhall Glacier Recreation Area), and Old-Growth Habitat. The Minerals LUD and TSC are secondary, with land managed per the LUD they overlie until such time as the secondary land use is implemented. The Non-development LUDs comprise approximately 73 percent of the IRA, with Semi-remote Recreation comprising 52 percent of the IRA. Scenic Viewshed, a Development LUD, encompasses approximately 27 percent of this IRA.

### 3.1.1.2 National Park Service

Within the study area, the NPS manages the Skagway unit of the Klondike Gold Rush National Historical Park. The park is within the Skagway and White Pass District National Historic Landmark (NHL), covering 12,976 acres. Actual ownership is split between the State of Alaska (8,723 acres), the federal government (2,419 acres), the Municipality of Skagway Borough (1,477 acres), and private owners (including Native allotments [220 acres], private land in Dyea [57 acres], and commercial land [80 acres]).

In addition to the historic structures in downtown Skagway, the major attraction of the Klondike Gold Rush Park is the Chilkoot Trail, located 9 highway miles west of Skagway in Dyea. The Chilkoot Trail unit covers 9,900 acres; it begins at the north edge of Dyea and extends 16.5 miles north along the Taiya River valley to the Canadian border. The General Management Plan emphasizes developing and following a comprehensive approach that will protect the natural resources and ensure perpetuation of a pristine landscape compatible with the historic setting.

### 3.1.1.3 State of Alaska

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

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

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

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

Finally, the State owns land interests in transportation corridors on each side of Lynn Canal. In Section 4407 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (a 2005 federal transportation law known as SAFETEA-LU; PL 109-59 as amended), Congress granted the State of Alaska multiple easements across Tongass National Forest lands for potential future roads. Two of these easements exist in the project area, one on each side of Lynn Canal. Broad planning-level easements have been recorded across the Tongass National Forest, with the exception of the easement on the east side of Lynn Canal.[4] These easements are to be refined to 300-foot-wide final easements when a project using the easements is approved for construction. The 2016 TLRMP acknowledges these easements, as discussed in Section 3.1.1.1.

### 3.1.1.4 Local Government

**City and Borough of Juneau –** Approximately 3,248 square miles of land are located within CBJ boundaries, including tidelands and submerged lands. The regional transportation policy set forth in the *Comprehensive Plan of the City and Borough of Juneau* is to support the improvement of transportation facilities and systems that reinforce Juneau's role as the capital city and a regional transportation and service center (CBJ, 2013). Juneau depends on air and marine transportation because no roads connect the area with other regions of the State and Canada. Strong local support exists for increasing ferry service in Southeast Alaska; improving and expanding air, marine, and highway transportation systems; and participating in studies of

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[4] The easement on the east side of Lynn Canal was not submitted by the USFS for recording because it is part of this project, and the project was judicially halted based on litigation. However, the Congressional grant of the easement was not affected by that litigation.

road transportation links between Juneau, Southeast Alaska, and Canada. The CBJ completed an *Area Wide Transportation Plan* in 2001; elements of this transportation plan are included in the 2013 *Comprehensive Plan* in order to support creation of a balanced and integrated multimodal surface transportation system. The 2013 *Comprehensive Plan* supports consideration of all affordable energy efficient transport alternatives to improve transportation links between Juneau and other areas of Southeast Alaska, including improved air (cargo and passenger) service, roadways, ferries, and fixed guideway systems.

The CBJ Assembly Resolution 2463 (March 16, 2009) made recommendations for transportation projects to DOT&PF for the 2010–2013 Statewide Transportation Improvement Program, one of which was extension of the Glacier Highway to MP 91.1 (just north of the Katzehin River delta, consistent with the road portion of Alternative 2B).

**Haines Borough –** The Haines Borough is located on the east and west shores of the Lynn Canal. The borough extends to the Canadian border. The area encompasses 2,350 square miles of land and 382 square miles of water. Approximately two-thirds of the land is owned by the federal government, almost one-third is owned by the State of Alaska, and about 2 percent is either privately owned or Borough land (Haines Borough, 2012a).

The Haines Borough Assembly adopted its *2025 Comprehensive Plan* on September 11, 2012, to guide growth over the next 10 to 20 years (Haines Borough, 2012a). This plan describes current conditions, reviews outstanding issues and needs, establishes broad goals that set overall direction, identifies specific objectives that are the desired future that the community wants to achieve over time, and sets out actions to chart a path to achieve the goals and objectives. Topics covered are quality of life, municipal government, the economy and economic development, current and future land use, transportation, recreation, utilities, public safety, community services, and education (Haines Borough, 2012a).

One of the Haines Borough *2025 Comprehensive Plan* transportation objectives (4C) is to support Alaska Marine Highway System (AMHS) ferry service to and from Haines. The plan advocates for daily AMHS day boat service between Upper Lynn Canal communities and Juneau, for the proposed Alaska Class ferry to serve the Upper Lynn Canal, and for an AMHS ferry to homeport or overnight in Haines. If a highway alternative is selected, however, a West Lynn Canal Road (Alternative 3) would be preferable to Haines Borough (Haines Borough, 2012a).

**Municipality of Skagway Borough –** In 2007, Municipality of Skagway Borough (the Municipality) voters approved dissolving the City of Skagway in favor of forming a borough. The boundaries of the borough are the same as the former city boundaries. Skagway is bounded on the south and west by the Haines Borough, and on the north and east by the U.S./Canada border. Skagway consists of approximately 461 square miles of land. Federal agencies control 71.6 percent, State agencies manage 25 percent, including 1.7 percent that is Taiya Inlet tidelands, the Municipality owns 2.8 percent, and 0.6 percent is in private ownership (Municipality of Skagway, 2009).

Land use within Skagway is governed primarily by its *2020 Comprehensive Plan* (Municipality of Skagway, 2009) and municipal code. The Skagway *2020 Comprehensive Plan* states that it is the goal of the Municipality to provide an integrated, efficient, safe, and reliable transportation network to facilitate the movement and goods in and through Skagway (Municipality of Skagway, 2009). The transportation policy supports maintaining and increasing year-round access to and from Skagway including public and private ferries, and air, road, trail, marine, and rail access. The Municipality depends upon the Klondike Highway and the AMHS to transport goods and people into and through Skagway. The plan acknowledges that the Skagway economy, population growth, and community development are closely tied to the movement of people and goods to and through town. The Municipality supports improved and more frequent ferry service to Skagway (Municipality of Skagway, 2009).

#### 3.1.1.5 Private Lands

The area of Berners Bay was traditionally used by the Auk Tlingit. The land north of Point St. Mary on the east side of Lynn Canal was traditionally used by the Chilkat Tlingit, as was much of the west side of Lynn Canal. Most of this land is now managed by the USFS and the State of Alaska. Sealaska, the regional Native corporation for Southeast Alaska, owns a parcel of land north of Sawmill Cove. Goldbelt, a Native corporation based in Juneau, owns approximately 1,400 acres in the study area surrounding Echo Cove. In 1996, Goldbelt prepared the Echo Cove Master Plan and the USFS circulated an EIS for a proposed access road from Echo Cove to Cascade Point in Berners Bay. The USFS completed a ROD in 1998. Goldbelt received a USFS special-use permit and a U.S. Army Corps of Engineers (USACE) Section 404 permit for the road. Construction began in 2005 with funding from the State of Alaska Industrial Roads Program. This road was completed in 2013. Goldbelt submitted a Master Plan to CBJ for Echo Cove in 1996 and is currently working on a plan to develop a marine facility at Cascade Point just north of Echo Cove (the facility was permitted by CBJ in 2004 and the permit was extended in 2007), which will be used to transport mine workers across Berners Bay. Although the permitting is complete, legal actions and funding constraints have delayed the project (NEI, 2013). Presently, instead of a ferry from Cascade Point, Kensington Mine employees are transported using a shuttle operated by Goldbelt, Inc. from Yankee Cove, 14 miles south of Slate Cove in Lynn Canal (Loiselle, personal communication 2012).

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

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

#### 3.1.1.6 Land and Resource Uses

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

**Timber Harvest** – The majority of land in Lynn Canal is USFS land and is part of the Tongass National Forest. The USFS currently has no plans for timber harvest and sales in Lynn Canal areas (Sandhofer, personal communication 2012). Lands in the northwest portion of Lynn Canal are part of Haines State Forest and, in the study area, the State manages those lands for scenic and recreational values, fish and wildlife, and potential mineral values: commercial timber harvest is prohibited. Forestry resources in Lynn Canal, even if they were available for logging, would more than likely be used as pulp product rather than as export logs, and the costs of pulp processing in Alaska may limit the growth potential in this industry in northern Southeast Alaska (NEI, 2012a).

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

The Kensington Gold Project is located just north of Berners Bay within CBJ boundaries and the Tongass National Forest. Coeur Alaska, Inc. (Coeur Alaska), the managing company for the Kensington Gold Project, acquired the Jualin gold prospect in 2001. Coeur Alaska received the State and federal permits for mine operation, began construction in 2009, and began production in 2012. The Kensington mine is projected to remain operating until 2021, based on its identified resource base and measured economic reserves. As with many large mines, the identified resource base of the mine could expand over time and the mine could operate over a longer period of time than is indicated by its current reserves. Currently, mine workers are transported by bus to Yankee Cove and then by boat to the mine’s dock at Slate Creek.

**Commercial Fishing –** Commercial fishing has historically been an important element of the economy of Southeast Alaska. Although market and other considerations have reduced profits in the salmon industry, commercial fishing continues to be a valuable contributor to the Juneau economic and employment base and an important sector of the Haines economy. According to Commercial Fisheries Entry Commission (CFEC) 2010 data for Juneau, 315 Juneau-based commercial fishermen fished 313 permits and harvested 15.8 million pounds of fish with an estimated gross income of $16.9 million (CFEC, 2011). Earnings per permit fished averaged $53,967. According to CFEC preliminary data for Haines, 81 Haines-based commercial fishermen fished 130 permits in 2010 and harvested 6.4 million pounds of fish with an estimated gross income of $7 million (CFEC, 2011). Commercial fishing has not been substantial in the Skagway economy. CFEC data for Skagway shows that 3 Skagway-based commercial fishermen fished 4 permits in 2011 (CFEC, 2011). Salmon, halibut and other groundfish, and shellfish (crab and shrimp) are the targeted species for Lynn Canal commercial fishing.

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

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

> Recreation in Lynn Canal is primarily water-based because of limited access. Boating is both a recreational activity and a means of transportation for other recreational pursuits, such as camping, hunting, hiking and kayaking. Berners Bay is a popular recreation area,

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

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

#### 3.1.1.7 Parks and Recreation Facilities

Many municipal, State, and federal parks and public recreation areas are located within the study area. The Municipality of Skagway Borough has two public parks: Pullen Creek Shoreline Park and Molly Walsh Park (Figure 3-5). Registry Rock, where boaters have painted their ship names on a rock outcrop for nearly a century, is an attraction in Skagway’s Railroad Dock area, but is not part of any designated park or recreation area or historic site. State parks include Point Bridget State Park, Sullivan Island State Marine Park, Chilkat State Park, Chilkoot Lake State Recreation Site, Portage Cove State Recreation Site, and Chilkat Islands State Marine Park (Figures 3-1 and 3-2). The NPS manages the Klondike Gold Rush National Historical Park in the Skagway area (Figure 3-5). The USFS has a public use recreation cabin in Berners Bay (Figure 3-2) and a day use area at Sturgill’s Landing south of Skagway (Figure 3-1), which connects with Sturgill’s Landing Trail. The USFS concurred that the Berners Bay cabin, Sturgill’s Landing Trail, and Sturgill’s Landing Day Use Area are the only designated recreational sites on USFS land in the project study area (Griffin, 2004).

The Lower Dewey Lake area is a popular hiking/picnicking destination and trail hub and is owned by the Municipality of Skagway Borough (Figure 3-5). The area has many trails connecting to Sturgill’s Landing, Icy Lake, Upper Reid Falls, Upper Dewey Lake, and Devil’s Punchbowl. On October 7, 2004, the City of Skagway (now the Municipality of Skagway

Borough) adopted an ordinance creating the *Dewey Lakes Recreation Area Management Plan*. This ordinance sets forth allowable and prohibited activities in this management area.

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

#### 3.1.1.8 Residential, Commercial, Industrial, and Public Facilities

**City and Borough of Juneau –** Auke Bay is categorized as urban in the 2013 CBJ *Comprehensive Plan*. Land use designations range from open space/natural areas to industrial. From the Auke Bay Ferry Terminal north to the end of the highway at Cascade Point, Glacier Highway is an arterial highway designed to accommodate traffic at steady speeds. The Eagle River to Berners Bay area (Subarea 1) is categorized in the 2013 CBJ *Comprehensive Plan* primarily as Rural. The lands in Berners Bay are designated primarily as Recreation Resource lands in the 2013 CBJ *Comprehensive Plan*. Echo Cove, which is located within Subarea 1, is identified as a Resource Development Area with a New Growth Area overlay (CBJ, 2013). This area includes the Davies Creek and Cowee Creek watersheds; a scenic corridor/viewshed (approximately 400 feet wide by 10 miles long) from Bridget Cove to Eagle River; and flooding hazard areas at Cowee and Davies creeks, Eagle River, Herbert River, Peterson Creek, and coastal areas (CBJ, 2013, p. 174).

**Haines Borough –** Active management within the Haines Borough boundaries takes place only within the former City of Haines boundaries (now called the Townsite Planning Zone) and in former City of Haines Coastal Management Areas Meriting Special Attention. All other areas of the Borough fall under the general use zoning district, until zoned otherwise (see Title 18 Land Use/Development of the Haines Borough Code). Traffic from a West Lynn Canal Highway that would be directed onto Mud Bay Road would be within the Mud Bay Planning/Zoning District. The intent of this district is to preserve residents’ “lifestyle, community scale, self-sufficiency, self-determination, and the basic rights of health, safety and welfare” (Haines Borough, 2008). This area includes a Rural Residential Zone, which provides “for the establishment of a rural residential area allowing for single family dwellings and cottage industries”; and a Cannery Zone, which is “intended to create a commercial area for the provision of support functions for the Haines fishing fleet” (Haines Borough, 2008).

**Municipality of Skagway Borough –** Land use within the Municipality of Skagway Borough is governed primarily by Skagway’s *2020 Comprehensive Plan* (Municipality of Skagway, 2009) and municipal code. The Skagway *2020 Comprehensive Plan* suggests a balance between well-located industrial and commercial land, future growth, port and waterfront utilities, and recreation areas. The Municipality supports port development and there has been long-standing community consensus for split use of the port for tourism and industrial uses. The State ferry terminal facility is jointly used by the Municipality and the State of Alaska; the Municipality owns the transfer bridge and one-third of the floating dock. Current land use is a mixture of water-related commercial and industrial activities, pedestrian paths and amenities, shops and restaurants, small boat harbor uses, a staging area for the city transfer bridge, and the Pullen Creek picnic area.

#### 3.1.1.9 Coastal Zone Management

The Alaska Coastal Management Program (ACMP), in force since the approval of the Alaska Coastal Management Act in 1977, expired on July 1, 2011[5], as provided by Alaska Statute (AS) 44.66.030. The ACMP was administered by the ADNR by districts throughout the state with the intent to preserve, protect, develop, use, and, where necessary, restore or enhance the coastal resources of the state. The ACMP was implemented by local governments, which were required to develop and enforce their own coastal management programs.

Because provisions for resources addressed under the ACMP have been incorporated into local plans and ordinances, coastal management programs still exist at the local level.

The CBJ's Coastal Management Program is reflected in policies and in the borough's codes. Further, when the CBJ's comprehensive plan was amended in March 2012, the *Juneau Coastal Management Plan* was specifically included. The *Haines Coastal Management Program* is reflected in the *2025 Haines Borough Comprehensive Plan*, which was adopted in September 2012 and incorporates the coastal management plan's enforceable policies. The enforceable policies of the *Haines Coastal Management Program* apply only to land and water uses and activities within the Haines Coastal Management Area Boundary, which is the same as the former City of Haines corporate boundary. Uses and activities occurring on lands and waters outside the Haines Coastal Management Area Boundary are subject to Haines policies only if a proposed action will have a direct and significant effect on coastal resources within the Haines Coastal Management Area coastal district boundaries. Since the Alaska statutes expired, the Municipality of Skagway Borough has not incorporated coastal management enforceable policies into its comprehensive plan. Some elements, however, are codified in its zoning regulation and, according to Skagway officials, are enforced as much as possible during development review (Van Horn, personal communication 2013).

### 3.1.2 Visual Resources

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

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

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[5] "The Alaska Coastal Management Question," or Ballot Measure 2, appeared on the August 28, 2012, ballot in Alaska as an "indirect initiated State statute." The measure, which would have established a new coastal management program, was defeated.

and textures of the surrounding environment visible on these days further highlight the extraordinary visual quality of the area.

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

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

The 2016 TLRMP includes guidance to manage scenic resources in the Tongass National Forest (USFS, 2016a, p. 4-54). Land management activities are rated based on their Scenic Integrity Objectives (SIOs).[6] These SIOs are categorized as follows (from most protective to least): High, Moderate, Low, and Very Low (USFS, 2016a, pp. 4-55 and 7-53).

The High SIO provides for land management activities that are not visually evident to the casual observer. Management activities should only repeat the form, line, color, and texture found in the existing landscape.

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

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

The Very Low SIO allows management activities of vegetative and landform alteration to dominate the landscape. When viewed in the background, the visual characteristics of these activities should blend with the surrounding landscape.

As mentioned in Section 3.1.1.1, TSCs have been identified on both the east and west sides of Lynn Canal. If a highway is formally proposed on either corridor, the corridor would be managed as a TSC. The SIO for TSCs is Low.

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[6] The 2006 Final EIS used Visual Quality Objectives (VQOs) in accordance with the 1997 TLMP. This Final SEIS has been updated to comply with the 2016 TLRMP, which replaced the VQOs with Scenic Integrity Objectives (SIOs). The primary difference between the VQOs and SIOs is that the SIOs better recognize the positive scenic values associated with some human-modified (cultural) features and settings. The VQOs and SIOs are similar enough that the definitions were written to allow for easy conversion between the two.

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

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

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

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

For additional information on the visual resource assessment methodology, see the *2014 Update to Appendix G - Visual Resources Technical Report* and *2017 Errata* (see Appendix Z).

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

#### 3.1.2.1 East Lynn Canal

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

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

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

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

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

#### 3.1.2.2 West Lynn Canal

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

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

### 3.1.3 Historical and Archaeological Resources

Section 106 of the National Historic Preservation Act, as amended (54 United States Code [USC] Subtitle III), requires federal agencies with jurisdiction over a project (including federal assistance to State projects) to identify and evaluate historic properties, assess the project's effect upon them, and afford the Advisory Council on Historic Preservation the opportunity to comment on the project if there would be an adverse effect on an historic property. Historic properties are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (54 USC 300-308).

A literature review completed in 1994 as part of the initial scoping process for the JAI Project identified several previous cultural resources studies in Lynn Canal. These studies identified a number of known and reported prehistoric and historic sites along both the eastern and western shores of Lynn Canal that could be affected by project alternatives. Cultural resources studies were undertaken in 1994 and 2003 to confirm the existence of reported sites, locate previously undiscovered sites, and evaluate the significance of these sites. The studies in both years were guided by a research design previously adapted by the Alaska Region of the USFS.

An Area of Potential Effect (APE) of approximately 164 feet on both sides of the alternative alignment centerlines, including potential terminal locations (a 328-foot-wide corridor) was assessed for cultural resources. Areas with a high potential for past human occupancy (e.g., river and stream mouths, shoreline benches below 100 feet in elevation, and areas of less than 25 percent slope) were surveyed on the ground. Areas with a low potential for past human occupancy received a reconnaissance-level survey using shoreline observations from a boat and a review of aerial photography. The APE includes areas that had been submerged with the weight of glacial ice and then exposed by the gradual rebound/uplift of land when the glaciers receded (see Section 3.2.1.1). The State Historic Preservation Officer (SHPO) was consulted and concurred that the APE and field methodology were applicable for the cultural resource inventories conducted for the proposed project (Bittner, 1995).

Additional cultural resources fieldwork was performed in the APE during fall 2003 and spring 2004, to more accurately locate previously discovered sites and to evaluate new areas potentially affected by revised alternative highway alignments and potential ferry terminal sites. In September 2003, formal tribal consultation letters were sent to 11 area tribes and Native organizations, with follow-up phone calls and face-to-face meetings when requested. As a result of this consultation, no potential traditional cultural properties were identified within the JAI Project APE. The results of all investigations and FHWA determinations of eligibility and effect were communicated to these same tribes and organizations in August 2004 (see correspondence section of Chapter 7.0 of the 2005 Supplemental Draft EIS). No additional comments were received from tribes and Native organizations at that time.

In 2012, DOT&PF conducted a follow-up literature review to determine whether any new information on cultural resources in the APE had become available since the 2006 Final EIS was issued. No new cultural resources were identified within the APE.

In February 2016, DOT&PF and FHWA met with the SHPO, Sealaska Corporation, Sealaska Heritage Institute, Douglas Indian Association, and Goldbelt Corporation to discuss concerns expressed in comments on the 2014 Draft SEIS regarding cultural resources. In these comments and during the meetings, the tribes and tribal organizations reiterated the cultural importance of the Berners Bay area, identifying several cultural resources of concern (see Chapter 7). No new (i.e., previously unidentified) sites within the APE were identified in these comments or during the meetings. All reported locations were considered during the development of the inventory design and were factored into the field survey methodology and project design. Sensitive sites are not disclosed in this public document, per Section 106 of the National Historic Preservation Act, but were accounted for in consultation, analysis, determinations of eligibility for the National Register of Historic Places (NRHP), and findings of effect.

In 1994 and 1995, formal determinations of NRHP eligibility were prepared for sites within the APE, and determinations were made of the potential effect of the project on historic properties eligible for the NRHP. Additional properties in the project area were determined eligible by the USFS in 2004. Formal determinations of NRHP eligibility were also prepared by FHWA for three additional sites within the project study area in 2004. On October 19, 2004, the SHPO concurred with the FHWA determinations of eligibility, proposing minor changes to site boundary delineations (Bittner, 2004).

The APE on the east side of Lynn Canal crosses three historic mining districts eligible for the NRHP: the Berners Bay, Jualin, and Comet/Bear/Kensington historic mining districts (Figure 3-6). The APE passes near a fourth district, the Ivanhoe/Horrible Historic Mining District. The Berners Bay Historic Mining District encompasses the material remains of historic mining activities that took place in the Juneau Mining District from the 1870s to 1944 and contain sufficient integrity to convey that significance. The Berners Bay Historic Mining District includes three smaller districts. Many of the material remains are located in these three smaller historic mining districts.

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

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

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

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

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

The Lower Dewey Lake Trail begins at a bridge across Pullen Creek and runs east/southeast toward Lower Dewey Lake. The Lower Dewey Lake Trail (Figure 3-5) is an historic route from the trailhead to the junction where the trail splits into the Upper Dewey Lake Trail, the Sturgill’s Landing Trail, and the Lower Dewey Lake Circuit Trail. The eligible portion of the trail ends near the northern end of Lower Dewey Lake at the junction point. The trail is outside the project’s APE. The trail is visible in a 1903 photograph of Skagway, and older rockwork supports some of the switchbacks.

The Skagway and White Pass District NHL extends from the Skagway harbor to the Canadian border at White Pass summit. This NHL includes the historic Skagway townsite, which has

152 contributing buildings; a log cabin and wharf built in 1897; the White Pass and Yukon Route (WP&YR) Railroad built between 1898 and 1900; and cliffside painting east of the White Pass Dock, known as the Ships Registry, dating back to 1918. The NHL is not within the project's APE.

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

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

### 3.1.4 Socioeconomic Resources

Information in this section is derived from the *Socioeconomic Effects Technical Report* (Revised Appendix EE of this Final SEIS). Additional economic and social information about the Lynn Canal vicinity is provided in that report.

#### 3.1.4.1 Juneau

Based on the 2010 Census (U.S. Census Bureau, 2010a), approximately 31,275 people reside in the community of Juneau. The population of Juneau has increased by 2 percent since 2000, when 30,711 individuals lived in Juneau, and 16 percent since 1990 when 26,751 persons lived in Juneau. The pace of growth has been slower than in the decades before the 1990s, with an average annual growth rate of 0.8 percent over the last 20 years.

According to the 2010 Census, approximately 69.7 percent of Juneau's population is white, and 11.8 percent is Alaska Native or American Indian. The remaining population consists of 6.1 percent Asian, 0.9 percent African American, and the remainder is other races (U.S. Census Bureau, 2010b).

The 2010 Census counted 12,187 occupied housing units in Juneau, with an average household size of approximately 2.6 persons. The 2010 American Community Survey identifies 12,005 households in Juneau. Among these households, 10.2 percent had incomes less than $25,000 in 2010, and 13.1 percent of all individuals living in Juneau had incomes below the poverty line.[7] More than 68 percent of Juneau households had incomes of over $50,000, with almost 50.4 percent earning $75,000 or more. Median household income was $75,517, and per capita income was $49,458 (U.S. Census Bureau, 2010b).

According to the Alaska Department of Labor and Workforce Development (ADOLWD), annual average employment in Juneau reached 18,057 jobs in 2011. Since 1980, employment in Juneau

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[7] Poverty status is determined by comparing annual income to poverty guidelines that vary by family size and composition. If a family's total income is less than the threshold, that family and every individual in it is considered in poverty. The 2012 poverty guidelines for Alaska are $13,970 for an individual, $18,920 for a two-person household, $23,870 for a three-person household, and $28,820 for a four-person household (Department of Health and Human Services, 2012).

has grown almost 67 percent, increasing at an average annual rate of 1.6 percent. Juneau's payroll totaled $816 million in 2011. In inflation-adjusted "real" dollars, total annual payroll in Juneau has increased by approximately 66 percent since 1980.

Juneau is the capital of Alaska. Government is Juneau's most important source of employment, accounting for about 41 percent of total employment and about 50 percent of the total annual wage and hour earnings in 2011. State government alone accounts for 24 percent of employment, and local government makes up about another 13 percent. Service-providing industries account for 50 percent of total employment in Juneau but only about 37 percent of the earnings. Goods-producing industries make up the balance of employment (9 percent) and earnings (about 14 percent) (ADOLWD, 2012). Many of the State and federal government jobs in Juneau are there because it is the state capital. There have been several capital move efforts and ballot initiatives over the past three decades. Relocating the capital to a location other than Juneau would decrease the number of government jobs as well as related service industry jobs.

The leisure and hospitality industry accounts for 8.1 percent of the service jobs in Juneau. Current employment in Juneau's visitor industry is 1,459 jobs and $26.5 million in annual payroll. Leisure and hospitality positions are mostly seasonal, lower-paying jobs, comprising only 3 percent of total earnings in Juneau.

The tourism industry has been Juneau's fastest-growing industry, primarily from cruise ship visits. Juneau cruise passenger volume reached almost 925,000 visitors in 2012. Between 1998 and 2005, the annual rate of growth from cruise ship visits ranged from 5 to 14 percent, but between 2006 and 2012, the annual rate of growth slowed to 0 to 5 percent.

According to Alaska Visitors Statistics Program data (ADCCED, 2012a), Alaska summer visitor traffic included an estimated 1.6 million out-of-state visitors between May 1 and September 30, 2011. This total number of summer visitors represents an increase of 22 percent over summer 2002 and 2 percent over summer 2010; however, it is 5 percent below summer 2006 and 9 percent below the peak year of 2007 (1.7 million summer visitors). Because of the continuing slow recovery of the U.S. economy, which leads to a reduction in "luxury" spending, slow growth for the Southeast Alaska visitor industry is projected into the future; this trend generally follows national trends (Southeast Conference, 2012).

In summer 2011, Juneau was the most visited destination in the state at 61 percent of Alaska's independent visitor market. The Juneau Convention and Visitors Bureau estimates that between 100,000 and 150,000 visitors arrive annually by non-cruise modes of travel.

Trends in the independent visitor market since 1993 are not well understood, but are reflected in airline and ferry arrival data. Between 1993 and 2011, airline passenger traffic increased by about 7 percent and ferry passenger traffic increased by 8 percent. During the same period, Juneau's population increased by about 12 percent. The increase in air travel to Juneau is likely the result of a combination of increased resident travel (from population growth) and increased visitor arrivals.

Over the long term, the State's commitment to marketing, perceived safety of overseas travel, exchange rates, demographic shifts, and other factors will determine how many independent visitors travel to Alaska.

Juneau's visitor market includes a relatively small number of recreational vehicle (RV) travelers. In 2010, a total of 597 RVs disembarked in Juneau (this included Juneau residents-owned RV travel), according to AMHS data (Gerrish, 2012). That represents about 17 percent of AMHS RV traffic in Southeast Alaska. Juneau's capacity to serve RVs is limited but adequate to meet current demand. It includes 78 RV-specific sites at private RV parks, and 124 sites that are available for camping and RV parking at the Mendenhall Campground.

Although the economy of Juneau is currently dominated by government and summer season tourism, Juneau seeks to diversify its economic base by facilitating new or expanding its current export industries such as mining, food processing, and manufacturing (CBJ, 2008). The Greens Creek Mine, owned by Hecla Mining Company, Juneau's largest private sector employer, has 337 workers. In 2012, Hecla Mining Company received approval to begin exploration for new ore deposits adjacent to the mine. The discovery of new ore deposits, together with expansion of the tailings disposal facility, could extend the life of the Greens Creek Mine an additional 30 to 50 years. Greens Creek employees live in Juneau and commute to the mine on a daily basis.

In 2011, Juneau's mining industry grew by about 207 year-round employees and 38 contract employees because of a new extraction operation at the Kensington Mine. The Kensington Gold Project is located approximately 45 air miles north of Juneau and is owned by Coeur d'Alene Mines Corporation. The mine site is within the CBJ boundaries and the Tongass National Forest. The Kensington Mine has an expected life of about 12 years, though additional ore discovery could extend the operating life of the mine.

The seafood industry in Juneau includes commercial fishing and seafood processing. According to CFEC 2010 data, 315 Juneau-based commercial fishermen fished 313 permits and harvested 15.8 million pounds of fish with an estimated gross income of $16.9 million (CFEC, 2011). Based on 2011 data, approximately 760 Juneau residents fish commercially, as permit holders or crew, landing 22.7 million pounds of fish with a value of $26.4 million (JEDC, 2012a). According to Juneau Economic Development Council data, eight shore-based seafood processing facilities in Juneau processed 15.9 million pounds of product, with a wholesale value of $50.3 million in 2011 (JEDC, 2012a).

Retail trade employment in Juneau for 2011 averaged 1,994 workers who earned a total annual payroll of $52 million. Large retail chain stores, such as Fred Meyer, Walmart, and Safeway, are among the top 10 private employers. Over the long term, the retail industry is expected to keep pace with changes in local basic industry employment and population and with growth in the visitor industry.

Healthcare providers and social service networks are some of the largest employers in Juneau, making up four of the ten largest firms. Private medical practices are available in the area as well as long-term care facilities; physical therapy services; alcohol treatment programs; and services for victims of domestic violence, AIDS patients, and terminally ill patients. The health services industry in Juneau provides health care to residents of outlying communities as well as the Juneau resident population. The health care and social assistance industry had average annual employment of 1,797 jobs in 2011, representing about 10 percent of the employment in the area and $65 million in annual payroll. With approximately 200 employees in Juneau, the largest healthcare provider in the region is the Southeast Alaska Regional Health Consortium (SEARHC). The Bartlett Regional Hospital in Juneau is the region's next largest healthcare provider. The hospital has a staff of 407 full-time equivalent employees. The hospital is considered part of local government in employment statistics.

Juneau's transportation sector, including air, water, trucking, and warehousing, generated employment of 1,052 and payroll of $40 million in 2011. Air transportation alone accounted for 380 of those jobs. With limited access options, the transportation industry in Juneau is a critical component of the economy. This sector will continue to grow according to the demands of the local population and growth in the visitor industry.

Most of Juneau's basic goods and materials are shipped into the city by barge. According to the *2014 Waterborne Commerce of the United States Waterways and Harbors*, total received freight (domestic and foreign) at Juneau was 673,170 tons and shipped freight was 255,905 tons for the year (USACE, 2016a).

Juneau International Airport is also a critical component for movement of cargo and business people traveling to or from the capital city. Further, the airport serves as a hub for northern Southeast Alaska. In 2009, approximately 9,000 tons of air freight was shipped to and from Juneau, about half of which was mail. Air freight shippers include Alaska Airlines, Evergreen, and Empire Air.

According to the CBJ Community Development Department, there were 13,057 housing units in the community in 2011, with a vacancy rate of 5 percent (3.2 percent for rentals; Kreiger and Schultz, 2011). Single-family homes comprise 58 percent of Juneau's housing inventory, and multifamily homes and condominiums/townhouses make up another 34.5 percent. The *Juneau Housing Needs Assessment* (JEDC, 2012b) found that Juneau's housing stock is inadequate to meet demand of renters and prospective owners, especially those considered "cost-burdened." The area has a shortage of affordable housing attributable to the continued increase in housing prices and a slow-down in new housing construction. As of 2011 there were 32,290 people (with 2.6 persons per household) living in Juneau. Population projections for the year 2050 predict a population decrease of 210 to 32,080. Although the population is expected to decline, a shortage of suitable housing could continue.

The CBJ had revenues of $134 million in 2010 (CBJ, 2010a). The majority of revenues collected by the CBJ are derived from taxes and State of Alaska sources. Local taxes include real property, sales, bed, liquor, and tobacco taxes.

The Juneau School District had 5,043 students during the 2011 to 2012 academic year. Enrollment has declined by 500 students since the 2002–2003 school year. The school district has typically offered education from kindergarten through twelfth grade, including vocational education programs and a number of alternative learning programs.

Capital City Fire and Rescue has 33 career staff, 70 volunteers, and 9 administrative staff. The Juneau Police Department has 50 sworn officers and 45 civilian staff.

The Alaska State Troopers maintain a headquarters in Juneau. In addition, the A Detachment of Alaska Wildlife Troopers is headquartered in Juneau and covers the entire mainland and numerous islands of Southeast Alaska.

#### 3.1.4.2 Haines

Based on the 2010 Census (U.S. Census Bureau, 2010a), approximately 2,508 people reside in the Haines Borough. According to ADOLWD estimates, the Haines Borough population totaled 2,620 residents in 2011. The population of Haines has grown at an average annual rate of 1.4 percent since 1980. In particular, the local population increased over the previous 5 years, from

2,357 in 2006 to 2,620 in 2011. Average annual population growth in the last 10 years from 2001 through 2011 was 0.9 percent (ADOLWD, 2013a).

Klukwan is a Native village located approximately 20 miles northwest of Haines west of the Haines Highway. The community of Klukwan is a census designated place (CDP). A CDP is a concentration of population identified by the U. S. Census Bureau for statistical purposes. CDPs are populated areas that lack separate municipal government, but which otherwise physically resemble incorporated places. Klukwan CDP is not part of the Haines Borough and is not incorporated as a municipality. It is governed by an Indian Reorganization Act Council. Based on the 2010 Census (U.S. Census Bureau, 2010a), approximately 95 people reside in the Klukwan CDP. This village of 98 residents (ADOLWD 2011 estimate) has experienced a significant net decrease of one-third of its population since 1986, when the population was 151.

According to the 2010 Census, approximately 83 percent of the Haines Borough population is white, 9 percent is Alaska Native or American Indian, and 0.6 percent is Asian. The remaining population is Native Hawaiian and Other Pacific Islander, Black or African American, or some other race (U.S. Census Bureau, 2010a). The only real growth in Haines is in the retirement community. Retirees are moving to Haines based on lifestyle decisions rather than local economic opportunities.

The 2010 Census counted 744 households in Haines, with an average household size of approximately 3.4 persons (U.S. Census Bureau, 2010a). Among those households, more than 18 percent had incomes of less than $25,000 in 2010, and 14.4 percent of all Haines residents had incomes below the poverty line. A total of 47 percent of Haines households had incomes of over $50,000, with almost 31 percent earning $75,000 or more. Median household income was $47,981, and per capita income was $27,979 (U.S. Census Bureau, 2010b).

In 2011, the Haines economy produced an annual average of 1,025 jobs (not including self-employed) and $33.3 million in wages. Employment grew by 79 percent from 1980 to 2011. This is an annual average growth rate of 1.9 percent.

Total Haines earnings in 2011 dollars decreased by almost 4.1 percent, from $34.7 million to $33.3 million, between 1991 and 2011. The average annual rate of decline for total earnings was approximately 0.1 percent during this 20-year period.

In terms of employment, the largest sector of the Haines economy is local government, with 152 jobs and $4.8 million in annual payroll in 2011. Retail trade accounted for 140 jobs with $3.2 million in payroll. The construction sector had average employment of 91 jobs with $6.6 million in payroll. Leisure and hospitality jobs peaked at 370 in August of 2011, while offering 206 average annual jobs with annual payroll of nearly $3.8 million.

The visitor industry directly or indirectly accounted for the annual equivalent of approximately 20.1 percent of total wage and salary employment and 11.4 percent of total wages during 2011. These jobs stem from local spending by visitors to the community, including cruise ship passengers, visitors traveling to and through Haines by ferry or highway, and visitors traveling to Haines to participate in special activities (e.g., attend the fair, take guided hunts, or view eagles).

The number of cruise ship passengers visiting the Borough dropped dramatically between its peak of 195,600 passengers in 2000 to 31,611 in 2012. The long-term outlook for cruise traffic to Haines is uncertain. Haines is likely to remain a secondary port of call. It lacks the tour and excursion opportunities needed to be popular with passengers and cruise lines. Cruise traffic will probably continue to be erratic as lines add or drop the port, depending on availability of other ports of call. Despite receiving few cruise ships in its port, Haines benefits from Skagway cruise ship ports of call. In 2011, approximately 28,500 cruise ship passengers visited Haines via the fast ferry from Skagway. These visitors spent an average of $135 per person in Haines during their stay in 2011, or $3.8 million total. Dependable fast ferry runs between these communities are essential to Haines to capture this business (Haines Borough, 2012).

Haines' non-cruise independent visitor traffic has also been declining. While not all ferry traffic is tourist-related, ferry traffic has also decreased. In 1992, ferry disembarking traffic included 45,300 passengers and 15,100 vehicles. In 2011, disembarking traffic totaled 33,284 passengers and 12,204 vehicles (DOT&PF, 2011b). This reflects an overall decline in the AMHS visitor market in recent years. This decrease in ferry traffic, as well as decreases in cruise ship passenger traffic, has been detrimental to some sectors of the Haines visitor industry, as well as to the local economy as a whole (Haines Borough, 2012). Visitor arrivals by air, however, have increased from 5,641 in 2002 to 9,636 in 2011 (RITA, 2013), but has not returned to levels recorded in the 1990s.

According to Commercial Fisheries Entry Commission preliminary data, 81 Haines-based commercial fishermen fished 130 permits in 2010 and harvested 6.4 million pounds of fish with an estimated gross income of $7 million. The largest single private-sector employer in the Haines Borough is Ocean Beauty Seafoods, a seafood processing plant in Excursion Inlet. There are four other seafood processing facilities in the Borough. Although tourism is the largest industry, seafood processing contributes a significant number of jobs—about 400 in 2009. However, most of the jobs are seasonal and are not filled by Haines residents.

The transportation industry in Haines accounted for an average of 29 jobs in 2010, with peak employment of 49 workers (ADOLWD, 2012). Payroll totaled approximately $0.8 million.

Employment in Haines's retail trade sector in 2011 averaged 140 jobs with $3.2 million in total annual payroll. The retail sector in Haines is particularly dependent on non-resident spending. This is reflected in the seasonal increase in retail employment. In 2011, retail employment peaked at 158 jobs in August, compared to October employment of 120.

To a significant degree, Haines' retailers compete against Juneau stores. Leakage from the Haines economy, which occurs when local consumers purchase goods and services from outside the community, has been an important issue for Haines merchants.

Medical services are provided by two facilities, the Haines Medical Clinic and the Klukwan Medical Clinic, both operated by SEARHC. Most routine and emergency health care services are provided locally; however, patients are evacuated to Juneau for procedures requiring general anesthesia. The increased population spurred by the visitor industry causes a corresponding increase in demand for local health care services during the summer. While the Haines population has been relatively stable, school district enrollment has been declining since 1997, with 310 enrolled students in 2012. The school district has typically offered education from pre-elementary through twelfth grade. In 2011, educational and healthcare services generated average employment of 137 jobs and annual payroll of $4.2 million. Educational and healthcare services accounted for 13 percent of the jobs in Haines in 2011 and 13 percent of the wage and hourly earnings.

The 2010 Census counted 1,631 housing units in Haines, of which 1,149 were occupied. Vacant housing units numbered 482 (30 percent), but 345 were classified as seasonal, recreational, or occasional-use units (U.S. Census Bureau, 2010a).

Haines Borough had revenues of $14.1 million in 2010. Local taxes included real property, sales, bed, and tour taxes. The Haines Volunteer Fire Department has a full-time training officer, full-time fire/EMS responder, fire chief, and 30 to 35 volunteer firemen. The Haines Police Department employs a police chief, sergeant, 4 patrol officers, a school resource officer, and 5 dispatch/jail personnel. There is one Alaska State Trooper and one Alaska Wildlife Trooper stationed in the Borough.[8]

#### 3.1.4.3 Skagway

Approximately 968 people resided in the Municipality of Skagway Borough in 2010 (U.S. Census Bureau, 2010a). Skagway's population has not changed significantly over the past 20 years, growing only 0.3 percent. However, during the summer the community experiences a significant influx of seasonal workers employed in the visitor industry.

According to the 2010 Census, approximately 91.4 percent of the population is white. The remaining population consists of 5.4 percent Alaska Native or American Indian, 0.5 percent Asian, and the remainder is other races (U.S. Census Bureau, 2010a).

The 2010 Census counted 386 households in Skagway, with an average household size of approximately 2.5 persons (U.S. Census Bureau, 2010a). Among these households, approximately 8.3 percent had incomes of less than $25,000 in 2010, and 20.1 percent of Skagway residents had incomes below the poverty line. Just over three quarters (76.5 percent) of the households had incomes of over $50,000, and of those households, 47.7 percent earned $75,000 or more. Median household income was $73,500, and per capita income was $57,832 (U.S. Census Bureau, 2010a).

The visitor industry is Skagway's most important industry. The number of cruise visitors to Skagway has more than tripled in the last 15 years, from 260,000 in 1996 to almost 820,000 in 2007 before falling back to 708,000 in 2011(Skagway Convention and Visitors Bureau, 2012). However, because of the continuing slow recovery of the U.S. economy, which leads to a reduction in "luxury" spending, slow growth for the Southeast Alaska visitor industry is projected into the future, which generally follows national trends (SEC, 2012).

Historically, Skagway has been an important transshipment center, with freight, fuel, and ore concentrates moving over its dock. Skagway seeks to balance its role as a tourist destination, which produces significant revenue and many seasonal jobs, with its role as a year-round transshipment hub, and has instituted the Gateway Project to enhance its port facilities. The Gateway Project is a cooperative effort among the Municipality of Skagway Borough, the Alaska Industrial Development and Export Authority, and the Government of Yukon, which is intended to better manage industrial and maritime activities in the port area, as well as improve existing pedestrian, vehicle, marine, and train traffic (Municipality of Skagway, 2013).

Non-cruise independent visitor travel to Skagway includes travelers arriving by ferry, air taxi, and highway. In 2011, 73,013 travelers arrived in Skagway via highway in a personal vehicle, according to Skagway Convention and Visitors Bureau data (2012). Additional visitors arrive by

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[8] As of February 2017, the Alaska State Trooper position was vacant.

bus, but this number is hard to quantify, as many bus passengers are on day trips associated with cruises. Ferry traffic has declined in recent years: the number of disembarking passengers in Skagway exceeded 40,000 in 1995 and years prior to that, but totaled only 21,216 passengers in 2011.

The transportation industry, which is dominated by the visitor industry, employed 239 workers in Skagway in 2007[9], representing about 24 percent of the total employment for the area and nearly 33 percent of the total earnings for the year. The transportation and warehousing sector accounted for 4 percent of personal income in 2010. Transportation workers are primarily employed with the WP&YR Railroad. The railroad was originally built to supply goods to interior gold mining camps. Today, the railroad connects Skagway with Carcross, British Columbia, and is one of the most popular visitor excursions in Alaska.

The Port of Skagway serves several important functions in the Municipality's economy. In addition to serving the cruise ship industry, it is an important freight terminal. According to the *2014 Waterborne Commerce of the United States Waterways and Harbors*, total received freight (domestic and foreign) at Skagway was 166,615 tons and shipped freight was 50,997 tons for the year (USACE, 2016b). According to Alaska Marine Lines, 43 percent of Skagway general freight continues on to the Yukon. Three mines are exporting ore out of Skagway: Keno (lead, zinc, and silver), Minto (copper and gold), and Wolverine (zinc and silver) (NEI, 2013). Most important, the port serves the cruise industry and its 708,000 passengers, as well as passengers traveling via the AMHS.

The retail trade industry in Skagway employed an average of 164 workers in 2011. Many of these positions were seasonal.

The 2010 Census counted 636 housing units in Skagway, of which 436 were occupied. Vacant housing units numbered 200 (31 percent), but 48 were classified as seasonal, recreational, or occasional-use units. Skagway is reported to have extreme shortages of housing during the peak summer season.

The Municipality of Skagway Borough had revenues of $14.8 million in 2010. More than 55 percent of the revenues were generated from sales and real property taxes. Skagway also has a bed tax.

The Skagway School District had 74 students during the 2011 to 2012 academic year. Enrollment has varied but has generally declined over the past 10 years. Education is offered from the pre-elementary through twelfth-grade levels at a single school.

The Dahl Memorial Clinic is owned and operated by the Municipality of Skagway Borough, although it contracts management services through an agreement with Bartlett Regional Hospital. The clinic is overseen by an administrator and staffed by two mid-level providers, a nurse practitioner, a physician's assistant, and support staff. Itinerant doctors, a dentist, pediatrician, public health nurse, and other specialists from Juneau visit the clinic on a rotating basis. Emergency medical patients are generally evacuated to Juneau.

Skagway's fire protection is provided by the Skagway Volunteer Fire Department. The department has two full-time employees, two part-time employees, and 34 volunteers. The

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[9] Due to changed confidentiality standards, 2007 was the last year that employment data were reported for this sector.

Skagway Police Department operates with seven full-time and four seasonal employees. The U.S. Customs and Immigration has an office in Skagway, and the NPS also has law enforcement officers on staff. No Alaska State Troopers are located in Skagway.

### 3.1.5 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order (EO) 12898. The order applies to "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The EO makes it the responsibility of each federal agency to make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Accompanying this order was a Presidential Memorandum directing each federal agency to analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when NEPA analysis occurs. Table 3-1 provides demographic information for the study area, based on U.S. Census data, to help identify minority and low-income communities potentially affected by the JAI Project.

**Table 3-1:**
**2010 Demographic and Economic Data**[1]

| Area | Population Year 2010 | Percent Minority or Mixed Race (2010) | Median Household Income[2] | Percentage of Individuals Below Poverty Level[2] |
|---|---|---|---|---|
| United States | 308,745,538 | 22 | $52,762 | 14.3 |
| Alaska | 710,231 | 33 | $69,014 | 9.5 |
| Juneau City and Borough | 31,275 | 30 | $75,517 | 13.1 |
| Haines Borough | 2,508 | 17 | $47,981 | 14.4 |
| Municipality of Skagway Borough | 968 | 9 | $73,500 | 20.1 |
| Klukwan | 95 | 92 | $43,333 | 3.5 |

[1] U.S. Census Bureau (2010b).

[2] U.S. Census Bureau (2010c).

Based on 2010 Census information, the percent minority populations in Klukwan are higher than the state percentage.

The U.S. Census Bureau uses a set of monthly income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the threshold, that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically but they are updated for inflation using the Consumer Price Index.

The 2012 poverty guidelines for Alaska for an individual is $13,970. The 2010 Census found that the average household size in Alaska was 2.65. The poverty guideline for a two-person household is $18,920 and for a three-person household is $23,870. The percent of individuals in poverty by area is included in Table 3-1.

### 3.1.6 Subsistence

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

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

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

Since 1990, salmon harvest under subsistence regulations has been authorized by the Board of Fisheries in discrete areas of Lynn Canal. Salmon are harvested in other areas of the Lynn Canal region under personal use regulations (ADF&G, 1994). In the study area, customary and traditional use areas for salmon, Dolly Varden, smelt, and steelhead identified by the Alaska Board of Fisheries include the Chilkat, Chilkoot, and Lutak inlets, the Chilkat River and its tributaries, and Chilkat Lake (Figures 3-7 through 3-9). Customary and traditional use areas for shellfish, bottom fish, and herring identified by the Alaska Board of Fisheries include almost all of upper Lynn Canal and its inlets to just south of the southern end of Sullivan Island (ADF&G, 1991) (Figures 3-7 through 3-9).

The 1988 Tongass Resource Use Cooperative Survey (Kruse and Frazier, 1988) remains the most comprehensive subsistence study conducted within the study area. In a more recent study, ADF&G reported harvest data for Klukwan, Haines, and Skagway (ADF&G, 1994). Federally recognized subsistence use of lands within the study area includes the residents of Klukwan, Haines, and Skagway. Most current available information was collected for deer, salmon, non-salmon finfish, marine invertebrates, and marine mammals. No mapped, specific land-use information exists for other species in the study area. For a complete discussion of subsistence in the study area, refer to the *Land Use Technical Report* (Revised Appendix DD of this Final SEIS).

### 3.1.6.1 Haines

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

Haines was originally the site of a Chilkoot Tlingit seasonal camp near the mouth of the Chilkat River. The 1988 Tongass Resource Use Cooperative Survey found 93 percent of the households used subsistence resources and 83 percent of households participated in subsistence harvests (Kruse and Frazier, 1988).

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

### 3.1.6.2 Juneau

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

### 3.1.6.3 Klukwan

Klukwan is a Tlingit community located near the confluence of the Chilkat, Klehini, and Tsirku rivers approximately 30 miles northwest of Haines. Subsistence is important economically and culturally to Klukwan residents, who continue to use the study area for these purposes. The people of Klukwan harvest salmon, non-salmon finfish (e.g., eulachon, trout, char, and halibut), black bear, brown bear, moose, mountain goat, marine mammals (harbor seals), and Sitka black-tailed deer. Deer are scarce in the Chilkat Valley and other mainland areas in the northern Lynn Canal area. Sitka black-tailed deer hunting occurs on portions of Lincoln, Shelter, Benjamin, and Sullivan islands. There is some moose harvest as well.

Residents of Klukwan generally fish for sockeye, pink, and chum salmon in designated subsistence harvest areas near their community. Non-salmon harvest for Klukwan residents takes place in all waters of Chilkat River for eulachon, Chilkoot and Lutak inlets for halibut, and Lynn Canal from Point St. Mary (entrance to Berners Bay) to Seduction Point, including waters around Sullivan Island and in William Henry Bay, for halibut (ADF&G, 1994).

The 1988 Tongass Resource Use Cooperative Survey found that 100 percent of Klukwan households used subsistence resources and 95 percent of households participated in the harvest of those resources (Kruse and Frazier, 1988).

Resource harvest for Klukwan is strongly focused on riverine and inland environments for most of the resources harvested. Chinook salmon, sockeye salmon, chum salmon, and eulachon were the primary species harvested in the Chilkat River system. In addition, Chinook and the other salmon, and bottomfish, were harvested in the marine environment by rod and reel.

Harbor seals were the primary marine mammals harvested. Moose, mountain goat, and bear were harvested along the local roads and rivers. Deer hunting was conducted along Lynn Canal by boat.

#### 3.1.6.4 Skagway

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

The 1988 Tongass Resource Use Cooperative Survey found that 96 percent of households used subsistence resources and 68 percent of household participated in harvest activities (Kruse and Frazier, 1988).

### 3.1.7 Transportation

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

Commercial jet aircraft provide access to Juneau. Commuter aircraft serve Haines, Skagway, and other communities that do not have the demand or facilities for jet aircraft service. Commuter air service between Juneau and Haines and Juneau and Skagway in 2013 accommodated approximately 3,600 passengers on both Wings of Alaska and Alaska Seaplanes (Wings of Alaska, 2013; Alaska Seaplanes, 2013). Most of the commuter aircraft in use in Lynn Canal can accommodate 5 to 9 passengers. Departing from Juneau to Haines, there are typically 7 daily scheduled flights in the winter and 14 in the summer. Departing from Juneau to Skagway, there are typically 6 flights operated daily in the winter and 14 daily flights in the summer. On average, there are four passengers per flight. The cost of one-way travel between Juneau and Haines is approximately $120 and between Juneau and Skagway is approximately $130.

The AMHS is the only form of public transportation that carries passengers and vehicles in Lynn Canal. During the summer, the Lynn Canal corridor is typically served by one mainline ferry originating from Bellingham (*M/V Columbia*) and one mainline ferry originating from Prince Rupert (*M/V Matanuska*); these ferries are scheduled to run weekly between May and September

(AMHS, 2013). In 2017, the *FVF Fairweather*, a fast vehicle ferry, was typically scheduled to run 3 days per week and the *M/V LeConte* was typically scheduled to run 2 days per week, late May through mid-September.

Private ferry companies provide passenger-only service between Lynn Canal communities. This service is seasonal from mid-May to mid-September. Multiple daily trips are scheduled between Haines and Skagway, as well as daily service between these communities and Juneau (Alaska Fjordlines, 2013; Haines-Skagway Fast Ferry, 2013).

Pedestrians and bicyclists are also served by the AMHS. The 2015 passenger-to-vehicle ratio in Lynn Canal was 3.1 to 1 (see Revised Appendix AA, *Traffic Forecast Report*). Assuming the actual number of passengers traveling with cars was closer to the highway average of 2.3, as many as approximately 19,400 people may have been "walk-on" passengers (i.e., pedestrians and bicyclists) on AMHS ferries in Lynn Canal in 2015.

At least 10 rivers in the project area may be navigable by small craft. 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. There is little known information regarding boat use on these rivers. The U.S. Coast Guard has jurisdiction for bridges over navigable rivers. Coordination with U.S. Coast Guard during development of the 2006 Final EIS established that the largest vessels using these rivers are air boats with a maximum height above water of 12 feet. It is unlikely that boats supporting interstate or foreign commerce frequent these waterways. Currently, there are no known plans to improve navigation of these waterways. No marinas, marine repair facilities, public boat ramps, or private docks are located on or within several miles of these rivers, which may limit access and use of the rivers by potential users (primarily recreational users).

## 3.2 Physical Environment

### 3.2.1 Geology

A geotechnical and geologic study was prepared in February 1994 by Shannon & Wilson, Inc. for inclusion in the 1997 Draft EIS *Juneau Access Improvement Reconnaissance Engineering Report*. Because geologic changes are not rapid occurrences, a new study was not prepared for the 2006 Final EIS. However, limestone features (termed karst) are located along the proposed alignment of the West Lynn Canal Highway alternative (Alternative 3), and a new study was completed in 2003 to further delineate and assess these features. Following selection of Alternative 2B in the 2006 ROD, DOT&PF conducted a geotechnical investigation of a 22-mile segment of the alternative designated as Zone 4. This work was summarized in the *Final Report, Lynn Canal Highway, Phase I, Zone 4 Geotechnical Investigation, State Project Number 71100* (Golder Associates, 2006). The geotechnical investigation included the identification and preliminary evaluation of geologic hazards affecting the alignment of Alternative 2B. With changes to the alignment since 2006 (i.e., to avoid and minimize impacts to wetlands and reduce the extent of rock side cast areas, changes based on advanced geotechnical survey information, and recent changes in 2012 in response to updated bald eagle nest survey data), DOT&PF updated the geologic hazards evaluation in 2012 in the *Revision of Geologic Hazard Summary – Juneau Access Improvements Supplemental Environmental Impact Statement Technical Memorandum* (Golder Associates, 2012). DOT&PF included discussion on geological hazards in the *2017 Update to Appendix D – Technical Alignment Report* in Appendix Z to provide additional discussion on means to mitigate the identified geological hazards. Information from the 2006 and 2012 geotechnical studies, as well as the *2017 Update to Appendix D – Technical Alignment Report*, has been incorporated into this Final SEIS.

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

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

#### 3.2.1.1 Geologic Features

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

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

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

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

DOT&PF engineers reviewed available information related to geologic features on the east and west sides of Lynn Canal (Clough and Redman, 1989; Wilson et al., 2015)[10], and determined that acid-generating rock or rock with high total metals content may occur within the project area. No on-site investigations have been conducted to identify acid-generating rock within the proposed project limits. Based on the available information, DOT&PF recognizes the potential for acid rock drainage to occur at various locations along the West Lynn Canal corridor and from Echo Cove to Independence Creek along the East Lynn Canal corridor.

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

As described above, karst is a three-dimensional terrain developed on and within soluble, carbonate bedrock in which caves develop. The Federal Cave Resources Protection Act (FCRPA) of 1988 (16 USC 4301-4310) requires protection of significant caves on federal lands. The purposes of the FCRPA are "(1) to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and (2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes." Although FCRPA protects caves, it does not specify protection of karst resources. The USFS recognizes that caves with associated features and resources are an integral part of the karst landscape, and that karst must therefore be managed as an ecological unit to ensure protection of cave resources.

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

A preliminary karst survey of the project area on the west side of Lynn Canal was performed in 1994. This survey was based primarily on literature and aerial photograph review and did not

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[10] USGS Mineral Resources Program https://minerals.usgs.gov/

include a field survey (Dames & Moore, 1994). An archaeological team investigating the route of Alternative 3 in 1994 documented a number of shoreline karst features during a ship-based survey (NLUR, 1994); however, a systematic karst survey of the project area was not conducted during these investigations.

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

Pertinent karst vulnerability rating criteria from the 1997 TLMP and a Tongass Plan Implementation Team Clarification Paper were used to rate karst features encountered in the field. These appear to be the same as those presented in Appendix H of the 2016 TLRMP. The criteria are as follows:[11]

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

The following paragraphs summarize the types of karstland encountered along the West Lynn Canal project area based on the vulnerability criteria category. Figure 3-10 identifies their locations.

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

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

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[11] The descriptions of karstland in the project area are consistent with the 2016 TLRMP.

high-vulnerability areas nonetheless, because they met the FCRPA definition of a significant cave (36 CFR 290).

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

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

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

#### 3.2.1.2 Geologic Hazards

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

**Avalanches –** The most common geologic hazard within the study area is avalanches. The avalanche information presented in the 1997 Draft EIS has been updated. Steep slopes, heavy snowfall and precipitation, high winds, and a climate influenced by both maritime and continental systems contribute to this hazard. The proposed road alignments along both the east and west sides of Lynn Canal traverse areas that exhibit considerable evidence of ongoing avalanche activity. These areas are marked by a lack of timber in the avalanche chutes and, in some areas, by large accumulations of snow at the base of the chutes in the spring and well into the summer. The paths are described as small, medium, large, and very large based on starting height, amount of snow, and avalanche frequency. Occasionally, subpaths run off from the main path. Figure 3-11 shows the location of the avalanche paths. The *Snow Avalanche Report* (Appendix J) and the *2017 Update to Appendix J – Snow Avalanche Report* in Appendix Z provide more detailed information on the snow avalanche paths mapped and rated along each side of Lynn Canal.

> **East Lynn Canal Highway Alignment -** The average annual snowfall for the East Lynn Canal, as a whole, is estimated to be 180 inches. This high level of snowfall contributes to 43 avalanche paths that might affect the alignment, including subpaths, on the east side of Lynn Canal. Of the paths identified, 10 are considered large or very large based on their high elevation starting zones and their tendency to produce frequent large avalanches. Runout from avalanche events in some of these paths would reach the

highway only once in several decades, whereas, in the absence of mitigation efforts, runout from events at other path locations could cross the highway more than once in an average winter.

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

The area north of these paths to the northern edge of the Katzehin River delta, a distance of 21 miles, contains 39 avalanche paths. They are found in three clusters of multiple paths that include large and very large paths. The first cluster is located opposite Eldred Rock, the second group is south of Yeldagalga Creek, and the third group is north of Yeldagalga Creek.

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

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

**Earthquakes –** Large earthquakes have occurred on the strike-slip faults associated with the Queen Charlotte/Fairweather fault system (Hanson and Combellick, 1998). This system, located along the outer coast of Southeast Alaska approximately 75 miles west of the study area, produces lateral motion parallel to the fault line. Within the last century, four earthquakes with magnitudes greater than 7.0 have occurred along the Queen Charlotte/Fairweather fault system (Hanson and Combellick, 1998). Recent earthquake activity along the Queen Charlotte/ Fairweather fault includes a 7.5-magnitude event on January 5, 2013 (AEIC, 2013). In addition to these well-recorded historic shocks on the main plate boundary, significant seismicity follows the southern end of the Denali fault system and has produced historic earthquakes of up to at least 6.4 in magnitude. The interior Alaska portion of the Denali fault was responsible for the 7.9 magnitude earthquake in November 2002. The Denali fault trends southeast beneath Lynn Canal and appears to join the Chatham Strait fault system, which continues south past the Juneau area. Little historic seismicity is associated directly with the Chatham Strait segments of this fault system. The Alaska Earthquake Information Center lists only 13 events of magnitude 4 or greater along this fault system within a radius of 35 miles of Haines (Ruppert, personal communication 2013). The strongest event had a magnitude of 6.9 with its epicenter 24 miles southwest of Haines.

**Landslides –** Landslides occur less frequently than snow avalanches. Most landslides are caused by the combined effects of geologic characteristics, soil types, and slope saturation by heavy precipitation or snowmelt. Earthquakes are also a triggering mechanism for landslides in

Southeast Alaska. Avalanche paths are also prone to slides during the summer months due to the lack of vegetative cover and the channel-like nature of avalanche chutes.

The 1997 Draft EIS identified three landslides along the East Lynn Canal alignment and two landslides along the West Lynn Canal alignment. There was an additional land slide that occurred in 2001 on the east side of Lynn Canal north of Independence Lake. Figure 3-11 identifies the locations of the slides. The identified slides are all rock slides created when large rock fractures at the top of a steep slope released rock and the falling rock caused the poorly attached, vegetated slope below to slide. Little soil movement was involved because in these areas there is almost no soil between the vegetation layer and the underlying rock.

The 2006 investigation of geologic hazards along the Alternative 2B alignment (Golder Associates, 2006) revealed the following types of geological hazards as being present along the alignment: debris flow, hazard rocks, landslides, rock slides, rockfalls, soil raveling, and transitional slides.[12] The investigation identified 112 locations of potential geologic hazards: 38 were determined to have a high probability of occurrence or likely to result in a more-severe event, 53 were determined to have a moderate probability of occurrence or likely to result in a moderately-severe event, and 21 were found to have a low probability of occurrence or likely to result in a less-severe event.

Following the 2006 geotechnical investigation, DOT&PF shifted the Alternative 2B alignment in several areas to avoid geologic hazards. The geologic hazards identified in 2006 were re-evaluated in 2016 to identify those that impact the current alignment, and to develop mitigation strategies for each hazard. The evaluation concluded that the East Lynn Canal corridor would encounter 78 locations of geologic hazards: 23 were determined to have a high probability of occurrence or likely to result in a more-severe event, 16 were determined to have a moderate probability of occurrence or likely to result in a moderately severe event, 7 were determined to have a low probability of occurrence or likely to result in a less-severe event, and the remaining hazards, most of which were rockfall, were determined to be unpredictable. The shifted alignment avoids 33 previously identified potential geologic hazards. Table 3-3 of the *2017 Update to Appendix D – Technical Alignment Report* in Appendix Z summarizes all previously identified geologic hazards and mitigation strategies, including avoidance by alignment shift.

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

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

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

The Chilkat and Endicott rivers on the west side of the canal also have the potential for glacial outburst flooding from large glaciers at their headwaters. More recent information on outburst floods in the study area is not available.

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[12] Avalanche hazards were not included in the Golder Associates (2006) report; however, they are described previously in this section.

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

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

### 3.2.2 Hydrology and Water Quality

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

#### 3.2.2.1 Climate

Lynn Canal has a maritime climate with temperatures in the range of 50 to 70 degrees Fahrenheit (°F) in the summer and 10°F to 35°F in the winter (ADCCED, 2012b). The north end of Lynn Canal around Haines and Skagway lies within a climatic transition zone that receives less precipitation than Juneau. Annual precipitation in the area ranges from 54 inches in Haines to 92 inches in the Endicott River Wilderness Area. Storms and rain showers occur throughout most of the year; however, precipitation is heavier and more frequent from November to January. The *2017 Update to Appendix J - Snow Avalanche Report* (see Appendix Z) estimates average snowfall for East Lynn Canal at 150–210 inches per year or approximately 12.5–17.5 feet per year, and for West Lynn Canal at 120 inches per year or approximately 10 feet per year. Melting snows and spring rains contribute large amounts of water to rivers and creeks within the study area.

#### 3.2.2.2 Freshwater Environment

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

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

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

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

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

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

#### 3.2.2.3 Groundwater

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

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

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

#### 3.2.2.4 Marine Environment

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

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

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

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

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

### 3.2.3 Floodplains

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

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

> The Federal Emergency Management Agency has not mapped floodplains in the project area. There is little information available about past floods. A floodplain analysis was conducted for this project. There are nine large rivers that potentially have extensive 100-year floodplains. From south to north, on the east side of Lynn Canal, these include the Gilkey, Antler, Lace, Berners and Katzehin rivers, and some of their tributaries. The west side includes the Endicott, Sullivan, 'Unnamed' (north of Sullivan Island), and North Glacier rivers, in addition to Chilkat Inlet at the mouth of the Chilkat River.
>
> The smaller, coastal streams have steep banks or channels that allow considerable overflows during floods. Although these channels carry floodwaters, they are not considered floodplains. Floodplains, which occur downstream in less steep areas,

typically have braided channels, and can cover wide areas of up to several square miles. Seasonal flooding often causes changes in the channels.

Available data show that the highest tide in the project area is [22.5 feet] above mean lower low water at Chilkat Inlet near Pyramid Island. The coastal floodplain is in the area affected by tides. Tidal fluctuation and stormwaves dominate coastal floodplains. In addition, tides will affect velocity and flow dynamics within the tidal zone.

### 3.2.4 Wild and Scenic Rivers

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

There are no designated Wild and Scenic Rivers in the project study area. Two rivers within the Lynn Canal corridor have been recommended by the USFS for designation: the Gilkey and the Katzehin rivers (Figures 1-1 and 3-3), both located on the east side of Lynn Canal. The Gilkey River joins with the Antler River, and the Antler River subsequently empties into Berners Bay. The lower 2 miles of the Katzehin River have been excluded from recommendation because this 2-mile segment is a designated transportation corridor.

Four additional rivers within the canal corridor are on the USFS list of potential Wild and Scenic Rivers but have not been recommended for designation: the Antler, Berners, Endicott, and Lace rivers. The Antler, Berners, and Lace rivers were not recommended because they are in a congressionally designated LUD II area that provides protection the USFS considers adequate (Figure 3-3). The Endicott River was not recommended because a majority of the river lies within the Endicott River Wilderness Area, and such a designation already serves to protect the river’s values.

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

### 3.2.5 Air Quality

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

#### 3.2.5.1 Air Quality Standards and Relevant Pollutants

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

Air quality is regulated at the federal level under the Clean Air Act Amendments of 1990 and the Final Conformity Rule (40 CFR, Parts 51 and 93). The Clean Air Act authorizes the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that pose a risk to public health. These primary standards represent the air quality levels, with an adequate safety margin, that are required to protect public health.

EPA has established standards for seven criteria pollutants: CO, ozone ($O_3$), particulate matter with an aerodynamic diameter of less than or equal to 10 microns ($PM_{10}$), particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), and airborne lead. The Alaska Ambient Air Quality Standards (AAAQS) mirror the federal standards for most of the pollutants. Air quality is regulated at the State level under the AAAQS promulgated in Title 18, Chapter 50, of the Alaska Administrative Code (AAC). Table 3-2 shows the federal and State air quality standards for selected pollutants.

The federal standards require each State to submit a State Implementation Plan (SIP) detailing strategies for attaining the standards.

In addition to the NAAQS, EPA has developed Prevention of Significant Deterioration standards that limit the incremental increase in air pollutant concentrations above the specified Prevention of Significant Deterioration standards. The study area is within the Southeast Alaska Intrastate Air Quality Control Region, where baseline dates have been set for $SO_2$ and $NO_2$, and incremental increases of these two pollutants must be below the levels set by EPA.

### 3.2.5.2 Attainment Status of Study Area

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

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

The Mendenhall Valley area, located approximately 40 miles south of the southern extent of potential highway construction, was designated as a moderate non-attainment area for airborne particulate matter ($PM_{10}$) by the EPA in 1990. On March 24, 1994, EPA approved the Mendenhall Valley $PM_{10}$ attainment plan. The plan strategy for improving air quality in the Mendenhall Valley focuses on control of wood smoke emissions and fugitive dust sources (e.g., glacial silt and dust from unpaved roads) during the winter months. There have been no measured violations of NAAQS since the plan has been in effect (EPA, N.d.).

### 3.2.5.3 Ambient Air Quality in the Study Area

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

**Table 3-2:**
**National and Alaska Ambient Air Quality Standards**

| Pollutant | Averaging Period | NAAQS | AAAQS |
|---|---|---:|---:|
| Carbon Monoxide (CO) | 1 hour | 35 ppm (40,000 µg/$m^3$) | 40,000 µg/$m^3$ |
| | 8 hours | 9 ppm (10,000 µg/$m^3$) | 10,000 µg/$m^3$ |
| Lead (Pb) | Rolling 3 months | 0.15 µg/$m^3$ | 0.15 µg/$m^3$ |
| Nitrogen Dioxide ($NO_2$) | 1 hour | 100 ppb | Not Applicable |
| | Annual | Not Applicable | 100 µg/$m^3$ |
| Ozone ($O_3$) | 8 hours | 0.075 ppm | 0.075 ppm |
| Respirable Particulate Matter ($PM_{10}$) | 24 hours | 150 µg/ $m^3$ | 150 µg/ $m^3$ |
| Fine Particulate Matter ($PM_{2.5}$) | 24 hours | 35 µg/ $m^3$ | 35 µg/ $m^3$ |
| | Annual | 12 µg/ $m^3$ | 15 µg/ $m^3$ |
| Sulfur Dioxide ($SO_2$) | 1 hour | 75 ppb | 196 µg/ $m^3$ |
| | 3 hours | Not Applicable | 1,300 µg/ $m^3$ |
| | 24 hours | Not Applicable | 365 µg/ $m^3$ |
| | Annual | Not Applicable | 80 µg/ $m^3$ |

µg/$m^3$ = micrograms per cubic meter
ppm = parts per million
ppb = parts per billion
Note: Standards from 40 CFR 50.8 and 18 AAC 50.010. Alaska standard for ammonia is not included in this table.

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

Air quality analyses must account for ambient concentrations of pollutants. With the exception of Anchorage, Fairbanks, and Juneau, Alaska does not have a statewide air toxics emission inventory (ADEC, 2001). The ambient air quality CO impact is rated insignificant for the study area, and no air quality sampling was completed to determine baseline conditions. Minimal to no development has occurred within the study area, except at the ends of the study area near Haines and Skagway. Air quality within the study area is estimated to be very good due to the absence of air pollution sources. Therefore, background levels of CO, $O_3$, sulfur oxides, and nitrogen oxides are estimated to be low. This determination is further supported by data accumulated for the EIS for the Kensington Gold Project, which is within the project area, showing that background concentrations of air pollutants were significantly below NAAQS (USFS, 1997a). On rare occasions, elevated $PM_{10}$ concentrations may exist in the study area when wood smoke or smoke from fires is carried south from the Yukon via northerly winds (USFS, 1992).

The Alaska Department of Environmental Conservation (ADEC) collected $PM_{2.5}$ measurements in 2004 and 2005 in Skagway. These data are not published but they have been included in the EPA air quality database for Alaska. Most of the measurements were less than 10 micrograms per cubic meter ($\mu g/m^3$) for the 24-hour average concentration. This is below the NAAQS 24-hour standard of 35 $\mu g/m^3$. On two occasions, $PM_{2.5}$ concentrations were elevated over typical conditions due to smoke from fires. On August 16, 2005, the 24-hour $PM_{2.5}$ concentration was recorded at 44 $\mu g/m^3$. This was attributed to smoke from an interior wildfire. On June 20, 2004, the 24-hour $PM_{2.5}$ concentration was recorded at 32.5 $\mu g/m^3$. This was attributed to a barge fire offshore of Haines. A review of recent data (2012–2014) from the air quality monitoring station in Juneau for $PM_{2.5}$ and $PM_{10}$ found levels below NAAQS (EPA, 2016b).

The *Alaska Rural Communities Emission Inventory* (ADEC, 2007) reported estimates of marine vessel emissions and total emissions for rural areas of Alaska. The daily and annual marine vessel emissions and total emissions estimates in the Haines and Skagway-Angoon areas for 2005 are provided in Table 3-3.

**Table 3-3:**
**Emissions Inventory (tons/year) in Haines and Skagway-Angoon, Alaska (2005)**

| Community | $HC^1$ | CO | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ |
|---|---|---|---|---|---|---|
| **Haines** | | | | | | |
| Marine Vessel Emissions | 6.12 | 46.45 | 285.32 | 12.69 | 12.30 | 103.75 |
| Other Emissions [2] | 1,945 | 2,110 | 111 | 1,472 | 378 | 10 |
| Total | 1,951 | 2,156 | 396 | 1,485 | 390 | 114 |
| Marine Vessel % of Total | 0.3% | 2.2% | 72.0% | 0.9% | 3.2% | 91.2% |
| **Skagway-Angoon** | | | | | | |
| Marine Vessel Emissions | 36.84 | 204.84 | 1,379.81 | 78.69 | 76.32 | 570.64 |
| Other Emissions [2] | 2,839 | 3,264 | 166 | 2,100 | 540 | 14 |
| Total | 2,876 | 3,469 | 1,546 | 2,179 | 616 | 585 |
| Marine Vessel % of Total | 1.28% | 5.91% | 89.26% | 3.61% | 12.38% | 97.61% |

Source: Alaska Department of Environmental Conservation, 2007.

[1] ADEC did not calculate emissions of volatile organic compounds (VOCs); instead, they included hydrocarbons (HC). Generally VOCs for marine vessels are about 105% of HC emissions.

[2] Excludes point sources and aviation.

These pollutant emissions demonstrate the magnitude of marine vessel emissions relative to other emissions in these communities. Specifically, the data show that marine vessels account for a relatively large percentage of total emissions of $NO_x$ and $SO_2$. Relative to other criteria pollutants, such as CO, $PM_{2.5}$, and $PM_{10}$, however, marine vessels account for a relatively small percentage of total emissions. Part of the reason for the high concentration of $SO_2$ is the relatively high concentration of sulfur in diesel fuels at the time of the analysis (e.g., 3,000 parts per million in 2005). Since then, new fuel standards have limited sulfur content in diesel fuel to 15 parts per million.

Based on monitored ambient air quality data from Juneau and the estimated emissions for Haines and Skagway-Angoon, current air quality can be assumed to be relatively good in the project area and in attainment with NAAQS.

#### 3.2.5.4 Greenhouse Gases and Climate Change

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). As the amount of GHGs in the atmosphere increases, more heat becomes trapped, contributing to climate change. The principal GHGs that enter the atmosphere because of human activities are carbon dioxide ($CO_2$), methane, nitrous oxide, and fluorinated gases. $CO_2$ makes up the largest component of these GHG emissions. An inventory of Alaska's GHG emissions found that 35 percent of all GHG emissions were from the transportation sector (Alaska Climate Change Subcabinet, 2009). Other contributors include industrial activities and the fossil fuel industry (50 percent), residential and commercial fuel use (8 percent), electricity (6 percent), and waste and agriculture (1 percent). In the CBJ, the transportation sector is a primary source of GHG emissions, comprising more than 50 percent of total emissions (CBJ, 2007).

Climate change is an issue of national and global concern. While the Earth has gone through many natural climatic changes in its history, there is general agreement that the Earth's climate is currently changing at an accelerated rate and will continue to do so for the foreseeable future.

Many GHGs occur naturally. Water vapor is the most abundant GHG and makes up approximately two thirds of the natural greenhouse effect. However, the burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries. Because atmospheric concentration of GHGs continues to climb, our planet will continue to experience climate change-related phenomena. For example, warmer global temperatures can cause changes in precipitation and sea levels.

### 3.2.6 Noise

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

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

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

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

The FHWA specifies noise abatement criteria (NAC) (codified in 23 CFR 772) for noise-sensitive human land uses. Noise abatement must be considered when the predicted future peak-noise-hour from highway traffic on new construction approaches or exceeds the NAC for specific land use types, or when a substantial increase occurs. DOT&PF updated its Noise Policy in April 2011 in response to changes in the FHWA noise regulations. The DOT&PF is responsible for implementing the FHWA regulations in Alaska, and considers a traffic noise impact to occur if predicted noise levels approach within 1 dBA of the FHWA NAC. The NAC are applied to the peak noise impact hour. If an adverse noise impact is predicted, FHWA's regulations and DOT&PF policy require that noise abatement measures be considered.

The following NAC apply to noise-sensitive land uses.

- **Activity Category A –** Exterior $L_{eq}$ (hourly [h]), dBA 56: Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. (There are no Activity Category A land uses in the project study area.)
- **Activity Category B –** Exterior $L_{eq(h)}$, dBA 66: Residential land use (e.g., homes adjacent to new highway construction).
- **Activity Category C –** Exterior $L_{eq(h)}$, dBA 66: Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings (e.g., the USFS cabin in Berners Bay ).
- **Activity Category D –** Interior $L_{eq(h)}$, dBA 51: Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios (e.g., facilities in the community of Juneau, Haines, or Skagway).
- **Activity Category E –** Exterior $L_{eq(h)}$, dBA 71: Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in Activity Categories A–D or F. (e.g., the exterior of hotels and motels in Juneau, Haines, or Skagway).
- **Activity Category F –** Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing. (e.g., Juneau International Airport).
- **Activity Category G –** Undeveloped lands that are not permitted for development.

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

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

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

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

Short-term measurements were collected at and near the USFS cabin at the head of Berners Bay. Alternative 2B would pass approximately 1,000 feet east of this cabin. Meteorological conditions were mostly favorable when data were collected from September 10–16, 2003. Measurements were 49 dBA at the beach to the west of the cabin and 52 dBA at the cabin. The higher levels at the cabin were attributable to a nearby stream and rain falling through the trees. Noise in Berners Bay includes intermittent sounds from helicopters, small airplanes, and small boats including airboats, with the greatest frequency occurring in the summer.

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

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

Long-term and short-term sound measurements were collected in Juneau, Haines, and Skagway where increased traffic on local roads resulting from project alternatives could result in indirect noise effects to sensitive receptors. In Juneau, the Glacier Highway from downtown to Auke Bay is densely developed. Some residential noise receptors either abut the highway or have a direct line of sight to the highway without benefit of intervening structures. From Auke Bay to Echo Cove, development density decreases and sensitive land use is mostly residential. The Eagle Beach State Campground and a camping area at Echo Cove are located adjacent to the highway.

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

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

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

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

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

Five short-term measurements were collected at four locations in downtown Skagway, including the front yards of residences at Spring Street and 10th Avenue and Main Street between 15th and 17th avenues, mid-block on 22nd Avenue between Main and State streets, Historic Moore

Homestead, and Pullen Creek Shoreline Park. Recorded levels varied from 44 to 57 dBA, except for one peak measurement of 70 dBA caused by a barking dog near the meter.

Additional information on noise can be obtained in the *Noise Analysis Technical Report* (Appendix L) and the *2017 Update to Appendix L - Noise Analysis Technical Report* (in Appendix Z).

### 3.2.7 Hazardous Materials

An Initial Site Assessment (ISA) was prepared in 2004 for the project area (2005 Supplemental Draft EIS Appendix M) and updated in 2012 (see *2014 Update to Appendix M – Initial Site Assessment* and *2017 Errata* in Appendix Z) to determine the potential for encountering hazardous materials during construction of any alternative. The objective of the ISA process is to evaluate, based on readily available information, whether hazardous materials or petroleum products are likely to be present along the project corridor or are likely to exist in the future due to on-site or nearby activities or problems. Hazardous materials include soil and groundwater contamination due to leaking underground storage tanks, aboveground storage tanks, pesticides, and other chemical discharges.

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

Known and potential hazardous material sites in the project area were identified through review of federal and State databases, agency interviews, aerial photography, and site reconnaissance. Federal and State database research was updated in 2012 (see *2014 Update to Appendix M – Initial Site Assessment* and *2017 Errata* in Appendix Z). Minimum search distances and the types of databases required for review were based on American Society for Testing and Materials standard E2247-08.

Based on federal and State database review, there are 19 recorded sites in the vicinity of the 2014 Draft SEIS alternatives (Figure 3-12). Sixteen are incident reports for releases to the environment and three are registered underground storage tanks at the Auke Bay AMHS ferry terminal.

Eleven of the 16 database records of releases are at the Auke Bay AMHS ferry terminal: 10 spill reports from 2005 to 2011 involving the release of petroleum hydrocarbons (e.g., fuel oil, gasoline, or diesel fuel), and one report of contamination from a leaking underground storage tank (LUST). Most of the reports of releases indicate that cleanup was initiated and the release secured, or the amount of release was low and the released material has since dissipated. The report of LUST at the ferry terminal states that a conditional closure was approved in 2004.

Three of the 16 database records of releases are associated with Coeur Alaska operations and are mostly hydraulic oil leaks. One was near Comet Beach and two were near Slate Creek. These releases have been cleaned up or, in the case of the report of sheen from unknown sources of in lower Slate Creek in 2010, have likely dissipated.

The remaining two records (i.e., of the 16 total) represent an aboveground tank at a residence on the Glacier Highway and the release of diesel range organics from the AT&T Alascom Sullivan River Microwave Repeater Station on the west side of Lynn Canal. The incident at the Glacier Highway residence occurred in 2003 and the status remains “open” in the ADEC database as of

2012. The Sullivan River Microwave Repeater Station is located 1 mile north of the Sullivan River and within 600 feet of the centerline for the Alternative 3 alignment. State records identify the contamination was cleaned up to the satisfaction of ADEC by 2010.

Although it did not appear in any federal or State database listings, the Kensington beach facility, which is located within the alignment under Alternative 2B at Comet, contains three 20,000-gallon above-ground diesel fuel storage tanks and an incinerator. DOT&PF would acquire this facility if Alternative 2B were selected. A Phase I environmental site assessment would be performed to assess any risk associated with the use, history, or removal of any of the facility infrastructure.

For specific information on the *2014 Update to Appendix M – Initial Site Assessment* and *2017 Errata*, refer to Appendix Z.

## 3.3 Biological Environment

### 3.3.1 Wetlands

Waters of the U.S., including wetlands, are regulated by the USACE under the authority of the Clean Water Act. Wetlands are defined in the following excerpt from the federal regulations implementing Section 404 of the Clean Water Act (33 CFR 328.3):

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

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

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

In the study area, the largest wetland areas occur on the east side of Lynn Canal at the northern end of Berners Bay and on lowlands between Slate Cove and Sherman Point (Figures 3-13 through 3-17). At the north end of Berners Bay, the Antler and Berners rivers and their tributaries support an extensive area of palustrine scrub-shrub, palustrine emergent, estuarine flooded and emergent, riverine flooded, and palustrine forested wetlands. Forested wetlands cover large areas between Slate Cove and Sherman Point with patches of emergent and scrub-shrub wetlands in depressions and areas of groundwater discharge. On the west side of Lynn Canal, the most extensive wetlands in the study area are present in the Endicott River and Sullivan River areas (Figures 3-15 through 3-17). The Davidson Glacier outwash plain supports a large number of relatively small wetlands and water bodies that have formed in the alluvial material including emergent wetlands, ponds with emergent or floating vegetation, and open water habitats.

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

Agency comments on the 1997 Draft EIS, as well as scoping comments for the 2005 Supplemental Draft EIS, indicated that further analysis was needed for the proposed project relative to wetlands, and a new wetlands analysis was conducted in 2003. The 2003 analysis focused on wetlands in the immediate vicinity of the alignment for project alternatives.

Field methods for verifying wetland classification and boundaries were based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetlands hydrology, as outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Information on general site hydrology was interpreted from aerial photographs. On-site observations of wetland hydrology included the following criteria: inundated or saturated soils, landscape position, oxidized or reduced root channels, or sediment and debris deposits from previous flooding. Qualitative field notes of functions and values were recorded on a modified version of the Juneau Airport EIS Wetland Functional Assessment Data Form.

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

In 2006, after the Final EIS was published, DOT&PF submitted a Clean Water Act Section 404 permit application to the USACE for the Final EIS preferred alternative, Alternative 2B. During the permit process, the wetlands in the area of the Antler and Berners/Lace rivers were delineated using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), as described above. The delineation resulted in better information on the extent of wetlands in this area and a minor reduction in the total number of wetland acres. The reduction is reflected in Section 3.3.1.2 (Distribution within the Project Area).

In 2010, the DOT&PF applied for a Clean Water Act Section 404 permit for the Glacier Highway Extension, a separate project from the JAI Project. Additional wetland delineation field work to refine wetland boundaries was completed for the three-mile extension. This delineation field work also produced better information on the extent of wetlands in this area, leading to a minor reduction in the total number of wetlands reported in the project area. The reduction is reflected in Section 3.3.1.2 (Distribution within the Project Area).

#### 3.3.1.1 Wetland Classifications

The classification of wetlands in the project area follows the NWI Classification System and includes both freshwater and saltwater-influenced wetlands. Palustrine wetlands are nontidal wetlands with vegetation either dominated by persistent emergent vegetation (“emergent”), shrubs (“scrub-shrub”), or trees (“forested”), or by water bodies that lack such vegetation and have relatively shallow water (“aquatic bed/open water”). Estuarine emergent wetlands, or salt marsh communities, consist of salt-tolerant vegetation in areas that are subject to tidal inundation and extend to the seaward limit of emergent vegetation and/or upstream where the ocean-derived salts measure less than 0.5 percent during low-flow periods. Figures 3-14 through 3-17 identify the locations of these wetlands within the project area.

**Palustrine Emergent Wetlands** – Palustrine emergent wetlands within the project area primarily occur in association with groundwater seeps (marshes or fens), muskeg or bog environments, and areas that are flooded to the extent that tree and shrub growth is inhibited. Sedges (*Carex* spp.) are typically the dominant species, with cottongrass (*Eriophorum* spp.) and water horsetail (*Equisetum fluviatile*) also found. These areas have a low shrub component of Labrador tea (*Ledum groenlandicum*), bog blueberry (*Vaccinium uliginosum*), or cloudberry (*Rubus chamaemorus*). Emergent wetlands are often components of larger wetlands complexes of scrub-shrub and forested wetlands and aquatic bed/open water features.

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

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

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

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

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

#### 3.3.1.2 Distribution within the Project Area

The East Lynn Canal wetlands are bounded by the Juneau icefields to the east, the Lynn Canal marine waters to the west, Skagway to the north, and the northern extent of the Glacier Highway to the south. Approximately 11,207 acres of wetlands lie within the eastern side of the study area. Palustrine forested wetlands make up over half of the wetlands in this area (Table 3-4).

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

**Table 3-4:**
**Project Area Wetlands by Type**

| Wetland Type | Acres (Percent of Total) | | |
|---|---|---|---|
| | East Lynn Canal | West Lynn Canal | Total Project Area |
| Estuarine Emergent | 573 (5.1%) | 392 (16.0%) | 966 (7.1%) |
| Palustrine Emergent | 1,812 (16.2%) | 340 (13.9%) | 2,152 (15.7%) |
| Palustrine Forested | 6,682 (59.6%) | 1,039 (42.4%) | 7,759 (56.6%) |
| Palustrine Scrub-shrub | 2,120 (18.9%) | 670 (27.3%) | 2,803 (20.4%) |
| Palustrine Aquatic Bed | 20 (0.2%) | 10 (0.4%) | 30 (0.2%) |
| Total Wetlands | 11,207 | 2,451 | 13,710 |

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

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

#### 3.3.1.3 Wetlands Functions

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

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

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

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

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

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

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

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

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

Detailed wetland maps and additional information on wetland function ratings are provided in the *Wetlands Technical Report* (Appendix O), and the *2014 Update to Appendix O – Wetlands Technical Report* and *2017 Errata* (see Appendix Z).

### 3.3.2 Marine and Freshwater Habitat (Including Essential Fish Habitat)

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

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

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

### 3.3.2.1 Marine Habitat in Lynn Canal

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

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

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

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

Thirty-one subtidal areas were surveyed using the Seabed Imaging and Mapping System, which consists of a video camera that is towed just above the seabed and a video recording system that links GPS fixed locations to the imagery. Figure 3-18 shows the 14 general locations where these 31 subtidal surveys were conducted. Video data were classified for geological and biological features, providing a classification record for every two seconds of imagery.

Surveys of 49 intertidal sites were conducted during low tide from August 26 to 29, 2003. These sites were identified by DOT&PF as areas potentially affected by highway construction and ferry terminal development.

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

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

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

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

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

**Subtidal Habitat –** Subtidal areas are the areas extending below the intertidal zone along the seabed toward the offshore region. The substrate in the subtidal areas surveyed in Lynn Canal consists of boulders, cobbles, gravel sediments, and mud. Fish, invertebrates, and vegetation are present in the subtidal area; the concentrations of these species depend on the type of substrate. Offshore regions consist predominantly of mud and sand with a minimum of vegetation, but observable populations of burrowing mollusks and fish occur. The subtidal areas nearer to the shore consist of a mixture of sandy and rocky substrates, with boulders and cobbles more concentrated toward the shore. The rocky substrates support a higher diversity of sessile fauna (e.g., cup corals and sea anemones) as well as mobile species (e.g., crabs and urchins) and algae (e.g., kelps and coralline reds). Areas where subtidal habitat surveys were conducted are noted on Figure 3-18. Site-specific observations are presented below.

- **Sawmill Cove –** A 500-by-1,600-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 100 feet. The seabed is composed almost exclusively of clastic sediment (muds, sand, and gravels) with occasional large cobble. Gravel content is highest in the intertidal zone and drops off rapidly in the offshore where sands and muds predominate. Rockweed was interspersed with large-bladed kelp. One species of this kelp (*Laminaria saccharina*) was sparse but persistent and evenly distributed throughout the site. No eelgrass, floating kelp, or giant kelp were noted at the site. Subtidal fauna included sea whips (*Halipterus* sp.), one location of orange sea pens, and one location with a bivalve and brozoan complex concentration. Mobile species were also recorded including yellowfin sole, rock sole, gunnels, snake pickleback, sculpin, sand lance, and a large school of young Pacific herring.
- **Slate Cove –** A 980-by-2,600-foot area was surveyed from the intertidal zone (at approximately +6 foot tidal elevation) to a depth of 125 feet. The site has a highly uniform seabed consisting of mud. A few boulders and cobbles were observed. No sea grasses or kelps were noted. Subtidal fauna was sparse with a few unidentified fish, a few flatfish, and one anemone observed.
- **Representative East Lynn Canal Shoreline between Comet and Katzehin River –** Surveys were conducted at three locations along the east coast of Lynn Canal between Comet and the Katzehin River. The surveys were conducted from the intertidal zone (from approximately +10 to -4 feet tidal elevation) to depths from 100 to 128 feet. This section of shoreline is very steep and has substrate with varying amounts of bedrock, sediment veneer over bedrock, and boulder-cobble-gravel sediments. Shell fragments were noted throughout the survey areas. Coralline red algae were common at all three survey areas, whereas bladed kelps, fucus, filamentous red algae, and foliose red algae were uncommon. Bryozoan complexes dominated the deeper areas of all three areas. Unidentified fish were common at two of the areas, and anemones, sea whips, and mottled stars were uncommon at all three areas. Green urchins were common in the intertidal zone at two survey areas and uncommon at the other. Barnacles and mussels were noted but uncommon.
- **Katzehin Ferry Terminal Area –** A 660-by-2,600-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 85 feet. The subtidal seabed is composed of a muddy zone. No vegetation was observed. Subtidal fauna was sparse with a few unidentified fish, a few flatfish, and a single anemone.

- **Taiya Inlet** – Two types of subtidal habitat were surveyed in the Taiya Inlet as representative of habitat potentially impacted by rock sidecasting. The first type represents a scenario where rock would land on an underwater outcrop (or ledge) of rock. The second represents a scenario where rock would fall into marine water with steep-sided shores. A survey area north of the Katzehin River where underwater bedrock outcrops were observed in deeper water represents the underwater outcrop scenario. The survey was conducted from the intertidal zone (from +6.5 foot tidal elevation) to a depth of 125 feet. Intertidal substrate was mostly boulder-cobble with offshore substrate mostly gravelly mud/sand. Shell fragments were sparsely distributed with higher concentrations associated with bedrock areas. Vegetation cover was restricted to the intertidal area and dominated by bladed kelps and coralline red algae. At depths greater than 50 feet, mussels, shrimp, and unidentified urchins were common. Green sea urchins, crab, snails, unidentified fish, and flatfish were noted but uncommon. Five steep-sided sites were surveyed in the Taiya Inlet. The surveys were conducted from the intertidal zone (0 foot tidal elevation to +11.5 foot tidal elevation) to depths from 100 to 148 feet. The shoreline was steep with variable substrate. Bedrock dominated the intertidal and shallow subtidal areas. Subtidal areas had rock with sediment veneers over bedrock. Shell fragments were common (30 to 50 percent coverage). Vegetation was observed in the shallow subtidal areas and primarily consisted of coralline algae, foliose green algae, fucus, filamentous red algae, and bladed kelp. Vegetation covers were typically low (e.g., one site had 25 percent coverage). Barnacles and mussels were common in the intertidal area, and shrimp were common in the subtidal areas. Sea urchins, anemones, bryozoan complexes, and fish were observed but were not common.
- **William Henry Bay** – A 1,300-by-3,000-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 70 feet. Fines rapidly increased in the offshore direction, with sands and muds extending to the 30 to 50 foot depth and muds predominate in deeper water. Vegetation was restricted to depths of less than 50 feet. Subtidal vegetation observed included minimal amounts of bladed kelp and filamentous red algae. Subtidal fauna observed included sea cucumbers; orange sea pens, which were common on the northern end of the survey area (33- to 65-foot depth); sea whips; anemones, which were common at depths greater than 33 feet; mottled sea stars, which were common between three and 20 feet; 18 crabs; and flatfish, which were common and had 44 individuals observed at depths greater than 23 feet throughout the survey area.

For further information on the marine environment in the study area, see the *EFH Assessment* (Appendix N) and the *2014 Update to Appendix N – Essential Fish Habitat Assessment* and *2017 Errata* (see Appendix Z).

#### 3.3.2.2 Freshwater Habitat in Lynn Canal

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

Approximately 90 streams are within the proposed project area, and about 29 percent of these streams (15 on the east and 11 on the west side of the canal) are known to support anadromous fish species (ADF&G, 2016a). Freshwater lake habitat in the area consists of high mountain lakes, which are usually surrounded by a variety of riparian vegetation.

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

Anadromous fish habitat has been identified along the east side of Lynn Canal within Berners Bay (the Berners, Lace, and Antler rivers, Johnston and Slate creeks, a side channel to the Lace River, and a slough south of the Antler River, and an unnamed creek northwest of Slate Cove); at Sherman, Sawmill, Independence, Sweeney, and Pullen creeks; and in the Katzehin River and a side channel to the Katzehin River (Figure 3-18). The Katzehin, Lace, and Antler rivers are large glacial river systems in U-shaped valleys. Many of these anadromous streams also support resident fish populations. There are several smaller streams with the potential to support resident fish; the remaining streams along the east side of the canal provide poor fish habitat and/or have steep waterfalls.

Anadromous fish habitat exists within rivers contained in floodplains and U-shaped valleys along the west side of Lynn Canal. Anadromous streams found in William Henry Bay are the Beardslee River and William Henry Creek. Other anadromous streams are the Endicott, Sullivan, and Chilkat rivers; Sullivan Creek; Glacier River; and four unnamed streams. As on the east side of Lynn Canal, many of the anadromous fish streams also support resident fish populations. Several smaller streams have the potential to support resident fish; the remaining streams along the west side of the canal provide poor fish habitat.

See the *Anadromous and Resident Fish Streams Technical Report* (Appendix P) and the *2014 Update to Appendix P – Anadromous and Resident Fish Streams Technical Report* and *2017 Errata* (see Appendix Z) for additional information on stream habitat in the project area.

### 3.3.3 Terrestrial Habitat

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

Terrestrial habitat in the Lynn Canal study area consists mostly of coastal coniferous rainforest, which occurs throughout the study area and is characterized by an overstory dominated by western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), and some scattered mountain hemlock (*T. mertensiana*), Alaska or yellow cedar (*Chamaecyparis nootkatensis*), and red alder (*Alnus oregona*). The TLRMP refers to this climax stage of the spruce/hemlock or hemlock forest habitat as old-growth forest. Large trees, decaying logs, lush undergrowth, and multiple canopy layers characterize old-growth forest habitat. There is a total of approximately 155,464 acres of old-growth forest in the Lynn Canal watershed, with 103,501 acres along East Lynn Canal and 51,963 acres along West Lynn Canal (see also the *Land Use Technical Report*, Revised Appendix DD of this Final SEIS). Old-growth forest typically extends from sea level to an elevation of approximately 2,500 feet, with subalpine and alpine habitats at higher elevations. In the typical Sitka spruce/western hemlock forest, the understory consists of shrubs such as Sitka alders (*A. crispa*), rusty menziesia (*Menziesia ferruginea*), blueberry (*Vaccinium ovalifolium and V. alaskensis*), red huckleberry (*V. parvifoloium*), salmonberry (*Rubus spectabilis*), shield ferns (*Dryopteris dilitata*), devils club (*Echinopanax horridum)*, and yellow skunk cabbage (*Lysichiton americanum*).

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

Interspersed within the forest are open, poorly drained areas, including muskeg and bog communities. These wetland communities are discussed in Section 3.3.1.

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

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

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

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

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

Three non-native plant species were found north of the Katzehin River. Two of these species, creeping buttercup (*Ranunculus repens*) and butter and eggs (*Linaria vulgaris*) are considered invasive. NMFS (2014) has noted that reed canarygrass and Japanese knotweed are present and spreading in Southeast Alaska, including along Lynn Canal.

Lands on both sides of Lynn Canal, in the vicinity of the JAI Project, contain substantial but sometimes discontinuous old-growth forest habitat. As stated in Section 3.1.1.1, the 2016 TLRMP preserves a large acreage of old-growth forest habitat as medium or large OGRs or as small reserves in Old-Growth Habitat LUDs.

The OGRs and Old-Growth Habitat LUDs are the key components of the forest’s old-growth habitat conservation strategy, which is meant to protect wildlife species as well as the forest itself, with emphasis on the viability of key indicator wildlife species. In short, the reserve system is “developed to maintain a functional and interconnected old-growth forest ecosystem on the Tongass by retaining intact, largely undisturbed habitat” (USFS, 2016a, Appendix D, p. D-6).

As described in the 2016 TLRMP Final EIS (USFS, 2016b, p. K-3), the old-growth reserve system must meet minimum size, spacing, and composition requirements, as follows:

- **Large old-growth reserves** – A large reserve must be 40,000 acres; 20,000 of those acres must be productive old-growth forest (more than 8,000 board feet [BF] per acre). At least 10,000 acres of the productive old-growth forest should be in the high volume class (more than 20,000 BF per acre).
- **Medium old-growth reserves** – A medium reserve is 10,000 acres; 5,000 of those acres must be productive old-growth forest. At least 2,500 acres should be in the high-volume class.
- **Small old-growth reserves** – Small reserves are identified within value comparison units (VCUs) of the Tongass National Forest. Small reserves must be at least 16 percent of the area of the VCU, and at least 50 percent of that area must be productive old-growth forest. Each reserve should contain at least 800 acres of productive old-growth forest, but must contain a minimum of 400 acres of productive old-growth forest.

Evaluation of any modification of reserves must include consideration of Non-Development LUDs that function as medium or large old-growth reserves to maintain the integrity of the old-growth forest ecosystem and contribute to a forest-wide system of reserves. Where the Non-Development LUDs do not fulfill size, spacing, and composition criteria of Old-Growth Habitat reserves, it would be necessary to add or modify old-growth reserves to meet the criteria. TLRMP documents indicate that an amendment to the TLRMP would be required in order to add or modify old-growth reserves.

In the project area, Old-Growth Habitat LUDs occur in the following VCUs:

- VCU 230 and VCU 240, adjacent Old-Growth Habitat LUDs on the east side of Lynn Canal north of Juneau near Echo Cove.
- VCU 160 and VCU 200, adjacent Old-Growth Habitat LUDs east of Lynn Canal in the area of Slate Cove and Point Saint Mary Peninsula on the northern edge of Berners Bay. The Old-Growth Habitat LUD in VCU 200 overlaps into VCU 160, and there is a separate Old-Growth Habitat LUD in VCU 160 as well.
- VCU 190, an Old-Growth Habitat LUD east of Lynn Canal in an area between Comet and Met Point.
- VCU 950, an Old-Growth Habitat LUD west of Lynn Canal near the National Forest boundary with Haines State Forest.

According to USFS policy, Old-Growth Habitat LUDs require a contiguous landscape of at least 16 percent of the VCU area, and 50 percent of this area must be productive old-growth timber (USFS, 1997b). Where feasible, the boundaries of an Old-Growth Habitat LUD should follow geographic features so that the boundaries can be recognized in the field. Along with the general criteria of size and productivity, connectivity between areas of old-growth habitat is also a criterion. The design of each habitat is to be based on wildlife concerns specific to the particular area.

Criteria commonly used in designating Old-Growth Habitat LUDs include important deer winter range, probable goshawk nesting habitat, probable marbled murrelet nesting habitat, large forest blocks, rare plant associations, and landscape linkages. The *Land Use Technical Report* (Revised Appendix DD of this Final SEIS) provides detailed information on Old-Growth Habitat LUDs in the study area.

### 3.3.4 Marine and Anadromous Fish and Shellfish

The waters in the Lynn Canal area support anadromous, resident, and marine finfish, and shellfish. The varied and dramatic topography of the area provides habitat for a diversity of fish species along the canal. See Section 3.3.2 for habitat descriptions.

#### 3.3.4.1 Marine Finfish

The following marine fish in the Lynn Canal were assessed: sablefish, yelloweye rockfish (*Sebastes ruberrimus*), other rockfish (*Sebastes* spp.), sculpin, skate, Pacific herring, and forage (prey) fish (eulachon, capelin, and sand lance).

Sablefish spawn at depths of 984 to 1,640 feet near the edges of the continental slope. Larval sablefish move into shallow nearshore waters for the first 1 to 2 years of their lives and begin moving offshore again to the continental slope and deep-water coastal fjords. Young sablefish have been known to occur in Lynn Canal estuaries (e.g., Berners Bay). Sablefish are highly mobile during part of their life. Substantial movement between the Bering Sea/Aleutian Islands and the Gulf of Alaska has been documented. Larval sablefish feed on small zooplankton.

Juveniles and adults are considered opportunistic feeders and feed on euphausiids, shrimp, cephalopods, squid, jellyfish, and other fish species.

Rockfish use three types of habitat: demersal shelf, pelagic shelf, and slope. Demersal shelf rockfish are nearshore bottom dwellers, inhabiting the continental shelf in rocky-bottomed areas. Pelagic shelf rockfish are nearshore schooling fish, inhabiting the continental shelf water column rather than along the ocean floor. Slope rockfish, which are deepwater species inhabiting the edge of the continental shelf, are unlikely to occur in Lynn Canal. Rockfish diet varies by species. In general, juvenile rockfish eat plankton and fish eggs, and adults feed on crustaceans and fish species.

Sculpins are bottom dwelling fish that lay adhesive eggs in nests against rocks. Larval sculpin are generally found in food-rich habitats, including fast-moving cold-water streams; rocky intertidal zones; and pier, wrecks, and reefs. Sculpin species have been caught near Skagway during marine and freshwater fish inventories and were observed in tidal pools during intertidal surveys conducted in 2003 for the JAI Project. Sculpin feed on small invertebrates (e.g., shrimp, crab, barnacles), small flatfish, eelpouts, other sculpin, and smelt.

Skate inhabit inner and outer shelf areas, most commonly soft-bottom areas. Skates lay fertilized eggs on the ocean floor where they hatch and grow to maturity. Skates have been collected in Lynn Canal trawl surveys. Skate prey on pollock, shrimp, crab, small flatfish, sculpin, eelpouts, smelt, and other bottom-dwelling species.

Pacific herring spawn primarily in shallow, vegetated intertidal and subtidal areas. After spawning, adults move offshore to feed. The young rear in sheltered bays and inlets and appear to remain segregated from adult populations until they mature. Pacific herring currently spawn in and around Berners Bay (Figure 3-19). Young herring feed on small copepods and nauplii, diatoms, and ostracods, and change to feed on crustaceans and medium-size zooplankton as they mature. Adult herring feed on zooplankton, pollock larvae, sand lance, capelin, and smelt.

The Pacific herring population in Lynn Canal has been substantially reduced over the decades to the point that it is no longer a viable commercial fishery. Various hypotheses have been made about why the stocks have declined, although none have been substantiated by scientific analysis. These hypotheses include one or some combination of the following factors: overfishing, increased predator populations, disease, habitat alteration/degradation, water pollution, and unfavorable oceanographic conditions.

In a quantitative assessment of the frequency with which explanations have been attributed to herring stock collapses worldwide, Pearson et al. (1999) found that overfishing (74 percent of the cases) was the most frequently cited cause, followed by environmental change (50 percent of cases), changes in food supply (15 percent), predation (2 percent), disease (2 percent), and habitat modification (2 percent). In most cases, these factors were seen to have acted in combination with others; single-factor causes other than overfishing (37 percent) or environmental change (13 percent) alone were rare.

Overfishing may have played a role in the initial decline of Lynn Canal herring stocks. As previously noted, stocks were harvested at a relatively low rate (<1,000 tons) until stock declines led to a fishery closure in 1982. Harvest did occur in some seasons when minimum spawning biomass thresholds were not met, and the Lynn Canal stock may have been especially susceptible to brief periods of overfishing due to poorly understood factors, such as its limited migratory range.

Since closure of the herring fishery in 1982, ADF&G has closely monitored the stock through aerial, skiff, and dive surveys. Currently these surveys show that the estimated biomass is approximately 3,200 tons below the 5,000-ton threshold for a sustainable commercial fishery. Spawn deposition estimates have fluctuated widely in the last decade, with a low of 509 tons documented in 2008 to 8,000 tons estimated in 2013. This fishery could return if biomass estimates return to a long-term trend above the 5,000-ton threshold (Thynes et al., 2016).

Eulachon aggregate near the bottom of estuarine and riverine channels prior to their spawning migration to the lower reaches of rivers with moderate velocities. Eulachon mass spawn at night. Survival of eggs in these large masses immediately after spawning is very low (<1 percent) (Willson et al., 2006). Most adults die following their first spawning. Newly hatched larvae are quickly flushed to the marine environment by the river currents where they will remain for several weeks. Juveniles and adults feed on planktonic prey. Eulachon spawn in Berners Bay rivers and the Katzehin, Chilkat, Skagway, and Taiya rivers.

Capelin spawn in intertidal zones with coarse sand and fine gravel substrate. Very few adult capelin survive after spawning. Capelin feed on planktonic prey for the most part although marine worms and small fish are also consumed.

Sand lance spawn in coastal inshore waters. Newly hatched larvae and adults migrate offshore in early summer and return to inshore waters to overwinter. Sand lance feed in the water column on crustaceans and zooplankton when young and adults feed on fish larvae, amphipods, annelids, and common copepods.

#### 3.3.4.2 Marine Shellfish

Shellfish species found in Lynn Canal include red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), golden king crab (*Lithoides aequispinus*), bairdi Tanner crab (*Chionoecetes bairdi*), Dungeness crab (*Cancer magister*), Pacific blue mussels (*Mytilus trossulus*), clams (*Macoma* spp.*),* and shrimp (*Decapoda* spp.). All of the shellfish except golden king crab inhabit the intertidal and subtidal zones at some time during their life history. Red and blue king, bairdi Tanner, and Dungeness crabs are all found at depths between the intertidal zone and approximately 600 feet (depending on their life stage), whereas golden king crabs are usually found much deeper, usually between 600 to 1,600 feet (ADF&G, 2004). Mussels and clams, which are less motile than crabs, are restricted to the intertidal and subtidal zones. Shrimp species inhabit varying depths and habitat types, but are generally found between the intertidal zone and depths of 1,800 feet.

#### 3.3.4.3 Anadromous Fish

Anadromous fish occurring in the Lynn Canal study area were identified by a 1994 field survey of streams in Lynn Canal and a recent review of ADF&G's *Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes*. The anadromous fish species found in Lynn Canal are all five Pacific salmon species (chinook, coho, sockeye, chum, and pink), steelhead/rainbow (*O. mykiss*) and cutthroat trout (*O. clarki*), Dolly Varden char (*Salvelinus malma*), round whitefish (*Prosopium cylindraceum*), and eulachon.

Depending upon the species, anadromous fish spend from one to several years rearing in freshwater (chinook, coho, and sockeye salmon; rainbow/steelhead and cutthroat trout; and Dolly Varden) or leave immediately upon emerging from the spawning gravels (chum and pink salmon). Still others move into fresh water with the tides, spawn, and return to saltwater (eulachon). Steelhead trout, rainbow trout that have spent a portion of their lives at sea, commonly spawn more than once, unlike salmon.

Chinook salmon tend to favor large river systems such as the Chilkat River for spawning and rearing, while sockeye salmon seek out river systems that include lakes, such as the Berners, Chilkoot, and Chilkat rivers. Coho salmon will rear in lakes but are usually found in small streams that empty directly into saltwater. In the Lynn Canal area, round whitefish are found only in the Chilkat River system. Round whitefish are less tolerant of the marine environment than other anadromous species, so during spring and summer, they move from freshwater out to nearshore brackish waters to feed, and then in fall move upstream to spawn and/or overwinter.

### 3.3.5 Wildlife

Hundreds of wildlife species (mammals, birds, and amphibians) live within or pass through the study area for the JAI Project. The 1997 Draft EIS primarily analyzed five species based on 1994 agency scoping comments. The 2006 Final EIS evaluated 27 species, including species identified in 2003 agency scoping comments. Some of these species were added because they are listed on federal or State agency conservation plans. Other species were added because they are susceptible to the effects of highway construction or represent management concerns for similar species. This Final SEIS presents information on four additional species that occur in the project area but were not analyzed in the previous studies: yellow-billed loon (*Gavia adamsii)*, black oystercatcher (*Haematopus bachmani)*, Aleutian tern (*Onychoprion aleuticus*), and dusky Canada goose (*Branta canadensis occidentalis*).

The principal discussion on bald eagles is provided in Section 3.3.6. Threatened and endangered species (Steller sea lions [*Eumetopias jubatus*] and humpback whales [*Megaptera novaeangliae*]) are discussed in Section 3.3.7. Figures 3-20 through 3-23 depict wildlife and habitat locations.

Many species have been placed into various categories by the USFS, State of Alaska, or other agencies, according to multiple population characteristics, predictable responses to certain human activities, low abundance, or susceptibility to habitat disturbance or loss. Subsequent to the 2006 Final EIS, the USFWS added an ESA candidate species, the USFS updated its Sensitive Species designations for Tongass National Forest and no longer uses a Species of Concern list (USFS, 2008b), and the State of Alaska no longer maintains a Species of Special Concern list (ADF&G, 2012a). The following subsections identify both the categories applicable to the species found in the study area and the species selected for analysis.

#### 3.3.5.1 Species Selected for Analysis

The species selected for analysis were drawn from USFS management indicator species (MIS), USFS's previously identified species of concern, USFS sensitive species, the previously listed State species of special concern, and other species identified by agencies of particular concern or representative of a group of species.

**USFS Management Indicator Species –** MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. The USFS recognizes limitations in the MIS concept but uses it to represent the complex of habitats, species, and associated management concerns for planning, assessment, and monitoring purposes (USFS, 1997b). As part of the TLRMP update process, USFS held a series of workshops in 2011 with representatives from the ADF&G, NMFS, and USFWS to evaluate the current MIS and develop a set of proposed MIS that would more effectively serve the Tongass National Forest. The MIS included in the 2016 TLRMP include mountain goat (*Oreamnos americanus*), Sitka black-tailed deer (*Odocoileus hemionus sitkensis*), marten (*Martes americana*), brown bear (*Ursus arctos*), black bear (*U. americanus*), and bald eagle (*Haliaeetus leucocephalus*) (USFS, 2016b). Based on the list (2016) and coordination and consensus with the resource agencies during scoping for the 2005 Supplemental Draft EIS, the species evaluated in this Final SEIS include the MIS listed above, in addition to river otter (*Lutra canadensis*) and Alexander Archipelago wolf (*Canis lupus ligoni*), which were previously included.

**USFS Species of Concern –** Because the 2008 TLRMP curtailed use of a Species of Concern list (USFS, 2008b), the species analyzed in the 2006 Final EIS under this heading have no special designation in the project area as of 2008.

**USFS Sensitive Species –** These species are considered susceptible or vulnerable to habitat alterations and management activities to the extent that there is concern for the long-term persistence of the species. Five bird species identified for analysis fall under this category: the yellow-billed loon, Queen Charlotte goshawk, black oystercatcher, Aleutian tern, and dusky Canada goose.

**State Species of Special Concern –**As of August 2011, the State of Alaska no longer maintains a list of Species of Special Concern (ADF&G, 2012a). Species that were formally listed and previously analyzed without any other past or current State or federal designation include the terrestrial bird species olive-sided flycatcher, gray-cheeked thrush, Townsend’s warbler, and blackpoll warbler.

**Other Species –** Species not included in the above categories but included in analysis for this Final SEIS include three birds, one amphibian, one terrestrial mammal, and five marine mammals. Kittlitz’s murrelet (*Brachyramchus brevirostris*) was petitioned for ESA listing in 2001 (Center for Biological Diversity et al., 2001).

The USFWS designated this species as a candidate species in 2004.[13] The yellow-billed loon was designated as a candidate for ESA listing on March 25, 2009 (USFWS, 2011). Harlequin duck (*Histrionicus histrionicus*) is included as a representative species of the waterfowl that inhabit Lynn Canal. Wood frog (*Rana sylvatica*) is representative of other amphibians such as the spotted frog and boreal toad that inhabit Lynn Canal. Moose (*Alces alces*) is included due to its importance as a game management species in Alaska. Sea otter (*Enhydra lutris*), minke whale (*Balaenoptera acutorostrata*), harbor porpoise (*Phocoena phocoena*), Dall’s porpoise (*Phocoenoides dalli*), and killer whale (*Orcinus orca*) are included because they are found in

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[13] Candidate species are plants and animals for which USFWS has sufficient information to propose them as endangered or threatened under the ESA but for which development of a listing regulation is precluded by other higher priority listing activities. Candidate species are not subject to regulatory protection, and human activities that may affect them are not restricted.

Lynn Canal and they are species protected by the Marine Mammal Protection Act (MMPA; 16 USC 1361 *et seq.*).

### 3.3.5.2 Terrestrial Habitat Use

The dominant terrestrial cover type, Sitka spruce/western hemlock forest, provides habitat for a variety of both mammal and bird species. The presence of large trees, decaying logs, lush undergrowth, and multiple canopy layers that characterize the spruce/hemlock forest of the study area provide unique habitat for many species for foraging, resting, nesting or denning, and as escape cover from predators. Forested wetlands, muskegs and bogs, and emergent wetlands occur in small, isolated pockets or large expanses, provide openings or breaks in forest cover, and are important to the overall habitat diversity in the region by providing both food and cover for some species of wildlife.

Migratory birds are protected under the Migratory Bird Treaty Act of 1918, which regulates the taking of migratory birds and their eggs or nests, and the Migratory Bird EO (EO 13186), which encourages federal agencies to avoid or minimize to the extent practicable adverse impacts on migratory bird resources. Forest habitat is used as foraging and nesting habitat by a number of migratory birds, several of which are species of special concern such as the olive-sided flycatcher, gray-checked thrush, Townsend’s warbler, and blackpoll warbler. Marbled murrelets also use the forest habitat for nesting. Resident forest-dwelling bird species such as woodpeckers, finches, sparrows, and thrushes also use these areas for foraging, nesting, and rearing young.

In accordance with a commitment in the 2006 ROD for the JAI Project, DOT&PF funded ADF&G population studies for 3 years to address potential game management concerns raised by ADF&G. These studies focused on brown bears, moose, mountain goats, and wolverines and provide additional detail on their terrestrial habitat use. This section includes updated information from those studies.

Forest habitat is important for cover and foraging for black bears during the spring, summer, and fall and for denning during the winter. Black bears are attracted to palustrine emergent and scrub-shrub wetlands for berry-producing shrubs, wetland grasses, sedges, and forbs such as skunk cabbage. Black bears migrate to estuarine areas in the spring and again in the fall along well-established corridors (Christensen and Van Dyke, 2004). See Figure 3-21.

The recent ADF&G study of brown bears, which involved tracking of collared bears from June 2006 to December 2010 (Flynn et al., 2012), focused on the area surrounding the drainages of Berners Bay, although bears were also recorded outside those areas. The estimated population centered on Berners Bay was 44 bears in 2006, 67 bears in 2007, and 60 bears in 2008, with a density of brown bears similar to that of other areas on the mainland coast between Ketchikan and Skagway. The highest numbers of bears moving through Berners Bay and surrounding drainages occurred during early summer and late summer. The recorded locations also identified brown bear crossings of rivers and creeks. The most brown bear crossings in the Berners Bay study area were at Sawmill Creek, Berners Bay estuary, Slate Creek, Sweeny Creek, and Independence Lake Creek just north of Comet (Flynn et al., 2012).

By June 1, most bears were out of their dens, and they moved to riparian areas and the estuary in Berners Bay to feed on lush vegetation. In the early summer, brown bears selected estuarine emergent habitats, as well as herbaceous, closed forest, open forest, shrub, and beach habitats.

About mid-July, salmon entered the local streams, and most bears sought spawning salmon. Late summer habitat selection included estuarine emergent, open forest, and shrub. Brown bear paths followed river bottoms in all seasons except denning. Brown bears were not recorded in alpine areas. Some bears started seeking out dens in mid-October. Denning bears emerged from dens from early April until late May (Flynn et al., 2012). Additional details regarding this study are in the *2017 Update to Appendix Q – Wildlife Technical Report* (see Appendix Z). Figure 3-22 shows brown bear habitat within the project area.

Forested wetlands provide a variety of plant forage species not found in upland forests. Other key forest-dwelling wildlife species in the study area include the marten (Figure 3-22) and Alexander Archipelago wolf (Figure 3-21), both of which require forest habitat for foraging and reproduction. Forested areas are important for the Sitka black-tailed deer (Figure 3-23), especially to avoid deep snow during the winter, after spending summer months in alpine and subalpine areas feeding on herbs and shrubs.

Emergent and scrub-shrub wetlands provide habitat for wildlife such as the Alaska wood frog and the boreal toad. Alaska wood frogs are common in various types of wetland habitat (Broderson, 1994).

Small populations of moose occur in the Berners Bay area (see Figure 3-23). The recent ADF&G study of moose in the Berners Bay area recorded moose along coastal areas around Berners Bay from Davies Creek (Echo Cove area) north to approximately 3 miles north of Slate Cove (White et al., 2012a). During the study, the population estimates declined from approximately 120 animals to 85 (and as low as 78 during 2009 to 2010), most likely due to deep and long-lasting snow levels during most of the winters (White et al., 2012a). Most moose activity occurred at elevations below 500 feet during all seasons. Predominant vegetative types important for moose in the Berners Bay area are deciduous shrublands, emergent herbaceous meadows, conifer forest, and unvegetated riparian and upland habitats (White et al., 2007). During summer (June to August), moose primarily used deciduous and riparian habitats. During winter (November to March), moose utilized deciduous habitats the most, but the use of conifer habitat during winter was observed where lower snow depths occurred. Additional details regarding this study are in the *2017 Update to Appendix Q - Wildlife Technical Report* (see Appendix Z).

The higher alpine and subalpine habitats support mountain goats during the spring and summer. During winter, goats use forest habitats for cover when snow forces them out of higher areas. Subalpine and alpine habitats are used by black bears to forage, brown bears to den (winter), and Sitka black-tailed deer to forage in the summer months. Kittlitz's murrelets nest at scattered sites located high on recently deglaciated rocky slopes. This species forages in glacially fed waters during the breeding season.

The recent ADF&G study of mountain goats in the Berners Bay area determined that mountain goats along eastern Lynn Canal migrated from alpine summer ranges (averaging > 3,000 feet) to remain in low elevation (<1,500 feet) forested winter ranges between late October and late April (White et al., 2012b). Some goats spent time below 500 feet in elevation during winter, including near tide line where steep terrain extended to sea level. East of Berners Bay, steep terrain does not consistently extend to sea level, and mountain goats winter at slightly higher elevations on average than other areas of Lynn Canal. Areas of high use during winter occur very close to the coast north of Comet. Most of the Berners Bay, Katzehin beach, and Slate Cove to Comet coastal areas are not considered mountain goat habitat due to their distance from steep escape terrain.

Additional details regarding this study are in the *2017 Update to Appendix Q – Wildlife Technical Report* (see Appendix Z).

The recent ADF&G study of wolverines in the eastern Lynn Canal area (Lewis et al., 2012) found the average home range for female wolverines to be 25 square miles during late winter to mid-summer and for males the range was 188 square miles. The home range areas encompass marine lowlands and mountainous terrain. Wolverines in the study made extensive use of valley sides throughout the Berners Bay area, from river bottoms to treeline and above. These correspond to low- to mid-elevation areas (<3,280 feet) with moderate slopes (30 percent). Wolverines were more likely to use shrub habitats (e.g., avalanche chutes and other shrubby areas) for foraging on small mammals and birds, and unvegetated habitats (e.g., alpine areas) for denning. Litters are born between February and April. Wolverines are active at any time of day, year round. They are carnivores, and are known to prey on voles, squirrels, snowshoe hares, and birds, and scavenge on larger animals (e.g., moose, deer, mountain goats; ADF&G, 2008). Sources of animal mortality, such as avalanche chutes, can be important for scavenging wolverines. A population estimate for wolverines in the study area was not accomplished, although a low density is very likely (Lewis et al., 2012). Additional details regarding this study are in the *2017 Update to Appendix Q – Wildlife Technical Report* (see Appendix Z).

Salt marsh habitats are one of the more important habitats in the region and support a large number of resident and migratory waterfowl and shorebird species at certain times of the year, as well as resident water bird species such as great blue heron. These areas are also important for terrestrial mammal species such as brown bear and black bear for scavenging and foraging on vegetation during the spring. The mudflats adjacent to estuarine wetlands provide a resting place for harbor seals and their pups during low tide.

Proximity to the shoreline along either exposed coastline (beach fringe) or along protected bays and coves (estuary fringe) is an important wildlife habitat feature. Beach fringe habitat, a mixture of both uplands and wetlands, has high seasonal value for black and brown bears, river otters, bald eagles, and Sitka black-tailed deer. Estuary fringe habitat consists of upland forest, palustrine wetlands, and often extensive estuarine wetlands (salt marsh). The estuarine fringe habitat along Berners Bay has been identified as potentially high value for many wetland functions, including habitat for disturbance-sensitive wildlife, and provides important habitat for moose, brown and black bear, and several species of migrant and resident waterfowl species. See the *Wildlife Technical Report* (Appendix Q) and the *2017 Update to Appendix Q – Wildlife Technical Report* (see Appendix Z) for additional information on wildlife in the study area.

#### 3.3.5.3 Marine Habitat Use

Marine habitats in Lynn Canal are used by marine birds, Steller sea lions, humpback whales, harbor seals, minke whales, killer whales, harbor porpoises, Dall’s porpoises, and sea otters. Steller sea lions and humpback whale are discussed in Section 3.3.7. The marine birds and other marine mammals are discussed below.

A variety of marine birds and waterfowl use Lynn Canal throughout the year. Harlequin ducks, common and king eiders, oldsquaws, and several species of scoter winter along the coast of Southeast Alaska, including Lynn Canal. Mew gulls, kittiwakes, murres, black oystercatchers, yellow billed loons, and other marine birds feed on invertebrates and fish in the Canal.

Harbor seals occur in marine waters and estuaries throughout Alaska. While they are most often found in water, they haulout on rocks, beaches and glacial ice to rest, give birth, and care for their young. In the project study area, haulout sites include a number of sand bars and rocky beaches including Berners Bay and at the mouth of the Katzehin River. See Figure 3-20. Harbor seals are non-migratory with local movements attributed to factors such as prey availability, weather, and reproduction. Harbor seals feed on a variety of fish, including pollock, Pacific cod, Pacific sand lance, sculpins, salmon and flatfishes, and oily fish such as capelin, eulachon, smelt, and Pacific herring. There are 12 stocks of harbor seals in Alaska. Seals within the project area are a part of the Lynn Canal/Stephens stock which has an abundance estimate of 8,870 animals (Allen and Angliss, 2012). The population trend for this stock is currently unknown.

Minke whales are found in all oceans of the world (Leatherwood et al., 1982). Two minke whale stocks are recognized in U.S. waters: Alaskan stock and the California/Oregon/Washington stock (Allen and Angliss, 2012). No population estimates exist for the Pacific population as a whole or for the Alaskan stock, therefore the population trend is unknown. From 1991 to 2007, 31 minke whales were observed in Southeast Alaska, but there were no sightings within Lynn Canal (Dalheim et al., 2009). Therefore, relatively few minke whales are expected to occur in the project area.

There are three eco-types of killer whales: resident (small-fish-eating; e.g., salmon), transient (mammal-eating; e.g., seals), and offshore (large-fish-eating; e.g., sharks). Of these three, the resident and transient ecotypes are the eco-types most likely to occur in the project area. Resident killer whales in Lynn Canal are most likely a part of the Alaska Resident stock, but some interchange between resident stocks has been documented (Allen and Angliss, 2012). As of 2009, 109 resident whales have been identified in Southeast Alaska, with concentrations of whales often found in Icy Strait, Lynn Canal, Stephens Passage, Frederick Sound, and upper Chatham Strait (Allen and Angliss, 2012; Dalheim et al., 2009). Transient killer whales have also been documented in Southeast Alaska although there have been few sightings in Lynn Canal (Dalheim et al., 2009). Transient killer whales in the project area are a part of the Eastern North Pacific transient stock which ranges from Alaska through California. A total of 219 transient killer whales have been identified between Southeast Alaska and British Columbia (Allen and Angliss, 2012). From 1991 to 2007, an increasing population trend of 5.2 percent annually has been documented for transient killer whales in Southeast Alaska (Dalheim et al., 2009).

There are three stocks of harbor porpoises in Alaska; the harbor porpoises in Lynn Canal belong to the Southeast Alaska stock (Allen and Angliss, 2012). Harbor porpoises inhabit coastal, shallow waters and research suggests that they prefer to stay within small geographic ranges, but more data are needed to confirm this theory. The current abundance estimate for the harbor porpoise in the Southeast Alaska stock is 11,146 animals (Allen and Angliss, 2012). The population appears to be stable, given only a 0.2 percent annual increase from 1991 through 2007 (Dalheim et al., 2009).

Dall’s porpoises are endemic to the northern North Pacific Ocean and adjoining seas, inhabiting both nearshore habitats and pelagic deep waters over the continental shelf and the oceanic basins (Rice, 1998; Allen and Angliss, 2012). There is only one Dall’s porpoise stock in Alaska, but the stock structure is not adequately understood (Allen and Angliss, 2012). The population for the entire Alaska stock is 83,400 animals, but the number of animals residing in Southeast Alaska is unknown (Allen and Angliss, 2012). Dall’s porpoises have been documented in Southeast Alaska with animals consistently found in Icy Strait, Lynn Canal, Stephens Passage and upper Chatham

Strait (Dalheim et al., 2009). From 1991 to 2007, an increasing population trend of 2.5 percent annually has been documented for Dall's porpoise (Dalheim et al., 2009).

Historically, sea otters occurred across the entire North Pacific Rim, but large-scale commercial exploitation in the 1800s nearly extirpated this species. After this large-scale harvest, there were no remnant sea otter populations in Southeast Alaska. Therefore, all of the current sea otters in the Southeast Alaska stock have been translocated from other Alaskan stocks. The range of the Southeast Alaska stock extends from Cape Yakataga to the southern boundary of Alaska (Gorbics and Bodkin, 2001). There are an estimated 10,563 sea otters in this stock (NMFS, 2008).Until recently, the species was not present in inside waters of Southeast Alaska, but they have been documented in Glacier Bay and Sumner Strait, which suggests that this population is expanding its geographic range (Esslinger and Bodkin, 2009). However, sea otter densities are still very low, which means that encountering this species in the project area is not likely.

### 3.3.6 Bald Eagles

The Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act provide regulatory authority for the protection of bald eagles.[14] The BGEPA prohibits anyone from "taking" bald eagles, their eggs, nest, or any part of the birds without a permit.[15] It defines "taking" as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." "Disturb'' means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Bald eagles are listed as an MIS by the USFS in its TLRMP because of their dependence on coastal areas for foraging and nesting (Goldstein et al., 2009).

Bald eagles are abundant in Southeast Alaska, with a population estimated at approximately 13,000 adults (Hodges, 2011). They are common, year-round inhabitants of the Lynn Canal area. During the summer months, nesting pairs disperse to nest sites along the coast. In winter, they tend to congregate in areas where food resources are plentiful and where they can seek shelter from strong winds and storms. Thousands of bald eagles winter in the Chilkat Bald Eagle Preserve because of the abundance of a late chum salmon run (Boeker, 2008). Fish are the most important prey for bald eagles in Southeast Alaska and often comprise 80–90 percent of their diet (Lincer et al., 1978). Eagles also prey on waterfowl, small mammals, sea urchins, clams, crabs, and carrion. In the winter months, ducks and geese may represent up to 20 percent of a bald eagle's diet (Isleib, 2008).

Nesting habitat is primarily old-growth trees near salt water (Hodges and Robards, 1982). Most nest trees are located within 600 feet of the shoreline (Suring, 2008). Some nests are occupied more frequently than others, and the productivity of each nest varies greatly. Only 25 to 55 percent of available nests are occupied during any given year. Bald eagles are most susceptible to

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[14] Golden eagles do not nest in the study area and, therefore, are not included in the affected environment or impact evaluation for the JAI Project.

[15] The regulations governing eagle permits can be found in 50 CFR part 13 (General Permit Procedures) and 50 CFR part 22 (Eagle Permits).

disturbance during the nesting season (March through August in Southeast Alaska; USFWS, 2009).

The USFWS has conducted surveys to identify several key seasonal concentration areas for bald eagles within the study area (Jacobson, 2003). During spring and during spawning aggregations of certain fish species, eagle concentrations have been observed in Berners Bay, the Katzehin River, and the Endicott River. Similarly, in the summer months, the tributaries of the Lace and Berners rivers, the Katzehin River, the Endicott River, and the Chilkat River also have high bald eagle concentrations.

The first bald eagle aerial survey for the project was conducted in 1994 by USFWS biologists. The USFWS conducted annual nest surveys along the East Lynn Canal route from 1997 through 2008 and again in 2012 with funding and administrative support from DOT&PF. Results of the 1997–2003 USFWS surveys are described in the *Bald Eagle Nesting and Productivity at Lynn Canal, Southeast Alaska, 1997–2003* (USFWS, 2003a) and were used in the assessment of bald eagle impacts in the 2006 Final EIS for the JAI Project. Subsequent USFWS surveys are documented in the *2014 Update to Appendix R – Bald Eagle Technical Report* and *2017 Errata* (in Appendix Z) and summarized in (note: data from 2003 are included in the table for purposes of comparison). The surveys included nests along a broad corridor of the East and West Lynn Canal routes; however, only nests within 0.5 mile of the work limits associated with the build alternatives are included in Table 3-5.

The 0.5-mile distance threshold is the greatest recommended distance from active bald eagle nests for permitted activities, according to the 2007 National Bald Eagle Management Guidelines (USFWS, 2007; see also *2014 Update to Appendix R – Bald Eagle Technical Report* and *2017 Errata* in Appendix Z).

The locations of all eagle nests found during the 2003 through 2012 USFWS surveys are shown in Figure 3-24.

See the *2014 Update to Appendix R – Bald Eagle Technical Report* and *2017 Errata* (see Appendix Z) for additional information on bald eagles in the study area, including a detailed list of the nests potentially affected by the JAI Project alternatives (in Attachment A of that report).

**Table 3-5:**
**Active Bald Eagle Nests and Nest Productivity, 2003–2012**

| East Lynn Canal | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2012** | **Mean** |
| Nest sites surveyed | 94 | 92 | 98 | 95 | 102 | 111 | 124 | 102.3 |
| Number of new nests | NA | NA | NA | 11 | 6 | 4 | 60 | 20.3 |
| Active nests (No. of nests and percent) | 37<br>39% | 35<br>38% | 45<br>46% | 46<br>48% | 46<br>45% | 42<br>38% | 48<br>39% | 42.7<br>42% |
| Successful nests (No. of nests and percent) | 20<br>21% | 17<br>19% | 22<br>22% | 23<br>24% | 15<br>15% | 16<br>14% | 22<br>18% | 19.3<br>19% |
| Active nests successful | 54% | 49% | 49% | 50% | 33% | 38% | 46% | 45% |
| Young/active nest | 0.78 | 0.60 | 0.64 | 0.65 | 0.48 | 0.48 | 0.63 | 0.60 |
| Young/successful nests | 1.40 | 1.24 | 1.32 | 1.30 | 1.47 | 1.25 | 1.36 | 1.33 |

| West Lynn Canal | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **2003** | **2004** | **2005[1]** | **2006[1]** | **2007[1]** | **2008[1]** | **2012** | **Mean** |
| Nest sites surveyed | 53 | 50 | --- | --- | --- | --- | 40 | 47.7 |
| Number of new nests | NA | NA | --- | --- | --- | --- | 21 | 21.0 |
| Active nests<br>(No. of nests and percent) | 22<br>42% | 26<br>52% | --- | --- | --- | --- | 18<br>45% | 22.0<br>46% |
| Successful nests<br>(No. of nests and percent) | 10<br>19% | 16<br>32% | --- | --- | --- | --- | 3<br>8% | 9.7<br>19% |
| Active nests successful | 45% | 62% | --- | --- | --- | --- | 17% | 41% |
| Young/active nest | 0.64 | 0.69 | --- | --- | --- | --- | 0.22 | 0.52 |
| Young/successful nests | 1.40 | 1.13 | --- | --- | --- | --- | 1.33 | 1.29 |

NA = not applicable

[1] No surveys completed during the year indicated.

Sources: USFWS, 2003a; USFWS, 2009; JAI Project 2006 Final EIS, Appendix W; *2014 Update to Appendix R – Bald Eagle Technical Report* and *2017 Errata* (see Appendix Z); Lewis, personal communication 2012.

Note: Nests located more than 0.5 mile from the work limits are not included.

### 3.3.7 Threatened and Endangered Species

Threatened and endangered species are plant and animal species that have been determined to be in danger of extinction based on criteria established by the ESA of 1973. The Act defines an endangered species as one that is likely to become extinct in the foreseeable future. A threatened species is defined as one likely to become in danger of extinction throughout all or a significant portion of its range within the foreseeable future. The ESA requires federal agencies to ensure that their projects do not have an adverse effect on populations of species protected under the Act. Section 7 of the ESA requires consultation with the appropriate federal agency (USFWS and/or NMFS) to ensure that the project is not likely to jeopardize a threatened or endangered species or its habitat.

Of the wildlife species known to occur in the study area for the JAI Project, two are considered in the threatened and endangered species analysis: Mexico Distinct Population Segment (DPS) humpback whales (threatened) and western DPS Steller sea lions (endangered). Figure 3-20 identifies locations within the study area that are frequented by humpback whales and Steller sea lions. The Kittlitz's murrelet listed as a candidate species by the USFWS in 2004 is also included in the wildlife analysis (see Section 3.3.5.2).

A 2007 petition to list the Lynn Canal stock of Pacific herring under the ESA was denied in 2008 because the Lynn Canal stock was not found to qualify as a DPS (73 FR 19824). In 2014, NMFS concluded that the Southeast Alaska DPS of Pacific herring, which includes the Lynn Canal stock, does not warrant listing for protection under the ESA (79 FR 18518).

#### 3.3.7.1 Humpback Whale

Humpback whales were extensively harvested by commercial whalers until the International Whaling Commission imposed a moratorium in 1965. Humpback whales were listed as endangered under the ESA in 1973 and were consequently listed as depleted under the MMPA.

On September 8, 2016, NMFS published a final decision that changed the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. The decision recognized the existence of 14 humpback whale DPSs based on distinct breeding areas in tropical and temperate waters: 5 DPSs were classified under the ESA (4 endangered and 1 threatened), and the other 9 DPSs were delisted. Humpback whales found in Southeast Alaska are predominantly members of the Hawaii DPS, which is not listed under the ESA. However, based on a comprehensive photo-identification study, members of the Mexico DPS (ESA-listed as threatened) are known to occur in southeast Alaska. Members of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales (NMFS, 2016). According to Wade et al. (2016), the probability of encountering a humpback whale from the Mexico DPS is 6.1 percent. The remaining 93.9 percent of individuals in southeast Alaska are likely members of the Hawaii DPS (Wade et al., 2016). All 14 DPSs of humpback whale remain listed as “depleted” under the Marine Mammal Protection Act and are on the Alaska State Endangered Species List (ADF&G, 2016b). There is no designated critical habitat for humpback whales.

Recent studies estimate the Hawaii DPS at 11,398 individuals and the Mexico DPS at 3,264 individuals (Wade et al., 2016). Wade et al. (2016) predict there are 6,137 humpback whales in the southeast Alaska feeding grounds during summer.

#### 3.3.7.2 Steller Sea Lion

Steller sea lions are distributed along the coast of the North Pacific Ocean from California through Japan, with the highest concentrations in the Gulf of Alaska and the Aleutian Islands. In 1990, Steller sea lions were listed as threatened under the ESA due to declines in the population throughout their range and critical habitat was designated in 1993 (55 FR 12645, 58 FR 45269). Based on distribution, genetics, and population trends, NMFS separated Steller sea lions into two DPS in 1997 with the dividing line near Cape Suckling (144°W), approximately 50 miles southeast of Cordova, Alaska (62 FR 30772). When NMFS separated the population into the two DPS units, the western DPS was reclassified as endangered under the ESA. In 2010, NMFS initiated a review to assess the listing classification of the eastern DPS (75 FR 37385) and in 2012 proposed its delisting (77 FR 23209). On November 4, 2013, NMFS noticed the final rule to delist the eastern DPS Steller sea lion, effective December 4, 2013 (78 FR 66139). The western DPS Steller sea lion remains listed as endangered. Although the eastern DPS is no longer protected under the ESA, it remains protected under the MMPA and the designated critical habitat remains unchanged because it was established for the entire population before the two DPS units were recognized. It is also protected as a USFS Alaska Region sensitive species.

Steller sea lions that inhabit Lynn Canal are a part of the eastern DPS, but there is some limited interchange between the eastern and western DPSs, and branded individuals from the western DPS have been observed in the JAI Project area. The ADF&G has documented 88 western DPS Steller sea lions in the eastern region, of which 40 percent were female, and 9 of these animals gave birth at rookeries in the eastern region. Data suggest that 5 out of these 9 females have permanently immigrated to the eastern region. The first western DPS Steller sea lion documented near the project area occurred in 2003 at Benjamin Island in Southern Lynn Canal. This animal was subsequently re-sighted in 2003 and 2004. Two additional animals have been observed at Benjamin Island in 2005 and 2006. Three individual western DPS Steller sea lions have been observed repeatedly at Gran Point from 2003 through 2012. There have been no western DPS Steller sea lions documented at Met Point (Jemison, personal communication 2013).

Within the JAI Project, only one site has been designated as a Steller sea lion Critical Habitat Area: the Gran Point haulout (50 CFR 226.202; see Figure 3-20). Under Section 7 of the ESA, as part of the consultations on the effects of the proposed project, DOT&PF agreed to monitor the use of the Gran Point haulout throughout the year. DOT&PF installed a remote video camera system in late 2002 to determine periods of Steller sea lion use.

Early data from the video camera monitoring at Gran Point indicated that the haulout was used most heavily in the spring, with more than a hundred sea lions present on most days. Then usage decreased in the early summer and there were periods of time (1- to 5-week blocks) when sea lions were absent. Use of the haulouts increased again by early fall, with more than a hundred animals present at each site by mid-September. There were generally fewer animals at Gran Point during December through March; however, data collected from 2006 through 2011 indicate a nearly year-round residency pattern for Steller sea lions at Gran Point. In addition, more animals were present from late summer through early fall compared to the earlier data (2002 through 2005). Video monitoring during winter months was discontinued in 2008, primarily due to the well-established, consistent use of the haulout during winter, and the assumption that winter construction in the areas around Met Point and Gran Point would be limited or not occur at all, and the difficulty in maintaining the system in winter.

In addition to the Gran Point and Met Point haulouts, Steller sea lions also have been observed to haulout in the spring on a small, offshore rock on the eastern shore of the mouth of Slate Creek Cove and near Cove Point in Berners Bay. There is little information on the use of these haulout sites, although juveniles and adults have been observed there during the peak of eulachon and herring spawning in April and May. There are no documented Steller sea lion haulouts on the Katzehin Flats, although Steller sea lions forage in this area.

The *Steller Sea Lion Technical Report* (Appendix S) and the *2014 Update to Appendix S – Steller Sea Lion Technical Report* and *2017 Errata* (in Appendix Z) include additional information on Steller sea lions.

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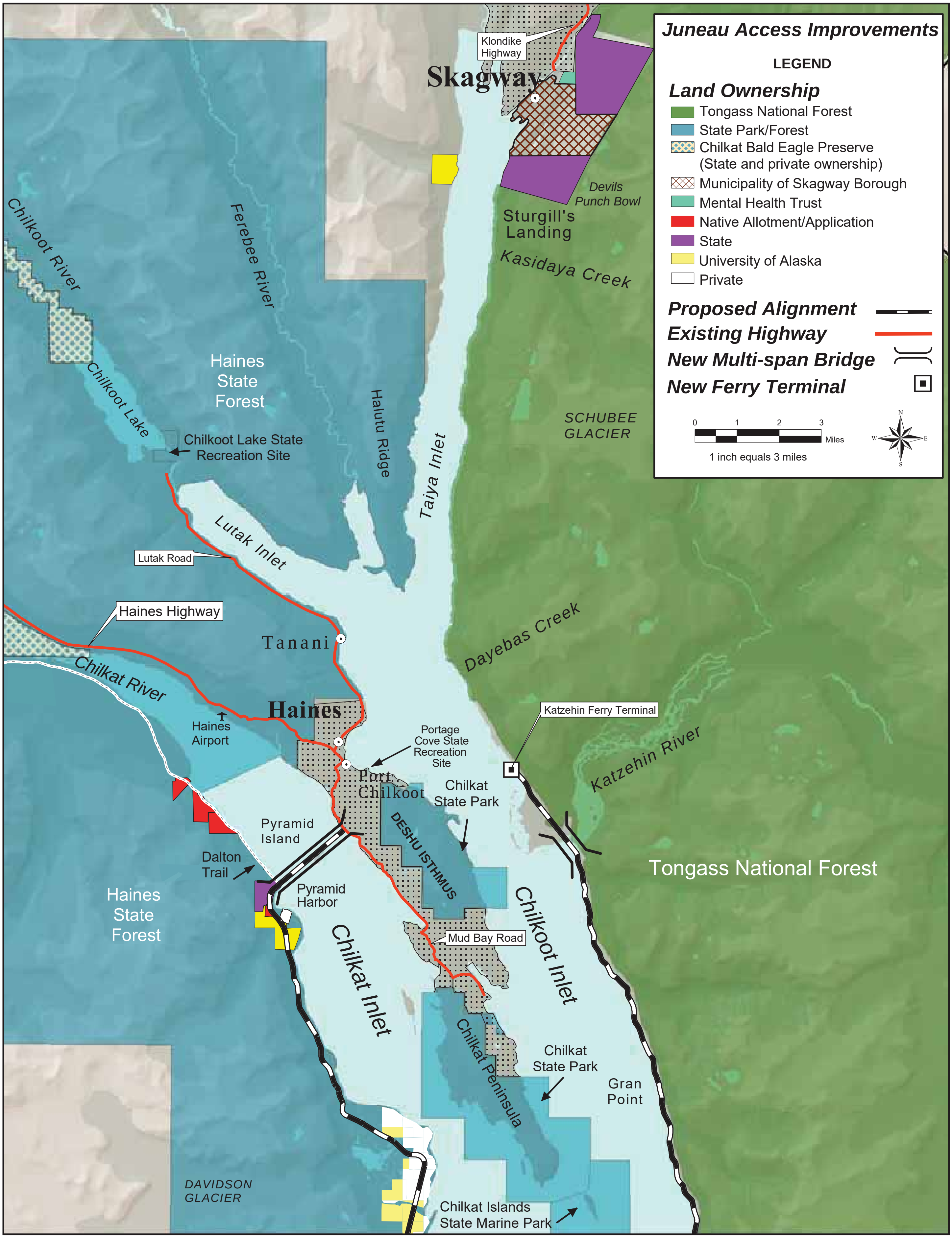

**Figure 3-1**
**Land Ownership at Northern End of Lynn Canal**

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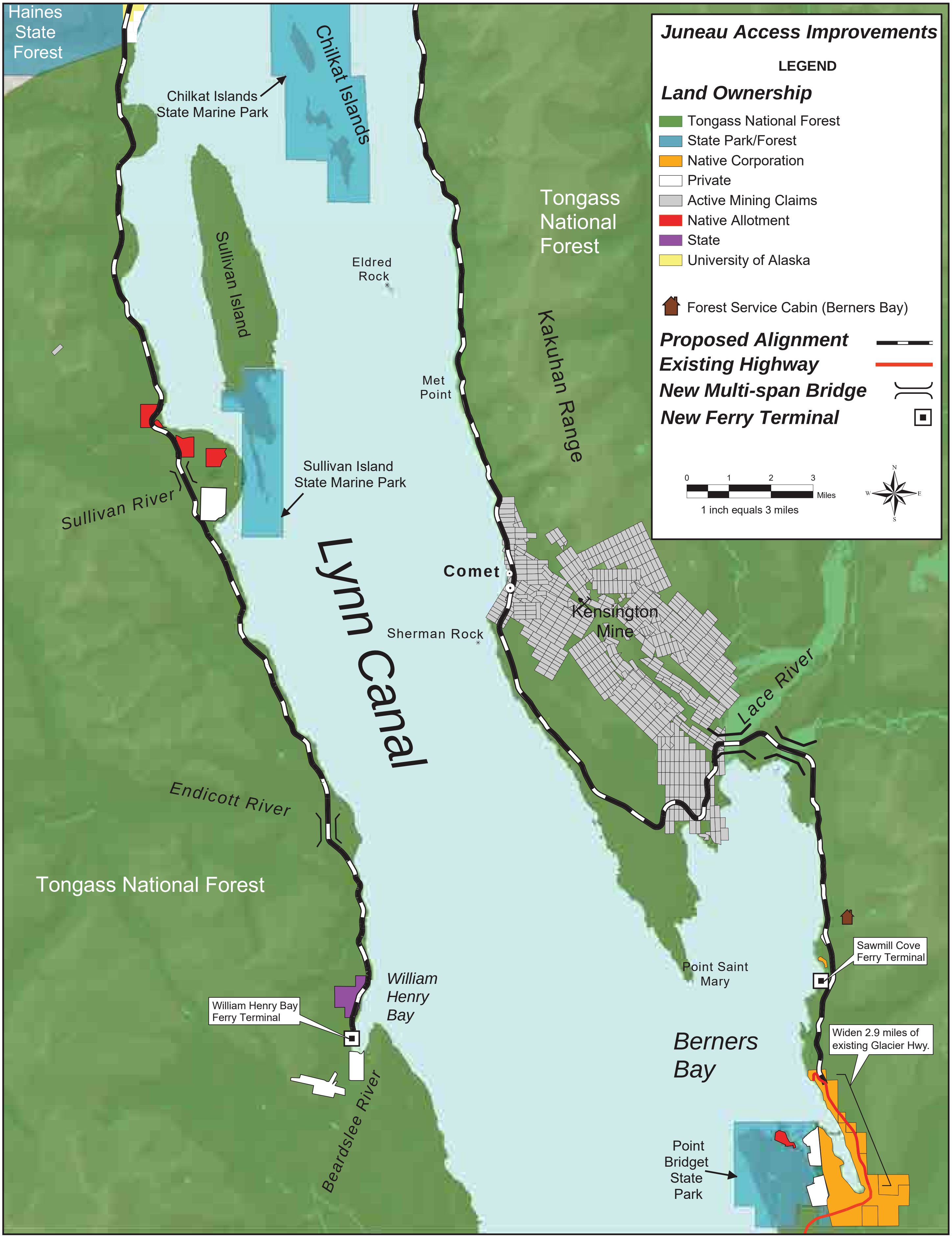

**Figure 3-2**
**Land Ownership at Southern End of Lynn Canal**

Document Path: Z:\07072 DOT&PF\174682 JAI SEIS\GIS\Map_Docs\Final\SEIS\Ch3\Fig3-3 Tongass Land Use.mxd

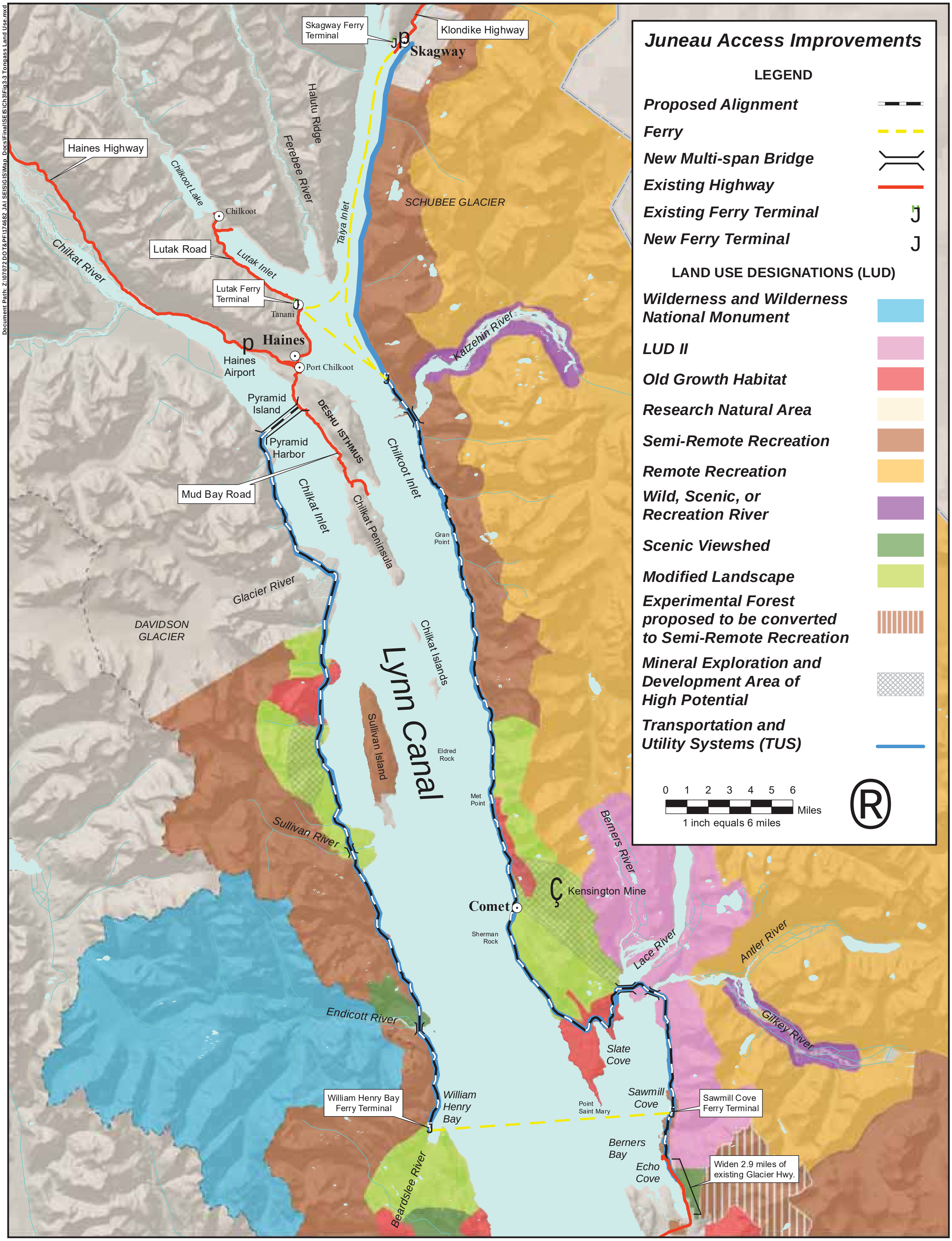

Figure 3-3

Tongass Land and Resources Management Plan (2008) Land Use Designations

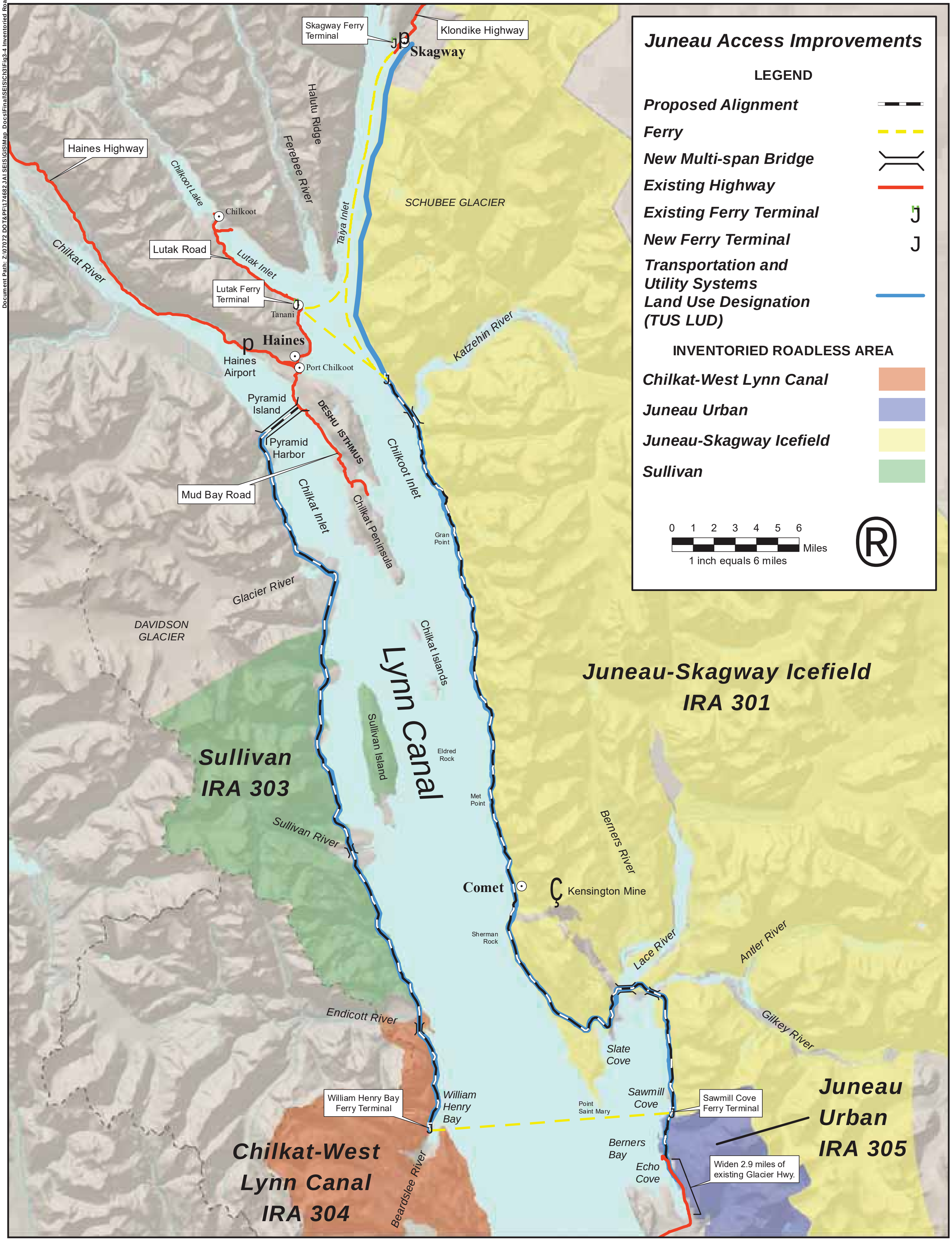

Figure 3-4
Inventoried Roadless Areas

Document Path: Z:\07072 DOT&PF\174682 JAI SEIS\GIS\Map_Docs\Final\SEIS\Ch3\Fig3-4 Inventoried Roadless Areas

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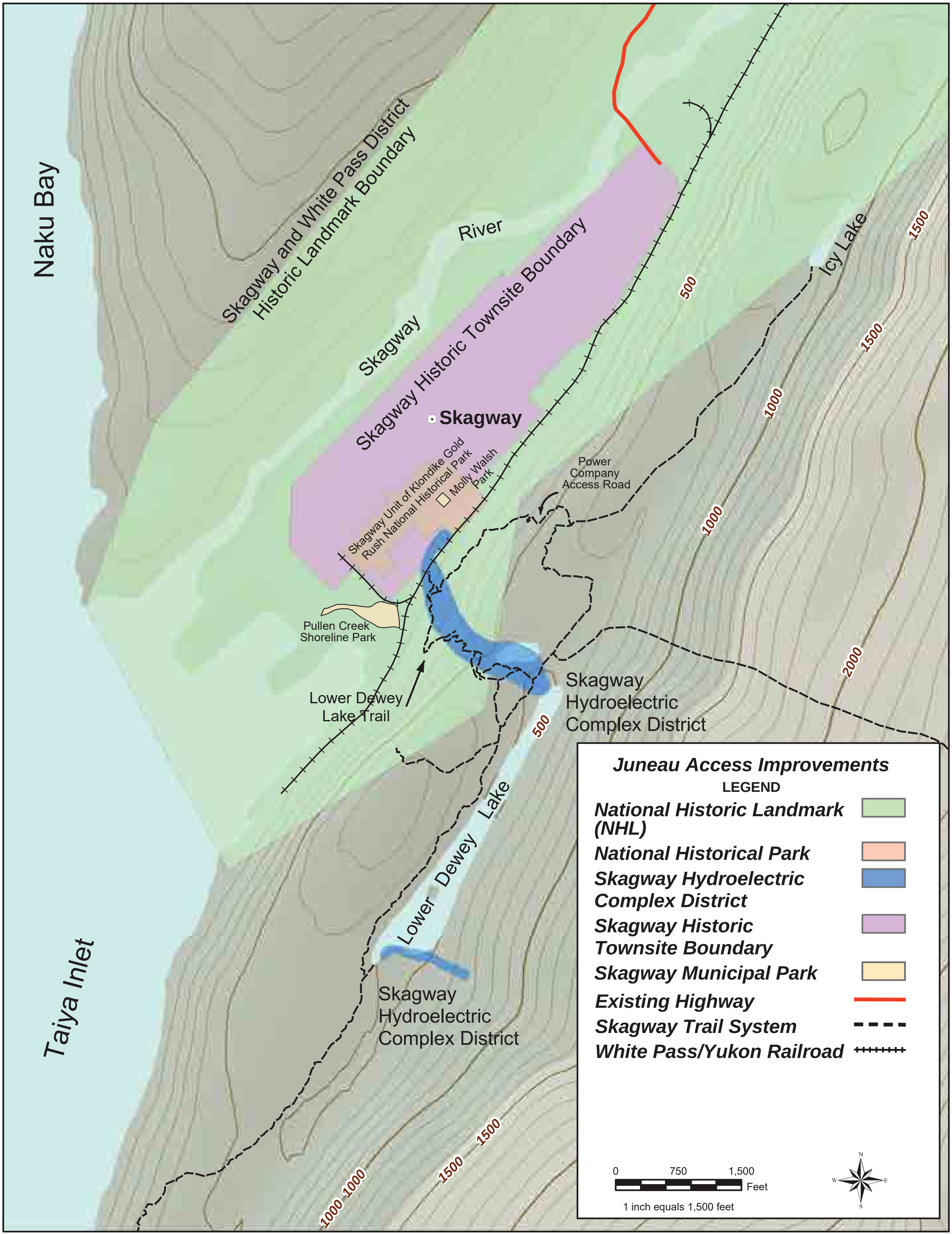

Figure 3-5
Parks, Trails and Historic Districts in the Skagway Area

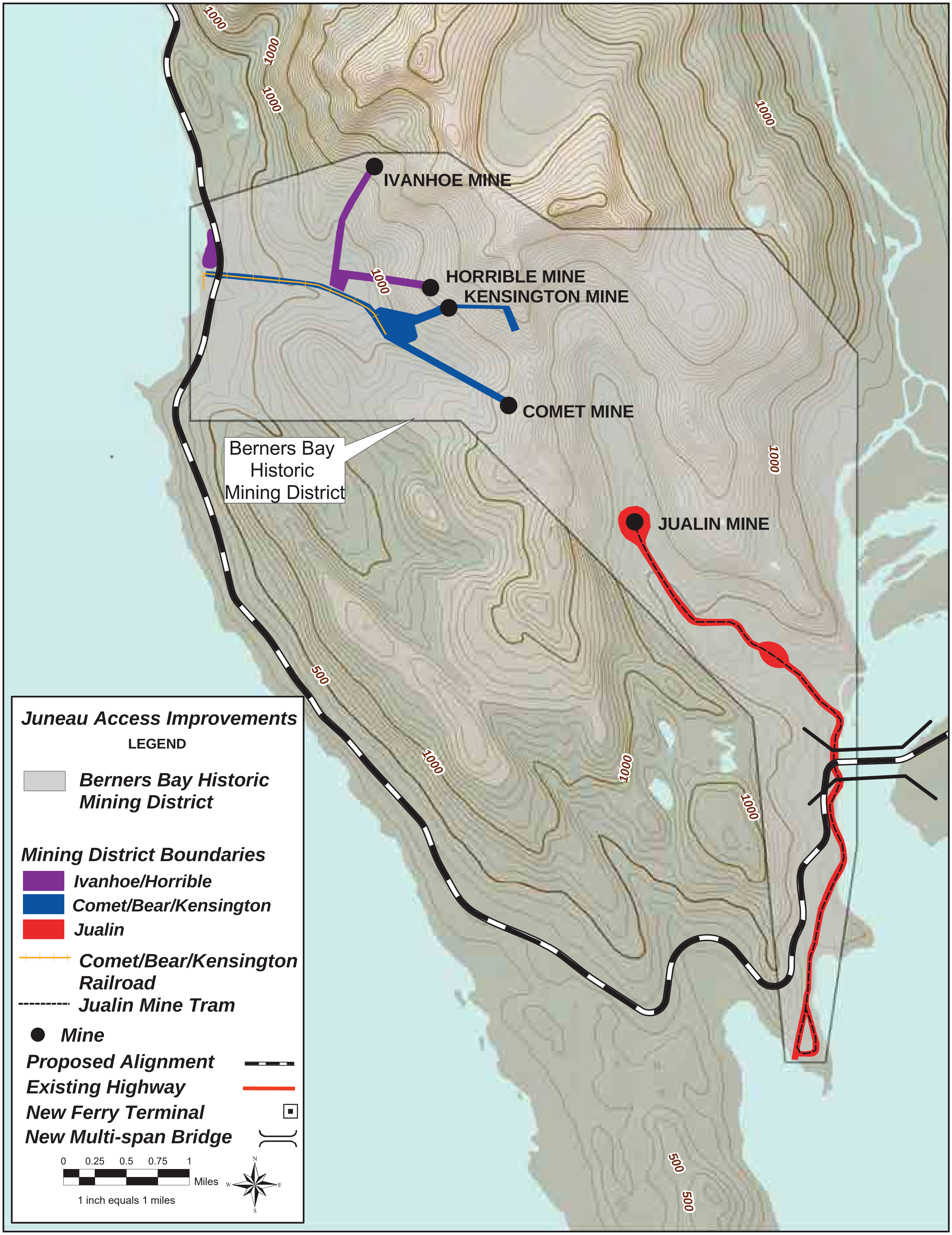

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**Figure 3-6**
**Historic Mining Districts in East Lynn Canal Area**

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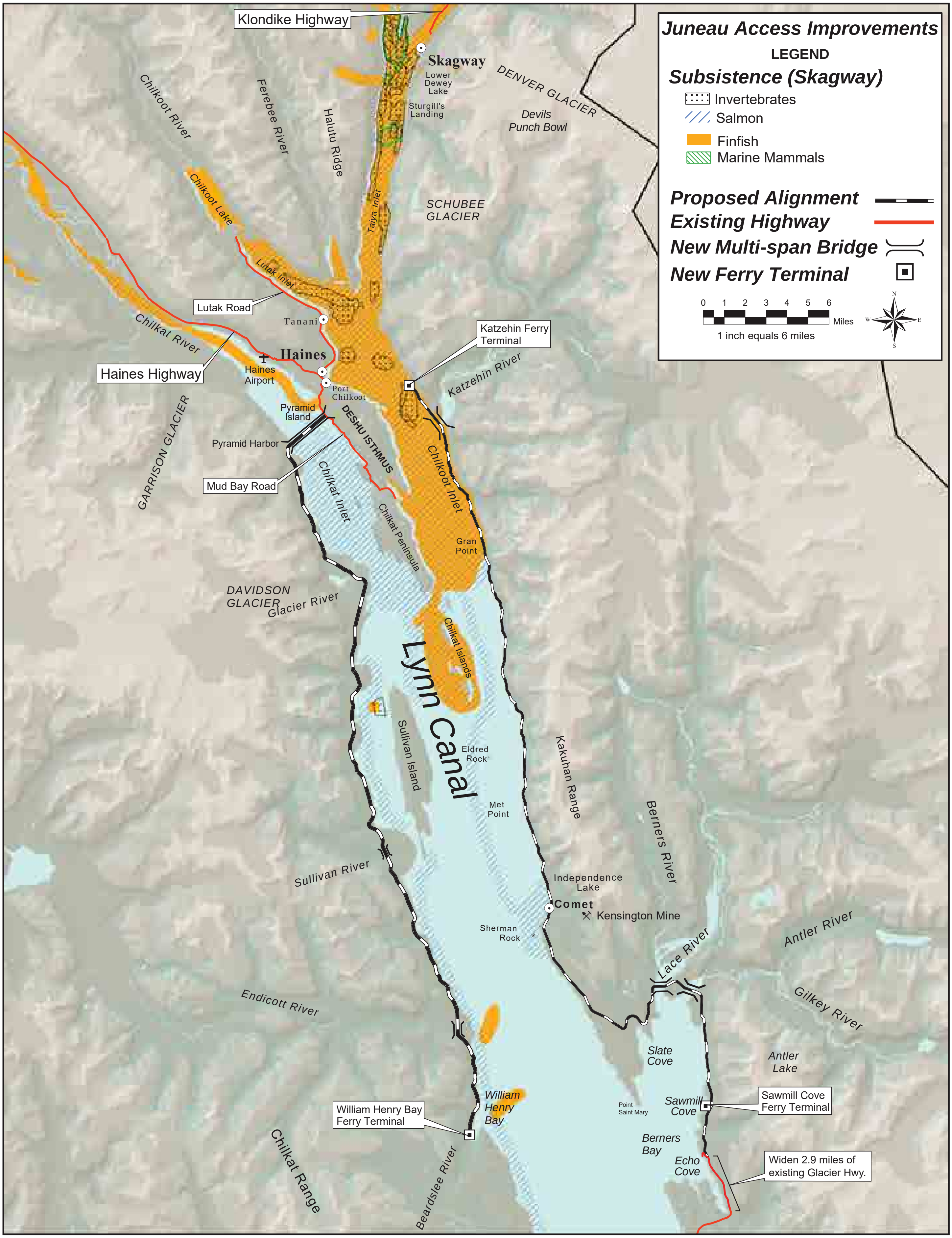

Figure 3-7
Skagway Subsistence

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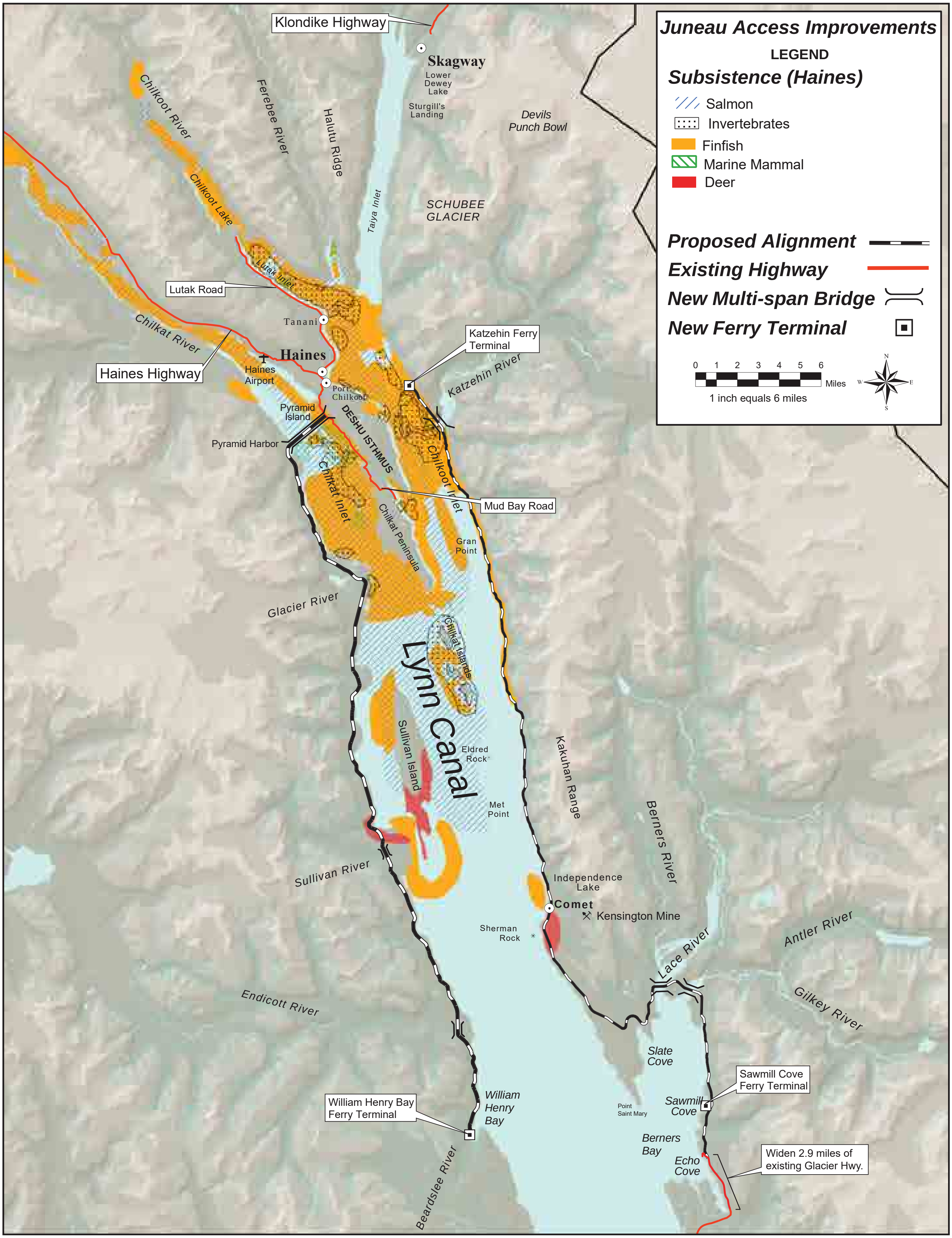

**Figure 3-8**
**Haines Subsistence**

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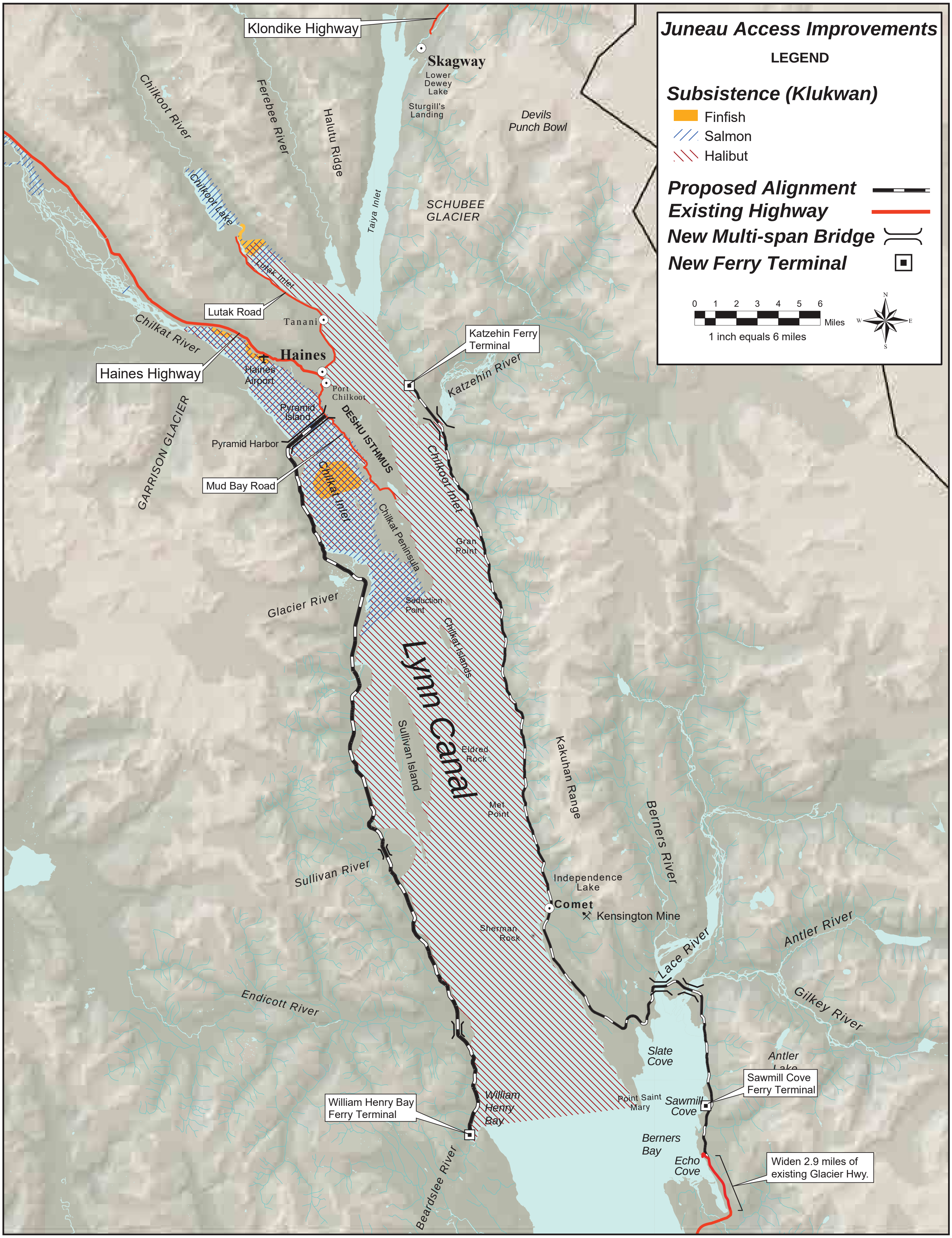

Figure 3-9
Klukwan Subsistence

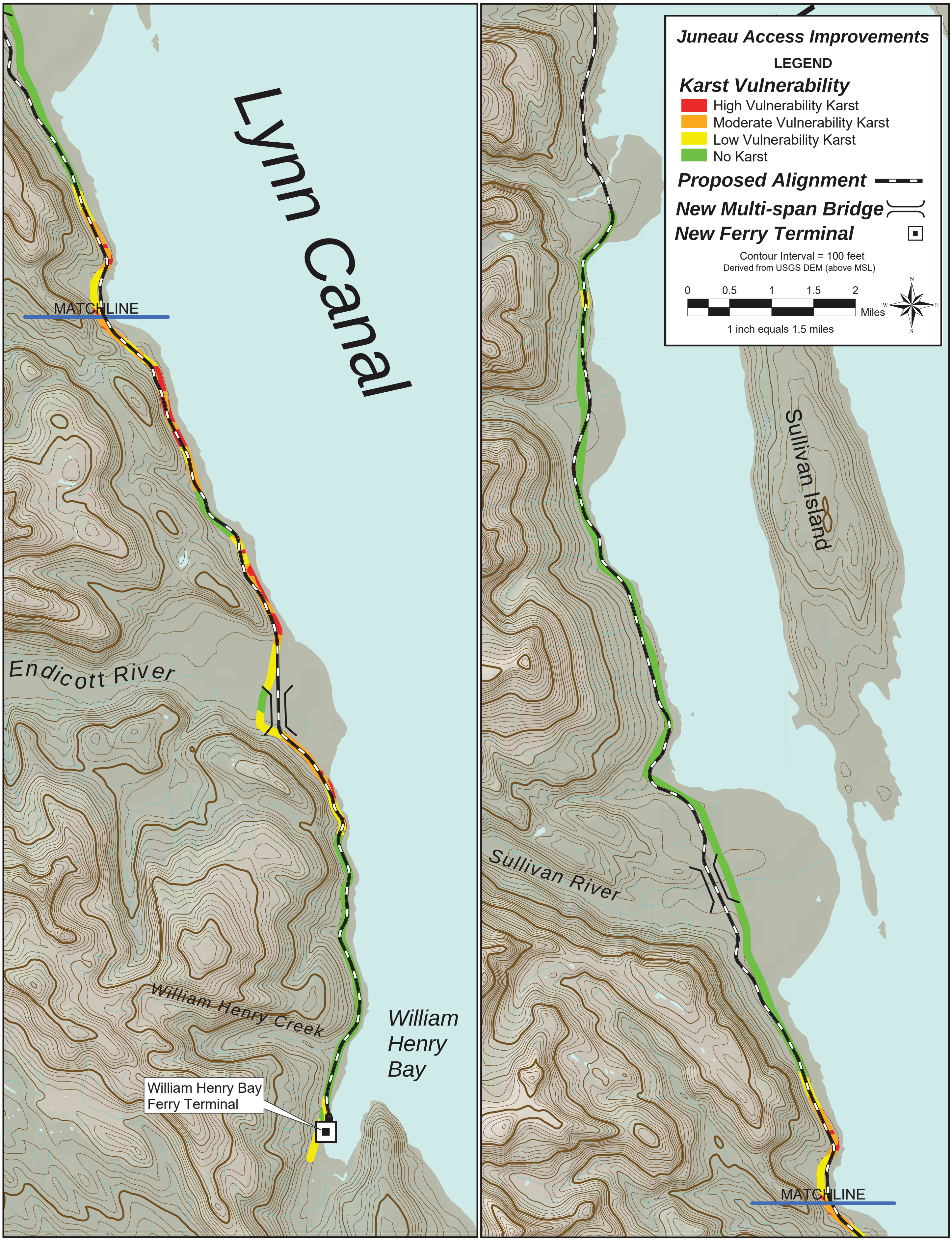

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**Figure 3-10**
**Karst Vulnerability for West Lynn Canal Area**

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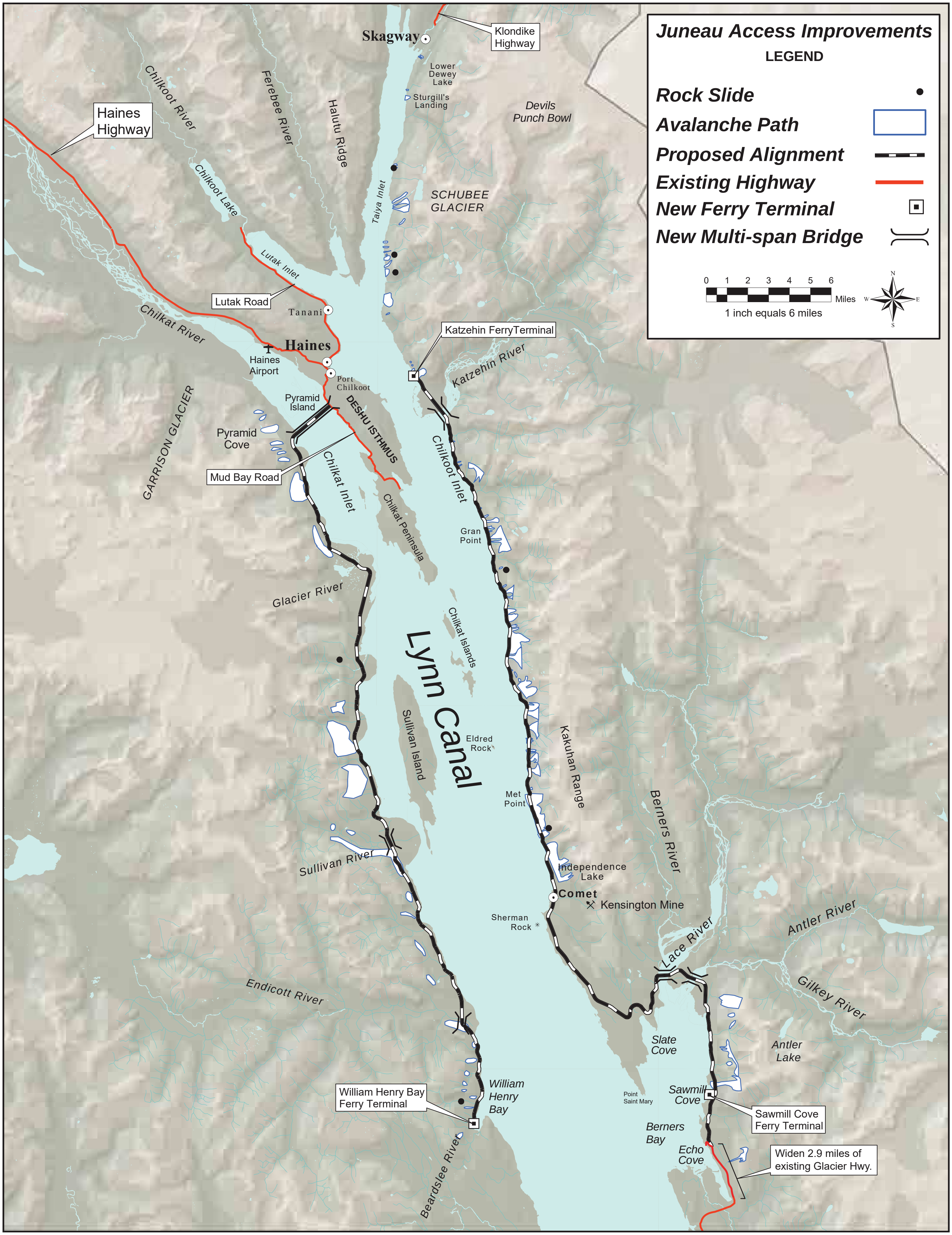

**Figure 3-11**
**Avalanche Paths and Rock Slides**

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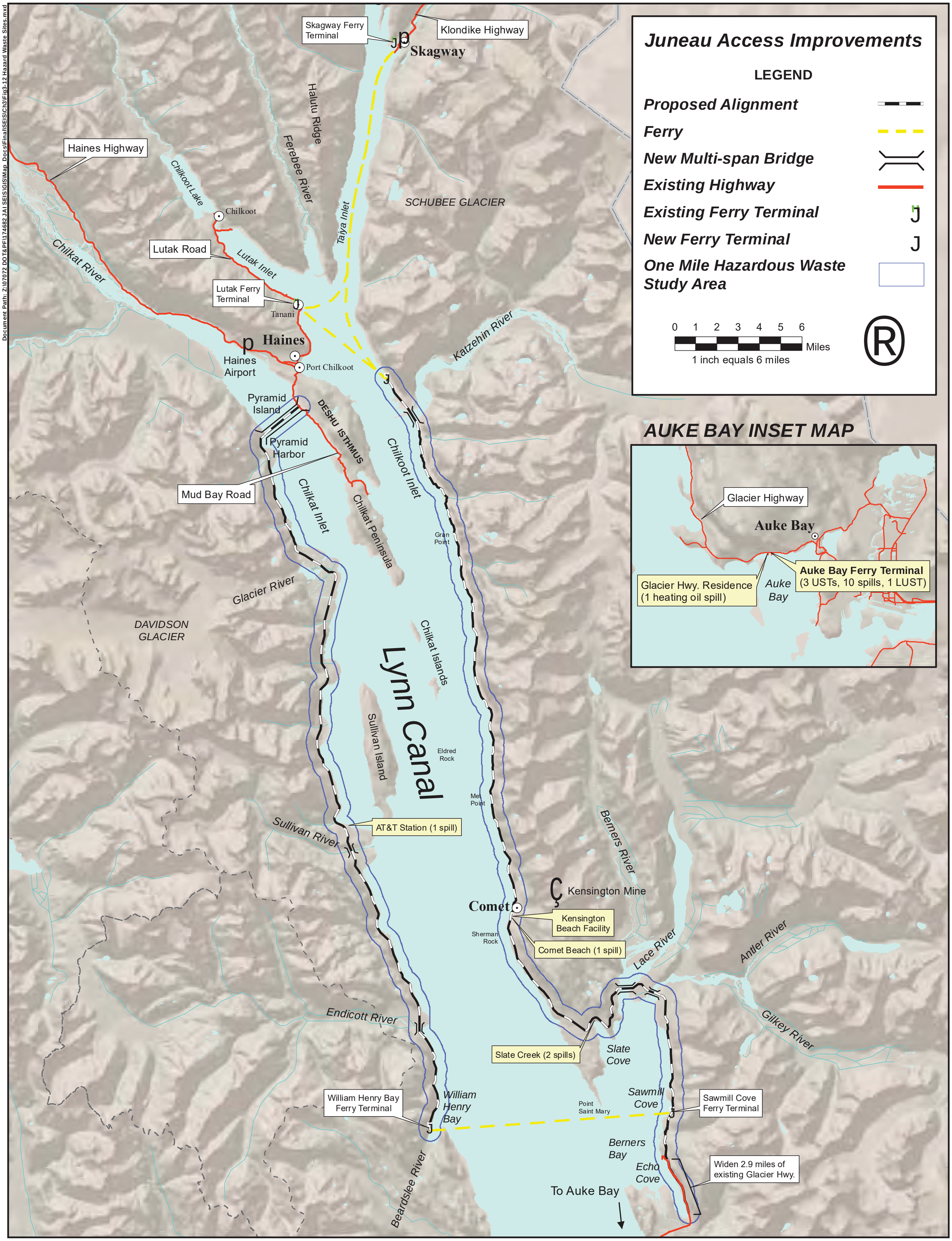

Figure 3-12
Potential Hazardous Waste Sites

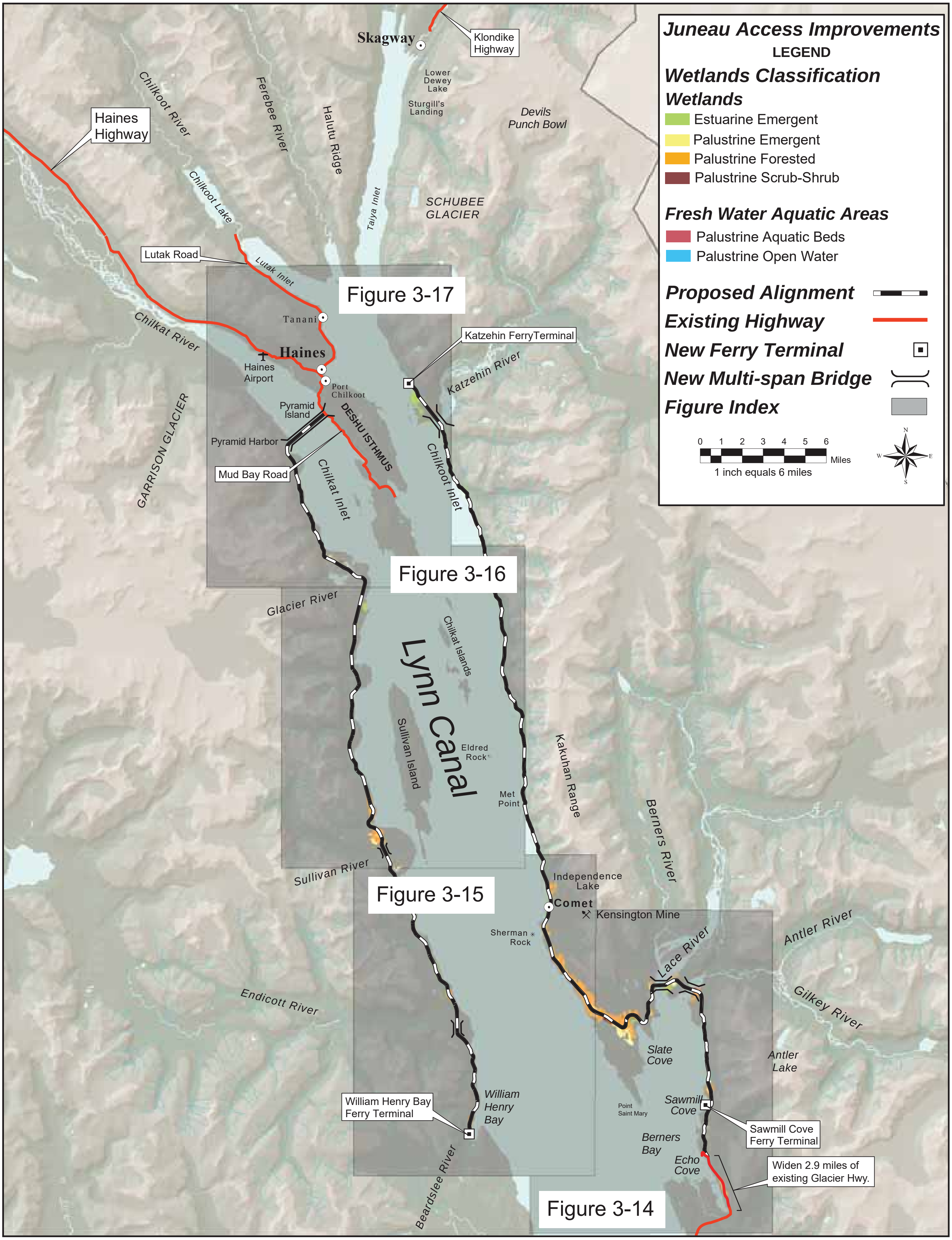

**Figure 3-13**
**Wetlands Classifications Figure Index**

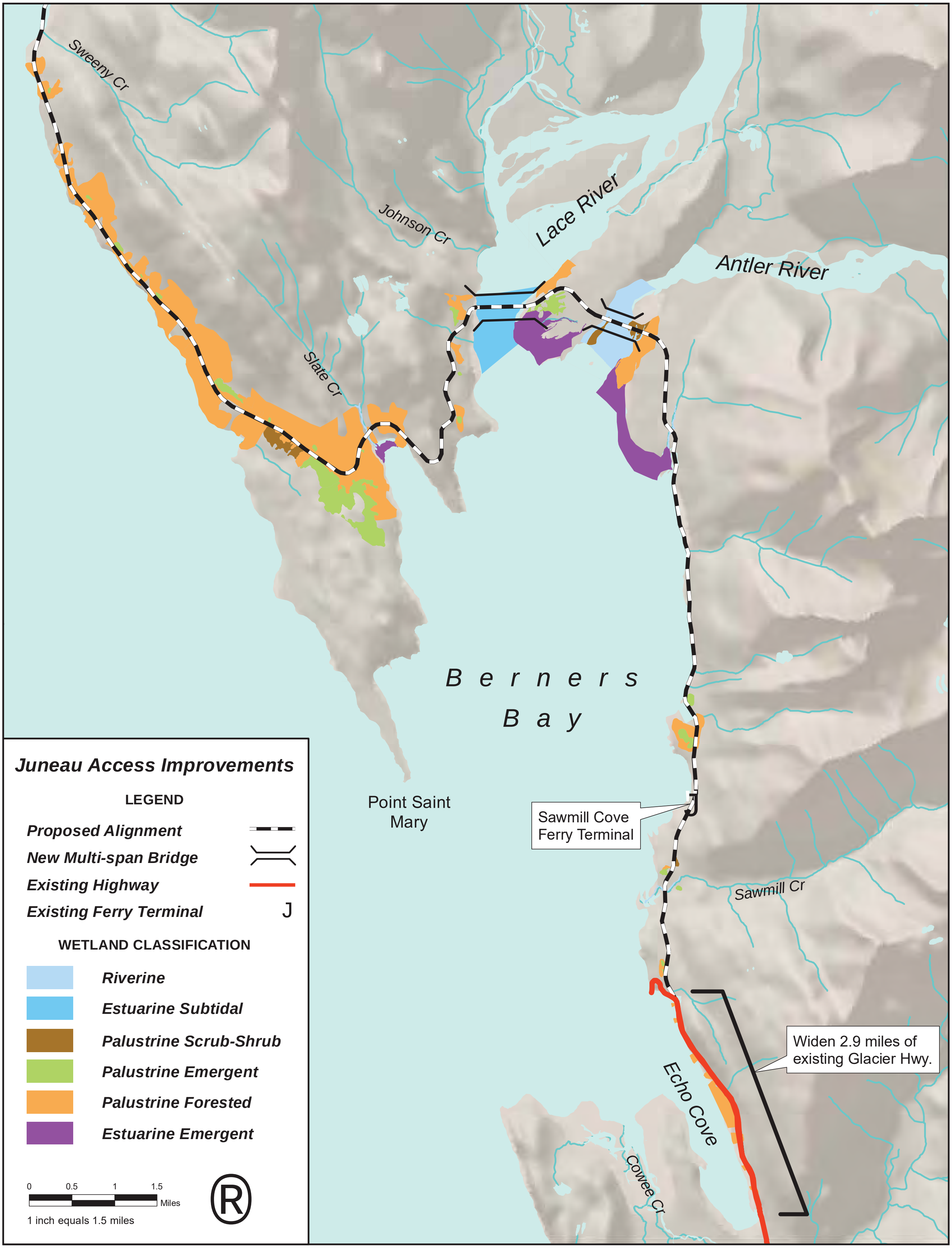

**Figure 3-14**
**Wetlands Berners Bay**

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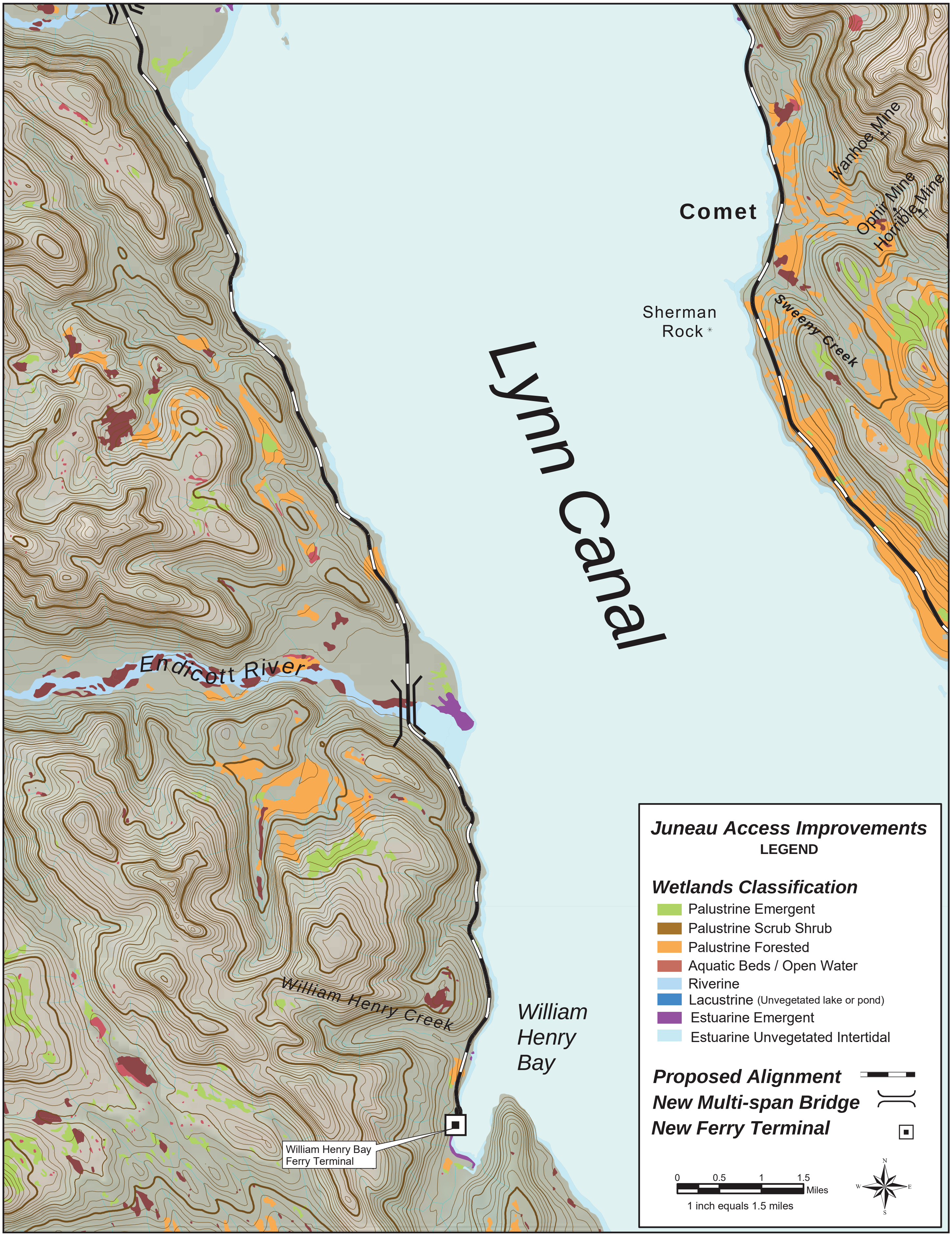

**Figure 3-15**
**Wetlands Classifications for William Henry Bay Area and Comet Area**

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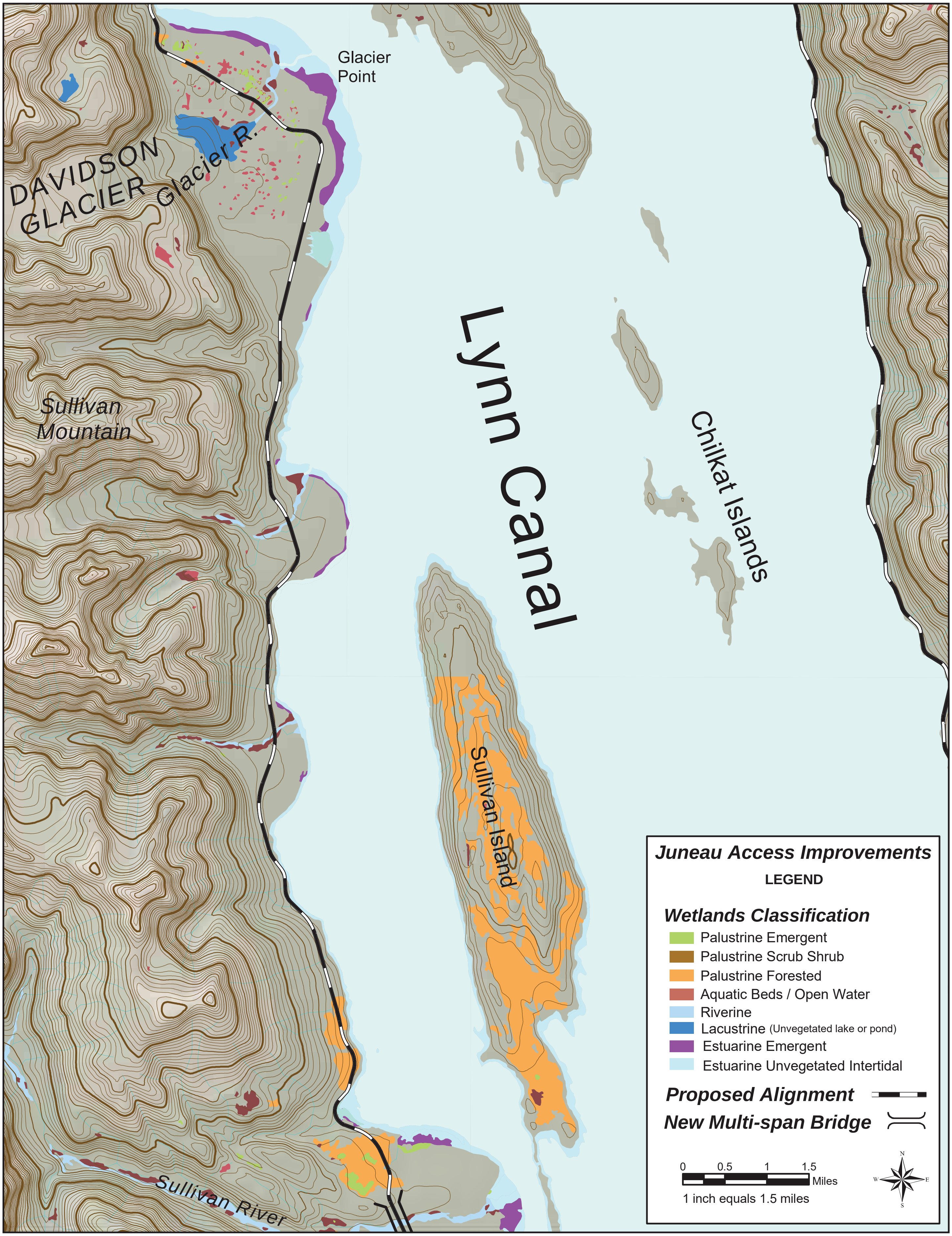

**Figure 3-16**
**Wetlands Classifications for Sullivan River Area**

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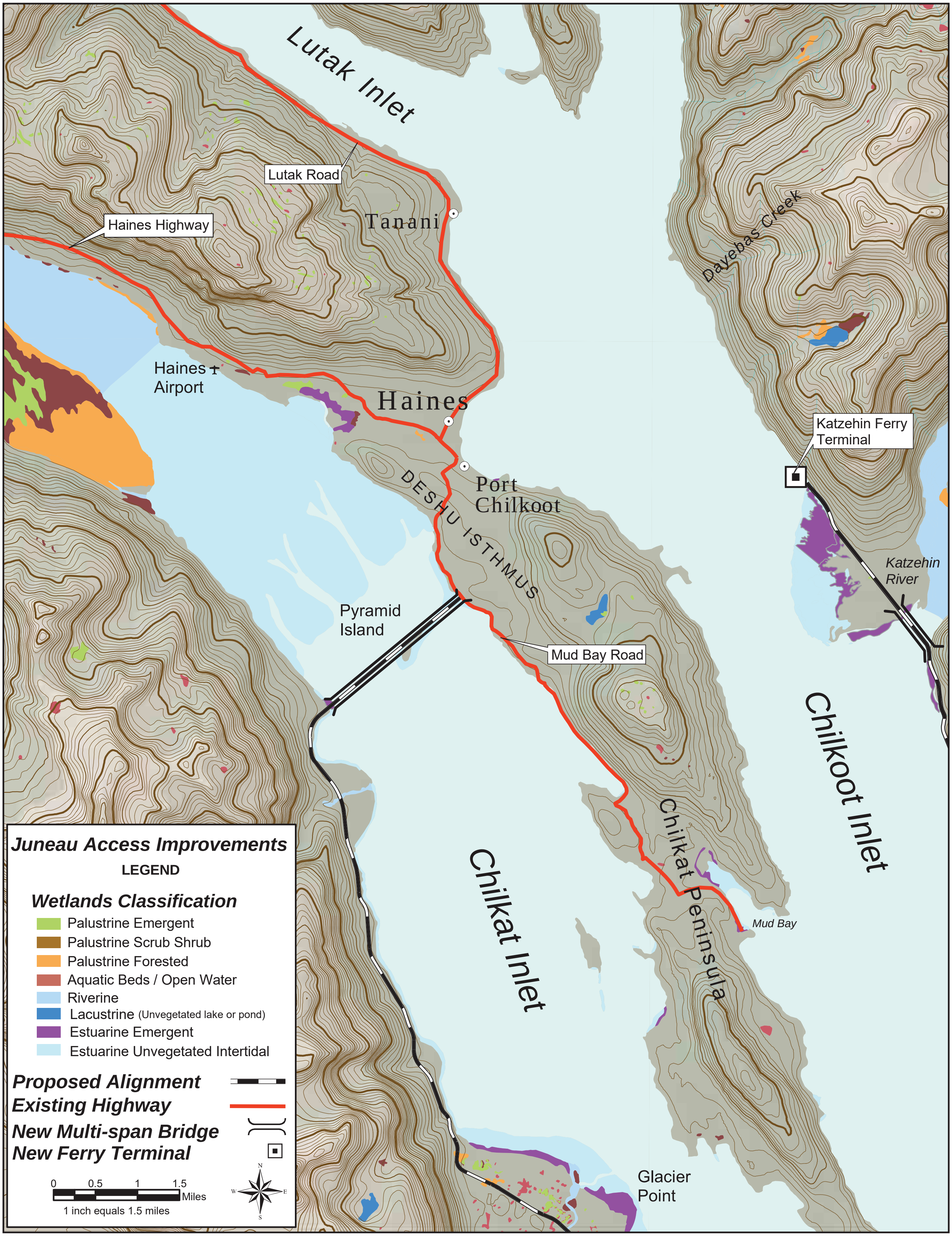

**Figure 3-17**
**Wetlands Classifications for Haines Area**

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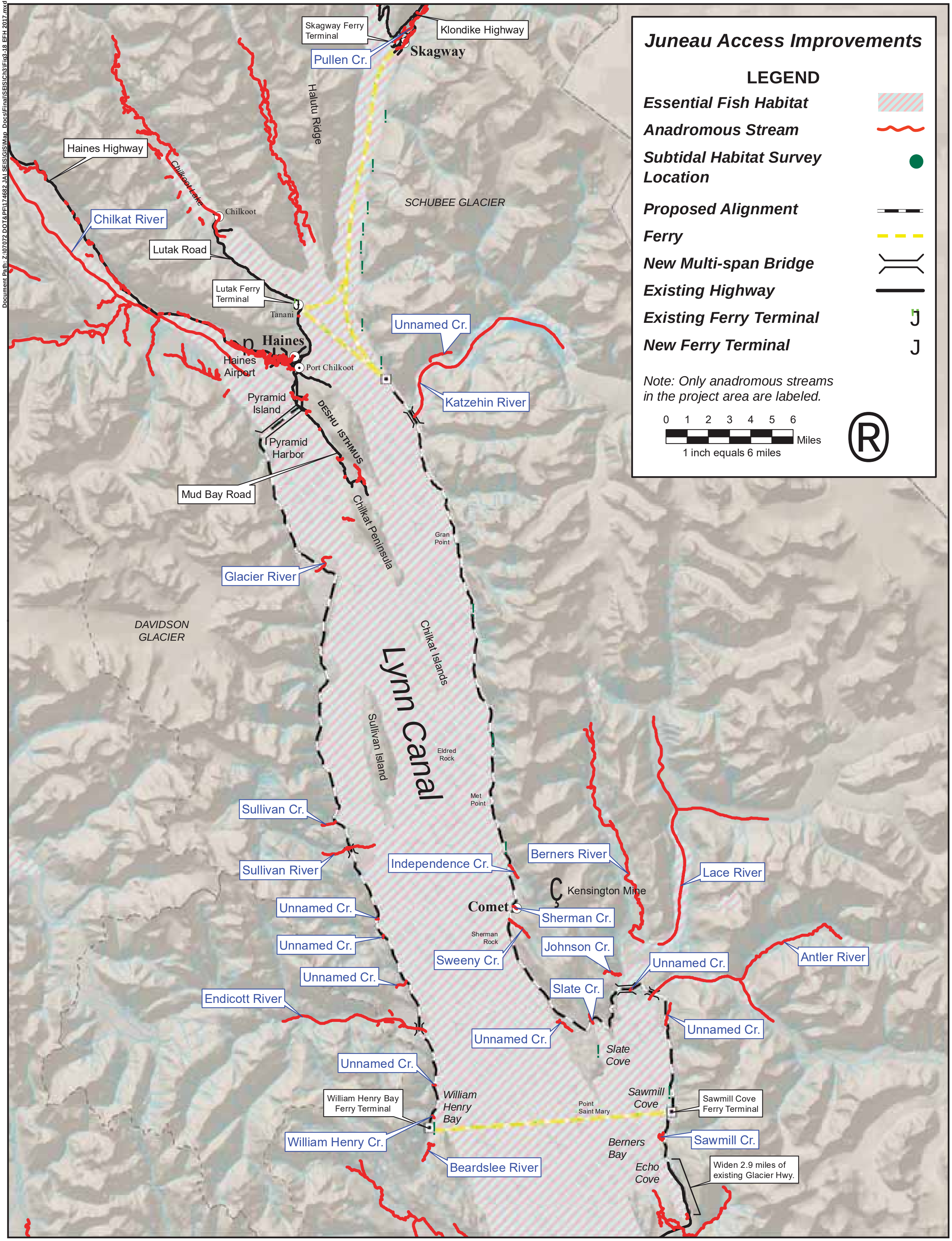

Figure 3-18
Essential Fish Habitat Including Anadromous Fish Streams

Document Path: Z:\07072 DOT&PF\174682 JAI SEIS\GIS\Map_Docs\Final\SEIS\Ch3\Fig 3-19 Herring.mxd

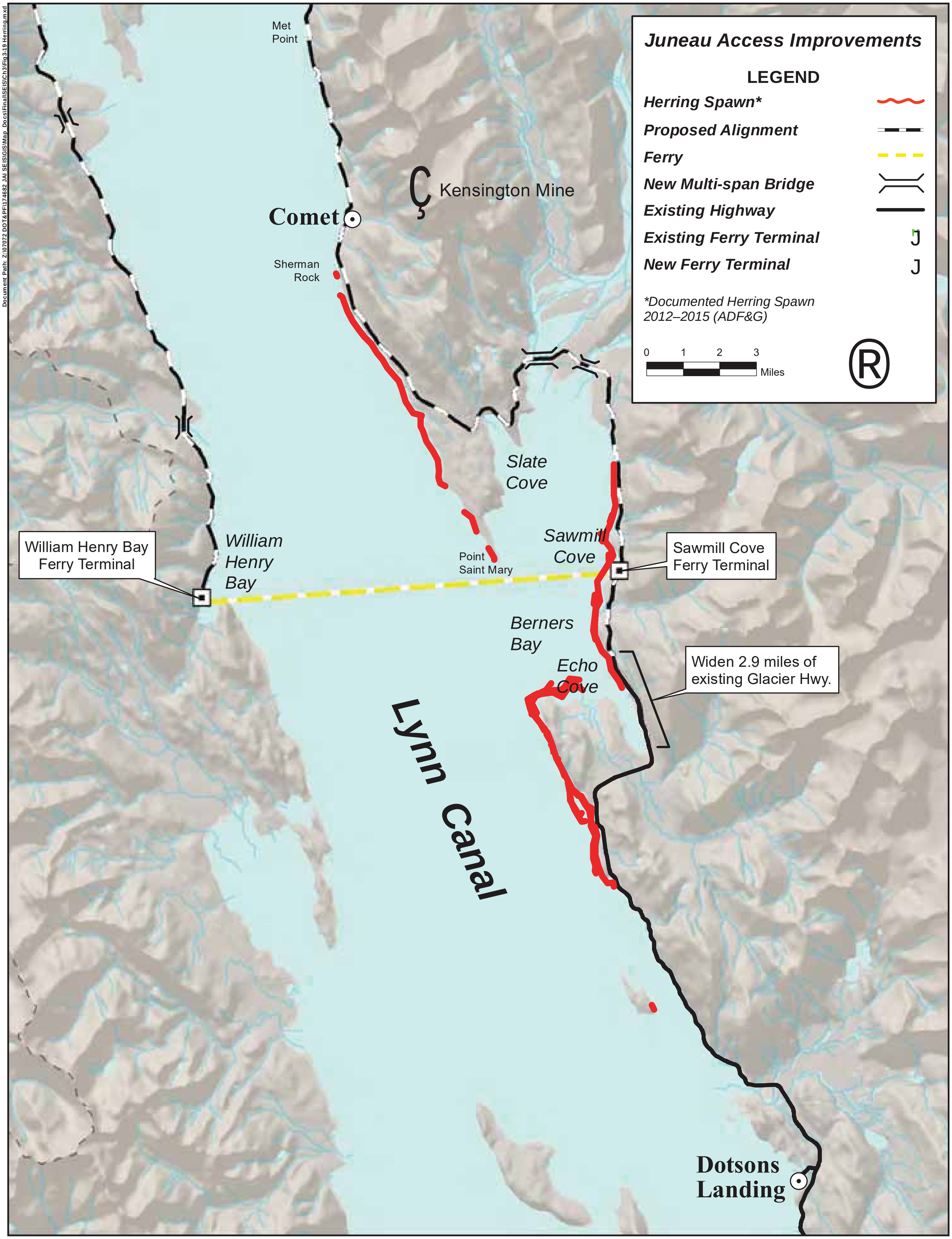

Figure 3-19
Herring Spawn

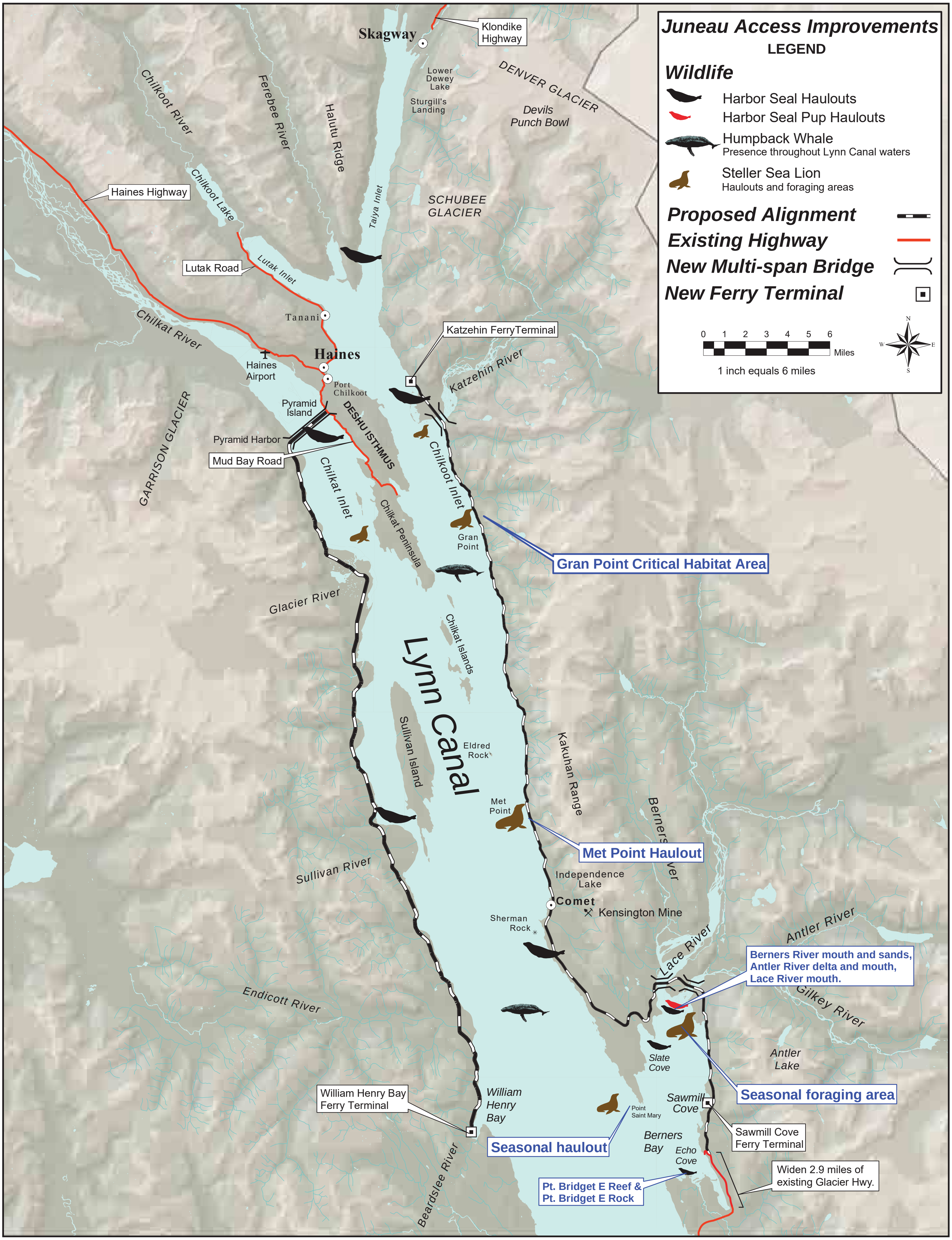

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**Figure 3-20**
**Marine Mammal Concentrations in Lynn Canal**

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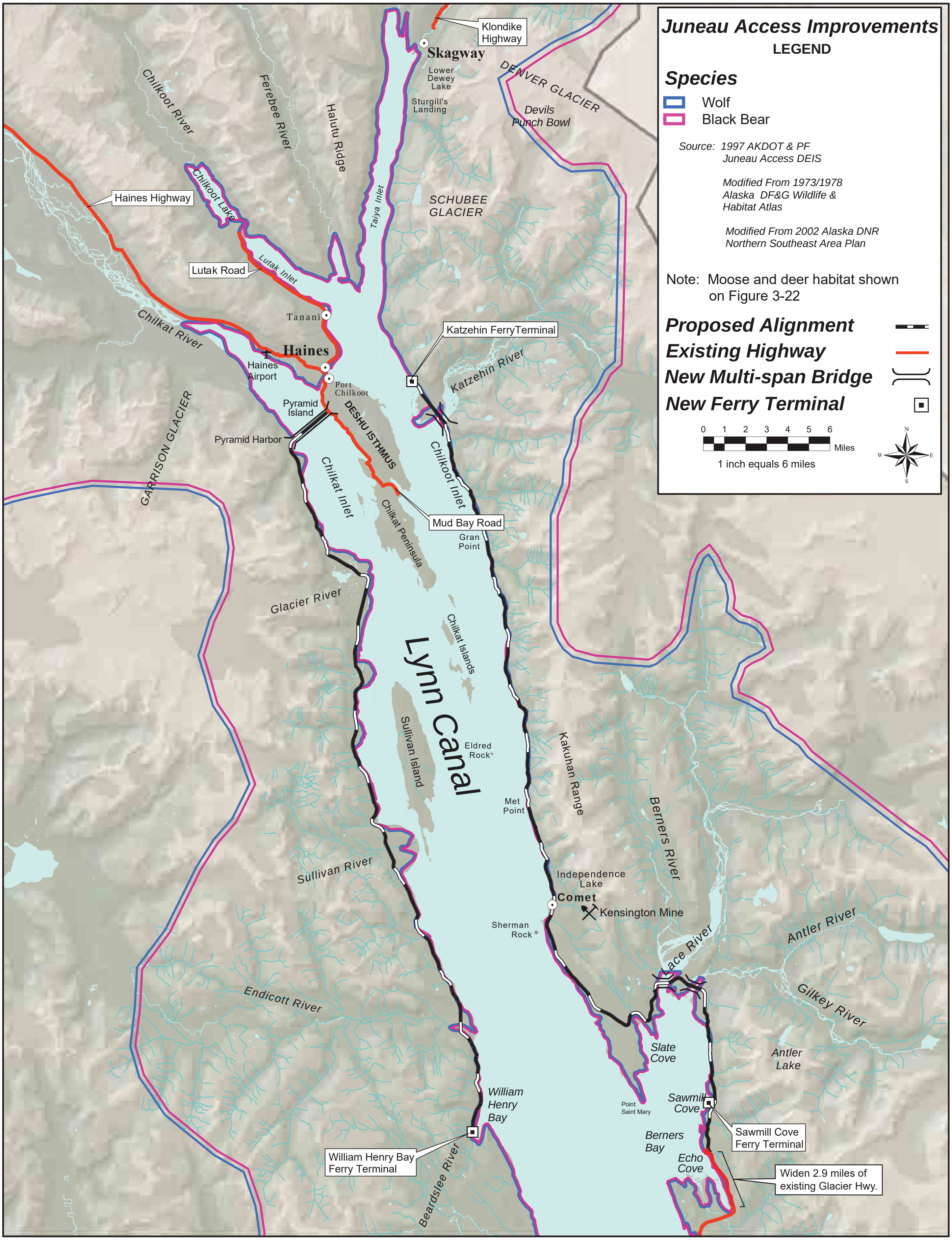

Figure 3-21
Wolf and Black Bear Habitat in Lynn Canal

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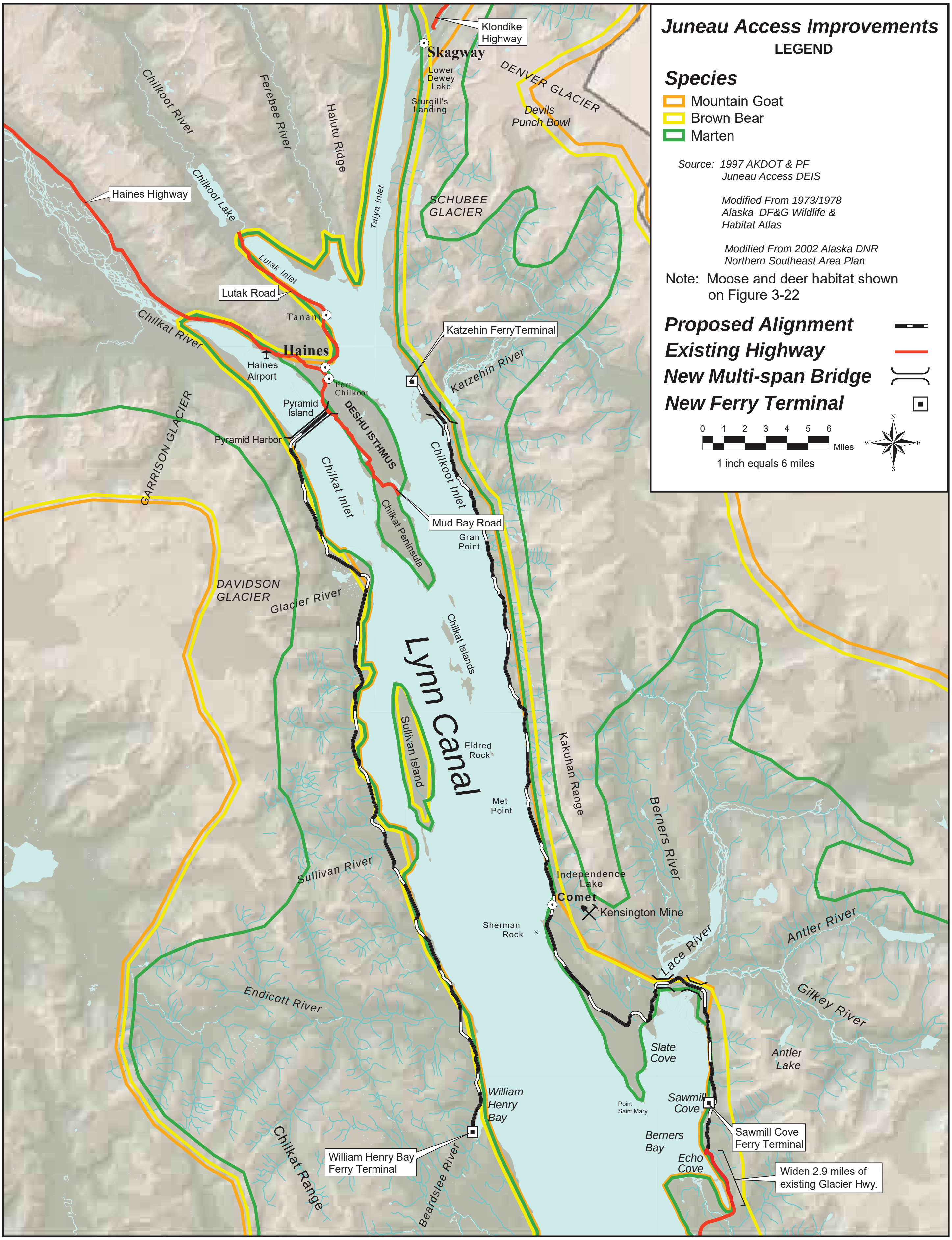

Figure 3-22
Mountain Goat, Brown Bear and Marten Habitat in Lynn Canal

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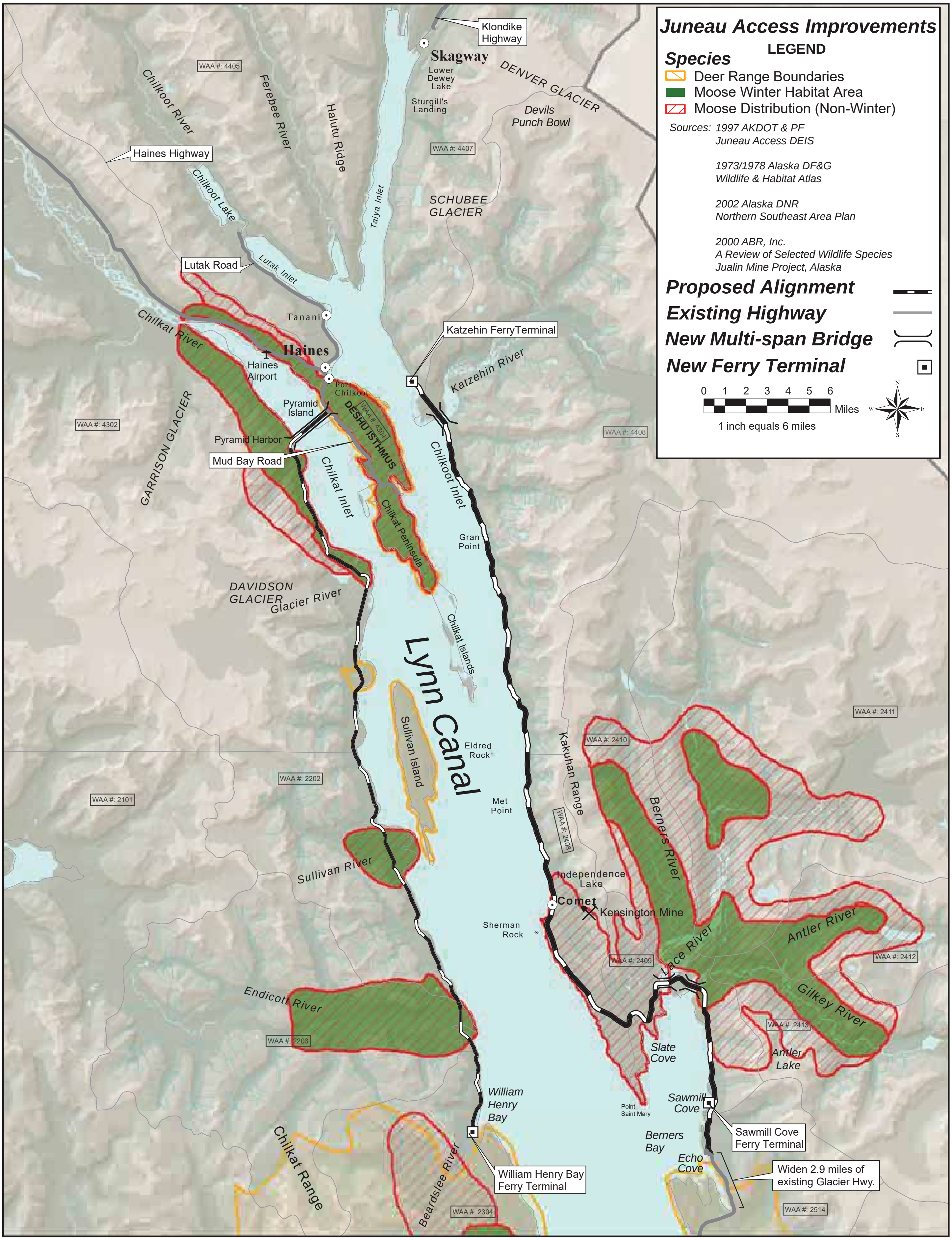

Figure 3-23
Moose and Deer Habitat in Lynn Canal

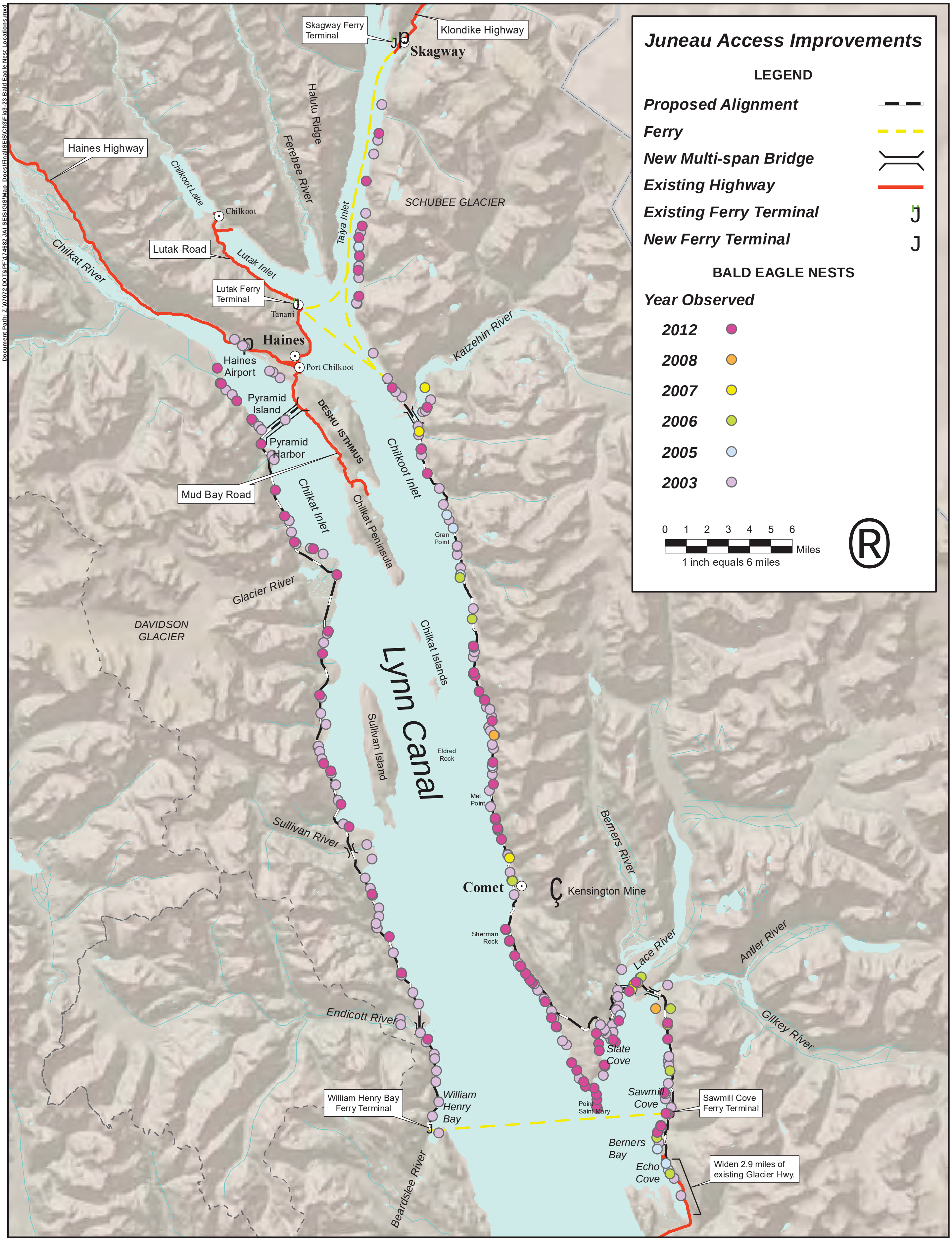

Figure 3-24
Bald Eagle Nest Locations

# 4 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

This chapter describes the likely direct, indirect, and cumulative effects of proposed Juneau Access Improvement (JAI) Project alternatives on the social, economic, physical, and biological environments of Lynn Canal. A substantial amount of the information on the potential environmental effects of project alternatives presented in the 2006 Final Environmental Impact Statement (EIS) remains valid and[1] was carried forward in the Draft Supplemental Environmental Impact Statement (SEIS) as appropriate.

The environmental impact assessment presented in this chapter is based on the following technical reports and updates, as appropriate:

- *Development of Alternative 1B – Enhanced Service with Existing Alaska Marine Highway System (AMHS) Assets*
- *Revenues and Expenditures Report for Lynn Canal, Fiscal Years 2005–2015*
- *Marine Segments Technical Report*
- *Traffic Forecast Report*
- *Technical Alignment Report*
- *User Benefit, Life-cycle Cost, and Total Project Cost Analyses*
- *Land Use and Coastal Management Technical Report (now the Land Use Technical Report)*
- *Visual Resources Technical Report*
- *Socioeconomic Effects Technical Report*
- *Household Survey Report*
- *Snow Avalanche Report*
- *Hydrology and Water Quality Technical Report*
- *Noise Technical Report*
- *Initial Site Assessment Technical Report*
- *Essential Fish Habitat Assessment*
- *Wetlands Technical Report*
- *Anadromous and Resident Fish Streams Technical Report*
- *Wildlife Technical Report*
- *Bald Eagle Technical Report*
- *Steller Sea Lion Technical Report*
- *Air Quality Modeling Memorandum*
- *Karst Technical Report*
- *Cultural Resources Technical Report*

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[1] To assist the reviewer, substantive changes to the 2014 Draft SEIS have been highlighted in gray.

The technical reports and their updates contain detailed analyses that are summarized in this chapter. With the exception of the *Household Survey Report*, *Karst Technical Report*, and the *Cultural Resources Technical Report*, all of the above-listed documents were updated or replaced entirely and appended to the 2014 Draft SEIS. This Final SEIS includes updates, revisions, and corrections to those appendices, as well as new appendices that respond to comments on the 2014 Draft SEIS.

This chapter begins with a discussion of the analytical methods used to evaluate potential project impacts. This discussion of methodology is followed by a discussion of the potential direct and indirect impacts of the no-build and build alternatives, the potential cumulative impacts of the proposed project, the relationship between the local short-term uses of the project area and the maintenance and enhancement of long-term productivity, and the irreversible and irretrievable commitments of resources that would be involved in the proposed project.

## 4.1 Methods for Analyzing Impacts

This section presents a summary of the methodologies used for impact assessment. Impacts have been evaluated based on the projected environmental changes caused by the build alternatives relative to Alternative 1 – No Action in 2025 and 2055, the planning years for this impact assessment. The Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) define direct effects as those caused by the action and that occur at the same time and in the same place as the action (40 Code of Federal Regulations [CFR] 1508.8). Indirect effects are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8). Cumulative effects on the environment can result from the direct and indirect effects of an action in combination with other actions over time (40 CFR 1508.7). This chapter addresses direct and indirect impacts potentially resulting from the individual alternatives in Sections 4.2 through 4.7. Construction impacts for all alternatives are discussed in Section 4.8 and cumulative impacts are discussed in Section 4.9.

### 4.1.1 Land Use

The impact assessment approach for land use is the same as the approach that was used for the 2006 Final EIS. Information has been updated based on the *Land Use Technical Report* (Revised Appendix DD). The evaluation of impacts to land uses was based on a comparison of the project alternatives and temporary construction facilities with land use plans and policies. Potential improvements to existing ferry terminal facilities are not addressed in the impact analysis because no land use changes would occur at those locations.

Note: In order to assess the potential impact on land ownership, the land use assessment evaluates a 300-foot-wide corridor where alternatives would traverse federal or State lands, as this is the typical width the Alaska Department of Transportation and Public Facilities (DOT&PF) uses for construction.

**Roadless Areas as a Resource –** Roadless areas are a resource with certain characteristics and with potential for future wilderness designation by Congress. The USFS uses nine “Roadless Area Characteristics,” identified in regulations (the Roadless Rule—36 CFR 294.11), to describe the resources or features that are present in the Inventoried Roadless Areas (IRAs). For this assessment, potential impacts of project alternatives on roadless areas were evaluated on the basis of their effects to these characteristics. The nine characteristics are described in

Section 3.1.1.1. Because most characteristics (e.g., topics related to soil, air, water, plants, animals, and recreation) are addressed elsewhere in this Final SEIS (i.e., other than the land use sections), the evaluation is cross-referenced to those specific sections and their impact assessments. Revised Appendix DD (*Land Use Technical Report*) provides additional information on Roadless Areas.

### 4.1.2 Visual Resources

The impact assessment approach for visual resources is the same as the approach that was used for the 2006 Final Environmental Impact Statement (EIS). Information has been updated based on the *2014 Update to Appendix G – Visual Resources Technical Report* (see Appendix Z of the Draft SEIS) and *2017 Errata* to the *2014 Update to Appendix G – Visual Resources Technical Report* (see Appendix Z of this Final SEIS). The visual impact assessment focused largely on the highway alignments included in project alternatives because improved ferry service would not alter landscape quality except in localized areas where new alternative ferry terminals could be constructed. Visual inventories were based on the existing Tongass National Forest database. Potential impacts of project alternatives on visual resources were based on management directives in the 2008 *Tongass Land and Resource Management Plan* (TLRMP), which has been superseded by the 2016 TLRMP. With respect to visual impact assessment, the 2016 TLRMP continues to incorporate the Scenery Management System of the 2008 TLRMP; therefore, the visual resources analysis presented in the 2014 Draft SEIS remains valid. The analysis focuses on the (Scenic Integrity Objectives (SIOs) of Land Use Designations (LUDs) adjacent to the proposed transportation corridor (i.e., the Transportation and Utility Systems [TUSs] LUD of the 2008 TLRMP, represented by the Transportation Systems Corridors [TSCs] of the 2016 TLRMP). A field review was conducted in the summer of 2003 to obtain photographs to develop visual simulations of the alternative highway alignments. The viewpoints for field photography, as well as the final viewpoints for visual simulations, were coordinated with the USFS. The impact assessment compared potential changes in visual quality in sensitive viewsheds resulting from proposed project alternatives.

### 4.1.3 Historical and Archaeological Resources

The method for assessing impacts on historical and archaeological resources is the same as the method that was used for the 2006 Final EIS. This Final SEIS incorporates updated information that has become available since that time. The Area of Potential Effect (APE) of project alternatives was established in consultation with the State Historic Preservation Officer (SHPO). Field surveys were conducted on areas of the APE with a high probability of containing cultural resources. Areas with a low potential for containing cultural resources were surveyed by shoreline observations and aerial photography. FHWA made a determination of the eligibility for the National Register of Historic Places (NRHP) of resources found during the field surveys. Potential disturbance or visual modification that could impact the cultural integrity of resources eligible for or on the NRHP was evaluated for each proposed project alternative, with additional consultation as required by the revised regulations for implementing the National Historic Preservation Act.

### 4.1.4 Socioeconomic Resources

The impact assessment approach for socioeconomic resources is the same as the approach that was used for the 2006 Final EIS. It addresses potential project-related impacts on the economy, public utilities, and the social environment of Lynn Canal. The socioeconomic analysis presented in the 2006 Final EIS has been updated using the *Socioeconomic Effects Technical Report* (Revised Appendix EE), which relied on a combination of primary and secondary research. Primary research included interviews with Juneau, Haines, and Skagway businesses as well as government and other community representatives. Secondary research used for the socioeconomic analysis included collection of published data and information prepared by local, State, and federal agencies as well as private-sector entities. Except where stated otherwise, economic effects are presented in 2016 dollars. These figures are not used to support other financial analyses of the project that were done for different years. By the nature of socioeconomic projections, the figures presented are relatively broad estimates and should be used to compare among alternatives instead of as absolute projections of dollar amounts.

### 4.1.5 Transportation

A new traffic forecast analysis was prepared for this Final SEIS. The analysis began with an overview of existing (base year) traffic within Lynn Canal. The available data for ferry travel, air travel, and freight traffic were summarized to provide a basis for calibrating the subsequent travel models. Note that the most recent data available were for the 2015 calendar year. Key pieces of data include the number of passengers (air and ferry) and vehicles traveling in Lynn Canal, average vehicle occupancy, average air and ferry fares, summer and winter seasonal factors, and the proportion of travelers traveling on the Juneau-Haines or Juneau-Skagway route.

There were two different types of models developed: a total demand model and a choice model. The total demand model predicted the “unconstrained”[2] potential volume for vehicular travel in Lynn Canal. This volume is the forecasted amount of traffic that could occur if a hypothetical highway existed between Juneau, Haines, and Skagway. Each of the JAI Project alternatives would capture only a fraction of this demand based on service characteristics of each alternative. The total demand model was created using household travel survey information and highway traffic counts.

Choice models were developed to predict the percentage of total demand that would utilize each alternative. For the JAI Project alternatives, the choice models calculated the percentage of total demand that would make a trip to or from Juneau based on the characteristics of each alternative. Inputs to the choice models included auto travel time, auto cost, ferry travel time, ferry cost, ferry delay (the delay associated with wait time, check-in time, load time, and unload time), and service index (a measure of each alternative’s relative travel convenience). The choice demand models produced a 2015 travel forecast. The forecast volumes were then adjusted to the base year (2025) and forecast year (2055) based on projected population growth in Juneau, Haines, and Skagway.

All traffic demand models attempt to predict future demand based on assumptions and data available in the present. To the extent that they are predicting a future, unknown condition, all demand models present a degree of uncertainty. For further discussion of the assumptions and

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[2] The word “unconstrained” is used to indicate what demand would be if travelers could drive directly to/from Juneau on a road because travel by road has the lowest cost and is more convenient compared with any travel alternative.

analysis used in developing the traffic forecast, see the *Traffic Forecast Report* (Revised Appendix AA).

For this Final SEIS, transportation impacts are evaluated from an economic perspective by looking at user benefits, life-cycle cost, and total project life cost (also known as cost of ownership). The analyses of transportation costs and economic benefits presented in the 2006 Final EIS have been updated in the *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF). User benefits were estimated by calculating the user benefits and costs for each alternative in comparison to the user benefits and costs of Alternative 1 – No Action. The cost-benefit analysis used for the SEIS is a reasonable approach for comparing the economics of the alternatives, but is only one consideration among an array of others addressed qualitatively and quantitatively in the SEIS. The economic analyses presented in the SEIS are not intended to represent a full measure of all benefits and costs associated with project alternatives. In fact, benefit-cost ratios described in Revised Appendix FF of this Final SEIS are based narrowly on user (traveler) benefits alone and do not consider a wide range of other potential household, commercial, industrial, and community benefits associated with improved Lynn Canal access. The SEIS addresses many topics qualitatively because they are difficult and controversial to monetize.

The user costs included in the analysis were the costs of travelers’ travel time; Alaska Marine Highway System (AMHS) fares; vehicle operating, maintenance, and ownership costs; and accident costs. The life-cycle cost analysis addresses all costs associated with the project (e.g., construction, operation, and maintenance), regardless of who pays. It does not evaluate any benefits. Future costs are brought back to the year of analysis using a discount rate; a discount rate is based on the concept that future dollars are less valuable than current dollars. Stated from the present perspective, current dollars could be invested, would grow more than the inflation rate, and could be used to pay future costs. In a life-cycle analysis, alternatives that have low initial costs but high future maintenance and/or construction cost look less expensive than alternatives with high initial costs and relatively low future costs. Unlike private industry, the State does not allocate and budget for future costs; funds are appropriated every year. To evaluate the total project costs that will have to be appropriated over the project’s life, a total project life cost analysis provides a summation of all annual capital and operating expenditures for each alternative, expressed in the present year with no discounting of future costs. Construction costs are based on 2016 unit prices. Each alternative would generate revenues based on ridership and ferry fares. To look at the likely costs to the State separate from these user fees, a total project life cost minus projected revenue is also provided.

For all cost analyses, construction was assumed to begin in 2019 and be completed by 2025. A 30-year post-construction operation period was evaluated, resulting in a 36-year analysis period (2019–2055) for each alternative.

### 4.1.6 Geology

The impact assessment for geology considered both the impacts of project alternatives on geologic resources and the potential effects of geologic hazards on project facilities. As indicated in Section 3.2.1.1, the geologic features of concern in the project area include karst on the west side of Lynn Canal and geologic hazards associated with avalanches and landslides.

Geologic hazards associated with alternative project facilities were identified in the *Reconnaissance Engineering Report* (DOT&PF, 1994b), *Final Report, Lynn Canal Highway, Phase I, Zone 4 Geotechnical Investigation, State Project Number 71100* (Golder Associates, 2006), and *Revision of Geologic Hazard Summary – Juneau Access Improvements Supplemental Environmental Impact Statement* (Golder Associates, 2012). The *2017 Update to Appendix D – Technical Alignment Report* (see Appendix Z of this Final SEIS) provides updated information on geological hazards, potential impacts on the project alternatives, and potential mitigation. Further geotechnical engineering investigations would be done during engineering design if a build alternative were selected for the project. This Final SEIS provides an assessment of the effects of those hazards on alternative project facilities.

#### 4.1.6.1 Karst

The karst impact assessment was conducted in four steps that take into account the TLRMP, the Tongass Plan Implementation Team vulnerability criteria, and management objectives for karst resources. Those steps are:

- **Step 1 – Identification of Potential Karstlands and Features –** This step involved the compilation and review of available information and preliminary characterization to identify potential karst terrains and features.
- **Step 2 – Field Inventory of Karst Resources –** On completion of Step 1, a field inventory of karst resources and potential karst features was completed for the segments of the West Lynn Canal Highway alignment (Alternative 3) determined to be underlain by carbonate bedrock.
- **Step 3 – Delineation of Karst Hydrologic System and Catchment Area –** Concurrent with Step 2, hydrologic information was collected and synthesized with other data to define, to the extent necessary and practicable for the proposed land use, the karst hydrologic system and approximate recharge or catchment areas along West Lynn Canal. The objective of this step was to understand the karst hydrologic system well enough to assess and characterize potential project-related impacts to down-gradient resources.
- **Step 4 – Assessment of Vulnerability to Management Activity –** Step 4 involved the processing and synthesizing of the data from Steps 1 through 3 to assess karst sensitivity to the relevant project alternatives and adjustment of the alignment where feasible.

#### 4.1.6.2 Avalanche

The avalanche hazard associated with the highway alternatives for the proposed project was assessed in terms of the avalanche hazard index (AHI). The AHI is a standard numerical scale index representing the probability of encounters between avalanches and vehicles on a highway and the likely resulting damage. It was developed in 1974 in Canada by the Avalanche Task Force and is published in its current form by Peter Schaerer (1989). The AHI provides a uniform standard for comparing the probability of an avalanche from one avalanche path to another. The index is also useful for comparing highway avalanche hazards from one region or snow climate to another. The unmitigated AHI was determined for each alternative and compared to several highways in North America. The North American standard for this hazard was used to determine appropriate mitigation measures, and a mitigated AHI was calculated. Updated information related to avalanche hazard from the *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z) has been incorporated into the alternatives analysis where appropriate.

#### 4.1.6.3 Landslides

The impact assessment for landslide and slope stability was completed by conducting surficial geologic mapping and hazard mapping of specific geologic hazards including rock slides, debris flows, rockfall, and other rock and slide hazards, supported by the use of light detection and ranging imagery, aerial photos, and digital mapping tools. Because Alternative 2B was advanced as the preferred alternative in the 2006 Final EIS, the geologic hazard studies (Golder Associates, 2006; 2012) focused on the East Lynn Canal Highway corridor. Detailed rock structure mapping was completed at 117 locations for proposed large rock cuts, fills, and bridge abutments, or where mitigation would be needed for rockfall hazard. Extremely large boulders were noted, as these may present challenges in removal and compaction of fill for road grading. However, optimal methods of rockfall mitigation may be reached through a variety of active and passive forms. Rockfall hazards can be mitigated through protection and stabilization tactics, which could include special blasting, hand scaling, and rock bolting as well as rockfall catchment ditches.

The rockfall hazard rating system used was based on event frequency, material volume, elevation of the source material, length of the alignment exposure (total length of the highway estimated to be at risk from the hazard), and predictability, which produced preliminary Geologic Hazard Rating System values (developed by Golder Associates) and Hazard Index Number (adapted from the U.S. Department of Transportation) for each potential hazard. Geologic hazard maps were produced summarizing the findings.

### 4.1.7 Hydrology and Water Quality

The impact assessment approach for hydrology and water quality is the same as the approach that was used for the 2006 Final EIS. Information was updated based on the *2014 Update to Appendix K – Hydrology and Water Quality Technical Report* (see Appendix Z in the Draft SEIS) and *2017 Errata* to the *2014 Update to Appendix K – Hydrology and Water Quality Technical Report* (see Appendix Z of this Final SEIS).

Where project alternatives would encroach on base floodplains, each alternative was evaluated for the following based on FHWA regulations in 23 CFR 650.111:

- Flooding risks
- Impacts on natural and beneficial floodplain values
- Potential for incompatible floodplain development
- Measures to minimize floodplain impacts
- Measures to restore and preserve natural and beneficial floodplain values

As indicated in Section 3.2.3, the Federal Emergency Management Agency has not mapped floodplains in the study area. A floodplain analysis was conducted by DOT&PF as part of the Reconnaissance Engineering Study (DOT&PF, 1994b). That analysis was used to evaluate flood risks and potential impacts of project alternatives to natural and beneficial floodplain values.

The potential impact of project alternatives on local surface water and groundwater hydrology was evaluated based on preliminary engineering hydraulic design for project alternatives.

The analysis of potential water quality impacts evaluated the pollutants from highway stormwater runoff and accidental spills that could enter surface water drainages crossed by project alternatives. The potential impacts of the disposal of sanitary waste generated at proposed new ferry terminals and by ferries were also evaluated. Alaska Department of Environmental Conservation (ADEC) Water Quality Standards (18 Alaska Administrative Code [AAC] 70, as amended) (AWQS) and the ADEC Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances were used to evaluate water quality impacts.

### 4.1.8 Air Quality

The Clean Air Act prohibits federal actions that delay attainment of any air quality standard. This Act requires a review of all planned stationary sources of air pollution and transportation projects in areas that do not attain National Ambient Air Quality Standards (NAAQS) (non-attainment areas) to ensure that they will not inhibit the ability of the State to ultimately achieve attainment of those standards. The review for stationary sources and other non-transportation emission sources is known as "general conformity," and the review of transportation projects is termed "transportation conformity." Because the proposed project is in an area that is either unclassified or classified as being in attainment by the Environmental Protection Agency (EPA), a conformity analysis is not required.

The pollutants of concern associated with the JAI Project are elevated concentrations of carbon monoxide (CO) and particulate matter with aerodynamic diameter less than or equal to 10 micros ($PM_{10}$). Simplified CO modeling was completed for the 1997 Draft EIS by first determining the CO emission factors using the EPA MOBILE 5 computer model. CO concentrations (unadjusted) were then determined using standard methods.

No air quality monitoring data are available for the study area. Therefore, background CO levels of 1 part per million (ppm) for the rural section and 2 ppm for the more urbanized areas near the endpoints of the project were then added to the modeled CO concentrations for comparison to the State and federal standards (1-hour CO average). The background CO concentrations were assumed based on ADEC input for the 1997 Draft EIS *Air Quality Analysis Technical Report* and guidance provided by the FHWA in *Appropriate Level of Highway Air Quality Analysis for a Categorical Exclusion, Environmental Assessment/Finding of No Significant Impact, and EIS* (FHWA, 1986).

The CO emission model was rerun using traffic data provided in the 2004 *Traffic Forecast Report* (Appendix C of the 2005 Supplemental Draft EIS) and emission results were presented in the 2004 *Air Quality Modeling Memorandum* (Appendix T of the 2006 Final EIS). The *2017 Update to Appendix T – Air Quality Modeling Memorandum* (in Appendix Z of this Final SEIS) determined that the updated traffic volume forecasts (see Revised Appendix AA, *Traffic Forecast Report*) are similar to traffic volume forecasts used in the 2004 air quality modeling and would generally result in projected emissions and pollutant concentrations similar to those presented in the 2006 Final EIS and, therefore, no new air quality modeling was necessary. The following paragraphs describe the 2004 air quality modeling.

Emission factors were determined using the updated MOBILE 5B computer model. Although EPA had also developed a newer emission factor model using the MOBILE 6 software and an updated CALINE 4 dispersion model, for the purposes of the 2004 analysis, no significant differences were noted during comparison runs of the older and newer models, other than those due to differences in inputs for traffic volume, temperatures, and highway design speeds.

The updated 2004 model simulation included CO estimates for the construction year (2008) and the design year (2038) using the peak week average daily traffic (ADT) data predicted for those two years, as described in the 2004 *Traffic Forecast Report* (Appendix C of the 2005 Supplemental Draft EIS). Where possible, the most conservative values were assumed for the model inputs so that a worst-case scenario for CO could be developed (highest value). A travel speed of 40 mph was used for air quality modeling for new highway segments to provide a conservative (worst-case) estimate of air quality impacts. A minimum distance of 50 feet from the roadway centerline was also modeled using worst-case meteorological conditions.

Project-related $PM_{10}$ concentrations were evaluated on a qualitative basis by comparing project-related traffic volumes to the traffic volumes in a similar environment where $PM_{10}$ measurements have been made.

Results of the 1997 and 2004 analyses are compared to the Alaska Ambient Air Quality Standards (AAAQS) (18 AAC 50.010), which adopt the federal NAAQS promulgated in 40 CFR 50.8.

DOT&PF analyzed ferry vessel emissions for each of the alternatives and the potential impacts of those emissions on ambient air quality at port and terminal locations. Total annual emissions of criteria pollutants were calculated for each alternative using emissions factors for ferry vessel engines (obtained from manufacturer) and information related to ferry operations for each alternative, such as the number of port calls per season, duration of trips, and idling time in each port (calculated by project traffic engineers). See Attachment 1 of the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z of this Final SEIS for more detail on this analysis.

### 4.1.9 Noise

Comments received on the 1997 Draft EIS indicated the need to conduct additional noise analyses of project alternatives. Baseline noise data gathered for the project in 2003, together with projected traffic volumes provided in the 2004 *Traffic Forecast Report* (Appendix C of the 2005 Supplemental Draft EIS), were used as input to FHWA noise models to predict future traffic noise with and without the project alternatives. Potential impacts were assessed by comparing projected future noise levels with and without project alternatives to the FHWA Noise Abatement Criteria (NAC) and were presented in the 2005 *Noise Technical Report* (in Appendix L of the 2005 Supplemental Draft EIS). The *2017 Update to Appendix L - Noise Technical Report* (in Appendix Z of this Final SEIS) determined that the 2016 traffic volumes forecasted are similar to traffic volume forecasts used in the 2005 *Noise Technical Report* and would result in noise levels similar to those presented in the 2006 Final EIS and, therefore, no new noise modeling was necessary. The projected noise levels and noise abatement recommendations in this Final SEIS are the same as those presented in the 2006 Final EIS.

### 4.1.10 Hazardous Waste

An initial site assessment (ISA) was conducted in 2003 and updated in 2013 to identify any known or likely areas of hazardous materials along the alignments and facility locations of the project alternatives. Federal and State databases were reviewed for this assessment.

In the 2004 *Initial Site Assessment Technical Report* (Appendix M of the 2005 Supplemental Draft EIS), a limited on-site field review was made for the portions of alternative alignments that were within the cities of Skagway and Haines. Past use of any property of potential interest and adjoining properties was researched by reviewing historical aerial photographs. Sites that are known to contain or could potentially contain contamination because of past activities were assigned a site hazard rating. Sites with a high or medium hazard within a 300-foot-wide corridor centered on the alternative alignments and related facilities were further evaluated and assigned an impact rating based on the potential cost of remediation.

The *2014 Update to Appendix M – Initial Site Assessment Technical Report* (in Appendix Z of the Draft SEIS) provides an update from the federal and State databases to identify additional sites of known or potential contamination within the project corridor. That updated information has been incorporated into the analysis of project impacts. Corrections to that report are provided in the *2017 Errata* to the *2014 Update to Appendix M – Initial Site Assessment Technical Report* (in Appendix Z of this Final SEIS).

### 4.1.11 Wetlands

This assessment evaluated potential project impacts on wetlands, wetland functions, and marine waters of the U.S. as required under Section 404 of the Clean Water Act and Executive Order (EO) 11990. Impacts on rivers and streams (freshwater waters of the U.S.) are addressed under marine and freshwater habitat. The principal direct impact of project alternatives on wetlands is their long-term loss through the placement of fill and modification of local hydrologic patterns.

The effect of the project on wetlands is addressed in the *Wetlands Technical Report* (Appendix O), the *2014 Update to Appendix O – Wetlands Technical Report* (in Appendix Z of the Draft SEIS), and the *2017 Errata* to the *2014 Update to Appendix O – Wetlands Technical Report* (in Appendix Z of this Final SEIS). The analysis of alternatives in this chapter has been updated to reflect the updated wetlands information.

### 4.1.12 Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat)

Potential project-related impacts to freshwater habitat and fish were evaluated by estimating the potential for direct and indirect mortality of fish and disruption or disturbance of spawning and rearing behavior as a result of construction and highway maintenance and operation. The *Anadromous and Resident Fish Streams Technical Report* (Appendix P), the *2014 Update to Appendix P – Anadromous and Resident Fish Streams Technical Report* (in Appendix Z of the Draft SEIS), and the *2017 Errata* to the *2014 Update to Appendix P – Anadromous and Resident Fish Streams Technical Report* (in Appendix Z of this Final SEIS) contain an analysis of these impacts. Habitat-related impacts (i.e., destruction of spawning and/or rearing habitat for anadromous fish) were assessed separately in the *Essential Fish Habitat Assessment* (Appendix N), the *2014 Update to Appendix N – Essential Fish Habitat Assessment* (in Appendix Z of the Draft SEIS), and the *2017 Errata* to the *2014 Update to Appendix N – Essential Fish Habitat Assessment* (in Appendix Z of this Final SEIS).

The essential fish habitat (EFH) assessment serves a dual purpose: it documents potential impacts of project alternatives on the intertidal and subtidal environments of Lynn Canal and it is being used to comply with the Magnuson-Stevens Fishery Conservation and Management Act requirement that federal agencies assess the effects of their actions on EFH for commercial fish stocks in all life stages and associated habitats. Potential project effects on EFH are summarized in Sections 4.3.13, 4.4.13, 4.5.13, 4.6.13, 4.8.11, and 4.9.2.10 for project alternatives.

The potential effects of project construction and operation on the fish species included in this analysis were evaluated based on projected changes in habitat quality and quantity and the estimated effect of those changes to local fish populations.

### 4.1.13 Terrestrial Habitat

The assessment of the potential impacts of project alternatives on terrestrial habitat was based on the long-term loss of those habitats resulting from the construction of project facilities. The effect of habitat loss on wildlife is addressed in the *Wildlife Technical Report* (Appendix Q) and *2017 Update to Appendix Q – Wildlife Technical Report* (in Appendix Z). The effects of the alternatives on terrestrial habitat in Tongass National Forest were also analyzed with regard to the areas of old-growth reserves (OGRs) within the areas that would be cleared during construction.

### 4.1.14 Wildlife

The 1994 *Wildlife Technical Report* assessed potential project-related impacts to wildlife using Habitat Capability Index (HCI) models, and still provides valid information for the proposed project. These HCI models were developed for black bear, brown bear, marten, and mountain goat, which were management indicator species identified by the USFS, the Alaska Department of Fish and Game (ADF&G), and the U.S. Fish and Wildlife Service (USFWS). Public and agency comments on the 1997 Draft EIS requested an expansion of the number of species considered for analysis and pointed out the limitations of the HCI models for assessing impacts from highway development. The impact analysis presented in the 2005 Supplemental Draft EIS did not rely on any new HCI modeling. However, the 2005 Supplemental Draft EIS summarizes statistics from the previous HCI model analyses where appropriate.

> Note: The consensus during 2003 resource agency scoping efforts for the 2005 Supplemental Draft EIS was that data from the 1997 HCI modeling were still valid as approximations of habitat capability impacts and should be incorporated into the 2005 Supplemental Draft EIS wildlife analysis. Some agency comments on the 2005 Supplemental Draft EIS requested that the limitations of the HCI models be more clearly explained. Some of these limitations are:
>
> 1. Habitat capability is a measure of the amount of habitat available and affected, not an actual measure of populations.
> 2. The models assess impact based on an assumed limiting factor for each species (e.g., late summer feeding habitat for brown bears and old-growth (OG), south-facing slopes within 1,300 feet of a cliff for goats). Other limiting factors may affect the population.
> 3. The models were developed in 1988 and used 1994 USFS forest data for habitat calculation, which may no longer be totally accurate.
> 4. The models were developed to analyze the effects of clearcut logging and associated roads; they may not work as well for impacts that are from roads alone.
> 5. The models do not incorporate the potential impact reduction provided by wildlife underpasses.

The potential impacts of project alternatives on wildlife were assessed in the following steps:

- **Step 1 - Setting up the Analysis –** The geographic scope of the wildlife analysis was defined using a combination of U.S. Geological Survey (USGS) and USFS maps and ADF&G Wildlife Analysis Areas.
- **Step 2 - Describing the Situation –** Wildlife species' preferred habitats, population trends (if known), and the types of interactions they have with humans in the study area, including how they interact with the existing transportation systems in Alaska, were described. This information was summarized from other documents and incorporated by reference.
- **Step 3 - Identifying Issues –** A number of federal laws and EOs address wildlife and development issues, including the Endangered Species Act (ESA), the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act (MBTA), EO 13186[3], and the Marine Mammal Protection Act (MMPA). A list of the issues to be considered was derived from these laws, public and agency comments during 2003 scoping for the 2005 Supplemental Draft EIS, and from USFS documents concerning road impact analysis (USFS, 1999 and 2000).
- **Step 4 - Assessing Benefits, Problems, and Risks –** For biological resources, guidelines for the NEPA recommend that population-level measures be used to evaluate the intensity of project-related effects and that the evaluation be quantifiable where possible.

If quantitative information is unavailable, professional judgment on the likelihood of an impact occurring or its severity may be used. Historical population survey data from resource management agencies and academic sources were used in the impact assessment to the extent possible. Given the uncertain nature of predicting the future effects of project alternatives, a combination of quantitative estimates and qualitative judgments was used to describe potential impacts.

See the *Wildlife Technical Report* (Appendix Q) for additional information on the impact assessment methodology. This Final SEIS updates information presented in the 2006 Final EIS based on the *2017 Update to Appendix Q – Wildlife Technical Report* (in Appendix Z of this Final SEIS). New information includes the results of wildlife surveys conducted by ADF&G.

### 4.1.15 Bald Eagles

Based on many years of experience in Southeast Alaska, the USFWS developed a set of guidelines for State- and federal-funded highway construction activities to ensure compliance with the Bald and Golden Eagle Protection Act (BGEPA) and prevent disruption of bald eagle nests. Those guidelines are incorporated into a USFWS and USFS interagency agreement.

Until their delisting in June 2007, bald eagles were on the endangered species list in the continental United States. In connection with the delisting, the USFWS announced a final rule on two new permit regulations that would allow for the disturbance and take of eagles and eagle nests under the BGEPA (USFWS, 2009). The 2009 eagle permit regulations are consistent with the National Bald Eagle Management Guidelines (USFWS, 2007).

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[3] The MBTA prohibits the taking of migratory birds, eggs, or nests. The Migratory Bird EO (13186) specifically encourages all federal agencies to avoid or minimize to the extent practicable adverse impacts to migratory bird resources.

The guidelines are based on three general recommendations to avoid disturbance to nesting bald eagles:

1. Keeping a distance between the activity and the nest (distance buffers).
2. Maintaining forested (or natural) areas between the activity and nest trees (landscape buffers).
3. Avoiding certain activities during the breeding season (timing buffers).

Depending on the nature and magnitude of impact on bald eagles that could result from each activity, the visibility of the activity from the nest, and the degree to which similar activities are already occurring near the nest, the USFWS has developed activity-specific guidelines and buffers to aid in determining when a permit would be required. Based on these guidelines, the DOT&PF would need to apply for an eagle Disturbance Permit for nests within 660 feet of the cut and fill limits and for active nests within 0.5 miles of blasting activities and other loud construction noises.

In addition to the USFWS regulations, the City and Borough of Juneau (CBJ) Land Use Code states that development is prohibited within 330 feet of an eagle nest on public land within the CBJ. The DOT&PF would need a variance from the CBJ for the JAI Project if the selected alternative requires construction within 330 feet of a bald eagle nest.

The potential impacts of project alternatives on bald eagles are determined by measuring the distances between eagle nests identified in the USFWS surveys and the cut-and-fill limits of each alternative. The effects of activities to bald eagles from the alternatives were then evaluated based on these distances relative to the USFWS National Bald Eagle Guidelines. This Final SEIS updates information presented in the 2006 Final EIS based on the *2017 Update to Appendix Q – Wildlife Technical Report* (in Appendix Z of this Final SEIS). Updated information includes the results of new bald eagle nest surveys and new criteria for suitable disturbance distances since the *Wildlife Technical Report* (Appendix Q).

### 4.1.16 Threatened and Endangered Species

As indicated in Section 3.3.7, only two species in the study area are classified as threatened or endangered under the ESA: the Mexico distinct population segment (DPS) humpback whale and the western DPS of the Steller sea lion.

In 2005, the National Marine Fisheries Service (NMFS) concurred with the FHWA's *not likely to adversely affect* determinations for species listed under the ESA, as presented in the 2005 revised *Biological Assessment* (BA) prepared for the project (FHWA, 2005). The revised BA and subsequent Letter of Concurrence (NMFS, 2005a) stated that, with impact minimization measures, the preferred alternative (Alternative 2B, at that time) would not adversely affect the eastern or western DPS of Steller sea lions, Steller sea lion critical habitat, or humpback whales.

FHWA submitted a revised BA to NMFS on January 30, 2014, to initiate formal Section 7 Consultation. With identification of Alternative 1 – No Action as the preferred alternative, FHWA notified NMFS that it was withdrawing the *Revised Biological Assessment* and request for formal consultation under ESA Section 7 for the JAI Project (see February 15, 2017, letter from FHWA to NMFS in Attachment B of Appendix JJ).

## 4.2 Alternatives 1 and 1B[4]

## 4.2A Alternative 1 (Preferred) – No Action

Alternative 1 – No Action includes a continuation of mainline ferry[5] service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs) already programmed for construction by the AMHS to replace the daily summer service provided by the motor vessel (*M/V*) *Malaspina* between the Lynn Canal communities of Juneau (Auke Bay) and Haines and Skagway (see Figure 2-5). Alternative 1 – No Action is not a direct continuation of 2013–2014 ferry service. Rather, it is a continuation of the AMHS's *current plan* and reflects the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project. No new roads or ferry terminals would be built, and there would be no improvements to existing facilities beyond those already programmed.

This section describes the environmental consequences to resources discussed in Chapter 3 resulting from Alternative 1 – No Action. This section discusses only the environmental areas for which changes from conditions described in Chapter 3 have been forecasted within the project planning horizon. No changes to existing conditions were identified for land use, visual resources, historical and archaeological resources, environmental justice, subsistence, geology, floodplains, Wild and Scenic Rivers, noise, hazardous materials, and biological resources; therefore, there is no description of impacts for these resources in this section.

### 4.2A.1 Socioeconomic Resources

As discussed in Section 1.4.1.3, the estimated travel demand in Lynn Canal is greater than what AMHS currently accommodates. Under Alternative 1 – No Action, the programmed improvements improve operations; therefore, Alternative 1 – No Action would increase traffic and the number of visitors. In addition, Lynn Canal is projected to have a slight increase in population (0.024 percent annually) during the 30-year forecast period of 2025 to 2055 (see Revised Appendix AA, *Traffic Forecast Report*). As a result, Alternative 1 – No Action would have negligible economic impacts in Juneau and Skagway. One Day Boat ACF would homeport in the Haines Borough and employ approximately 20 people, but would not noticeably change economic conditions in Lynn Canal. In addition, Alternative 1 – No Action would not alter the quality of life for residents in Juneau, Haines, and Skagway.

### 4.2A.2 Transportation

The 2004 Southeast Alaska Transportation Plan (SATP; DOT&PF, 2004b) calls for construction of a highway from Juneau to Skagway with a ferry from Katzehin to Haines. The SATP will be updated to reflect the identification of Alternative 1 – No Action as the recommended improvement in the plan.

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[4] Alternatives 1 and 1B are separate alternatives and are addressed in separate subsections: 4.2A and 4.2B, respectively. The purpose of using this alphanumeric scheme for these sections is to maintain the same section numbers as those used in the 2006 Final EIS for ease of reference in the remainder of this chapter. Alternatives 1 and 1B are grouped together because both are "no build" alternatives. Alternative 1B is, however, an action alternative and is analyzed to the same level of detail as all action alternatives.

[5] Larger vessels of the AMHS that travel the length of the system from Bellingham or Prince Rupert, B.C. to Southeast and South Central Alaska communities are called mainline ferries. Smaller vessels that are referred to as "day boats" connect smaller communities with each other and with the mainline routes.

DOT&PF's 2016–2019 Statewide Transportation Improvement Program (STIP; Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. Alternative 1 – No Action is consistent with the currently adopted STIP.

#### 4.2A.2.1 Demand and Capacity

Projected traffic demand in 2055 for Alternative 1 – No Action is provided in Table 4-1. Annual ADT demand in Lynn Canal is projected to be 80 vehicles and summer ADT is projected to be 125 vehicles in 2055 under Alternative 1 – No Action (see Revised Appendix AA, *Traffic Forecast Report*).

**Table 4-1:**
**2055 Forecast Demand and Capacity Juneau to/from Haines and Skagway for Alternative 1 – No Action**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1 – No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

The capacity of the ferry system in Lynn Canal under Alternative 1 – No Action is approximately 154 vehicles per day during the summer; therefore, summer demand would not exceed capacity under Alternative 1 – No Action. The peak week demand, however, is approximately 300 ADT, which would exceed summer capacity. Alternative 1 – No Action would accommodate approximately 51 percent of the peak week ADT. As with current operations, AMHS could schedule additional service in Lynn Canal during identified high volume days. Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternative 1 – No Action would realize and accommodate[6] 6 percent of the latent summer demand.

Under Alternative 1 – No Action, the local summer ADT between Haines and Skagway (i.e., traffic that originates in Haines and goes to Skagway, or vice versa) is projected to be approximately 53 vehicles in 2025 and 2055. Combined with the traffic traveling between Juneau and Skagway, the summer ADT on the Haines-Skagway link is 98. The projected average summer daily capacity on the Day Boat ACF traveling between Haines and Skagway is 197 vehicles, which would accommodate the demand between Haines and Skagway. Additional Haines-Skagway capacity would be provided by the mainliners.

#### 4.2A.2.2 Travel Flexibility and Opportunity

In the summer, Alternative 1 – No Action would provide eight round-trips per week between Juneau and Haines and eight round-trips per week between Juneau and Skagway. Mainline ferries would make two trips per week and Day Boat ACFs would make the remaining six trips. In the winter, Alternative 1 – No Action would provide four round-trips per week between Juneau and Haines and four round-trips between Juneau and Skagway. One trip to each

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[6] Each of the action alternatives satisfies the purpose and need to varying degrees based on the capacity it provides, and each has been designed to accommodate the demand that would occur given its particular attributes, such as cost, travel time, and convenience. There is an underlying latent demand for travel in the corridor (unconstrained demand), and more or less of that demand would be realized with each alternative, depending on the attributes of that alternative.

community would be on a mainline ferry and the Day Boat ACFs would make up the remaining trips.

#### 4.2A.2.3 Travel Time

Using the Day Boat ACFs, one-way travel time between Juneau and Haines would be 6.2 hours and between Juneau and Skagway would be 8.1 hours. Using a mainline ferry, travel time between Juneau and Haines would be 7.2 hours and between Juneau and Skagway would be 9.1 hours.

The Day Boat ACF between Haines and Skagway would take approximately 2.4 hours for a one-way trip. The Haines-Skagway Day Boat ACF would make a minimum of two round-trips per day, six days per week, plus one round-trip on the seventh day in the summer, and one round-trip per day six days per week in the winter.

#### 4.2A.2.4 State and User Costs

The 36-year life-cycle cost[7] of Alternative 1 – No Action would be $441 million, which includes all State and federal capital costs and all State operating costs discounted to 2016 dollars (see Table 4-2).

**Table 4-2:**
**Thirty-Six-Year Life-Cycle Costs for Alternative 1 – No Action**

| Alternative | Capital Cost ($million) | Operating Cost ($million) | Total Life-Cycle Cost ($million) |
|---|---|---|---|
| 1 – No Action | $119 | $322 | $441 |

The total project life costs less residual value over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $787 million (capital plus operating costs, Table 4-3). The net cost to the State during the analysis period would be about $378 million in 2016 dollars, or about $279 per vehicle transported in Lynn Canal.

**Table 4-3:**
**Thirty-Six-Year Total Project Life Costs for**
**Alternative 1 – No Action, 2019–2054 (2016 Dollars)**

| Alternative | Total Funds | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $378 | $279 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

Based on the 2015 AMHS rate structure, the anticipated total user cost[8] for a family of four in a 19-foot-long vehicle to travel between Juneau and Haines would be $229.00. The cost for the

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[7] Life-cycle costs are the construction, refurbishment, and maintenance costs and a 36-year operation period discounted to 2016 dollars.

[8] Total user costs are out-of-pocket costs and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

same family to travel between Juneau and Skagway would be $301.50. For a driver with a 19-foot vehicle, the total user cost would be $131.50 between Juneau and Haines and $169.00 between Juneau and Skagway. For an adult walk-on passenger (i.e., person traveling without a vehicle), the cost would be $39.00 between Juneau and Haines and $53.00 between Juneau and Skagway. Total user costs for Alternative 1 – No Action are reported in Table 4-4.

**Table 4-4:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Cost for Alternative 1 – No Action**

| Alternative | Example scenario | Haines User Cost[1] | | Skagway User Cost[1] | |
|---|---|---|---|---|---|
| | | Total User Cost | Out of Pocket Cost | Total User Cost | Out of Pocket Cost |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on Passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |

[1] Total user cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the ferry terminal.

### 4.2A.2.5 Other Transportation Impacts

AMHS expenditures in Lynn Canal for fiscal year 2015 were close to $25 million (including annual overhaul costs[9]), of which approximately $20 million was paid by the State (Revised Appendix BB, *Revenues and Expenditures Report for Lynn Canal, Fiscal Years 2005-2015*). The average annual AMHS operating cost of Alternative 1 – No Action from 2025 to 2055 is estimated to be about $18.2 million (Table 4-5). This projected reduction from actual 2015 costs is due in large part to the planned use of the lower cost Day Boat ACFs in place of the *M/V Malaspina* as a summer shuttle in Lynn Canal.

The 2025-2054 average annual AMHS revenue for Alternative 1 – No Action is projected to be $8.1 million, which would result in a $10.1 million annual State payment for transportation in Lynn Canal.

**Table 4-5:**
**Annual AMHS Operating Costs, Revenues, and Estimated State Funding for Alternative 1 – No Action**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue ($million)[1] | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF).

[1] Fare box revenue paid to AMHS; excludes gas tax receipts.

[2] Revised total is due to (1) the updating of the costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

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[9] Annual overhaul refers to maintenance and inspection of vessels to meet U.S. Coast Guard operating requirements.

**Pedestrians and Bicyclists –** Under Alternative 1 – No Action, walk-on passengers in Lynn Canal would continue to board and disembark at the existing ferry terminals in Auke Bay, Haines, and Skagway the same way they do now. The number of daily walk-on passengers during summer is projected to be 125 (Table 4-6; see Revised Appendix AA, *Traffic Forecast Report*). Bicyclists are considered walk-on passengers.

**Table 4-6:**
**Average Daily Ridership in Summer for Alternative 1 – No Action, 2055**

| | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| Alternative 1 – No Action | 410 | 285 | 125 | 30% |

Note: See Revised Appendix AA, *Traffic Forecast Report*

## 4.2A.3 Hydrology and Water Quality

### 4.2A.3.1 Hydrology

Alternative 1 – No Action would not affect surface water flow or circulation within Lynn Canal. No changes would be made to transportation facilities that would result in impacts to surface water resources, including floodplains.

### 4.2A.3.2 Water Quality

The AMHS is held to compliance requirements for discharge to waters of the United States by the ferries used in the system according to 18 AAC 69 (Commercial Passenger Vessel Environmental Compliance Program) and wastewater disposal requirements in 18 AAC 72, amended in 2006 and 2012, respectively. These regulations require a routine sample analysis of each vessel for total suspended solids and fecal coliform and for them to be in compliance with AWQS. Routine sampling is the responsibility of AMHS.

Treated wastewater from mainline ferry vessels would continue to be discharged into Lynn Canal under Alternative 1 – No Action and is expected to meet AWQS; therefore, impacts to water quality from discharge of wastewater from the AMHS mainline ferries under Alternative 1 – No Action are not anticipated.

The Day Boat ACFs would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the ADEC (Alaska Pollutant Discharge Elimination System [APDES] permit) and would meet Alaska-established waste discharge limitations.

The ferry terminal sewage treatment facilities at Auke Bay, Haines, and Skagway would continue to operate under Alternative 1 – No Action. There are no documented impacts associated with these systems; therefore, negligible impacts to water quality from the terminal treatment facilities are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality.

### 4.2A.4 Air Quality

Alternative 1 – No Action would not affect overall ambient air quality in the study area because vehicular emissions of criteria pollutants, based on ADT, and ferry vessel operations would be similar to existing conditions. Alternative 1 – No Action is projected to have no negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions.

## 4.2B Alternative 1B – Enhanced Service with Existing AMHS Assets

Alternative 1B incorporates all of the programmed improvements (including the two Day Boat ACFs) described under Alternative 1 – No Action and, as with Alternative 1 – No Action, no other new roads or ferry terminals would be built (see Figure 2-6 and Revised Appendix CC, *Development of Alternative 1B – Enhanced Service with Existing Alaska Marine Highway System Assets*). Alternative 1B enhances the ferry service provided under Alternative 1 – No Action by increasing summer capacity and number of sailings in Lynn Canal with continued use of *M/V Malaspina*, which would make one round trip per day 5 days per week on a Skagway-Auke Bay-Skagway route. On the sixth day, the *M/V Malaspina* would sail on the Skagway-Auke Bay-Haines-Skagway route, and on the seventh day, it would sail that route in reverse (Skagway-Haines-Auke Bay-Skagway). Alternative 1B also involves reduced fares for all trips (Day Boat ACF, *M/V Malaspina*, and mainline ferry) in Lynn Canal to increase ridership. This section describes the environmental consequences to resources discussed in Chapter 3 that result from Alternative 1B.

### 4.2B.1 Land Use

#### 4.2B.1.1 Land Ownership

Alternative 1B would not require acquisition of any property for transportation facilities. There would be no direct impact to land ownership.

#### 4.2B.1.2 Consistency with Land Use and Management Plans

The regional transportation policy set forth in the CBJ *Comprehensive Plan* is to support the improvement of transportation facilities and systems that reinforce Juneau's role as the capital city and a regional transportation and service center. The plan supports consideration of all affordable energy-efficient transport alternatives to improve transportation links between CBJ and other areas of Southeast Alaska, including improved air (cargo and passenger) service, roadways, ferries, and fixed guideway systems (CBJ, 2008). Alternative 1B is consistent with the CBJ *Comprehensive Plan*.

The Haines Borough and Municipality of Skagway Borough comprehensive plans support improvement of the AMHS to provide better ferry access to these two communities (Haines Borough, 2012; Municipality of Skagway, 2009). Therefore, Alternative 1B is consistent with these plans.

Goldbelt's *Echo Cove Master Plan* (Goldbelt, 1996) included construction of a road from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternative 1B is not inconsistent with this plan, but would not facilitate it in any way.

#### 4.2B.1.3 Land Use

Alternative 1B would have no direct impact on land use, as it would involve existing transportation facilities in Lynn Canal. This alternative would result in relatively small changes in the number of travelers between Juneau, Haines, and Skagway. The improved access resulting from this alternative would have negligible indirect impacts on land use.

### 4.2B.2 Coastal Zone Management

Alternative 1B would have no direct impact on land use, so no consistency determination for coastal zone management is required.

### 4.2B.3 Visual Resources

Alternative 1B would result in more frequent views of ferries on Lynn Canal from the land. However, the frequency would not increase to the extent that noticeably different visual impressions of the region would be created relative to the impressions that currently exist.

### 4.2B.4 Historical and Archaeological Resources

Alternative 1B would not require acquisition of any new property for transportation facilities. There would be no construction or ground disturbance under Alternative 1B. Therefore, FHWA has determined that no historic properties would be affected by Alternative 1B.

### 4.2B.5 Socioeconomic Resources

#### 4.2B.5.1 Overview

When compared to Alternative 1 – No Action, enhanced service using existing AMHS assets in Lynn Canal under Alternative 1B would result in a small change to the movement of goods and people as well as the links between the economies of Juneau, Haines, Skagway, and Whitehorse. Alternative 1B is expected to result in an increase in traffic relative to Alternative 1 – No Action. Conditions that would exist under Alternative 1B would be very similar to the future economic conditions set forth in Section 3.1.4 (Affected Environment, Socioeconomic Resources).

#### 4.2B.5.2 Juneau

**Population, Economics, Housing, and Municipal Revenues** – The total traffic to and from Juneau associated with Alternative 1B is estimated at 135 annual ADT in 2025 and would remain the same through 2055. Alternative 1B would generate approximately 69 percent more annual ADT in Lynn Canal than Alternative 1 – No Action (80 annual ADT) from 2025 through 2055. The increase in visitor traffic over Alternative 1 – No Action would be 30 annual ADT because approximately one-quarter of the total change in traffic associated with this alternative is anticipated to be from Juneau residents. The estimates of new traffic also do not include baseline traffic (baseline traffic is already affecting the economy and therefore is not counted along with new traffic in estimating new visitor spending).

Assuming all traffic is round-trip, the 30 annual ADT attributable to increased visitor traffic to/from Juneau would equate to 15 new round trips. With each additional visiting vehicle carrying an average of 3.2 people[10], Juneau is projected to receive a total of approximately 16,400 new visitors per year under Alternative 1B.

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[10] The average annual occupancy on the AMHS in Lynn Canal is 3.2 passengers per vehicle.

Based on data from the Alaska Visitor Statistics Program (AVSP) VI, for the purposes of this study, it is assumed that visitor spending in Juneau would average $77 per visitor per day (McDowell Group, 2012a). Annual visitor spending in Juneau, therefore, would increase by approximately $1.26 million because of Alternative 1B (Table 4-7). The economic impact of this additional spending would include new employment and payroll sources in Juneau. Based on a ratio of visitor spending to payroll and per capita income, this increase in annual visitor spending in Juneau would generate approximately $470,000 in new payroll and an estimated 15 additional jobs.

**Table 4-7:**
**Alternative 1B Projected Traffic and Resulting Visitor Economic Impacts in Juneau, 2055**

| | **2055** |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 80 |
| Total Traffic under Alternative 1B (annual ADT) | 135 |
| Change in Traffic (annual ADT) (over No Action) | 55 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 30 |
| Total New Visitors Annually (over No Action) | 16,400 |
| Total New Visitor Spending Annually (over No Action) | $1,260,000 |
| New Local Payroll Annually (over No Action) | $470,000 |
| New Local Employment Annually (over No Action) | 15 |

Note: Numbers may not total exactly due to rounding.

Each new job in the Juneau economy results in an increase in population of about 1.5 people.[11] Therefore, the 15 new jobs in Juneau resulting from increased traffic and visitors under Alternative 1B would result in a population increase of 23 residents. This increase would represent an overall increase of about 0.07 percent over the 2015 population (33,277; see Revised Appendix EE, *Socioeconomic Effects Technical Report*).

Based on 2.6 persons per household, a population increase of 23 residents would result in additional demand for approximately nine housing units. The housing unit demand generated by Alternative 1B would be within the vacant housing capacity.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $1.26 million annually would generate (assuming all of the spending is taxable) $63,000 in additional sales tax revenues (based on a 5 percent tax rate).

**Industry/Commercial Sectors –** The visitor industry is Juneau's only basic industry likely to be affected by Alternative 1B. As discussed above, Alternative 1B would generate approximately 16,400 new visitors per year to Juneau in 2025 and the following years, through 2055. To the extent that Alternative 1B would improve ferry frequency, convenience, and cost, there would be an increase in the number of independent visitors traveling to Juneau. This impact is anticipated to be negligible.

Alternative 1B is not expected to directly affect mine development in the Juneau area. Alternative 1B would decrease travel time between Juneau and Skagway, which may result in additional Skagway residents seeking work at Juneau area mines.

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

To the extent that Alternative 1B would improve ferry frequency, convenience, and cost, it would have an overall positive, but minor, economic effect on Juneau's local retail trade and service sector industries that provide goods and services to visitors. These benefits would stem from minor increases in Haines and Skagway resident spending in Juneau and minor increases in non-resident visitor spending in Juneau—both offset partially by increased spending by Juneau residents in Haines and Skagway.

Alternative 1B is not likely to result in increased competition for commercial fishing fleets from subsistence and sport fish users because it would not open access to new areas. This alternative would not enhance seafood processors' access to fresh fish markets. In addition, Alternative 1B would have no effect on the forest products industry.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 1B is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

Alternative 1B would not affect Juneau public utilities. All utilities are adequate to accommodate any population increases attributable to Alternative 1B through 2055.

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum impact on Juneau's population from Alternative 1B would be an increase of less than 1 percent.

Health and social services demand is mainly a function of population, and would therefore not be expected to change substantially under Alternative 1B. Additional independent visitors to Juneau, particularly older retirees, would place some new demands on emergency room and other medical and dental services in Juneau. Increases in demand for health care services would be negligible when compared with existing demand.

Traffic increases resulting from enhanced services would not affect fire and emergency medical services (EMS) within the current service area. Juneau would likely experience a small increase in local police and EMS calls as a result of additional visitors in town, but more visitors would also result in more resources for the local economy (Decker, personal communication 2012).

**Quality of Life –** According to the 1994 *Juneau Access Household Survey* (McDowell Group, 1994), more than three-quarters of Juneau residents agree that improved access to their community is important. There is less agreement on whether quality of life is best served by access via highway or via ferry service. Many proponents of a highway acknowledge that better ferry service would improve quality of life, but not by enough. Many proponents of ferry service believe that better access is important, but only ferry access would result in an overall improvement in the quality of life.

The reasons for these differing views are complex and interwoven with how individuals view Juneau's lack of highway access. Research and public comment over the past two decades have shown that some residents cherish this condition, while others deplore it. Further, improved transportation is generally associated with growth opportunities, and growth typically affects quality of life. Finally, as noted in Revised Appendix EE, the *Socioeconomic Effects Technical Report*, the isolation associated with lack of highway access induces a sense of psychological comfort in some residents and a feeling of frustration and claustrophobia in others.

### 4.2B.5.3 Haines

**Population, Economics, Housing, and Municipal Revenues** – The total traffic to/from Haines associated with this alternative is estimated to be 70 annual ADT in 2025 and would remain the same through 2055. Alternative 1B would generate approximately 40 percent more annual ADT than Alternative 1 – No Action (50 annual ADT).

Using the same method as described for Juneau (Section 4.2B.5.2), converting these vehicle traffic estimates to number of new visitors indicates that Haines would see approximately 6,400 new visitors per year as a result of Alternative 1B. Based on data from the AVSP VI, for the purposes of the analysis for this Final SEIS, it is assumed that visitor spending in Haines would average $77 per visitor per day (McDowell Group, 2012a). Annual visitor spending in Haines, therefore, would increase by about $490,000 because of Alternative 1B. The economic impact of this additional spending would include new employment and payroll in Haines. Based on visitor industry-related payroll and spending in Southeast Alaska for the 2010–2011 season, a multiplier was derived to determine new visitor related payroll above Alternative 1 – No Action (McDowell Group, 2012b). This increase in visitor spending in Haines would generate about $180,000 in new payroll annually and five additional jobs (Table 4-8).

**Table 4-8:**
**Alternative 1B Projected Traffic and Resulting Visitor Economic Impacts in Haines, 2055**

| | 2055 |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 50 |
| Total Traffic under Alternative 1B (annual ADT) | 70 |
| Change in Traffic (annual ADT) (over No Action) | 20 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 10 |
| Total New Visitors Annually (over No Action) | 6,400 |
| Total New Visitor Spending Annually (over No Action) | $490,000 |
| New Local Payroll Annually (over No Action) | $180,000 |
| New Local Employment Annually (over No Action) | 5 |

Note: Numbers may not total exactly due to rounding.

Alternative 1B is expected to have negligible impacts on Haines’ current and future population. It would not provide substantive impetus for growth in local basic industries. Because population is primarily a function of economic growth, Alternative 1B would not be expected to yield a measurable change in Haines’ population (eight new residents). Alternative 1B would result in five additional jobs in Haines.

Alternative 1B is expected to result in no measurable change in Haines’ housing and real estate markets. As Alternative 1B would not result in measurable new local employment or population increase above the No Action, there would not be a measurable need for additional housing in Haines in 2025 and the following years through 2055 (two additional housing units).

Alternative 1B would have negligible effects on Haines’ municipal revenues and expenditures. New visitor spending associated with this alternative (approximately $490,000 annually) would generate approximately $27,000 in Haines annual sales tax revenues in 2055.

**Industry/Commercial Sectors –** The visitor industry in Haines is the only basic industry likely to be affected by Alternative 1B. The cruise ship visitor market to Haines would not be affected by Alternative 1B. As discussed above, Alternative 1B would generate approximately 6,400 new visitors to Haines per year in 2055. Alternative 1B is not likely to result in increased competition for commercial fishing fleets from subsistence and sport fish users because it would not open access to new areas. This alternative would not enhance seafood processors' access to fresh fish markets. It is not anticipated to change ongoing or future mining prospects. In addition, Alternative 1B would have no effect on the forest products industry.

The effects of Alternative 1B on Haines' local retail trade and service sector industries that provide goods and services to visitors would be minor. The effect on shipping costs is expected to be negligible; therefore, no reduction in business profitability or the cost of living in Haines is expected. Spending by Juneau residents and other non-residents in Haines would increase, though that increase would be minor in the local economy overall.

A small but measurable improvement in marine passenger and vehicle transportation would be provided for Lynn Canal under Alternative 1B as demonstrated by traffic forecasts, but it is not expected to improve freight transportation infrastructure in the region.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 1B is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

Alternative 1B would not affect Haines public utilities. As Alternative 1B is expected to have negligible impacts on Haines' current and future population and no measurable change in Haines' housing and real estate markets, the current utilities would be adequate to accommodate Alternative 1B through 2055.

School enrollment is a function of population. Because population impacts are expected to be negligible, the same would be true of impacts on enrollment. In addition, health and social services demand is mainly a function of population, and would therefore not be expected to change under Alternative 1B as compared to Alternative 1 – No Action.

Minimal traffic increases resulting from Alternative 1B would not greatly affect fire and EMS within the current service area. Increased traffic to and through Haines could place additional demands on the community's fire protection and EMS. If fire and EMS personnel respond to incidents outside current service areas, it would reduce capacity to deliver normal services while those personnel and equipment are occupied. The Haines Police department does not expect any substantial impact from Alternative 1B (Musser, personal communication 2014).

**Quality of Life –** Alternative 1B increases the number of ferry trips between Juneau and Haines relative to Alternative 1 – No Action from 8 to 10 trips and reduces fares and increases capacity on that route. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994, and Appendix I of the 2005 Supplemental Draft EIS), and the similarities between Alternative 1 – No Action and Alternative 1B with respect to service to/from Haines, Alternative 1B would likely not be perceived as a major improvement to the quality of life by a majority of Haines residents.

#### 4.2B.5.4 Skagway

**Population, Economics, Housing, and Municipal Revenues –** The traffic to and from Skagway under Alternative 1B would be 65 annual ADT in 2025 and would remain the same through 2055. Alternative 1B would generate approximately 117 percent more annual ADT than Alternative 1 – No Action (30 annual ADT).

Using the same method as described for Juneau (Section 4.2B.5.2), converting these vehicle traffic estimates to number of new visitors indicates that Skagway would see about 15,200 new visitors per year. Based on data from the AVSP VI, for the purposes of this study, it is assumed that visitor spending in Skagway would average $77 per visitor per day (McDowell Group, 2012a). Annual visitor spending in Skagway, therefore, would increase by about $1.17 million because of Alternative 1B. This increase in annual visitor spending in Skagway would generate about $440,000 in new payroll and 10 additional jobs (Table 4-9).

**Table 4-9:**
**Alternative 1B Projected Traffic and Resulting Visitor Economic Impacts in Skagway, 2055**

| | **2055** |
|---|---|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 30 |
| Total Traffic under Alternative 1B (annual ADT) | 65 |
| Change in Traffic (annual ADT) (over No Action) | 35 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 25 |
| Total New Visitors Annually (over No Action) | 15,200 |
| Total New Visitor Spending Annually (over No Action) | $1,170,000 |
| New Local Payroll Annually (over No Action) | $440,000 |
| New Local Employment Annually (over No Action) | 10 |

Note: Numbers may not total exactly due to rounding.

Alternative 1B is expected to have negligible impacts on Skagway’s current and future population, with approximately 15 new residents relative to Alternative 1 – No Action. This increase represents 1.4 percent increase over the 2015 population of 1,040 and 0.6 percent over the summer population of approximately 2,500 (SDC, 2013).

Alternative 1B is not expected to result in any measurable change in Skagway’s housing and real estate markets. The population increase of 15 individuals would create a demand for an additional six housing units (assuming 2010 Census estimate of 2.5 persons per household).

The 2010 U.S. Census indicated that Skagway has about 152 vacant housing units, not including seasonal, recreational, and occasional use units. While Skagway has a shortage of affordable homes for first-time home buyers and a lack of seasonal employee housing, the projected demand is anticipated to be accommodated by the vacant housing capacity of Skagway. During summer, this demand would be harder to meet. It is likely that the private sector would respond by construction of additional housing if residential land is available.

Alternative 1B is not expected to result in a substantial change in Skagway’s borough revenues and expenditures. New visitor spending associated with this alternative (approximately $1.17 million) would generate approximately $47,000 per year in Skagway sales tax revenues (based on a 4 percent tax rate).

**Industry/Commercial Sectors –** The visitor industry is Skagway's only basic industry likely to be affected by Alternative 1B. As discussed above, Alternative 1B would generate approximately 15,200 new visitors per year to Skagway in 2055.

The effects of Alternative 1B on Skagway's local retail trade and service sector industries that provide goods and services to visitors would be minor. The effect on shipping costs is expected to be negligible; therefore no reduction in business profitability or the cost of living in Skagway is expected. Spending by Juneau residents and other non-residents in Skagway would increase, but only slightly.

Alternative 1B is not likely to result in increased competition for commercial fishing fleets from subsistence and sport fish users because it would not open access to new areas. This alternative would not enhance seafood processors' access to fresh fish markets. In addition, Alternative 1B would have no effect on the forest products or mining industry.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 1B is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

Alternative 1B would not affect Skagway public utilities. As Alternative 1B is expected to have negligible impacts on Skagway's current and future population and would cause no measurable change in Skagway's housing and real estate markets, the current utilities would be adequate to accommodate Alternative 1B through 2055.

School enrollment is a function of population. Because population impacts are expected to be negligible, the same would be true of impacts on enrollment. In addition, health and social services demand is mainly a function of population, and would therefore not be expected to change under Alternative 1B as compared to Alternative 1 – No Action.

Minimal traffic increases resulting from Alternative 1B would not greatly affect fire and EMS within the current service area. Emergency response demands from additional traffic through Skagway could affect the Skagway Volunteer Fire Department (SVFD). The SVFD's size and reliance on volunteers makes responding to multiple emergencies very challenging. Skagway police would not expect a substantial increase in activity as a result of improved access. The department already adds four seasonal officers to address the influx of summer population and visitors, and this is expected to be sufficient to handle whatever additional demand is generated by improved ferry service.

**Quality of Life –** Improved access would increase traffic in Skagway; however, increases in traffic under Alternative 1B would be minimal. Skagway residents have indicated that increased tourism, economic growth, and enhanced recreation would be the main benefits of improved access to Juneau. Negative impacts cited include increased crime, undesirable transients, and loss of spending in local businesses. Skagway is well located to act as an interim shopping/dining spot for travelers between Juneau and Whitehorse (McDowell Group, 1994).

When surveyed in 2003 (Appendix I of the 2005 Supplemental Draft EIS), most Skagway residents said that improved access to Juneau is important (24 percent) or very important (59 percent). Residents said the best way to provide access is by ferry (60 percent); 35 percent chose a highway. On average, Skagway residents make an average of 10.1 trips per household per year to Juneau. The main reasons for traveling are vacation/recreation (27 percent), to connect with jet flights at Juneau Airport (17 percent), business (17 percent), medical (16 percent), shopping (15 percent), and visiting friends and relatives (8 percent).

### 4.2B.6 Subsistence

Because Alternative 1B would not increase access to areas where subsistence harvests currently occur, it would not result in direct or indirect impacts to subsistence uses.

### 4.2B.7 Transportation

The 2004 SATP calls for construction of a highway from Juneau to Skagway with a ferry from Katzehin to Haines. The SATP will be updated to reflect the identification of Alternative 1 – No Action as the recommended improvement in the plan.

DOT&PF's 2016–2019 STIP (Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. As Alternative 1B does not include any capital improvements, it is not inconsistent with the STIP, and Alternative 1 – No Action is also consistent with the currently adopted STIP.

#### 4.2B.7.1 Demand and Capacity

Traffic demand for Alternative 1B was projected for 2025 and 2055 using the transportation model summarized in Section 4.1.5. These projections were based on 2015 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel time, value of time, and frequency of delay. The travel demand expressed as ADT is a combination of the demand between Juneau and Haines and Juneau and Skagway.

Projected traffic demand in 2055 for Alternative 1 – No Action and Alternative 1B is provided in Table 4-10. Traffic demand for 2025 and 2055 is predicted to remain the same for this alternative because of relatively flat population projections in southeast Alaska during the 30-year forecast period (see Revised Appendix AA, *Traffic Forecast Report*). A comparison between Alternative 1 – No Action and Alternative 1B indicates that Alternative 1B would realize and accommodate approximately an additional 55 ADT relative to Alternative 1 – No Action.

**Table 4-10:**
**2055 Forecast Demand and Capacity Juneau to/from Haines and Skagway for Alternative 1 – No Action and Alternative 1B**

| Alternative | Demand ADT | Demand Summer ADT | Demand Winter ADT | Peak Week Demand ADT | Summer Capacity(vehicles per day) |
|---|---|---|---|---|---|
| 1 – No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |
| 1B | 135 (70/65) | 210 (110/100) | 50 (30/20) | 510 (265/245) | 331 (160/171) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

The capacity of Alternative 1B is determined by the capacity of the ferry links from the Day Boat ACF, mainline ferry, and *M/V Malaspina*. As shown in Table 4-10, the summer demand for ferry travel between Juneau and Skagway or Juneau and Haines would be about 210 vehicles in 2055. The number of ferry trips between Auke Bay and Haines/Skagway under Alternative 1B has been set to accommodate the projected summer ADT to and from both communities. The peak week demand is approximately 510 ADT, which would exceed summer capacity. Some ferries may be at maximum capacity resulting in travelers having to wait for the next ferry or change their preferred ferry time. Alternative 1B would accommodate approximately 73 percent of the peak week ADT. During peak times, or special events, additional sailings could be provided to meet the demand. As with current operations, AMHS could schedule additional ferry service in Lynn Canal during identified high-volume days.

Because of these ferry links, the capacity of Alternative 1B would not meet the projected unconstrained travel demand in the Lynn Canal corridor. Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternative 1B would realize and accommodate about 19 percent of the latent summer demand.

The projected local[12] travel demand between Haines and Skagway with Alternative 1B is the same as Alternative 1 – No Action. The local Haines-Skagway summer ADT is projected to be approximately 53 vehicles in 2025 and in 2055 for both Alternative 1 – No Action and Alternative 1B. In a typical summer week, most traffic will be able to travel directly between Juneau and Haines/Skagway, unlike Alternative 1 – No Action, which requires Juneau-Skagway travelers to connect through Haines. The *M/V Malaspina* will be able to accommodate the Juneau-Skagway traffic, leaving all of the capacity (197) on the Haines-Skagway Day Boat ACF available for this use, and is sufficient to meet the demand.[13] Additional Haines-Skagway capacity is provided by the mainliners and the *M/V Malaspina* (which would travel Haines-Skagway one day per week and Skagway-Haines one day per week).

#### 4.2B.7.2 Travel Flexibility and Opportunity

Alternative 1B would provide increased flexibility and opportunity for travel relative to Alternative 1 – No Action. Under Alternative 1B, travel between Auke Bay and Haines would be made available by the Day Boat ACF, the same as under Alternative 1 – No Action. In the summer, there would be 10 Auke Bay-Haines round trips per week[14] and nine same vessel trips per week between Auke Bay and Skagway.[15] Seven of these trips would be direct service using the *M/V Malaspina*. The other two trips would be on the mainline ferry. In winter, service would decrease to four Auke Bay-Haines round trips per week and four Auke Bay-Skagway round trips per week.

#### 4.2B.7.3 Travel Time

Table 4-11 provides travel times for vessels and routes that would be used for Alternative 1B. Under Alternative 1B, travel times on the mainline ferry and Day Boat ACFs are the same as they are under Alternative 1 – No Action. Travel between Skagway and Auke Bay on the *M/V Malaspina* would take approximately 6.8 hours.

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[12] For the purposes of this SEIS, “local” refers to passenger and vehicle traffic that only goes back and forth between Haines and Skagway; i.e., it is traffic that either boards in Haines and disembarks in Skagway, or boards in Skagway and disembarks in Haines. This local Haines-Skagway travel demand is not considered part of the overall demand for travel to and from Juneau in Lynn Canal.

[13] Some Juneau-Skagway traffic may choose to travel via Haines depending on scheduling, personal preference, or other reasons. This traffic is expected to be minimal and not have a substantial impact on the ability of the Day Boat ACF to meet the travel demand between Haines and Skagway.

[14] Seven of these trips would be using the Day Boat ACF, two trips would be via a mainline ferry, and one trip would be via the *M/V Malaspina*.

[15] Summer travelers would have the option to go to Haines on the Day Boat ACF and transfer to the other Day Boat ACF to get to Skagway. This option would provide six additional trips to Skagway per week. However, few travelers would be likely to do this due to the longer travel time.

Travel times between Haines and Skagway under Alternative 1B would remain unchanged (2.4 hours) relative to Alternative 1 – No Action.

**Table 4-11:**
**Summer Travel Times for Alternative 1 – No Action and Alternative 1B**

| Route | Travel Time (hours) | | |
|---|---|---|---|
| | Alternative 1 – No Action (Day Boat ACF)[1] | Alternative 1B | |
| | | Day Boat ACF | *M/V Malaspina* |
| Auke Bay-Haines | 6.2 | 6.2 | 6.4 |
| Auke Bay-Skagway | 8.1 | 8.1 | 6.8 |

[1] With Alternative 1 – No Action and Alternative 1B, the mainline ferry (i.e., service along the length of the system, from Bellingham, WA, or Prince Rupert, B.C.) would have a travel time of 7.2 hours between Auke Bay and Haines and 9.1 hours between Auke Bay and Skagway.

### 4.2B.7.4 State and User Costs

The 36-year life-cycle cost of Alternative 1B would be $704 million, which includes all State and federal capital costs and all State operating costs discounted to 2016 dollars (Table 4-12).

**Table 4-12:**
**Thirty-Six-Year Life-Cycle Costs for the No Action Alternative and Alternative 1B**

| Alternative | Capital Cost ($million) | Operating Cost ($million) | Total Life-Cycle Cost ($million) |
|---|---|---|---|
| 1 – No Action | $119 | $322 | $441 |
| 1B | $236 | $468 | $704 |

The total project life costs less residual value over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $1.2 billion (capital plus operating costs, Table 4-13). The net cost to the State during the analysis period would be about $577 million in 2016 dollars, or about $283 per vehicle transported in Lynn Canal (Table 4-13).

**Table 4-13:**
**Thirty-Six-Year Total Project Life Costs for Alternative 1 – No Action and Alternative 1B, 2019–2054 (2016 Dollars)**

| Alternative | Total Costs | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $378 | $279 |
| 1B | $255 | $958 | $1,212 | $981 | $404 | $577 | $283 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

The average annual operating cost of Alternative 1B in 2055 is estimated to be about $26.5 million, which would be an increase of $8.3 million from Alternative 1 – No Action.

The anticipated total user costs[16] of travel between Juneau and Skagway or Haines for travelers are listed in Table 4-14 for Alternative 1 – No Action and Alternative 1B. As discussed in Section 4.2A.2 under Alternative 1 – No Action, the total user cost for a family of four in a 19-foot-long vehicle would be $229.00 between Juneau and Haines, $301.50 between Juneau and Skagway. For a driver with a 19-foot-long vehicle, the total user cost would be $131.50 between Juneau and Haines and $169.00 between Juneau and Skagway. For a walk-on passenger, the cost would be $39 between Juneau and Haines and $53.00 between Juneau and Skagway. With Alternative 1B, these fares would be reduced by 20 percent (Table 4-14).

**Table 4-14:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Cost for Alternative 1 – No Action and Alternative 1B**

| **Alternative** | **Example Scenario** | **Haines User Cost[1]** | | **Skagway User Cost[1]** | |
|---|---|---|---|---|---|
| | | **Total User Cost** | **Out-of-Pocket Cost** | **Total User Cost** | **Out-of-Pocket Cost** |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |
| 1B | Family of 4 in a 19-foot vehicle | $183.00 | $181.00 | $242.00 | $242.00 |
| | Driver only in a 19-foot vehicle | $105.50 | $103.50 | $135.50 | $135.50 |
| | Walk-on passenger[2] | $31.00 | $31.00 | $42.50 | $42.50 |

[1] Total cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the ferry terminal.

Based on total user costs, travel time cost, and the projected travel in the Lynn Canal corridor through 2055, total user benefits in terms of reduced travel cost for Alternative 1B in 2016 dollars are provided in Table 4-15. As indicated in that table, Alternative 1B would provide benefits to travelers of $24 million relative to Alternative 1 – No Action over the 36-year period.

One economic measure of an alternative is its net present value. Net present value is the total of the user benefits minus the net cost of an alternative over and above the net cost of Alternative 1 – No Action for a given period of time. The net present value of Alternative 1B for this period is about negative $135 million because the incremental project costs are greater than the user benefits provided.

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[16] Total user costs are out-of-pocket costs and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

**Table 4-15:**
**User Benefits and Net Present Value of Alternative 1B versus Alternative 1 – No Action[1]**

| Alternative | User Benefits ($million) | Net Incremental Project Costs ($million)[2] | Net Present Value ($million) |
|---|---|---|---|
| 1B | $24 | $159 | -$135 |

[1] For the period 2019 to 2054 discounted to 2016 dollars.

[2] Overall project costs minus revenues.

### 4.2B.7.5 Other Transportation Impacts

**Air Taxi** – It is possible that some travel (especially between Juneau and Skagway) would be diverted from air taxi operations currently serving the Lynn Canal to ferries under Alternative 1B due to the direct ferry service between the two communities. However, as the ferry trip is still approximately 7 hours, the number of trips diverted from air taxi operations is expected to be minimal.

**AMHS** – Because of the increase in ferry service in Lynn Canal with Alternative 1B, it is estimated to require more State funding than Alternative 1 – No Action (Table 4-16). This alternative would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

**Table 4-16:**
**Annual AMHS Operating Costs, Revenues, and Estimated State Funding for Alternative 1 – No Action and Alternative 1B**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue ($million)[1] | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |
| 1B | $26.5[2] | $11.2.0 | $15.3 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF)

[1] Fare box revenue paid to AMHS; excludes gas tax receipts.

[2] Revised total is due to (1) the updating of costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs. Alternative 1B was also revised due to changes made to the alternative.

**Pedestrians and Bicyclists** – Under Alternative 1B, it anticipated that the percentage of walk-on passengers would be the same as Alternative 1 – No Action. The number of daily walk-on passengers (which includes bicyclists) during summer is projected to be 210 (Table 4-17) for Alternative 1B.

Because fares are 20 percent lower under Alternative 1B than Alternative 1 – No Action, the out-of-pocket cost also would be lower (see Table 4-17).

**Table 4-17:**
**Average Daily Ridership in Summer for Alternative 1 – No Action and Alternative 1B, 2055**

|  | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| Alternative 1 – No Action | 410 | 285 | 125 | 30 |
| Alternative 1B | 690 | 480 | 210 | 30 |

Note: See Revised Appendix AA, *Traffic Forecast Report*

## 4.2B.8 Geology

Alternative 1B would not involve excavation or other construction activities; therefore, the proposed alternative would have no direct or indirect effects on geological resources.

## 4.2B.9 Hydrology and Water Quality

### 4.2B.9.1 Hydrology

Enhanced service with existing AMHS assets would have no additional impact to hydrology under Alternative 1B relative to Alternative 1 – No Action. Alternative 1B does not include construction of any additional facilities to aid in additional services. Therefore, it is unlikely that impacts to the hydrology of both freshwater and the marine system would occur.

### 4.2B.9.2 Water Quality

No substantial impacts to water quality are anticipated under Alternative 1B. Continued mainline ferry service in Lynn Canal would result in continued discharge of treated wastewater into Lynn Canal from those vessels, which is expected to meet AWQS. The Day Boat ACFs would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the EPA (National Pollutant Discharge Elimination System [NPDES] permit) and/or ADEC (APDES Permit) and would meet EPA- and Alaska-established waste discharge limitations.

The ferry terminal sewage treatment facilities at Auke Bay, Haines, and Skagway would continue to operate under these alternatives. There are no documented impacts associated with these systems; therefore, negligible impacts to water quality from the terminal treatment facilities are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Additional ferry trips made by the *M/V Malaspina* between Auke Bay and Skagway under Alternative 1B relative to Alternative 1 – No Action increase the potential for these types of accidents. Historically, accidental discharges, spills, and leaks have been minor, with only minimal and temporary impacts to water quality.

## 4.2B.10 Air Quality

Alternative 1B is projected to have no negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions. The estimated annual load of emissions (tons/year) for Alternative 1B relative to total emissions loading at active marine centers is presented in Section 4.9.2.7 with a discussion of this potential cumulative impact.

## 4.2B.11 Hazardous Materials

There are no proposed transportation improvements associated with Alternative 1B that would involve excavation or other construction activity that could affect, or be affected by, hazardous materials sites.

### 4.2B.12 Wetlands

Because Alternative 1B would enhance service with existing AMHS assets and would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on wetlands.

### 4.2B.13 Marine and Freshwater Habitat and Species (including Essential Fish Habitat)

Because Alternative 1B would not result in the construction of any new highways or ferry terminals, it would not result in the loss of EFH.

Ferry operations under Alternative 1B would be greater than under Alternative 1 – No Action. Ferries generating propeller wash and surface wakes near shore would increase localized turbidity, which could impact aquatic habitats such as eelgrass beds in Lynn Canal. Studies conducted by NMFS (Harris, Neff, and Johnson, 2012; Holsman et al., 2006; Laurel et al., 2007; Murphy et al., 2000; Johnson et al., 2003) have documented declines in eelgrass cover, species composition, and fishery declines in areas subjected to effects from ferries. Eelgrass beds in the terminal area of Auke Bay are already disturbed, and additional wave energy at the Auke Bay Ferry Terminal from ferry operations is not anticipated to substantially degrade the eelgrass bed adjacent to Auk Nu Cove beyond its current condition. FHWA has determined that Alternative 1B would not have a substantial adverse effect on eelgrass beds or other EFH.

### 4.2B.14 Terrestrial Habitat

Because Alternative 1B would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on terrestrial habitat.

### 4.2B.15 Wildlife

#### 4.2B.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall’s porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.3.17, Threatened and Endangered Species.

Alternative 1B would not result in the loss of any habitat for marine mammals. Marine vessel collisions with marine mammals have the potential to cause injury or mortality (Laist et al., 2001); however, documented interactions between marine mammals and AMHS vessels in northern Lynn Canal are low (Savage, 2015). Minke whales are unlikely to be affected by increased ferry traffic associated with Alternative 1B. Minke whales typically change course and speed to avoid a noisy ship, but when feeding in an area of high prey availability, whales tolerate very loud noises. No collisions between Minke whales and AMHS ferries have been documented. Fast-moving and maneuverable species such as harbor seals, harbor porpoise, Dall’s porpoise, and killer whales would not be expected to be affected by any increased ferry traffic in Lynn Canal associated with Alternative 1B. Sea otters would not be affected by Alternative 1B increased ferry traffic because their population in Lynn Canal is low and they are associated primarily with nearshore habitats. Concern for harbor seals is focused on disturbance at haulouts. Alternative 1B would use existing dock facilities and ferry routes that are distant from seal haulouts; therefore, Alternative 1B would have no impacts on seals.

#### 4.2B.15.2 Marine Birds

Expansion of summer ferry service in Lynn Canal relative to No Action may result in more frequent disturbance to marine birds that utilize Lynn Canal for foraging: marbled murrelets, Kittlitz's murrelets, yellow-billed loons, and harlequin ducks. Marine birds and waterfowl feeding or resting along the ferry route in Lynn Canal would fly or swim away from approaching ferries and resume their normal behavior in another location. The impacts would primarily be the energetic cost to avoid ferries. Collisions are unlikely due to the swimming and diving abilities of marine birds. These species most frequently use nearshore, protected areas for feeding and resting, and are less likely to be in the main channel of Lynn Canal; therefore, impacts are not likely. Marine birds may be flushed by ferries in shallow coastal waters approaching terminals; however, this sort of disturbance would not be frequent enough to have a population-level effect on these species.

#### 4.2B.15.3 Terrestrial Mammals

Because Alternative 1B would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on terrestrial mammals.

#### 4.2B.15.4 Terrestrial Birds

Because Alternative1B would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on terrestrial birds.

#### 4.2B.15.5 Amphibians

Because Alternative 1B would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on amphibians.

### 4.2B.16 Bald Eagles

Because Alternative 1B would not result in the construction of any new highways or ferry terminals, it would have no direct or indirect effects on terrestrial or freshwater habitats used by bald eagles.

### 4.2B.17 Threatened and Endangered Species

Alternative 1B would enhance ferry service with existing AMHS assets, and would not result in the construction of any new highways or ferry terminals. As such, Alternative 1B would not affect Steller sea lions at any traditional haulouts. Steller sea lions at Gran Point and Met Point haulouts are habituated to large commercial marine vessels that currently pass through Lynn Canal. The increased ferry traffic in Lynn Canal under Alternative 1B would not measurably change the potential for Steller sea lion or humpback whale interactions with vessels. Although it is possible for a sea lion or whale to be harmed by a collision with a vessel, they are generally very agile animals and successfully avoid such encounters, even with fast vehicle ferries (FVFs) that travel at twice the speed of vessels that would be used for Alternative 1B. There have been no reports of any sea lion or humpback whale mortalities due to the current operation of the AMHS ferries in Lynn Canal. Because the ferry traffic associated with Alternative 1B would operate at speeds similar to existing ferry service and would be in the same travel corridor, it is expected that sea lions and humpback whales would be unaffected by these vessels. For these reasons, the FHWA has made the preliminary determination that Alternative 1B is not likely to adversely affect Western DPS Steller sea lions or Mexico DPS humpback whales.

### 4.2B.18 Permits and Approvals

Permits, consultations, and approvals required for Alternative 1B are limited to:

- NMFS ESA Section 7 consultation for threatened and endangered species

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

Under this alternative, there would be a highway extending from Cascade Point to the Katzehin River delta (see Figure 2-7a). The portion of the Glacier Highway extending from Echo Cove to Cascade Point would be widened from the existing 26 feet to 30 feet. A new ferry terminal would be constructed 2 miles north of the Katzehin River, with ferry service connecting Katzehin to Skagway and Haines. Mainline ferry service would be terminated at Auke Bay.

DOT&PF and the USFS have identified appropriate sites for pullouts and scenic overlooks that would also be part of this alternative. These sites are listed below (Figure 4-1).

- A pullout near the crossing of Sawmill Creek.
- A pullout and trailhead would be located on the highway above the USFS cabin in Berners Bay, and DOT&PF would construct a trail to the cabin.
- An Antler River pullout would be located just south of the bridge over the Antler River.
- A Lace and Berners River pullout would be located just west of the bridge over the Lace River.
- A Slate Cove pullout would be located west of Slate Cove.
- The planned Comet highway maintenance building would include a rest stop with public facilities. A pullout and scenic overlook on the canal side of the highway would also be provided.
- A pullout on the east side of the highway and a pullout and scenic overlook on the canal side of the highway would be located near the Brown Point geodetic marker.
- A pullout and scenic overlook would be located near Eldred Rock.
- A pullout on the east side of the highway and a pullout and scenic overlook on the canal side of the highway would be located near Yeldagalga Creek.
- A pullout and scenic overlook would be located in a valley south of the Katzehin River.
- A pullout and scenic overlook would be located north of the Katzehin River.

The impact assessment provided in this section includes consideration of the potential impacts of the proposed pullouts and scenic overlooks. The USFS has indicated that trails at four of the pullouts are reasonably foreseeable if the highway is constructed. (See USFS letter dated November 2, 2005, in Chapter 7 of the 2006 Final EIS for information regarding trails envisioned by USFS.) These four trails are included in the cumulative impact assessment provided in this chapter. A separate environmental analysis would be completed by the USFS for these trails prior to their construction.

### 4.3.1 Land Use

#### 4.3.1.1 Land Ownership

Current ownership of the land that would be required for the highway ROW and the new ferry terminal facility for Alternative 2B is presented in Table 4-18. As indicated in that table, about 96 percent of the land is part of the Tongass National Forest under the management of the USFS. This land would remain under federal ownership with a highway easement conveyed to the State. Goldbelt and other private owners would be compensated for lands acquired for a new highway ROW at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. The ROW requirements assume 150-foot width across the Goldbelt and other private lands and 300-foot width on USFS lands. DOT&PF considers the 150-foot ROW width on private lands to be sufficient given the terrain through those areas. The 300-foot ROW width on USFS lands is based upon the width specified in the Memorandum of Understanding for Section 4407 easements (see Section 3.1.1.3), and is also consistent with the ROW width established by the federal government for the Haines Highway and similar roads across public lands within the State. DOT&PF generally limits impacts to private and municipal owners by taking only what is necessary for the immediate project and minor future improvements. For State and federal lands, DOT&PF usually obtains a standard 300 feet to allow for a one-time land transfer that would also accommodate any future expansion.

**Table 4-18:**
**Land Ownership of Required Right-of-Way for Alternative 2B**

| Ownership (acres) | | | Total (acres) |
|---|---|---|---|
| USFS | Goldbelt | Private | |
| 1,592 | 90 | 6 | 1,688 |

Note: 300-foot ROW on federal and State lands and 150-foot ROW on private and municipal lands.

#### 4.3.1.2 Consistency with Land Use and Management Plans

As described in Section 3.1.1.1, the TLRMP identifies Transportation Systems Corridors, or TSCs. TSCs include easements established by law, such as those established under Section 4407 of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), as amended by the Fixing America's Surface Transportation (FAST) Act. Such an easement exists along the east side of Lynn Canal, and Alternative 2B would use the easement; therefore, this alternative is consistent with the TLRMP. A portion of the USFS land crossed by the Alternative 2B alignment along the east shore of Berners Bay is currently managed under LUD II, which refers to congressionally designated lands where the principal management goal is to retain the primitive wildland character of the area while allowing necessary State highways (Figure 3-3). The rest of the USFS land along the alignment is managed under the TLRMP designation of Semi-Remote Recreation, Old-Growth Habitat, Scenic Viewsheds, and Modified Landscape. The Kensington Gold Project area is in a LUD for Minerals. In accordance with the TLRMP, if Alternative 2B were the selected alternative for the JAI Project, the USFS would change the management of the highway corridor to TSC, and the management prescriptions for the TSC would take precedence over the prescriptions of the LUDs underlying the corridor (USFS, 2016b:3-313). The USFS, in consultation with ADF&G and USFWS, would adjust the boundaries of the affected Old-Growth Habitat LUDs in accordance with OGR standards in the TLRMP (see OGR discussion in Section 4.3.14). Such a boundary adjustment would require a formal amendment to the TLRMP and an associated NEPA decision approval by the USFS.

The State of Alaska believes the use of a State transportation easement granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, and located on the east side of Lynn Canal would not require further evaluation for consistency with the TLRMP. If for some reason DOT&PF could not use all or a portion of this easement, FHWA would seek to secure a transportation easement across Tongass National Forest through a federal land appropriation process authorized by 23 USC 317.

The stated regional transportation policy set forth in the 2008 CBJ *Comprehensive Plan* is “to support the improvement of transportation facilities and systems that reinforce Juneau’s role as the capital city of Alaska and a regional transportation and service center.” The plan supports consideration of all affordable, energy efficient transport alternatives to improve transportation links between Juneau and other areas of Southeast Alaska including air (cargo and passenger) service, roadways, ferries, and fixed guideway systems (CBJ, 2008). Alternative 2B is consistent with the CBJ *Comprehensive Plan*. Alternative 2B is also consistent with the 2009 CBJ Assembly Resolution 2463. That resolution made recommendations for transportation projects to DOT&PF for the 2010–2013 STIP, one of which was extension of the Glacier Highway to MP 91.1 (just north of the Katzehin River delta, which is the proposed location of the Katzehin Ferry Terminal in Alternative 2B).

The Haines Borough *2025 Comprehensive Plan* adopted in 2012 indicates a desire for increased AMHS trips to Haines and for an AMHS ferry to homeport or overnight in Haines (Haines Borough, 2012). The *2025 Comprehensive Plan* also indicates a preference for a west-side road, should one be selected. Alternative 2B crosses USFS lands with a general use designation in the Haines Borough *2025 Comprehensive Plan*. Haines Borough Ordinance 03-02-007 indicates that the intent of the general use designation is to provide a minimum of planning, platting, and land use regulation in rural areas. A transportation facility would be consistent with this zoning designation. While Alternative 2B would overnight a ferry in Haines, it is not consistent with the Borough’s comprehensive plan; however, State agencies’ projects are not required to conform to local land use plans.

The Municipality of Skagway Borough *2020 Comprehensive Plan* states that it is the goal of the Municipality to provide an integrated, efficient, safe, and reliable transportation network to facilitate the movement and goods in and through Skagway (Municipality of Skagway, 2009). The transportation policy supports maintaining and increasing year-round access to and from Skagway, including public and private ferries, and air, road, trail, marine, and rail access. Alternative 2B is consistent with the Borough’s comprehensive plan.

Goldbelt’s Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternative 2B is consistent with this plan and would use the alignment of the existing road. Alternative 2B may contribute to a decision to develop other plan elements.

#### 4.3.1.3 Land and Resource Uses

Alternative 2B would substantially increase access to the east Lynn Canal coastline for recreation and tourism. Improved access to forest land is expected to increase use and thus the need for management and monitoring. Access from Alternative 2B would result in more nonresident visitors arriving in Juneau, Haines, or Skagway by personal vehicle. The numbers of overall visitors to Juneau would increase because the highway would offer a previously untapped visitor population a more independent, flexible and economic access option. An increase in independent visitors could also increase the demand for more recreational vehicle (RV) parks.

The DOT&PF and the USFS have identified recreation opportunities at sites along this alignment. DOT&PF would create pullouts at areas suitable for construction of trailheads (by others), which would facilitate use of Tongass National Forest lands (Figure 4-1). Pullouts are proposed near Sawmill Creek, Berners Bay, Antler and Lace rivers, Slate Cove, Comet, Brown Point, Eldred Rock, Yeldagalga Creek, and south and north of the Katzehin River. In addition, paved shoulders suitable for bicyclist and pedestrian use would be constructed along the highway.

Alternative 2B would improve opportunities for recreational activities such as hiking, camping, sightseeing, rafting, canoeing, kayaking, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway systems in Juneau, Haines, and Skagway. Berners Bay and the Katzehin River delta are already popular locations on the east side of Lynn Canal for remote and semi-remote recreation. A highway through these areas would make them more accessible for people looking for a rustic, but not totally remote outdoor experience.

A highway would also make the USFS-maintained Berners Bay cabin more accessible for recreation. As discussed above, a pullout and trailhead would be located on the highway above the Berners Bay cabin and DOT&PF would construct a trail to the cabin. See Section 6.2.2.2 for a discussion on the Berners Bay cabin and access from a trailhead along the East Lynn Canal Highway.

The highway would not impact the landing strip north of the Katzehin River. A highway could also provide opportunities for outfitters to make more recreational trips available to the public in the region. For example, river crossings often provide good places for putting in or taking out kayaks. Bridges associated with Alternative 2B could open up opportunities for new kayak trips.

Opening up the recreation opportunities of the coastline along the east side of Lynn Canal would be perceived as a negative impact to the quality of the experience by those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there. Current users of Berners Bay who travel there by kayak, canoe, small boat, or float plane would find the experience there different. As a general mitigation for impacts to Berners Bay users desiring a remote, water-access experience, DOT&PF would construct a new water-accessed cabin to be managed by the USFS at a location selected in consultation with the USFS.

Many of the rivers and streams that would be crossed by Alternative 2B contain resident and anadromous fish stocks available for sport fishing. The region also supports populations of mountain goat, bear, and moose, big game species available for take by resident and out-of-state hunters. Hunting and fishing pressure has increased along every highway in Alaska that has opened a formerly remote area. Increases in recreational hunting and recreational and personal use fishing would be expected along Alternative 2B. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and make recommendations to the Board of Fish and Game to adjust fish and game regulations, as necessary, to protect those resources from over utilization.

Improved access to fish streams and the resultant higher level of use by sport fishers would require a greater level of effort by ADF&G in terms of surveying streams and enforcing regulations. Increased access to Juneau and the resultant increase in visitors would put additional pressure on existing sport fishing facilities in Juneau, including boat ramps. The CBJ would be responsible for evaluating the need for additional or expanded facilities as demand in the Borough increases.

Better access and through-traffic resulting from Alternative 2B may contribute to a decision by Goldbelt to develop some of its plan elements.

Alternative 2B would benefit the Kensington Gold Project by facilitating the transport of goods and services to the mine site from Juneau and making it more convenient for workers in Juneau, Skagway, and Haines to reach the site. A highway would provide easier and less expensive access to other mineral occurrences, prospects, and former mines along the east side of Lynn Canal. It is unlikely that any mineral deposits in the region would be developed solely because of this improved access. Development of mineral resources is capital intensive, involving many other costs besides access. Market conditions must be high enough to account for all of these costs before development can occur.

**Roadless Areas –** Alternative 2B would not substantially change the natural integrity and appearance or opportunities for solitude in IRA 301 or 305 (see Section 3.1.1.1 for a discussion of IRAs and Revised Appendix DD, *Land Use Technical Report,* Section 4.4, for detail on the effects of Alternative 2B on roadless areas). IRA 301 encompasses 1,201,474 acres, of which 98 percent is managed as Non-Development LUDs. IRA 305 encompasses 94,800 acres. Within the 300-foot-wide assessment corridor, Alternative 2B would have a cleared width of approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the highway is closer than 1,200 feet from the shore), for a maximum total width of 2,500 feet. Therefore, Alternative 2B would impact 8,647 acres largely along the eastern boundary of IRA 301, and 648 acres of IRA 305. This represents 0.73 percent of the land encompassed by IRA 301, and 0.64 percent of the land encompassed by IRA 305.[17]

Alternative 2B would reduce the amount of land remaining roadless. This remaining area would appear natural, and would still provide opportunities for solitude, self-reliance, adventure, and primitive recreation. The roadless area inventory boundary would not change; there would be a road within the IRA. Access to the roadless area would change from water access to a combination of water and highway access. Alternative 2B would not affect any identified scientific or educational features in IRA 301 or IRA 305. Alternative 2B is also consistent with the TLRMP, which indicates that the road corridor for Alternative 2B in IRA 301 and IRA 305 would be managed as a TSC. Revised Appendix DD, *Land Use Technical Report,* provides additional information on Roadless Areas. The Secretary of Agriculture and the USFS may be required to make an affirmative finding under the Roadless Rule that the easements granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, were "established by law" and therefore that a road using the easements would be consistent with the Roadless Rule.

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[17] The Glacier Highway extension, completed in 2011, currently runs 0.7 mile in IRA 305; nevertheless, the USFS still maps this as an IRA. Alternative 2B would slightly widen the existing road and would extend the road within IRA 305 approximately 2 miles to the northern edge of the IRA.

#### 4.3.1.4 Parks and Recreation Facilities

Alternative 2B would require no land from any municipal, State, or federal park or formally designated public recreation areas within the study area. None of the recreation facilities identified in Section 3.1.1.7 are within the construction limits of Alternative 2B. Based on a USFS request, the Berners Bay cabin would have access from the highway under this alternative, and pullouts would be provided where trailheads could be constructed by others. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

### 4.3.2 Coastal Zone Management

The CBJ and Haines incorporated enforceable policies for coastal zone management into their respective comprehensive plans and/or ordinances, as described in Section 3.1.1.8. Official determination of consistency with enforceable provisions would occur during local review of construction projects, including roads, ferry terminals, or other improvements and modifications needed to implement the alternative. The CBJ has provided the DOT&PF a consistency determination for the highway segment of Alternative 2B from Echo Cove to Sweeney Creek (Figure 3-18; CBJ, 2006), which does not expire. The Haines Borough has incorporated several coastal management enforceable policies into its comprehensive plan. Consistency with enforceable provisions would be assured during local review of plans for individual construction projects as required by Alaska Statute 35.30. The Municipality of Skagway Borough has not incorporated coastal management enforceable policies into its comprehensive plan, but some elements are codified in other ordinances, and compliance with the ordinances would occur during the development review process.

### 4.3.3 Visual Resources

In 2003, visual simulations were made of Alternative 2B at typical viewpoints that represent characteristic viewing conditions in each of the major landscape units described in Section 3.1.2. The locations of those viewpoints are provided in Figure 4-2. A description of the visual character of the alternative at each viewpoint is provided below.

#### 4.3.3.1 Berners Bay

**Views from the Bay** – In Berners Bay, the most susceptible views to potential impacts from Alternatives 2B include:

- Views from Berners Bay
- Views from small boats and ferries
- Views from the Berners Bay cabin
- Views from lower reaches of Berners, Lace, and Antler rivers
- Views from Point Bridget State Park

Figure 4-3 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway is approximately 2.4 miles from the viewer, and it is located in an area not requiring substantial cuts and fills. Therefore, the highway is not likely to dominate the existing natural setting. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, this condition is highly dependent on the view distance.

Figure 4-4 is a visual simulation of the highway under Alternative 2B just south of the confluence of the Berners, Lace, and Antler rivers on the east side of Berners Bay within proximity of the Berners Bay cabin. Topography within this area varies from gentle to moderately steep. As a result, it is likely that cut-and-fill areas would be intermittently visible from this viewpoint. A distinct line created by the removal of vegetation would also be noticeable. The layering of landscapes surrounding primarily all but the central western portion of the bay dominates existing viewsheds. Figure 4-5 provides a visual simulation of Alternative 2B within Berners Bay. A strong linear band created by exposing lighter soil and rock in cut-and-fill areas would be most noticeable. The proposed bridge would create contrast in form; however, depending on the angle of view as well as the distance, the bridge would be more or less noticeable. Steep road cuts on the eastern edge of Berners Bay would dominate the existing setting out to the middleground viewing threshold. The bridge and highway would dominate the existing setting when they are included in foreground views.

Views of the road and bridges, cut and fill, changes in vegetative cover, vehicle movement, and vehicle lights could affect some viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views from the Highway** – Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense OG forest in most places. Crossing the Berners River and Antler River delta, views to the east would open up to an extensive marsh in front of a forested valley cut through steep and rugged mountains. Many of the views looking west from a highway would be panoramic, taking in Berners Bay and Lynn Canal with the snow- capped peaks of the Chilkat Range in the background approximately 12 miles away.

#### 4.3.3.2 Point St. Mary to Eldred Rock

**Views from Lynn Canal** – From Point St. Mary to Comet, views most susceptible to potential impacts from Alternative 2B include:

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

Figure 4-6 is a visual simulation of Alternative 2B from Lynn Canal looking east toward Sherman Point. The existing viewshed is unique, as it has scenes that contain rolling terrain in the foreground and middleground and mountains in the background. Because of the highway being sited within an area of less steep topography, the visibility of cut-and-fill areas is reduced. Although the linear band created by the removal of vegetation would be noticeable in the middle and foreground viewing thresholds, much of the proposed roadway would hug the shoreline, blending into the coastline. Overall, the roadway would appear as a linear band at the land-water interface and would be a co-dominant to subordinate feature within the natural setting.

Figure 4-7 provides a visual simulation of Alternative 2B within middleground views of the area from the canal north of Comet. The highway would traverse steep topography in an area interspersed with vegetation. A waterfall occurs in the viewshed as well as a noticeable rockslide. The highway would create a distinct linear feature across the existing setting that would compete with and detract from natural landscape features. This conclusion is primarily a factor of substantial cut-and-fill areas occurring within the existing viewshed.

From just north of Comet to Eldred Rock, the most susceptible views to potential impacts from Alternative 2B include:

- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from and around Eldred Rock Lighthouse
- Views from cruise ships and small boats

Figure 4-8 provides a visual simulation of Alternative 2B from a traveler in the Lynn Canal on a vessel near Eldred Rock, with the highway at a distance of approximately 1.5 miles. As indicated in the simulation, the highway would represent a strong linear feature introduced to an otherwise natural setting. Some portions of the roadway would be sited close to the water's edge, thus reducing visibility of this linear band. In other areas, the highway would be sited up to 100 feet above the water's edge and traverse areas of extreme slope, creating dominant shear-cut faces. The strong linear feature of the highway within the natural setting would be readily apparent to travelers on Lynn Canal. The highway would be a co-dominant feature in the viewshed.

Views of the road, cut and fill, changes in vegetative cover, vehicle movement, and vehicle lights could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views From the Highway –** Views from a highway would alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the east shoreline in the foreground and the water of the Canal in the middle- and background, with background views of the rugged, snow-capped peaks of the Chilkat Range across the Canal.

#### 4.3.3.3 Eldred Rock to Mount Villard

**Views from Lynn Canal –** Alternative 2B would be visible in the viewshed of the Katzehin River delta. Views most susceptible to impact in this area include:

- Views from the Katzehin River Valley downstream reach proposed as a Wild and Scenic River
- Views from Portage Cove Campground
- Views from Haines
- Views from cruise ships and small boats
- Views from shoreline cabins

Figures 4-9 and 4-10 show visual simulations of Alternative 2B within the middleground viewing threshold in this area. From the location assumed in Figure 4-9, a viewer traveling within Chilkoot Inlet in the vicinity of the Katzehin River would likely notice a linear band created by the exposure of lighter soils as well as the bridge spanning the river mouth. Although the proposed bridge would be noticeable, the scale of both landform and vegetation modifications is less than that of cut-and-fill areas constructed on mountain slopes. Southbound travelers would not notice this portion of the highway to the same degree as northbound travelers approaching the river headwaters because the highway would be masked by topography as the inlet turns to a more northwesterly direction than a northern direction.

As shown in Figure 4-10, the highway would appear as a linear band along the base of Mount Villard. Topography along this link is very steep and vegetation intermittent. As a result, cut-and-fill areas would be highly noticeable in middle- and background views. The proposed ferry terminal north of the Katzehin River delta for Alternative 2B would be noticeable as an interruption in the line associated with the roadway. The existing natural setting dominates this viewshed, and it is unlikely that the highway would visually compete with the existing setting. The proposed bridge crossing the Katzehin River, from this viewpoint, would not compete substantially with the natural setting.

Views of the road, bridge, and ferry terminal; cut and fill; changes in vegetative cover; and introduction of vehicle movement and lights could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views From the Highway –** Views from a highway would typically alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the east shoreline in the foreground and the water of the Canal in the middle- and background, with background views of the rugged, snow-capped peaks of the Chilkat Range across the Canal. At the bridge over the Katzehin River, views would encompass the broad floodplain of this river and the deep, forested valley extending to the east.

#### 4.3.3.4 Consistency with USFS Scenic Integrity Objectives[18]

As explained in Chapter 3, the TLRMP assigned SIOs for each LUD. The SIO for the TSC (which replaces the TUS LUD in the 2008 TLRMP) is Low with only the foreground of views considered. This SIO should be achieved within one year of construction. Alternative 2B would be consistent with this SIO. Wherever possible, the alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway from Lynn Canal. Vegetation within this buffer would be maintained to the extent practicable. Also, to the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. In many locations, the alternative would exceed the Low SIO rating and would be consistent with the Moderate SIO. In order to demonstrate the overall visual effect of Alternative 2B and address the USFS guideline to meet the SIO of adjacent LUDs to the extent feasible, DOT&PF also evaluated the alternative’s consistency with the SIOs of the adjacent LUDs.

**Berners Bay –** USFS LUD II land in Berners Bay has a High SIO. However, from Echo Cove to Sawmill Cove, the SIO is Moderate. Alternative 2B would be partially visible from many of the views of the coastline from the bay. Therefore, at most locations it would meet the Moderate SIO. It would not meet the High SIO where it is visible from the bay. To the extent feasible, soil would be spread on the rock slopes and seeded to minimize visual impacts.

**Slate Cove to Eldred Rock –** Most of the USFS land along the Lynn Canal coast from Slate Cove to a point north of Eldred Rock has a Low SIO. However, the SIO is High within the two Old-Growth Habitat LUDs along this section. Alternative 2B would meet or exceed the Low

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[18] The 2006 Final EIS used Visual Quality Objectives (VQOs) in accordance with the 1997 TLMP. This Final SEIS has been updated based on the 2016 TLRMP, which (consistent with the 2008 TLRMP) replaces the VQOs with Scenic Integrity Objectives (SIOs). The primary difference between the VQOs and SIOs is that the SIOs better recognize the positive scenic values associated with some human-modified (cultural) features and settings. The VQOs and SIOs are similar enough that the definitions were written to allow for easy conversion between the two.

SIO. The highway would be visible in the Old-Growth Habitat LUD north of Comet from some views in Lynn Canal. Therefore, it would not meet the High SIO in this location, but would meet the Moderate SIO by minimizing clearing and vegetating slopes.

**Eldred Rock to Katzehin Ferry Terminal –** Most of the USFS land from Eldred Rock to the Katzehin Ferry Terminal has a Moderate SIO. Alternative 2B would be visible from some but not all views from Lynn Canal and would therefore meet the Moderate SIO. The SIO adjacent to the alignment from the Katzehin River to the terminal site has a High SIO. At the Katzehin River and at several locations where the road crosses steep terrain, the highway would be visible, and in these sections meeting a High SIO is not feasible. To the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility.

### 4.3.4 Historical and Archaeological Resources

Based on record searches and surveys of the study area, Alternative 2B would not affect any known prehistoric resources. Consultations with Native Tribes and organizations have indicated that there are areas of cultural importance but have not indicated that this alternative would impact any traditional cultural properties. Historic resources potentially affected by Alternative 2B are discussed below.

Alternative 2B would cross the Jualin Mine Tram, a contributing element of the Jualin Historic Mining District, as well as the encompassing Berners Bay Historic Mining District, just inshore from Berners Bay (Figure 3-6). At this location, the rails on the tram are visible on the ground between the shore and a rock bluff to the west. The alternative would bridge over the tram to the top of the rock bluff, leaving the tram intact. Alternative 2B would impact no other structures or features that contribute to the Jualin Historic Mining District. For these reasons, FHWA has determined that Alternative 2B would have no adverse effect on the Jualin Tram or the Jualin Historic Mining District.

Alternative 2B would cross the Comet/Bear/Kensington Railroad (Figure 3-6), a contributing element of the Comet/Bear/Kensington and Berners Bay Historic Mining Districts, in a forested area where the rail sections are missing but where the cleared ROW and evidence of the supporting pilings and trestles can be seen heading easterly toward the Comet/Bear/Kensington mill site. The alternative would bridge over the railroad ROW, and would cross no other structures or features that contribute to the Historic Mining District. For these reasons, FHWA has determined that Alternative 2B would have no adverse effect on the Comet/Bear/Kensington Railroad or the Comet/Bear/Kensington Historic Mining District.

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

Alternative 2B would pass through the Berners Bay Historic Mining District. The only contributing elements affected are the Jualin Mine Tram and the Comet/Bear/Kensington Railroad, both of which would be crossed by a bridge. Therefore, FHWA has determined that Alternative 2B would have no adverse effect on the Berners Bay Historic Mining District.

Alternative 2B would increase human access in the east Lynn Canal area. Increased access could result in indirect impacts because of disturbance to historic and prehistoric cultural sites from hikers, hunters, and other recreational users.

DOT&PF and FHWA have consulted with the USFS and the SHPO regarding potential impacts to historic properties in the APE of Alternative 2B. On October 5, 2005, SHPO concurred with FHWA's determination that Alternative 2B would have no adverse effect on any historic property (see correspondence section of Chapter 7 of 2005 Supplemental Draft EIS). In June 2012, following correspondence from FHWA detailing the minor changes to Alternative 2B, the SHPO reconfirmed that a finding of no adverse effect remains appropriate for this alternative.

### 4.3.5 Socioeconomic Resources

#### 4.3.5.1 Overview

The improved access in the Lynn Canal that would result from Alternative 2B would facilitate the movement of goods and people through and to the northern Southeast Alaska region. This would create closer links between the economies of Juneau, Haines, Skagway, and Whitehorse.

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

The redistribution of tourism-related economic benefits might result in net economic gain in one area of the state, offset by economic loss in another. On a regional basis, improved access would result in a net gain to Juneau's local retail industry, and Haines and Skagway could realize some loss in certain types of retail sales such as durable goods.

Population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by the improved access resulting from Alternative 2B. Haines has a fairly large retirement population. Improved access would possibly enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors, particularly health care services and cultural activities. To the extent that this occurs, Haines' population would grow as a result of improved access. Better access to/from Haines would also increase the number of Juneau residents with second homes or cabins in the Haines area. Of the three major communities in the Lynn Canal corridor, Juneau would experience the most population growth due to improved access, though as mentioned previously, that growth would not be large.

The population increase associated with better access to Juneau could be accommodated within the existing housing stock of that community. Property values in Haines might increase because of its growing reputation as a retirement community and/or demand for second homes or cabins by Juneau residents. The increased traffic through Skagway resulting from Alternative 2B could increase the value of the commercial property in that town.

Local governments would be affected by improved access in the Lynn Canal corridor in the following ways:

- Increased demand for public safety services in remote areas of the Juneau and Haines Boroughs as well as outlying Skagway areas
- Potential increased demand for some public utilities
- Increased local road maintenance costs
- Increases in sales and bed tax revenues from traveler-related spending
- Increases in property tax revenues

Improved access would affect the health care industry in several ways. Haines and Skagway residents would have better access to Juneau's well-developed health care sector. This improved access would mean less reliance on local and/or Whitehorse health care providers. Provision of EMS is a key function of clinics in Haines and Skagway. Demand for these kinds of services would increase as non-resident traffic through those communities increased.

Improved highway access to northern Southeast Alaska would have minor or negligible effects on other segments of the region's economy. The cruise ship industry is principally affected by berth facilities at points of origin (e.g., Seattle and Vancouver, British Columbia [B.C.]) and destination (Juneau, Skagway, and Haines), and is projected to grow at an annual average rate of 1 to 2 percent over the next 10 to 20 years. The manufacturing sector in Juneau would benefit from better access to markets in Haines, Skagway, and Whitehorse. Better access to the Alaska/Canada highway system would also improve the economics associated with serving markets in Interior Alaska from the Lower 48 states. The region's wholesale trade sector would benefit from the lower cost of transportation between Juneau, Haines, and Skagway. Currently, wholesalers, primarily in Juneau, compete with Seattle distributors for this regional business.

The following subsections provide a more detailed discussion of the economic and social effects to Juneau, Haines, and Skagway projected for Alternative 2B. A portion of the information presented here is based on interviews with industrial representatives and public service providers. See the *Socioeconomic Effects Technical Report* (Revised Appendix EE of this Final SEIS), for references to these interviews as well as further discussion of the socioeconomics analysis.

#### 4.3.5.2 Juneau

**Population, Economics, Housing, and Municipal Revenues –** Alternative 2B is predicted to generate 820 annual ADT in 2055, a daily increase of 740 trips relative to Alternative 1 – No Action, which would affect population, economics, housing, and municipal revenues in the region (see Revised Appendix AA, *Traffic Forecast Report*). Traffic on Alternative 2B is predicted to remain relatively constant over the 30-year period between 2025 and 2055, changing from 810 to 820 annual ADT.

The total increase in visitor traffic to and from Juneau associated with Alternative 2B is estimated to be 395 annual ADT in 2055.[19] Assuming all traffic is round-trip, the 395 annual ADT attributable to increased visitor traffic to/from Juneau would equate to approximately 195 new round trips a day (i.e., one-half of the annual ADT). With each additional visiting vehicle carrying an average of 2.3 people[20], Juneau is projected to receive as many as 166,600 new visitors annually under Alternative 2B (i.e., number of new round trips per day multiplied by 2.3 people per trip multiplied by 365 days per year). Visitors to Juneau are estimated to spend $77 per visitor per day (McDowell Group, 2012a). Annual visitor spending in Juneau, therefore, would increase by as much as $12.83 million, approximately, as a result of Alternative 2B (Table 4-19).

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[19] This estimate is less than half of total traffic associated with Alternative 2B because Juneau residents would account for the majority of traffic on the highway. The estimate of new traffic also does not include baseline traffic because that traffic is already affecting the economy.

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

The economic impact of this additional spending would include new employment and payroll sources in Juneau. This increase in annual visitor spending in Juneau would generate approximately $4.79 million in new payroll and 130 additional jobs (Table 4-19).

**Table 4-19:**
**Alternative 2B Projected Traffic and Resulting Visitor Economic Impacts in Juneau, 2055**

| | **2055** |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 80 |
| Total Traffic under Alternative 2B (annual ADT) | 820 |
| Change in Traffic (annual ADT) (over No Action) | 740 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 395 |
| Total New Visitors Annually (over No Action) | 166,600 |
| Total New Visitor Spending Annually over No Action) | $12,830,000 |
| New Local Payroll Annually (over No Action) | $4,790,000 |
| New Local Employment Annually (over No Action) | 130 |

Note: Numbers may not total exactly due to rounding.

Generally, each new job in the Juneau economy results in an increase in population of about 1.5 people.[21] Therefore, the 130 new jobs in Juneau resulting from Alternative 2B would be expected to result in a population increase of about 195 residents.

Under Alternative 2B, a Day Boat ACF would be based in Skagway; changing from its homeport location of Auke Bay under Alternative 1 – No Action. Assuming that all the crew members and their families relocate from Juneau to Skagway, Juneau could experience a loss of approximately 35 residents. This loss would be somewhat offset by additional highway maintenance employees for the East Lynn Canal Highway, which is estimated at two full time and five seasonal positions. Assuming these positions would be filled by people relocating to Juneau with family members, the net loss of Juneau residents would be approximately 15.

A population increase in Juneau of 195 residents would represent an overall increase of about 0.6 percent of Juneau's population (2015 population is estimated at about 33,277).

Based on 2.6 persons per household (from 2010 Census data), a population increase of 195 residents would result in additional demand for about 75 housing units. Juneau had approximately 650 vacant housing units in 2010, so this additional demand is within Juneau's housing capacity.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of approximately $12.83 million annually would generate (assuming all of the spending is taxable) about $642,000 in additional sales tax revenues (based on a 5 percent tax rate).

Alternative 2B would increase the value of private property along the highway, though the extent of that increase is difficult to estimate. For example, Goldbelt's property in and north of Echo Cove would increase in value. CBJ would have an increase in property tax revenues because of this increase in property values. Residents in this area would pay higher property taxes.

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

Alternative 2B would be likely to spur development of private property along the highway, including Goldbelt's property in the Echo Cove/Cascade Point areas. As undeveloped Alaska Native Claims Settlement Act (ANILCA) Corporation entitlement property, it is currently not subject to property taxes.

**Industry/Commercial Sectors –** A highway link on the east side of Lynn Canal would be expected to substantially affect the independent visitor segment of Juneau's visitor industry, but not the cruise visitor market. Juneau's cruise market is expected to continue to grow independent of the JAI Project—especially with the expansion of calls by smaller cruise vessels running multi-day round trips out of Juneau (NEI, 2013).

Alternative 2B would benefit the independent visitor industry in Juneau. Among independent visitors, those traveling by personal vehicle are the most likely to be affected by Alternative 2B (NEI, 2013).

With this alternative, Juneau would become the mainline ferry terminus for the AMHS, resulting in a significant number of independent visitors traveling to Juneau that otherwise might not visit the community. Approximately 60 percent, or approximately 24,600, of the non-resident travelers now using the ferry between Juneau and Haines-Skagway are spending time in Juneau. Most of the current pass-through visitors (about 16,400) would be spending some time in Juneau with Alternative 2B.

RV travelers on the ferry who otherwise would have gone directly to Haines or Skagway would be forced to disembark in Juneau (termed diverted RVs). While some travelers would choose to travel on directly to Skagway and/or Haines via Katzehin, others would take advantage of the opportunity to visit the capital city, as well as Mendenhall Glacier and other attractions. The total number of diverted RVs would be about 450 in 2025, upon completion of construction (see the *Socioeconomic Effects Technical Report*, Revised Appendix EE). This is in addition to the approximately 600 RVs currently traveling to Juneau (see Section 3.1.4.1), resulting in a total of 1,050 RVs per year visiting Juneau. The 2006 Final EIS indicated that independent visitor traffic in Lynn Canal is expected to double under Alternative 2B and this is believed to still be true. Applying this growth to the total baseline and diverted RV traffic of 1,050 results in an estimate of 2,100 annual RVs to Juneau, once Alternative 2B is constructed. The current capacity for RV camping in Juneau would not be sufficient to meet demand. It is expected that the private sector would respond to an increased demand and develop additional RV-related services, including increasing capacity, RV rental businesses, and RV supply services. If the private sector were unable to develop enough new RV park capacity, the impacts likely would include (1) greater use of pullouts and commercial parking lots by RVs and (2) an eventual reputation for lack of capacity (e.g., in online reviews and in guidebooks) that likely would dampen demand and reduce visitation by visitors in RVs.

The process of planning and building an RV park in Juneau would present some challenges to prospective RV park operators. According to city officials, it is difficult to find developable land in Juneau appropriate for RV parks. The land would need to have easy highway access, water and electrical utilities, and accommodating neighbors. Such a location is likely to be desirable to a variety of interests, and in the past, RV parks have not been able to promise the revenues that other operations would.

The increase in RV traffic associated with Alternative 2B would not occur until after construction was completed, and then would increase gradually over time. Construction is estimated to take at least 6 years. This would provide time during which the CBJ could work with interested landowners to develop a plan for RV facilities expansion.

Construction of Alternative 2B would result in logging incidental to clearing the highway ROW. A highway would improve access to timber stands that at some future date could be made available for harvest. The USFS, however, manages the Tongass National Forest (over 95 percent of the highway alignment) within the study area primarily as a "mostly natural setting" as designated in the TLRMP LUDs. The LUDs in this area, including LUD II, Old-Growth Habitat, and Semi-Remote Recreation, are classified as unsuitable for timber production, and commercial timber harvest is not allowed. However, two areas along the eastern shore of Lynn Canal are designated for moderate development, including the Scenic Viewshed and Modified Landscape LUDs, which allow timber harvesting. Although the USFS currently has no plans to harvest timber on East Lynn Canal, it would require the harvest and sale of timber felled from the Alternative 2B corridor pursuant to the Juneau Access Settlement (Sandhofer, personal communication 2012; USFS, 2008c).

Development of Alternative 2B would have no effect on the operation of the Kensington Gold Mine, which opened in 2009 and is fully operational. Coeur Alaska, Inc., (Coeur Alaska) ships supplies into the mine and ore out by barge from Slate Cove, the nearest place for a deepwater port. This method of moving supplies and product would continue even if Alternative 2B were implemented, because it would be more cost-effective to ship directly to and from the mine rather than bear the expense of shipping to or from Juneau or Skagway first and rehandling the materials. A highway under Alternative 2B could reduce the cost of transporting workers to the site. It could also help to ensure prompt medical responses to injuries of mine personnel.

Alternative 2B is not anticipated to have a substantive impact on shipment of fresh seafood out of Juneau. Most of the product that is now shipped out via jet would be anticipated to continue to be shipped by that mode as it appears to adequately meet buyers' and sellers' needs. Alternative 2B could be used to ship the fresh seafood that is currently shipped via ferry (NEI, 2013).

Water transportation is the primary method of moving freight to and from Juneau, with Seattle being the primary port of origin and destination. Alaska Marine Lines (AML) and Northland Services provide this barge service. Transportation by barge is expected to remain the mode by which most freight is shipped to/from Juneau. The economies of scale possible with barge service, and the relatively frequent service offered into Juneau (at least three barges/week) places the economics on the side of barge transportation.

AMHS transports less than 3 percent of freight in Lynn Canal. Freight on AMHS ferries is almost always transported on "unaccompanied" van trailers (i.e., without tractor or driver). In 2014, the AMHS carried 193 vans from Juneau to Haines, 206 vans from Haines to Juneau, 29 vans from Haines to Skagway, and 5 vans from Skagway to Haines (see Revised Appendix EE, *Socioeconomic Effects Technical Report*). Alternative 2B would change this freight transportation pattern in Lynn Canal: van trailers would be unloaded at Juneau (Auke Bay) and drivers would transport the cargo by road to Katzehin and from there on the shuttle ferry to Haines or Skagway and their final destinations. Note that under Alternative 1 – No Action, unaccompanied vans would be allowed on the mainliners but would not typically be allowed on the Day Boat ACFs. Unaccompanied vans that use the mainliners under Alternative 1 – No Action would be affected and shippers would need to switch to a different method of transportation. Truck traffic north of the Auke Bay ferry terminal would increase. Because there would be no change in barge or ferry freight service to Juneau from points south, no change to consumer prices would be expected in Juneau as a result of the project.

**Utilities and Public Services –** Alternative 2B is expected to have negligible impact on Juneau utilities. All of the utilities are adequate to accommodate any population increases attributable to the improved access afforded by Alternative 2B through 2055.

Much of the information provided below on the effects of Alternative 2B is based on interviews with public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

School enrollment is a function of population. Because population impacts are expected to be minimal (i.e., 195 new residents in 2055), the same would be true of impacts on enrollment. The maximum impact on Juneau's population from Alternative 2B would be about 30 additional students spread across all grades.

The cost of transporting students to Haines or Skagway could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day.

Health and social services demand is mainly a function of population, and would therefore not be expected to change substantially under Alternative 2B. Additional independent visitors to Juneau, particularly older retirees, would place some new demands on emergency room and other medical and dental services in Juneau. Demand for health care services resulting from additional highway accidents would be negligible when compared with existing demand.

Traffic increases resulting from improved access would not affect fire and EMS within the current service area. The closest Capital City Fire and Rescue station to Alternative 2B is at Auke Bay. As this is a volunteer response station, the station located near the Juneau International Airport (JIA) would be the station most likely to be dispatched to emergencies in the Alternative 2B corridor within the CBJ.

Improved access would have a modest impact on the ability of police services to handle the increase in local traffic congestion and to respond to occasional emergency calls on the new highway within the CBJ. The Juneau Police Department is currently operating at the limits of its capacity and would need to create and fund new positions that incorporate new responsibilities to maintain its existing service level. The Alaska State Troopers, under the Department of Public Safety, do not provide enforcement services within the municipalities, but respond to calls everywhere else in the boroughs. Troopers would respond to calls in the Alternative 2B corridor. If Alternative 2B is implemented, the Department of Public Safety may need to reallocate some of its resources to adjust to the additional needs in the corridor. Alaska State Troopers would be responsible for the highway north of Eldred Rock in the Haines Borough, and would patrol the highway en route.

The Juneau Police Department has discussed whether connecting Juneau to the outside highway system would result in new types of crime or more serious crime. Although Alternative 2B would not create a direct highway link, it would create easier and cheaper access. Only 5 percent of arrests in the CBJ involve non-residents and less than 2 percent involve people from outside Alaska. Juneau also has very low rates for many of the crimes associated with more "connected" communities, such as gang activity and car theft. It has relatively higher incidences of crime that may be associated with isolation (e.g., domestic and alcohol-related crimes). One possibility raised in public scoping is that ending either a highway or mainline ferry service in Juneau would precipitate an "end-of-the-road" effect, bringing to town more transients who are unable to support themselves and individuals with mental and behavioral problems. However, the U.S. and Canadian customs stations on the Haines and Klondike highways act as a significant filter in this regard, and Haines and Skagway do not have this problem.

The Juneau Police Department believes that there is not enough evidence or precedents to suggest that simply improving access would affect the nature and rates of local crime. Much more of a factor than access is Juneau's distance from other population centers, particularly large cities. The Juneau Police Department believes a highway connection might be associated with some increase in teen runaways and perhaps some additional auto theft and credit card incidents. There could be an increase in importation of illegal drugs; however, local officials indicate it is already relatively easy to move these substances in and out of Juneau.

**Quality of Life –** The household surveys conducted in 1994 (McDowell Group, 1994) and 2003 (Appendix I of the 2005 Supplemental Draft EIS) indicated that more than three-quarters of Juneau residents agree that improved access to their community is important. There is less agreement on whether quality of life is best served by highway access. Many proponents of a highway acknowledge that better ferry service would improve quality of life, but not by enough. Many proponents of ferry service believe better access is important, but only ferry access would result in an overall improvement in the quality of life. In October 2000, Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road.

The reasons for these differing views are complex and interwoven with how individuals view Juneau's lack of highway access. Research and public comment over the past two decades have shown that some residents cherish this condition while others deplore it. Further, improved transportation is generally associated with growth opportunities, and growth typically affects the quality of life. Finally, as noted in the *Socioeconomic Effects Technical Report* for this Final SEIS (see Revised Appendix EE), the isolation associated with lack of highway access induces a sense of psychological comfort in some residents and a feeling of frustration and claustrophobia in others.

#### 4.3.5.3 Haines

**Population, Economics, Housing, and Municipal Revenues –** Alternative 2B is predicted to generate 455 annual ADT in Haines in 2055, an increase of 405 trips daily relative to Alternative 1 – No Action, which would affect population, economics, housing, and municipal revenues in the region (see Revised Appendix AA, *Traffic Forecast Report*). Traffic on Alternative 2B is predicted to remain relatively constant over the 30-year period between 2025 and 2055, changing from 450 to 455 annual ADT.

The total increase in visitor traffic to/from Haines associated with Alternative 2B is estimated to be 220 annual ADT in 2055.

The increase in visitor traffic with Alternative 2B relative to Alternative 1 – No Action would equate to about 91,900 new visitors annually in Haines. Assuming that visitors would spend an average of $77 per passenger per day in Haines (McDowell Group, 2012a), visitor spending in the community would increase by approximately as much as $7.08 million per year as a result of Alternative 2B.

In terms of economic impact, increased spending in Juneau by Haines residents would offset some (or all) of the new visitor spending in Haines. Approximately 10 percent of new spending that would occur in Juneau with Alternative 2B would be by Haines residents; therefore, the net visitor spending in Haines attributable to Alternative 2B would be approximately $5.8 million annually (Table 4-20). This net increase in annual visitor spending in Haines would generate as much as $2.16 million in new payroll and about 60 additional jobs.

**Table 4-20:**
**Alternative 2B Projected Traffic and Resulting Visitor Economic Impacts in Haines, 2055**

| | 2055 |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 50 |
| Total Traffic under Alternative 2B (annual ADT) | 455 |
| Change in Traffic (annual ADT) (over No Action) | 405 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 220 |
| Total New Visitors Annually (over No Action) | 91,900 |
| Total New Visitor Spending Annually (over No Action) | $7,080,000 |
| Less New Haines Resident Spending in Juneau Annually | $1,280,000 |
| Net Change in Visitor Spending in Haines Annually | $5,800,000 |
| New Local Payroll Annually (over No Action) | $2,160,000 |
| New Local Employment Annually (over No Action) | 60 |

Note: Numbers may not total exactly due to rounding.

Each new job in the Haines economy would result in a population increase of about 1.5 people.[22] Therefore, for the 60 new jobs in Haines, the population would increase by about 90 residents or about 3.6 percent of the existing Haines population (2015 population is estimated at about 2,493).

A traffic-related population increase of 90 residents would result in additional demand for about 26 housing units based on 3.4 persons per household (from 2010 Census data). Improved access would enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors. To the extent that this occurs, demand for property in Haines would increase. Further, because of land availability in Haines and its drier climate when compared to Juneau, additional Juneau residents may seek seasonal or year-round homes in Haines with Alternative 2B. Finally, improved access to the Kensington Gold Mine could result in demand among mine workers for Haines area housing. This impact could range from a few to several dozen housing units, depending on how ferry schedules mesh with mine shift schedules, ferry rates, availability of company-provided transportation, and other factors. The housing demand that would be stimulated by Alternative 2B may increase housing development in Haines and increase local property values as well as property taxes.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of about $7.08 million annually would generate about $389,000 in additional sales tax revenues (based on a 5.5 percent tax rate). Haines would also

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

receive an increase in property tax revenues as a result of the potential increase in private property values mentioned above.

**Industry/Commercial Sectors –** Haines is having difficulty maintaining a position in the independent and cruise visitor markets. Independent visitor travel to Haines has been declining, direct cruise traffic has been erratic, and the local visitor industry has a growing dependence on Skagway cruise passengers taking excursions to the Haines area. Alternative 2B would affect Haines' non-Alaskan independent market but would not affect the cruise market.

As indicated previously, visitor traffic to Haines is expected to increase with Alternative 2B. The economic impact of this change in traffic depends primarily on visitors' length of stay. The key factor regarding length of stay now and after construction of Alternative 2B would be the degree to which Haines develops and promotes local assets and attractions.

Alternative 2B would provide better opportunities for Haines residents to find employment with the Kensington Gold Project or for employees of the mine to relocate to Haines. The mine is within the CBJ but about equidistant between Haines and Juneau. A variety of factors could persuade employees to live in Haines, including housing affordability, smaller schools, access to fish and game resources, and quality of life associated with residing in a smaller community.

Alternative 2B would affect freight movement to and through Haines. Haines is an important transshipment point, linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. Waterborne freight arrives in Haines on a weekly basis through AML barge service. AMHS ferries also provide freight service to Haines.

The critical issue for local commercial truck drivers is AML's plans for serving Haines should a highway be constructed. AML currently has three to four full-time truckers living in Haines, and they often add one to two additional staff in the summer. Representatives of AML have stated that they would not alter their barge service to Haines should a highway be constructed. The cost of off-loading vans in Juneau and trucking to Haines would not be competitive with continued barge service to Haines. Freight containers that are now shipped to Haines on the AMHS ferries, however, would be off-loaded at Auke Bay, and trucked to Haines via East Lynn Canal Highway and the Katzehin ferry. Note that under Alternative 1 – No Action, unaccompanied vans would be allowed on the mainliners but would not typically be allowed on the Day Boat ACFs. Unaccompanied vans that use the mainliners under Alternative 1 – No Action would be affected and shippers would need to switch to a different method of transportation. The cost to ship a container in either direction between Haines and Juneau is estimated to be similar to the cost of shipping an unaccompanied van trailer or up to 5 percent higher (see Revised Appendix EE, *Socioeconomic Effects Technical Report*, for detail on container shipments). Because only 3 percent of Lynn Canal freight containers are shipped by AMHS, this potential change is not expected to have any noticeable effect on overall consumer prices in Haines.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 2B is based on interviews with public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

School enrollment is a function of population. Because population impacts are expected to be minimal (i.e., 90 new residents in 2055), the same would be true of impacts on enrollment. The increase in students resulting from Alternative 2B would be about 20 spread across all grades, assuming enrollment increases at the same rate as population.

The cost of transporting students to Juneau and other southeast communities could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day.

Solid waste, hazardous waste, and electric utilities would not be affected in the Haines Borough by the development of Alternative 2B based on the potential population growth associated with this alternative through 2055. Haines' water supply and wastewater treatment system is adequate to accommodate 10 percent population growth. Alternative 2B would generate a maximum of about 6 percent population growth. This growth would not be sufficient to require expansion of these public utilities.

Improved access could make it somewhat easier and faster to transport patients either on an emergency or a scheduled basis to Juneau from Haines. However, air transport for medical emergencies would remain the method of choice. The Haines Medical Clinic is operated by Southeast Alaska Regional Health Consortium (SEARHC). SEARHC is a regional organization with substantial facilities in Juneau. Improved access between Juneau and Haines would reduce cost and increase the efficiency of SEARHC operations by facilitating movement of staff, supplies, and samples between SEARHC locations.

Increased traffic through and to Haines would place additional demands on the community's fire and emergency response services. If fire and emergency response personnel respond to incidents outside current service areas, which includes the portion of the Haines Borough on the east side of Lynn Canal, it would reduce capacity to deliver normal services while those personnel and equipment are occupied. Any influx of new traffic is not likely to be large enough to affect the basic level of local demand for fire and emergency response services in Haines.

The Haines Police Department does not expect substantial impacts from improved access. Most crime in Haines involves local residents in spite of its highway connection to the north. Although the northern segment of Alternative 2B is in the Haines Borough, patrol and enforcement would generally be conducted by Alaska State Troopers.

**Quality of Life –** Alternative 2B would change Haines' quality of life in a number of ways. The household surveys indicate that 87 percent of Haines residents agreed that improved access to their community is important. In the 1994 household survey, Haines residents cited increased recreation opportunities, economic growth, and better access to health care and job markets as potential improvements to quality of life that could result from a highway. The principal negative impact on quality of life cited by Haines residents was social change, such as increased crime and the appearance of undesirable transients, increased traffic, and declining local businesses. As discussed previously and in Section 4.3.7, traffic would increase in Haines with Alternative 2B. It is also projected that residents of Haines would increase their spending in Juneau. For Alternative 2B, increased spending in Juneau may be offset by increased visitor spending, though a shift in consumer type may have an impact on the types of retail businesses in Haines. There is no evidence that crime would increase in Haines because of Alternative 2B because as most crime in Haines involves local residents in spite of the community's highway connection to the north.

#### 4.3.5.4 Skagway

**Population, Economics, Housing, and Municipal Revenues** –Alternative 2B is predicted to generate 365 annual ADT in Skagway in 2055, an increase of 335 trips relative to the No Acton Alternative, which would affect population, economics, housing and municipal revenues in the region (see Revised Appendix AA, *Traffic Forecast Report*). Traffic on Alternative 2B is predicted to remain relatively constant over the 30-year period between 2025 and 2055, changing from 360 to 365 annual ADT.

Based on the 1994 household survey (McDowell Group, 1994) conducted for this project, Skagway households spent a total of about $900,000 that year in Juneau. If the 1994 spending data were adjusted for inflation, annual Skagway household spending in Juneau would total about $1.4 million in 2012. There were 386 households counted in Skagway in the 2010 Five-Year American Community Survey (U.S. Census Bureau, 2010c). After adjusting for population, and assuming Skagway household spending habits are the same, Skagway residents likely spent approximately $1.9 million in Juneau in 2012.

In the 1994 survey, 72 percent of Skagway households indicated that their spending in Juneau would increase with improved access.

Despite this leakage from the Skagway economy, Alternative 2B is expected to economically benefit the community. The total increase in visitor traffic to Skagway associated with Alternatives 2B is estimated to be 245 annual ADT in 2055. Growth in Juneau resident travel accounts for the majority of this traffic increase, as the 1994 *Juneau Access Household Survey* (McDowell Group, 1994) measured a strong interest among Juneau residents for more travel to Skagway (residents predicted traveling three times more frequently to Skagway with highway access).

This increase in annual ADT is projected to result in an increase in visitors to Skagway by as much as 102,800 annually. Independent visitors would spend an average of $77 per visitor per day in Skagway (McDowell Group, 2012a). This expenditure would result in an annual increase in visitor spending of approximately $7.92 million (Table 4-21). This net increase in visitor spending in Skagway would generate an annual average of approximately $2.95 million in new payroll and 80 new jobs (Table 4-21).

**Table 4-21:**
**Alternative 2B Projected Traffic and Resulting Visitor Economic Impacts in Skagway, 2055**

| | **2055** |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 30 |
| Total Traffic under Alternative 2B (annual ADT) | 365 |
| Change in Traffic (annual ADT) (over No Action) | 335 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 245 |
| Total New Visitors Annually (over No Action) | 102,800 |
| Total New Visitor Spending Annually (over No Action) | $7,920,000 |
| New Local Payroll Annually (over No Action) | $2,950,000 |
| New Local Employment Annually (over No Action) | 80 |

Note: Numbers may not total exactly due to rounding.

Because of the nature of much of the Skagway population, each new job in the economy results in a population increase of about 1.5 people. Therefore, with increased visitor spending creating 80 new jobs in Skagway, the population of Skagway would increase by about 120 new residents under Alternative 2B.

Under Alternative 2B, the Day Boat ACF would be based in Skagway, changing from its homeport location of Auke Bay under Alternative 1 – No Action. Assuming that all the crew members and their families relocate from Juneau to Skagway, Skagway would experience an additional increase of 35 residents for a total of 155.

A population increase in Skagway of 155 residents would represent an overall increase of 14.9 percent over the year-round population of the community (2015 year-round population is estimated at about 1,040) and approximately 6.2 percent over the summer population of approximately 2,500 (SDC, 2013).

A population increase of 155 residents would result in additional demand for about 62 housing units (based on the 2010 Census Skagway average of 2.5 persons per household). The 2010 U.S. Census indicated that Skagway has about 152 vacant housing units, not including seasonal, recreational, and occasional use units. Skagway has a shortage of affordable homes for first-time home buyers and a lack of seasonal employee housing which may make it difficult to accommodate the projected demand. During the summer, this demand would be harder to meet as less housing is available during the summer season. It is likely that the private sector would respond by constructing additional single-family and multi-family housing if residential land is available. This increase in housing demand would have a strong seasonal component and would result in an increase in local property values with a corresponding increase in property tax.

Skagway would experience an increase in sales and bed tax revenues in conjunction with increased visitor spending. The $7.92 million estimated annual increase in visitor spending would generate as much as $317,000 in additional sales tax revenues (based on a 4 percent tax rate). Additional bed tax revenues would also be generated.

**Industry/Commercial Sectors –** Alternative 2B would affect tourism in Skagway, particularly the non-Alaskan independent visitor market. Construction of a highway on the Alternative 2B alignment would not alter cruise lines' decisions on port calls in either community. Concern has been expressed about the possible loss of cruise ship traffic to Skagway if a highway were constructed to Juneau. The concern is that in an effort to reduce fuel costs and travel times, cruise lines would bus passengers to Skagway rather than make a port call.

Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety.

Members of the NorthWest CruiseShip Association (NWCA) discussed the proposed highway alternatives during the 2003 NWCA Operations and Technical Committee meeting as well as the Government Affairs and Community Relations Committee meeting. As a follow-up to their discussions, NWCA sent a letter to the Governor of Alaska stating that construction of a highway would have no effect on members' itineraries. NWCA estimated its member lines carry 97 percent of Alaska cruise passengers. Given that cruise line managers think that a direct highway link would not affect their operations, Alternative 2B is unlikely to have any effect.

(The NWCA, now the North West & Canada division of the Cruise Lines International Association (CLIA), consists of Carnival CruiseLine, Celebrity Cruises, Crystal Cruises, Disney Cruise Line, Holland America, Norwegian Cruise Line, Princess Cruises, Oceania Cruises, Regent Seven Seas Cruises, Royal Caribbean Cruise Line, and Silversea Cruises.)

Regional managers for Princess Tours and Gray Line, the primary ground transportation providers for all large ships have stated that terminating voyages in Juneau and busing cruise ship passengers to/from Skagway is not feasible due to limitations regarding tour capacity, pricing, and timing. A round-trip bus excursion would require a minimum of 7 hours and would require a ferry link, leaving little time for passengers to experience the sites and activities in Skagway or the popular rail excursion. Although a flight and bus tour combination might reduce the overall transportation time, this option is not practical due to the high cost of the flight, capacity limitations, and potential for weather cancellations. Given these factors, it is not likely that bus excursions would replace cruise ship port calls in Skagway.

The other concern expressed during public scoping is the aesthetic impact a highway visible from the water would have on the quality of the cruise experience in Lynn Canal. According to cruise operators, it is likely that Alternative 2B would have little or no effect on current cruise itineraries. Cruise ships generally sail at night and visit a port during the day; therefore, the aesthetic impact of the highway is not an issue for the cruise industry.

Skagway is also an important transshipment point linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. In 2010, 70,427 tons of freight moved through the Skagway port, with almost half (45 percent) of the freight being petroleum products (USACE, 2010b). Freight is also transported by AMHS.

Under Alternative 2B, AMHS freight containers bound for Skagway would be trucked on the East Lynn Canal Highway from the Auke Bay Ferry Terminal to the Katzehin Ferry Terminal and then ferried with the driver on the shuttle ferry to Skagway. The cost of transporting these vans over Alternative 2B's highway and then by shuttle ferry from Katzehin is estimated to be about 10 percent higher than the cost of all-ferry transport. Because only a small fraction of freight would be affected by this change, resulting changes in consumer costs in Skagway are expected to be minimal (see Revised Appendix EE, *Socioeconomic Effects Technical Report*, for detail on container shipments).

With the exception of freight currently moved from Juneau to Skagway on the ferry, Skagway is not expected to see any change in waterborne freight service with Alternative 2B. The cost of off-loading vans or fuel from barges in Juneau, trucking to Katzehin, and then shuttling to Skagway is more than the cost associated leaving freight on the barges.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternatives 2B are based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

School enrollment is a function of population. Because population impacts are expected to be minimal (i.e., 155 new residents in 2055), the same would be true of impacts on enrollment. The increase in students resulting from Alternative 2B would be about 10 spread across all grades.

The cost of transporting students to Juneau and other southeast communities could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day.

Alternative 2B would increase demands for water supply, wastewater treatment and solid waste disposal in the Municipality of Skagway Borough. Current water supply capacity for the community is adequate for the current population and for supplying cruise ships in the summer. A booster station was recently completed at 17th Avenue and State Street, which includes a new well and pump to improve water pressure for the north end of town (Municipality of Skagway, 2009). Skagway's wastewater treatment system operates at near full hydraulic capacity for short periods of time during the fall wet season, and the wastewater volumes are higher during the summer due to the large number of visitors in town and the commercial bus lines that empty their wastewater systems for processing in Skagway. Increased summer visitor traffic associated with Alternative 2B would not measurably affect this fall peak, but could increase summer volumes. The treatment plant is presently being upgraded (State of Alaska, 2010). Overall, the system is adequate for the next 20 to 25 years (Lawson, personal communication 2013). Skagway's solid waste incinerator is adequate for non-peak demand but operates at capacity due to the heavy cruise traffic during the summer peak. A rebuild of key equipment at the plant is presently underway. Anticipated growth in cruise ship traffic would place additional demands on the system. A permit has been acquired for the Municipality of Skagway to expand its landfill capacity. Although the Municipality has yet to initiate construction, Alternative 2B would not affect its plans for expansion.

The Dahl Memorial Clinic is operated by the Municipality of Skagway Borough. This clinic does not offer inpatient care, and overnight or long term care patients are transferred to Sitka (SEARHC) or Juneau. Improved access between Juneau and Skagway could make it easier and faster to transport patients to inpatient care facilities, and reduce cost and increase the efficiency of health care operations in northern Southeast Alaska. However, air transport would likely remain the method of choice.

The emergency response demands resulting from additional traffic would have a small impact the SVFD. The SVFD's small size and reliance on volunteers would make responding to multiple emergencies difficult, but the service area (Skagway to the Canadian border) would not change. Continued growth in demands on SVFD resources could strain present SVFD resources and could require additional paid staff.

The Skagway Police Department does not expect a substantial increase in activity as a result of Alternative 2B. The department adds four seasonal officers to address the influx of summer population and visitors and believes that this action is enough to handle the additional demand that would be generated by Alternative 2B.

Police incidents in Skagway tend to involve residents, seasonal workers, cruise visitors, and Canadian visitors. The proportion of non-resident arrests is relatively high, perhaps 75 percent by department estimates. Police activity occasionally correlates with the celebration of Canadian holidays, when visitors drive down the Klondike Highway to Skagway.

**Quality of Life –** In 1994, Skagway residents indicated that increased tourism, economic growth, and enhanced recreational opportunities would be the principal benefits of improved access in Lynn Canal (McDowell Group, 1994). Negative impacts on quality of life from improved access cited by Skagway residents included increased crime, the presence of undesirable transients, and loss of spending in local businesses. In the 2003 household survey

(Appendix I of the 2005 Supplemental Draft EIS), most Skagway residents said that improved access to Juneau is important (24 percent) or very important (59 percent). Many residents said the best way to provide surface access is by ferry (53 percent), while 41 percent chose a highway. Much of the concern Skagway residents appear to have with a highway is the potential loss in cruise ship visitors and the resulting economic loss for the community. As discussed under "Industry/Commercial Sectors," the cruise ship industry has indicated that the presence of a highway between Juneau and Skagway would not change its plans for calling on Skagway. Therefore, a highway between Juneau and Katzehin would similarly not affect cruise operations.

### 4.3.6 Subsistence

Alternative 2B would not affect subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty islands, the lands adjacent to Taiya Inlet, or the south shore of James Bay. It would not affect subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

Haines and Skagway residents use the Katzehin River area for subsistence harvest of marine invertebrates and marine mammals. Alternative 2B, combined with USFS plans for potential public access locations along the highway, would increase access to areas for subsistence harvest activities that previously were accessible only by boat or aircraft. This access could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but for others the increased competition for resources would be negative.

Juneau is not recognized as a subsistence community under the Alaska National Interest Lands Conservation Act. However, some residents of Juneau use Berners Bay and Lynn Canal for personal use harvests of fish and shellfish. See Revised Appendix DD, *Land Use Technical Report*, for additional detail regarding subsistence.

After reviewing the 1988 Tongass Resource Use Cooperative Study (Kruse and Frazier, 1988), harvest data from ADF&G (1994), 2003 scoping comments for development of the 2005 Supplemental Draft EIS, comments received at the 2005 Supplemental Draft EIS public hearing, comments received from Cooperating Agencies on the 2005 Preliminary Final EIS, comments received following circulation of the 2006 Final EIS, comments received during 2012 scoping for the Draft SEIS, and comments on the 2014 Draft SEIS, the FHWA has determined that Alternative 2B would not significantly restrict subsistence uses.

### 4.3.7 Transportation

The 2004 SATP calls for construction of a highway from Juneau to Skagway with a ferry from Katzehin to Haines. Alternative 2B is not consistent with the 2004 SATP because the East Lynn Canal Highway would end at Katzehin, not Skagway; and a ferry would transport travelers between Katzehin and Skagway. The DOT&PF is updating the SATP to reflect the identification of Alternative 1 – No Action as the recommended improvement in the plan.

DOT&PF's 2016–2019 STIP (Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. Alternative 2B is not consistent with the 2016-2019 STIP, while Alternative 1 – No Action is consistent with the currently adopted STIP.

#### 4.3.7.1 Demand and Capacity

Traffic demand for Alternative 2B was projected for 2025 and 2055 using the transportation model summarized in Section 4.1.5. These projections were based on 2015 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel time, value of time and frequency of delay. The travel demand expressed as ADT is a combination of the demand between Juneau and Haines and Juneau and Skagway. It is also, therefore, an estimate of the through traffic on the highway segments common to both destinations.

Projected traffic demand in 2025 for Alternative 1 – No Action and Alternative 2B is provided in Table 4-22. A comparison between Alternative 1 – No Action and Alternative 2B indicates that Alternative 2B would realize and accommodate substantially more travel demand in the Lynn Canal corridor than Alternative 1 – No Action. Approximately 10 times as much traffic would travel under Alternatives 2B than on the AMHS system under Alternative 1 – No Action in 2055.

**Table 4-22:**
**2025 Forecast Demand and Capacity Juneau to/from Haines and Skagway for Alternative 1 – No Action and Alternative 2B**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1 – No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |
| 2B | 810 (450/360) | 1,260 (700/560) | 495 (275/220) | 3,090 (1,720/1,370) | 1,484 (848/636) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

Table 4-23 provides projections of traffic demand and capacity in 2055 for Alternative 1 – No Action and Alternative 2B. These projections reflect the slight increase in population over the 30-year period. Approximately 10 times as much traffic would travel on Alternative 2B than on the AMHS system under Alternative 1 – No Action in 2055.

**Table 4-23:**
**2055 Forecast Demand and Capacity Juneau to/from Haines and Skagway for Alternative 1 – No Action and Alternative 2B**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1—No Action | 80 (50/30) | 125 (80/45) | 50(30/20) | 300 (190/110) | 154 (93/61) |
| 2B | 820 (455/365) | 1,270 (705/565) | 495 (275/220) | 3,115 (1,730/1,385) | 1,484 (848/636) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

The capacity of Alternative 2B is limited by the capacity of the ferry link between Katzehin and Haines and Skagway. It is projected that the average daily summer demand for this ferry travel between Juneau and Skagway or Juneau and Haines would be as much as 1,270 vehicles. The number of ferry trips between Haines and Katzehin and Katzehin and Skagway has been set to accommodate the projected summer ADT to and from both communities. Some ferries may be at maximum capacity, resulting in travelers having to wait for the next ferry or change their preferred ferry time. Alternative 2B would accommodate approximately 48 percent of the peak week ADT in 2025 and 2055. During peak times and for specific events, additional sailings would be provided to meet the demand. In such cases, AMHS would add ferry trips by operating on longer daily schedules.

Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternative 2B would realize and accommodate approximately 76 percent of the latent summer demand.

The projected local[23] travel demand between Haines and Skagway with Alternative 2B is the same as Alternative 1 – No Action (i.e., summer ADT is projected to be approximately 53 vehicles in 2025 and in 2055 for both Alternative 1 – No Action and Alternative 2B). The projected summer daily capacity on the Haines-Skagway shuttle is 72 vehicles, which would accommodate the demand between Haines and Skagway.

### 4.3.7.2 Travel Flexibility and Opportunity

Alternative 2B would provide increased flexibility and opportunity for travel between Juneau and Haines or Skagway, relative to Alternative 1 – No Action. Under Alternative 2B, travel between Juneau and Haines and Juneau and Skagway would be linked to ferries from Katzehin. In the summer, there would be eight round trips per day between Katzehin and Haines and six round trips per day between Katzehin and Skagway. In winter, service would decrease to six round-trips per day to/from Haines and four round trips per day to/from Skagway.

As a result of wind and wave conditions in Lynn Canal, ferry cancellations may occur (as they could under any of the alternatives). In winter, the road would be closed at times because of weather conditions or avalanches. As indicated in Section 4.3.8.2, Alternative 2B roadway would be closed an average of about 12 days per year. Service to and from Juneau during a road closure would be by one or more of the Day Boat ACFs that would be part of Alternative 2B. Generally, a Day Boat ACF would be used for this purpose if the road were closed for more than 1 day. The maximum anticipated duration of any avalanche related closure is 2 days (see *2017 Update to Appendix J ‑ Snow Avalanche Report* in Appendix Z). The Day Boat ACF could transport 53 vehicles to/from Auke Bay. This same ferry could shuttle additional vehicles in each direction if Coeur Alaska’s Slate Cove dock were available. See Section 4.3.8.2 for more detail.

For through-travelers using the AMHS mainline ferry service to access Haines or Skagway from ports south of Juneau (or vice versa), the travel pattern would be altered because mainline ferry service would terminate at Juneau. Through-travelers would disembark at Juneau/Auke Bay and would drive north on the East Lynn Canal Highway and then take the shuttle ferry to Haines or Skagway. For people in vehicles, this likely would be a minor change in travel flexibility or opportunity. For walk-on ferry passengers, an additional step of reserving a rental car, using public transportation, reserving an airplane seat, or finding a ride would be required. Such passengers likely would see this requirement as reducing reduction in travel flexibility and opportunity.

During winter, no direct Haines-Skagway shuttle would operate: one vessel would operate between Skagway and Katzehin, and the second vessel would operate between Haines and Katzehin. Haines-Skagway travelers would have to ride one ferry to the Katzehin Ferry Terminal

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[23] For the purposes of this SEIS, “local” refers to passenger and vehicle traffic that only goes back and forth between Haines and Skagway; i.e., it is traffic that either boards in Haines and disembarks in Skagway, or boards in Skagway and disembarks in Haines. This local Haines-Skagway travel demand is not considered part of the overall demand for travel to and from Juneau in Lynn Canal.

and then transfer to the other ferry. This routing reduces traffic demand and allows for annual maintenance on the vessels. Each winter, the three vessels would be serviced one at a time, while the remaining two continued to operate. Even with only two vessels operational in winter, there would be multiple trips per day versus the few trips per week in Alternative 1 – No Action.

#### 4.3.7.3 Travel Time

Table 4-24 provides a comparison of travel times between Alternative 1 – No Action and Alternative 2B. Travel times are based on the assumption of an average highway travel speed of 45 mph and include load and unload time for ferry travel. Under Alternative 2B, travel between Auke Bay and Skagway would take approximately 4.0 hours, and travel between Auke Bay and Haines would take about 3.3 hours.

Alternative 2B would take approximately 2.9 hours less than Alternative 1 – No Action to travel between Auke Bay and Haines. Alternative 2B would take approximately 4.1 hours less to travel between Auke Bay and Skagway. The Alternative 2B travel time is based on approximately half the travelers arriving randomly due to the frequency of the ferry schedule, while the other half would time their arrival to match the schedule.[24] Missing a scheduled departure due to lateness or a full boat would entail a 2-hour wait for the Haines-Katzehin shuttle, and about a 3-hour wait for the next Skagway-Katzehin shuttle. Similarly, some travelers under Alternative 1 – No Action would plan to arrive before the minimum check-in time to avoid the possibility of losing their reservations.

**Table 4-24:**
**Summer Travel Times for Alternative 1 – No Action and Alternative 2B**

| Route | Travel Time (hours) | |
|---|---|---|
| | Alternative 1 – No Action (Day Boat ACF) [1] | Alternative 2B |
| Auke Bay-Haines | 6.2 | 3.3 |
| Auke Bay-Skagway | 8.1 | 4.0 |

[1] With Alternative 1 – No Action, the mainline ferry (i.e., service along the length of the system, from Bellingham, Washington, or Prince Rupert, B.C.) would have a travel time of 7.2 hours between Auke Bay and Haines and 9.1 hours between Auke Bay and Skagway.

Summer travel times between Haines and Skagway under Alternative 2B would remain unchanged (2.4 hours) relative to Alternative 1 – No Action. Winter travel times would increase under Alternative 2B compared to Alternative 1 – No Action. During winter, no direct Haines-Skagway shuttle would operate: one vessel would operate between Skagway and Katzehin and the second vessel would operate between Haines and Katzehin. Haines-Skagway travelers would need to ride one ferry to the Katzehin Ferry Terminal and then transfer to the other ferry.

#### 4.3.7.4 State and User Costs

The 36-year life-cycle costs[25] for Alternative 1 – No Action and Alternative 2B discounted to 2016 dollars are provided in Table 4-25. These costs include State and federal capital costs and

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[24] On shuttle ferry systems with relatively short runs, multiple round trips per day, and capacity to meet projected demand, taking reservations is an unnecessary expense and would also increase travel time.

[25] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 6-year construction period and a 30-year operation period discounted to 2016 dollars.

State maintenance and operating expenses. Capital costs include design, ROW acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

**Table 4-25:**
**Thirty-Six-Year Life-Cycle Costs for the No Action Alternative and Alternative 2B**

| Alternative | Capital Cost ($million) | Operating Cost ($million) | Total Life-Cycle Cost ($million) |
|---|---|---|---|
| 1—No Action | $119 | $322 | $441 |
| 2B | $511 | $356 | $867 |

Table 4-26 provides an estimate of total project life costs less residual value, expressed in 2016 dollars with no discounting of future costs. The total project life cost over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $1.2 billion (capital plus operating costs, Table 4-26). As indicated in the table, the capital cost of Alternative 2B would be higher than Alternative 1 – No Action due to the required highway and ferry terminal facilities.

**Table 4-26:**
**Thirty-Six-Year Total Project Life Costs for Alternative 1 – No Action and Alternative 2B, 2019-2054 (2016 Dollars)**

| Alternative | Total Funds | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $378 | $279 |
| 2B | $416 | $740 | $1,156 | $778 | $371 | $407 | $43 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

Table 4-26 indicates that the net cost to the State of Alternative 2B during the analysis period would be about $29 million more than Alternative 1 – No Action. This is because both the capital and operating costs for Alternative 2B would be greater than those associated with Alternative 1 – No Action. Alternative 2B would carry more vehicles than Alternative 1 – No Action and, therefore, Alternative 2B would cost the State less than Alternative 1 – No Action on a per vehicle basis.

Alternative 2B would have an annual operating cost of approximately $20.9 million versus $18.2 million for Alternative 1 – No Action.

The anticipated total costs[26] of travel between Juneau and Skagway or Haines for travelers are listed in Table 4-27 for Alternative 1 – No Action and Alternative 2B. This table also lists the out-of-pocket cost[27] of travel between Juneau and Skagway or Haines for the same travelers. As indicated in the table, Alternative 2B would reduce the total travel cost by nearly two thirds of the cost to travel on a mainline vessel under Alternative 1 – No Action. The out-of-pocket cost

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[26] Total user costs are out-of-pocket costs and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

[27] Out-of-pocket costs are a combination of estimated fares and gasoline on highway segments. Fares for Alternative 1 – No Action are actual 2015 fares charged.

(fuel and fares) for a family of four in a 19-foot-long vehicle to/from Haines with Alternative 2B would be approximately one-fifth the cost of Alternative 1 – No Action. To and from Skagway, the Alternative 2B out-of-pocket cost is approximately one-fourth the cost of Alternative 1 – No Action. The out-of-pocket cost for a driver with a 19-foot-long vehicle to/from Haines and Skagway also would be approximately one-fourth of the Alternative 1 – No Action cost. For a walk-on passenger, the cost would be approximately one-eighth the Alternative 1 – No Action cost to/from Haines (excluding the cost of transportation to/from the Katzehin Ferry Terminal) and approximately one-tenth the cost to/from Skagway.

**Table 4-27:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Cost for Alternative 1 – No Action and Alternative 2B**

| Alternative | Example Scenario | Haines User Cost[1] | | Skagway User Cost[1] | |
|---|---|---|---|---|---|
| | | Total User Cost | Out-of-Pocket Cost | Total User Cost | Out-of-Pocket Cost |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on Passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |
| 2B | Family of 4 in a 19-foot vehicle | $81.50 | $47.00 | $100.50 | $67.50 |
| | Driver only in a 19-foot vehicle | $69.00 | $34.50 | $79.00 | $46.50 |
| | Walk-on passenger[2] | $5.00 | $5.00 | $8.50 | $8.50 |

[1] Total cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the Katzehin Ferry Terminal. Including transportation between Katzehin and Auke Bay Ferry Terminals, the cost to/from Haines is estimated to be between $42 and $60, while the cost to/from Skagway is estimated to be between $50 and $68.

Based on total user costs, travel time cost, and the projected travel in the Lynn Canal corridor through 2054, total user benefits in terms of reduced travel cost for Alternative 2B in 2016 dollars is provided in Table 4-28. As indicated in that table, Alternative 2B would provide benefits to travelers of $128 million relative to Alternative 1 – No Action during the 36-year period.

**Table 4-28:**
**User Benefits and Net Present Value of Alternative 2B versus Alternative 1 – No Action[1]**

| Alternative | User Benefits ($million) | Net Incremental Project Costs ($million)[2] | Net Present Value ($million) |
|---|---|---|---|
| 2B | $128 | $479 | -$351 |

[1] For the period 2019 to 2054 discounted to 2016 dollars.

[2] Overall project costs minus revenues.

One economic measure of an alternative is its net present value. Net present value is the total of the user benefits minus the net cost of an alternative over and above the net cost of Alternative 1 – No Action for a given period of time. The 2019 to 2054 net present values of Alternative 2B are provided in Table 4-28. The net present value of Alternative 2B for this period is about negative $351 million because the incremental project costs are greater than the user benefits provided.

#### 4.3.7.5 Other Transportation Impacts

**Freight –** Water transportation is the primary method of moving freight within Lynn Canal. Freight is transported from Seattle by barge to Juneau, Skagway, and Haines. AMHS ferries also move limited amounts of freight in vans to and between the communities of Lynn Canal. Haines and Skagway are important transshipment points, linking Inside Passage barge and ferry freight to the Yukon and Interior Alaska.

Alternative 2B would not substantially alter barged freight traffic between Juneau and Seattle. As noted in Section 4.3.5, AMHS transports less than 3 percent of freight in Lynn Canal and the freight is almost always transported on unaccompanied van trailers (i.e., without tractor or driver). Under Alternative 2B, van trailers would be unloaded at Juneau (Auke Bay), and drivers would transport the cargo by road to Katzehin and from there on the shuttle ferry to Haines or Skagway and their final destinations. Note that under Alternative 1 – No Action, unaccompanied vans would be allowed on the mainliners but would not typically be allowed on the Day Boat ACFs. Unaccompanied vans that use the mainliners under Alternative 1 – No Action would be affected and shippers would need to switch to a different method of transportation. Under Alternative 2B, the cost of shipping a container from Juneau to Haines is estimated to be similar or slightly greater, and about 10 percent greater to Skagway, when compared to Alternative 1 – No Action. The shipment transit time would be reduced by about half. Because the majority of freight goes by barge and because barge service is not anticipated to change, costs to consumers overall are unlikely to change noticeably (see Revised Appendix EE, *Socioeconomic Effects Technical Report,* for details on container shipments).

Trucking companies servicing other Alaska communities were asked to approximate the cost of trucking between these two cities if a highway were available. Those estimates averaged about $0.25 per pound of freight compared to the existing barge freight cost of $0.05 per pound. Although trucking goods from Seattle is not competitive with barge service, a highway with ferry link to Juneau may provide opportunities for transporting time-sensitive freight, such as fresh fish. Air freight, which currently serves this function, costs between $0.53 and $0.77 per pound between Juneau and Seattle.

Alternative 2B would not result in a change in scheduled barge service to Haines and Skagway. Freight that now moves from Juneau to Haines and Skagway on the ferry would instead be trucked at a lower cost.

**Air Taxi –** Alternative 2B is likely to divert traffic from the air taxi operations currently serving Lynn Canal. The degree to which travelers might change their current air travel behavior would depend on travel times and costs.

**AMHS –** With Juneau serving as the northern terminus for mainline AMHS ferry service under Alternative 2B, the AMHS would only need to operate short ferry routes in Lynn Canal. The change in schedule and routes would free up mainline ferry operating time: approximately 18 hours in winter and 36 hours in summer. With these additional hours, the mainline ferry could stop at additional ports, spend more time in existing ports, or operate at slower speeds for better fuel efficiency, depending on the assessed needs and level of State support available.

The projected average annual AMHS operating costs and estimated AMHS State support for Alternative 2B in 2055 are provided in Table 4-29. As indicated in the table, Alternative 1 – No Action is estimated to require State funding of about $10.1 million in 2055. Alternative 2B is estimated to require State funding in 2055 of $7.7 million, approximately $2.0 million less than the funding that would be required for Alternative 1 – No Action.

**Table 4-29:**
**Annual AMHS Operating Costs, Revenues, and Estimated State Funding for Alternative 1 – No Action and Alternative 2B**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue[1] ($million) | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |
| 2B | $18.5 | $10.8 | $7.7 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF).

[1] Fare box revenue paid to AMHS; excludes gas tax receipts.

[2] Revised total is due to (1) the updating of costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Safety** – Available statewide crash information indicates the crash rate for Rural Other Principal Arterials between 2002 and 2012 averaged 168.73 crashes per 100 million vehicle miles traveled (VMT). Based on this statewide crash rate information and 2055 traffic projections, it is anticipated that there would be approximately 38.5 crashes per year on the East Lynn Canal Highway. In the 30-year operation period (2025 through 2055), it is estimated there would be approximately 1,156 crashes.

The fatal crash rate on Rural Other Principal Arterials between 2002 and 2012 averaged 2.06 fatal crashes per 100 million VMT. Based on this statewide fatal crash rate information, there are projected to be approximately 14 traffic fatalities over the 30-year (2025 to 2055) study period on Alternative 2B.

There have been no fatalities on the AMHS system since 1975. There was a fatality in 1975 when the *M/V Malaspina* ran over a fishing boat, resulting in the drowning of one person. The National Transportation Safety Board (NTSB, 2013) reports one case in which an AMHS vessel, the *M/V LeConte*, ran aground north of Sitka causing $3 million in property damage, including extensive hull damage, and one injury (NTSB, 2004). The NTSB also reports two cases of electrical fires onboard the *M/V Columbia*, one that caused the ship to lose propulsion and passengers to be evacuated. In this case, minor reportable injuries occurred to passengers, although they were not directly attributed to the fire (NTSB, 2000 and 2003). The other fire aboard the *M/V Malaspina* occurred while the ship was in drydock, so no evacuations were needed and no passengers were injured (NTSB, 2012). Alternative 2B is likely to result in little change to the number or types of accidents on the AMHS system.

**Capital Move –** Lack of highway access is often cited by capital move proponents as one of the reasons to move the state capital. Alternative 2B would not provide a direct highway link to Juneau, but would improve access in terms of cost, frequency, and capacity. This may reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the state capital.

**Pedestrians and Bicyclists** – The highway proposed for Alternative 2B would include 4-foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Ferries for this alternative would accommodate bicyclists and foot passengers.

For Alternative 2B, DOT&PF anticipates that fewer people would be ferry walk-on passengers when compared to existing conditions and Alternative 1 – No Action. The percentage of AMHS walk-on passengers that would choose to travel in their own vehicle if Alternative 2B were selected for the project would depend on a variety of factors such as the cost, frequency, and convenience of a bus or van service. Based on the 2010 Census, approximately 90 percent of the households in Juneau, Haines, and Skagway own at least one vehicle, and 45 to 80 percent of the households own two or more vehicles. Travelers without vehicles would have to rent a vehicles, take a commuter flight, travel on a private carrier (such as a taxi, or shuttle service if they develop), or find a ride with someone to accommodate this demand.

The one-way out-of-pocket user cost of travel to/from Juneau to Haines or Skagway for a passenger with a car under Alternative 2B would be lower than the cost for a walk-on passenger under Alternative 1 – No Action, and it would appear to be more convenient to have a car to travel between Juneau and Katzehin. While transportation services may be developed by private entities to accommodate walk-on passengers, the cost, frequency, and convenience of a bus or van service would depend on the size of the market. Following completion of highway construction, there would be a period of transition as entrepreneurs or established service providers tested the market by offering some moderate level of service, such as one or two round-trips daily between communities during the summer.

Table 4-30 presents a projection of the number of passengers, including the number of walk-on passengers, during summer for Alternative 1 – No Action and Alternative 2B (see Revised Appendix AA, *Traffic Forecast Report*). With Alternative 2B, it is projected that there would be 95 walk-on passengers during summer, representing approximately 3 percent of the forecast for total number of summer passengers.

**Table 4-30:**
**Average Daily Ridership in Summer for Alternative 1 – No Action and Alternative 2B, 2055**

| | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| Alternative 1 – No Action | 410 | 285 | 125 | 30% |
| Alternative 2B | 2,920 | 2,825 | 95 | 3% |

Note: See Revised Appendix AA, *Traffic Forecast Report*

The potential for bus/van service to develop between Katzehin and Juneau with Alternative 2B was evaluated based on case studies of bus service elsewhere in Alaska[28] and interviews with 12 land transportation service providers (see the *Socioeconomic Effects Technical Report,* Revised Appendix EE). Based on this evaluation, it is likely that Alternative 2B would result in daily summer coach service linking Juneau, Haines, Skagway, and possibly Whitehorse. Winter

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[28] Bus services examined in these case studies were Alaska Park Connection between Seward and Denali National Park, Homer Stage Lines between Homer, Soldotna, Kenai, and Seward, Alaska Trails between Anchorage, Wasilla, and Talkeetna with continuing service to Healy, Alaska Direct Bus Lines between Fairbanks and Whitehorse, and Yukon Alaska Tourist Tours between Skagway and Whitehorse.

service would be less frequent, with bus service offered perhaps every other day between Juneau and Haines and Skagway. Cost would ultimately depend on the size of the market but is estimated to be in the range of $42 to $60 to/from Haines and between $50 and $68 to/from Skagway based on the projected shuttle fares and rates on similar existing bus services. This would place the cost in the same range as the Alternative 1 – No Action AMHS adult passenger fares for the Juneau-Skagway and Juneau-Haines ferry links.

It should be noted that Skagway has the only ferry terminal in Lynn Canal that is within reasonable walking distance from residential areas. All other existing terminals must be reached by private vehicle or private carrier. The ferry terminals have been located based on the efficiency of ferry moorage and routes rather than the convenience of walk-on passengers.

Walk-on passengers who end up relying on bus service to/from the Katzehin Ferry Terminal (if it develops) would have less flexibility and opportunity to travel compared to travelers who drive, as it is likely that bus service would not be available for every ferry sailing (i.e., walk-on passengers would need to time their travels with the bus schedule). It is anticipated that walk-on passengers relying on renting a vehicle, using a taxi, or getting a ride with someone would have more flexibility and shorter travel times than those relying on the bus. People who share a car with others may be inconvenienced if one household member were using the vehicle to travel on Alternative 2B.

Walk-on passengers traveling between Haines or Skagway and JIA would have to coordinate schedules for flight, ferry, and bus (or other ground transportation) under Alternative 2B, just as they do today. Instead of arranging for ground transportation between the Auke Bay Ferry Terminal and JIA, travelers would have to arrange for transportation from Katzehin. As Katzehin is farther away from JIA, it may be more difficult to coordinate schedules and make travel arrangements, so travelers may find this less convenient than travel under Alternative 1 – No Action. The cost for a walk-on passenger from Haines/Skagway to the airport under Alternative 2B (including ground transportation) is anticipated to be similar to or slightly higher than the cost under Alternative 1 – No Action, as the cost of transportation between Auke Bay and JIA is the same for both alternatives (see Table 4-31). The number of travelers in the party would also be a consideration. Another factor for airport travelers to consider is the cost of airport parking. In 2016, airport on-site long-term parking cost $14/day and $75/week, and parking within a 5-minute walk from the terminal was $5/day and $100/month.

**Table 4-31:**
**Comparison of Walk-on Passenger Out-Of-Pocket Costs**

| Alternative | Auke Bay-Haines | Auke Bay-Skagway |
|---|---|---|
| 1 – No Action | $39.00 | $53.00 |
| 2B | $42.00 – 60.00 | $50.00 – 68.00 |

Note: Out-of-pocket costs exclude the cost of ground transportation between Auke Bay and JIA. In 2017, the cost of a taxi from Auke Bay to JIA was approximately $20.

Commenters on the 2014 Draft SEIS expressed concerns about impacts to walk-on passengers who are low income, minority, senior citizens, disabled, or students. The impacts of Alternative 2B on these groups depends on how they accommodate their non-ferry travel (i.e., whether they rent a vehicle, use a taxi, get a ride, or take a bus). Even under Alternative 1 – No Action, these walk-on populations need transportation to/from the Auke Bay and Haines Ferry Terminals (the

Skagway Ferry Terminal is within walking distance to the community center). With access to a vehicle and the ability to drive, these populations would benefit from improved travel time, improved flexibility and opportunity to travel, and lower travel costs. Those choosing to continue as walk-on passengers would pay approximately the same as under Alternative 1 – No Action, considering the possible cost of transportation by bus between Katzehin and Auke Bay. Alternatively, people could fly to/from Juneau but would be subject to the current airfare, which may be higher than the ferry fare. Additional information regarding impacts to low-income and minority populations is discussed in Section 4.7.2. Additional information about student transportation under Alternative 2B is discussed in Section 4.3.5.

**Bridges over Navigable Waters –** The Katzehin, Lace, and Antler rivers are navigable waters, currently used by small craft (see Section 3.1.7). FHWA has evaluated U.S. Coast Guard (USCG) bridge permitting requirements under 23 CFR 650.805 and 33 CFR 115.70[29] and has made a preliminary determination that no bridge permits are necessary for Alternative 2B, and that proposed navigational clearances are reasonable (see Section 7.7 and the attachment of the Public and Agency Coordination chapter in the 2014 Draft SEIS).

### 4.3.8 Geology

Alternative 2B would impact no unique geologic resources in the study area. This alternative would be subject to a variety of geologic hazards, including earthquake-induced ground tremors, avalanches, and landslides. As stated in Section 3.2.1, DOT&PF conducted geotechnical investigations of the Alternative 2B corridor after the alternative was selected in the 2006 Record of Decision (ROD; Golder Associates, 2006 and 2012). Those investigations have been incorporated into this Final SEIS. As a result of those investigations, the alignment of the East Lynn Canal Highway was changed in several locations to avoid potential hazards.

Additional geotechnical investigations would be used in support of the final engineering design of the selected alternative, if it were a build alternative. These studies would minimize the impact of geologic hazards on the road embankment and related structures.

#### 4.3.8.1 Seismic Activity

As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). Seismic risk would be taken into account in the design of roadway pavement and highway structures. It is probable that a large earthquake in the project area would cause damage to a highway, as is the case with many other Alaskan highways in seismic areas. Geologic hazards related to seismic events that could affect the roadway pavement and highway structures include tsunamis, liquefaction, and slope instability.

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[29] Under 23 CFR 650.805, a USCG permit shall not be required if the FHWA determines that the proposed federally aided or assisted bridge is over waters (1) which are not used or are not susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce and (2) which are (i) not tidal, or (ii) if tidal, used only by recreational boating, fishing, and other small vessels less than 21 feet in length. Under 33 CFR 115.70, the USCG can give advance approval for the location and plans of bridges to be constructed across reaches of waterways navigable-in-law, but not actually navigated other than by logs, log rafts, rowboats, canoes and small motorboats. In such cases, the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation.

DOT&PF would design the highway, bridges, ferry terminals, and other structures to satisfy American Association of State Highway and Transportation Officials (AASHTO) design specifications. AASHTO guidelines identify measures, such as structural components for bridges and ferry terminal structures, which resist damage from seismic effects related to earthquakes. With these measures, bridges can safely undergo the large distortions that result from earthquakes.

There is no national standard for the design of structures to resist the effects of tsunamis; however, the bridges and ferry terminal components would incorporate design recommendations to withstand hurricane-type storm surges that are similar to tsunami effects, such as high water levels and loads imposed from storm waves.

For road components other than structures, there are no guidelines for seismic resistance. Road embankments that have the potential to be affected by wave action or tsunamis are designed to include measures provided by guidance from the FHWA HEC-25 (Highways in the Coastal Environment), U.S. Army Corps of Engineers (USACE) EM 1110-2-1100 (Coastal Engineering Manual), and the DOT&PF Coastal and Harbor Design Procedures Manual.

While there is no national standard for the design of structures to resist the effects of liquefaction, soil softening, lateral spread, and slope instability, these factors would be considered in the design. A geotechnical exploration would be conducted during the design phase to determine the engineering properties of the soil at proposed bridge crossings. These results would be used to develop recommendations for foundation design: the bridges would be founded on deep, large-diameter pipe piles that can accommodate large deformations associated with seismic hazards. The piles that would support the bridges would be able to accommodate long-term scour and other factors that alter the riverbed elevation.

#### 4.3.8.2 Avalanches

The *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z) identifies 43 avalanche paths along the East Lynn Canal Highway corridor. The proposed highway alignment for Alternative 2B crosses 41 avalanche paths (the other two identified paths do not reach the alignment). Based on the *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z), the calculated unmitigated AHI for Alternative 2B is 291.

This unmitigated figure is considered very high, but is in the middle range for highways operated with good safety records in avalanche terrain. (For example, Rogers Pass, B.C., has an unmitigated AHI of 1,004, and the previous Seward Highway alignment from Anchorage to Seward had an unmitigated AHI of 331.)

Avalanche hazards can include the risk of property damage, injury, and death. Establishing hazard reduction and risk management methods as part of operational highway procedures can lower the probability of adverse avalanche encounters and increase road safety. Alternative 2B incorporates hazard reduction methods that create physical changes to the alternative include using elevated fills and bridges, adjusting the alignment of a highway, and constructing barriers and snowsheds. These methods are considered part of the alternative and were incorporated into construction costs; they were not budgeted with the annual cost of implementing the avalanche control program. A snowshed is most often constructed as a concrete arch that carries slides over the highway while allowing traffic to flow unimpeded through it. Based on the findings of the *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z), DOT&PF would construct snowsheds at three avalanche path locations to further reduce the avalanche hazard associated with Alternative 2B.

Risk management refers to the operations that can reduce the consequences of exposure to avalanches. These methods include forecasting, warnings, temporary highway closures, and use of explosives to release unstable snow during temporary highway closures. Explosives and remote exploders are used for avalanche mitigation to trigger avalanches when a road is closed, rather than waiting for avalanches to release naturally when the public is traveling. The intended result is an increased frequency of generally smaller avalanches during closures and a decreased frequency of larger slides with greater risks when the road is open. With combined appropriate hazard reduction and operational risk management efforts, the mitigated AHI for Alternative 2B would be reduced to an AHI value of approximately 28. A mitigated AHI value of 30 or less is the North American standard for safe operation of a highway (see *2017 Update to Appendix J – Snow Avalanche Report* in Appendix Z). DOT&PF would propose to use blaster boxes to deliver explosives to potential avalanche sites. Blaster boxes are secure steel cabinets mounted on a mast in an avalanche-protected location from which they can fire pre-targeted mortar rounds into avalanche starting zones by remote control. Blaster boxes require helicopter flights to nearby landing zones to deliver the rounds, can fire only 10 shots before reloading, require time to set up and maintain, and have a high initial installed cost, but they allow explosive delivery by one operator, even under stormy conditions. Doppler radar and seismic detectors help to verify avalanche release when the system is operated, and can also provide warnings of natural avalanche cycles. Helicopter delivery of explosive charges to release unstable snow would be used on avalanche paths that require less-frequent explosive work. The explosive charges would be dropped by hand from a low-hovering helicopter with the door removed. Helicopter delivery has proven to be an effective, accurate, and flexible method for covering large areas in a short time. The major disadvantage is that helicopter delivery requires calm ridgetop winds and good visibility. The lack of good flying weather can result in substantial delays and missed opportunities.

The *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z) calculated closure periods using the same data consistently used in all AHI calculations. The closure period calculations and AHI calculations are based on 100 years of weather records from Juneau correlated with 6 years of avalanche observations in Lynn Canal. Estimates of average closure time per year, average number of closures per year, closure length, and capital and operating budgets for highway maintenance relative to avalanche hazards for Alternative 2B are provided in Table 4-32. The capital costs of avalanche control equipment and facilities have been included in the construction cost estimate, and the annual operating cost for avalanche control has been included in the maintenance and operating cost estimate for each alternative.

**Table 4-32:**
**Costs, Closures, and Mitigated Avalanche Hazard Index for Alternative 2B**

| Alternative | Capital Cost | Annual Operating Cost | Average Closure Time per Year (days) | Average Number of Closures per Year | Closure Length (days) | Mitigated Avalanche Hazard Index |
|---|---|---|---|---|---|---|
| 2B | $11,185,325 | $1,458,719 | 12.1 | 9.9 | 0.8 to 2.2 | 28.2 |

Winter travel would be periodically limited by road closures for avalanche control; however, one or more ferries would be made available to transport vehicles and passengers in Lynn Canal if the highway were to be closed for more than 1 day. The maximum anticipated duration of any avalanche related road closure is 2 days. The Day Boat ACFs, with a capacity of 53 vehicles, would be sufficient for the route in the event of road closure. If, during these closures, more vehicles are needed to be transported, additional sailings would be made depending on winter sea conditions.

Trained technicians experienced in controlled avalanche release would monitor the East Lynn Canal Highway on a daily basis. The technicians would issue daily avalanche forecasts to DOT&PF crews, with updates as conditions change. The technicians would recommend avalanche control operations or preventive road closures to DOT&PF personnel when the avalanche hazard is high.

Combined hazard reduction that includes elevated fills, bridges, and snowsheds, and a standard risk management program with avalanche forecasting, explosives delivery, and preventive road closers would reduce the risk of damage to vehicles and people traveling on the Alternative 2B highway. Planned and unplanned closures would be posted on DOT&PF’s 511 website, phone and email listserv, and various social media platforms to ensure that road users receive regular updates of highway conditions.

DOT&PF would dedicate maintenance personnel and resources for routine maintenance, and would use State and/or federal highway funds to perform major repairs as needed.

#### 4.3.8.3 Landslides and other Geological Hazards

For this project, seven different types of geologic hazards were identified: debris flow, hazard rocks, landslides, rock slides, rockfalls, soil raveling, and transitional slides. Of these hazards, the most common and most significant are debris flows and rockfalls.

**Debris Flows** - Alternative 2B’s alignment would require crossing 43 debris flows. The majority of the debris flows would be crossed within the active transport zone, which is characterized as highly channelized, steep gradients (10–15%), with a combination of erosion and deposition of levees. Crossing a debris flow in the transport zone is optimal and typically presents the narrowest, best confined area to cross. Ideally, the crossing will convey the debris flow event unimpeded under the road via a bridge or a specially designed culvert structure. This minimizes any deposition of debris material and reduces maintenance. Where conveyance could not be reasonably achieved, the roadway could be protected with a debris basin constructed on the uphill side of the road and sized to contain the volume of a single design event. Construction of the basins would be limited by the terrain and require continual maintenance effort to keep the basin cleared of accumulated debris.

**Rockfalls** - There are 53 identified rockfall hazards along the Alternative 2B alignment. Mitigation strategies for rockfall hazards include avoidance, removal, stabilization, and protection. Twenty-three of the identified rockfall hazards would be effectively mitigated by avoidance or removal of the rockfall initiation zone by blasting operations required to construct the alignment. The remaining 30 rockfall hazards would be mitigated through stabilization and protection strategies. Stabilization includes hand scaling, special blasting, and rock bolting. Protection includes draped mesh, attenuation fences, barrier fences, and widened rockfall catchment ditches.

**Rockslides -** There are two rockslides in the proximity of the proposed Alternative 2B roadway alignment (see Figure 3-11 and the *Appendix Z - 2017 Update to Appendix D, Technical Alignment Report*). The slide located approximately 2 miles south of Gran Point would be spanned by a bridge. By crossing over the slide, the roadway would not be at risk. The slide located approximately 1.5 miles south of Met Point is avoided entirely as the roadway passes below the runout zone of the slide.

#### 4.3.8.4 Geochemical Properties

During highway construction, blasting activities could expose rock having geochemical properties that pose a hazard to the environment. Rock with acid-generating potential or high total metals content that is exposed to surface water runoff could affect aquatic life and water quality in streams. On site investigations to date have not identified acid-generating rock within the limits of the Alternative 2B alignment. Based on recent experience in Southeast Alaska and available information related to geologic features in the Alternative 2B corridor (see *2017 Update to Appendix D – Technical Alignment Report* at Appendix Z), DOT&PF believes there would be a potential for encountering acid-generating rock during construction of Alternative 2B. A detailed on-site geotechnical investigation would be undertaken by DOT&PF during the final design, if Alternative 2B were selected. Because acid-generating rock is primarily a concern when rock cuts are made near fish-bearing streams, DOT&PF would mitigate the potential effects of drainage from rock cuts in such areas by, for example, constructing roadside drainage ditches in the vicinity of acid-generating rock and diverting the drainage away from fish bearing streams.

#### 4.3.8.5 Outburst Floods

As described in Section 3.2.1, the Meade Glacier at the head of the Katzehin River creates a glacially dammed lake that discharges annually. Glacial outburst floods also have the potential of occurring on the rivers in Berners Bay. The bridges crossing these rivers would be designed to safely pass these floods.

### 4.3.9 Hydrology and Water Quality

#### 4.3.9.1 Floodplains

Planning and preliminary design of Alternative 2B has been done in compliance with DOT Order 5650.2 (Floodplain Management and Protection) and 23 CFR 650 Subpart A (Location and Hydraulic Design of Encroachment on Floodplains).

**Flooding Risks –** The alignment for a highway between Echo Cove and Katzehin runs perpendicular to most of the natural drainages along the east side of Lynn Canal. Therefore, it is not possible to avoid transverse encroachments of these drainages. Alternative 2B would have no longitudinal encroachments of any drainages. No regulatory floodways occur in the project area. The transverse encroachments are mainly bridge piers that would be designed so that Alternative 2B would not create significant flood risks.

**Impacts on Natural and Beneficial Floodplain Values –** Alternative 2B would cross 46 streams. Most of these streams are less than 50 feet wide. Bridges would be used to cross 19 streams, including all anadromous fish streams. Eleven of the bridges would be single-span structures. For these bridges, each bridge and its piers would be located sufficiently outside of the predicted base flood elevation of the streams, as determined by hydraulic studies to be conducted during the final engineering design of the selected alternative. Five streams would have a single support but the support would not be within ordinary high water. Multi-span bridges would be constructed at the crossings of the Katzehin, Lace, and Antler rivers. These larger bridges would extend beyond the outer most channels at each river delta to protect their natural, meandering flow. The multi-span bridges would require placement of supports in the river floodplain. These supports would be spaced to accommodate the design flood and avoid impacts during flood events.

**Potential for Incompatible Floodplain Development –** There are no community floodplain development plans for the project area. The streams crossed by Alternative 2B that have a large enough floodplain for development are located within the Tongass National Forest. All of these lands are designated as LUD II, semi-remote recreation areas, or OGRs where the principal management goal is to retain the natural character of the area. Therefore, no incompatible floodplain development would occur in the project area.

Alternative 2B would provide a highway where there are currently no roads. The highway would serve as a new evacuation route for emergencies for private properties adjoining the road and for Juneau.

**Measures to Minimize Floodplain Impacts and Preserve Natural and Beneficial Floodplain Values –** All of the larger floodplains would be crossed with bridges. Bridge abutments would be located outside the floodplains. Multiple-span bridges would be supported on piles with groups of in-line piles spaced at least 130 feet apart.

**Compliance with EO 11988 –** In accordance with the analysis required in DOT Order 5650.2 (Floodplain Management and Protection) and 23 CFR 650 Subpart A (Location and Hydraulic Design of Encroachment on Floodplains), FHWA has determined that Alternative 2B is in compliance with EO 11988. This alternative cannot avoid transverse encroachments of base floodplains along the alignment; however, the alternative would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially impact natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

#### 4.3.9.2 Hydrology

Alternative 2B would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would percolate through the shot-rock fill or eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downgradient side through culverts. This flow diversion would include sufficient cross-culverts to adequately maintain the water’s natural downgradient flow. Culverts would be designed for the 50-year rainfall event and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

The ferry terminal north of the Katzehin River would require the placement of fill (shot-rock generated during highway construction) at the terminal site and dredging to approximately 25 feet below mean lower low water. These encroachments would not measurably change the hydrodynamics of Lynn Canal or Berners Bay.

#### 4.3.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to watercourses whose drainages include Alternative 2B principally through runoff from the highway.

Results from stormwater research by the FHWA indicate that stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT and FHWA, 1987). Studies conducted in Anchorage, Alaska, under the Municipality of Anchorage (MOA) Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). These studies showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below the AWQS. Only dissolved concentrations of copper and lead were noted to be above their AWQS; however, modest dilution would likely reduce these concentrations below their AWQS. Identified concentrations would not adversely impact streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of Alternative 2B and the predicted low annual ADT, fewer impacts to water quality in the project area would occur than were found in the Anchorage studies. Studied runoff was collected from Anchorage roadways that ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). Studied melt water was from snow collected from a mix of these types of roads. In comparison, Alternative 2B would have summer ADT volumes of approximately 1,260 in 2025 and 1,265 in 2055. During winter, ADT would be less than 500 vehicles per day.

Highway runoff and melt water from Alternative 2B would have lesser quantities of potential contaminants than what was observed in the Anchorage studies due to a lower traffic volume and less development in the Lynn Canal corridor. Snow would be cleared from the highway and deposited along its length, instead of being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area. Runoff from the proposed highway and bridges would not exceed AWQS or adversely impact the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be lower than on most highways due to the rural setting of the highway and the low predicted highway traffic volume. Nevertheless, the potential for spills due to a highway vehicle accident would be created.

The following Best Management Practices (BMPs) would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments.
- Rock would be used to stabilize toes of slopes at ponds and stream crossings.

- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- To the extent practicable, only soil or rock excavated from the construction limits or immediately adjacent to the highway would be used for highway and ferry terminal embankments.
- Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternative 2B would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal north of Auke Bay would be eliminated. The ferries that would be used for Alternative 2B would have sanitary waste holding tanks.[30] Sanitary waste from the ferries would be treated at the existing treatment facilities in Skagway. A sewage treatment facility with a permitted outfall would be installed at the Katzehin Ferry Terminal to treat sanitary waste from the restrooms in the Katzehin Ferry Terminal building. The facility would meet all federal and State water quality requirements. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would be used; therefore, no adverse impacts to water quality would occur. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternative 2B.

Highway and bridge runoff would contribute small amounts of turbidity and pollutant loads to local drainages flowing to Lynn Canal. No roadside restroom facilities are proposed along the roadway alignment other than at the maintenance and operations station at Comet. Contaminant concentrations in runoff from the proposed highway and/or bridges would not exceed AWQS or adversely impact the water quality of receiving waters for the long term.

### 4.3.10 Air Quality

The increase in vehicular traffic and changes in ferry vessel traffic associated with Alternative 2B would not affect the Mendenhall Valley non-attainment area based on consultations with the EPA for the 1997 Draft EIS, the current status of the area, and the impact analysis presented in this section. The analysis presented in this section also projects that Alternative 2B would have no negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions.

#### 4.3.10.1 Carbon Monoxide

Simplified dispersion modeling was conducted for CO emissions from projected maximum peak traffic volumes.[31] Using the most conservative climatic conditions (i.e., low wind speeds and a stable atmosphere that produces the highest pollutant concentrations), the modeling indicated that the maximum 1-hour average CO concentration associated with these emissions would be 1 ppm. Adding this concentration to an estimated background value of 1 ppm and 2 ppm for rural

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

[31] These volumes were 1,800 in 2008 and 3,250 in 2038 based on Alternative 2; Alternative 2B projected volumes are less; therefore, emissions would be less.

and urban (e.g., Haines, Skagway, and Auke Bay) segments of Alternative 2B indicates that CO concentrations would not approach the 9 ppm CO NAAQS. In the *2017 Update to Appendix T – Air Quality Modeling Memorandum* (in Appendix Z of this Final SEIS), DOT&PF confirmed that Alternative 2B traffic would not result in an increase in CO concentrations that would approach the NAAQS.

In response to comments on the 2014 Draft SEIS, ferry emissions modeling was performed to estimate the annual load of emissions (tons/year) for all alternatives relative to total emissions loading at active marine centers. The results of that modeling effort indicate that the ferry emissions associated with Alternative 2B would approximately double the AMHS ferry emissions of Alternative 1 – No Action, but the contribution to total marine vessel emissions would be minor. See Attachment 1 to the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z for detailed modeling results and Section 4.9.2.7 for a discussion of the potential cumulative impact.

### 4.3.10.2 Particulates

A qualitative analysis was done for $PM_{10}$ for Alternative 2B. This analysis compared project-related traffic with traffic in an area with similar meteorological conditions where $PM_{10}$ has been monitored.

$PM_{10}$ is monitored at Floyd Dryden Middle School on Mendenhall Loop Road in Juneau. Peak-hour traffic volume on this road was 1,201 vehicles in 2000. The 24-hour average $PM_{10}$ concentration measured at this monitoring station was 27 micrograms per cubic meter ($\mu g/m^3$) in that year. Projected peak hour traffic for Alternative 2B was estimated at 9 percent of the summer ADT. Summer ADT for Alternative 2B is projected to be 1,260 and 1,270 vehicles in 2025 and 2055, respectively. Therefore, the peak hour traffic for this alternative would be about 115 vehicles in 2025 and 2055; which is 10 times smaller than the volumes recorded in Juneau on Mendenhall Loop Road in 2000. Using this multiplier, the 24-hour average $PM_{10}$ concentration with Alternative 2B would be 2.7 $\mu g/m^3$.

This estimate is substantially below the 150 $\mu g/m^3$ 24-hour average NAAQS for $PM_{10}$. Because the Mendenhall Loop Road $PM_{10}$ data include dust from unpaved roads in the valley and paved roads generally contribute only a small fraction of the total $PM_{10}$, this estimate of project-related $PM_{10}$ concentrations overestimates the actual concentrations that would result from Alternative 2B.

With regard to particulates generated by diesel fuel use, Alternative 2B would result in 50 percent more ferry fuel use and a proportionate increase in particulate emissions, relative to Alternative 1 – No Action. This increase, however, would not approach the NAAQS for $PM_{10}$.

The combined particulate emissions from vehicles and ferries under Alternative 2B would be greater than particulate emissions under Alternative 1 – No Action, but would not result in an air quality impact relative to NAAQS.

### 4.3.10.3 Conformity

The project area is located in an air quality attainment area where the State Implementation Plan (SIP) does not contain any transportation control measures. Therefore, conformity procedures do not apply to this project, and a conformity determination is not required per 40 CFR 51.

### 4.3.11 Hazardous Materials

The *2014 Update to Appendix M – Initial Site Assessment Technical Report* (see Appendix Z) identified three incidents along the alignment of Alternative 2B as being an area of potential concern with respect to hazardous materials. These incidents were listed in the Emergency Response Notification System database, sometimes referred to as the "Spills and Accidents" database, which contains data on toxic chemical spills and other accidents reported to the National Response Center. The three reported incidents are attributed to Coeur Alaska mining activities. They were all small, and the released materials have dissipated or been removed. These incidents are unlikely to affect the development of Alternative 2B because of their size and status of cleanup.

Although it did not appear in any federal or State database listings, the Kensington beach facility, which is located within the alignment for Alternative 2B at Comet, contains three 20,000-gallon above-ground diesel fuel storage tanks and an incinerator. DOT&PF would acquire this facility if Alternative 2B were selected. A Phase I environmental site assessment would be performed prior to acquisition to assess any risk associated with the use, history, or removal of any of the facility infrastructure.

### 4.3.12 Wetlands

The specific aquatic habitats that would be affected by Alternative 2B, including habitats affected by the proposed ferry terminal, are provided in Table 4-33. Alternative 2B would result in the loss of approximately 61 acres of wetlands and approximately 32 acres of unvegetated intertidal and subtidal areas. The preliminary alignment for highway segments of Alternative 2B has been adjusted several times to avoid wetlands and reduce the impacts to wetlands that could not be avoided. During design DOT&PF would investigate additional measures to reduce impacts, including further small alignment changes, steepened slopes, and reduced embankment heights.

Alternative 2B would not require filling of palustrine or estuarine emergent wetlands. All but approximately 0.7 acre of the wetlands that would be affected by Alternative 2B are forested wetlands. The wetland functions and values that would be affected by a highway include a reduction in groundwater recharge and discharge, lateral flow, surface hydrologic control, wildlife habitat functions, and riparian support.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Flow of surface water as well as shallow groundwater blocked by the highway embankment that would eventually flow to the surface would be conveyed down-gradient by culverts under the highway embankment. Alteration of hydrology because of the highway embankment could result in corresponding changes to the vegetation and over time could affect wetland functions within and outside the highway ROW. The extent of this effect would depend on localized hydrologic patterns; however, effects would be minimized through the use of porous fill material and cross-drainage structures.

The Berners Bay sub-region is an ecologically diverse area that supports several species of migratory birds, mammals, and plant species. Within the Berners Bay sub-region, between the start of the project at Echo Cove to the Slate Creek drainage at Slate Cove, development of Alternative 2B would require fill and excavation in 5.7 acres of wetlands.

### Table 4-33:
### Alternative 2B Impacts to Wetlands and Other Waters of the U.S. (Acres)

| Sub-region | Classification | Areas of Fill (acres) |
|---|---|---|
| **Berners Bay** | **Wetlands** | |
| | Palustrine Forested | 5.0 |
| | Palustrine Scrub-Shrub | 0.7 |
| | **Subtotal** | **5.7** |
| | **Intertidal and Subtidal Areas** | |
| | **Subtotal** | **0.0** |
| **Slate Cove to Sherman Point** | **Wetlands** | |
| | Palustrine Forested | 53.4 |
| | **Subtotal** | **53.4** |
| | **Intertidal and Subtidal Areas** | |
| | **Subtotal** | **0.0** |
| **Sherman Point to Katzehin River** | **Wetlands** | |
| | Palustrine Forested | 1.6 |
| | **Subtotal** | **1.6** |
| | **Intertidal and Subtidal Areas** | |
| | Rocky Shores | 21.7 |
| | Unconsolidated Bottom | 3.2 |
| | **Subtotal** | **24.9** |
| **Katzehin River to Terminal Area** | **Wetlands** | |
| | Estuarine Emergent | 0.0 |
| | **Subtotal** | **0.0** |
| | **Intertidal and Subtidal Areas** | |
| | Rocky Shores | 7.2 |
| | **Subtotal** | **7.2** |
| **All East Lynn Canal Sub-regions** | **Wetlands** | |
| | Palustrine Forested | 60.0 |
| | Palustrine Scrub-Shrub | 0.7 |
| | Estuarine Emergent | 0.0 |
| | **Subtotal** | **60.7** |
| | **Intertidal and Subtidal Areas** | |
| | Rocky Shores | 28.9 |
| | Unconsolidated Bottom | 3.2 |
| | **Subtotal** | **32.1** |
| | **Sub-region Totals** | |
| | Total Wetlands | 60.7 |
| | Total Intertidal and Subtidal Areas | 32.1 |
| | **Total Acres** | **92.8** |

Note: Acreages do not include impacts to unvegetated areas of small streams intersected by the proposed road alignment.

The salt marsh at the head of Berners Bay and adjacent to the Lace and Berners rivers provides several important ecological functions, including surface hydrologic control, riparian support, and wildlife habitat functions. This wetland is rated very high for wildlife functions based on documented use by waterfowl, bald eagles, and marine mammals. Portions of this wetland provide fish habitat functions, depending on the elevation of the wetland. Regional ecological diversity is rated high, as this wetland receives substantial use by wildlife and this type of wetland is limited in the project study area. The alignment for Alternative 2B was adjusted in 2003 to avoid this wetland and further adjusted in 2005 and 2008 to provide greater separation between the highway and the salt marsh area.

Adjacent to the Antler and Berners rivers and on the west shore of Berners Bay, the proposed alignment for Alternative 2B would impact primarily palustrine forested wetlands. The effects of this action would include modifying the groundwater recharge functions, the discharge/lateral flow functions, the surface hydrologic control functions, and the sediment retention functions of these wetlands. Large areas of similar habitat in the surrounding areas, and adequate ditching and drainage structures, would moderate losses of any of these functions. Wildlife habitat functions would be reduced due to the loss of forest, but an abundance of similar habitat is adjacent to the alignment.

From Slate Cove to Sherman Point, Alternative 2B would require fill and excavation in approximately 53.4 acres of wetlands, all of which are palustrine forested wetlands. The alignment was adjusted in 2005 to avoid emergent wetlands. The functions affected by Alternative 2B in this area would be the same as those described for the palustrine forested wetlands along Berners Bay. Regional ecological diversity would not be substantially affected by this loss of wetlands, as this habitat type is common and widespread throughout the surrounding area. The proposed alignment avoids the seasonally flooded emergent/scrub-shrub wetland between Slate Cove and Sherman Point. From about 5 miles north of Point St. Mary to Comet there is a narrow band of uplands along the shore. At the request of resource agencies, the alignment was shifted uphill into forested wetlands in this area in order to avoid the numerous eagle nest trees in the upland area along the shore and to avoid marine fills.

From Sherman Point to the Katzehin River, Alternative 2B would affect 1.6 acres of palustrine forested wetland near Independence Lake. This would have little effect on wetland functions and values in the area. Approximately 55 percent of all shoreline impacts of Alternative 2B would occur in this portion of the proposed alignment. A total of 24.9 acres of marine habitat (rocky shores and unconsolidated bottom) would be filled in this area. Potential impacts of this fill on marine habitat are discussed in Section 4.3.13.

The alignment of Alternative 2B was adjusted in 2005 to avoid filling estuarine emergent wetlands near the Katzehin River crossing and along the upper levels of the large flats on the north side of the delta. This salt marsh habitat on the Katzehin River outwash plain is important in terms of wildlife habitat functions. Since 2006, the terminal site has been reconfigured to eliminate the need to fill any estuarine emergent wetlands. The current highway alignment at the ferry terminal would fill approximately 0.6 acre of intertidal and subtidal habitat (rocky shore). In addition, fill for the Katzehin Ferry Terminal would result in the loss of approximately 6.6 acres of intertidal and subtidal habitat (rocky shore) for breakwaters and terminal facilities.

The indirect effects of Alternative 2B on wetlands include the potential introduction of contaminants from de-icing and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These activities could cause the further loss of wildlife habitat functions, reduction of ecological diversity, and sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for travelers, would minimize the risk of these effects occurring.

Sand would be used on the highway in the winter. A small quantity of salt (up to 5 percent of the total weight of the sand) is used to keep the sand friable. Because the amount of salt is minimal, it is unlikely to substantially damage adjacent vegetation.

Alternative 2B does not include access facilities for off-road vehicles (ORVs); however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through vegetation destruction, erosion, and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the road is constructed.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternative 2B. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands. With identification of Alternative 1 – No Action as the preferred alternative, DOT&PF notified USACE that it was withdrawing its Section 404/10 Permit Application for the JAI Project (included as *2014 Update to Appendix X – Draft Section 404/10 Application and Draft Section 404(b)(1) Analysis* in Appendix Z of the 2014 Draft SEIS) (see letter from DOT&PF to USACE in Attachment A of Appendix JJ).

### 4.3.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

During environmental studies for the Supplemental Draft EIS, the FHWA determined that the project alternatives may adversely affect EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act. Following this determination, DOT&PF prepared an EFH assessment to assess the effects of project alternatives on commercial fish stocks in all life stages and associated habitats. This section summarizes that assessment, which was provided in Appendix N of the 2005 Supplemental Draft EIS and was updated for this Final SEIS (see the *2017 Update to Appendix N – Essential Fish Habitat Assessment* in Appendix Z).

The loss of EFH (intertidal and subtidal habitat) due to highway and ferry terminal construction under Alternative 2B would be 32.1 acres. An additional 4.4 acres of subtidal habitat would be affected by dredging. Indirect effects could occur from modifications to the shoreline that reduce the quality of fish habitat.

Placement of in-water fill in 25.5 acres for highway for highway construction, including an area of intertidal fill at the Katzehin River bridge abutment to prevent scour, would bury all intertidal and subtidal organisms at the specific fill locations eliminating habitat and altering the surrounding habitat. The in-water fill would reduce the amount of refuge habitat available to larval stage eulachon, which are found in estuarine areas in Lynn Canal for an approximately 2-week period following spawning (Willson et al., 2006). Intertidal and subtidal invertebrate species are opportunistic, and the slopes of fill areas would likely be colonized by similar intertidal and subtidal species over a few seasons. However, because the amount and character of the area available for recolonization would be different from the undisturbed intertidal and subtidal zone, recolonization would not restore the community to its original state, reducing its value as foraging habitat for commercial fish species. Because of the small amount of intertidal and subtidal habitat that would be filled by Alternative 2B relative to the total available, this impact would not affect regional populations of any fish or invertebrate species.

A new ferry terminal would be constructed north of the Katzehin River for Alternative 2B. Because the terminal would not be located near the river mouth, it would not interfere with anadromous fish passage in the Katzehin River. The breakwaters at the terminal would be constructed with gaps or large culverts to allow passage of juvenile fish near the shore.

The proposed Katzehin Ferry Terminal site consists of a steep boulder beach transitioning to a less steep cobble beach. There is a boulder-cobble-gravel substrate in the upper subtidal/lower intertidal zone and a muddy substrate in the lower subtidal zone at this site. Vegetation is present in the shallow intertidal zone, and stalked kelp is present in one part of the lower intertidal zone; however, no seabed vegetation was seen in video imagery of the lower subtidal zone. Due to the steepness of the beach, potential wave exposure, and lack of subtidal vegetation, the proposed Katzehin Ferry Terminal site is less important to commercial fish and crab species than other more protected coves. For this reason, the loss of 6.57 acres of intertidal and subtidal habitat from fill placement and the 4.40 acres of dredging to construct the new ferry terminal as well as maintenance dredging in approximately 30 years would not measurably alter EFH or fish populations in the Katzehin River delta area or in Lynn Canal. Operations of this ferry terminal would not affect Pacific salmon, Pacific herring, or eulachon because of the spatial separation of the terminal from the Katzehin River and other areas of Lynn Canal important to these species.

The loss of intertidal and subtidal habitat from placement of fill and dredging would reduce the amount of habitat available to prey species for Steller sea lions and other marine species, but would not be expected to affect regional populations of any fish or invertebrate species and, therefore, would not affect availability of prey species.

There is the potential for accidental fuel spills from ferries at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location. Spill prevention and cleanup plans would be in place for shuttle ferry operations to minimize potential impacts from accidental spills.

The ferries that would be used for Alternative 2B would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the ADEC (APDES permit) and would meet Alaska-established waste discharge limitations. For this reason, the effluent should not impact fish or crab habitat or affect fish and crab populations in Lynn Canal, including Berners Bay.

Alternative 2B would bridge 10 streams that support anadromous fish populations, including the Lace, Antler, and Katzehin rivers (one stream is bridged above anadromous fish use). The bridges crossing all but the Lace, Antler, and Katzehin rivers would not encroach on the stream channel. Piers for the bridges over the Lace, Antler, and Katzehin rivers would be approximately

130 feet apart and would not impede fish movement in these rivers. The northern-most channel of the Antler River identified as a eulachon spawning area would be clear-spanned to avoid impacts to this habitat.

Stormwater and melt water runoff from bridges over anadromous fish streams would not alter water quality sufficiently to impact crab or anadromous and marine fish habitat. As discussed in Section 4.3.9.3, studies of highway runoff in Alaska indicate that the volume of traffic on Alternative 2B would not be large enough for runoff from the highway to cause the exceedance of any AWQS in receiving waters.

In summary, the construction of Alternative 2B would result in the direct loss of 32.05 acres of EFH as a result of filling for highway and ferry terminal construction, as well as the modification of subtidal habitat resulting from dredging. Alternative 2B would bridge all streams crossed by highway segments that support anadromous fish populations. Piers for the bridges over the Lace, Antler, and Katzehin rivers that would be required for Alternative 2B would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

The direct loss of 32.05 acres of foraging habitat through highway fill and ferry terminal construction, as well as the modification of some subtidal habitat as a result of dredging, would not substantially affect any fish and invertebrate populations in Lynn Canal. As a result, sport and commercial fisheries would not be affected.

NMFS has offered the following additional EFH conservation recommendations for this alternative pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act:

- Realign the Berners/Lace and Antler River multi-span bridges so that they are located as far upstream as possible, minimizing the adverse effects of bridge construction and the effects on in-stream flows. Eulachon are important forage for federally managed fish species (as well as marine mammals) and spawn up to 4 miles upriver. Moving the bridge alignments upstream would decrease the amount of wetland habitat impacted, reduce effects on eulachon and Steller sea lions and other wildlife that use the mudflats, and minimize future human impacts to the river deltas by providing additional distance between the roadway and river outlets in Berners Bay.
- Provide compensatory mitigation sufficient to compensate for the loss of intertidal, subtidal, and wetland habitats.

With DOT&PF’s and FHWA’s identification of Alternative 1 – No Action as the preferred alternative for the JAI Project, there is no longer a need to complete an EFH consultation.

The alignment for Alternative 2B and the siting of the Katzehin Ferry Terminal have been adjusted through preliminary engineering studies to limit intertidal and subtidal fill. Alignment revisions have resulted in a reduction of approximately 14 acres of rock side cast and eliminated the need for an ocean disposal site for excess rock from excavation. During design of the selected alternative, DOT&PF would continue to investigate ways to further reduce this fill. The bridges over the Berners/Lace and Antler rivers have been realigned as far upstream as possible in response to the conservation recommendations.

### 4.3.14 Terrestrial Habitat

Alternative 2B would result in the loss of vegetation within the cleared area[32] of the highway. The acreage of vegetation types on USFS lands[33] that would be removed for this alternative is estimated to be:

- 412 acres of OG forest
- 206 acres of other forest
- 15 acres of open shrub and meadow
- 7 acres of other terrestrial habitat

This vegetation loss would include coniferous forest plants, such as western hemlock, western hemlock-yellow cedar, Sitka spruce, mixed conifer, mountain hemlock, and Sitka spruce-black cottonwood, and shrub (non-forest brush) and open meadow or muskeg vegetation communities.

Most of the terrestrial habitat that would be affected by Alternative 2B is in the Tongass National Forest. As discussed in Appendix K of the TLRMP, earlier adopted versions of the TLMRP established an OGR system to manage this important habitat for many terrestrial species. Alternative 2B would impact three mapped small OGRs established under the reserve system (see Figure 3-3):

- **Value Comparison Unit (VCU) 160** ‑ Alternative 2B would run through a small OGR (Old-Growth Habitat LUD #10) in VCU 160 in the Slate Cove area. Approximately 104 acres of OG Habitat LUD #10 (1,282 acres total size) would be managed under the prescriptions for TSCs, which would take precedence over the underlying OG Habitat LUD. This would result in this OGR not meeting the TLRMP minimum total acre criteria. Within the 104 acres, construction would eliminate 40 acres of forest (i.e., approximately 64 acres of forest would remain standing within the highway ROW, but would not be protected). Of 1,173 acres of productive OG forest in the LUD, 91 acres would be incorporated in the TSC, and 31 acres would be eliminated/cleared. The road would divide the OGR and its OG habitat into inland and seaward portions, and the road would lie within the beach buffer at Berners River. The beach buffer is considered some of the most important habitat for wildlife because it provides corridors along the beach, winter habitat, and bald eagle nesting habitat.
- **VCU 200** ‑ Alternative 2B would run through the small OGR (Old-Growth Habitat LUD #11) associated with VCU 200 and located on Point Saint Mary peninsula. This reserve partially overlaps VCU 160. Approximately 63 acres of OG Habitat LUD #11 (3,312 acres total size) would be managed under the TSC management prescription. The OG Habitat LUD would continue to meet TLRMP minimum total acreage criteria. Within the 63 acres, construction would eliminate 20 acres of forest (i.e., about 43 acres of forest

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[32] Timber clearing is proposed 10 feet beyond the top of cut slopes and 10 feet beyond the toe of embankment slopes. Removing large standing timber at the top of cut slopes eliminates the potential for trees falling into the road/traffic as a result of root disturbance. The additional clearing also provides for equipment access in rock cut areas for drilling activities. Removing timber at the toe of embankment slopes limits the severity of crashes when vehicles run off the road and down embankment slopes. This provides a “clear zone” at the toe of slope to allow vehicles the opportunity to come to a stop without colliding with a large tree.

[33] Comparable vegetation mapping is not available for other lands. The forest acreages that follow include forested wetlands; open shrub and meadow areas may be wetlands or uplands (USFS, 2013).

would remain standing within the highway ROW, but would not be protected). Of 1,450 acres of productive OG forest in the LUD, 17 acres would be incorporated in the TSC, and 7 acres would be eliminated/cleared. The road would divide the reserve and its OG habitat into inland and seaward portions, and some of the road would lie within the beach buffer, which is considered some of the most important habitat for wildlife because it provides corridors along the beach, winter habitat, and bald eagle nesting habitat.

- **VCU 190** ‐ Alternative 2B would cross this small OGR (Old-Growth Habitat LUD #9) from an area north of Comet to approximately Met Point. Approximately 114 acres of OG Habitat LUD #9 (1,744 acres total size) would be managed under the TSC management prescription, which would result in this OGR not meeting the TLRMP minimum total acre criteria. Within the 114 acres, construction would eliminate 46 acres of forest (i.e., approximately 68 acres of forest would remain standing within the highway ROW, but would not be protected). Of 732 acres of productive OG forest in the LUD, 56 acres would be incorporated in the TSC, and 23 acres actually would be eliminated/cleared. The road would divide the reserve and its OG habitat into inland and seaward portions, and the road would lie entirely within the beach buffer, which is considered some of the most important habitat for wildlife because it provides corridors along the beach, winter habitat, and bald eagle nesting habitat.

Wildlife impacts are more completely addressed in Section 4.3.15 and in the *2017 Update to Appendix Q - Wildlife Technical Report* (in Appendix Z).

Consistent with procedures spelled out in the TLRMP, the USFS has examined the impacts of Alternative 2B in conjunction with ADF&G and USFWS. The interagency team has recommended that the boundaries of OG Habitat LUDs #9 and #10 should be adjusted to help retain the viability of the OG Habitat LUDs to function as links in the overall OG habitat conservation strategy for the Tongass National Forest. The interagency team described a biologically preferred alternative for modifying the boundaries of these to reserves (Brockmann et al., 2015). Despite the likely adjustment to the boundaries, the OG Habitat LUDs would be compromised under Alternative 2B because of increased road miles, reduced acreage of productive OG forest in the VCUs overall, impacts to connectivity, and fragmentation of large blocks of productive OG forest. The USFS likely would implement the boundary change through its own NEPA decision and through TLRMP amendment. The interagency team did not recommend any change for OG Habitat LUD #11. In addition to the small OGRs, Alternative 2B would go through OG forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large OGRs. The lands within all of these LUDs contain stands of OG forest, ranging from low to high volume. Alternative 2B would reduce the size of the OG forest stands in all VCUs, as well as create a separation of some OG forest areas into inland and shoreward areas. Alternative 2B would remove approximately 412 of 103,501 acres of OG forest along the east side of Lynn Canal.

Tidelands and submerged lands south and north of the mouth of the Katzehin River and adjacent to the proposed terminal are designated as a wildlife habitat and harvest area by the Alaska Department of Natural Resources (ADNR) in its *Northern Southeast Area Plan* (ADNR, 2002a) and are managed to protect sensitive wildlife habitats and areas important to fisheries. As noted in Section 4.3.13, loss of 6.6 acres of intertidal and subtidal habitat from fill placement and the 4.4 acres of dredging to construct the new ferry terminal, as well as maintenance dredging in approximately 30 years, would not measurably alter fish populations in the Katzehin River delta area or in Lynn Canal. The potentially affected area is low value habitat. If Alternative 2B were selected, DOT&PF would file an application with ADNR for an Interagency Land Management Assignment for the Katzehin Ferry Terminal. ADNR would review the applications relative to the Area Plan and comments from agencies, and issue its decision to transfer management authority of the tidelands and submerged lands at the ferry terminal location, as long as fisheries and wildlife resources, among other resources, are protected. Based on the low habitat value and the level of impact, a positive outcome is anticipated. A bridge over the Katzehin River and ferry terminal north of the Katzehin River appears to be compatible with USFS and ADNR land management plans.

The loss of vegetation represents less than 1 percent of the vegetation in the study area. The loss of this vegetation would not adversely affect any rare or unique community types or any listed threatened and endangered or USFS sensitive plant species. This alternative may affect two plant species considered rare by the Alaska Natural Heritage Program (ANHP; paper birch and wild blue lettuce).

Clearing of the highway ROW would increase the potential for blow-down of trees adjacent to the ROW or slides in unstable areas.

Alternative 2B could have indirect effects on terrestrial vegetation. By improving the access to the area, human activity would increase along the highway corridor. This increase could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

### 4.3.15 Wildlife

#### 4.3.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall’s porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.3.17, Threatened and Endangered Species.

Harbor seals frequently haul out at a number of rocky beaches and sand bars in the study area, including sand bars in Berners Bay and at the mouth of the Katzehin River. Many harbor seals use Berners Bay in the spring and summer for feeding and hauling out, especially near the confluence of the Antler and Lace Rivers (Marston et al., 2002; USFWS, 2003b). Along the majority of the highway, vehicle traffic would not affect harbor seals because the proposed highway is at least 100 yards from the shoreline. Harbor seals at this distance would notice activity on the highway but would be unlikely to flush from the haulout or shoreline (Jansen et al., 2010). In addition, traffic noise beyond this distance would be at an intensity similar to other noise sources in the natural environment (i.e., at or below ambient noise levels) and would not create abnormally loud or sudden sounds that would disturb harbor seals. The alignment of Alternative 2B is several hundred yards away from beaches and sand bars in Berners Bay. The proposed highway alignment for Alternative 2B would be adjacent to the beach at a number of locations north of Sherman Point. It is possible that harbor seals could abandon haulouts in these locations. Seals may habituate to highway traffic at the Katzehin River or may choose to utilize areas further downstream from the bridge. Operation of the ferry terminal at Katzehin is not expected to cause disturbance to harbor seals at haulouts because of the distance between this terminal and seal haulouts.

Minke whales tend to be attracted to motor boats. Therefore, the presence of ferries would not drive minke whales away from an area. For this reason, shuttle ferries in Chilkoot and Taiya inlets associated with Alternative 2B would not be expected to displace this species. Because of this attraction, increased ferry traffic may increase the risk of collision; however, collision accidents with minke whales are very rare (Allen and Angliss, 2012). In addition, minke whales rarely occur in Lynn Canal (Dalheim et al., 2009). Therefore, Alternative 2B is unlikely to impact the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid ferry boats and would not be impacted by the ferry traffic associated with Alternative 2B.

Sea otters are rarely found in Lynn Canal (Esslinger and Bodkin, 2009). Like the harbor seal, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternative 2B. Alternative 2B is unlikely to impact sea otters in Lynn Canal.

Normal winter and summer maintenance activities such as snow removal, sanding, brush cutting, crack sealing, and culvert cleanout would not produce noise levels higher than the predicted 30-year peak hour traffic. Winter operation would also require infrequent detonation of unstable snow in the avalanche zones along the alignment. Hauled-out marine mammals may react to the sounds by diving into the water from land or by submerging when they are in the water. Generally, they return to their previous behavior within an hour or so after isolated disturbances. The noise and vibration created by the resulting avalanche would be no different than that from naturally occurring avalanches.

#### 4.3.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz's murrelets, harlequin ducks, black oystercatchers, yellow-billed loons, Aleutian terns, and dusky Canada geese.

Great blue herons nest in trees near preferred feeding areas, typically quiet shorelines and marshy areas. Alternative 2B would result in the loss of potential nest trees on the banks at large river crossings. The type of nesting and feeding habitat preferred by great blue herons is not limited in Berners Bay or the Katzehin River delta. Great blue herons have habituated to human presence and vehicle traffic in many urban and rural areas, including Juneau, so they would be expected to habituate to normal vehicle traffic from Alternative 2B over time. For these reasons, increased human activity or a small loss in habitat with Alternative 2B would not result in population-level effects on this species.

Marbled murrelets are common in nearshore waters along the eastern shore of Lynn Canal and in Berners Bay and are presumed to nest throughout the study area (USFWS, 2003b). This species nests in OG trees, often near the coast. Alternative 2B would impact less than 1 percent of the available nesting habitat preferred by marbled murrelets in Lynn Canal. Therefore, Alternative 2B would not have population-level effects on this species.

The Kittlitz's murrelet appears to be rare in the project area. It nests in high-elevation talus slopes and feeds in nearshore waters. Loss of habitat would be less than 1 percent of available habitat in Lynn Canal, and highway traffic is expected to have no effect on this species. Alternative 2B would not result in population-level effects on this species.

Harlequin ducks are also common in nearshore waters along the eastern shore of Lynn Canal and in Berners Bay (USFWS, 2003b) and nest along the banks of swift-running streams. These birds are wary of people and will swim or fly away when approached (Rosenberg, Patten, and Rothe, 1994). Highway traffic noise could disturb harlequins in nearshore resting and feeding areas where the highway alignment is at the shoreline. The majority of the highway is not located on the shoreline, and loss of less than 1 percent of available nearshore habitat in Lynn Canal would not result in population-level effects on this species.

Black oystercatchers have been observed in Lynn Canal, but are considered uncommon. Alternative 2B would result in the loss of approximately 29 acres of rocky shore habitat. Most of the loss would occur between Sherman Point and the Katzehin River where no sightings of oystercatchers have been recorded (eBird, 2013). The loss of rocky shore habitat could result in a loss of breeding and feeding habitat for black oystercatchers. Additionally, highway traffic during operations or maintenance activities would disturb black oystercatchers in rocky shore habitats adjacent to the alignment. However, with the low densities of oystercatchers in the Lynn Canal area relative to the amount of rocky shore habitat available outside the project area, any displaced birds would likely move to other unoccupied rocky shore habitat nearby. The loss of less than 1 percent of available habitat and disturbance during operations and maintenance would not have a population-level effect on this species. Ferry navigation would avoid rocky shorelines, so there would be no anticipated disturbance to black oystercatchers from ferry traffic.

Only low numbers of yellow-billed loons have been documented in Berners Bay and Lynn Canal. The impacts to yellow-billed loons from Alternative 2B traffic would primarily be the loons’ energetic cost of swimming and diving to avoid ferries in northern Lynn Canal. Collisions are unlikely due to their excellent swimming and diving abilities and their low occurrence in Lynn Canal. Therefore, any disturbance from ferry or vehicle traffic on loons would be negligible. The short periods of ferry navigation in shallow coastal waters (< 130 feet deep) near the existing and proposed ferry terminals would minimize the potential for disturbance to yellow-billed loons (see Jehl, 1970 and Haney, 1990).

The Aleutian tern is thought to be a casual or accidental spring and summer visitor in Southeast Alaska and is not likely to be found in the JAI Project area. Although it is known to breed as far south as Glacier Bay, Glacier Bay is considered to be the furthest southern extent of its range in the region; therefore, Alternative 2B would not likely affect Aleutian terns. Alternative 2B would not result in the loss of palustrine or estuarine emergent wetlands, which is preferred nesting habitat of Aleutian terns. Because Aleutian terns nest onshore and feed over ocean waters, they are unlikely to be disturbed by ferries. Noise and human presence introduced with the proposed highway may preclude Aleutian terns from colonizing small portions of these habitats adjacent to project facilities.

Dusky Canada geese do not breed or winter in the project area. They could potentially use estuarine tide flats in the project area as foraging habitat during migration; however, banding studies have concluded that the geese migrate offshore and make few stops during migration (Bromley and Rothe, 2003). Alternative 2B would not result in any habitat loss for dusky Canada geese, and disturbance effects from maintenance and vehicle traffic would likely be negligible due to their transient use of the project area during migration.

Pullouts would be proposed near Sawmill Creek, Berners Bay, Antler and Lace Rivers, Slate Cove, Comet, Brown Point, Eldred Rock, Yeldagalga Creek, and south and north of the Katzehin

River, and would increase human presence that may disturb waterfowl in the area, particularly at the Katzehin River delta and Berners Bay. In general, waterfowl in the area are located along the shoreline or in the water away from the highway and vehicular traffic. Although unlikely, it is possible that waterfowl could be struck by vehicles traversing the area. Specific data on number of potential bird strikes are not available.

#### 4.3.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, wolverine, and mountain goat. The assessment of project effects for these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and indirect impacts of increased human activity in the study area.

The direct loss of wetland and terrestrial habitat described in Sections 4.3.12 and 4.3.14 would amount to less than 1 percent of these habitats available in the study area. Additional loss of habitat because of windblown trees adjacent to the ROW or changes in local hydrologic patterns may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and moose, and spring and fall beach habitat is important for bears.

Behavioral avoidance of a highway on the alignment for Alternative 2B or physical features of the highway such as steep embankments or retaining walls may function as a barrier to movement for some species and may fragment their habitat by limiting their ability to use all of their range. Alternative 2B would have little effect on the movement of moose or mountain goats. Moose readily cross highways; therefore, habitat fragmentation is not an issue for that species. Mountain goat summer habitat is primarily at higher elevations than the proposed highway alignment, but the alignment would intersect winter habitat in east Lynn Canal. An area designated by USFS as a small OGR, located along the east side of Lynn Canal north of Point Sherman where steep mountainsides come directly to saltwater, is used by mountain goats. Goats could use lower elevations along the proposed highway alignment of Alternative 2B between Comet and Slate Cove to avoid deep snow conditions (ABR Inc., 2000). However, this is not high-quality winter habitat for goats because it lacks steep escape terrain. Due to poor visibility and driving conditions between November and early May, the proposed highway could create the potential for vehicle collisions with mountain goats in moderate-high winter use areas. Areas where goats have crossed the corridor of the Alternative 2B alignment include south of Katzehin River to “Brown” (north of Comet), as well as the mouth of Berners River and upper Echo Cove (White et al., 2012b). Wildlife crossing signage in areas of high brown bear, moose, and mountain goat use as identified by ADF&G would be incorporated into the road design.

Sitka black-tailed deer use a variety of habitat types, so it is unclear how habitat fragmentation might affect their survival (USFS, 1997a). They appear to be limited by heavy snow conditions and the quality of winter habitat. Based on a lack of high-quality winter habitat, the deer population is considered very small on the east side of Lynn Canal north of Berners Bay (Barten, 2001).

Black bears in Southeast Alaska tend to migrate seasonally between winter dens at higher elevations and summer feeding grounds at lower elevations. Radio collared bears in Berners Bay have been shown to move between high elevations and shorelines on a regular basis (Robus and

Carney, 1996). Also, black bears are known to feed on salmon at the Sawmill Creek estuary in the fall. For this reason, many bears would likely have to cross portions of the proposed highway alignment at least twice a year. A lack of escape cover near some portions of Alternative 2B and traffic disturbance could block some bears from portions of their existing home ranges, such as lower reaches of anadromous fish streams. Because black bears are highly adaptable and often learn to coexist near human development, a highway is not expected to result in a substantial effect on black bear populations in the study area. The highway would likely result in mortality of some black bear from vehicle collisions. The HCI model results for the 1997 Draft EIS predicted that an East Lynn Canal Highway would decrease black bear habitat capability on the east side of Lynn Canal by about 6 percent compared to present conditions.

Brown bears move seasonally between higher elevation dens and lower elevation foraging habitat, for example, in Berners Bay in the isthmus between the Lace and Antler rivers (Christensen and Van Dyke, 2004). Most brown bear crossings of the Alternative 2B alignment location are at Sawmill Creek, Berners Bay estuary, Slate Creek, Sweeny Creek, and Independence Lake Creek. The highway could inhibit the number and/or timing of bear crossings between upland and coastal habitats in those areas. If females with cubs have reduced access to important food resources, cub survival could be affected. Under Alternative 2B, four bridges and two under crossings for wildlife are planned for the Berners Bay area along known brown bear crossings, which may reduce displacement and avoidance of brown bears from crossing to and from coastal beaches and emergent vegetation, salmon, and other food resources in those areas.

A highway on the alignment for Alternative 2B is not likely to fragment the range of marten, as they would readily cross the road to access favorable habitat. The mature forest habitat along the shoreline potentially serves as a movement corridor for marten between high-density forest areas such as found in Berners Bay, the Katzehin River drainage, and other drainages on the east side of Lynn Canal. A highway would reduce the size of this corridor of fringe habitat and may potentially reduce movement of marten between these areas (Barten, personal communication, 2005). The largest impact of this alternative on marten would be the indirect impact of trapping. Marten are highly desirable as a furbearing species and are relatively easy to trap. Alternative 2B would increase human presence and access in the region, probably increasing the number of marten trapped in the East Lynn Canal region. The HCI model results for the 1997 Draft EIS predicted that an East Lynn Canal Highway could decrease marten habitat capability on the east side of Lynn Canal by 32 percent primarily because of trapping. The effects of this increased pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc.

Alternative 2B would not fragment the ranges of marten and river otter except possibly in the area of Gran Point and Met Point. As discussed in Section 4.3.17.1, Gran Point and Met Point are important haulout areas for Steller sea lions. To discourage people from accessing them, the design for Alternative 2B would include cut banks near each haulout. These barriers could inhibit the movement of martens and river otters in these two areas, although there would be culverts these animals could use to cross the highway. Although a highway could impact individual animals, it is not expected to have population-level effects on martens and river otters in the study area.

Wolves are known to be present in the Lace, Antler, and Katzehin River valleys. Wolves travel widely in pursuit of prey and strongly avoid areas of human activity (USFS, 2000; Person, 2001). Some wolves use estuarine areas to feed on marine mammals and fish, but the importance of these areas for wolves in the Berners Bay area is not known. The proposed highway would likely not create a barrier to wolf movement, but provide more access for people to beaches and riparian areas, potentially inhibiting the use of these areas by wolves and their access to prey species. An estimated less than 1 percent of wolf habitat would be lost due to the construction of the proposed highway. It is not expected that the loss of habitat or fragmentation would have population-level effects on wolves in Lynn Canal.

Wolverines along east Lynn Canal use shrub habitats below 3,280 feet extensively (Lewis et al., 2012). An estimated less than 1 percent of this habitat would be lost due to the construction of the proposed highway. It is unlikely that this habitat loss would impact wolverine populations, because of their large ranges.

Wolverine populations are especially vulnerable to localized extirpations (i.e., elimination of the population) caused by overharvest due to their low densities and reproductive rates (Hornocker and Hash, 1981; Krebs et al., 2004; Squires et al., 2007). However, local extirpation of wolverines in the entire project area is unlikely because of the location of the highway at the edge of their habitat, and the low site fidelity of wolverines in southeast Alaska (Lewis et al., 2012). To protect the wolverine population along East Lynn Canal from overharvest, ADF&G could revise its current management strategy by season or highway zone closures, emergency orders, quotas, or other such tools.

Road-killed animals could become a food source for scavenging wolverines, perhaps increasing their vulnerability to collisions. The Alternative 2B alignment is adjacent to areas with high probability of use by wolverines for much of its length, and wolverines were recorded on both sides of the alignment in the Berners Bay and Point St. Mary peninsula areas. Due to the very low density of wolverines in the Lynn Canal area (Lewis et al., 2012) and their tendency to avoid areas of human influence, the probability for collisions is likely low.

Collisions with vehicles would result in an increase in mortality among many terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as moose and deer, as well as those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are expected to occur with species that tend to avoid roads such as the wolf and brown bear. It is not possible to quantify the effect of mortality from vehicle collisions on wildlife populations in the study area, but there would likely be losses over time.

The moose population around Berners Bay consists of only about 85 to 120 animals (Flynn et al., 2012) and is subject to a popular but limited draw hunt, with one to five permits issued per year (Timothy, 2014). Moose are often attracted to highways to feed on roadside grasses and brush and to escape deep snow. This association with highways is responsible for hundreds of moose being killed in Alaska each year, with an unknown number of others sustaining potentially fatal injuries (DOT&PF, 2003c). The number of moose killed by vehicles each year would fluctuate with weather conditions and the density of moose near the highway. Sporadic traffic mortality is unlikely to become an important factor in the maintenance of this population.

DOT&PF would use helicopters to deliver explosive devices to unstable avalanche zones along Alternative 2B during spring. Mountain goats are very sensitive to human disturbance in their alpine habitats, especially from helicopters (USFS, 2001). Avalanche control could result in mountain goat mortality because avalanche chutes are in steep habitat preferred by goats, and are occasionally used for winter forage (White et al., 2012b). Avalanche chutes are preferred foraging habitat for wolverine during spring and summer (Lewis et al., 2012). As a result, avalanche control could result in mortality to wolverines; however, the probability of mortality related to avalanche control for Alternative 2B would likely be low due to low wolverine densities in the area. The noise from avalanche detonation would be noticeable to mountain goats and other wildlife. The noise created by the resulting avalanche would be no different than that from naturally occurring avalanches.

Alternative 2B could facilitate the hunting of mountain goats, black bear, wolves, wolverine, moose, and brown bear. Incidents of Defense of Life and Property may increase due to increased movement of people through wildlife habitats. Trappers, hunters, and fishermen could benefit from the improved access. As a result of the increased access, ADF&G would consider management actions to ensure sustainable harvests. Possible management actions by ADF&G could include more active monitoring and enforcement duties by State and federal agencies (ADF&G, 2012b). Furthermore, the effects of increased hunting and trapping pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. ADF&G confirmed in January 2016 that no additional staff would be anticipated to manage additional harvests that may occur as a result of implementing Alternative 2B. Therefore, it is expected that this increased pressure would not result in undesirable population-level effects to mountain goats, black and brown bears, wolves, wolverine, or moose in addition to those due to habitat loss and fragmentation.

#### 4.3.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend’s warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily OG forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). There are approximately 103,501 acres of OG forest on the east side of Lynn Canal. Alternative 2B would affect less than 1 percent of the OG forest. Therefore, Alternative 2B is not expected to result in population-level impacts to these species.

Alternative 2B would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create “edge effects,” which is the edge between forest and grass or shrub lands that can be used by some avian predators such as ravens, jays, and crows. These effects would add to the decreased value of nesting habitat for neo-tropical migrants near the highway.

#### 4.3.15.5 Amphibians

Frogs and toads such as the wood frog, spotted frog, and boreal toad live in both marshy and forested wetlands as well as upland areas adjacent to ponds. Because amphibians have small home ranges and do not appear to travel far from their natal (birth) pools (NatureServe, 2003), the potential impacts resulting from highway maintenance and operation would be limited to those animals that live near the proposed alignment. The potential impacts of a highway to amphibians would occur through mortality from roadkill and potential pollution of habitat from highway runoff of pollutants from accidental spills. To avoid impacts to amphibian breeding areas and to reduce overall amphibian effects, the alignment has been moved to avoid open water and emergent wetlands. A pre-construction survey would be conducted to confirm the highway would not impact any amphibian ponds. Impacts are not expected to affect amphibian populations.

### 4.3.16 Bald Eagles

The principal concerns for maintenance and operation of Alternative 2B with regard to bald eagles is disturbance of nesting birds and abandonment of nesting sites. No communal roosting locations are known to occur along the highway alignment. Construction effects to bald eagles are addressed in Section 4.8.12.6. Since the 2006 Final EIS and ROD were issued, the alignment for Alternative 2B has been shifted, where possible, to avoid nests that would be less than 30 feet from the project facilities. In some cases, steep slopes and the need to avoid intertidal and wetland fill prevented shifting the alignment further away from eagle nests. Figure 4-11 shows the proposed highway alignment for Alternative 2B with the approximate distances to eagle nests.

The USFWS has developed a set of distance guidelines for construction activities near active eagle nests that have been used for this impact assessment. Table 4-34 lists the number of eagle nests within the distance guidelines for Alternative 2B.

**Table 4-34:**
**Number of Bald Eagle Nests in Proximity to Alternative 2B**

| Distance from Highway Alignment / Ferry Terminal for Alternative 2B | Number of Nests |
|---|---:|
| 661 feet – 0.5 mile | 36 |
| 331–660 feet | 36 |
| 101–330 feet | 29 |
| 61–100 feet | 11 |
| 31–60 feet | 18 |
| 0–30 feet | 7 |
| Total nests within 0.5 mile | 137 |

In Southeast Alaska, bald eagles that have chosen nest sites in or near urban areas are often acclimated to high levels of human activity (Johnson, 1990). Bald eagles are most susceptible to disturbance during the nesting season (March through August in Southeast Alaska). Bald eagles subjected to disturbance during the breeding season may seek new, more remote nest sites or may abandon nests (Fraser and Anthony, 2008). Studies have shown that bald eagle pairs may react to human activities very differently. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pairs (USFWS, 2009).

During operation of the East Lynn Canal Highway, blasting by helicopter along avalanche-prone areas of the highway to protect the highway and travelers from late spring avalanches could occur during the nest selection period. Bald eagles in nests located in or near the avalanche-prone areas or feeding near Berners Bay or the Katzehin River may be impacted by intermittent helicopter operations and blasting noise. Charges would be dropped into avalanche trigger zones generally located well above the timberline, relatively far from eagle nests or feeding locations along the shoreline. Response to such disturbances may include flushing from the nest, or abandoning the nest (Steidl and Anthony, 2000). Blasting along avalanche-prone areas of Alternative 2B could occur within 0.5 mile of up to 46 nests in the most severe snow circumstances, but in a typical spring only a fraction of that total might be affected. DOT&PF would coordinate with USFWS during final design to determine if a Disturbance Permit is necessary for annual blasting in avalanche areas.

Maintenance and operation of Alternative 2B would involve a persistent source of noise that may result in the relocation of individual eagle pairs to alternate nest trees within their nesting territory. Individual eagle pairs may even abandon their nesting territory and associated hunting perches altogether, especially during the summer months, when traffic volumes are predicted to peak. Because food availability has been identified as a key factor that influences breeding success, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the east shoreline of Lynn Canal. As a result, Alternative 2B is not likely to adversely affect the overall population of bald eagles in the Lynn Canal area.

### 4.3.17 Threatened and Endangered Species

Section 7 consultation for threatened and endangered species included humpback whales, Steller sea lions, and Steller sea lion critical habitat at Gran Point. Informal Section 7 consultation with NMFS began in 1994 regarding potential impacts to Steller sea lions and humpback whales and has continued with NMFS throughout the project's development. NMFS has concurred twice (in 1998 and 2005) that, with appropriate mitigation measures, project alternatives were not likely to adversely affect ESA-listed species. FHWA determined that Alternative 2B may affect and is likely to adversely affect the western DPS of Steller sea lion and humpback whales and initiated formal consultation with NMFS in accordance with Section 7. With identification of Alternative 1 – No Action as the preferred alternative, FHWA withdrew from the Section 7 consultation process (see February 15, 2017, letter from FHWA to NMFS in Attachment B of Appendix JJ).

#### 4.3.17.1 Steller Sea Lions

Since the 2006 ROD was issued, Alternative 2B has been modified to address geotechnical issues, permitting requirements, and bald eagle nest locations. In general, the new alignment of Alternative 2B is likely to have fewer impacts to Steller sea lions as compared with the alignment studied in the 2006 Final EIS because portions of the highway have shifted inland. The two principal haulouts along the proposed alignment for Alternative 2B that are used on an annual basis by Steller sea lions are Gran Point and Met Point. Gran Point is designated as critical habitat under the ESA. Although Met Point is not used by sea lions as extensively as Gran Point, it is still an important haulout for this species. Steller sea lions also haul out seasonally on Point St. Mary, approximately 2 miles southwest of Slate Cove, during the spring when feeding on spawning aggregations of eulachon and Pacific herring in Berners Bay. Tidal wash rocks at the tip of land forming the east side of Slate Cove are also used by Steller sea lions during the spring feeding period.

For Alternative 2B, the alignment near the Gran Point haulout has been shifted uphill and redesigned to go through two tunnels to avoid a rockfall area and cuts through slopes. This alignment modification moves the road farther away from the Gran Point haulout: approximately 100 to 600 feet horizontally and 50 to 100 feet vertically depending on location. Near the Met Point haulout, a portion of the road alignment (roughly 1,500 feet) has been shifted 25 to 100 feet closer to Lynn Canal and other areas of the alignment have shifted farther landward. Operation and maintenance of the highway would not result in disturbance of either haulout. Projected peak traffic noise levels for 2038 are 65 A-weighted decibels (dBA) at the centerline of the highway, and would attenuate to 32 dBA at a distance of 280 feet (see the *2017 Update to Appendix L – Noise Technical Report* (in Appendix Z) and the *2014 Update to Appendix S – Steller Sea Lion Technical Report* (in Appendix Z of the Draft SEIS). The highway would be approximately 500 feet from the Gran Point haulout and 300 feet from the Met Point haulout at its closest point. Traffic noise would not be audible above the background (ambient) noise level.

Normal winter and summer maintenance activities such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out would not produce levels higher than the predicted 30-year peak hour traffic. Winter operation would also require infrequent detonation of unstable snow in the three avalanche starting zones within the 3,000-foot radius around the two haulouts. Each of the three avalanche starting zones is projected to require detonation with a single charge at a frequency of once every 10 years or more at each zone. The noise from avalanche detonation would be noticeable at both the Gran Point and Met Point haulouts. Steller sea lions may react to the sounds by diving into the water from land or by submerging when they are in the water. Generally, they return to their previous behavior within an hour or so after isolated disturbances. The noise and vibration created by the resulting avalanche would be no different than that from naturally occurring avalanches.

Sea lions have been observed to approach and investigate marine vessels and other noise sources and appear to adapt to noise and human presence under some conditions (Richardson et al., 1995). Several major haulouts are located near busy shipping lanes and ports along the Pacific coast, with sea lions exhibiting little disturbance even as human activities increase (Johnson et al., 1990). In some areas, sea lions haul out on man-made structures close to humans (Richardson et al., 1995). In a study of Steller sea lions at a haulout in Glacier Bay National Park, the proximity and behavior of approaching marine vessels affected the activity rate of sea lions at the haulout (Mathews, 1997). Vessels that maintained a slow, steady course and kept the engines on seemed to disturb sea lions less than vessels with an erratic course or speed. This study may indicate that private vessels, which are more maneuverable and whose operators may be less aware of protection rules, might disturb Steller sea lions more than larger commercial vessels (NPS, 2003). Alternative 2B would not include any new boat launch sites for private or commercial vessels.

In response to NMFS concerns about potential pedestrian access and disturbance at the Gran Point and Met Point haulouts, highway design elements have been incorporated into Alternative 2B that are intended to prevent motorists from leaving the highway corridor and approaching these haulouts. The measures include steep road cuts adjacent to either haulout. DOT&PF would monitor the effectiveness of these design elements after highway construction and make additional changes, if necessary, to keep people away from these haulouts.

FHWA determined that Alternative 2B may affect and is likely to adversely affect the western DPS of Steller sea lions as well as designated critical habitat for the species (Gran Point Critical Habitat Area) in the action area. Adverse effects to critical habitat would be associated with new construction and occupancy information; operational effects would not be adverse. Although Alternative 2B is likely to adversely affect Steller sea lion critical habitat during construction, FHWA concluded that it would not destroy or adversely modify Steller sea lion critical habitat at Gran Point. Construction-related effects are described in detail in Section 4.8.12.7. Cumulative effects of Alternative 2B on Steller sea lions with past, present, and reasonably foreseeable future actions are described in Section 4.9.2.15.

#### 4.3.17.2 Humpback Whales

Alternative 2B would increase marine traffic in Chilkoot and Taiya inlets. The increase in ferry traffic associated with this alternative would not be high enough to substantially increase the risk of collisions with humpback whales.

Pile driving for construction of the ferry terminal at Katzehin has the potential to disturb humpback whales in the area. To reduce the likelihood of disturbance, trained observers would be used during pile driving to ensure that this activity does not occur when humpback whales are within 660 feet of the construction area.

With ESA-listed Mexico DPS humpback whales comprising approximately 6 percent of the whales in the area, the potential for these disturbances to impact listed whales is very small. FHWA determined that Alternative 2B may affect, but is not likely to adversely affect the Mexico DPS humpback whales. Construction-related effects are described in Section 4.8.12.7.

### 4.3.18 Permits and Approvals

Alternative 2B would require the following permits, consultations, and approvals:

- USFS transportation and utility easement issued under SAFETEA-LU Section 4407, as amended by the FAST Act, for use of Tongass National Forest lands, and USFS special use permit for any project activities or facilities located outside the Section 4407 easement on the Tongass National Forest.
- U.S. Army Corps of Engineers (USACE) Section 404 (Clean Water Act) permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit (Rivers and Harbors Act) for dredge, fill, and structures placed below mean high water
- NMFS ESA Section 7 consultation for threatened and endangered species
- NMFS MMPA Incidental Harassment Authorization for marine mammals
- USFWS eagle Disturbance Permit for nests within 660 feet of the cut and fill limits and for active nests within 0.5 mile of blasting activities and other loud construction noises. USFWS may require a Disturbance Permit for annual blasting in avalanche areas.
- APDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 (Clean Water Act) Water Quality Certification in support of Section 404 permit was obtained May 18, 2011 and is valid until May 18, 2016. No additional Water Quality Certification is anticipated.

- ADNR Title 41 fish habitat permits for any work below ordinary high water in streams with anadromous or resident fish were obtained on June 30, 2006 for the bridges over the Katzehin River, Lace/Berners River, and Antler River. DOT&PF will request reissuance of these permits under ADF&G Title 16.
- ADNR Interagency Land Management Assignment for use of tidelands at the Katzehin Ferry Terminal and easements for highway segments with fill below mean high water
- Authorization from ADEC for treated wastewater discharge from the Katzehin Ferry Terminal
- ADEC review of the Storm Water Pollution Prevention Plan (SWPPP) under the APDES Alaska General Permit
- Bureau of Alcohol, Tobacco, Firearms, and Explosives for use of explosives in avalanche control

## 4.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 proposes a new highway primarily on the west side of Lynn Canal (see Figure 2-8). This alternative would include: widening of the existing portion of Glacier Highway from Echo Cove to Cascade Point from 26 feet to 30 feet; construction of a highway from Cascade Point to Sawmill Cove on the same alignment as Alternative 2B (on the east side of Lynn Canal); and construction of a highway on the west side of the canal from William Henry Bay to Mud Bay Road in Haines. New ferry terminals would be located at Sawmill Cove and William Henry Bay to provide for shuttle ferry service across Lynn Canal. In addition, a bridge would cross the Chilkat River/Inlet on the west side of Lynn Canal from Green Point at Pyramid Harbor to Haines via Pyramid Island and connect to Mud Bay Road near Haines.

DOT&PF and the USFS considered appropriate sites for pullouts and scenic overlooks for Alternative 3 in 2003. The proposed locations of these sites are listed below and provided in Figure 4-12.

- A pullout near Sawmill Creek (east side of Lynn Canal)
- A pullout at William Henry Bay Ferry Terminal
- A scenic overlook on the shoreline near Lance Point
- A pullout near the Endicott River
- A pullout and scenic overlook north of the Cant geodetic marker
- A pullout near the Sullivan River
- A pullout and scenic overlook near the Gen geodetic marker
- A pullout near the Deep geodetic marker

The environmental impact assessment provided in this section includes consideration of the potential impacts of the proposed pullouts and scenic overlooks. The USFS has indicated that trails at four of the pullouts are reasonably foreseeable if the highway is constructed. (See November 2, 2005 letter from USFS in Chapter 7 of the 2006 Final EIS.) A separate environmental analysis would be completed by the USFS for these trails prior to their construction. These four trails are included in the cumulative impacts section of this chapter (Section 4.9).

### 4.4.1 Land Use

#### 4.4.1.1 Land Ownership and Management

Current ownership of the land that would be required for the highway ROW and new ferry terminal facilities for Alternative 3 is presented in Table 4-35. As indicated in that table, approximately 28 percent of the 1,419 acres of required ROW for Alternative 3 is federal land in the Tongass National Forest under the management of the USFS. This land would remain under federal ownership with a highway easement conveyed to the State. About 281 acres, or 20 percent, of the ROW is already owned by the State. The remaining land required for the Alternative 3 ROW is under private or University of Alaska ownership. Private landowners, Goldbelt, and the University of Alaska would be compensated for lands required for a new highway ROW at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. The ROW requirements assume a 150-foot width across the Goldbelt and other private lands and 300-foot width on USFS lands.

DOT&PF considers the 150-foot ROW width on private lands to be sufficient given the terrain through those areas. The 300-foot ROW width on USFS lands is based upon the width specified in the Memorandum of Understanding for Section 4407 easements (see Section 3.1.1.3), and is also consistent with the ROW width established by the federal government for the Haines Highway and similar roads across public lands within the state. DOT&PF generally minimizes impacts to private and municipal owners by taking only what is necessary for the immediate project and minor future improvements. For State and federal lands, DOT&PF usually obtains a standard 300 feet to allow for a one-time land transfer that would also accommodate any future expansion.

**Table 4-35:**
**Land Ownership of Required Right-of-Way for Alternative 3**

| Ownership (acres) | | | | | | Total (acres)[1] |
|---|---|---|---|---|---|---|
| USFS | State of Alaska | Alaska Native Allotment | Goldbelt | University of Alaska | Private | |
| 960 | 281 | 11 | 90 | 34 | 44 | 1,419 |

Note: 300-foot ROW on federal and State lands and 150-foot ROW on private and municipal lands.

[1] Due to rounding, numbers may add up to more than the total shown.

#### 4.4.1.2 Consistency with Land Use and Management Plans

As described in Sections 5 (p. 5-10) and 7 (p. 7-65) of the TLRMP, the TLRMP identifies Transportation Systems Corridors, or TSCs. TSCs include easements established by law, such as those granted under Section 4407 of SAFETEA-LU, as amended by the FAST Act. Such easements exist on the west and east sides of Lynn Canal, and Alternative 3 would fall within the easements; therefore, the DOT&PF believes this alternative is consistent with the TLRMP. The USFS land crossed by the alternative along the east shore of Berners Bay is currently managed under LUD II, Semi-Remote Recreation, and Scenic Viewshed designations (Figure 3-3). The USFS land crossed by Alternative 3 on the west side of Lynn Canal includes designations for Semi-Remote Recreation, Old Growth Habitat, and Modified Landscape. A small area around Endicott River is managed as Scenic Viewshed. In accordance with the TLRMP, if Alternative 3 was the selected alternative for the JAI Project, the USFS would manage the corridor under the

TSC management prescriptions, which would take precedence over the management prescriptions of the LUDs underlying the corridor (USFS, 2016b: 3-313).

The State of Alaska believes that use of State transportation easements granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, and located on the east and west sides of Lynn Canal would not require further evaluation for consistency with the TLRMP. If for some reason DOT&PF could not use all or a portion of these easements, FHWA would seek to secure a transportation easement across Tongass National Forest through a federal land appropriation process authorized by 23 USC 317.

The regional transportation policy set forth in the CBJ 2008 *Comprehensive Plan* is “to support the improvement of transportation facilities and systems that reinforce Juneau’s role as the capital city of Alaska and a regional transportation and service center.” The plan supports consideration of all affordable, energy-efficient transport alternatives to improve transportation links between CBJ and other areas of Southeast Alaska including air (cargo and passenger) service, roadways, ferries, and fixed guideway systems (CBJ, 2008). The CBJ *Comprehensive Plan* has identified tidelands in Berners Bay for a potential ferry terminal site. Alternative 3 is consistent with the CBJ *Comprehensive Plan*.

Goldbelt’s Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternative 3 is consistent with this plan and would use the alignment of the existing road. Alternative 3 may facilitate development of the other plan elements.

State tidelands and submerged lands near the Sawmill Cove area are managed to provide a dispersed recreation experience, wildlife habitat, harvest opportunities, and waterfront development by ADNR. The CBJ *Comprehensive Plan* designates the shorelands around the potential Sawmill Cove Ferry Terminal as Resource Development, with the potential to create a marine terminal (CBJ, 2008). A ferry terminal at Sawmill Cove would be compatible with USFS, ADNR, and CBJ management plans.

The majority of the land on the west side of Lynn Canal from north of the Tongass National Forest to the Pyramid Harbor area (Figures 3-1 and 3-2) is owned by the State of Alaska and is managed by the ADNR under the Haines State Forest Plan. Alternative 3 would cross approximately 7 miles of this State forest. The plan identifies preferred uses for forest land and the policies for managing these uses, emphasizing management flexibility. Transportation projects are consistent with the plan as long as they follow the State of Alaska Forest Resources and Practices Act and its regulations.

A portion of the West Lynn Canal Highway would be located within the Haines Borough. Land management intent within the Haines Borough is expressed in the Haines Borough *2025 Comprehensive Plan* (2012a) and the City of Haines Land Use Code (Title 18; Haines Borough, 2013) for planning and zoning. The *2025 Comprehensive Plan* considers new highway construction that might occur in the Lynn Canal area, and expresses opposition to a highway on the east side, preference for improved AMHS service in the Lynn Canal, and preference for a highway on the west side of Lynn Canal (Alternative 3), should a highway alternative be selected.

The Alternative 3 alignment crosses the Chilkat River/Inlet at Pyramid Island and joins Mud Bay Road. This area is within Haines Borough and is zoned General Use. Alternative 3 terminates at Mud Bay Road in Haines and would be consistent with this existing transportation use.

The Municipality of Skagway Borough *2020 Comprehensive Plan* states that it is the goal of the Municipality to provide an integrated, efficient, safe, and reliable transportation network to facilitate the movement and goods in and through Skagway (Municipality of Skagway, 2009). The transportation policy supports maintaining and increasing year-round access to and from Skagway including public and private ferries, and air, road, trail, marine, and rail access. Alternative 3 is not consistent with the Borough's comprehensive plan; however, State agencies' projects are not required to conform to local land use plans.

#### 4.4.1.3 Land and Resource Uses

Alternative 3 would improve opportunities for recreational activities such as hiking, camping, sightseeing, boating, bicycling, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway systems in Juneau, Haines, and Skagway. Access from Alternative 3 would result in more nonresident visitors arriving in Juneau, Haines, or Skagway by personal vehicle. The number of overall visitors to Juneau would increase because the highway would offer a previously untapped visitor population a more independent, flexible, and economical access option. The Haines State Forest is already a popular location for remote and semi-remote recreation. A highway through this area would make it more accessible for people looking for a rustic, but not completely remote outdoor experience. A highway could also provide opportunities for outfitters to make more recreational trips available to the public in the region. A highway and Sawmill Cove Ferry Terminal would improve access to Berners Bay for canoe and kayaker users.

Opening up these recreational opportunities on the coastline along the east side of Lynn Canal to Sawmill Cove and the west side of Lynn Canal from William Henry Bay to Haines would have a negative effect on the quality of the experience to those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there. The West Lynn Canal Highway would not affect the landing strip north of the Endicott River.

Many of the rivers and streams that would be crossed by the West Lynn Canal Highway contain resident and anadromous fish stocks available for sport fishing. The region also supports populations of mountain goat, bear, and moose available for take by resident and out-of-state hunters. Hunting and fishing pressure has increased along every highway in Alaska that has opened formerly remote areas. Increases in hunting and fishing would occur along the West Lynn Canal Highway. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect these resources from over utilization.

Improved access to fish streams and the resultant higher level of use by sport fishers would require a greater level of effort by ADF&G in terms of surveying streams and enforcing regulations. Increased access to Juneau and the resultant increase in visitors would put additional pressure on existing sport fishing facilities, including boat ramps. The CBJ would be responsible for evaluating the need for additional or expanded facilities as demand increases.

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

A highway would provide easier and less expensive access to mineral occurrences, prospects, and claims along the west side of Lynn Canal; however, it is unlikely that this improved access alone would enhance the economic viability of any of these mineral deposits. Development of mineral resources is capital intensive, involving many other costs besides access. Market conditions must be high enough to account for all of these costs before development can occur.

University of Alaska lands and Alaska Mental Health Trust lands crossed by or near the Alternative 3 alignment would likely increase in value if a highway were built.

**Roadless Areas –** Alternative 3 would not substantially change the natural integrity and appearance or opportunities for solitude in IRAs 303, 304, and 305 (see Revised Appendix DD, *Land Use Technical Report*, Section 4.4, for detail on the effects of Alternative 3 on roadless areas). IRA 303 consists of 66,363 acres, 78 percent of which is managed as Non-Development LUDs. Area 304 covers 199,858 acres and 77 percent of this area is managed as Non-Development LUDs. IRA 305 encompasses 94,800 acres. Within the 300-foot-wide assessment corridor, Alternative 3 would have a cleared width of approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the alignment is closer than 1,200 feet from shore), for a total width averaging 2,500 feet. Therefore, Alternative 3 would affect 3,557 acres of IRA 303, 1,244 acres of IRA 304, and 612 acres of IRA 305. Alternative 3 would reduce IRA 303 by 0.84 percent, IRA 304 by 0.11 percent, and IRA 305 by 0.07 percent.[34]

Alternative 3 would reduce the amount of land remaining roadless. The remaining area would appear natural and would still provide opportunities for solitude and other aspects of primitive recreation. The roadless area inventory boundary would not change; there would be a road within the IRA. Access to the roadless area would change from solely by water and air to include access via highway. Alternative 3 would not affect any identified scientific or educational features in IRAs 303, 304, and 305. Alternative 3 is also consistent with the TLRMP, which indicates that the road corridor for Alternative 3 in IRAs 303, 304, and 305 would be managed as a TSC. Revised Appendix DD, *Land Use Technical Report*, provides additional information on Roadless Areas. The Secretary of Agriculture and the USFS may be required to make an affirmative finding under the Roadless Rule that the easements granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, were "established by law" and therefore that a road using the easements would be consistent with the Roadless Rule.

### 4.4.1.4 Parks and Recreation Facilities

No land from a municipal, State, or federal park or recreation area would be acquired by Alternative 3. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

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[34] Because a ROW exists in this area, the Glacier Highway extension (0.7 mile in this IRA) has in part already occurred, but the USFS still maps this as an IRA.

### 4.4.2 Coastal Zone Management

The CBJ and Haines incorporated enforceable policies for coastal zone management into their respective comprehensive plans and/or ordinances, as described in Section 3.1.1.8. Official determination of consistency with these enforceable provisions would occur during local review of construction projects, including roads, ferry terminals, or other improvements and modifications needed to implement the alternative. The CBJ's previous consistency determination for Alternative 2B from Echo Cove to Sweeney Creek (CBJ, 2006; see Section 4.3.2) would need to be modified for Alternative 3 to include the access to the Sawmill Cove Ferry Terminal. The Haines Borough has incorporated several coastal management enforceable policies into its comprehensive plan. Consistency with enforceable provisions would be assured during local review of construction plans for individual construction projects as required by Alaska Statute 35.30. The Municipality of Skagway Borough has not incorporated coastal management enforceable policies into its comprehensive plan, but some elements are codified in other ordinances and compliance with the ordinances would occur during the development review process.

### 4.4.3 Visual Resources

Visual simulations were made for Alternative 3 at viewpoints in each of the major landscape units described in Section 3.1.2. The locations of those viewpoints are provided in Figure 4-2. A description of the visual character of the alternative at each viewpoint is provided below.

#### 4.4.3.1 Berners Bay

**Views from the Bay –** In Berners Bay, the most susceptible views to potential impacts from Alternative 3 would be views from boats in the bay. Figure 4-13 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway would be approximately 2.4 miles east from the viewer and would be located in an area not requiring substantial cuts and fills. Therefore, the highway would not likely dominate the existing natural setting. At closer distances, the ferry terminal at Sawmill Cove and the highway would be more noticeable. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, this condition would be highly dependent on the view distance.

Figure 4-14 is a visual simulation of the highway in the foreground at the Sawmill Cove Ferry Terminal proposed for Alternative 3. The highway would be noticeable intermittently along the eastern edge of Berners Bay. However, the proposed ferry terminal would likely be highly visible from this distance (approximately 1 mile) and through the middleground viewing threshold. The changes to form, line, color, and texture introduced by the ferry terminal would dominate the existing viewshed.

Views of the road and ferry terminal, vehicle movement, and vehicle lights could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views from the Highway –** Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense OG forest in most places. Many of the views looking west from the highway would be panoramic, taking in Berners Bay and Lynn Canal with the snow-capped peaks of the Chilkat Range in the background approximately 12 miles away.

#### 4.4.3.2 William Henry Bay to Sullivan Island

**Views from Lynn Canal** – Views most susceptible to potential impacts from Alternative 3 in this area:

- Views from within the Endicott River Wilderness
- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from cruise ships, ferries, and small boats
- Views from private land

Figure 4-15 is a visual simulation of Alternative 3 from William Henry Bay, approximately 0.3 mile from the proposed project. Topography along this portion of the proposed alignment consists primarily of rolling to steep hills. Vegetation is of a closed canopy forest character. William Henry Bay is a small enclosed bay. Middleground and background views of the proposed highway would be limited for marine travelers. The roadway itself would be visible intermittently as it traverses east and north around the outer edge of the bay. The proposed ferry terminal is likely to dominate the existing viewshed because it would introduce a high degree of change in form, line, color, and texture to the existing natural setting.

Figure 4-16 is a visual simulation of Alternative 3 looking west from Lynn Canal toward William Henry Mountain. Viewers of the proposed highway from this location are likely to notice an intermittent linear band around the toe of William Henry Mountain. The Alternative 3 alignment has reduced linear visibility based on the roadway being sited on a gentle topographic bench. This view demonstrates the effectiveness of vegetative screening.

Figure 4-17 is a visual simulation of Alternative 3 looking from Lynn Canal to the Endicott River delta with the Alternative 3 alignment in the foreground. Topography consists mainly of rolling hills within a closed-canopied forest and wetlands associated with the Endicott River. It is likely that the proposed highway would be intermittently noticeable from foreground and middleground views. The proposed bridge crossing the Endicott River may become a dominant feature within this viewshed. The existing natural setting contains many features that dominate the viewshed (e.g., the Endicott River delta and mountain ranges as well as coastline features [rock outcrops]). Minimal, if any, areas of cuts would be visible within the river delta.

Views of the road, bridge, and ferry terminal, as well as vehicle movement and lights, could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views from the Highway** – Views from the highway would typically alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the Canal in the middle- and background, with background views of the rugged, snow-capped peaks alone the east side of Lynn Canal. The crossings of the Sullivan and Endicott Rivers would open scenes to the west up forested valleys.

#### 4.4.3.3 Sullivan Island to Chilkat River

**Views from Lynn Canal** – Views most susceptible to potential impacts from Alternative 3 in this area:

- Views from residential areas in Haines and along roadways

- Views from small boats
- Views from Chilkat State Park
- Views from cabins
- Views from resorts/camps
- Views from the Haines State Forest Resource Management Area
- Views from visitors accessing Davidson Glacier

Figure 4-18 is a visual simulation of Alternative 3 from Lynn Canal where the proposed highway would traverse the headwater delta of the Davidson Glacier. The topography is very flat along this portion of the proposed alignment. The highway would have limited, if any, visible cuts in this area. In addition, vegetative screening would not make it very visible from Lynn Canal.

Figure 4-19 is a visual simulation of Alternative 3 from Chilkat River near Pyramid Island looking north to the proposed bridge that would cross the Chilkat River under this alternative. From this viewpoint, the bridge would provide a contrast in line, form, and color to the existing natural/semi-modified setting. This proposed crossing is of such a large scale that it may be noticeable even in background views. It is likely that the bridge would dominate views when it is in the foreground to middleground.

Views of the road and bridge, vehicle movement, and vehicle lights could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

**Views from the Highway –** At the southern end of this segment of the highway, views would alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the Canal in the middle- and background, with background views of the rugged, snow-capped peaks alone the east side of Lynn Canal. Davidson Glacier would be very prominent in views from the road where the alignment crosses below it. At the northern end of the highway, views would encompass the Chilkat River/Inlet and the community of Haines.

#### 4.4.3.4 Consistency with USFS Scenic Integrity Objectives[35]

The SIO for the TSC is Low, with only the foreground of views considered. This SIO should be achieved within one year of construction. Alternative 3 would be consistent with this SIO. Wherever possible, the alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway from Lynn Canal. Also, to the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. In many locations, the alternative would exceed the Low SIO. In order to demonstrate the overall visual effect of the alternatives, DOT&PF also evaluated the consistency of Alternative 3 with the SIOs of the adjacent LUDs.

USFS land from Echo Cove to Sawmill Cove has a Moderate SIO. The highway for Alternative 3 would not be visible from the coastline until Sawmill Cove. At this point, the access road to the

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[35] The 2006 Final EIS used Visual Quality Objectives (VQOs) in accordance with the 1997 TLMP. This Final SEIS has been updated based on the 2016 TLRMP, which replaced the VQOs with SIOs. The primary difference between the VQOs and SIOs is that the SIOs better recognize the positive scenic values associated with some human-modified (cultural) features and settings. The VQOs and SIOs are similar enough that the definitions were written to allow for easy conversion between the two.

new terminal and the terminal facility would be visible from Berners Bay. This segment of the project meets the SIO of adjacent land except at the terminal site. It is not feasible to achieve a Moderate SIO at the Sawmill Cove Ferry Terminal.

USFS lands on the west side of Lynn Canal have a High SIO at river deltas and William Henry Bay and a Moderate to Low SIO in all other areas. The West Lynn Canal Highway would be largely masked from views from Lynn Canal except at river crossings and the ferry terminal proposed at William Henry Bay. Therefore, the highway would achieve a Moderate SIO and conform to the SIOs of adjacent LUDs except at river crossings and in views from within William Henry Bay, where it would be visible in foreground and middleground views. It is not feasible to achieve a High SIO at river crossings and the William Henry Bay terminal.

### 4.4.4 Historical and Archaeological Resources

Alternative 3 would cross the Dalton Trail just north of Pyramid Harbor. This is the only property within the APE that is eligible for the NRHP.

The Dalton Trail would be bridged. Alternative 3 would have a visual effect on the trail. However, this effect would not be adverse because the visual context of the trail has changed from historical conditions and the primary view would be from the highway, as the trail is not currently in use. For this reason, FHWA has determined that Alternative 3 would have no adverse effect on the Dalton Trail.

Indirect effects on known and unknown historical and archaeological resources for Alternative 3 could result from increased access. Implementation of Alternative 3 would increase human access in the west Lynn Canal area. Increased access could result in disturbance of historic and prehistoric cultural sites from hikers, hunters, and other recreational users.

### 4.4.5 Socioeconomic Resources

#### 4.4.5.1 Overview

Improved access in Lynn Canal resulting from Alternative 3 would facilitate the movement of goods and people and create closer links between the economies of Juneau, Haines, Skagway, and Whitehorse.

A redistribution of the independent visitor market would result if Alternative 3 were implemented. Overall, the number of independent travelers passing through Juneau and Haines is expected to increase. Cruise ship traffic to Juneau, Haines, and Skagway would not be affected by Alternative 3.

Alternative 3 would not substantially affect the population and demographics of Juneau, Haines, and Skagway. Juneau would experience the largest population growth of the three communities due to improved access. This growth would translate into a demand for approximately 61 additional housing units in Juneau.

#### 4.4.5.2 Juneau

**Population, Economics, Housing, and Municipal Revenues** – Alternative 3 is predicted to generate 665 annual ADT in 2055, an increase of 585 trips relative to Alternative 1 – No Action, which would affect population, economics, housing, and municipal revenues in the region.

Traffic on Alternative 3 is predicted to remain constant over the 30-year period between 2025 and 2055 (665 annual ADT).

The total increase in visitor traffic to and from Juneau associated with Alternative 3 is estimated at 325 annual ADT in 2055. Assuming all traffic is round-trip and each additional visiting vehicle would carry an average of 2.3 people, Alternative 3 would result in up to 135,600 new non-Juneau resident visitors annually. Assuming visitors to Juneau would spend $77 per visitor per day (McDowell Group, 2012a), visitor spending in Juneau would increase by as much as $10.44 million because of Alternative 3 (Table 4-36). This increase in visitor spending in Juneau would generate an annual average of about $3.9 million in new payroll and about 105 new jobs.

**Table 4-36:**
**Alternative 3 Projected Traffic and Resulting Visitor Economic Impacts in Juneau, 2055**

| | **2055** |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 80 |
| Total Traffic under Alternative 3 (annual ADT) | 665 |
| Change in Traffic (annual ADT) (over No Action) | 585 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 325 |
| Total New Visitors Annually (over No Action) | 135,600 |
| Total New Visitor Spending Annually (over No Action) | $10,440,000 |
| New Local Payroll Annually (over No Action) | $3,900,000 |
| New Local Employment Annually (over No Action) | 105 |

Note: Numbers may not total exactly due to rounding.

Each new job in the Juneau economy results in an increase in population of about 1.5 people.[36] Therefore, the 105 new jobs in Juneau resulting from Alternative 3 would result in a population increase of approximately 158 residents. This increase would represent an overall increase of about 0.5 percent in Juneau's current population (estimated at 33,277 in 2015; see Revised Appendix EE, the *Socioeconomic Effects Technical Report*).

Based on 2.6 persons per household (from 2010 Census data), a population increase of 158 residents in Juneau would result in additional demand for about 61 housing units. In 2011, Juneau had approximately 13,057 housing units with a vacancy rate of 5 percent. The demand generated by Alternative 3 would be within the vacant housing capacity.

Alternative 3 would increase the value of private property along the highway, though the extent of the increase cannot be estimated. For example, Goldbelt's property in and north of Echo Cove would increase in value. The CBJ would have an increase in property tax revenues because of this increase in property values. Residents in this area would pay higher property taxes.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $10.44 million per year would generate (assuming all of the spending is taxable) $522,000 in additional annual sales tax revenues (based on a 5 percent tax rate).

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

**Industry/Commercial Sectors –** Alternative 3 would not affect the cruise ship industry in Juneau. Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety. Alternative 3 would not affect any of these factors.

As indicated in the previous discussion on population, economics, housing, and municipal revenues, the independent visitor industry in Juneau would benefit under Alternative 3. With completion of a highway, Juneau would become the mainline ferry terminus for the AMHS, resulting in a number of independent visitors stopping in Juneau that otherwise might not visit the community. The number of RVs traveling to Juneau would increase similar to those in Alternative 2B. The current capacity for RV camping in Juneau would not be sufficient to meet demand.

The process of planning and building an RV park in Juneau would present some challenges to prospective RV park operators. According to city officials, it is difficult to find developable land in Juneau appropriate for RV parks. The land would need to have easy highway access, water and electrical utilities, and accommodating neighbors. Such a location is likely to be desirable to a variety of interests, and in the past RV parks have not been able to promise the revenues that other operations would.

The increase in RV traffic associated with Alternative 3 would not occur until after construction was completed, and then would increase gradually over time. Construction is estimated to take 6 years. This would provide time during which the CBJ could work with interested landowners to develop a plan for RV facilities expansion.

Construction of Alternative 3 would result in logging incidental to clearing the highway ROW. A highway would improve access to timber stands that at some future date could be made available for harvest. The USFS manages the Tongass National Forest within the study area primarily as a “mostly natural setting,” though that portion of the National Forest north of Sullivan Rock is classified as “moderate development,” which allows logging. The State’s current forest management plan for that portion of the Haines State Forest precludes commercial logging. Mental Health Trust and University Trust lands are managed to provide income to the trusts. Highway access would increase the likelihood that logging would occur on these lands. Although a highway would help facilitate logging in the area, it would not be the main impetus for future logging. State and federal management policies and market conditions for Alaska’s forest products in general would have a greater effect on future logging possibilities.

The West Lynn Canal Highway would provide access to areas with known mineral potential, such as the area west of Sullivan Island. Improved access would increase the likelihood of future exploration.

Water transportation is the primary method of moving freight to and from Juneau, with Seattle being the primary port of origin and destination. This barge service is provided by AML and Northland Services. Transportation by barge would be expected to remain the mode by which most freight is shipped to Juneau. The economies of scale possible with barge service, and the relatively frequent service offered into Juneau (at least three barges/week) places the economics on the side of barge transportation.

AMHS transports less than 3 percent of freight in Lynn Canal. Freight on AMHS ferries is almost always transported on unaccompanied van trailers (i.e., without tractor or driver). In 2014, the AMHS carried 193 vans from Juneau to Haines, 206 vans from Haines to Juneau, 29 vans from Haines to Skagway, and 5 vans from Skagway to Haines (see *Socioeconomic Effects Technical Report*, Revised Appendix EE). Alternative 3 would change this freight transportation pattern in Lynn Canal: van trailers would be unloaded at Juneau (Auke Bay), and drivers would transport the cargo by road to Haines or Skagway using the West Lynn Canal Highway. Note that under Alternative 1 – No Action, unaccompanied vans would be allowed on the mainliners but would not be typically allowed on the Day Boat ACFs. Unaccompanied vans that use the mainliners under Alternative 1 – No Action would be affected and shippers would have to switch to a different method of transportation. Truck traffic north of the Auke Bay ferry terminal would increase. Because there would be no change in barge or ferry freight service to Juneau from points south, no change to consumer prices would be expected in Juneau as a result of the project.

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 3 is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

A West Lynn Canal Highway would not affect Juneau utilities. All of the utilities are adequate to accommodate any population increases attributable to the improved access afforded by Alternative 3 through 2055.

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum impact on Juneau's population from Alternative 3 would be an increase of less than 1 percent. This would mean an additional 30 students spread across all grades.

The cost of transporting students to Haines and Skagway could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day. Health and social services demand is mainly a function of population, and would therefore not be expected to change substantially under Alternative 3. Additional independent visitors to Juneau, particularly older retirees, would place some new demands on emergency room and other medical and dental services in Juneau. Demand for health care services resulting from additional highway crashes would be negligible when compared with existing demand.

Traffic increases resulting from improved access would not affect fire and EMS within the current service area. The closest Capital City Fire and Rescue station to Alternative 3 is at Auke Bay. As this is a volunteer response station, the station near the JIA would be the station most likely to be dispatched to emergencies in the portion of the Alternative 3 corridor that is within the CBJ.

The Juneau Police Department has discussed whether connecting Juneau to the outside highway system would result in new types of crime or more serious crime. Only 5 percent of arrests in the CBJ involve non-residents and less than 2 percent involve people from outside Alaska. Juneau also has very low rates for many of the crimes associated with more "connected" communities, such as gang activity and car theft. It has relatively higher incidents of crime that may be associated with isolation (e.g., domestic and alcohol-related crimes). One possibility raised in public scoping is that ending either a highway or mainline ferry service in Juneau would precipitate an "end-of-the-road" effect, bringing to town more transients who are unable to support themselves and individuals with mental and behavioral problems. However, the U.S. and Canadian customs stations on the Haines and Klondike highways act as a significant filter in this regard, and Haines and Skagway do not have this problem.

The Juneau Police Department believes that there is not enough evidence or precedents to suggest that simply improving access would affect the nature and rates of local crime. Much more of a factor than access is Juneau's distance from other population centers, particularly large cities. The Juneau Police Department believes a highway connection might be associated with some increase in teen runaways and perhaps some additional auto theft and credit card incidents. There could be an increase in importation of illegal drugs; however, local officials indicate it is already relatively easy to move these substances in and out of Juneau.

**Quality of Life –** According to the 1994 and 2003 household surveys (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), more than three-quarters of Juneau residents agree that improved access to their community is important. There is less agreement on whether quality of life is best served by highway access. Many proponents of a highway acknowledge that better ferry service would improve quality of life, but not by enough. Many proponents of ferry service believe that better access is important, but only ferry access would result in an overall improvement in the quality of life. The household survey indicated 36 percent of Juneau residents preferred an East Lynn Canal Highway, 36 percent preferred improved ferry service, and 16 percent preferred the West Lynn Canal Highway.

The reasons for these differing views are complex and interwoven with how individuals view Juneau's lack of highway access. Research and public comment over the past two decades have shown that some residents cherish this condition while others deplore it. Further, improved transportation is generally associated with growth opportunities, and growth typically affects the quality of life. Finally, as noted in the *Socioeconomic Effects Technical Report* (Revised Appendix EE), the isolation associated with lack of highway access induces a sense of psychological comfort in some residents and a feeling of frustration and claustrophobia in others. Alternative 3 would still leave Juneau unconnected by a direct highway link to the continental highway system; therefore, for those that perceive quality of life in terms of connectedness the quality of life would not substantially change.

#### 4.4.5.3 Haines

**Population, Economics, Housing, and Municipal Revenues –** Traffic to and from Haines on the Alternative 3 alignment is predicted to remain constant over the 30-year period between 2025 and 2055 (420 annual ADT[37]; see Revised Appendix AA, *Traffic Forecast Report*).

Currently, northbound ferry travelers with vehicles can take mainline ferry service to either Haines or Skagway. With Alternative 3, these mainline ferry travelers would disembark at the Auke Bay Ferry Terminal and then travel by vehicle to or through Haines, creating a substantial increase in traffic to the community. The total increase in visitor traffic to Haines associated with this alternative is estimated to be 200 annual ADT in 2055. Growth in Juneau resident travel

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[37] These annual ADT numbers are projected traffic destined for Haines. Including Skagway-bound traffic would increase these numbers to 665 annual ADT. Only the Haines-bound traffic is used for this analysis.

accounts for the majority of this traffic increase over Alternative 1 – No Action, as the 2003 household survey measured a strong interest among Juneau residents in more travel to Haines.

New visitor traffic of 200 annual ADT would result in an increase of approximately 83,900 annual visitors to Haines. Assuming that visitors would spend an average of $77 per visitor per day, visitor spending in the community would increase as much as $6.46 million annually as a result of Alternative 3. In terms of economic impact, increased spending in Juneau by Haines residents would offset approximately $5.22 million of this new visitor spending in Haines, resulting in a net increase in spending in Haines by as much as $1.24 million (Table 4-37). A net increase in visitor spending in Haines of $1.24 million in 2055 would generate $460,000 in new payroll and about 15 new jobs.

**Table 4-37:**
**Alternative 3 Projected Traffic and Resulting Visitor Economic Impacts in Haines, 2055**

| | **2055** |
|---|---:|
| Total Traffic Under Alternative 1 – No Action (annual ADT) | 50 |
| Total Traffic under Alternative 3 (annual ADT) | 420 |
| Change in Traffic (annual ADT) (over No Action) | 370 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 200 |
| Total New Visitors Annually (over No Action) | 83,900 |
| Total New Visitor Spending Annually (over No Action) | $6,460,000 |
| Less New Haines Resident Annual Spending in Juneau | $5,220,000 |
| Net Change in Annual Spending in Haines | $1,240,000 |
| New Local Payroll Annually (over No Action) | $460,000 |
| New Local Employment Annually (over No Action) | 15 |

Note: Numbers may not total exactly due to rounding.

Generally, each new job in the Haines economy results in a population increase of about 1.5 people.[38] Therefore, for the 15 new jobs in Haines resulting from Alternative 3, the population would increase by about 23 residents, or about 0.9 percent of the existing Haines population (population estimate for Haines in 2015 is 2,493; see Revised Appendix EE, the *Socioeconomic Effects Technical Report*).

A population increase of 23 residents would result in additional demand for about 7 housing units, assuming 3.4 persons per household (based on 2010 Census persons per household). Improved access would enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors. To the extent that this occurs, demand for property in Haines would increase. Also, because of land availability in Haines and its drier climate when compared to Juneau, it is possible that additional Juneau residents may seek seasonal homes in Haines with the West Lynn Canal Highway. It is likely that few residents of Juneau would seek year-round housing in Haines because of the ferry link Alternative 3 would require.

Alternative 3 would improve the opportunity for development of some type on property owned by the University of Alaska. The university owns a substantial amount of land in the Glacier

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

Point and Pyramid Point areas, and would manage these lands to the maximum financial benefit of the university. Development could include logging, which would depend on market conditions, subdivision development, leases for commercial development, or some combination of these options. The Alaska Mental Health Trust also owns a small parcel of the land in the Glacier Point area and could pursue similar profit-oriented development with improved access. Highway access to private property near Haines would increase the value of land in that area with a corresponding increase in the property taxes associated with the land.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $6.46 million annually would generate $356,000 in additional sales tax revenues (based on a 5.5 percent tax rate). Haines would also experience an increase in property tax revenues because of the increase in private property values mentioned above.

**Industry/Commercial Sectors –** Haines is struggling to maintain a position in the independent and cruise visitor markets. Independent visitor travel to Haines has been declining, direct cruise traffic has been erratic, and the local visitor industry has a growing dependence on Skagway cruise passengers taking excursions to the Haines area. As indicated above, Alternative 3 would substantially improve Haines' independent visitor market, but would not affect the cruise market.

As discussed previously, small parcels of University of Alaska and private land near Pyramid Harbor and Glacier Point would be more easily developed with the West Lynn Canal Highway. This development could include visitor industry facilities, small-scale logging, or a combination of development activity.

Alternative 3 would improve access to areas in the Chilkat Range with known mineral potential. Better access increases the likelihood of discovery of mineral deposits and, ultimately, commercial production.

Barge service to Haines would not be expected to change with Alternative 3. Therefore, shipping costs for goods moved by this mode would not change as a result of Alternative 3. However, some freight comes into Haines via ferry from Juneau. Shipment of that freight by truck via the Sawmill Cove Ferry Terminal and new highway is estimated to cost approximately 10 percent more than the current cost of shipping an unaccompanied van trailer on a mainline AMHS vessel. This could translate into slightly higher costs for Haines consumers and/or or decreased profits for merchants. However, since at least 97 percent of freight containers would continue to travel by barge, the overall economic effect of the changes is expected to be negligible (see the *Socioeconomic Effects Technical Report,* Revised Appendix EE, for detail on container shipments).

**Utilities and Public Services –** Much of the information provided below on the effects of Alternative 3 is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Revised Appendix EE).

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum increase in students resulting from Alternative 3 would be about 20 in 2055 spread across all grades.

The cost of transporting students to Juneau and other southeast communities could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day.

Solid and hazardous waste facilities and electric utilities in the Haines Borough have adequate capacity to meet the slight increase in demand associated with the development of Alternative 3. Haines' water supply and wastewater treatment system is adequate to accommodate current and expected water demand for the next 20 years (Haines Borough, 2012). The slight population growth associated with Alternative 3, which is projected to be about 0.9 percent of the current population, and is not likely to result in the need for expansion of these facilities.

Improved access could make it somewhat easier and faster to transport patients either on an emergency or scheduled basis to Juneau from Haines. However, air transport for medical emergencies would remain the method of choice. The Haines Medical Clinic is operated by SEARHC, a regional organization with a large presence in Juneau. Improved access between Juneau and Haines would reduce cost and increase the efficiency of SEARHC operations by facilitating movement of staff and supplies between SEARHC locations.

Increased traffic through and to Haines would place additional demands on the community's fire and emergency response services. If fire and emergency response personnel respond to incidents outside current service areas, such as currently inaccessible parts of the borough south of Haines, it would substantially reduce their capacity to deliver normal services while those personnel and equipment are occupied. This impact would be most pronounced with Alternative 3, which is forecast to increase annual ADT to 420 vehicles moving between Juneau and Haines.

The Haines Police Department does not expect substantial impacts from improved access. Most crime in Haines involves local residents in spite of the highway connection to the north. State Troopers[39] would patrol the highway from the Chilkat River bridge to the William Henry Bay terminal, as this is beyond the Haines Police Department service area.

**Quality of Life –** Haines' quality of life would change in a number of ways under Alternative 3. The household surveys indicate that 87 percent of Haines residents agree that improved access to their community is important. In the 1994 household survey (McDowell Group), Haines residents cited increased recreation opportunities, economic growth, and better access to health care and job markets as potential improvements to quality of life that could result from a highway. The principal negative impact on quality of life cited by Haines residents was social change such as increased crime and the appearance of undesirable transients, increased traffic, and declining local businesses. As indicated above, traffic would increase in Haines with Alternative 3. It is also projected that residents of Haines would increase their spending in Juneau. For Alternative 3, increased spending in Juneau would be offset by increased visitor spending, though a shift in consumer type may have an impact on the types of retail businesses in Haines. There is no evidence that crime would increase in Haines with Alternative 3 because most crime in Haines involves local residents in spite of the community's highway connection to the north.

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[39] As of February 2017, the Alaska State Trooper position was vacant.

#### 4.4.5.4 Skagway

**Population, Economics, Housing, and Municipal Revenues –** Traffic to and from Skagway from Alternative 3 is predicted to remain relatively stable at 245 annual ADT over the 30-year period between 2025 and 2055. The total increase in visitor traffic to Skagway associated with Alternative 3 is estimated to be 155 annual ADT. This increase in visitor annual ADT is projected to result in an increase of approximately 65,900 independent visitors annually to Skagway. Assuming that visitors would spend an average of $77 per day in Skagway, visitor spending in the community would increase by as much as $5.07 million as a result of Alternative 3. This increase in visitor spending would generate 50 additional jobs and additional payroll of $1.89 million (Table 4-38).

**Table 4-38:**
**Alternative 3 Projected Traffic and Resulting Visitor Economic Impacts in Skagway, 2055**

| | **2055** |
|---|---:|
| Total Traffic under Alternative 1 – No Action (annual ADT) | 30 |
| Total Traffic under Alternative 3 (annual ADT) | 245 |
| Change in Traffic (annual ADT) (over No Action) | 215 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 155 |
| Total New Visitors Annually (over No Action) | 65,900 |
| Total New Visitor Spending Annually (over No Action) | $5,070,000 |
| New Local Payroll Annually (over No Action) | $1,890,000 |
| New Local Employment Annually (over No Action) | 50 |

Note: Numbers may not total exactly due to rounding.

With 50 new jobs, a population increase of about 75 residents would be expected (assuming each new job results in an increase of about 1.5 people). A population increase in Skagway of 75 residents would represent an overall increase of about 7.2 percent (the population estimate for Skagway in 2015 is 1,040; see Revised Appendix EE, the *Socioeconomic Effects Technical Report*).

Assuming about 2.5 residents per household (based on 2010 Census persons per household), population growth of about 50 residents would translate into demand for about 30 additional units. The 2010 U.S. Census indicated that Skagway has about 152 vacant housing units, not including seasonal, recreational, and occasional use units. Skagway has a shortage of affordable homes for first-time home buyers and a lack of seasonal employee housing, which may make it difficult to accommodate the projected demand. It is likely that the private sector would respond by construction of additional housing if residential land is available.

Skagway would experience an increase in sales and bed tax revenues associated with increased visitor spending. The estimated initial increase in visitor spending of $5.07 million annually would generate about $203,000 in additional sales tax revenues (assuming a 4 percent tax rate). This spending would also generate additional bed tax revenues.

**Industry/Commercial Sectors –** Construction of the West Lynn Canal Highway would not alter cruise lines' decisions on port calls in Skagway. Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety.

Members of the NWCA discussed the proposed highway alternatives during the 2003 NWCA Operations and Technical Committee meeting as well as the Government Affairs and Community Relations Committee meeting. As a follow-up to their discussions, NWCA sent a letter to the Governor of Alaska stating that construction of a highway would have no effect on members' itineraries. NWCA estimated its member lines carry 97 percent of Alaska cruise passengers. Given that cruise line managers think that a direct highway link would not affect their operations, Alternative 3 is unlikely to have any effect. (The NWCA, now the North West & Canada division of the CLIA, consists of Carnival Cruise Line, Celebrity Cruises, Crystal Cruises, Disney Cruise Line, Holland America, Norwegian Cruise Line, Princess Cruises, Oceania Cruises, Regent Seven Seas Cruises, Royal Caribbean Cruise Line, and Silversea Cruises.)

Regional managers for Princess Tours and Gray Line, the primary ground transportation providers for all large ships, have stated that terminating voyages in Juneau and busing cruise ship passengers to Skagway is not feasible due to limitations regarding tour capacity, pricing, and timing. A round-trip bus excursion to Skagway on a West Lynn Canal Highway could not be accomplished in a single day, requiring two shuttle ferry trips as well as the highway link. Therefore, passengers on ships terminating their cruise in Juneau could not experience the sites and activities in Skagway or the popular rail excursion. Given these factors, it is not likely that bus excursions would replace cruise ship port calls in Skagway under Alternative 3.

Skagway is also an important transshipment point linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. In 2010, 70,427 tons of freight moved through the Skagway port, with almost half (45 percent) of the freight being petroleum products (USACE, 2010b). Skagway would continue to be an important transshipment point with Alternative 3. Freight moving through Skagway to the Yukon from barge shipments would still be less expensive than transporting it via the West Lynn Canal Highway.

Transporting freight containers by AMHS would require truck hauling via the Sawmill Cove Ferry Terminal and West Lynn Canal Highway to Haines, and then by a second shuttle ferry to Skagway. It is estimated to cost approximately 58 percent more to haul freight this way than the current cost of shipping an unaccompanied van trailer on a mainline AMHS vessel. This could raise costs for some consumer goods in Skagway or decrease profits. However, since at least 97 percent of freight containers would continue to travel by barge, the overall economic effect of the changes is expected to be negligible (see Revised Appendix EE, *Socioeconomic Effects Technical Report,* for detail on container shipments).

**Utilities and Public Services –**Alternative 3 would result in minimal population growth in Skagway, it would not appreciably impact utilities and public services. The cost of transporting students to Juneau and other southeast communities could change depending on a variety of factors, including the number of students and the need to overnight away from home. The opportunity for students to travel between the communities could increase due to reduced costs and the increased ability to make the trip within the same day.

**Quality of Life –** In 2011, Skagway had about 717,000 visitors, primarily in the summer months. Alternative 3 would increase the number of annual visitors by less than 2.5 percent. This increase would not result in a change in the quality of life in the community.

Alternative 3 would improve access to and from Skagway by improving trip opportunity. Improved access would be considered a beneficial effect on quality of life by some. Other residents would not feel that it improved their quality of life because of the two ferry trips required to and from Juneau.

### 4.4.6 Subsistence

Alternative 3 would not affect subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty Islands, the lands adjacent to Taiya Inlet, and the south shore of St. James Bay. It would not affect subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

Alternative 3 would have no direct effects on subsistence uses. Improved access to subsistence use areas along the West Lynn Canal Highway in the Sullivan River area could indirectly affect the intensity of subsistence harvest and the availability of resources. Alternative 3, together with USFS plans for potential public access locations along the highway, would make Lynn Canal much more accessible for other hunters. Alternative 3 could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but for others the increased competition for resources would be perceived as a negative impact. Subsistence is further discussed in Revised Appendix DD, the *Land Use Technical Report*.

Based on the information obtained to date with respect to subsistence resources and the analysis presented in the 2006 Final EIS, comments received during 2012 scoping for the Draft SEIS, and comments on the 2014 Draft SEIS, FHWA has determined that Alternative 3 would not significantly restrict subsistence uses.

### 4.4.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. Alternative 3 is not consistent with the 2004 SATP. The SATP will be updated to reflect the identification of Alternative 1 – No Action as the recommended improvement.

DOT&PF’s 2016–2019 STIP (Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. Alternative 3 is not consistent with the 2016–2019 STIP, while Alternative 1 – No Action is consistent with the currently adopted STIP.

#### 4.4.7.1 Demand and Capacity

Traffic demand on Alternative 3 was projected for 2025 and 2055 using the transportation model summarized in Section 4.1.5. These projections were based on 2015 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Table 4-39 compares projected traffic demand and capacity for Alternative 3 with Alternative 1 – No Action in 2025. As indicated in the table, the West Lynn Canal Highway is projected to realize and accommodate substantially higher travel demand in the Lynn Canal corridor than Alternative 1 – No Action. Approximately eight times as much traffic would travel on the West Lynn Canal Highway as on the AMHS under Alternative 1 – No Action in 2025.

**Table 4-39:**
**2025 Forecast Demand and Capacity for Alternative 1 – No Action and Alternative 3**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1 – No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |
| 3 | 665 (420/245) | 1,030 (650/380) | 405 (255/150) | 2,520 (1,590/930) | 1,272 (816/456) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

Projected traffic demand and capacity for the West Lynn Canal Highway and Alternative 1 – No Action in 2055 are provided in Table 4-40. These projections reflect the slight increase in population over the 30-year period. As indicated in Table 4-39 and Table 4-40, Alternative 3 has the capacity to meet the projected summer ADT in 2055. Because of the capacity limit of the ferries between Sawmill Cove and William Henry Bay and the ferry between Haines and Skagway, Alternative 3 would provide capacity for approximately 51 percent of peak week demand. During peak times, or special events, additional sailings could be provided to meet the demand. In such cases, AMHS could add ferry trips by operating on longer daily schedules.

More than eight times as much traffic would travel on the West Lynn Canal Highway as on the AMHS system under Alternative 1 – No Action in 2055 (see Table 4-40).

**Table 4-40:**
**2055 Forecast Demand and Capacity for Alternative 1 – No Action and Alternative 3**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1—No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |
| 3 | 665 (420/245) | 1,040 (655/385) | 405 (255/150) | 2,545 (1,605/940) | 1,272 (816/456) |

Note: The first number is the total demand or capacity. Numbers in parentheses are the demand or capacity split between Haines and Skagway, respectively.

The summer ADT between Juneau and Skagway is projected to be 385 vehicles in 2025 and 2055. The number of ferry trips and ferry capacity between Haines and Skagway have been planned to accommodate the projected 2025 and 2055 summer ADT.

Because of the ferry links for this alternative, the capacity of Alternative 3 would not meet the projected unconstrained travel demand in the Lynn Canal corridor. Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternative 3 would realize and accommodate approximately 65 percent of the latent summer demand in 2025 and 2055.

By providing increased frequency of service between Haines and Skagway, Alternative 3 would have the indirect effect of increasing travel demand between Haines and Skagway. Under Alternative 1 – No Action, the local[40] ADT between Haines and Skagway is projected to be approximately 53 vehicles in 2025 and 2055. With Alternative 3, local travel demand between

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[40] For the purposes of this SEIS, "local" refers to passenger and vehicle traffic that only goes back and forth between Haines and Skagway (i.e., it is traffic that either boards in Haines and disembarks in Skagway, or boards in Skagway and disembarks in Haines). This local Haines-Skagway travel demand is not considered part of the overall demand for travel to and from Juneau in Lynn Canal.

Haines and Skagway in summer is projected to be 61 ADT in 2025 and 2055 (McDowell Group, 2016). The Alternative 3 Haines-Skagway shuttle would be sized to accommodate this demand in addition to the Juneau-Skagway demand.

### 4.4.7.2 Travel Flexibility and Opportunity

Alternative 3 would improve flexibility and opportunity for travel between Juneau and Haines relative to Alternative 1 – No Action. Travelers would be dependent on the shuttle ferry schedule between Sawmill Cove and William Henry Bay, which is projected to make 12 round trips per day in the summer. This level of service is a substantial improvement over Alternative 1 – No Action, which offers eight ferry round trips per week between Juneau and Haines.

An indirect impact of the forecast demand for Alternative 3 would be increased opportunities for travelers to take shuttle ferry trips between Haines and Skagway. Under Alternative 1 – No Action, the Haines-Skagway ferry service would operate two times per day in the summer. Ferries between Haines and Skagway in the summer would operate six times per day under Alternative 3.

The West Lynn Canal Highway would be susceptible to avalanches in the winter, and is estimated to be closed an average of 5.5 days per year due to avalanches (see Section 4.4.8.1). No closure is expected to exceed a day.

For through-travelers using the AMHS mainline ferry service to access Haines or Skagway from ports south of Juneau (or vice versa), the travel pattern would be altered because mainline ferry service would terminate at Juneau. Through-travelers would disembark at Juneau/Auke Bay and would drive north to the Sawmill Cove Ferry Terminal, shuttle across Lynn Canal, and take the West Lynn Canal Highway to Haines. Skagway travelers would take another shuttle ferry from Haines to Skagway. For people in vehicles, this likely would be a minor change in travel flexibility or opportunity, although for Skagway-bound passengers, waiting for two shuttle ferries may be seen as inconvenient compared to riding the mainline ferry, even though the overall time in transit likely would be shorter. For walk-on ferry passengers, an additional step of reserving a rental car, public transportation, or an airplane seat, or finding a ride would be required. Such passengers likely would see this requirement as reducing travel flexibility and opportunity.

During the winter, the direct Haines-Skagway shuttle would continue to operate, but only one ferry (instead of two) would sail between Sawmill Cove and William Henry Bay. This routing would meet reduced traffic demand and would allow for annual maintenance on the vessels. Each winter, each of the three vessels would be serviced, while the remaining two continue to operate. Even with just two vessels operational in the winter, there would be multiple trips per day in 2055 versus the few trips per week under Alternative 1 – No Action.

### 4.4.7.3 Travel Time

Table 4-41 provides a comparison of travel times between Alternative 1 – No Action and Alternative 3. The travel time between Auke Bay and Haines with Alternative 3 is estimated to be about 3 fewer hours than traveling on the Day Boat ACF under Alternative 1 – No Action, and about 4 fewer hours than traveling on a mainline ferry under Alternative 1 – No Action.

Travel time between Auke Bay and Skagway under Alternative 3 would be approximately 2 to 2.5 fewer hours (depending on direction) than under Alternative 1 – No Action, when taking a

Day Boat ACF. With Alternative 3, traveling between Auke Bay and Skagway would be between 3.5 and 4 fewer hours (depending on direction) than the time required to travel on a mainline ferry under Alternative 1 – No Action.[41] The estimated Alternative 3 travel time is based on the assumption that approximately half the travelers would be arriving randomly due to the frequency of the ferry schedule, while the other half would time their arrival to match the schedule.[42] Similarly, many travelers on the Day Boat ACFs under Alternative 1 – No Action would plan to arrive before the minimum allowed check-in time to avoid the possibility of losing their reservations. Also under Alternative 3, the Haines-Skagway ferry would run at a different frequency than the cross-Lynn Canal ferries, so some travelers would have to wait for their second ferry connection, increasing the time to and from Skagway.

**Table 4-41:**
**Summer Travel Times for Alternative 1 – No Action and Alternative 3**

| Route | Travel Time (hours) | |
|---|---|---|
| | Alternative 1 – No Action (Day Boat ACF) [1] | Alternative 3 |
| Auke Bay-Haines | 6.2 | 3.2 |
| Auke Bay-Skagway | 8.1 | 5.5 NB/5.1 SB[2] |

[1] With Alternative 1 – No Action, the mainline ferry (i.e., service along the length of the system, from Bellingham, WA, or Prince Rupert, B.C.) would have a travel time of 7.2 hours between Auke Bay and Haines and 9.1 hours between Auke Bay and Skagway.

[2] The travel time is different for northbound (NB) and southbound (SB) because there are more ferry crossings between Sawmill Cove and William Henry Bay (12 per day in the summer) than between Haines and Skagway (6 per day in the summer); therefore, northbound travelers have more wait time in Haines. In addition, northbound travelers would need to depart Sawmill Cove on one of the first eight ferries to make the Haines-Skagway connection (i.e., before 6:30 pm).

Alternative 3 would have no impact on travel times between Haines and Skagway. The travel time, 2.4 hours, would be the same for the Haines-Skagway shuttle ferry under Alternative 1 – No Action and Alternative 3. The Haines-Skagway ferry would operate more frequently under Alternative 3 than under Alternative 1 – No Action, so the waiting time would be less for travelers who do not time their arrival at the ferry terminal with ferry sailing times.

#### 4.4.7.4 State and User Costs

The 36-year life-cycle costs[43] for Alternative 1 – No Action and Alternative 3 discounted to 2016 dollars are provided in Table 4-42. These costs include State and federal capital costs and State maintenance and operating expenses. Capital costs include design, ROW acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

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[41] The travel time is different for northbound (NB) and southbound (SB) because there are more ferry crossings between Sawmill Cove and William Henry Bay (12 per day in the summer) than between Haines and Skagway (6 per day in the summer); therefore, northbound travelers have more wait time in Haines. In addition, northbound travelers would need to depart Sawmill Cove on one of the first eight ferries to make a Haines-Skagway connection (i.e., before 6:30 pm).

[42] On ferry systems with relatively short runs, multiple round trips per day, and capacity to meet projected demand, taking reservations is an unnecessary expense and would increase travel time.

[43] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 6-year construction period and a 30-year operation period, discounted to 2016 dollars.

**Table 4-42:**
**Thirty-Six-Year Life-Cycle Costs for Alternative 1 – No Action and Alternative 3 ($millions)**

| Alternative | Capital Cost | Operating Cost | Total Life-Cycle Cost |
|---|---|---|---|
| 1 – No Action | $119 | $322 | $441 |
| 3 | $467 | $370 | $837 |

Table 4-43 provides an estimate of total project life costs less residual value, expressed in 2016 dollars with no discounting of future costs. The total project life cost over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $1.2 billion (capital plus operating costs, Table 4-40). As indicated in the table, the capital cost of Alternative 3 would be higher than Alternative 1 – No Action due to the cost of required highway, shuttle ferries, and ferry terminal facilities.

**Table 4-43:**
**Thirty-Six-Year Total Project Life Costs for Alternative 1 – No Action and Alternative 3, 2019-2054 (2016 Dollars)**

| Alternative | Total Funds | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $378 | $279 |
| 3 | $393 | $774 | $1,167 | $810 | $449 | $361 | $46 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

Table 4-43 indicates that the West Lynn Canal Highway would have a lower net cost to the State during the analysis period than Alternative 1 – No Action. This is because the increased State revenues for this alternative would essentially offset increased State costs relative to Alternative 1 – No Action. The West Lynn Canal Highway would carry more vehicles than Alternative 1 – No Action. Therefore, Alternative 3 would cost the State less than Alternative 1 – No Action on a per-vehicle basis.

Alternative 3 would have an annual operating cost of approximately $22.1 million versus $18.2 million for Alternative 1 – No Action.

The anticipated total cost[44] and out-of-pocket cost[45] of travel between Juneau and Haines or Skagway on the West Lynn Canal Highway for travelers are provided in Table 4-44. As indicated in the table, under Alternative 3, the total out-of-pocket cost for a family of four in a 19-foot-long vehicle to travel to/from Haines would be approximately one-fourth the cost of the same travel under Alternative 1 – No Action. For travel to/from Skagway, Alternative 3 would cost approximately one-third the cost of the same travel under Alternative 1 – No Action. For a

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[44] Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

[45] Out-of-pocket costs are a combination of estimated fares and gasoline on highway segments. Fares for Alternative 1 – No Action are actual 2015 fares charged.

driver with a 19-foot-long vehicle or a walk-on passenger, the out-of-pocket costs also would be lower with Alternative 3.

**Table 4-44:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Cost for Alternative 1 – No Action and Alternative 3**

| Alternative | Example scenario | Haines User Cost[1] | | Skagway User Cost[1] | |
|---|---|---|---|---|---|
| | | Total User Cost | Out-of-Pocket Cost | Total User Cost | Out-of-Pocket Cost |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |
| 3 | Family of 4 in a 19-foot vehicle | $90.50 | $59.50 | $144.00 | $111.00 |
| | Driver only in a 19-foot vehicle | $71.50 | $40.50 | $105.00 | $72.50 |
| | Walk-on passenger[2] | $7.50 | $7.50 | $15.50 | $15.50 |

[1] Total cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the ferry terminals. Including ground transportation, the cost to/from Haines is estimated to be between $42 and $60, while the cost to/from Skagway is estimated to be between $50 and $68.

The cost of taking the Haines-Skagway shuttle ferry would be less under Alternative 3 than under Alternative 1 – No Action.

Based on total user costs, travel time cost, and the projected travel in the Lynn Canal corridor through 2054, total user benefits in terms of reduced travel cost for the West Lynn Canal Highway are estimated to be about $70 million relative to Alternative 1 – No Action during the 30 years after construction (Table 4-45).

**Table 4-45:**
**User Benefits and Net Present Value of Alternative 3 versus Alternative 1 – No Action[1]**

| Alternative | User Benefits ($million) | Net Incremental Project Costs ($million)[2] | Net Present Value ($million) |
|---|---|---|---|
| 3 | $70 | $401 | -$331 |

[1] For the period 2019 to 2054 discounted to 2016 dollars.

[2] Overall project costs minus revenues.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of Alternative 1 – No Action for a given period of time. The incremental cost of Alternative 3 over Alternative 1 – No Action for this same period is $401 million. Therefore, the 2019 to 2054 net present value of Alternative 3 is approximately negative $331 million because the incremental project costs are greater than the user benefits provided (Table 4-45).

#### 4.4.7.5 Other Transportation Impacts

**Freight** – Water transportation is the primary method of moving freight within Lynn Canal. Freight is transported from Seattle by barge to Juneau, Skagway, and Haines. AMHS ferries also move limited amounts of freight in vans to and between the three communities. Haines and Skagway are important transshipment points linking Inside Passage barge and ferry freight to the Yukon and Interior Alaska.

The West Lynn Canal Highway would not alter barge freight traffic between Juneau and Seattle. Freight van trailers shipped on AMHS ferries would be unloaded at the Auke Bay Ferry Terminal and trucked to the Sawmill Cove Ferry Terminal, shuttled across Lynn Canal, and driven north on the West Lynn Canal Highway to Haines. Freight bound for Skagway would continue on the Haines-Skagway shuttle. Note that under Alternative 1 – No Action, unaccompanied vans would be allowed on the mainliners, but would not typically be allowed on the Day Boat ACFs. Unaccompanied vans that use the mainliners under Alternative 1 – No Action would be affected and shippers would have to switch to a different method of transportation. For shipping a container from Juneau to Haines, the cost is estimated to be approximately 10 percent greater under Alternative 3, and approximately 58 percent greater for Juneau to Skagway. The shipment transit time would be reduced by approximately one-half to Haines and one-third to Skagway. Because the vast majority of freight goes by barge and barge service is not anticipated to change, costs to consumers overall are unlikely to change noticeably, although the cost of shipping select items between Juneau and Skagway could raise costs for some consumer goods in Skagway or decrease profits (see Revised Appendix EE, *Socioeconomic Effects Technical Report,* for detail on container shipments).

Trucking companies servicing other Alaska communities were asked to approximate the cost of trucking between these two cities if a highway were available. Those estimates averaged about $0.25 per pound of freight compared to the existing barge freight cost of $0.05 per pound. Although trucking goods from Seattle is not competitive with barge service, a highway with ferry link to Juneau may provide opportunities for transporting time-sensitive freight, such as fresh fish. Air freight, which currently serves this function, costs between $0.53 and $0.77 per pound between Juneau and Seattle.

The West Lynn Canal Highway would not result in a change in scheduled barge service to Haines and Skagway. Because of the ferry links involved in Alternative 3, barge service would continue to be the preferred mode of shipping freight to these two communities.

**Air Taxi** – Alternative 3 is likely to divert some traffic from the air taxi operations currently serving Lynn. The degree to which travelers might change their current air travel behavior would depend on travel times and costs.

**AMHS** – With Juneau serving as the northern terminus for mainline AMHS ferry service under Alternative 3, the AMHS would only need to operate short shuttle routes in Lynn Canal. The projected annual AMHS operating costs and the estimated State support for Alternative 3 in 2055 is provided in Table 4-46. As indicated in the table, Alternative 1 – No Action is estimated to require State funding of about $107 million in 2055. Ferry operations for Alternative 3 are estimated to require State funding of $6.5 million. Although Alternative 3 would not have a substantial impact on AMHS funding requirements, it would affect mainline ferry operations. The change in schedule and routes would free up mainline ferry operating time: approximately 18 hours in winter and 36 hours in summer. With these additional hours, the mainline ferry could stop at or spend more time in other ports or operate at slower speeds for better fuel efficiency, depending on the assessed needs and level of State support available.

**Table 4-46:**
**Annual AMHS Operating Costs, Revenues, and Estimated State Funding for Alternative 1 – No Action and Alternative 3**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue ($million)[1] | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |
| 3 | $19.9 | $13.4 | $6.5 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF).

[1] Fare box revenue paid to AMHS; does not include gas tax receipts.

[2] Revised total is due to (1) the updating of costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Safety –** Available statewide crash information indicates the crash rate for Rural Other Principal Arterials between 2002 and 2012 averaged 168.73 crashes per 100 million VMT. Based on this statewide crash rate information and 2055 traffic projections, it is anticipated that there would be approximately 29.5 crashes per year on the West Lynn Canal Highway. In the 30-year operation period (2025 through 2055), it is estimated there will be approximately 886 crashes.

The fatal crash rate on Rural Other Principal Arterials between 2002 and 2012 averaged 2.06 fatal crashes per 100 million VMT. Based on this statewide fatal crash rate information, there are projected to be approximately 11 traffic fatalities over the 30-year (2025 to 2055) study period on Alternative 3.

There have been no fatalities on the AMHS system since 1975. There was a fatality in 1975 when the *M/V Malaspina* ran over a fishing boat, resulting in the drowning of one person. The NTSB (NTSB, 2013) reports one case in which an AMHS vessel, the *M/V LeConte*, ran aground north of Sitka causing $3 million in property damage, including extensive hull damage, and one injury (NTSB, 2004). The NTSB also reports two cases of electrical fires onboard the *M/V Columbia*, one that caused the ship to lose propulsion and passengers to be evacuated. In this case, minor reportable injuries occurred to passengers, although they were not directly attributed to the fire (NTSB, 2000 and 2003). The other fire aboard the *M/V Malaspina* occurred while the ship was in drydock, so no evacuations were needed and no passengers were injured (NTSB, 2012).

**Capital Move –** Lack of highway access is often cited by capital move proponents as one of the reasons to move the State capital. Alternative 3 would not provide a direct highway link, but would improve access to Juneau. This may likely reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the State capital.

**Pedestrians and Bicyclists –** The highway proposed for Alternative 3 would include 4-foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Ferries for these alternatives would accommodate bicyclists and foot passengers.

Under Alternative 3, it is anticipated that fewer people would be ferry walk-on passengers than under existing conditions and under Alternative 1 – No Action. The percentage of AMHS walk-on passengers that would choose to travel in their own vehicle if Alternative 3 were selected for the project would depend on a variety of factors such as the cost, frequency, and convenience of a bus or van service. Based on the 2010 Census, approximately 90 percent of the households in Juneau, Haines, and Skagway own at least one vehicle, and 45 to 80 percent of the households own two or more vehicles. Travelers without a vehicle would have to rent a vehicle, take a commuter flight, travel on a private carriers (such as a taxi or shuttle service if they develop), or find a ride with someone to accommodate this demand. People who share a car with others may be inconvenienced if one household member were using the vehicle to travel on the West Lynn Canal Highway.

The out-of-pocket user cost of travel to/from Juneau for a passenger with a car under Alternative 3 would be lower than the cost for a walk-on passenger under Alternative 1 – No Action. It would appear to be more convenient to use a car to travel to and from the ferry terminals in both Juneau and Haines.

While transportation services may be developed by private entities to accommodate walk-on passengers, the cost, frequency, and convenience of a bus or van service would depend on the size of the market. Following completion of highway construction, there would be a period of transition as entrepreneurs or established service providers test the market by offering some moderate level of service, such as one or two round-trips daily between communities during the summer.

Table 4-47 indicates the number of passengers, including the number of walk-on passengers, during the summer for Alternative 1 – No Action and Alternative 3. With Alternative 3, it is projected that there would be 75 walk-on passengers during summer, which is approximately 3 percent of the forecast for total number of summer passengers (see Revised Appendix AA, *Traffic Forecast Report*).

**Table 4-47:**
**Average Daily Ridership in Summer for Alternative 1 – No Action and Alternative 3, 2055**

| Alternative | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| 1 - No Action | 410 | 285 | 125 | 30% |
| 3 | 2,390 | 2,315 | 75 | 3% |

Note: See Revised Appendix AA, *Traffic Forecast Report.*

The potential for bus/van service to develop with Alternative 2B was evaluated based on case studies of bus service elsewhere in Alaska[46] and interviews with 12 land transportation service providers (see addendum to the *Socioeconomic Effects Technical Report* in Appendix H of the 2005 Supplemental Draft EIS). The Alternative 2B analysis is applicable to that for Alternative 3 because it looks at the possibility of using bus/van service to connect Juneau to Haines and Skagway. Based on this evaluation, it is also likely that Alternative 3 would result in daily summer coach service linking Juneau, Haines, Skagway, and possibly Whitehorse. Winter service would be less frequent, with bus service offered perhaps every other day to/from Haines

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[46] Bus services examined in these case studies were Alaska Park Connection between Seward and Denali National Park, Homer Stage Lines between Homer, Soldotna, Kenai, and Seward, Alaska Trails between Anchorage, Wasilla, and Talkeetna with continuing service to Healy, Alaska Direct Bus Lines between Fairbanks and Whitehorse, and Yukon Alaska Tourist Tours between Skagway and Whitehorse.

and Skagway. Cost would ultimately depend on the size of the market but would likely be in the range of $42 to $60 one-way between Juneau and Haines based on the shuttle fare and rates on similar existing bus services. This would place the cost roughly equal to the Juneau/Haines passenger fare under Alternative 1 – No Action. The cost between Juneau and Skagway would be approximately $8 higher due to the additional fare for travel on the Haines-Skagway shuttle.

Walk-on passengers who end up relying on bus service to/from the William Henry Bay and Sawmill Cove Ferry Terminals (if it develops)[47] would have less flexibility and opportunity to travel compared to travelers who drive, as it is likely that bus service would not be available for every ferry sailing (i.e., walk-on passengers would have to time their travels with the bus schedule). It is anticipated that walk-on passengers relying on renting a vehicle, using a taxi, or getting a ride with someone would have more flexibility and shorter travel times than those relying on the bus.

Walk-on passengers traveling between Haines or Skagway and JIA would have to coordinate schedules for flight, ferry, and bus (or other ground transportation) under Alternative 3, just as they do today. Instead of arranging for ground transportation between the Auke Bay Ferry Terminal and JIA, travelers would have to arrange for transportation from Sawmill Cove. As Sawmill Cove is farther away from JIA, it may be harder to coordinate schedules and make travel arrangements, so travelers may find this less convenient than under Alternative 1 – No Action. The cost for a walk-on passenger from Haines/Skagway to the airport under Alternative 3 may be similar to or slightly higher than the cost under Alternative 1 – No Action, as the cost of transportation between Auke Bay and JIA is the same for both alternatives (Table 4-48 ). The number of travelers in the party would also be a consideration. Another factor for airport travelers to consider is the cost of airport parking. In 2016, airport on-site long-term parking was $14/day and $75/week, and parking within a 5-minute walk from the terminal was $5/day and $100/month.

**Table 4-48:**
**Comparison of Walk-on Passenger Out-Of-Pocket Costs**

| Alternative | Auke Bay-Haines | Auke Bay-Skagway |
|---|---|---|
| 1 – No Action | $39.00 | $53.00 |
| 3 | $42.00 – 60.00 | $50.00 – 68.00 |

Note: Out-of-pocket costs exclude the cost of ground transportation between Auke Bay and JIA. In 2017, the cost of a taxi from Auke Bay to the JIA was approximately $20.

Some comments on the 2014 Draft SEIS expressed concerns about impacts to walk-on passengers who are low income, minority, senior citizens, disabled, or students. The impacts of Alternative 3 on these groups depends on how they accommodate their non-ferry travel (i.e., whether they rent a vehicle, use a taxi, get a ride from someone, or take a bus). Even under Alternative 1 – No Action, some of these walk-on populations need transportation to/from the Auke Bay and Haines ferry terminals (the Skagway Ferry Terminal is within walking distance to the community center). With access to a vehicle and the ability to drive, these populations would benefit from improved travel time, improved flexibility and opportunity to travel, and lower travel costs. Those choosing to continue to travel as walk-on passengers would under Alternative 3, pay approximately the same as they would pay under Alternative 1 – No Action (even

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[47] Under Alternative 3, walk-on passengers may need bus service between Haines and William Henry Bay as well as between Sawmill Cove and Auke Bay.

considering the possible cost of transportation by bus between Haines and Auke Bay). Alternatively, people could fly to/from Juneau, but would be subject to the airfare, which may be higher than the ferry fare. Additional information regarding impacts to low-income and minority populations is discussed in Section 4.7.2. Additional information about student transportation under Alternative 3 is discussed in Section 4.3.5.

It should be noted that Skagway has the only ferry terminal in Lynn Canal that is within reasonable walking distance from residential areas. All other existing terminals must be reached by private vehicle or private carrier. The ferry terminals have been located based on the efficiency of ferry moorage and routes, not the convenience of walk-on passengers.

**Bridges over Navigable Waters –** The Sullivan, Endicott, and Chilkat rivers may be navigable by small craft. If Alternative 3 were selected for construction, FHWA would evaluate USCG bridge permitting requirements under 23 CFR 650.805 and 33 CFR 115.70. The bridges over these rivers would require bridge permits from the USCG unless FHWA makes the determination that the bridges would qualify for exemption under 23 CFR 650.805 or advance approval under 33 CFR 115.70, as amended.

### 4.4.8 Geology

Alternative 3 would be subject to a variety of geologic hazards, including earthquake-induced ground tremors, avalanches, and landslides. Geotechnical investigations would be used in support of the final engineering design of the selected alternative, if it were a build alternative. These studies would minimize the impact of geologic hazards on the road embankment and related structures.

#### 4.4.8.1 Geologic Hazards

**Seismic Activity –** As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). It is probable that a large earthquake in the study area would cause damage to a highway, as is the case with many other Alaskan highways in seismic areas. Geologic hazards related to seismic events that could affect the roadway pavement and highway structures include tsunamis, liquefaction, and slope instability.

DOT&PF would design the highway, bridges, ferry terminals, and other structures to satisfy AASHTO design specifications. AASHTO guidelines identify measures, such as structural components for bridges and ferry terminal structures, which resist damage from seismic effects related to earthquakes. With these measures, bridges can safely undergo the large distortions that result from earthquakes. There is no national standard for the design of structures to resist the effects of tsunamis; however, the bridges and ferry terminal components would incorporate design recommendations to withstand hurricane-type storm surges that are similar to tsunami effects, such as high water levels and loads imposed from storm waves. For road components other than structures, there are no guidelines for seismic resistance. Road embankments that have the potential to be affected by wave action or tsunamis, are designed to include measures provided by guidance from the FHWA HEC-25 (Highways in the Coastal Environment), USACE EM 1110-2-1100 (Coastal Engineering Manual), and the DOT&PF Coastal and Harbor Design Procedures Manual.

While there is no national standard for the design of structures to resist the effects of liquefaction, soil softening, lateral spread, and slope instability, these factors would be considered in the design. A geotechnical exploration would be conducted during the design phase to determine the engineering properties of the soil at proposed bridge crossings. These results would be used to develop recommendations for foundation design: the bridges would be founded on deep, large-diameter pipe piles that can accommodate large deformations associated with seismic hazards. The piles that would support the bridges would be able to accommodate long-term scour and other factors that alter the riverbed elevation.

**Avalanche** - Avalanche hazards can include the risk of property damage, injury and death. The proposed Alternative 3 alignment crosses 19 avalanche paths, of which 11 are considered large or very large. Using survey data, refined alignments, long-term climate studies, and additional winter observations, the calculated unmitigated AHI for Alternative 3 is 102. The average predicted closure would be about a half day long, with no closures lasting longer than a day. This unmitigated figure is considered high, but is in the middle range for highways operated with good safety records in avalanche terrain. (For example, Rogers Pass, B.C., has an unmitigated AHI of 1,004, the previous alignment of Seward Highway from Anchorage to Seward had an unmitigated AHI of 331, the previous Seward Highway from Anchorage to Girdwood had an unmitigated AHI of 188.)

Establishing hazard reduction and risk management methods can lower the probability of hazardous avalanche encounters and increase road safety on the Alternative 3 alignment. Alternative 3 incorporates avalanche hazard reduction methods that create physical changes to the highway, including constructing barriers, creating elevated fills on avalanche paths, or adjusting the alignment of a highway. Risk management refers to the operations that can prevent consequences of exposure to avalanches.  These methods include forecasting, warnings, temporary highway closures, and use of explosives to release unstable snow during temporary highway closures. Planned and unplanned closures would be posted on DOT&PF's 511 website, phone and email listserv, and various social media platforms to ensure that road users receive regular updates of highway conditions. Through the use of appropriate hazard reduction and operational risk management efforts, the mitigated AHI for Alternative 3 would be reduced to an AHI value of approximately 18. A mitigated AHI value of 30 or less is within the North American standard for safe operation of a highway (see *2017 Update to Appendix J – Snow Avalanche Report* in Appendix Z).The *2017 Update to Appendix J – Snow Avalanche Report* (see Appendix Z) calculated closure periods for the West Lynn Canal Highway using the same data used consistently in all AHI calculations. The closure period and AHI calculations are based on 100 years of weather records from Juneau, correlated with 6 years of avalanche observations in Lynn Canal. An estimate of average closure time per year, average number of closures per year, closure length, and capital and operating budgets for highway maintenance relative to avalanche hazards for Alternative 3 is provided in Table 4-49. The capital costs of avalanche control equipment and facilities have been included in the construction cost estimate, and the annual operating cost for avalanche control has been included in the maintenance and operating cost estimate for Alternative 3.

For Alternative 3, DOT&PF would use howitzer fire to release unstable snow. A howitzer could hit all of the avalanche paths on the West Lynn Canal Highway from five firing locations accessible from the highway. The howitzers would likely be obtained under a lease agreement from the U.S. Army, and all crew would be required to attend gunners' school and reach the required levels of certification and experience to operate howitzers. One avalanche path along the alignment for Alternative 3 would require the use of a blaster box or other remote exploder instead of long howitzer shots needed for the avalanche path. The addition of a blaster box would raise capital costs but would lower the potential for closure on the West Lynn Canal Highway.

Trained technicians experienced in controlled avalanche release would monitor the West Lynn Canal Highway on a daily basis. The technicians would issue daily avalanche forecasts to DOT&PF crews, with updates as conditions change. The technicians would recommend avalanche control operations or preventive road closures to DOT&PF personnel when the avalanche hazard is high.

DOT&PF would dedicate maintenance personnel and resources for routine maintenance, and would use State and/or Federal highway funds to perform major repairs as needed.

**Table 4-49:**
**Costs, Closures, and Mitigated Avalanche Hazard Index for Alternative 3**

| Alternative | Capital Cost | Annual Operating Cost | Average Closure Time per Year (days) | Average Number of Closures per Year | Closure Length (days) | Mitigated Avalanche Hazard Index |
|---|---|---|---|---|---|---|
| 3 | $6,199,259 | $1,257,483 | 6.4 | 10.8 | 0.4 to 0.9 | 18.0 |

**Landslides –** Figure 3-11 illustrates the locations of previous slides, as well as avalanche paths in the Alternative 3 corridor. Two previous rockslides have been identified in the vicinity of Alternative 3. Neither slide path reaches the proposed alignment. Avalanche paths can also produce slides during the spring and summer months, but these slides tend to be smaller than the avalanches on the same path and generally do not extend to the bottom of the path.

Geotechnical studies during design would identify any areas where alignment adjustments, rockfall barriers, or slope stabilization is appropriate to reduce rockfall hazard. DOT&PF would implement a combination of these mitigation methods to provide optimal mitigation for rockfall hazard. DOT&PF would be staffed and equipped to repair damage from slides and maintain the highway in operable condition.  DOT&PF would dedicate maintenance personnel and resources for routine maintenance, and would use State and/or Federal highway funds to perform major repairs as needed.

### 4.4.8.2 Geologic Resources

Approximately 10 percent of the Alternative 3 alignment overlaps moderate-vulnerability karst areas and less than 2 percent overlaps high-vulnerability karst areas on the west side of Lynn Canal. These karst areas are described in Section 3.2.1.1. Additional field studies for karst would be conducted during final design if Alternative 3 were selected for construction. Direct effects from Alternative 3 would include the alteration of hydrologic patterns, the disturbance and removal of protective surficial material and vegetation, and the destruction of surficial karst features. No known caves or other important karst features would be affected by Alternative 3.

The strength of downgradient soil cover may be reduced over time by concentrated water flow through highway culverts, which could allow sediment, nutrients, and debris transport into subsurface karst features. Surface soils, which are typical above karst features, and vegetation create a protective barrier between surface water and karst systems. The disturbance or removal of protective surficial material, vegetation, and trees could change the karst vulnerability rating, which is based on the presence or absence of surface material. The removal of the protective barrier could also alter water table recharge rates. Cave entrances could also become blocked or permanently filled by loose sediment, debris, and downed trees.

Alternative 3 could indirectly affect karst resources due to increased accessibility to areas where karst is known to occur. Increased accessibility could result in recreational use or vandalism to caves and other karst features.

#### 4.4.8.3 Geochemical Properties

During highway construction, blasting activities could expose rock having geochemical properties that pose a hazard to the environment. Rock with acid-generating potential or high total metals content that is exposed to surface water runoff could affect aquatic life and water quality in streams. On site investigations to date have not identified acid-generating rock within the limits of the Alternative 3 alignment. Based on recent experience in Southeast Alaska and available information related to geologic features in the Alternative 3 corridor (see *2017 Update to Appendix D – Technical Alignment Report* at Appendix Z), DOT&PF believes there would be a potential for encountering acid-generating rock during Alternative 3 construction. A detailed on-site geotechnical investigation would be undertaken by DOT&PF during the final design, if Alternative 3 were selected. Because acid-generating rock is primarily a concern when rock cuts are made near fish-bearing streams, DOT&PF would mitigate the potential effects of drainage from rock cuts in such areas by, for example, constructing roadside drainage ditches in the vicinity of acid-generating rock and diverting the drainage away from fish bearing streams.

#### 4.4.8.4 Outburst Floods

As described in Section 3.2.1.2, the glaciers in the headwaters of the Chilkat and Endicott rivers have the potential to cause glacial outburst flooding. The bridges crossing these rivers would be designed to safely pass these floods.

### 4.4.9 Hydrology and Water Quality

#### 4.4.9.1 Floodplains

Planning and preliminary design of Alternative 3 have been done in compliance with DOT Order 5650.2 (Floodplain Management and Protection) and 23 CFR 650 Subpart A (Location and Hydraulic Design of Encroachment on Floodplains).

**Flooding Risks** – The alignment for the West Lynn Canal Highway runs perpendicular to the natural drainages along the west side of the canal. Therefore, it is not possible to avoid transverse encroachments of these drainages. The alternative would have no longitudinal encroachments of any drainages. There are no regulatory floodways in the study area. The transverse encroachments have been designed so that the West Lynn Canal Highway would not create a significant flood risk.

**Impacts on Natural and Beneficial Floodplain Values** – Alternative 3 would cross 32 streams, 26 of which would be bridged. Single-span bridges would be used to cross 10 streams. For these streams, each bridge and its piers would be located sufficiently outside of the predicted base flood elevation of the streams, as determined by hydraulic studies to be conducted during the final engineering design of the selected alternative. Multi-span bridges would be constructed at other crossings, including the Endicott, Sullivan, and Chilkat Rivers. These larger bridges would extend beyond the outfall channels at each river delta to protect their natural, meandering flow. The bridges would require placement of supports in the river floodplain. These supports would be spaced approximately 130 feet apart and sized to accommodate the design flood and avoid impacts during flood events. These designed bridges would be constructed to maintain navigation at all tide stages.

**Potential for Incompatible Floodplain Development –** Alternative 3 crosses the Endicott and Sullivan Rivers in the Tongass National Forest, where floodplain development would not be allowed. The floodplain of the Chilkat River on the west side of the proposed bridge crossing is State land. Therefore, Alternative 3 would not encourage incompatible floodplain develop in that area. The floodplain on the east side is already accessible and Alternative 3 would not increase accessibility. In this location, the Chilkat River floodplain is a silt deposition area not conducive to development.

Alternative 3 would provide a highway where there are currently no roads. The highway would serve as a new evacuation route for emergencies from private properties adjoining the road and for Haines.

**Measures to Minimize Floodplain Impacts and Preserve Natural and Beneficial Floodplain Values –** All of the larger floodplains would be crossed with bridges. Bridge abutments would be located outside the floodplains. Multiple-span bridges would be supported on piles, with groups of in-line piles spaced at least 130 feet apart.

**Compliance with EO 11988 –** In accordance with the analysis required in DOT Order 5650.2 (Floodplain Management and Protection) and 23 CFR 650 Subpart A (Location and Hydraulic Design of Encroachment on Floodplains), FHWA has determined that Alternative 3 is in compliance with EO 11988. This alternative cannot avoid transverse encroachments of the base floodplains along the alignment; however, the alternative would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially affect natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

#### 4.4.9.2 Hydrology

A highway on the Alternative 3 alignment would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downstream side through culverts. This flow diversion would be minor and would adequately maintain the water's natural downgradient flow. Culverts would be designed for the 50-year rainfall event, and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

The ferry terminals at William Henry Bay and Sawmill Cove would require the placement of fill in Lynn Canal and Berners Bay (shot-rock generated during highway construction) at each proposed terminal site. These small encroachments would not measurably change circulation and currents in Lynn Canal or Berners Bay. The proposed terminals are sited so as not to obstruct discharge from nearby streams and creeks. Breakwaters are currently not planned for either terminal.

#### 4.4.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to water courses whose drainages include the highway on the Alternative 3 alignment, principally through runoff from the highway.

Results from stormwater research by the FHWA indicate that stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT & FHWA, 1987). Studies conducted in Anchorage, Alaska, under the MOA Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). Results showed dissolved concentrations of calcium, chromium, magnesium, and zinc below their AWQS. Only dissolved concentrations of copper and lead were noted above their AWQS; however, modest dilution would likely reduce these concentrations below their AWQS. Identified concentrations would not adversely affect streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of Alternative 3 and the predicted low annual ADT, fewer impacts to water quality in the study area are expected than were found in the Anchorage studies. The studied runoff was collected from Anchorage roadways, which ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). The studied melt water was from snow collected from a mix of these types of roads. In comparison, Alternative 3 would have summer ADT volumes of approximately 1,030 in 2025 and 1,040 in 2055. During winter, ADT would be less than 500 vehicles per day.

Highway runoff and melt water from the West Lynn Canal Highway would have lesser quantities of potential contaminants than what was observed in the Anchorage studies due to a lower traffic volume and less area development. Snow would be cleared from the highway and deposited along its length rather than being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area on the highway. Runoff from the highway and bridges would not be expected to exceed AWQS or adversely affect the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be low due to the rural setting of the highway and the low predicted highway traffic volume. Cut slopes that are composed of soil would be hydroseeded with non-invasive Alaska cultivars to minimize erosion.

The following BMPs would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soils) would be used for the roadway and ferry terminal embankments.
- Rock would be used to stabilize toes of slopes at ponds and stream crossings.

- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- To the extent practicable, only soil or rock excavated from the construction limits or immediately adjacent to the highway would be used for highway and ferry terminal embankments.
- Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternative 3 would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal north of Auke Bay would be eliminated. The ferries that would be used for Alternative 3 would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sewage treatment facilities with a permitted outfall would be installed at the Sawmill Cove and William Henry Bay Ferry Terminals to treat sanitary waste from the restrooms. The facilities would meet all federal and State water quality requirements. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would be used; therefore, no adverse impacts to water quality would occur. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternative 3.

Highway and bridge runoff would contribute a small amount of turbidity and pollutant loads to local drainages flowing to Lynn Canal. No roadside restroom facilities are proposed along the roadway alignment. Contaminant concentrations in runoff from the proposed highway and/or bridges would not be expected to exceed AWQS or adversely affect the water quality of receiving waters for the long term.

### 4.4.10 Air Quality

The increase in vehicular traffic and changes in ferry vessel travel associated with Alternative 3 would not affect the Mendenhall Valley non-attainment area based on consultations with the EPA during the 1997 Draft EIS process. Traffic forecasts conducted for the 2005 Supplemental Draft EIS indicate that future traffic volumes would be less than those developed for the 1997 Draft EIS. The analysis presented in this section also projects that Alternative 3 would have no negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions.

#### 4.4.10.1 Carbon Monoxide

As discussed in Section 4.3.10.1, simplified dispersion modeling was conducted for CO emissions from projected maximum peak traffic volumes. Peak traffic volumes for Alternative 3 would be approximately 80 percent of the peak traffic volumes modeled. The modeling predicted that maximum one-hour average CO concentrations associated with maximum peak traffic combined with background CO concentrations would total 2 to 3 ppm in addition to estimated background levels of 1 to 2 ppm. The NAAQS for one-hour average CO concentrations is 9 ppm. The maximum one-hour average CO concentrations associated with Alternative 3 traffic would be less than the concentrations for the modeled traffic; therefore, Alternative 3 would not result in an exceedance of the NAAQS for CO. In the *2017 Update to Appendix T – Air Quality*

*Modeling Memorandum* (see Appendix Z of this Final SEIS), DOT&PF confirmed that Alternative 3 traffic would not result in an increase in CO concentrations that would approach the NAAQS.

In response to comments on the 2014 Draft SEIS, ferry emissions modeling was performed to estimate the annual load of emissions (tons/year) for all alternatives relative to total emissions loading at active marine centers. The results of that modeling effort indicate that the ferry emissions associated with Alternative 3 would approximately triple the AMHS ferry emissions of Alternative 1 – No Action, but the contribution to total marine vessel emissions would be minor. See Attachment 1 to the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z for detailed modeling results and Section 4.9.2.7 for a discussion of the potential cumulative impact.

#### 4.4.10.2 Particulates

As discussed in Section 4.3.10.2, the effect of Alternative 3 traffic on $PM_{10}$ concentrations is based on a comparison with $PM_{10}$ concentration measured at Floyd Dryden Middle School monitoring station where the 24-hour average was 27 $\mu g/m^3$ in 2000. Projected peak hour traffic for Alternative 3 was estimated at 9 percent of the summer ADT. Summer ADT for Alternative 3 is projected to be 1,030 and 1,040 vehicles in 2025 and 2055, respectively. Therefore, the peak hour traffic for this alternative would be about 100 vehicles in 2025 and 2055, which is about 12 times smaller than the volumes recorded on Mendenhall Loop Road in 2000. Using this multiplier, the 24-hour average $PM_{10}$ concentration with Alternative 2B would be 2.25 $\mu g/m^3$.This estimate is substantially below the 150 $\mu g/m^3$ 24-hour average NAAQS for $PM_{10}$. Because the Mendenhall Loop Road $PM_{10}$ data include dust from unpaved roads in the valley and paved roads generally contribute only a small fraction of the total $PM_{10}$, this estimate of project-related $PM_{10}$ concentrations overestimates the actual concentrations that would result from Alternative 3.

With regard to particulates generated by diesel fuel use, Alternative 3 would result in 50 percent more ferry fuel use and a proportionate increase in particulate emissions, relative to Alternative 1 – No Action. This increase, however, would not approach the NAAQS for $PM_{10}$.

The combined particulate emissions from vehicles and ferries under Alternative 3 would be greater than particulate emissions under Alternative 1 – No Action, but would not result in an air quality impact relative to NAAQS.

#### 4.4.10.3 Conformity

The project area is located in an air quality attainment area where the SIP does not contain any transportation control measures. Therefore, conformity procedures do not apply to this project, and a conformity determination is not required per 40 CFR 51.

### 4.4.11 Hazardous Materials

The *2014 Update to Appendix M – Initial Site Assessment Technical Report* (see Appendix Z in the Draft SEIS) identified one site along the West Lynn Canal Highway alignment as being an area of potential concern with respect to hazardous materials: the AT&T Alascom Sullivan River Repeater Station. This site is located 0.75 mile west of Lynn Canal, about 13 miles south of Haines. The station is located approximately 600 feet from the centerline of the alignment for

Alternative 3, outside the study area used for this evaluation. The diesel contamination associated with this site was cleaned and the site status closed as of 2010. This site is unlikely to affect the development of Alternative 3 because of its location and status of cleanup.

### 4.4.12 Wetlands

A total of 26 acres of wetlands and 11.8 acres of other aquatic habitat would be would be filled or excavated under Alternative 3. The preliminary alignment for highway segments of Alternative 3 has been adjusted several times to avoid wetlands and reduce the impacts to wetlands that could not be avoided. During design DOT&PF would investigate additional measures to reduce impacts, including further small alignment changes, steepened slopes, and reduced embankment heights.

As indicated in Table 4-50, most wetlands affected by the West Lynn Canal Highway would be forested wetlands. The wetland functions and values that would be affected by a highway include a reduction in groundwater recharge and discharge, lateral flow, surface hydrologic control, wildlife habitat functions, and riparian support.

Alternative 3 would affect 0.9 acre of palustrine scrub-shrub and 0.6 acres of palustrine forested wetlands between Echo Cove and Sawmill Cove. This impact to palustrine forested wetlands would result from upgrading the existing Glacier Highway from Echo Cove to Cascade Point. Impacts to wetland functions would primarily consist of reduction in wildlife habitat and riparian support, and alteration of surface hydrologic control and groundwater discharge functions. Waters of the U.S. filled includes 1.9 acres of marine habitat filled at Sawmill Cove discussed in Section 4.4.13.

From William Henry Bay to the Davidson Glacier outwash plain, Alternative 3 would fill a total of 18.7 acres of palustrine forested wetlands in five locations. The effect to these wetlands would include reduced groundwater recharge and groundwater discharge/lateral flow functions, modification of the surface hydrologic control, and a slight reduction in wildlife habitat function with the loss of forest habitat. One forested wetland north of the Sullivan River is rated high for nutrient transformation/export due to the amount of surface water flowing through it. Alternative 3 would affect a total of 1.9 acres of palustrine emergent wetlands in two locations of this segment. Impacts to functions of these wetlands would affect groundwater discharge and lateral flow. At two locations, the proposed alignment is forced toward the beach due to steep terrain. In these areas, fill in marine habitats includes 0.4 acre of estuarine emergent and 0.09 acre of beach bar habitat in addition to the 4.8 acre impact in William Henry Bay.

Most of the small wetlands associated with kettle ponds on the Davidson Glacier outwash plain would be avoided by the proposed Alternative 3 alignment. However, two small isolated emergent wetlands and a small pond with floating vegetation would be partially filled by the highway. These areas are small and would involve filling approximately 0.4 acre of palustrine emergent wetlands as well as 0.2 acre of palustrine aquatic bed. North of the Davidson River crossing, a 1.1-acre fill would be required across a portion of a newly created beaver pond. Fill of portions of the two isolated emergent wetlands and the pond would primarily reduce the sediment retention functions and the nutrient transformation/export function of these wetlands. Wildlife habitat functions would also be reduced slightly, but these wetlands are quite small and there are many similar wetlands in the area. Fill of a portion of the beaver pond would reduce the wildlife habitat functions of this wetland to a small degree. Impacts to beavers as a result of this fill would be minor.

North of the Davidson Glacier, Alternative 3 would intersect the uphill portion of a small area of palustrine forested wetland. At this location, the highway would reduce the groundwater recharge function, groundwater discharge/lateral flow function, and the surface hydrologic control function of wetlands.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. The surface water or shallow groundwater blocked by the highway embankment would eventually flow to the surface and be diverted by ditches to culverts under the highway embankment. Alteration of hydrology due to the highway embankment could result in corresponding changes to the vegetation and over time, these changes could affect wetland functions within and outside the highway ROW. The extent of this effect would depend on localized hydrologic patterns; however, effects could be minimized with porous fill material and cross-drainage structures.

The indirect effects of Alternative 3 on wetlands include the potential introduction of contaminants from the application of de-icers and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These activities could cause the further loss of wildlife habitat functions, reduction of ecological diversity, and a reduction in sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for wetland users, would minimize the risk of these effects occurring.

The use of salt-treated sand to improve road conditions during the winter could potentially affect roadside vegetation; however, high rainfall in this region would minimize most impacts from road salt (Wegner and Yaggi, 2001). Due to the small quantity of salt (up to 5 percent per total weight of sand) used to keep the sand friable for winter maintenance, no detectable impacts on adjacent vegetation are likely.

Alternative 3 does not include access facilities for ORVs; however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through erosion and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the road is constructed. An ORV enforcement policy would also need to be developed by ADNR for the Haines State Forest.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternative 3. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands.

## Table 4-50:
## Wetlands and Other Waters of the U.S. Affected by Alternative 3 (Acres)

| Sub-Region | Classification | Area of Fill (acres) |
|---|---|---|
| Berners Bay | **Wetlands** | |
| | Palustrine Forested | 0.6 |
| | Palustrine Scrub-Shrub | 0.9 |
| | **Subtotal** | **1.5** |
| | **Intertidal and Subtidal Areas** | |
| | Rocky Shores | 1.9 |
| | **Subtotal** | **1.9** |
| William Henry Bay to Davidson Glacier Outwash Plain | **Wetlands** | |
| | Palustrine Forested | 18.7 |
| | Palustrine Emergent | 1.9 |
| | Estuarine Emergent | 0.4 |
| | **Subtotal** | **21.0** |
| | **Intertidal and Subtidal Areas** | |
| | Beach Bars | 0.09 |
| | Rocky Shores | 4.8 |
| | **Subtotal** | **4.9** |
| Davidson Glacier Outwash Plain | **Wetlands** | |
| | Palustrine Forested | 1.1 |
| | Palustrine Emergent | 0.4 |
| | **Subtotal** | **1.5** |
| | **Freshwater Aquatic Areas** | |
| | Palustrine Aquatic Beds | 0.2 |
| | **Subtotal** | **0.2** |
| Davidson Glacier Outwash Plain to Haines | **Wetlands** | |
| | Palustrine Forested | 0.9 |
| | Estuarine Emergent | 1.1 |
| | **Subtotal** | **2.0** |
| | **Intertidal and Subtidal Areas** | |
| | Beach Bars | 4.8 |
| | **Subtotal** | **4.8** |
| Total Wetland Alternative 3 | **Wetlands** | |
| | Palustrine Forested | 21.3 |
| | Palustrine Emergent | 2.3 |
| | Palustrine Scrub-Shrub | 0.9 |
| | Estuarine Emergent | 1.5 |
| | **Total** | **26** |
| Total Other Waters of the U.S. Alternative 3 | **Freshwater Aquatic Areas** | |
| | Palustrine Aquatic Beds | 0.2 |
| | **Subtotal** | **0.2** |
| | **Intertidal and Subtidal Areas** | |
| | Beach Bars | 4.9 |
| | Rocky Shores | 6.7 |
| | **Subtotal** | **11.6** |
| | **Total** | **11.8** |
| **Total Waters of the U.S.** | | **37.8** |

Note: Acreages do not include riverine areas intersected by the proposed road alignment.

### 4.4.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

During environmental studies for the 2005 Supplemental Draft EIS, the FHWA determined that the project alternatives may adversely affect EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act. Following this determination, DOT&PF prepared an EFH assessment to assess the effects of project alternatives on commercial fish stocks in all life stages and associated habitats. This section summarizes that assessment, which was provided in Appendix N of the 2005 Supplemental Draft EIS and was updated for this Final SEIS (see the *2017 Update to Appendix N – Essential Fish Habitat Assessment* in Appendix Z).

The alignment for the West Lynn Canal Highway would be forced toward the beach at two locations between William Henry Bay and Davidson Glacier. This would result in the fill of 0.09 acre of intertidal beach. This small area of fill would result in the loss of some habitat for benthic organisms that form the base of the food web for some commercial fish species but would not have population-level effects on any marine species in Lynn Canal.

Under Alternative 3, 4.8 acres of intertidal habitat would be filled for the construction of the causeway on the north side of Pyramid Island. The fill would be located in an area that is subject to continuous deposition of glacial silt and does not support a substantial benthic community. Therefore, the loss of this habitat would not measurably alter the food web in this portion of the Chilkat River/Inlet. For this reason, fill placement in this area would have no measurable effect on any populations of marine organisms in Lynn Canal.

William Henry Bay was investigated as part of the 2003 intertidal survey. The intertidal zone at William Henry Bay is a rich and biologically diverse area. The ferry terminal proposed for this site consists of a sand, gravel, cobble, and boulder beach changing to boulders towards the north, away from the head of the bay. This site exhibits high value as fish habitat. Salmon, sculpins, and other small fish were observed in the intertidal zone and numerous clumps of fish eggs, likely sculpin eggs, were found in crevices and tidal pools in the lower intertidal zone. Crabs were occasionally observed on subtidal underwater camera surveys and flatfish were common throughout the subtidal survey area at depths greater than 23 feet. The proposed terminal site is habitat used for spawning, rearing, and growth to maturity by sculpin and other fish species.

The terminal would cover 800 feet of shoreline, or about 6 percent of the available shoreline in William Henry Bay. The loss of 4.8 acres of the intertidal and subtidal zones at the proposed terminal site would have a small impact to fish and crab species, as similar value intertidal and subtidal fish habitat is extensive in William Henry Bay. Although the character of the terminal substrate would differ from natural habitat, benthic organisms would recolonize it and provide some recovery of the habitat.

The seabed at the Sawmill Cove Ferry Terminal site consists almost exclusively of muds, sand, and gravels with some bedrock outcrops and occasional cobbles. Gravel content is highest in the intertidal zone and drops off rapidly in the subtidal zone, where sands and muds predominate. Vegetation cover is closely linked to the gravel component; therefore, cover drops off rapidly in the offshore. Video surveys of the site conducted in 2003 and 2004 indicated dense rockweed at the headlands on the north and south sides of the cove to about the zero foot tidal elevation. In the lower intertidal zone, rockweed was interspersed with two kinds of large-blade kelp. While this kelp is sparse, it is persistent and evenly distributed throughout the site. No eelgrass or stalked kelp is present at the site. Crabs use the subtidal and intertidal zones in Sawmill Cove and a variety of fish species have been observed at the site including yellowfin sole, rock sole, gunnels, snake prickleback, sculpin, and Pacific herring.

The impact to 3.2 acres of intertidal and subtidal habitat (1.9 acres of fill and 1.3 acres of dredge) at the Sawmill Cove Ferry Terminal site, the replacement of natural substrates due to terminal construction, and the dredging of approximately 16,000 cubic yards for a mooring basin would alter habitat usage in the disturbed area. Filling would result in the loss of habitat while dredging and ongoing use would substantially reduce habitat value in the dredged areas. The in-water fill would reduce the amount of refuge habitat available to larval stage eulachon, which are found in estuarine areas in Lynn Canal for an approximately 2-week period following spawning (Willson et al., 2006). The footprint of the ferry terminal would affect approximately 300 feet (0.06 mile) of shoreline at mean lower low water, which is equivalent to less than 2 percent of the alongshore herring spawn length (approximately 3 miles) observed in Berners Bay in 2003. This amount of habitat loss would not measurably affect other fish populations or marine bird populations in the Berners Bay area.

At the Sawmill Cove Ferry Terminal, turbidity could be increased over ambient conditions for short periods as ferries maneuver into and out of the terminal. Short-term turbidity increases and propeller scour could displace some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal.

There is the potential for accidental fuel spills from ferries to occur at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location.

The ferries that would be used for Alternative 3 would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged under an APDES and would meet Alaska-established waste discharge limitations. For this reason, the effluent would not affect fish habitat or affect fish populations in Lynn Canal, including Berners Bay.

Alternative 3 would cross 10 streams on the west side of Lynn Canal that support anadromous fish populations, including the Endicott and Sullivan Rivers and the Chilkat River/Inlet, as well as Sawmill Creek on the east side of Lynn Canal. The bridges crossing all but the Endicott, Sullivan, and Chilkat rivers would not encroach on the stream channel. The piers for the bridges on these rivers would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

Other, smaller non-anadromous streams crossed by the project alternatives would be channeled through culverts. Culverts in waters with the potential to have resident fish would be designed in accordance with the standards provided in the Memorandum of Agreement between ADF&G and DOT&PF for the “Design, Permitting, and Construction of Culverts for Fish Passage” (DOT&PF, 2001).

Stormwater and melt water runoff from bridges over anadromous fish streams and the Chilkat River would not alter water quality sufficiently to affect crab or anadromous and marine fish habitat. As discussed in Section 4.4.9, studies of highway runoff in Alaska indicate that the volume of traffic on the West Lynn Canal Highway would not be large enough for runoff from the highway to cause the exceedance of any Alaska Water Quality Standards in receiving waters.

In summary, the construction of Alternative 3 would result in the direct loss of 11.6 acres of EFH as a result of filling for highway and ferry terminal construction at Sawmill Cove and William Henry Bay. The habitat loss would include 1.9 acres of historically documented spawning habitat for Lynn Canal Pacific herring stock in Sawmill Cove. Ferry maneuvers at Sawmill Cove could increase turbidity in the vicinity of the terminal sufficiently to affect Pacific herring eggs and larvae at the terminal site. Alternative 3 would bridge all streams crossed by highway segments that support anadromous fish populations. Piers for the bridges over the Sullivan and Endicott rivers and the Chilkat River/Inlet that would be required for Alternative 3 would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

The incremental effect of the Sawmill Cove Ferry Terminal on Pacific herring stock would be relatively small; therefore, this loss is not expected to adversely affect the stock's ability to recover to previous population levels. However, NMFS as well as EPA and ADF&G have expressed concern that the ferry terminal and ferry traffic in Berners Bay could have an adverse effect on the Lynn Canal herring stock. For other commercial fish species, the direct loss of 11.6 acres of habitat through highway fill and ferry terminal construction as well as modification of 1.3 acres of habitat through dredging would not adversely affect any fish and invertebrate populations in Lynn Canal. During preparation of the 2006 Final EIS, both NMFS and the Department of Natural Resources, Office of Habitat Management and Permitting (now managed under the ADF&G) believed special conservation measures, including no operations during the herring spawning period, would be necessary. FHWA did not consider the option of closing ferry operations during the herring spawning period (for this alternative) as a reasonable alternative; hence, no detailed analysis of this modification was performed. If Alternative 3 were selected, FHWA and DOT&PF would consult with NMFS and the ADF&G to identify appropriate measures to mitigate impacts to herring.

The alignment for Alternative 3 and design of ferry terminals have been adjusted through preliminary engineering studies to limit intertidal and subtidal fill. During design of the selected alternative, DOT&PF will continue to investigate ways to further reduce this fill. Compensatory mitigation would be provided for the loss of intertidal and subtidal habitat.

### 4.4.14 Terrestrial Habitat

Alternative 3 would result in the loss of vegetation within the cleared area[48] of the highway. The acreage of vegetation types on USFS lands[49] that would be removed is estimated as follows:

- 308 acres of OG forest
- 52 acres of other forest
- 2 acres of open shrub and meadow
- 6 acres of other terrestrial habitat

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[48] Timber clearing is proposed 10 feet beyond the top of cut slopes and beyond the toe of embankment slopes. Removing large standing timber at the top of cut slopes eliminates the potential for trees falling into the road/traffic as a result of root disturbance. The additional clearing also provides for equipment access in rock cut areas for drilling activities. Removing timber at the toe of embankment slopes limits the severity of crashes when vehicles run off the road and down embankment slopes. This provides a "clear zone" at the toe of slope to allow vehicles the opportunity to come to a stop without colliding with a large tree.

[49] Comparable vegetation mapping is not available for other lands. The forest acreages that follow include forested wetlands; open shrub and meadow areas may be wetlands or uplands (USFS, 2013).

Another 134 acres of mostly forested terrestrial habitats would be eliminated on Haines State Forest land.

OG and other forests that would be affected by Alternative 3 consist of the following coniferous forest plant species: western hemlock, western hemlock-yellow cedar, Sitka spruce, mixed conifer, mountain hemlock, and Sitka spruce-black cottonwood.

Most of the terrestrial habitat that would be affected by Alternative 3 is in the Tongass National Forest. As discussed in Appendix K of the TLRMP, previous adopted versions of the TLRMP established an OGR system to manage this important habitat for many terrestrial species. Alternative 3 would impact one small OGR (OG Habitat LUD #1) established under the reserve system. It is within VCU 950 on the west side of Lynn Canal approximately 2 miles south of the Tongass National Forest's boundary with Haines State Forest (see Figure 3-3). Approximately 97 acres of OG Habitat LUD #1 (3,385 acres total size) would be managed under the TSC management prescription. The OG Habitat LUD would continue to meet TLRMP minimum total acre criteria. Within the 97 acres, construction would eliminate 30 acres of forest (i.e., approximately 67 acres of forest would remain standing within the highway ROW, but would not be protected). Of 836 acres of productive OG forest in the LUD, 75 acres would be incorporated in the TSC and 24 acres would be eliminated/cleared. The road would divide the reserve and its OG habitat into inland and seaward portions, and the road would impact most of the beach buffer, which is considered some of the most important habitat for wildlife because it provides corridors along the beach, winter habitat, and bald eagle nesting habitat. Wildlife impacts are addressed more completely in Section 4.4.15 and in the *2017 Update to Appendix Q – Wildlife Technical Report* (in Appendix Z of this Final SEIS).

Based on procedures outlined in the TLRMP, the USFS has examined these impacts in conjunction with ADF&G and USFWS. The interagency team has recommended that the boundaries of OG Habitat LUD #1 should remain as they are. The interagency team did not find suitable patches of productive OG forest in the VCU to justify boundary changes and did not recommend any changes to the boundaries of this OG Habitat LUD (Brockmann et al., 2015). Alternative 3 would compromise OG Habitat LUD #1 with increased road miles, reduced acreage of productive OG forest, impacts to connectivity, and fragmentation of large blocks of productive OG forest; however, the LUD would remain consistent with TLRMP acreage prescriptions and would continue to function as a link in the overall OG habitat conservation strategy for the Tongass National Forest.

On Tongass National Forest lands, in addition to the Old-Growth Habitat LUD, Alternative 3 would pass through OG forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large OGRs. Alternative 3 would reduce the size of the OG forest stands in the reserve units, as well as create a separation of some OG forest areas into downslope and upslope areas. Alternative 3 would remove approximately 308 acres of OG forest mapped along the east and west sides of Lynn Canal (predominantly west side, which has 51,963 acres (see the *Land Use Technical Report*, Revised Appendix DD).

The loss of vegetation represents less than 1 percent of vegetation in the study area. The loss of this vegetation would not adversely affect any rare or unique community types, any listed threatened and endangered or USFS sensitive plant species, or plants considered rare by the ANHP.

Clearing of the highway ROW would increase the potential for blowdown of trees adjacent to the ROW or slides in unstable areas.

Alternative 3 would have indirect effects on terrestrial vegetation. By improving the access to the area, mostly on the west side of Lynn Canal, human activity would increase along the highway corridor. Increased human activity could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

### 4.4.15 Wildlife

#### 4.4.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall’s porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.4.17.

Harbor seals haul out on rocky beaches and sandbars in protected waters along the west side of Lynn Canal, including beaches near the Sullivan River, Davidson Glacier delta, and Pyramid Island. It is unlikely that vehicle traffic would have any effect on harbor seals where the proposed highway is at least 100 yards from the shoreline on the west side of Lynn Canal. Harbor seals at this distance would notice activity on the highway, but would be unlikely to flush from the haulout or shoreline (Jansen et al., 2010). In addition, beyond this distance, traffic noise would be at an intensity similar to other noise sources in the natural environment (i.e., ambient noise levels) and would not create abnormally loud or sudden sounds that would disturb harbor seals. Therefore, Alternative 3 would not affect harbor seal haulouts at the Sullivan River, Davidson Glacier, or Berners Bay. The crossing over the Chilkat River would pass immediately north of Pyramid Island. Highway traffic in this area could lead to harbor seals abandoning this island as a haulout.

Minke whales tend to be attracted to motor boats. Therefore, the presence of such vessels would not drive minke whales away from an area. For this reason, shuttle ferries across Lynn Canal, Berners Bay, and in Chilkoot and Taiya inlets associated with Alternative 3 would not displace this species. Because of this attraction, increased ferry traffic may increase the risk of collision; however, collision accidents with minke whales are very rare (Allen and Angliss, 2012). In addition, minke whales rarely occur in Lynn Canal (Dalheim et al., 2009). Therefore, Alternative 3 is unlikely to affect the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall’s porpoise can readily avoid ferries and would not be impacted by the ferry traffic associated with Alternative 3.

Sea otters rarely occur in Lynn Canal (Esslinger and Bodkin, 2009). Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternative 3. Alternative 3 is unlikely to affect sea otters in Lynn Canal.

Marine mammals are typically disturbed by loud, unexpected noises. Although marine mammals may be disturbed by vessel noise, the low-level, steady noise produced by ferries would be less than that produced from other activities such as blasting or pile driving, and is not expected to result in adverse effects to marine mammals.

#### 4.4.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz's murrelets, harlequin ducks, black oystercatchers, yellow-billed loons, Aleutian terns, and dusky Canada geese.

Great blue herons nest in trees near preferred feeding areas, typically quiet shorelines and marshy areas. They are likely to be present in small numbers at river and stream outlets all along the Alternative 3 alignment. A West Lynn Canal Highway would result in the loss of potential nest trees on the banks at large river crossings. The type of nesting and feeding habitat preferred by great blue herons is not limited in the Sullivan River or the Endicott River deltas. Great blue herons have habituated to human presence and vehicle traffic in many urban and rural areas, including Juneau, so they would be expected to habituate to normal vehicle traffic on the West Lynn Canal Highway over time. For these reasons, increased human activity or a small loss in habitat with the West Lynn Canal Highway is not expected to result in population-level effects on this species.

Marbled murrelets are common in nearshore waters along the western shore of Lynn Canal and are presumed to nest throughout the study area (USFWS, 2003b). This species nests in old-growth trees, often near the coast. Alternative 3 would affect less than 1 percent of the available nesting habitat preferred by marbled murrelets in Lynn Canal. For this reason, the West Lynn Canal Highway should not result in population-level effects on this species.

Kittlitz's murrelets appear to be rare in the study area. It nests in high-elevation talus slopes and feeds in nearshore waters. Loss of habitat would be less than 1 percent of available habitat, and highway traffic is expected to have no effect on this species. Alternative 3 would not result in population-level effects on this species.

Harlequin ducks are also common in nearshore waters along the western shore of Lynn Canal, and nest along the banks of the larger rivers and streams along the alignment of Alternative 3. These birds are wary of people and will swim or fly away when approached (Rosenberg, Patten, and Rothe, 1994). Highway traffic noise could disturb harlequins in nearshore resting and feeding areas where the highway alignment is at the shoreline. The majority of the highway is not located on the shoreline, and loss of less than 1 percent of available nearshore habitat in Lynn Canal would not result in population-level effects on this species.

Blue herons and trumpeter swans do not feed and nest in open marine waters of Lynn Canal and therefore would not be affected by Alternative 3. Marbled murrelet, Kittlitz's murrelet, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting; therefore, they would not be present along the ferry routes for Alternative 3 in the main channel of Lynn Canal. These birds may be flushed by ferries approaching terminals. This disturbance would affect a small portion of the available feeding and nesting habitat, and would not have a population-level effect on these species.

Black oystercatchers have been observed in Lynn Canal, but are considered uncommon. Alternative 3 would result in the loss of 6.7 acres of rocky shore habitat. Most (4.8 acres) of the loss would occur on the remote west side of Lynn Canal between William Henry Bay and Davidson Glacier outwash, where no observations of oystercatchers have been recorded. The rest of the habitat loss (1.9 acres) would occur in the southern section of highway south of Sawmill Cove. Small numbers of oystercatchers (1 to 6 at a time) have been intermittently recorded around Berners Bay and the Point Bridget area in April and May, and August through October (eBird, 2013). Highway traffic during operations or maintenance activities could disturb black oystercatchers in rocky shore habitats adjacent to the alignment. However, with the low densities of oystercatchers in the Lynn Canal area relative to the amount of rocky shore habitat available outside the project area, any displaced birds would likely move to other unoccupied rocky shore habitat nearby. The loss of less than 1 percent of available habitat in Lynn Canal would not have a population-level effect on this species. Ferry navigation would avoid rocky shorelines, so there would be no anticipated disturbance to black oystercatchers from ferry traffic.

Only low numbers of yellow-billed loons have been documented in Berners Bay and Lynn Canal. The impacts to yellow-billed loons would be primarily the loons' energetic cost of swimming and diving to avoid ferries in mid- and northern Lynn Canal. Collisions are unlikely due to their excellent swimming and diving abilities. The short periods of ferry navigation in shallow coastal waters (< 130 feet deep) near the proposed ferry terminals would minimize the potential for any disturbance to yellow-billed loons (see Jehl, 1970 and Haney, 1990).

Alternative 3 would not likely affect Aleutian terns because the project is outside the species' known range (see Section 4.3.15) and the species is thought to be a casual or accidental spring and summer visitor in southeast Alaska, though it is known to breed as far south as Glacier Bay. Alternative 3 would result in the loss of 7.6 acres of palustrine or estuarine emergent wetlands, which is preferred nesting habitat of Aleutian terns. Noise and human presence introduced with the proposed highway may preclude Aleutian terns from colonizing small portions of these habitats adjacent to project facilities. Because Aleutian terns nest onshore and feed over ocean waters, they are unlikely to be disturbed by Alternative 3 ferries.

Dusky Canada geese do not breed or winter in the project area. They could potentially use estuarine tide flats in the project area as foraging habitat during migration; however, banding studies have concluded that the geese migrate offshore and make few stops during migration (Bromley and Rothe, 2003). Alternative 3 would result in the loss of 1.5 acres of estuarine emergent wetland, which is potential resting and feeding habitat for dusky Canada geese during migration. Disturbance effects from maintenance and vehicle traffic would likely be negligible due to their transient use of the project area during migration.

#### 4.4.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, wolverine, and mountain goat. The assessment of project effects on these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and indirect impacts from increased human activity in the project area.

The direct loss of wetland and terrestrial habitat described in Sections 4.4.12 and 4.4.14 would amount to less than 1 percent of these habitats that are available in the study area. Additional loss of habitat because of windblown trees adjacent to the ROW or changes in local hydrologic patterns may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and moose and spring and fall beach habitat is important for bears.

The beach fringe and numerous riparian areas along the west side of Lynn Canal provide high-value habitats for many terrestrial mammals, including bears, martens, river otters, moose, and wolves. The Alternative 3 alignment is more inland that the East Lynn Canal alignment and therefore affects more forest habitat and less beach fringe habitat. The 1997 HCI models predicted that the direct loss of habitat would reduce the habitat capability for brown bear, black bear, marten, and mountain goat by about 1 percent or less. However, behavioral avoidance of the West Lynn Canal Highway may function as a barrier to movement for some species, and may fragment their habitat by limiting their ability to use all of their range.

Because black bears are highly adaptable and often learn to coexist near human development, habitat fragmentation is not expected to result in a substantial effect on black bear populations in the study area. Black bears use the Sawmill Creek estuary area during salmon runs and would need to cross the highway or pass under the Sawmill Creek bridge. The highway would likely result in mortality of some black bears from collisions with vehicles. The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway would decrease black bear habitat capability in the areas crossed by or adjacent to the alignment by 2 percent compared to present conditions.

Brown bears tend to avoid highway traffic more than black bears. As indicated in Section 4.3.15, one study found that brown bears avoided roads regardless of traffic volume. Thus, they would be more likely than black bears to abandon certain parts of their range rather than cross the highway, and less likely to be involved in vehicle collisions. Because the West Lynn Canal Highway would separate higher elevation habitats from beach fringe and estuary habitats and because these latter areas often contain important resources for brown bears, the effective loss of habitat could reduce reproductive success or survival of some bears (Schoen et al., 1993).

The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway would decrease brown bear habitat capability in the areas crossed by or adjacent to the alignment by 23 percent compared to present conditions. To reduce habitat fragmentation, bridges over anadromous streams would be designed to provide underpasses for wildlife movement. Brown bear populations and their seasonal movements were not studied by Flynn et al. (2012) on the west side of Lynn Canal, but their findings on patterns of habitat selection and use are likely to be similar to those on the east side of Lynn Canal. Disturbance of brown bears by tourists and other motorists could occur near salmon streams crossed by the Alternative 3 highway along west Lynn Canal. The impact of this disturbance could be mitigated by restricting public access at these streams and placing pullouts away from the highest potential brown bear feeding and crossing areas.

The West Lynn Canal Highway is not likely to fragment the range of marten, as they would readily cross the road to access favorable habitat. The largest impact of this alternative on marten would be the indirect impact of trapping. Marten are highly desirable as a furbearing species and are relatively easy to trap. Alternative 3 would increase human presence and access in the region, probably increasing the number of marten trapped in the west Lynn Canal region. The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway could decrease marten habitat capability in the areas crossed by or adjacent to the alignment by 30 percent primarily because of trapping. The effects of this increased pressure could be controlled by ADF&G through season duration, take limits, lottery drawings, etc. Therefore, it is expected that this increased pressure would not result in additional population-level effects.

The West Lynn Canal Highway would not fragment the ranges of marten and river otter. As indicated above, the amount of habitat that would be lost for these species because of Alternative 3 is small relative to the total available habitat. Marten density on the west side of Lynn Canal is expected to be greater due to the abundance of OG habitat compared to the east side of Lynn Canal. Overall, density is likely less than 0.5 marten per square mile (Schumacher, personal communication, 2005). It is expected that the largest impact from the West Lynn Canal Highway would be direct loss of individuals from collisions with vehicles and the increased trapping pressure resulting from improved access to the region.

Wolves travel widely in pursuit of prey and strongly avoid highways (USFS, 2000; Person, 2001). Some wolves use estuarine areas but the importance of these areas for wolves is not known. Because the proposed highway alignment is mostly at lower elevations, traffic and human activity may limit access to beaches and downstream riparian areas along the alignment for wolves. The highway itself would not likely create a barrier to wolf movement.

Sitka black-tailed deer use a variety of habitat types, so it is unclear how small-scale habitat loss and fragmentation might affect their populations. Based on the lack of hunter success with this species, the deer population is considered very small on the west side of Lynn Canal north of William Henry Bay (Barten, 2001).

Moose distribution is more widespread on the west side of Lynn Canal than on the east side. St. James Bay, William Henry Bay, the Endicott River Valley, and the southern part of the Chilkat River Valley all have moose populations that are connected with larger populations in Glacier Bay and the Chilkat River Valley (Hessing, 2002). Direct loss of habitat would be small compared to the available habitat, and because moose readily cross roads, habitat fragmentation is not an issue with this species.

The short Glacier Highway extension of Alternative 3 on the east side of Lynn Canal does not intersect mountain goat habitat, due to its lack of suitable forage (White et al., 2012b). The findings of the White et al. (2012b) study indicate that the West Lynn Canal Highway may intersect moderate- to high-use winter mountain goat habitat. However, there is more potential wintering habitat between the Chilkat Mountains and Lynn Canal for goats to use as refuge from human disturbance. If any goats did enter the highway corridor, the impacts would be limited to individual animals and would not affect the population as a whole. Therefore, impacts from habitat loss, maintenance, and vehicle traffic for this alternative would be negligible.

Collisions with vehicles would result in an increase in mortality among several terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as moose and deer, as well as those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are likely to occur with species that tend to avoid roads, such as the wolf and brown bear. Mountain goats would probably not be substantially impacted, as they would seldom be found adjacent to the highway alignment. It is not possible to quantify the effect of mortality from vehicle collisions on wildlife populations in the project area, but there would likely be losses over time.

DOT&PF would conduct snow studies along the West Lynn Canal Highway during the winter as part of an avalanche control program. Some of these studies would be conducted by helicopter. Mountain goats are very sensitive to human disturbance in their alpine habitats, especially from helicopters (USFS, 2001). Avalanche control could result in mortality to mountain goats because avalanche chutes are in steep habitat preferred by goats and are occasionally used for winter forage (White et al., 2012b). The noise from avalanche detonation would be noticeable to mountain goats and other wildlife. The noise created by the resulting avalanche would be no different than that from naturally occurring avalanches.

The West Lynn Canal Highway would make a large area more accessible to hunters and trappers. As is the case elsewhere in Alaska where roads from populated areas have been built into semi-remote and remote areas, hunting and trapping pressure on species such as black and brown bears, moose, deer, mountain goats, martens, and river otters would increase on the west side of Lynn Canal with Alternative 3. The effects of this increased pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. Therefore, it is expected that this increased pressure would not result in population-level effects. Incidents of Defense of Life and Property could increase due to increased movement of people through wildlife habitats; however, such incidents would be unlikely to have a population-level effect.

Wolverine populations are especially vulnerable to localized extirpations (i.e., elimination of the population) caused by overharvest due to their low densities and reproductive rates (Hornocker and Hash, 1981; Krebs et al., 2004; Squires et al., 2007). However, local extirpation of wolverines in the entire project area is unlikely because of the location of the highway at the edge of their habitat, and the low site fidelity of wolverines in southeast Alaska (Lewis et al., 2012). Wolverine harvest is controlled by ADF&G trapping regulations. To protect the wolverine population along roads adjacent to Lynn Canal from overharvest, ADF&G could revise its current management strategy by season or highway zone closures, emergency orders, quotas or other such tools.

Road-killed animals could become a food source for scavenging wolverines, perhaps increasing their vulnerability to collisions. The Alternative 3 alignment is adjacent to areas with high probability of use by wolverines for much of its length. Due to the very low density of wolverines in the Lynn Canal area (Lewis et al., 2012) and their tendency to avoid areas of human influence, the probability for collisions is likely low.

#### 4.4.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend’s warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily OG forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). There are approximately 51,963 acres of forest on the west side of Lynn Canal, most of which is OG. Alternative 3 could affect less than 1 percent of the total. Therefore, Alternative 3 would not be expected to result in population-level impacts to these species.

A West Lynn Canal Highway would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create “edge effects,” which are used by some avian predators such as ravens, jays, and crows. These effects would add to the decreased value of nesting habitat for neo-tropical migrants near the highway. Other suitable nesting habitat is not limited in the area; therefore, Alternative 3 would not be expected to result in population-level impacts to these species.

#### 4.4.15.5 Amphibians

Frogs and toads live in both marshy and forested wetlands as well as upland areas adjacent to ponds. Because amphibians have small home ranges and do not appear to travel far from their natal pools (NatureServe, 2003), potential impacts from highway maintenance and operation would be limited to those animals that live near the proposed alignment. The potential impacts of a highway to amphibians would be through mortality from roadkill and potential pollution of habitat from highway runoff involving pollutants from accidental spills.

### 4.4.16 Bald Eagles

The principal concerns for maintenance and operation of the West Lynn Canal Highway with regard to bald eagles are disturbance of nesting birds and abandonment of nesting sites. No communal roosting locations are known to occur along the highway alignment. Construction effects to bald eagles are addressed in Section 4.8.12.6. Since the 2006 Final EIS and ROD were issued, the alignment for Alternative 3 has been shifted, where possible, to avoid nests that would be less than 30 feet from the highway alignment and ferry terminals. Figure 4-11 shows the proposed highway alignment for Alternative 3 with the approximate distances to eagle nests. A total of 79 bald eagle nests (identified in 2012) are located within 0.5 mile of the Alternative 3 highway alignment. Table 4-51 lists the number of eagle nests within the study area and distances from the Alternative 3 highway alignment and ferry terminals**.**

**Table 4-51:**
**Number of Bald Eagle Nests in Proximity to Alternative 3**

| Distance from Highway Alignment / Ferry Terminal for Alternative 3 | Number of Nests (surveyed in 2012) |
|---|---:|
| 661–0.5 mile | 23 |
| 331–660 feet | 24 |
| 101–330 feet | 25 |
| 61–100 feet | 4 |
| 31–60 feet | 3 |
| 0–30 feet | 0 |
| Total nests within 0.5 mile | 79 |

In Southeast Alaska, bald eagles that have chosen nest sites in or near urban areas are often acclimated to high levels of human activity (Johnson, 1990). Bald eagles are most susceptible to disturbance during the nesting season (March through August in Southeast Alaska). Bald eagles subjected to disturbance during the breeding season may seek new, more remote nest sites or may abandon nests (Fraser and Anthony, 2008). Studies have shown that bald eagle pairs may react to human activities very differently. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pairs (USFWS, 2009).

During operation of the West Lynn Canal Highway, blasting along avalanche-prone areas of the highway to protect the highway and travelers from late spring avalanches could occur during the nest selection period. Bald eagles in nests located in or near the avalanche-prone areas or concentrated feeding areas near the Endicott and Chilkat Rivers could be impacted by intermittent helicopter operations and blasting noise. Explosive charges would be dropped into avalanche trigger zones generally located well above timberline, relatively far from eagle nests or feeding areas along the shoreline. Response to such activities could include flushing from the nest or abandoning the nest (Steidl and Anthony, 2000). Blasting along avalanche-prone areas of Alternative 3 would occur within 0.5 mile of up to approximately 23 nests. DOT&PF would coordinate with USFWS during final design to determine if a Disturbance Permit would be necessary for annual blasting in avalanche areas.

Maintenance and operation of the West Lynn Canal Highway would involve a persistent source of noise that may result in the relocation of individual eagle pairs to alternate nest trees within their nesting territory. Individual eagle pairs may even abandon their nesting territory and associated hunting perches altogether, especially during the summer months when traffic volumes are predicted to peak. Because food availability is identified as a key factor that influences breeding success, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the west shoreline of Lynn Canal. As a result, Alternative 3 is not likely to adversely affect the overall population of bald eagles in the Lynn Canal area.

### 4.4.17 Threatened and Endangered Species

#### 4.4.17.1 Steller Sea Lions

Alternative 3 would not affect any identified Steller sea lion haulout sites or designated critical habitat. Maintenance and operations of the Sawmill Cove Ferry Terminal could cause temporary disturbance to Steller sea lions in Berners Bay, particularly in late April and early May, while they are feeding on spring forage fish aggregations. However, FHWA made the preliminary determination that this alternative is not likely to adversely affect the western DPS Steller sea lion population in Lynn Canal. Alternative 3 does not include any new boat launch facilities and is therefore unlikely to increase recreational or commercial use of motorized vessels in the area. In 2006, NMFS expressed concern that a ferry terminal at Sawmill Cove would have potential adverse direct and indirect effects on Steller sea lions (NMFS, 2005a). The potential for sea lion and ferry collisions is considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, they are generally very agile and successfully avoid encounters when in the water. Steller sea lions are typically disturbed by loud, unexpected noises. Although Steller sea lions may be disturbed by vessel noise, the low-level, steady noise produced by ferries would be less than that produced from other activities, such as blasting or pile driving, and would not be expected to result in adverse effects to Steller sea lions. Selection of Alternative 3 may necessitate formal consultation on western DPS Steller sea lions with NMFS under Section 7 of the ESA. Construction-related effects are described in Section 4.8.12.7 and cumulative effects of Alternative 3 on Steller sea lions with past, present, and reasonably foreseeable future actions are described in Section 4.9.2.15.

#### 4.4.17.2 Humpback Whales

FHWA has made the preliminary determination that highway and vessel traffic and maintenance activities associated with Alternative 3 would not adversely affect the Mexico DPS humpback whales in Lynn Canal. Ferry traffic across Lynn Canal would increase as a result of this alternative, but mainline ferry service would be terminated. The increased ferry traffic may increase the risk of collisions with humpback whales, but such events have been rare in the past and would likely continue to be rare (Allen and Angliss, 2012). Whale densities are low along the ferry routes, further reducing the likelihood of collisions. Humpback whales are typically disturbed by loud, unexpected noises. Although humpback whales could be disturbed by vessel noise, the low-level, steady noise produced by ferries would not be expected to result in adverse effects to humpback whales. With ESA-listed Mexico DPS humpback whales comprising approximately 6 percent of the whales in the area, the potential for these disturbances to impact listed whales is very small.

In 2006, NMFS expressed concern that ferry traffic in Berners Bay associated with Alternative 3 may adversely affect humpback whales. Selection of Alternative 3 would necessitate formal consultation on Mexico DPS humpback whales with NMFS under Section 7 of the ESA. Construction-related effects are described in Section 4.8.12.7.

### 4.4.18 Permits and Approvals

Alternative 3 would require the following permits, consultations, and approvals:

- USFS transportation and utility easement issued under SAFETEA-LU Section 4407, as amended by the FAST Act, for use of Tongass National Forest lands, and USFS special use permit for any project activities or facilities located outside the Section 4407 easement on the Tongass National Forest.
- USACE Section 404 permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- NMFS ESA Section 7 consultation for threatened and endangered species
- NMFS MMPA Incidental Harassment Authorization for marine mammals
- USFWS eagle Disturbance Permit for nests within 660 feet of the cut and fill limits and for active nests within 0.5 mile of blasting activities and other loud construction noises. USFWS may require a Disturbance Permit for annual blasting in avalanche areas.
- ADEC APDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADF&G Title 16 fish habitat permit for any work below ordinary high water in streams with anadromous or resident fish
- ADNR Interagency Land Management Assignment for use of tidelands at the Sawmill Cove and William Henry Bay Ferry Terminals, and an easement for highway segments with fill below mean high water
- Authorization from ADEC for treated wastewater discharge from the Sawmill Cove and William Henry Bay Ferry Terminals
- ADEC review of the SWPPP under the APDES Alaska General Permit
- Bureau of Alcohol, Tobacco, Firearms and Explosives for use of explosives in avalanche control

## 4.5 Alternatives 4A and 4C – FVF and Conventional Monohull Shuttle Service from Auke Bay

This section discusses the direct and indirect effects of Alternatives 4A and 4C. Under both of these alternatives, ferry service would be provided between Auke Bay and Haines, and between Auke Bay and Skagway (see Figure 2-9). With Alternative 4A, service would be provided by two newly constructed FVFs that would offer daily summer service between Auke Bay and Haines/Skagway. Alternative 4C would operate two Day Boat ACFs, which are conventional monohull vessels, between Auke Bay and Haines/Skagway in the summer. Mainline ferry service would continue with a minimum of twice-weekly, round-trip service in the summer and once-weekly service in the winter. Construction associated with Alternatives 4A and 4C would be limited to the reconstruction of the west end of the Auke Bay Ferry Terminal to create new double end ferry berths and, for Alternative 4C, the Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Day Boat ACF.

### 4.5.1 Land Use

#### 4.5.1.1 Land Ownership

Alternatives 4A and 4C would not require acquisition of any property for transportation facilities. There would be no direct impact to land ownership.

#### 4.5.1.2 Consistency with Land Use and Management Plans

The regional transportation policy set forth in the CBJ *Comprehensive Plan* is to support the improvement of transportation facilities and systems that reinforce Juneau’s role as the capital city and a regional transportation and service center. The plan supports consideration of all affordable energy-efficient transport alternatives to improve transportation links between CBJ and other areas of Southeast Alaska, including improved air (cargo and passenger) service, roadways, ferries, and fixed guideway systems (CBJ, 2008). Alternatives 4A and 4C are consistent with the CBJ *Comprehensive Plan*.

The Haines Borough and Municipality of Skagway Borough comprehensive plans support improvement of the AMHS to provide better ferry access to these two communities (Haines Borough, 2012; Municipality of Skagway, 2009). Therefore, Alternatives 4A and 4C are consistent with these plans.

Goldbelt’s Echo Cove Master Plan included construction of a road from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternatives 4A and 4C are not inconsistent with this plan but would not facilitate it in any way.

#### 4.5.1.3 Land Use

Alternatives 4A and 4C would have no direct impact on land use, as they would involve existing transportation facilities in Lynn Canal. Expansion of ferry facilities at Auke Bay would be an improvement to existing, well-established, water-related transportation/industrial uses within that area. These alternatives would result in relatively small changes in the number of travelers between Juneau, Haines, and Skagway. The improved access resulting from these alternatives would have negligible indirect impacts on land use.

### 4.5.2 Coastal Zone Management

Alternatives 4A and 4C involve construction in CBJ and the Municipality of Skagway Borough, but no construction in the Haines Borough. The CBJ incorporated enforceable policies for coastal zone management into its comprehensive plan and ordinances, as described in Section 3.1.1.8. Official determination of consistency with enforceable provisions would occur during local review of construction plans for the ferry terminal improvements at Auke Bay. Consistency with enforceable provisions would be assured during local review of construction plans as required by Alaska State 35.30. The Municipality of Skagway Borough has not incorporated coastal management enforceable policies into its comprehensive plan, but some elements are codified in other ordinances, and compliance with the ordinances would occur during the development review process.

### 4.5.3 Visual Resources

Alternatives 4A and 4C would result in more frequent views of ferries on Lynn Canal from the land. However, the frequency would not increase to the extent that noticeably different visual impressions of the region would be created relative to the impressions that currently exist.

### 4.5.4 Historical and Archaeological Resources

Alternatives 4A and 4C would not require acquisition of any new property for transportation facilities. The only construction would be reconstruction of the west end of the Auke Bay Ferry Terminal. There are no eligible properties in the APE of the Auke Bay Ferry Terminal. Therefore, FHWA has determined that Alternatives 4A and 4C would not affect any historic properties.

### 4.5.5 Socioeconomic Resources

#### 4.5.5.1 Overview

Alternatives 4A and 4C would not create any substantial change in economic conditions in Juneau, Haines, or Skagway. Both the population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by these alternatives. These alternatives would not measurably affect public services or make major changes in the perceived quality of life in Juneau, Haines, or Skagway. The following subsections provide a more detailed discussion of the economic and social effects to Juneau, Haines, and Skagway for Alternatives 4A and 4C.

#### 4.5.5.2 Juneau

**Population, Economics, Housing, and Municipal Revenues** – Alternatives 4A and 4C are predicted to generate 145 and 95 annual ADT in Juneau, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055.

Alternatives 4A and 4C include continuing mainline AMHS ferry service to and from Haines and Skagway. For this reason, these two alternatives would have little effect on independent visitor traffic to Juneau. The total increase in visitor traffic to and from Juneau associated with Alternative 4A is estimated to be 35 annual ADT relative to Alternative 1 – No Action (Table 4-52). It is estimated that Alternative 4C would have negligible effect on visitor traffic to and from Juneau with an increase of 5 annual ADT relative to Alternative 1 – No Action

(Table 4-52). Therefore, Alternative 4C would provide negligible change in economic conditions in Juneau relative to Alternative 1 – No Action, and the changes resulting from Alternative 4A would be minor, as described below.

Assuming visiting vehicles carry 3.2 people (see Revised Appendix AA, *Traffic Forecast Report*), Juneau is projected to receive as many as 19,900 new visitors in 2055 with Alternative 4A and 4,100 new visitors in 2055 with Alternative 4C. With average visitor spending at $77 per visitor per day (McDowell Group, 2012b), annual visitor spending in Juneau would increase by as much as $1.53 million as a result of Alternative 4A and $310,000 as a result of Alternative 4C. This increased visitor spending in Juneau would generate an annual average of about $570,000 in new payroll and about 15 jobs as a result of Alternative 4A and $120,000 in new payroll and approximately 5 jobs as a result of Alternative 4C.

**Table 4-52:**
**Alternatives 4A and 4C Projected Traffic and Resulting Visitor Economic Impacts in Juneau, 2055**

| | **Alternative** | |
|---|---|---|
| | **4A** | **4C** |
| Total Traffic under Alternative 1 – No Action (annual ADT) | 80 | 80 |
| Total Traffic under Alternatives 4A and 4C (annual ADT) | 145 | 95 |
| Change in Traffic (annual ADT) (over No Action) | 65 | 15 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 35 | 5 |
| Total New Visitors Annually (over No Action) | 19,900 | 4,100 |
| Total New Visitor Spending Annually (over No Action) | $1,530,000 | $310,000 |
| New Local Payroll Annually (over No Action) | $570,000 | $120,000 |
| New Local Employment Annually (over No Action) | 15 | 5 |

Note: Numbers may not total exactly due to rounding.

Generally, each new job in the economy results in an increase in population of about 1.5 people.[50] Therefore, the 15 new jobs in Juneau resulting from Alternative 4A would increase population by about 23 residents, which represents an overall increase of about 0.07 percent of Juneau's population (2015 population of 33,277). Alternative 4C would generate 5 additional jobs related to visitor traffic and spending, which would increase population by about 8 residents, representing an overall increase of approximately 0.02 percent of Juneau's population

Assuming 2.6 persons per household (from 2010 Census data), a population increase of 23 residents with Alternative 4A would result in additional demand for approximately 9 housing units in Juneau. A population increase of 8 residents with Alternative 4C would result in additional demand for approximately 3 housing units in Juneau. According to the CBJ Community Development Department, there were 13,057 housing units in the community in 2011, with a vacancy rate of 5 percent. The project demand is well within the existing vacant housing capacity of Juneau. Because of the small increase in independent visitors and population associated with Alternatives 4A and 4C, the value of private property in Juneau would not measurably increase.

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[50] This number is based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $1.53 million under Alternative 4A would generate (assuming all of the spending is taxable) approximately $76,000 in additional sales tax revenues annually (based on a 5 percent tax rate). Alternative 4C would generate approximately $310,000 in additional visitor spending, resulting in approximately $16,000 in additional sales tax revenues.

**Industry/Commercial Sectors –** The principal economic benefits of Alternatives 4A and 4C would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services** – Alternatives 4A and 4C would not measurably affect utilities and public services in Juneau relative to Alternative 1 – No Action.

**Quality of Life –** Alternative 4A would double the number of summer ferry trips between Juneau and Haines and Skagway relative to Alternative 1 – No Action. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), this improved access would be perceived as an improvement to quality of life by a majority of Juneau residents, providing increased recreational opportunities. Alternative 4C would only add one or two more ferry trips per week between Juneau and Haines and Skagway; therefore, this alternative would not result in any change in the perceived quality of life relative to Alternative 1 – No Action.

#### 4.5.5.3 Haines

**Population, Economics, Housing, and Municipal Revenues –** Alternatives 4A and 4C are predicted to generate 80 and 55 annual ADT in Haines, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055. As is the case with Juneau, Alternative 4A would have a minor benefit to the Haines economy and Alternative 4C would provide a negligible benefit to the Haines economy relative to Alternative 1 – No Action (Table 4-53). The total increase in visitor traffic to and from Haines associated with Alternative 4A is estimated to be 15 annual ADT and Alternative 4C is estimated to be 5 annual ADT in 2055.

**Table 4-53:**
**Alternatives 4A and 4C Projected Traffic and Resulting Visitor Economic Impacts in Haines, 2055**

| | Alternative | |
|---|---|---|
| | **4A** | **4C** |
| Total Traffic under Alternative 1 – No Action (annual ADT) | 50 | 50 |
| Total Traffic under Alternatives 4A and 4C (annual ADT) | 80 | 55 |
| Change in Traffic (annual ADT) (over No Action) | 30 | 5 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 15 | 5 |
| Total New Visitors Annually (over No Action) | 9,300 | 1,800 |
| Total New Visitor Spending Annually (over No Action) | $720,000 | 130,000 |
| New Local Payroll Annually (over No Action) | $270,000 | 50,000 |
| New Local Employment Annually (over No Action) | 5 | - |

Note: Numbers may not total exactly due to rounding.

Assuming that a visiting vehicle carries an average of 3.2 people, Haines is projected to receive as many as 9,300 new non-resident visitors annually with Alternative 4A and 1,800 new non-resident visitors annually with Alternative 4C. Assuming that visitors would spend an average of $77 per visitor per day in Haines (McDowell Group, 2012a), visitor spending in the community would increase by about $720,000 per year as a result of Alternative 4A and $130,000 per year as a result of Alternative 4C. Because Alternatives 4A and 4C would not change the cost of travel between Juneau and Haines, it is not expected that the number of trips that Haines residents would take to Juneau for shopping would increase substantially. Therefore, there would be little increased spending in Juneau to offset increased spending in Haines by visitors to that community. This increase in visitor spending in Haines would generate as much as $270,000 annually in new payroll and an average of about five additional jobs under Alternative 4A and as much as $50,000 annually in new payroll and no additional jobs under Alternative 4C.

Each new job in the economy results in an increase in population of about 1.5 people.[51] Therefore, the five new jobs in Haines resulting from Alternative 4A would increase population by approximately eight residents.[52] This would represent an overall increase of about 0.3 percent of Haines population (2015 population of 2,493). Alternative 4C would not generate additional jobs related to visitor traffic and spending.

Assuming 3.4 persons per household (from 2010 Census data), a population increase of approximately eight residents would result in additional demand for about two housing units. The 2010 U.S. Census indicated that Haines has about 137 vacant housing units, not including seasonal, recreational, or occasional use units. The project demand is well within the existing vacant housing capacity of Haines. The small increase in independent visitors and population associated with Alternative 4A would not measurably increase the value of private property in Haines. Alternative 4C would not generate an increase in population or additional housing units.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $720,000 annually would generate approximately $40,000 in additional sales tax revenues (based on a 5.5 percent tax rate). Alternative 4C would result in total additional visitor spending in Haines of approximately $130,000 annually, which would generate approximately $7,000 in additional sales tax revenues.

**Industry/Commercial Sectors –** The principal economic benefits of Alternatives 4A and 4C would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services –** Alternatives 4A and 4C would not measurably affect utilities and public services in Haines Borough relative to Alternative 1 – No Action.

**Quality of Life –** Alternative 4A would double the number of ferry trips between Juneau and Haines relative to Alternative 1 – No Action. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft

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[51] This number is based on an estimated participation rate of 65 percent, meaning that 65 percent of the Haines population participates in the local labor force.

[52] Under Alternatives 4A and 4C, the Haines-Skagway shuttle would be a smaller vessel requiring fewer crew members to operate than Alternative 1 – No Action. The crew members who are no longer needed on the Haines-Skagway route may be transferred to work on a different AMHS ferry and relocate their households to another community. This out-migration would slightly reduce the population gain from new jobs; however, it is not considered in the assessment of overall population impacts in order to present the maximum potential effects of these alternatives.

EIS), this improved access would be perceived as an improvement to quality of life by a majority of Haines residents. Better access to shopping and other services in Juneau, and more recreational opportunities are potential benefits cited by some Haines residents. Alternative 4C would only add one or two more ferry trips per week between Juneau and Haines; therefore, this alternative would not result in any change in the perceived quality of life relative to Alternative 1 – No Action.

#### 4.5.5.4 Skagway

**Population, Economics, Housing, and Municipal Revenues –** Alternatives 4A and 4C are predicted to generate 65 and 40 annual ADT in Skagway, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055. Alternative 4A would have a minor benefit to the Skagway economy, and Alternative 4C would provide negligible change in economic conditions in Skagway relative to Alternative 1 – No Action (Table 4-54). The total increase in visitor traffic to and from Skagway associated with Alternative 4A is estimated to be 30 annual ADT in 2055, and the total increase in visitor traffic to and from Skagway associated with Alternative 4C is estimated to be 5 annual ADT in 2055.

Assuming all traffic is round-trip, and 2 annual ADT on a ferry equals one additional visiting vehicle carrying approximately 3.2 people, Skagway is projected to receive a total of about 17,500 new visitors annually with Alternative 4A and 4,100 new visitors with Alternative 4C. Assuming that visitors would spend an average of $77 per passenger per day in Skagway (McDowell Group, 2012a), visitor spending in the community would increase by about $1.35 million per year as a result of Alternative 4A and $310,000 under Alternative 4C. This increase in visitor spending under Alternative 4A would generate an annual average of about $500,000 in new payroll and about 15 additional jobs in Skagway, and the increase in visitor spending under Alternative 4C would generate an annual average of about $120,000 in new payroll and about 5 additional jobs in Skagway (Table 4-54).

**Table 4-54:**
**Alternatives 4A and 4C Projected Traffic and Resulting Visitor Economic Impacts in Skagway, 2055**

| | **Alternative** | |
|---|---|---|
| | **4A** | **4C** |
| Alternative 1 – No Action (annual ADT) | 30 | 30 |
| Total Traffic under Alternatives 4A and 4C (annual ADT) | 65 | 40[1] |
| Change in Traffic (annual ADT) (over No Action) | 35 | 10 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 30 | 5 |
| Total New Visitors Annually (over No Action) | 17,500 | 4,100 |
| Total New Visitor Spending Annually (over No Action) | $1,350,000 | $310,000 |
| New Local Payroll Annually (over No Action) | $500,000 | $120,000 |
| New Local Employment Annually (over No Action) | 15 | 5 |

[1] Nearly all new traffic on this alternative is Skagway resident travel.

Note: Numbers may not total exactly due to rounding.

Each new job in the Skagway economy results in an increase in population of about 1.5 people.[53] Therefore, 15 new jobs in Skagway would result from Alternative 4A, and these jobs would be expected to result in a population increase of approximately 23 residents, an overall increase of approximately 2.2 percent of Skagway's current population (2015 population of 1,040). Alternative 4C would result in an increase of 5 new jobs, and these jobs would be expected to result in a population increase of approximately 8 new residents. This would be an overall increase of approximately 0.7 percent of Skagway's 2015 population.

Assuming 2.5 persons per household, a population increase of about 23 residents under Alternative 4A would result in additional demand for approximately 9 housing units and a population increase of approximately 8 residents under Alternative 4C would result in additional demand for approximately 3 housing units. While Skagway has a shortage of affordable homes for first-time home buyers and a lack of seasonal employee housing, the projected demand is anticipated to be accommodated by the vacant housing capacity of Skagway. During the summer, this demand would be harder to meet. It is likely that the private sector would respond by construction of additional housing if residential land is available. Because of the small increase in independent visitors and population associated with Alternative 4A, it is not expected to measurably increase the value of private property in Skagway.

Sales tax revenues would increase at a rate proportional to the increase in spending in Skagway. Total additional visitor spending of approximately $1.35 million annually under Alternative 4A would generate about $54,000 in additional sales tax revenues (based on a 4 percent tax rate). Alternative 4C would result in a total additional visitor spending of approximately $310,000 annually and would generate about $13,000 in additional sales tax revenues.

**Industry/Commercial Sectors –** The principal economic benefits of Alternatives 4A and 4C would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services –** Alternatives 4A and 4C would not measurably affect utilities and public services in Skagway relative to Alternative 1 – No Action.

**Quality of Life –** Alternative 4A would double the number of ferry trips between Juneau and Skagway relative to Alternative 1 – No Action. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), this improved access would be perceived as an improvement to quality of life by a majority of Skagway residents. Increased tourism and more recreational opportunities are potential benefits cited by some Skagway residents. Alternative 4C would only add one or two more ferry trips per week between Juneau and Skagway; therefore, this alternative would not result in much change in the perceived quality of life relative to Alternative 1 – No Action.

### 4.5.6 Subsistence

Because Alternatives 4A and 4C would not increase access to areas where subsistence harvests currently occur, they would not result in direct or indirect impacts to subsistence uses. See Revised Appendix DD, *Land Use Technical Report*, for additional detail regarding subsistence.

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[53] This number is based on an estimated participation rate of 65 percent, meaning that 65 percent of the Skagway population participates in the local labor force.

## 4.5.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. Alternatives 4A and 4C are not consistent with the 2004 SATP. The SATP will be updated to reflect the identification of Alternative 1 – No Action as the recommended improvement.

DOT&PF's 2016–2019 STIP (Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. Alternatives 4A and 4C are not consistent with the 2016-2019 STIP, while Alternative 1 – No Action is consistent with the currently adopted STIP.

### 4.5.7.1 Demand and Capacity

Traffic demand for Alternatives 4A and 4C was projected for 2025 and 2055 using the transportation model summarized in Section 4.1.5. These projections were based on 2015 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Projected traffic demand and capacity for Alternative 1 – No Action and Alternatives 4A and 4C in 2055 are provided in Table 4-55. As noted in Section 4.5.5, traffic under Alternatives 4A and 4C is expected to remain relatively constant for the 30-year period between 2025 and 2055. The only difference is an increase of 5 ADT in the peak week from 2025 and an increase of 5 ADT for Alternative 4C in winter from 2025. As indicated in the table, Alternatives 4A and 4C would provide a combined capacity (mainline ferry and shuttles) of 311 and 275 vehicles, respectively, which would meet the demand for this mode of transportation in all but the peak week. As with current operations, AMHS could schedule additional service in Lynn Canal during identified high volume days and special events.

**Table 4-55:**
**2055 Forecast Demand and Capacity for Alternative 1 – No Action and Alternatives 4A and 4C**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity (vehicles per day) |
|---|---|---|---|---|---|
| 1 – No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154 (93/61) |
| 4A | 145 (80/65) | 225 (125/100) | 90 (50/40) | 550 (300/245) | 311 (162/149) |
| 4C | 95 (55/40) | 150 (85/65) | 60 (35/25) | 370 (205/160) | 275 (144/131) |

Note: The first number is the total demand or capacity. The first number in parentheses is vehicle demand or capacity between Juneau and Haines, and the second number is vehicle demand or capacity or demand between Juneau and Skagway.

Because Alternatives 4A and 4C are limited to ferry service, they would not meet the projected unconstrained travel demand in the Lynn Canal corridor. Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternatives 4A and 4C would realize and accommodate approximately 16 and 14 percent of the latent summer demand, respectively. Alternatives 4A and 4C would accommodate approximately 58 percent and 75 percent of the peak week ADT, respectively.

The projected local[54] travel demand between Haines and Skagway with Alternatives 4A and 4C

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[54] For the purposes of this SEIS, "local" refers to passenger and vehicle traffic that only goes back and forth between Haines and Skagway; i.e., it is traffic that either boards in Haines and disembarks in Skagway, or boards in Skagway

is the same as Alternative 1 – No Action. The Haines-Skagway summer ADT is projected to be approximately 53 vehicles in 2025 and in 2055 for both Alternative 1 – No Action and Alternatives 4A and 4C. The projected average summer daily capacity on the Haines-Skagway shuttle is 62 vehicles, which would accommodate the demand between Haines and Skagway. Additional capacity would be provided by the mainliners.

#### 4.5.7.2 Travel Flexibility and Opportunity

Alternative 4A would result in an increase in flexibility and opportunity for travel in Lynn Canal. This alternative would approximately double the number of round-trips in Lynn Canal from one per day to two per day in the summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel.

Alternative 4C would leave travel flexibility and opportunity in Lynn Canal largely unchanged relative to Alternative 1 – No Action. Under Alternative 4C, nine round-trips per week would be possible between Juneau and Haines or Skagway in the summer. Under Alternative 1 – No Action, there would be eight round-trips per week between Juneau and both Haines and Skagway in the summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel, and it would be difficult if not impossible to travel between Juneau and Haines or Skagway and return the same day.

Alternatives 4A and 4C would provide the same number of ferry trips between Haines and Skagway as Alternative 1 – No Action.

#### 4.5.7.3 Travel Time

Table 4-56 provides a comparison of travel times for Alternative 1 – No Action and Alternatives 4A and 4C. As indicated in the table, travel between Auke Bay and Haines under Alternative 4A would be approximately 2.3 fewer hours than Alternative 1 – No Action and approximately 4 fewer hours between Auke Bay and Skagway. In Alternative 4C, the travel time between Auke Bay and Haines would be the same as in Alternative 1 – No Action. To travel between Auke Bay and Skagway, Alternative 4C would be approximately 1.5 fewer hours than Alternative 1 – No Action.

**Table 4-56:**
**Summer Travel Times for Alternative 1 – No Action and Alternatives 4A and 4C**

| Route | Travel Time (hours) | | |
|---|---|---|---|
| | Alternative 1 – No Action (Day Boat ACF) [1] | Alternative 4A | Alternative 4C |
| Auke Bay-Haines | 6.2 | 3.9 | 6.2 |
| Auke Bay-Skagway | 8.1 | 4.1 | 6.6 |

[1] With Alternative 1 – No Action, the mainline ferry (i.e., service along the length of the system, from Bellingham, WA, or Prince Rupert, B.C.) would have a travel time of 7.2 hours between Auke Bay and Haines and 9.1 hours between Auke Bay and Skagway.

Alternatives 4A and 4C would not affect the travel time between Haines and Skagway. It would remain 2.4 hours, the same as Alternative 1 – No Action.

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and disembarks in Haines. This local Haines-Skagway travel demand is not considered part of the overall demand for travel to and from Juneau in Lynn Canal.

### 4.5.7.4 State and User Costs

The 36-year life-cycle costs[55] for Alternative 1 – No Action and Alternatives 4A and 4C discounted to 2016 dollars are provided in Table 4-57. These costs include State and federal capital costs and State maintenance and operating expenses. Capital costs include design, vessel and terminal construction, vessel refurbishment, and vessel replacement.

**Table 4-57:**
**Thirty-Six-Year Life-Cycle Costs for Alternative 1 – No Action and Alternatives 4A and 4C ($millions)**

| Alternative | Capital Cost | Operating Cost | Total Life-Cycle Cost |
|---|---|---|---|
| 1 – No Action | $119 | $322 | $441 |
| 4A | $417 | $514 | $931 |
| 4C | $184 | $377 | $561 |

Table 4-58 provides an estimate of total project life costs less residual value, expressed in 2016 dollars with no discounting of future costs. The total project life cost (capital plus operating costs) over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $1.6 billion for Alternative 4A and $981 million for Alternative 4C (Table 4-58). As indicated in the table, Alternatives 4A and 4C would have higher capital and operating costs during the analysis period than Alternative 1 – No Action. Although State revenues from fares would be higher for Alternatives 4A and 4C than for Alternative 1 – No Action, they would not offset the increased cost of these alternatives to the State. Therefore, the State would pay more for Alternatives 4A and 4C than for Alternative 1 – No Action. The cost per vehicle to the State would be higher for Alternatives 4A and 4C compared to Alternative 1 – No Action.

**Table 4-58:**
**Thirty-Six-Year Total Project Life Costs for Alternative 1 – No Action and Alternatives 4A and 4C, 2019–2054 (2016 dollars)**

| Alternative | Total Funds | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $3782 | $279 |
| 4A | $496 | $1,125 | $1,621 | $1,170 | $482 | $6887 | $335 |
| 4C | $188 | $793 | $981 | $824 | $342 | $482 | $313 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

Alternatives 4A and 4C would have annual operating costs of approximately $33.7 million and $22.7 million, respectively, versus $18.2 million for Alternative 1 – No Action.

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[55] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 6-year construction period and a 30-year operation period, discounted to 2016 dollars.

The anticipated total cost[56] and out-of-pocket cost of travel between Juneau and Skagway or Haines for travelers are listed in Table 4-59 for Alternative 1 – No Action and Alternatives 4A and 4C. The Alternatives 4A and 4C user costs for travel between Juneau and Haines or Skagway would be the same as Alternative 1 – No Action. Mainline ferry fares would be unchanged from Alternative 1 – No Action under Alternatives 4A and 4C. The cost of taking the shuttle ferry between Haines and Skagway would remain the same under Alternatives 4A and 4C as with Alternative 1 – No Action.

**Table 4-59:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Costs for Alternative 1 – No Action and Alternatives 4A and 4C**

| Alternative | Example scenario | Haines User Cost[1] | | Skagway User Cost[1] | |
|---|---|---|---|---|---|
| | | Total User Cost | Out-of-Pocket Cost | Total User Cost | Out-of-Pocket Cost |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |
| 4A and 4C | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on passenger[2] | $39.00 | $39.00 | $53.00 | $53.00 |

[1]Total cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the ferry terminal.

Table 4-60 shows the 36-year value of user benefits and net present values for Alternatives 4A and 4C. User benefits include reduced out-of-pocket costs[57], travel time, vehicle maintenance and ownership costs, and accident costs. Alternative 4A would provide $38 million in user benefits over 36 years. Alternative 4C would offer approximately $10 million in user benefit.

**Table 4-60:**
**User Benefits and Net Present Value of Alternatives 4A and 4C versus Alternative 1 – No Action[1]**

| Alternative | User Benefits ($million) | Net Incremental Project Costs ($million)[2] | Net Present Value ($million) |
|---|---|---|---|
| 4A | $38 | $241 | -$202 |
| 4C | $10 | $85 | -$75 |

[1] For the period 2019 to 2054 discounted to 2016 dollars.

[2] Overall project costs minus revenues.

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[56] Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

[57] Out-of-pocket costs are ferry fares. Fares for Alternative 1 – No Action and Alternatives 4A and 4C are based on actual 2015 fares charged.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of Alternative 1 – No Action for a given period of time. The 2019 to 2054 net present values of Alternatives 4A and 4C are negative numbers at about negative $202 and negative $75 million, respectively. In other words, the costs of these alternatives are greater than the value of their user benefits.

### 4.5.7.5 Other Transportation Impacts

**Air Taxi** – It is likely that some travel would be diverted from air taxi operations currently serving the Lynn Canal to ferries under Alternative 4A and Alternative 4C due to the increased convenience of more trips.

**AMHS** – AMHS service in Lynn Canal under Alternative 1 – No Action is estimated to require State funding of about $10.1 million in 2055 annually. Because of the increase in ferry service in Lynn Canal with Alternatives 4A and 4C, both are estimated to require more State funding than Alternative 1 – No Action (Table 4-61). These alternatives would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

**Table 4-61:**
**Annual AMHS Operating Costs, Revenues, and Estimated State Funding for Alternative 1 – No Action and Alternatives 4A and 4C**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue ($million)[1] | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |
| 4A | $33.7[2] | $14.4 | $19.3 |
| 4C | $22.7[2] | $9.8 | $12.9 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Project Cost Analyses* (Revised Appendix FF).

[1] Fare box revenue paid to AMHS; excludes gas tax receipts.

[2] Revised total is due to (1) the updating of costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Pedestrians and Bicyclists -** Table 4-62 shows the projected number of summer walk-on passengers for Alternative 1 – No Action and Alternatives 4A and 4C. Alternatives 4A and 4C have a higher projection of summer walk-on passengers than Alternative 1 – No Action. The cost of travel under Alternatives 4A and 4C is the same as under Alternative 1 – No Action. Alternatives 4A and 4C have more frequency and opportunity for walk-on passengers to travel than Alternative 1 – No Action.

**Table 4-62:**
**Average Daily Ridership in Summer for Alternative 1 – No Action and Alternatives 4A and 4C, 2055**

| Alternative | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| 1 - No Action | 410 | 285 | 125 | 30% |
| 4A | 745 | 520 | 225 | 30% |
| 4C | 495 | 345 | 150 | 30% |

Note: See Revised Appendix AA, *Traffic Forecast Report.*

Comments on the 2014 Draft SEIS expressed concerns about impacts to walk-on passengers who are low income, minority, senior citizens, disabled, or students. Under Alternative 4A, these populations would have a shorter travel time due to the use of an FVF. As Alternatives 4A and 4C use the same ferry terminals as Alternative 1 – No Action, no additional impacts are anticipated (i.e., travelers would need to access the ferry terminals in Haines, Skagway, and Juneau the same way they do now).

### 4.5.8 Geology

Alternatives 4A and 4C would involve reconstruction of the west end of the Auke Bay Ferry Terminal. The proposed improvement would have no direct or indirect effects on geological resources.

### 4.5.9 Hydrology and Water Quality

#### 4.5.9.1 Hydrology

Because Alternatives 4A and 4C would only involve relatively minor reconstruction of existing ferry terminal dock facilities, they would not affect circulation within Lynn Canal. No other changes would be made to transportation facilities; therefore, there would be no impacts to surface water resources, including floodplains.

#### 4.5.9.2 Water Quality

Ferry operations under Alternatives 4A and 4C would have little effect on area water quality. Continued mainline ferry service in Lynn Canal would result in continued discharge of treated wastewater into Lynn Canal from those vessels, which is expected to meet AWQS. The FVFs (Alternative 4A) and the Day Boat ACFs (Alternative 4C) would not discharge wastewater into Lynn Canal. These vessels would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the ADEC (APDES permit) and would meet Alaska-established waste discharge limitations.

The ferry terminal sewage treatment facilities at Auke Bay, Haines, and Skagway would continue to operate under these alternatives. There are no documented impacts associated with these systems; therefore, negligible impacts to water quality from the terminal treatment facilities are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality.

### 4.5.10 Air Quality

Emissions from marine vessels and motor vehicles are directly proportional to the amount of fuel they burn. As indicated in Section 4.7.6, ferry and motor vehicle operations under Alternative 4A would consume about 4.3 times as much fuel as under Alternative 1 – No Action, due primarily to the high fuel consumption rates of the FVFs. Therefore, emissions of CO, $NO_x$, and particulates would be about 4.3 times higher under Alternative 4A than under Alternative 1 – No Action. This would not result in violations of federal and State air quality standards because pollutant concentrations in the region are so low and the volume of emissions from Alternative 4A is relatively low compared with other more urbanized areas.

Alternative 4C would use conventional monohull ferries and fuel consumption would be almost 70 percent higher than under Alternative 1 – No Action. Therefore, emissions under Alternative 4C would be greater than emissions under Alternative 1 – No Action. The effect on air quality, however, would be negligible because the air quality in the study area is very good and the project-related emissions would not approach the NAAQS.

Neither Alternative 4A nor 4C would be projected to have negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions. In response to comments on the 2014 Draft SEIS, ferry emissions modeling was performed to estimate the annual load of emissions (tons/year) for all alternatives relative to total emissions loading at active marine centers. The results of that modeling effort indicate that the ferry emissions associated with Alternative 4A would approximately triple the AMHS ferry emissions of Alternative 1 – No Action, but the contribution to total marine vessel emissions would be minor. Alternative 4C emissions would be similar to emissions under Alternative 1 – No Action. See Attachment 1 to the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z for detailed modeling results, and Section 4.9.2.7 for a discussion of the potential cumulative impact.

### 4.5.11 Hazardous Materials

The *2014 Update to Appendix M – Initial Site Assessment Technical Report* (see Appendix Z of the Draft SEIS) identified 15 sites of potential concern in the area of the proposed transportation improvements associated with Alternatives 4A and 4C: 10 oil or fuel spill sites at the Auke Bay Ferry Terminal, a leaking underground storage tank (LUST) site at Auke Bay Ferry Terminal, a contaminated site from a leaking aboveground residential heating oil tank on Glacier Highway, and three ADEC registered underground storage tanks (USTs) at the Auke Bay Ferry Terminal.

The 10 oil and fuel spill incidents were small, and the released materials have dissipated or have been removed. They pose no potential hazardous materials risk to the project.

The LUST site at the Auke Bay Ferry Terminal was granted a conditional closure from ADEC in 2004; however, it is currently being monitored because contaminated materials remain on site. Alternatives 4A and 4C present a potential hazardous materials risk associated with the LUST site at the Auke Bay Ferry Terminal. If the reconstruction of the west end of the Auke Bay Ferry Terminal requires structural modifications or demolition in the area of the contaminated materials from the LUST site, DOT&PF would need to investigate the disturbance area and appropriately manage or remove the contaminated materials prior to reconstruction.

The incident at the Glacier Highway residence occurred in 2003 and the status remains “open” in the ADEC database. This site poses no threat to development associated with Alternative 4A or 4C.

Two of the three ADEC registered USTs at the Auke Bay Ferry Terminal have been removed, but the third, and largest, is currently in operation. The remaining UST at the Auke Bay Ferry Terminal would be either left in place and monitored, or removed with reconstruction of the west end of the terminal, if the design required it.

### 4.5.12 Wetlands

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on wetlands.

### 4.5.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

Reconstruction of the west end of the Auke Bay Ferry Terminal would require the removal of pilings, replacement of pilings, and placement of some fill in the bay. Fill and pilings would result in the loss of less than one acre of intertidal and subtidal habitat. This loss would not result in a measurable reduction in any benthic or fish populations in the project region or Auke Bay.

Ferry operations under Alternatives 4A and 4C would be somewhat greater than under Alternative 1 – No Action. This increase would not be large enough to have a measurably different effect on marine and freshwater habitat or fish and other marine species than Alternative 1 – No Action. Ferries generating propeller wash and surface wakes near shore would increase localized turbidity, which could impact aquatic habitats such as eelgrass beds in Lynn Canal. Studies conducted by NMFS (Harris, Neff, and Johnson, 2012; Holsman et al., 2006; Laurel et al., 2007; Murphy et al., 2000; Johnson et al., 2003) have documented declines in eelgrass cover, species composition, and fishery declines in areas subjected to effects from ferries. Eelgrass beds in the terminal area of Auke Bay are already disturbed, and additional wave energy at the Auke Bay Ferry Terminal from ferry operations is not anticipated to substantially degrade the eelgrass bed adjacent to Auk Nu Cove beyond its current condition. FHWA has determined that Alternatives 4A and 4C would not have a substantial adverse effect on EFH.

### 4.5.14 Terrestrial Habitat

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial habitat.

### 4.5.15 Wildlife

#### 4.5.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall’s porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.5.17.

Seals are habituated to current ferry traffic. Because Alternatives 4A and 4C would use existing terminals, and would only increase traffic on existing routes, they would not affect harbor seal use of Lynn Canal.

Minke whales tend to be attracted to motor boats. Therefore, the presence of such vessels would not drive minke whales away from an area. Because of this attraction, increased ferry traffic would increase the risk of collision, particularly with the FVFs proposed under Alternative 4A; however, collision accidents with minke whales are very rare (Allen and Angliss, 2012). In addition, minke whales rarely occur in Lynn Canal (Dalheim et al., 2009). Therefore, Alternatives 4A and 4C are unlikely to have an impact on the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall’s porpoise can readily avoid ferries, even the FVFs proposed for Alternative 4A, and would not be affected by the ferry traffic associated with Alternatives 4A and 4C.

Sea otters rarely occur in Lynn Canal (Esslinger and Bodkin, 2009). Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternatives 4A and 4C. These alternatives are unlikely to affect sea otters in Lynn Canal.

#### 4.5.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz’s murrelets, harlequin ducks, black oystercatchers, yellow-billed loons, Aleutian terns, and dusky Canada geese.

Blue herons and trumpeter swans do not feed and rest in open marine waters of Lynn Canal and therefore would not be affected by Alternatives 4A and 4C. Marbled murrelets, Kittlitz’s murrelets, black oystercatchers, yellow-billed loons, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting, and are less likely to be in the main channel of Lynn Canal. Marine birds may be flushed by ferries in shallow coastal waters approaching terminals; however, this sort of disturbance would not be frequent enough to have a population-level effect on these species.

Implementation of Alternatives 4A and 4C would result in the loss of 0.7 acre of rocky shore habitat at the Auke Bay Ferry Terminal. The loss of rocky shore habitat would result in a loss of potential breeding and feeding habitat for black oystercatchers; however ongoing human activities in this area likely deter its use by these birds. With the low densities of oystercatchers in the Lynn Canal area relative to the amount of rocky shore habitat available outside the project area and high vessel and shore use at Auke Bay Ferry Terminal, it is not likely that Alternative 4A or 4C would displace nesting black oystercatchers. Displaced birds would likely move to other unoccupied rocky shore habitat nearby. The loss of less than 1 percent of habitat in Lynn Canal would not have a population-level effect on this species.

Alternatives 4A and 4C would not likely affect Aleutian terns because the project is outside the species’ known range (see Section 4.3.15) and the Aleutian tern is thought to be a casual or accidental spring and summer visitor in southeast Alaska, though it is known to breed as far south as Glacier Bay. Alternatives 4A and 4C would not result in the loss of palustrine or estuarine emergent wetlands, which is preferred nesting habitat of Aleutian terns. Because Aleutian terns nest onshore and feed over ocean waters, they are unlikely to be disturbed by Alternative 4A and 4C ferries.

Dusky Canada geese do not breed or winter in the project area. They could potentially use estuarine tide flats in the project area as foraging habitat during migration, however, banding studies have concluded that the geese migrate offshore and make few stops during migration (Bromley and Rothe, 2003). Alternatives 4A and 4C would not result in any habitat loss for dusky Canada geese and disturbance effects from maintenance and vehicle traffic would likely be negligible due to their transient use of the project area during migration.

#### 4.5.15.3 Terrestrial Mammals

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial mammals.

#### 4.5.15.4 Terrestrial Birds

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial birds.

#### 4.5.15.5 Amphibians

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on amphibians.

### 4.5.16 Bald Eagles

Because Alternatives 4A and 4C would involve only reconstruction of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial or freshwater habitats used by bald eagles.

### 4.5.17 Threatened and Endangered Species

#### 4.5.17.1 Steller Sea Lion

Alternatives 4A and 4C would not affect Steller sea lions at any traditional haulouts and would not measurably change the potential for Steller sea lion/AMHS ferry interactions.

The potential for sea lion and ferry collisions is considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, Steller sea lions are generally very agile and successfully avoid such encounters. Collisions with vessels are not believed to be a significant source of mortality of Steller sea lions (Allen and Angliss, 2012).

For these reasons, the FHWA has made the preliminary determination that Alternatives 4A and 4C are not likely to adversely affect western DPS Steller sea lions. Construction-related effects are described in Section 4.8.12.7.

#### 4.5.17.2 Humpback Whales

Ferry traffic in Lynn Canal would increase as a result of Alternatives 4A and 4C. The increased ferry traffic would increase the risk of collisions with humpback whales. The use of FVFs for Alternative 4A would further increase the risk of collisions because research has shown that vessel-whale collisions increase proportionately when the speed of vessels increases above 14 knots (Laist et al., 2001). Collisions have been rare in the past and would likely continue to be rare despite this increased risk (Allen and Angliss, 2012). FHWA has made the preliminary determination that Alternatives 4A and 4C are not likely to adversely affect Mexico DPS humpback whales. Construction-related effects are described in Section 4.8.12.7.

### 4.5.18 Permits and Approvals

Permits and approvals required for Alternatives 4A and 4C are limited to modifications to the Auke Bay Ferry Terminal. The following permits, consultations, and approvals would be required:

- USACE Section 404 permit for fill below the high tide line
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- NMFS ESA Section 7 consultation for threatened and endangered species
- NMFS MMPA Incidental Harassment Authorization for marine mammals
- ADEC APDES Stormwater General Permit for stormwater discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADNR Interagency Land Management Assignment for use of additional tidelands
- ADEC review of the SWPPP under the APDES Stormwater General Permit

## 4.6 Alternatives 4B and 4D – FVF and Conventional Monohull Shuttle Service from Berners Bay

This section evaluates the direct and indirect effects of Alternatives 4B and 4D. Under both of these alternatives, a 2.3-mile highway would be constructed from Cascade Point to Sawmill Cove in Berners Bay. In addition, the 2.9-mile portion of Glacier Highway from Echo Cove to Cascade Point would be widened from 26 feet to 30 feet. A new double end berth would be needed at Auke Bay and a ferry terminal would be constructed at Sawmill Cove. Ferry service would then be provided between Sawmill Cove and Haines/Skagway during the summer months (see Figure 2-10). During the winter (October 1 to May 15), ferry service would be provided to between Auke Bay and Haines/Skagway (see Figure 2-11). With Alternative 4B, two new FVFs would be used for this service. Under Alternative 4D, two Day Boat ACFs, which are conventional monohull vessels, would be used for the ferry service and the Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Day Boat ACF. Mainline AMHS ferry service would continue with a minimum of two round-trips per week in the summer and one round-trip per week in the winter.

There would be one pullout near the crossing of Sawmill Creek on the highway for these two alternatives. The USFS has indicated a trail at this pullout is reasonably foreseeable if the highway is constructed. A separate environmental analysis would be completed by the USFS for this trail. The trail is included in the cumulative effects section of this chapter (Section 4.9).

### 4.6.1 Land Use

#### 4.6.1.1 Land Ownership and Management

The required highway ROW from Echo Cove to Sawmill Cove and the new ferry terminal at Sawmill Cove would occupy up to 72 acres of federal land in the Tongass National Forest under the management of the USFS and 90 acres of land owned by Goldbelt. The Tongass National Forest land would remain in federal ownership with a highway easement conveyed to the State. Goldbelt would be compensated for lands acquired for a new highway ROW at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

#### 4.6.1.2 Consistency with Land Use Plans

The USFS land crossed by the road alignment for Alternatives 4B and 4D is currently managed under LUD II, which refers to congressionally designated lands where the principal management goal is to retain the primitive wildland character of the area while allowing necessary State highways (Figure 3-3). With development of Alternative 4B or 4D, the USFS would apply the TSC management prescription to the land within the highway corridor, giving it precedence over the underlying LUD management prescriptions. The highway segments of Alternatives 4B and 4D are consistent with the TLRMP.

The State of Alaska believes that use of the State transportation easement on the east side of Lynn Canal granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, would not require further evaluation for consistency with the TLRMP. If for some reason DOT&PF could not use all or a portion of the easement, FHWA would seek to secure a transportation easement across Tongass National Forest through a federal land appropriation process authorized by 23 USC 317.

ADNR manages State tidelands and submerged lands near the Sawmill Cove area to provide a dispersed recreation experience, wildlife habitat, harvest opportunities, and waterfront development. The CBJ *Comprehensive Plan* designates the shorelands around the potential Sawmill Cove Ferry Terminal as Resource Development, with the potential to create a marine terminal (CBJ, 2008). A ferry terminal at Sawmill Cove would appear to be compatible with USFS, ADNR, and CBJ management plans.

The regional transportation policy set forth in the CBJ 2008 *Comprehensive Plan* is “to support the improvement of transportation facilities and systems that reinforce Juneau’s role as the capital city of Alaska and a regional transportation and service center.” The plan supports consideration of all affordable energy efficient transport alternatives to improve transportation links between CBJ and other areas of Southeast Alaska, including improved air (cargo and passenger) service, roadways, ferries, and fixed guideway systems (CBJ, 2008). Alternatives 4B and 4D are consistent with the CBJ *Comprehensive Plan*.

The Haines Borough and Municipality of Skagway Borough comprehensive plans support improvement of the AMHS to provide better ferry access to these two communities (Haines Borough, 2012; Municipality of Skagway, 2009). Therefore, these alternatives are consistent with the plans and policies of Haines and Skagway.

Goldbelt’s Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternatives 4B and 4D are consistent with this plan and would use the alignment of the road to Cascade Point, and continuing to Sawmill Cove. Alternatives 4B and 4D would generate some additional traffic in the Cascade Point area that may facilitate development of the other plan elements.

#### 4.6.1.3 Land and Resource Uses

The highway improvements from Echo Cove to Cascade Point and the extension of the highway to Sawmill Cove would improve opportunities for recreational activities such as hiking, camping, sightseeing, rafting, canoeing, kayaking, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway system in Juneau. Berners Bay is already a popular location for remote and semi-remote recreation. A highway to Sawmill Cove would make it more accessible for people looking for a rustic but not pristine outdoor experience. It could also provide opportunities for outfitters to make more recreational trips available to the public in the region. Opening up the recreation opportunities of the coastline along the east side of Lynn Canal to Berners Bay would be perceived as a negative impact by those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there.

Sawmill Creek would be crossed by the highway proposed for Alternatives 4B and 4D. This stream supports resident and anadromous sport fish. The region also supports populations of mountain goats and bears, which are popular big game species for resident and out-of-state hunters. Hunting and fishing pressure has increased substantially along every highway in Alaska that has opened a formerly remote area to local communities and outside visitors. Increases in hunting and fishing would be expected along the extension of the highway from Cascade Point to Sawmill Cove. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect those resources from over utilization.

Under Alternatives 4B and 4D, Goldbelt would benefit from improved access to its Echo Cove lands. Better access would facilitate development opportunities, including transportation-related activities, recreation, and tourism and residential development.

**Roadless Areas –** Alternatives 4B and 4D would not substantially change the natural integrity and appearance or opportunities for solitude in IRA 305 (see Revised Appendix DD, *Land Use Technical Report*, Section 4.4, for detail on the effects of Alternative 3 on roadless areas). IRA 305 encompasses 94,800 acres.[58] Within the 300-foot-wide assessment corridor, the highway segment of Alternatives 4B and 4D would have a cleared width averaging approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the alignment is closer than 1,200 feet from the shore), for a total width averaging 2,500 feet. Therefore, Alternatives 4B and 4D would affect 612 acres largely along the western boundary of IRA 305. This represents about 0.07 percent of the land encompassed by IRA 305.

Alternatives 4B and 4D would reduce the amount of land remaining roadless. The remaining area would appear natural and would still provide opportunities for solitude and primitive recreation. The roadless area inventory boundary would not change; there would be a road within the IRA. Alternatives 4B and 4D would not affect any identified scientific or educational features in Area 305. Alternatives 4B and 4D are also consistent with the TLRMP which indicates that a proposed State road corridor along the alignment for Alternatives 4B and 4D in IRA 305 would be managed as a TSC if one of these alternatives were selected. Revised Appendix DD, *Land Use Technical Report*, provides additional information on Roadless Areas. The Secretary of Agriculture and the USFS may be required to make an affirmative finding under the Roadless Rule that the easements granted by Congress under Section 4407 of SAFETEA-LU, as amended by the FAST Act, were “established by law” and therefore that a road using the easements would be consistent with the Roadless Rule.

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[58] Because a ROW exists in this area, impacts of the Glacier Highway extension (0.7 mi in this IRA) have in part already occurred, but the USFS still maps this as an IRA.

#### 4.6.1.4 Parks and Recreation Facilities

No land from a municipal, State, or federal park or recreation area would be required by Alternatives 4B and 4D. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

### 4.6.2 Coastal Zone Management

Alternatives 4B and 4D involve construction in CBJ and the Municipality of Skagway Borough, but no construction in the Haines Borough. The CBJ incorporated enforceable policies for coastal zone management into its comprehensive plan and ordinances, as described in Section 3.1.1.8. Official determination of consistency with enforceable provisions would occur during local review of construction plans for roads, ferry terminals, or other improvements and modifications needed to implement the alternative. The CBJ's consistency determination for Alternative 2B from Echo Cove to Sweeney Creek (CBJ, 2006; see Section 4.3.2) could be modified for Alternative 4B or 4D. Consistency with enforceable provisions would be assured during local review of construction plans as required by Alaska Statute 35.30. The Municipality of Skagway Borough has not incorporated coastal management enforceable policies into its comprehensive plan, but some elements are codified in other ordinances, and compliance with the ordinances would occur during the development review process.

### 4.6.3 Visual Resources

#### 4.6.3.1 Views from the Bay

In Berners Bay, the most susceptible views to potential impacts from Alternatives 4B and 4D are views from boats in the bay. Figure 4-20 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway is approximately 2.4 miles east of the viewer and is located in an area not requiring substantial cuts and fills. Therefore, the highway is not likely to dominate the existing natural setting. At closer distances, the ferry terminal at Sawmill Cove and the highway would be more noticeable. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, from this distance it would not be a dominant feature in the viewshed.

Figure 4-21 is a visual simulation of the highway in the foreground at the Sawmill Cove Ferry Terminal proposed for Alternatives 4B and 4D. The highway would be noticeable intermittently along the eastern edge of Berners Bay. However, the proposed ferry terminal would likely be highly visible from this distance (approximately 0.5 mile) and through the middleground viewing threshold. The changes to form, line, color, and texture introduced by the ferry terminal would dominate the existing viewshed.

Views of the road and ferry terminal, as well as vehicle movement and lights, could affect viewers by changing their perception of the comparative isolation of this area. Movement of vehicles, during both the construction and operation stages, could result in a visual impact to viewers.

Alternatives 4B and 4D would result in more frequent views of ferries on Lynn Canal from the land. However, the frequency would not be increased to the extent that noticeably different visual impressions of the region would be created relative to the impressions that currently exist.

#### 4.6.3.2 Views from the Highway

Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense OG forest in most places. At the Sawmill Cove terminal, views to the west would include Point Bridget, Point St. Mary, and the opening of Berners Bay across to the west side of Lynn Canal.

#### 4.6.3.3 Consistency with USFS Scenic Integrity Objectives[59]

The SIO for the TSC is Low, with only the foreground of views considered. Alternatives 4B and 4D would be consistent with this SIO. The alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway. Except for the ferry terminal and highway approach, these alternatives would exceed the Low SIO. In order to be consistent with the TLRMP goal of achieving the SIOs of adjacent LUDs to the extent feasible, DOT&PF also evaluated the consistency of Alternatives 4B and 4D with the SIO of the adjacent LUD.

USFS land from Echo Cove to Sawmill Cove has a Moderate SIO. The highway for Alternatives 4B and 4D would not be visible from the coastline until Sawmill Cove. At this point, the access road to the new ferry terminal and the terminal facility would be visible from Berners Bay; therefore, the alternatives would conform to the SIO of adjacent lands except at the terminal area. It is not feasible to make the ferry terminal not visible from views of the area; however, during design, ways of reducing the terminal’s visual dominance would be investigated.

### 4.6.4 Historical and Archaeological Resources

There are no eligible historic properties in the APE of Alternatives 4B and 4D. Therefore, FHWA has determined that Alternatives 4B and 4D would not affect historic properties.

These alternatives would indirectly increase recreational use of land adjacent to the new highway. Increased recreational use could result in disturbance of any undiscovered historic and prehistoric cultural sites in the area by hikers, hunters, and other recreational users.

### 4.6.5 Socioeconomic Resources

#### 4.6.5.1 Overview

Alternatives 4B and 4D would not create any substantial change in economic conditions in Juneau, Haines, or Skagway. Both the population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by these alternatives. These alternatives would not measurably affect public services or make major changes in the perceived quality of life in Juneau, Haines, or Skagway. The following subsections provide a more detailed discussion of the economic and social effects to Juneau, Haines, and Skagway for Alternatives 4B and 4D.

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[59] The 2006 Final EIS used Visual Quality Objectives (VQOs) in accordance with the 1997 TLMP. This Final SEIS has been updated based on the 2016 TLRMP, which replaced the VQOs with Scenic Integrity Objectives (SIOs). The primary difference between the VQOs and SIOs is that the SIOs better recognize the positive scenic values associated with some human-modified (cultural) features and settings. The VQOs and SIOs are similar enough that the definitions were written to allow for easy conversion between the two.

#### 4.6.5.2 Juneau

**Population, Economics, Housing, and Municipal Revenues** – Alternatives 4B and 4D are predicted to generate 240 and 225 annual ADT, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055.

Alternatives 4B and 4D include continuing mainline AMHS ferry service to/from Haines and Skagway. Because of this, these two alternatives would have minor effect on independent visitor traffic to Juneau. The total increase in visitor traffic to and from Juneau associated with these alternatives is estimated to be 85 annual ADT for Alternative 4B and 75 annual ADT for Alternative 4D for 2055 (Table 4-63). This additional visitor traffic in Juneau would result in an annual total of as much as 49,100 new visitors under Alternative 4B and 45,000 new visitors under Alternative 4D. With average spending of $77 per visitor per day (McDowell Group, 2012b), annual visitor spending in Juneau would increase by as much as $3.78 million as a result of Alternative 4B and $3.46 million under Alternative 4D. This increase in visitor spending would generate an annual average of about $1.41 million in new payroll and about 40 additional jobs in Juneau under Alternative 4B and $1.29 million in new payroll and 35 new jobs under Alternative 4D (Table 4-63).

**Table 4-63:**
**Alternatives 4B and 4D Projected Traffic and Resulting Visitor Economic Impacts in Juneau, 2055**

| | Alternative | |
|---|---|---|
| | **Alternative 4B** | **Alternative 4D** |
| Total Traffic under Alternative 1 – No Action (annual ADT) | 80 | 80 |
| Total Traffic under Alternatives 4B and 4D (annual ADT) | 240 | 225 |
| Change in Traffic (annual ADT) (over No Action) | 160 | 145 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 85 | 75 |
| Total New Visitors Annually (over No Action) | 49,100 | 45,000 |
| Total New Visitor Spending Annually (over No Action) | $3,780,000 | $3,460,000 |
| New Local Payroll Annually (over No Action) | $1,410,000 | $1,290,000 |
| New Local Employment Annually (over No Action) | 40 | 35 |

Note: Numbers may not total exactly due to rounding.

Generally, each new job in the Juneau economy results in an increase in population of about 1.5 people.[60] Therefore, the new jobs in Juneau resulting from Alternatives 4B and 4D would be expected to result in a population increase of 60 and 53 residents, respectively. This would represent a maximum increase of about 0.2 percent of Juneau's current population (2015 population of 33,277).

Based on 2.6 persons per household (from 2010 Census data), a population increase of 60 and 53 residents in 2055 would result in additional demand for about 23 and 20 housing units for Alternatives 4B and 4D, respectively. According to the CBJ Community Development Department, there were 13,057 housing units in the community in 2011, with a vacancy rate of 5 percent. The project demand is well within the existing vacant housing capacity of Juneau. The

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[60] This number is based on an estimated participation rate of 65 percent, meaning 65 percent of the Juneau population participates in the local labor force.

FVF for Alternatives 4B and the Day Boat ACFs for 4D would homeport in Sawmill Cove in the summer and in Auke Bay in the winter. Crew for these vessels would require housing, creating a small additional demand for housing in Juneau. Because of the small increase in independent visitors and population associated with Alternatives 4B and 4D, neither of these alternatives would measurably increase the value of private property in Juneau.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $3.46 million (Alternative 4D) to $3.78 million (Alternative 4B) would generate as much as (assuming all of the spending is taxable) $173,000 to $189,000, respectively, in additional sales tax revenues annually (based on a 5 percent tax rate). Extension of the highway to Sawmill Cove and associated traffic would lead to an increase in property values in the area if Goldbelt's properties were developed. Additional property tax revenue would be generated.

**Industry/Commercial Sectors –** The principal economic benefits of Alternatives 4B and 4D would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services** – Alternatives 4B and 4D would not noticeably affect utilities and public services in the CBJ relative to Alternative 1 – No Action.

**Quality of Life –** Alternative 4B would more than triple the number of summer ferry trips between Juneau and Haines and double the number of summer ferry trips between Juneau and Skagway relative to Alternative 1 – No Action. Alternative 4D would double the number of summer ferry trips between Juneau and Haines/Skagway. In addition, Alternatives 4B and 4D would reduce most summer out-of-pocket user costs by approximately 34 percent relative to Alternative 1 – No Action. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), this improved access would be perceived as an improvement to quality of life by a majority of Juneau residents, providing increased recreational opportunities.

#### 4.6.5.3 Haines

**Population, Economics, Housing, and Municipal Revenues –** Alternatives 4B and 4D are predicted to generate 130 and 125 annual ADT, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055. As is the case with Juneau, Alternatives 4B and 4D would have a minor benefit to the Haines economy. The total increase in visitors to and from Haines associated with Alternatives 4B and 4D is estimated to be 45 and 40 annual ADT, respectively, in 2055.

Haines is projected to receive as much as 25,100 new visitors with Alternative 4B and 23,900 new visitors with Alternative 4D per year relative to Alternative 1 – No Action. Assuming that visitors would spend an average of $77 per visitor per day in Haines (McDowell Group, 2012a), annual visitor spending in the community would increase by about $1.93 million as a result of Alternative 4B and $1.84 million as a result of Alternative 4D. Because Alternatives 4B and 4D would not substantially change the cost of travel between Juneau and Haines, it is not expected that the number of trips that Haines residents would take to Juneau for shopping would increase substantially. However, there would be some increased resident spending in Juneau to offset increased spending in Haines by visitors there. The increase in visitor spending would generate an annual average of about $720,000 in new payroll and 20 new jobs in Haines under Alternative 4B and $690,000 in new payroll and 20 new jobs under Alternative 4D (Table 4-64).

**Table 4-64:**
**Alternatives 4B and 4D Projected Traffic and Resulting Visitor Economic Impacts in Haines, 2055**

| | Alternative | |
|---|---|---|
| | **4B** | **4D** |
| Total Traffic under Alternative 1 – No Action (annual ADT) | 50 | 50 |
| Total Traffic under Alternatives 4B and 4D (annual ADT) | 130 | 125 |
| Change in Traffic (annual ADT) (over No Action) | 80 | 75 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 45 | 40 |
| Total New Visitors Annually (over No Action) | 25,100 | 23,900 |
| Total New Visitor Spending Annually (over No Action) | $1,930,000 | $1,840,000 |
| New Local Payroll Annually (over No Action) | $720,000 | $690,000 |
| New Local Employment Annually (over No Action) | 20 | 20 |

Note: Numbers may not total exactly due to rounding.

Each new job in the economy results in an increase in population of about 1.5 people.[61] Therefore, the 20 new jobs in Haines resulting from Alternatives 4B and 4D would be expected to result in a population increase of 30 residents in 2055. [62] This would represent an overall increase of about 1.2 percent of Haines' current population (2015 forecasted population of 2,493).

Based on 3.4 persons per household (from 2010 Census data), a population increase of 30 residents would result in additional demand for about 9 housing units in Haines. The 2010 U.S. Census indicated that Haines has about 137 vacant housing units, not including seasonal, recreational, and occasional use units. The project demand is well within the existing vacant housing capacity of Haines. The small increase in independent visitors and population associated with Alternatives 4B and 4D, is not expected to measurably increase the value of private property in Haines.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $1.93 (Alternative 4B) to $1.84 (Alternative 4D) million per year would generate $106,000 to $101,000 in additional annual sales tax revenues, respectively (based on a 5.5 percent tax rate).

**Industry/Commercial Sectors –** The principal economic benefits of Alternatives 4B and 4D would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services –** Alternatives 4B and 4D would not measurably affect utilities and public services in the Haines Borough relative to Alternative 1 – No Action.

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[61] This number is based on an estimated participation rate of 65 percent meaning 65 percent of the Haines population participates in the local labor force.

[62] Under Alternatives 4B and 4D, the Haines-Skagway shuttle would be a smaller vessel requiring fewer crew members to operate relative to Alternative 1 – No Action. The crew members who are no longer needed on the Haines-Skagway route may be transferred to work on a different AMHS ferry and relocate their households to another community. This out-migration would slightly reduce the population gain from new jobs; however, it is not considered in the assessment of overall population impacts in order to present the maximum potential effect of these alternatives.

**Quality of Life –** Alternative 4B would approximately double the number of summer ferry trips between Auke Bay and Haines/Skagway relative to Alternative 1 – No Action. Alternative 4D would double the number of summer ferry trips between these two communities. In addition, Alternatives 4B and 4D would reduce out-of-pocket user costs for a driver plus a 19-foot vehicle and a family of four with a 19-foot vehicle by between 20 and 32 percent, respectively, relative to Alternative 1 – No Action. Fares for walk-on passengers, excluding the cost of transportation to and from the ferry terminal, would be reduced approximately 35 percent to Haines and 9 percent to Skagway. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), this improved access would be perceived as an improvement to quality of life by a majority of Haines residents. Better access to shopping and other services in Juneau, and more recreational opportunities are potential benefits cited by some Haines residents.

#### 4.6.5.4 Skagway

**Population, Economics, Housing, and Municipal Revenues –** Alternatives 4B and 4D are predicted to generate 110 and 100 annual ADT, respectively, in 2025. Traffic on these alternatives is predicted to remain constant over the 30-year period between 2025 and 2055. Alternatives 4B and 4D would have a minor benefit to the Skagway economy. The total increase in visitor traffic to and from Skagway under Alternative 4B is estimated to be 60 annual ADT in 2055. Alternative 4D would result in an increase in visitor traffic to and from Skagway of 50 annual ADT in 2055.

Skagway is projected to receive a total of about 34,500 new visitors annually with Alternative 4B and 29,800 new visitors annually with Alternative 4D. Assuming that visitors would spend an average of $77 per day in Skagway (McDowell Group, 2012a), visitor spending in the community would increase by about $2.65 million per year as a result of Alternative 4B and $2.29 million per year as a result of Alternative 4D. This increase in visitor spending under Alternative 4B would generate an annual average of about $990,000 in new payroll and about 25 new jobs in Skagway, and Alternative 4D would generate an annual average of about $860,000 in new payroll and about 25 new jobs in Skagway (Table 4-65).

**Table 4-65:**
**Alternatives 4B and 4D Projected Traffic and Resulting Visitor Economic Impacts in Skagway, 2055**

| | **Alternative** | |
|---|---|---|
| | 4B | 4D |
| Total Traffic under Alternative 1 – No Action (annual ADT) | 30 | 30 |
| Total traffic under Alternatives 4B and 4D (annual ADT) | 110 | 100[1] |
| Change in Traffic (annual ADT) (over No Action) | 80 | 70 |
| Change in Visitor Traffic (annual ADT) (over No Action) | 60 | 50 |
| Total New Visitors Annually (over No Action) | 34,500 | 29,800 |
| Total New Visitor Spending Annually (over No Action) | $2,650,000 | $2,290,000 |
| New Local Payroll Annually (over No Action) | $990,000 | $860,000 |
| New Local Employment Annually (over No Action) | 25 | 25 |

[1] Nearly all new traffic on these alternatives is Skagway resident travel.

Note: Numbers may not total exactly due to rounding.

Each new job in the Skagway economy results in an increase in population of about 1.5 people.[63] Therefore, the 25 new jobs in Skagway resulting from Alternatives 4B and 4D would be expected to result in a population increase of about 38 residents each. This would represent an overall increase of about 3.6 percent of Skagway's current population (2015 population of 1,040).

Assuming 2.5 persons per household (based on 2010 Census), a population increase of 38 residents would result in additional demand for about 15 housing units. The 2010 U.S. Census indicated that Skagway has about 152 vacant housing units, not including seasonal, recreational, and occasional use units. While Skagway has a shortage of affordable homes for first-time home buyers and a lack of seasonal employee housing, the projected demand is anticipated to be accommodated by the vacant housing capacity of Skagway. During the summer, this demand would be harder to meet. It is likely that the private sector would respond by construction of additional housing if residential land is available. Because of the small increase in independent visitors and population associated with Alternative 4B, it is not expected to increase the value of private property in Skagway.

Sales tax revenues would increase at a rate proportional to the increase in spending in Skagway. Total additional visitor spending of approximately $2.65 million annually under Alternative 4B would generate about $106,000 in additional tax revenues per year (based on a 4 percent tax rate). Total additional visitor spending of approximately $2.29 million annually under Alternative 4D would generate about $92,000 in additional tax revenues per year.

**Industry/Commercial Sectors** – The principal economic benefits of Alternative 4B would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

**Utilities and Public Services** – Alternatives 4B would not affect utilities and public services in Skagway relative to Alternative 1 – No Action.

**Quality of Life** – Alternatives 4B and 4D would double the number of ferry trips between Juneau and Skagway relative to Alternative 1 – No Action. In addition, Alternatives 4B and 4D would reduce most summer out-of-pocket user costs by approximately 34 percent relative to Alternative 1 – No Action. Based on the 1994 and 2003 household surveys conducted for the project (McDowell Group, 1994; Appendix I of the 2005 Supplemental Draft EIS), this improved access would be perceived as an improvement to quality of life by a majority of Skagway residents. Increased tourism and more recreational opportunities are potential benefits cited by some Skagway residents.

### 4.6.6 Subsistence

The only new highway segment for these alternatives would be an extension of the Glacier Highway. Juneau is not a subsistence community under ANILCA. Because Alternatives 4B and 4D would not substantially change access to locations within Lynn Canal, they would not result in direct or indirect impacts to subsistence uses. See Revised Appendix DD, *Land Use Technical Report*, for additional detail regarding subsistence.

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[63] This number is based on an estimated participation rate of 65 percent, meaning 65 percent of the Skagway population participates in the local labor force.

### 4.6.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a ferry from Katzehin to Haines. Alternatives 4B and 4D are not consistent with the 2004 SATP. The SATP will be updated to reflect the identification of Alternative 1 – No Action as the recommended improvement.

DOT&PF's 2016–2019 STIP (Amendment 3, June 28, 2017) does not include funding for any JAI Project build alternatives. Alternatives 4B and 4D are not consistent with the 2016–2019 STIP, while Alternative 1 – No Action is consistent with the currently adopted STIP.

#### 4.6.7.1 Demand and Capacity

Traffic demand for Alternatives 4B and 4D was projected for 2025 and 2055 using the transportation model summarized in Section 4.1.5. These projections were based on 2015 traffic in the Lynn Canal corridor, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Projected traffic demand and capacity for Alternatives 4B and 4D in 2055 are provided in Table 4-66 along with travel demand for Alternative 1 – No Action. As noted in Section 4.6.5, traffic under Alternatives 4B and 4D is expected to remain relatively constant for the 30-year period between 2025 and 2055. The only difference is an increase of 5 ADT under Alternative 4B in summer and peak week from 2025, a 5 ADT increase under Alternative 4D in winter from 2025, and a 10 ADT increase under Alternative 4D in the peak week from 2025. As indicated in the table, Alternatives 4B and 4D would increase summer capacity by roughly two to three times Alternative 1 – No Action capacity. This capacity would be sufficient to meet travel demand for this transportation mode except in the peak summer week. Alternative 4B would meet 54 percent of the peak week capacity and Alternative 4D would meet 58 percent. As with current operations, AMHS could schedule additional service in Lynn Canal during identified high volume days and special events.

**Table 4-66:**
**2055 Forecast Demand and Capacity for Alternative 1 – No Action and Alternatives 4B and 4D**

| Alternative | Annual Demand ADT | Summer Demand ADT | Winter Demand ADT | Peak Week Demand ADT | Summer Capacity(vehicles per day) |
|---|---|---|---|---|---|
| 1 - No Action | 80 (50/30) | 125 (80/45) | 50 (30/20) | 300 (190/110) | 154(93/61) |
| 4B | 240 (130/110) | 375 (205/170) | 90 (50/40) | 910 (500/410) | 487 (250/237) |
| 4D | 225 (125/100) | 345 (190/155) | 60 (35/25) | 850 (470/380) | 487 (250/237) |

Note: The first number is the total demand or capacity. The first number in parentheses is vehicle demand or capacity between Juneau and Haines, and the second number in parentheses is vehicle demand or capacity between Juneau and Skagway.

Because Alternatives 4B and 4D are limited largely to ferry service, they would not meet the projected unconstrained travel demand in the Lynn Canal corridor. Latent (unconstrained) demand in the corridor during the summer is estimated to be about 1,950 ADT. Alternatives 4B and 4D would each have capacity to realize and accommodate approximately 25 percent of the latent summer demand.

The projected local[64] travel demand between Haines and Skagway with Alternatives 4B and 4D is the same as Alternative 1 – No Action. The projected average summer capacity of 61 vehicles per day for the Haines-Skagway shuttle would accommodate the projected demand for travel between Haines and Skagway with Alternatives 4B and 4D. Additional capacity would be provided by the mainliners.

#### 4.6.7.2 Travel Flexibility and Opportunity

Alternatives 4B and 4D would result in an increase in flexibility and opportunity for travel in Lynn Canal. Alternative 4B would approximately double the number of round-trips between Juneau and Haines to 16 trips per week in summer. It would also essentially double the number of round-trips between Juneau and Skagway to 16 trips per week in summer. Alternative 4D would also double the number of round-trips between Juneau and Haines/Skagway to 16 trips per week in summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel.

Alternatives 4B and 4D would have the same opportunity for travel between Haines and Skagway as Alternative 1 – No Action.

#### 4.6.7.3 Travel Time

Table 4-67 provides a comparison of travel times between Alternative 1 – No Action and Alternatives 4B and 4D. As indicated in the table, travel between Auke Bay and Haines under Alternative 4B would be 2.5 fewer hours than Alternative 1 – No Action (using the Day Boat ACFs) and approximately 4.2 fewer hours between Auke Bay and Skagway. Travel between Auke Bay and Haines under Alternative 4D would be about 1.2 fewer hours than Alternative 1 – No Action. Between Auke Bay and Skagway, Alternative 4D would be approximately 2.7 fewer hours than Alternative 1 – No Action.

**Table 4-67:**
**Summer Travel Times for Alternative 1 – No Action and Alternatives 4B and 4D**

| **Route** | **Travel Time (hours)** | | |
|---|---|---|---|
| | **Alternative 1 – No Action (Day Boat ACF)[1]** | **Alternative 4B** | **Alternative 4D** |
| Auke Bay-Haines | 6.2 | 3.7 | 5.0 |
| Auke Bay-Skagway | 8.1 | 3.9 | 5.4 |

[1] With Alternative 1 – No Action, the mainline ferry (i.e., service along the length of the system, from Bellingham, WA, or Prince Rupert, B.C.) would have a travel time of 7.2 hours between Auke Bay and Haines and 9.1 hours between Auke Bay and Skagway.

Alternatives 4B and 4D would not affect the travel time between Haines and Skagway. It would remain 2.4 hours, the same as Alternative 1 – No Action.

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[64] For the purposes of this SEIS, “local” refers to passenger and vehicle traffic that only goes back and forth between Haines and Skagway; i.e., it is traffic that either boards in Haines and disembarks in Skagway, or boards in Skagway and disembarks in Haines. This local Haines-Skagway travel demand is not considered part of the overall demand for travel to and from Juneau in Lynn Canal.

#### 4.6.7.4 State and User Costs

The 36-year life-cycle costs[65] for Alternative 1 – No Action and Alternatives 4B and 4D discounted to 2016 dollars are provided in Table 4-68. These costs include State and federal capital costs and State maintenance and operating expenses. Capital costs include design, ROW acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

**Table 4-68:**
**Thirty-Six-Year Life-Cycle Costs for Alternative 1 – No Action and Alternatives 4B and 4D ($millions)**

| Alternative | Capital Cost | Operating Cost | Total Life-Cycle Cost |
|---|---|---|---|
| 1—No Action | $119 | $322 | $441 |
| 4B | $515 | $508 | $1,023 |
| 4D | $207 | $397 | $604 |

Table 4-69 provides an estimate of total project life costs less residual value, expressed in 2016 dollars with no discounting of future costs. The total project life costs over the 36-year period (expressed in 2016 dollars with no discounting) would be approximately $1.7 billion for Alternative 4B and $1.0 billion for Alternative 4D (capital plus operating costs, Table 4-69). As indicated in the table, Alternatives 4B and 4D would have higher capital and operating costs for the State during the analysis period than Alternative 1 – No Action. For Alternative 4B, State revenues from fares would be higher than for Alternative 1 – No Action, but would not offset the increased cost of this alternative to the State. Therefore, the State would pay more for Alternative 4B than for Alternative 1 – No Action. The net State cost for Alternative 4D would be lower than the net State cost of Alternative 1 – No Action because the increased State revenues for this alternative would essentially offset increased State costs relative to Alternative 1 – No Action. Alternatives 4B and 4D would cost the State less per vehicle than Alternative 1 – No Action because of the larger number of vehicles transported.

**Table 4-69:**
**Thirty-Six-Year Total Project Life Costs for Alternative 1 – No Action and Alternatives 4B and 4D, 2019–2054 (2016 Dollars)**

| Alternative | Total Funds | | | State Funds | | | |
|---|---|---|---|---|---|---|---|
| | Capital Costs ($million)[1] | Operating Costs ($million) | Total Project Costs ($million) | Total Cost ($million) | Total Revenue ($million)[2] | Net Cost ($million) | Cost/Vehicle (dollars) |
| 1 – No Action | $128 | $659 | $787 | $671 | $292 | $378 | $279 |
| 4B | $608 | $1,110 | $1,718 | $1,165 | $611 | $554 | $179 |
| 4D | $208 | $840 | $1,048 | $870 | $561 | $308 | $105 |

[1] Residual value subtracted.

[2] Includes both fares paid to AMHS and gas tax receipts.

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[65] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 6-year construction period and a 30-year operation period, discounted to 2016 dollars.

Alternatives 4B and 4D would have annual operating costs of approximately $33.3 million and $24.2 million, respectively, versus $18.2 million for Alternative 1 – No Action.

The anticipated total[66] and out-of-pocket cost[67] of travel between Juneau and Skagway or Haines for travelers are listed in Table 4-70 for Alternative 1 – No Action and Alternatives 4B and 4D. Those alternatives would reduce the cost relative to Alternative 1 – No Action. The cost of taking the shuttle ferry between Haines and Skagway would remain the same under Alternatives 4B and 4D as with Alternative 1 – No Action (see Table 4-70).

**Table 4-70:**
**Juneau to/from Haines and Skagway Total and Out-of-Pocket User Cost for Alternative 1 – No Action and Alternatives 4B and 4D**

| Alternative | Example scenario | Haines User Cost[1] | | Skagway User Cost[1] | |
|---|---|---|---|---|---|
| | | Total User Cost | Out-of-Pocket Cost | Total User Cost | Out-of-Pocket Cost |
| 1 – No Action | Family of 4 in a 19-foot vehicle | $229.00 | $227.00 | $301.50 | $301.50 |
| | Driver only in a 19-foot vehicle | $131.50 | $129.50 | $169.00 | $169.00 |
| | Walk-on passenger[2] | $5.00 | $5.00 | $8.50 | $8.50 |
| 4B and 4D | Family of 4 in a 19-foot vehicle | $165.50 | $150.50 | $220.00 | 206.50 |
| | Driver only in a 19-foot vehicle | $103.00 | $88.00 | $131.00 | $117.50 |
| | Walk-on passenger[2] | $25.00 | $25.00 | $35.50 | $35.50 |

[1] Total cost is based on fares plus $0.60 per mile for vehicular travel (AAA, 2015). Out-of-pocket cost is based on fares and gasoline consumption.

[2] Does not include cost of transportation to/from the ferry terminal.

User benefits include reductions in out-of-pocket costs, travel time, vehicle maintenance and ownership costs, and accident costs. Table 4-71 gives the 36-year value of user benefits as well as net present values of Alternatives 4B and 4D. User benefits are primarily due to the reduced cost to travel a shorter distance by ferry in summer.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of Alternative 1 – No Action for a given period of time. The 2019 to 2054 net present value of Alternative 4B is about negative $211 million. In other words, the costs of this alternative are greater than the value of its user benefits. For Alternative 4D, the net present value over the period is about negative $26 million.

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[66] Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

[67] Out-of-pocket costs are a combination of estimated fares and gasoline used on highway segments. Fares for Alternative 1 – No Action are actual 2015 fares charged. Fares for Alternatives 4B and 4D are based on 2015 fares charged, prorated by distance of ferry travel.

**Table 4-71:**
**User Benefits and Net Present Values for Alternatives 4B and 4D versus Alternative 1 – No Action[1]**

| Alternative | User Benefits ($million) | Net Incremental Project Costs ($million)[2] | Net Present Value ($million) |
|---|---|---|---|
| 4B | $54 | $265 | -$211 |
| 4D | $35 | $61 | -$26 |

[1] For the period 2019 to 2054 discounted to 2016 dollars.

[2] Overall project costs minus revenues.

### 4.6.7.5 Other Transportation Impacts

**Air Taxi –** It is likely that some travel would be diverted from the air taxi operations currently serving the Lynn Canal to ferries with Alternatives 4B and 4D due to increased travel opportunity.

**AMHS –** AMHS service in Lynn Canal under Alternative 1 – No Action is estimated to require State funding of about $10.7 million in 2055 annually. The estimated annual subsidy for AMHS service under Alternatives 4B and 4D in 2055 is $16.0 and $8.5 million, respectively (Table 4-72). Alternatives 4B and 4D would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

**Table 4-72:**
**Annual AMHS Operating Costs, Revenues and Estimated State Funding for Alternative 1 – No Action and Alternatives 4B and 4D**

| Alternative | AMHS Operating Cost ($million) | AMHS Revenue ($million)[1] | Estimated AMHS State Funding ($million) |
|---|---|---|---|
| 1 – No Action | $18.2[2] | $8.1 | $10.1 |
| 4B | $33.2[2] | $18.8 | $14.4 |
| 4D | $24.2[2] | $17.1 | $7.1 |

Source: *Marine Segments Technical Report* (Revised Appendix GG) and *User Benefit, Life-cycle Cost, and Total Cost Analyses* (Revised Appendix FF).

[1] Fare box revenue paid to AMHS; excludes gas tax receipts.

[2] Revised total is due to (1) the updating of costs to 2015 dollars and (2) a discrepancy in the data relied on to generate the 2014 Draft SEIS mainliner operating costs.

**Pedestrians and Bicyclists –** The highway proposed for Alternatives 4B and 4D would include 4- foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Ferries for these alternatives would accommodate bicyclists and walk-on passengers. Table 4-73 shows the projected number of summer walk-on passengers for Alternative 1 – No Action and Alternatives 4B and 4D. Alternatives 4B and 4D have higher projections of summer walk-on passengers than Alternative 1 – No Action.

**Table 4-73:**
**Average Daily Ridership in Summer for Alternative 1 – No Action and Alternatives 4B and 4D, 2055**

| Alternative | Total Passengers | Passengers in Vehicles | Walk-on Passengers | Walk-on Percentage |
|---|---|---|---|---|
| 1 – No Action | 410 | 285 | 125 | 30% |
| 4B | 1,240 | 1,065 | 165 | 14% |
| 4D | 1,140 | 995 | 155 | 14% |

Note: See Revised Appendix AA, *Traffic Forecast Report*

In summer, walk-on passengers would need to take a private carrier or find a ride with someone else to Sawmill Cove or travel on the twice-weekly mainline ferry from Auke Bay. If there is sufficient demand, it is likely that private bus/van service would be instituted between the Sawmill Cove terminal and Juneau. Some comments on the 2014 Draft SEIS expressed concerns about impacts to walk-on passengers who are low income, minority, senior citizens, disabled, or students. The impacts of Alternatives 4B and 4D on these groups depends on how they accommodate their non-ferry travel (i.e., whether they rent a vehicle, use a taxi, get a ride from someone else or bus) or whether they chose to travel on the mainliner. Even under Alternative 1 – No Action, these walk-on populations need transportation to/from the Auke Bay and Auke Bay and Haines ferry terminals (the Skagway Ferry Terminal is within walking distance to the community center). With access to a vehicle and the ability to drive, these populations would benefit from improved travel time, improved flexibility and opportunity to travel, and lower travel costs. Those choosing to continue as walk-on passengers would pay approximately the same as under Alternative 1 – No Action, considering the possible cost of transportation by bus between Sawmill Cove and Auke Bay. Alternatively, people could fly to/from Juneau but would be subject to the current airfare which may be higher than the ferry fare. Additional information regarding impacts to low-income and minority populations is discussed in Section 4.7.2. In Alternatives 4B and 4D, the mainline ferry has the same schedule, cost, and travel time as the mainline ferry in Alternative 1 – No Action.

### 4.6.8 Geology

Alternatives 4B and 4D would not affect any unique geologic resources in the project area. These alternatives would be subject to earthquake-induced ground tremor. As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). Based on USGS hazard maps published in 2007, there is a 10 percent probability of an earthquake in the next 50 years that would cause ground accelerations of 0.1 to 0.2 g[68] in the project area (Wesson et al., 2007). These types of ground accelerations would be taken into account in the design of roadway pavement, highway structures, and ferry terminal structures. It is probable that a maximum ground acceleration in the study area would cause damage to project facilities, as is the case with many other Alaska transportation facilities in seismic areas.

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

### 4.6.9 Hydrology and Water Quality

#### 4.6.9.1 Floodplains

The highway proposed for Alternatives 4B and 4D would cross Sawmill Creek. This creek would be crossed with a single-span bridge. The bridge structure and its supports would be located sufficiently outside the predicted base flood elevation of the creek, as determined by additional hydraulic studies to be conducted during the final engineering design of the selected alternative.

There are no floodplain development plans for the area from Echo Cove to Sawmill Cove. Sawmill Creek is located in the Tongass National Forest and is designated Semi-Remote Recreation. The principal management goal of this designation is to retain the natural character of the area. Therefore, no incompatible floodplain development would be likely in the project area.

**Compliance with EO 11988–** In accordance with the analysis required in DOT Order 5650.2 (Floodplain Management and Protection) and 23 CFR 650 Subpart A (Location and Hydraulic Design of Encroachment on Floodplains), FHWA has determined that Alternatives 4B and 4D are in compliance with EO 11988. These alternatives cannot avoid transverse encroachments of base floodplains along their alignment; however, the alternatives would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially affect natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

#### 4.6.9.2 Hydrology

The proposed highway segment for Alternatives 4B and 4D would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downstream side through culverts. Culverts would be placed to minimize roadside flow and maintain downslope hydrology. Culverts would be designed for the 50-year rainfall event, and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

The Sawmill Cove Ferry Terminal would require the placement of fill in Berners Bay. This small encroachment would not measurably change circulation and currents in the bay. The proposed terminal is sited so as not to obstruct discharge from Sawmill Creek. Breakwaters are currently not planned for the terminal.

#### 4.6.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to water courses whose drainages encompass the proposed highway between Echo Cove and Sawmill Cove, principally through runoff from the highway.

Results from stormwater research by the FHWA indicate stormwater runoff from low to medium traffic volumes (fewer than 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT & FHWA, 1987). Studies conducted in Anchorage, Alaska, under the MOA Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). Results showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below their AWQS. Only dissolved concentrations of copper and lead were noted to be above their AWQS; however, modest dilution would likely reduce these concentrations to below their AWQS. Identified concentrations would not adversely affect streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of the highway between Echo Cove and Sawmill Cove and the predicted low annual ADT, fewer impacts to water quality in the project area are expected than were found in the Anchorage studies. The studied runoff was collected from Anchorage roadways that ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). The studied melt water was from snow collected from a mix of these types of roads. In comparison, a highway from Echo Cove to Sawmill Cove would have a maximum peak week ADT during the period of 2025 and 2055 of 935 to 1,010 vehicles because of the capacity limitations of the ferry.

Highway runoff and melt water from the highway between Echo Cove and Sawmill Cove would have lesser quantities of potential contaminants than what was observed in the MOA Watershed Management Program due to a lower traffic volume and less area development. The ferry terminal would only be used in summer. Maintenance in the winter would be at the same level as other secondary roads in the Juneau road system. Snow would be cleared from the highway and deposited along its length instead of being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area. Runoff from the proposed highway and bridges would not be expected to exceed AWQS or adversely affect the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be low due to the rural setting of the highway and the low predicted highway traffic volume.

The following BMPs would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments
- Rock would be used to stabilize toes of slopes at ponds and stream crossings
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover
- Only soil or rock excavated from the construction area or immediately adjacent to the highway would be used for highway and ferry terminal embankments.

Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternatives 4B and 4D would have little effect on area water quality. Continued mainline ferry service in Lynn Canal would result in continued discharge of treated wastewater into Lynn Canal from those vessels, which is expected to meet AWQS. The FVFs (Alternative 4B) and the Day Boat ACFs (Alternative 4D) would not discharge wastewater to Lynn Canal. These vessels would have sanitary waste holding tanks and the wastewater would be pumped to an onshore facility for disposal. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the ADEC (APDES permit) and would meet Alaska-established waste discharge limitations.

A sewage treatment facility with a permitted outfall would be installed at the Sawmill Cove Ferry Terminal. Discharges from the sewage treatment facilities would operate within permit guidelines. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would likely be used. Negligible adverse impacts to water quality from the terminal treatment facility are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these effects have been minor, with only minimal and temporary impacts to water quality. Highway and bridge runoff would contribute minimal turbidity and pollutant loads to local drainages flowing to Berners Bay. Contaminant concentrations in runoff from the proposed highway and/or bridges would not be expected to exceed AWQS or adversely affect the water quality of receiving waters for the long term.

### 4.6.10 Air Quality

Emissions from ferries and motor vehicles are directly proportional to the amount of fuel they burn. As indicated in Section 4.7.6, ferry and motor vehicle operations under Alternative 4B would consume about four times as much fuel as under Alternative 1 – No Action, due primarily to the high fuel consumption rates of FVFs. Therefore, emissions of CO, $NO_x$, and particulates would be about four times higher under Alternative 4B than under Alternative 1 – No Action. This would not result in violations of federal and State air quality standards because pollutant concentrations in the region are so low and the volume of emissions from Alternative 4B is relatively low compared with other more urbanized areas.

Alternative 4D fuel consumption would be about twice that of Alternative 1 – No Action. Therefore, emissions under Alternative 4D would be about twice the emissions of Alternative 1 – No Action.

Neither Alternative 4B nor Alternative 4D would be projected to have negative human health or environmental consequences resulting from project-related vehicle or ferry vessel emissions. In response to comments on the 2014 Draft SEIS, ferry emissions modeling was performed to estimate the annual load of emissions (tons/year) for all alternatives relative to total emissions loading at active marine centers. The results of that modeling effort indicate that the ferry emissions associated with Alternative 4B would be approximately four to five times the AMHS ferry emissions of Alternative 1 – No Action, but the contribution to total marine vessel emissions would be minor. Alternative 4D would have emissions approximately double the ferry emissions of Alternative 1 – No Action. See Attachment 1 to the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z for detailed modeling results and Section 4.9.2.7 for a discussion of the potential cumulative impact.

### 4.6.11 Hazardous Materials

The *2014 Update to Appendix M – Initial Site Assessment Technical Report* (see Appendix Z in the Draft SEIS) identified 15 sites of potential concern in the area of the proposed transportation improvements associated with Alternatives 4B and 4D: 10 oil or fuel spill sites at the Auke Bay Ferry Terminal, a LUST site at Auke Bay Ferry Terminal, a contaminated site from a leaking aboveground residential heating oil tank on Glacier Highway, and three ADEC registered USTs at the Auke Bay Ferry Terminal.

The 10 oil and fuel spill incidents were small, and the released materials have dissipated or have been removed. They pose no potential hazardous materials risk to the project.

The LUST site at the Auke Bay Ferry Terminal was granted a conditional closure from ADEC in 2004; however, it is currently being monitored because contaminated materials remain on site. Alternatives 4B and 4D present a potential hazardous materials risk associated with the LUST site at the Auke Bay Ferry Terminal. If the reconstruction of the west end of the Auke Bay Ferry Terminal requires structural modifications or demolition in the area of the contaminated materials from the LUST site, DOT&PF would need to investigate the disturbance area and appropriately manage or remove the contaminated materials prior to reconstruction.

The incident at the Glacier Highway residence occurred in 2003 and the status remains “open” in the ADEC database. This site poses no threat to development of Alternative 4B or 4D.

Two of the three ADEC registered USTs at the Auke Bay Ferry Terminal have been removed, but the third, and largest, is currently in operation. The remaining UST at the Auke Bay Ferry Terminal would be either left in place, and monitored or removed with reconstruction of the west end of the terminal, if the design required.

### 4.6.12 Wetlands

A total of 1.5 acres of wetlands and 2.6 acres of other waters of the U.S. would be affected between Echo Cove and Sawmill Cove under Alternatives 4B and 4D. Upgrades to the existing Glacier Highway would require 0.6 acre of wetland impact and the highway extension from Cascade Point to Sawmill Cove would require an additional 0.9 acre of wetlands. The Sawmill Cove Ferry Terminal would require 1.9 acres of marine fill and dredging (rocky shore), and the Auke Bay Ferry Terminal modifications would require 0.7 acre of marine fill (rocky shore). The preliminary alignment for highway segments of Alternatives 4B and 4D has been adjusted to avoid wetlands and reduce the impacts to wetlands that could not be avoided.

As indicated in Table 4-74, 40 percent of the affected wetlands would be forested wetlands. The effects of filling these forested wetlands include reduced groundwater recharge and groundwater discharge/lateral flow functions, modification of the surface hydrologic control, and a reduction in wildlife habitat function with the loss of forest habitat.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Flow of surface water or shallow groundwater blocked by the highway embankment would eventually flow to the surface and be diverted by ditches to culverts under the highway embankment. Alteration of hydrology because of the highway embankment could result in corresponding changes to the vegetation and over time could affect wetland functions within and outside of the highway ROW. The extent of this effect would depend on localized hydrologic patterns; however, effects would be minimized with porous fill material and cross-drainage structures.

The indirect effects of the proposed highway for Alternatives 4B and 4D on wetlands include the potential introduction of contaminants from de-icing and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These wetland impacts could cause the further loss of wildlife habitat functions, the reduction of ecological diversity, and the reduction of sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for wetland users, would minimize the risk of these effects occurring.

**Table 4-74:**
**Wetlands and Other Waters of the U.S. Affected by Alternatives 4B and 4D**

| Wetlands and Other Waters of the U.S. | Area Impacted by Alternatives 4B and 4D (acres) |
|---|---|
| **Wetlands** | |
| Palustrine Forested | 0.6 |
| Palustrine Scrub-Shrub | 0.9 |
| **Subtotal** | 1.5 |
| **Intertidal and Subtidal Areas** | |
| Rocky Shore | 2.6 |
| **Subtotal** | 2.6 |
| **Total Acres** | 4.1 |

Note: This total does not include fill associated with culvert placement in non- anadromous streams. This additional acreage would be determined during design and permitting.

The use of salt-treated sand to improve road conditions during the winter could potentially affect roadside vegetation; however, high rainfall in this region would minimize most impacts from road salt (Wegner and Yaggi, 2001). Due to the small quantity of salt used to keep the sand friable for winter maintenance there would be negligible impacts on adjacent vegetation.

Alternatives 4B and 4D do not include access facilities for ORVs; however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through destruction of vegetation, erosion and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the highway is constructed.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternatives 4B and 4D. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would investigate ways to further minimize encroachment on wetlands. Compensatory mitigation would be provided for wetland losses associated with the selected alternative.

### 4.6.13 Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat)

Under Alternatives 4B and 4D, approximately 3.2 acres of intertidal/subtidal habitat would be filled or dredged for the Sawmill Cove Ferry Terminal. Based on a subtidal survey conducted in 2003, the seabed at the proposed terminal site is almost exclusively muds, sand, and gravels, though there may be some bedrock outcrops on the seabed in one location and occasional cobbles. Gravel content is highest in the intertidal zone and drops off rapidly in the subtidal zone, where sands and muds predominate. Vegetation cover is closely linked to the gravel component; therefore, cover drops off rapidly in the offshore. Video surveys of the site conducted in 2003 and 2004 indicated dense rockweed at the headlands on the north and south sides of the cove to about the zero foot tidal elevation. In the lower intertidal zone, rockweed is interspersed with two kinds of large-blade kelp. While this kelp is sparse, it is persistent and evenly distributed throughout the site. Crabs use the subtidal and intertidal zones in Sawmill Cove and a variety of fish species have been observed at the site including yellowfin sole, rock sole, gunnels, snake prickleback, sculpin, and Pacific herring. Marine birds such as great blue herons are known to forage in these habitats.

The impact to 3.2 acres of intertidal and subtidal habitat, the replacement of natural substrates due to terminal construction, and the dredging for a mooring basin would alter habitat usage in the disturbed area. Filling would result in the loss of habitat, while dredging and ongoing use would substantially reduce habitat value in the dredged areas. This would affect important EFH species such as eulachon by reducing the amount of refuge habitat available to larval stage eulachon, which are found in estuarine areas in Lynn Canal for an approximately 2-week period following spawning (Willson et al., 2006). The Sawmill Cove Ferry Terminal would cover less than 2 percent of the alongshore herring spawning length (approximately 3 miles) observed in Berners Bay in 2003. This habitat loss would not measurably affect other fish populations in the Berners Bay area.

Turbidity at the ferry terminal could be increased over ambient conditions for short periods by ferries maneuvering into and out of the terminal. Short-term turbidity and propeller or water jet scour could affect some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal.

There is the potential for accidental fuel spills from ferries at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location.

The FVFs or conventional monohull vessels would have sanitary waste holding tanks and would not discharge wastewater to open water. There would be no wastewater effluent affecting fish habitat or fish populations in Lynn Canal, including Berners Bay.

Stormwater and melt water runoff from the bridge over Sawmill Creek would not alter water quality sufficiently to affect anadromous and marine fish habitat. As discussed in Section 4.6.9, studies of highway runoff in Alaska indicate that the volume of traffic on the proposed highway for Alternatives 4B and 4D is not large enough for runoff to cause the exceedance of any AWQS in receiving waters.

The highway from Echo Cove to Sawmill Cove would cross Sawmill Creek, an anadromous fish stream. This bridge would not encroach on the stream channel. Therefore, it would not affect EFH.

In summary, the construction of Alternatives 4B and 4D would result in the direct loss of 3.2 acres of EFH as a result of filling and dredging for the Sawmill Cove Ferry Terminal. This is historically documented spawning habitat for Lynn Canal Pacific herring stock. Ferry maneuvers at Sawmill Cove could increase turbidity in the vicinity of the terminal sufficiently to affect Pacific herring eggs and larvae at the terminal site. Alternatives 4B and 4D would bridge Sawmill Creek, which supports anadromous fish populations. The bridge would not encroach on the streambed. None of these impacts would be large enough to measurably affect fish and invertebrate populations in Lynn Canal.

The incremental effect of the Sawmill Cove Ferry Terminal on Pacific herring stock is relatively small; therefore, this loss by itself is not expected to adversely affect the stock's ability to recover to previous population levels. However, NMFS as well as EPA and ADF&G have expressed concern that the ferry terminal and ferry traffic in Berners Bay could have an adverse effect on the Lynn Canal herring stock. During preparation of the 2006 Final EIS, both NMFS and the Office of Habitat Management and Permitting believed special conservation measures, including no operations during the herring spawning period, would be necessary. In 2006, the FHWA and the DOT&PF agreed to modify Alternatives 4B and 4D to avoid operating in Berners Bay from October 1 to May 15, as opposed to the original summer operations proposed as May 1 to September 30. The herring spawning season ends in early May. For other commercial fish species, the direct loss of 3.2 acres of habitat from ferry terminal construction would not adversely affect any fish and invertebrate populations in Lynn Canal.

If the selected alternative includes the Sawmill Cove terminal, DOT&PF would continue to investigate ways to further reduce intertidal and subtidal impacts associated with the terminal. Compensatory mitigation would be provided for the loss of intertidal and subtidal habitat.

### 4.6.14 Terrestrial Habitat

Alternatives 4B and 4D would result in the loss of vegetation within the cleared area[69] of the highway to Sawmill Cove. The acreage of vegetation types on USFS lands[70] that would be removed is estimated to be:

- 38 acres of OG forest
- 4 acres of other forest
- 2 acres of open shrub and meadow
- 6 acres of other terrestrial habitat

Much of the terrestrial habitat that would be affected by Alternatives 4B and 4D is in the Tongass National Forest. As discussed in Appendix K of the TLRMP, previous adopted versions of the TLRMP established an OGR system to manage this important habitat for many terrestrial species. Alternatives 4B and 4D would not affect any small OGR (OG Habitat LUD). The

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[69] Timber clearing is proposed 10 feet beyond the top of cut slopes and beyond the toe of embankment slopes. Removing large standing timber at the top of cut slopes eliminates the potential for trees falling into the road/traffic as a result of root disturbance. The additional clearing also provides for equipment access in rock cut areas for drilling activities. Removing timber at the toe of embankment slopes limits the severity of crashes when vehicles run off the road and down embankment slopes. This provides a "clear zone" at the toe of slope to allow vehicles the opportunity to come to a stop without colliding with a large tree.

[70] Comparable vegetation mapping is not available for other lands. The forest acreages that follow include forested wetlands; open shrub and meadow areas may be wetlands or uplands (USFS, 2013).

highway segment for these alternatives would go through OG forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large OGRs. The lands within these LUDs contain stands of OG forest, some of which are high volume, and others are low volume. Alternatives 4B and 4D would reduce the size of the OG forest stands in the area, as well as create a separation of some OG forest areas into downslope and upslope areas. These alternatives would remove approximately 38 of 74,470 acres of OG forest along the east side of Lynn Canal.

The loss of vegetation represents less than 1 percent of vegetation in the study area. The loss of vegetation would not adversely affect any listed threatened and endangered species, USFS sensitive species, or plant species considered rare by the ANHP. Impacts to terrestrial wildlife would be minor and are discussed further in Section 4.6.15 and in the *2017 Update to Appendix Q – Wildlife Technical Report* (in Appendix Z of this Final SEIS).

Clearing of the highway ROW would increase the potential for blowdown of trees adjacent to the ROW or slides in unstable areas.

The proposed highway extension could have indirect effects on terrestrial vegetation. By improving access to the area, human activity would increase along the highway corridor. This activity could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

### 4.6.15 Wildlife

#### 4.6.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall's porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.6.17.

Harbor seals use the Sawmill Cove area for feeding when prey fish concentrate there, but their main haulouts in Berners Bay are on sandbars near the major rivers; therefore, they are not likely to be affected by operation of the ferry terminal or the highway. The increased frequency of ferry service in Lynn Canal is not expected to result in any appreciable changes in effects on harbor seals relative to Alternative 1 – No Action.

Minke whales tend to be attracted to motor boats. Therefore, the presence of such vessels would not drive minke whales away from an area. Because of this attraction, increased ferry traffic would increase the risk of collision, particularly with the FVFs proposed under Alternative 4B; however, collision accidents with minke whales are very rare (Allen and Angliss, 2012). In addition, minke whales rarely occur in Lynn Canal (Dalheim et al., 2009). Therefore, Alternatives 4B and 4D are unlikely to have an impact on the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid ferries, even the FVFs proposed for Alternative 4B, and would not be affected by the ferry traffic associated with Alternatives 4B and 4D.

Sea otters rarely occur in Lynn Canal (Esslinger and Bodkin, 2009). Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternatives 4B and 4D. These alternatives are unlikely to affect sea otters in Lynn Canal.

Marine mammals are typically disturbed by loud, unexpected noises. Although marine mammals could be disturbed by vessel noise, the low-level, steady noise produced by ferries would be less than that produced from other activities, such as blasting or pile driving, and would not be expected to result in adverse effects to marine mammals.

#### 4.6.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered include the great blue heron, marbled murrelet, Kittlitz’s murrelet, harlequin duck, trumpeter swan, black oystercatcher, yellow-billed loon, Aleutian terns, and dusky Canada geese.

The proposed highway would result in the loss of some nesting habitat for great blue herons and marbled murrelets; however, the amount of habitat loss relative to the amount available in the study area is small. Nesting habitat for harlequin ducks and trumpeter swans is concentrated farther north in Berners Bay than Sawmill Cove, and Kittlitz’s murrelets nest on high-elevation talus slopes, which are not present along the highway alignment for Alternatives 4B and 4D.

Trumpeter swans typically nest in marshy areas near small lakes and use estuarine areas to feed. They are principally found further north in Berners Bay, near the Lace, Antler, and Berners River drainages. Therefore, Alternatives 4B and 4D are not expected to affect this species.

Blue herons and trumpeter swans do not feed and rest in open marine waters of Lynn Canal and therefore would not be affected by Alternatives 4B and 4D. Marbled murrelets, Kittlitz’s murrelets, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting; therefore, they would not be present along the ferry routes for Alternatives 4B and 4D in the main channels of Lynn Canal. These birds may be flushed by ferries approaching terminals. Although this sort of disturbance would be more frequent with Alternatives 4B and 4D than with Alternative 1 – No Action, it would not be frequent enough to have a population-level effect on these species.

Black oystercatchers have been observed in Lynn Canal, but are considered uncommon. Alternatives 4B and 4D would result in the loss of 1.9 acres of rocky shore habitat in Berners Bay and 0.7 acres at the Auke Bay Ferry Terminal. The loss of rocky shore habitat would result in a loss of potential breeding and feeding habitat for black oystercatchers; however ongoing human activities near the rocky shore habitat at the Auke Bay Ferry Terminal likely deter its use by these birds. Highway traffic during operations or maintenance activities could disturb black oystercatchers in rocky shore habitats adjacent to the widened and newly constructed alignment. However, with the low densities of oystercatchers in the Lynn Canal area relative to the amount of rocky shore habitat available outside the project area, displaced birds would likely move to other unoccupied rocky shore habitat nearby. The loss of habitat would not have a population-level effect on this species. Ferry navigation would avoid rocky shorelines, so there would be no anticipated disturbance of black oystercatchers from ferry traffic.

Only low numbers of yellow-billed loons have been documented in Berners Bay and Lynn Canal. Yellow-billed loons may experience some disturbance from ferry activities in Lynn Canal but impacts to yellow-billed loons would primarily be the loons’ energetic cost of swimming and diving to avoid ferries. Collisions are unlikely, due to their excellent swimming and diving abilities. Based on the apparent low numbers of loons present in Lynn Canal, and the relatively low numbers of ferries, disturbance would likely be minimal.

Alternatives 4B and 4D would not likely affect Aleutian terns because the project is outside the species' known range (see Section 4.3.15) and the Aleutian tern is thought to be a casual or accidental spring and summer visitor in southeast Alaska, though it is known to breed as far south as Glacier Bay. Alternatives 4B and 4D would not result in the loss of palustrine or estuarine emergent wetlands, which is preferred nesting habitat of Aleutian terns. Because Aleutian terns nest onshore and feed over ocean waters, they are unlikely to be disturbed by Alternative 4B and 4D ferries. Noise and human presence introduced with the proposed highway may preclude Aleutian terns from colonizing small portions of these habitats adjacent to project facilities.

Dusky Canada geese do not breed or winter in the project area. They could potentially use estuarine tide flats in the project area as foraging habitat during migration; however, banding studies have concluded that the geese migrate offshore and make few stops during migration (Bromley and Rothe, 2003). Alternative 4B and 4D would not result in any habitat loss for dusky Canada geese and disturbance effects from maintenance and vehicle traffic would likely be negligible due to their transient use of the project area during migration.

#### 4.6.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, mountain goat, and wolverine. The assessment of project effects on these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and the indirect impacts of increased human activity in the study area.

The direct loss of wetland and terrestrial habitat described in Sections 4.6.12 and 4.6.14 would amount to less than 1 percent of these habitats available in the study area. Additional loss of habitat because of windblown trees adjacent to the ROW for the highway to Sawmill Cove or changes in local hydrologic patterns along this highway may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and spring and fall beach fringe is important for bears.

The beach fringe between Echo Cove and Sawmill Cove provides high-value habitat for many terrestrial mammals, including bears, martens, river otters, and wolves. The highway alignment for Alternatives 4B and 4D would divide the home range of some bears that winter at higher elevations and move down to the coast during summer to forage, particularly for black bears that feed on salmon at Sawmill Creek. For species averse to human presence, the highway may limit their ability to use all of their range, thus fragmenting their habitat. Because black bears are highly adaptable and often learn to coexist near human development, habitat fragmentation is not expected to result in a substantial effect on black bear populations in the study area. The highway would likely result in mortality of some black bears from vehicle collisions.

Brown bears have been documented using areas just north of Echo Cove to Sawmill Cove in late summer and autumn (Flynn et al., 2012). This road alignment along East Lynn Canal for Alternative 4B and 4D would not intersect the major areas of predicted or recorded use for the

Berners Bay population (Flynn et al., 2012); however, there would likely be seasonal disturbance and displacement of bears using beaches near Sawmill Cove and Point St. Mary during ferry operations. The highway could inhibit the number and/or timing of bear crossings between upland and coastal habitats in those areas (Waller and Servheen, 2005). The bridge crossing of Sawmill Creek would maintain a terrestrial corridor along the stream bank for bears to cross under the highway.

Wolves travel widely in pursuit of prey and strongly avoid areas of human activity (USFS, 2000; Person, 2001). Some wolves use estuarine areas, but the importance of these areas for wolves is not known. The proposed highway would provide more access for people to beaches in the Sawmill Cove vicinity, potentially inhibiting the use of this area by wolves.

The proposed highway for Alternatives 4B and 4D would not fragment the ranges of martens and river otters, as these species have small home ranges and readily cross roads. Sitka black-tailed deer use a variety of habitat types, so it is unlikely that the small-scale habitat loss and potential fragmentation at the northern end of its range in the project study area would affect their populations. Mountain goat habitat is primarily at higher elevations than the proposed highway alignment; however, in winter, goats often venture down to low elevations, including rock bluffs close to shore. They seldom venture far from steep escape terrain. The highway from Echo Cove to Sawmill Cove would affect the winter habitat of goats in this area.

Collisions with vehicles would result in an increase in mortality among many terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as deer and moose, as well as those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are likely to occur with species that tend to avoid roads, such as wolves and brown bears. Mountain goats would not be substantially affected, as they would generally not be found adjacent to the highway alignment. There would be some losses, but the mortality from collisions with vehicles would not likely have population-level effects on most wildlife species in the study area.

The moose population around Berners Bay consists of only about 80–120 animals and is subject to a popular but limited registration-only hunt (Flynn et al., 2012). Moose rarely travel as far south as Sawmill Cove. The number of moose killed by vehicles traveling from Echo Cove to Sawmill Cove would be very low.

The highway for Alternatives 4B and 4D would make a small area more accessible to hunters and trappers. Hunting and trapping pressure on species such as the black and brown bear, moose, deer, mountain goat, marten, and river otter would increase along this highway segment. The effects of this increased pressure would be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. Therefore, this small amount of increased pressure would not result in population-level effects. Incidents of Defense of Life and Property from bears could increase due to increased movement of people through wildlife habitats; however, such incidents would be unlikely to have a population-level effect on black or brown bears.

The proposed highway segment of Alternatives 4B and 4D does not intersect wolverine predicted use areas (i.e., shrubland and alpine habitats). If any wolverines did enter the highway corridor, impacts would be limited to individual animals and would not affect the population as a whole.

#### 4.6.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend's warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily OG forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). The amount of habitat that would be lost by the proposed highway for Alternatives 4B and 4D would be negligible in comparison. Therefore, these alternatives would not result in population-level impacts to these species.

The highway segment for Alternatives 4B and 4D would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create "edge effects," which are used by some avian predators such as ravens, jays, and crows. This would add to the decreased value of nesting habitat for neo-tropical migrants near the highway.

#### 4.6.15.5 Amphibians

Frogs and toads live in both marshy and forested wetlands as well as upland areas adjacent to ponds. The amount of wetlands lost as a result of the proposed highway for Alternatives 4B and 4D would be small compared to the amount of total wetlands near the proposed highway alignment. Amphibians have small home ranges and do not appear to travel far from their natal pools (NatureServe, 2003). Therefore, the potential impacts of highway maintenance and operation would be limited to those animals that live near the proposed highway segment. The principal impacts of a highway to amphibians would be through mortality from vehicles and pollution of wetlands from highway stormwater runoff and accidental spills. These impacts would not affect amphibian populations on an area-wide basis.

### 4.6.16 Bald Eagles

A total of 16 bald eagle nests are documented within 0.5 mile of the ferry terminal highway portion of these alternatives (Table 4-75). Nests located along the existing Glacier Highway between Echo Cove and Cascade Point and eagles using these nests would be generally accustomed to daily motor vehicle activity. No communal roosting locations are known to occur along the highway alignment. Alternatives 4B and 4D would not affect the overall population of bald eagles in the Lynn Canal area because most of the nests along this alternative (56 percent) are located more than 660 feet from the highway alignment and ferry terminal. See Section 4.8.12.6 for construction impacts regarding bald eagles. Figure 4-11 shows the proposed highway alignment and indicates the approximate distances of the eagle nests from the highway alignment and ferry terminal.

There are no avalanche-prone areas along the highway from Echo Cove to Sawmill Cove; therefore, no blasting and related disturbance to bald eagles would occur.

**Table 4-75:**
**Number of Bald Eagle Nests in Proximity to Alternatives 4B and 4D**

| Distance from Highway Alignment/Ferry Terminal for Alternatives 4B and 4D | Number of Nests |
|---|---|
| 661 feet–0.5 mile | 8 |
| 331–660 feet | 6 |
| 101–330 feet | 2 |
| 61–100 feet | 0 |
| 31–60 feet | 0 |
| 0–30 feet | 0 |
| Total nests within 0.5 mile | 16 |

## 4.6.17 Threatened and Endangered Species

### 4.6.17.1 Steller Sea Lion

Alternatives 4B and 4D would not affect Steller sea lions at any traditional haulouts or designated critical habitat. Maintenance and operations of the Sawmill Cove Ferry Terminal could cause temporary disturbance to Steller sea lions in Berners Bay, particularly in late April and early May, while they are feeding on spring forage fish aggregations; however, FHWA has made the preliminary determination that these alternatives are not likely to adversely affect the Steller sea lions in Lynn Canal. Alternatives 4B and 4D do not include any new boat launch facilities and are therefore unlikely to increase recreational or commercial use of motorized vessels in the area. As noted in the 2006 Final EIS, NMFS has expressed concern that ferry traffic in Berners Bay may adversely affect Steller sea lions.

The potential for sea lion and ferry collisions is considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, Steller sea lions are generally very agile and successfully avoid such encounters. Because Alternative 4B would use FVF vessels, there is a slightly increased chance of a vessel collision with a sea lion.

Selection of Alternative 4B or 4D would necessitate formal consultation on western DPS Steller sea lions with NMFS under Section 7 of the ESA. Construction-related effects are described in Section 4.8.12.7 and cumulative effects of Alternatives 4B and 4D on Stellar sea lions with past, present, and reasonably foreseeable future actions are described in Section 4.9.2.15.

### 4.6.17.2 Humpback Whales

FHWA has made the preliminary determination that highway and vessel traffic and maintenance activities associated with Alternatives 4B and 4D would not adversely affect the Mexico DPS humpback whales in Lynn Canal. Ferry traffic in Lynn Canal would increase as a result of Alternatives 4B and 4D. The increased ferry traffic would increase the risk of collisions with humpback whales. As noted in the 2006 Final EIS, NMFS has expressed concern that ferry traffic in Berners Bay may adversely affect humpback whales.

The use of FVFs for Alternative 4B would further increase the risk of collisions because research has shown that vessel-whale collisions increase proportionately when the speed of vessels increases above 14 knots (Laist et al., 2001). However, collisions have been rare in the past and would likely continue to be rare (Allen and Angliss, 2012). In 2006, FHWA agreed to modify Alternatives 4B and 4D to avoid operating in Berners Bay until May 15.

Selection of Alternative 4B or 4D would necessitate formal consultation on Mexico DPS humpback whales with NMFS under Section 7 of the ESA. Construction-related effects are described in Section 4.8.12.7, and cumulative effects of Alternatives 4B and 4D on Mexico DPS humpback whales with past, present, and reasonably foreseeable future actions are described in Section 4.9.2.15.

### 4.6.18 Permits and Approvals

Alternatives 4B and 4D would require the following permits, consultations, and approvals:

- USFS transportation and utility easement issued under SAFETEA-LU Section 4407, as amended by the FAST Act, for use of Tongass National Forest lands, and USFS special use permit for any project activities or facilities located outside the Section 4407 easement on the Tongass National Forest.
- USACE Section 404 permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- NMFS ESA Section 7 consultation for threatened and endangered species
- NMFS MMPA Incidental Harassment Authorization for marine mammals
- USFWS eagle Disturbance Permit for nests within 660 feet of the cut and fill limits and for active nests within 0.5 mile of blasting activities and other loud construction noises.
- ADEC APDES Stormwater General Permit for stormwater discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADF&G Title 16 Fish Habitat Permit for work below ordinary high water in streams with anadromous or resident fish
- ADNR Interagency Land Management Assignment for use of tidelands at the Sawmill Cove Ferry Terminal
- Authorization from ADEC for treated wastewater discharge from the Sawmill Cove Ferry Terminal
- ADEC review of the SWPPP under the APDES Stormwater General Permit

## 4.7 Other Environmental Issues

### 4.7.1 Wild and Scenic Rivers

There are no designated Wild and Scenic Rivers in the study area. Two rivers in the study area have been recommended for designation: the Gilkey and the Katzehin rivers, both located on the east side of Lynn Canal. The Gilkey River joins the Antler River upstream of where the Antler River is crossed by the proposed alignment for Alternative 2B. Therefore, the proposed project would not affect the status of the Gilkey River. The Katzehin River is crossed by the proposed alignment for Alternative 2B near its mouth. The lower 2 miles of the river have been excluded from recommendation as Wild and Scenic because that reach was reserved for a possible transportation corridor crossing. Therefore, no alternative would affect the proposed Wild and Scenic status of the Katzehin River.

The Sullivan River has not been evaluated by the USFS with regard to eligibility as a Wild and Scenic and/or Recreation River. As discussed in the 2006 Final EIS, the USFS has indicated that the lower reach of the Sullivan River, where the Alternative 3 alignment would cross, is clearly not eligible due to past development activities. The upper reaches of the river would not be affected by Alternative 3 other than creating easier access for recreational users. Therefore, Alternative 3 would not affect the Wild and Scenic or recreational status of the Sullivan River.

### 4.7.2 Environmental Justice

Effective transportation decision-making depends on understanding and properly addressing the unique needs of different socioeconomic groups. EO 12898 addresses this by requiring each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." FHWA defines a "minority population" as "any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity" (FHWA, 1998). Minority groups addressed by the EO include: Black or African American, Hispanic, Asian American, American Indian/Alaskan Native, and Native Hawaiian or Pacific Islander.

FHWA defines a "low-income population" as "Any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity" (FHWA, 1998). Low-income persons are described as "a person whose household income is at or below the Department of Health and Human Services poverty guidelines" (FHWA, 2013).

Highway segments of Alternatives 2B, 3, 4B, and 4D pass through undeveloped land that is largely owned by the federal or State government. Therefore, no highway segments of any alternative would pass through minority and/or low-income neighborhoods.

It was determined in the 2006 Final EIS that the increased traffic on the Glacier Highway resulting from the project alternatives would not substantially affect the level of service of the highway or substantially increase noise at adjacent residences. Based on 2017 updates to the traffic and noise analyses, this conclusion remains valid.

As discussed in Section 3.1.5, the community of Klukwan is identified as a minority population when compared to state and national data (92 percent minority or mixed race based on 2010 Census data). The median household income of Klukwan is also below the state and national averages; however, Klukwan is not identified as a low income population because the median income level in this area is not below the poverty level for the average household size for this community (2.3, based on 2010 Census data) and the percentage of individuals below the poverty level is below state and national levels.

None of the proposed alternatives would directly affect any property in the immediate vicinity of Klukwan; therefore, there would be no disproportionate direct adverse effect to minority and low-income populations in that community. Under proposed project alternatives, more visitor traffic would travel the highway adjacent to Klukwan. However, this community would not be affected any more than Juneau, Haines, or Skagway. Increased traffic near Klukwan could result in increased tourism and economic development, which are beneficial effects.

Implementation of a build alternative, particularly the West Lynn Canal or East Lynn Canal Highway, would create local employment and business opportunities for local residents, including Alaska Natives, which is a beneficial effect of the proposed project. As indicated in the discussion of land use effects of project alternatives, some of the property required for the Alternative 3 ROW is owned by Alaska Natives. These owners, as well as all other private property owners, would be compensated for their land at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Within the study area, an upgraded transportation system, either a highway or an improved ferry system, would improve access to regional medical care, which would be a beneficial effect. Upgrading the transportation system may increase economic development activities and provide economic opportunities for minority and low-income residents, which are beneficial effects.

The high cost of travel in Lynn Canal has an impact on low-income travelers, in some cases precluding their ability to travel outside their hometown. As shown in Table 4-76, Alternative 1B, would reduce the cost of travel in this area, benefiting all travelers.

Alternatives 4A and 4C would have the same cost of travel as Alternative 1 – No Action. The cost under Alternatives 2B and 3 for low-income walk-on passengers without access to a vehicle could depend on how they travel to/from the Katzehin Ferry Terminal. Travelers without vehicles would have to rent a vehicle, take a commuter flight, travel on a private carrier (such as a taxi or shuttle service if they develop), or find a ride with someone. If they chose to take a bus (bus service is anticipated to develop if sufficient demand develops), they would be required to purchase a bus ticket. Even with the price of a bus ticket added in, the cost is expected to be in the same range as the cost for Alternative 1– No Action. Alternatives 4B and 4D cost would be in the same range as Alternative 1 – No Action cost or slightly higher, depending on the cost of transportation between Sawmill Cove and Auke Bay.

**Table 4-76:**
**Comparison of Out-Of-Pocket Costs**

| Alternative | Auke Bay-Haines | | | Auke Bay-Skagway | | |
|---|---|---|---|---|---|---|
| | Walk-on Passenger | Driver plus 19-foot Vehicle | Family of Four plus 19-foot Vehicle | Walk-on Passenger | Driver plus 19-foot Vehicle | Family of Four plus 19-foot Vehicle |
| 1 – No Action | $39.00 | $129.50 | $227.00 | $53.00 | $169.00 | $301.50 |
| 1B | $31.00 | $103.50 | $181.00 | $42.50 | $135.50 | $242.00 |
| 2B[1] | $42.00 – 60.00 | $34.50 | $47.00 | $50.00 – 68.00 | $46.50 | $67.50 |
| 3[1] | $42.00 – 60.00 | $40.50 | $59.50 | $50.00 – 68.00 | $72.50 | $111.00 |
| 4A and 4C | $39.00 | $129.50 | $227.00 | $53.00 | $169.00 | $301.50 |
| 4B and 4D[2] | $42.00 – $50.00 | $88.00 | $150.50 | $52.50 – $60.00 | $117.50 | $206.50 |

[1] Including the cost of potential bus service (anticipated to develop if sufficient demand develops) plus the ferry fare.

[2] The bus fare is assumed to be 41 percent of the Alternative 2B bus fare (prorated based on distance). Numbers may not total exactly due to rounding.

Based on the above discussion and analysis, FHWA has determined that none of the build alternatives would cause disproportionally high and adverse effects on low-income or minority communities.

### 4.7.3 Farmlands

There are no prime or unique farmlands in the State of Alaska and the study area does not appear on the U.S. Department of Agriculture Natural Resources Conservation Service list of farmlands of State or local importance. None of the proposed project alternatives would impact farmland.

### 4.7.4 Relocation Impacts

No residences, businesses, farms, churches, or nonprofit organization facilities would be relocated by any proposed project alternative.

### 4.7.5 Coastal Barriers

Federal legislation requires that any federal action that could potentially affect Coastal Barrier Resources Systems must be consistent with the Federal Coastal Barriers Resource Act of 1982 and the Coastal Barrier Improvement Act of 1990. Coastal Barrier Resources Systems consist of undeveloped coastal barriers on the Atlantic and Gulf Coasts. No coastal barriers have been identified on the West Coast of the U.S. Therefore, none of the proposed project alternatives would have any effect on coastal barriers.

### 4.7.6 Energy

The estimated annual fuel use for transportation of each of the proposed project alternatives was computed for the years 2025 and 2055. Approximate fuel consumption was calculated for AMHS ferries and projected highway vehicles. Ferry fuel consumption was based on a gallon/hour usage rate for individual vessels identified for each marine segment multiplied by projected transit times and annual operating schedules. Reported AMHS fuel consumption rates were used where applicable. For the mainline ferry segments, an average consumption rate for the mainline vessels currently operating in Lynn Canal (*M/V Columbia and M/V Matanuska*) was used. The fuel consumption rate of the Day Boat ACF vessel was derived from previously published estimates (Elliott Bay Design Group, 2013). For the new conventional monohull intended to serve as the Haines-Skagway shuttle (Alternatives 2B, 3, 4A, 4B, 4C, and 4D), the estimated fuel usage varied by alternative based on the projected size of each vessel to be built. For the FVFs, the fuel consumption rate of *FVF Chenega* and *FVF Fairweather* was used. Vehicle fuel consumption rates were based on an average fuel efficiency multiplied by the forecasted annual ADT volumes and roadway distance traveled under each alternative. Total annual fuel consumption estimates for each alternative were then divided by each alternative's respective annual ADT using the Juneau-Haines link for the years 2025 and 2055 to provide a per-vehicle fuel use estimate. The per-vehicle usage by alternative provides an approximate annual per-vehicle fuel consumption rate based on the number of forecasted vehicles moving through Lynn Canal.

Table 4-77 presents the estimated annual operational energy usage for all project alternatives. Over the 30-year analysis period (2025-2055), there is a negligible change in energy use for all of the alternatives because traffic levels are expected to remain relatively constant. Alternatives 1B, 2B, and 4B show a minor increase in energy use over the analysis period based on traffic projections. All action alternatives would have greater fuel consumption than Alternative 1 – No Action, but would also provide greater transportation capacity than Alternative 1 – No Action. Alternatives 4A and 4B would use the most fuel due to the energy requirements of the FVFs. Fuel consumption estimates for Alternatives 2B and 3 are influenced by the higher vehicular volumes on road portions of these alternatives.

Alternatives 2B and 3 would have substantially lower fuel use per vehicle than Alternative 1 – No Action and all other alternatives due to their lower ferry fuel consumption and higher ADT. Alternatives 1B and 4A through 4D increase the capacity of the transportation system in Lynn Canal relative to Alternative 1 – No Action, primarily by increasing the number of ferry trips. The FVFs proposed for Alternatives 4A and 4B consume more fuel than conventional monohull vessels; therefore, they have a higher per vehicle fuel usage than Alternative 1 – No Action. Fuel usage per vehicle for Alternative 4D is lower than under Alternative 1 – No Action because of the shorter travel distance from Sawmill Cove to Haines and Skagway than from Auke Bay.

**Table 4-77:**
**Estimated Annual Operational Energy Usage[1]**

| Alternative | Fuel (thousands of gallons) | | | | | | Per Vehicle Fuel Usage (gallons)[5] | |
|---|---|---|---|---|---|---|---|---|
| | Year 2025 | | | Year 2055 | | | 2025 | 2055 |
| | Ferry[2,3] | Vehicle[4] | Total | Ferry[2,3] | Vehicle[4] | Total | | |
| 1—No Action | 853 | 6 | 858 | 853 | 6 | 858 | 29 | 29 |
| 1B | 1,334 | 9 | 1,343 | 1,334 | 10 | 1,344 | 27 | 27 |
| 2B | 1,381 | 1,087 | 2,468 | 1,381 | 1,101 | 2,481 | 8 | 8 |
| 3 | 1,468 | 836 | 2,304 | 1,468 | 836 | 2,304 | 9 | 9 |
| 4A | 3,507 | 11 | 3,518 | 3,507 | 11 | 3,518 | 66 | 66 |
| 4B | 2,786 | 217 | 3,003 | 2,786 | 220 | 3,006 | 34 | 34 |
| 4C | 1,448 | 7 | 1,455 | 1,448 | 7 | 1,455 | 42 | 42 |
| 4D | 1,630 | 201 | 1,831 | 1,630 | 201 | 1,831 | 22 | 22 |

[1] All calculations are based on travel between Auke Bay and downtown Haines and the Skagway Ferry Terminals.

[2] Source: AMHS, 2015; Elliot Bay Design Group, 2013.

[3] Ferry fuel use is based on transit times. Fuel use associated with loading/unloading or energy used to operate ferry terminals was not estimated for any of the alternatives. No overhaul time or vessel substitution is factored into the analysis; each ferry option under each alternative is assumed to operate year-round.

[4] Based on 21.4 miles per gallon (mpg) fleet average for light duty vehicles and projected ADT. Source: USDOT, 2017.

[5] Calculation based on Juneau-Haines ADT forecast by alternative (see Revised Appendix AA, *Traffic Forecast Report*).

### 4.7.7 Noise

The traffic noise impacts presented in the 2006 Final EIS were based on noise modeling that incorporated summer ADT forecasts for 2038 (see Appendix L and the *2017 Update to Appendix L – Noise Technical Report* in Appendix Z) to consider the noise impacts associated with the highest traffic volumes. In order to determine whether additional noise modeling was needed for this Final SEIS, project analysts compared the 2038 summer ADT volumes from the 2006 Final EIS with the 2055 summer ADT volumes developed for this Final SEIS (see Revised Appendix AA, *Traffic Forecast Report*). Table 4-78 presents the two forecasts and the percent difference between the two values.

**Table 4-78:**
**Design Year/30-Year Summer ADT Traffic Forecasts**

| Alternative | 2006 Final EIS Traffic Forecasts[1] Design Year 2038 | Current SEIS Traffic Forecasts[2] Design Year 2055 | Difference in 2017 vs. 2006 Final EIS Design Year Traffic Forecast Volumes |
|---|---|---|---|
| 1 – No Action | 230 | 125 | 46% decrease in traffic volumes |
| 1B | NA | 210 | N/A |
| 2B | 1,190 | 1,270 | 7% increase in traffic volumes |
| 3 | 940 | 1,040 | 11% increase in traffic volumes |
| 4A | 390 | 225 | 42% decrease in traffic volumes |
| 4B | 470 | 375 | 20% decrease in traffic volumes |
| 4C | 260 | 150 | 42% decrease in traffic volumes |
| 4D | 350 | 345 | 1% decrease in traffic volumes |

[1] See Appendix L.
[2] See *2017 Update to Appendix L – Noise Technical Report* (in Appendix Z).

### 4.7.7.1 Direct Impacts

Noise levels in the project area would continue to be dominated by natural sounds under Alternative 1 – No Action with intermittent man-made noise sources including ferries, pleasure craft, airplanes, and helicopters. As indicated in Section 3.2.6, short-term noise measurements taken at the edge of Berners Bay near the USFS cabin in 2003 and documented hourly sound levels between 49 and 52 dBA.

Noise levels were also measured on the Chilkat Peninsula, south of Haines in 2003. Those measurements documented sound levels of 35 dBA. This wide difference in sound levels is the result of meteorological conditions at the time that measurements were taken and natural water features near noise monitoring sites. These noise levels are expected to continue into the future under Alternative 1 – No Action because there would be no vehicle noise added at those locations.

Alternative 1B was not evaluated in the 2006 Final EIS. It is similar to No Action in that it would not include new road, ferry, or ferry terminal construction. The 2017 traffic forecasts for Alternative 1B are similar to the traffic forecasts for No Action; therefore, potential noise impacts from Alternative 1B would be similar to those identified for Alternative 1 – No Action.

The noise modeling results presented in the 2006 Final EIS indicate that a peak-hour noise level of 65 dBA from traffic on the highway segments of the project alternatives with roadway improvements outside of developed areas (i.e., Alternatives 2B, 3, 4B, and 4D) would be contained within 35 feet of the centerline of the road. Based on simple noise attenuation theory, roadway noise generally decreases by 3 to 6 dBA with every doubling of distance from the source. Where traffic is continuous and the sound travels across hard surfaces such as paving and buildings, the decrease is typically 3 dBA. Where traffic is continuous and the sound travels over soil and vegetation, the decrease is on the order of 4.5 dBA. Where traffic is light, and the noise from each vehicle can be distinguished, the decrease is about 6 dBA. Considering the highest traffic volumes of all alternatives would average approximately one vehicle every 30 seconds (see Table 4-78; based on the highest summer ADT, which would occur under Alternative 2B, and assuming summer peak-hour traffic volumes would be 9 percent of 1,270, or 114 vehicles during the peak hour), the sound of individual vehicles would be distinct and the attenuation of about 5 to 6 dBA with every doubling of distance could be expected from traffic noise. With this level of attenuation, vehicle noise associated with these alternatives is likely to decrease to existing levels typical of the undeveloped areas of Lynn Canal within about 100 to 300 yards of the roadway, depending largely on weather conditions (e.g., traffic noise would be masked at shorter distances during rain and wind storms).

In the 2006 Final EIS, summer peak-hour through traffic noise at the USFS cabin on Berners Bay from Alternative 2B in 2038 was estimated to be approximately 47 dBA. The current alignment of Alternative 2B is farther from the cabin (approximately 1,000 feet away) than the alignment was in 2006; therefore, a much lower noise level would be expected. Noise levels at this cabin would be well below 66 dBA, which is the NAC for this land use; therefore, there would be no traffic noise impact at the cabin.

**Juneau** –Project alternatives would not have a direct impact on sensitive receptors in Juneau except at the Echo Cove campground. The campground is approximately 600 feet from the highway alignment of Alternatives 2B, 3, 4B, and 4D. Of these alternatives, Alternative 2B would have the largest volume of traffic and would therefore create the greatest traffic noise. The peak-hour traffic noise for Alternative 2B was estimated to be approximately 44 dBA at the campground in the 2006 Final EIS. With a 12 percent increase in traffic (based on updated traffic numbers presented in Table 4-78), that estimate would not increase by more than 1 dBA. Existing noise at the campground was measured at 43 dBA. This could be expected to vary depending on meteorological conditions and campground activity. The noise from a highway on the alignment for project alternatives would not increase the peak-hour noise by more than about 1 to 2 dBA. This increase would not be perceptible to the average human ear; and the resulting noise level would not result in a highway traffic noise impact.

**Haines –** Project alternatives would not have a direct impact on sensitive receptors in Haines. Noise modeling was used to predict the noise level from Alternative 2B at the Chilkat Peninsula. The acoustical conditions associated with Chilkoot Inlet, which lies between the peninsula and the proposed highway alignment, were included in the noise model. The predicted noise level due to the highway under 2038 peak summer traffic conditions presented in the 2006 Final EIS would be approximately 30 dBA at the closest location in Chilkat State Park. Ambient (2003) noise levels measured on the peninsula were approximately 35 dBA. Therefore, traffic noise from Alternative 2B would cause an increase of only 1 to 2 dBA to the overall noise environment. This increase would not be perceptible to the average human ear.

**Skagway –** Alternatives 2B, 3, and 4A through 4D would have no direct noise impacts to Skagway as these alternatives would involve no new roadway there.

#### 4.7.7.2 Noise Abatement Evaluation

As discussed in Section 3.2.6, noise abatement must be considered when the predicted future peak hour noise from highway traffic on new construction approaches or exceeds the NAC (23 CFR 772), or when a substantial increase occurs. No project alternative’s projected traffic noise level would approach the NAC or have a substantial increase over ambient conditions. Therefore, noise abatement has not been considered.

### 4.7.7.3 Indirect Impacts

Similar to direct impacts, the assessment of indirect noise impacts in the 2006 Final EIS was based on traffic forecasts for 2038. The revised traffic forecasts for 2055 in Table 4-78 show increases and decreases in traffic for each alternative relative to the 2038 forecast. Understanding that traffic volumes could double or be reduced by half and have a relatively small (3 dBA) noise impact, the revised traffic forecasts for 2055 shown in Table 4-78 do not affect the assessment of indirect noise impacts presented in the 2006 Final EIS. The descriptions of indirect impacts from the 2006 Final EIS in the following paragraphs, therefore, are generally representative of the potential impacts associated with the project alternatives as described in this Final SEIS. Alternative 1B would have impacts similar to Alternative 1 – No Action. Note that the assessment is based on the NAC for residential land use that has since changed (see Section 3.2.6). Although the NAC are established to assess the potential for direct traffic noise impacts, they are used here as a point of reference. FHWA is not required to consider abatement for indirect impacts. The new NAC for residential land use, interior and exterior, are 1 dBA lower than the NAC used in the analysis presented in the 2006 Final EIS. This change, coupled with the slight changes in traffic volume from the updated traffic forecast, would fall within the margin of error of predicting traffic noise impacts.

**Alternative 1 – No Action** – Based on past trends in population growth, it was estimated that traffic in the Juneau, Haines, and Skagway areas would increase at the rate of 1 percent a year into the future. This would increase traffic volumes in these areas by approximately 35 percent by 2038. This increase in traffic would also increase noise adjacent to existing roads in these communities.

***Juneau*** – Existing traffic noise along Egan Drive and Glacier Highway in Juneau was estimated by computer modeling using traffic volumes measured in 2002. Based on this modeling, exterior peak-hour summer traffic noise along these highways is estimated to be at or above 65 dBA at 25 housing units in Juneau (14 single-family residences, 10 condominiums, and the Auke Bay RV Park; see Table 4-79). Based on a field survey of the Juneau area, there are a number of noise sensitive receptors near Egan Drive and Glacier Highway where the exterior areas closest to the highway do not appear to receive frequent human use and therefore it is most appropriate to evaluate potential interior noise impacts. For these other receptors, modeling indicates that interior peak-hour traffic noise is at or above 50 dBA at 103 housing units (single-family residences, residence rooms in the Pioneer's Home, condominiums, apartments, DeHart's upper floor, and the Squire's Rest Building).

The increase in summer traffic associated with Alternative 1 – No Action is projected to increase noise levels in Juneau relative to existing conditions by up to 2 dBA by the year 2038 for all modeled roadway segments. Although this noise increase would not be noticeable since the average human ear does not typically recognize noise increases below 3 dBA, it would increase the number of housing units in Juneau receiving exterior peak-hour traffic noise at or above 65 dBA by 11 (all single-family residences). It would also increase the number of housing units in Juneau receiving interior peak-hour traffic noise at or above 50 dBA by 19 (17 single-family residences and 2 apartments). Table 4-79 lists sensitive receptors in the Juneau area that are currently at or above the NAC[71] and sensitive receptors that would be affected by traffic noise with Alternative 1 – No Action in 2038.

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[71] Referring to the NAC in effect at the time the 2006 Final EIS was issued.

### Table 4-79:
### Housing Units along Egan Drive and Glacier Highway in the Juneau Area Impacted by Summer Traffic Noise (at or above NAC)

| **Location** | **Number of Housing Units** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Modeled Existing Condition (2002)** | | **Alternative 1 – No Action[1] (2038)** | | **Alternative 2B (2038)** | | **Alternative 3 (2038)** | | **Alternatives 4A–4D (2038)** | |
| | **In** | **Ex** | **In** | **Ex** | **In** | **Ex** | **In** | **Ex** | **In** | **Ex** |
| Egan Drive from Twin Lakes Drive to Old Glacier Highway | 21 | 1 | 29 | 3 | 29 | 3 | 29 | 3 | 29 | 3 |
| Glacier Highway from Old Glacier Highway to Engineers Cutoff Road | 23 | 12 | 26 | 14 | 26 | 14 | 26 | 14 | 26 | 14 |
| Glacier Highway from Engineers Cutoff Road to Fritz Cove Road | 16 | 10 | 17 | 12 | 17 | 12 | 17 | 12 | 17 | 12 |
| Glacier Highway from Fritz Cove Road to Auke Bay Road | 15 | 0 | 17 | 1 | 17 | 1 | 17 | 1 | 17 | 1 |
| Glacier Highway from Auke Bay Road to Auke Nu Drive | 23 | 2 | 26 | 4 | 26 | 4 | 26 | 4 | 26 | 4 |
| Glacier Highway from Auke Nu Drive to Terminus | 5 | 0 | 6 | 2 | 13 | 4 | 11 | 3 | 7–11[2] | 2–3[3] |
| Total | 103 | 25 | 121 | 36 | 128 | 38 | 126 | 37 | 122–126 | 36–37 |

Note: In = interior at or above 50 dBA $L_{eq(h)}$ , Ex = exterior at or above 65 dBA $L_{eq(h)}$.

[1] Alternative 1B would have results similar to Alternative 1 – No Action.

[2] Eleven for Alternatives 4A, 4B, and 4D, and 7 for Alternative 4C.

[3] Three for Alternatives 4A, 4B, and 4D, and 2 for Alternative 4C.

***Haines*** **–** Increased summer traffic in Haines under Alternative 1 – No Action would increase traffic noise in downtown Haines by 2 dBA in 2038. Existing exterior peak-hour noise levels in Haines range from 34 to 57 dBA. As mentioned above, an increase of 2 dBA would not noticeably increase the perceived noise adjacent to roads in Haines. Therefore, project alternatives would not result in noise impacts in Haines.

***Skagway*** **–** Peak-hour noise at a residence (LT-3 at 420 22nd Avenue) nearest State Street and the Skagway railroad yard was measured in 2003 at just below 65 dBA. At a residence at 12th Avenue and Broadway a block away from the White Pass & Yukon Route Railroad line, peak-hour noise was measured in 2003 at 60 dBA. Based on short-term noise measurements, peak-hour noise in downtown Skagway further away from the railroad line and other non-traffic noise sources was estimated to be less than 60 dBA.

Peak-hour traffic noise levels in Skagway were modeled using 2002 summer traffic levels to represent current conditions. Most traffic coming into or out of Skagway on the Klondike Highway travels on 23rd Avenue and State Street north of 21st Avenue before dispersing onto other roads in Skagway. Exterior peak-hour traffic noise at receptors along State Street between 21st and 23rd avenues and 23rd Avenue between State and Main streets was modeled to range from 57 to 62 dBA. Modeled traffic noise levels were lower than measured noise levels in Skagway. This modeling indicates that vehicle traffic is not the dominant source of noise in most of the community. Other noise sources such as rail traffic and aircraft are primarily responsible for the high measured peak hour noise levels in Skagway (60 to 65 dBA). The northeast section of town is close to the railroad tracks which have up to 120 train movements per day in the summer with many passenger trains during the measured peak hour. Airplane and helicopter noise also contributes to the high noise level with up to 130 takeoffs and landings per day in the summer. With existing traffic noise levels of 57 to 62 dBA, these other noise sources likely contribute approximately 62 to 64 dBA in order for the total peak hour noise level to be 65 dBA.

Noise measurements and modeling indicate that no sensitive receptors in Skagway currently receive exterior peak-hour traffic noise of 65 dBA or greater. However, it is estimated that interior peak-hour traffic noise at the residence where State Street becomes 23rd Avenue, the residence on the southwest corner of State Street and 22nd Avenue, and the daycare center on the southwest corner of 23rd Avenue and Main Street currently exceeds 50 dBA.

Increased summer traffic in Skagway under Alternative 1 – No Action would also increase traffic noise in the community by 1 to 2 dBA in 2038. An increase of 2 dBA would not noticeably increase the perceived noise adjacent to roads in Skagway. Because traffic is not the dominant source of noise in the community, the small increase projected for Alternative 1 – No Action would not increase peak-hour noise at the exteriors of any sensitive receptors to 65 dBA; however, it is estimated that this increase in noise would result in an interior peak-hour traffic noise of 50 dBA or greater at the residences on State Street and 22nd Avenue (north- and southwest corners), the residence on State and 23rd Avenue, the daycare center on the corner of 23rd Avenue and Main Street, and the apartments on the northwest corner of State Street and 21st Avenue.

**Build Alternatives** – Project build alternatives would increase traffic on roads in Juneau, Haines, and Skagway relative to Alternative 1 – No Action.[72] This would have the indirect effect of increasing traffic noise at receptors adjacent to these roads. Although analysis of the need for noise abatement is not required by FHWA regulations for these indirect impacts, NAC[73] noise levels are useful in their evaluation.

***Juneau*** – In most cases, exterior and interior noise exposure at sensitive receptors along Glacier Highway and Egan Drive with Alternatives 2B, 3, and 4A through 4D would be the same as estimated for Alternative 1 – No Action (Table 4-79). As Table 4-79 shows, two additional sensitive receptors would receive exterior peak-hour traffic noise at or above 65 dBA with Alternative 2B relative to Alternative 1 – No Action. Interior peak-hour noise levels would be at or above 50 dBA at 7 additional sensitive receptors with Alternative 2B (Table 4-79) relative to Alternative 1 – No Action. With Alternative 3, one more receptor would receive exterior peak-hour traffic noise at or above 65 dBA and five more receptors would receive interior peak-hour noise levels at or above 50 dBA when compared to Alternative 1 – No Action (Table 4-79). With Alternatives 4A, 4B, and 4D, one more receptor would receive exterior peak-hour traffic noise at or above 65 dBA and five more receptors would receive interior peak-hour noise levels at or

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[72] With the exception of Alternative 1B, which would have impacts similar to Alternative 1 – No Action.

[73] NAC noise levels in this discussion refer to the NAC that were in effect at the time the 2006 Final EIS was issued.

above 50 dBA (Table 4-79) relative to Alternative 1 – No Action. For Alternative 4C, the only difference from Alternative 1 – No Action would be that one more receptor would receive interior peak-hour noise levels at or above 50 dBA (Table 4-79).

Alternative 2B would increase peak hour noise at the Adlersheim Wilderness Lodge near Yankee Cove by 8 dBA. Current (2002) peak hour noise at the lodge is estimated to be 51 dBA. Peak hour noise in 2038 with Alternative 2B would be 59 dBA.

***Haines*** **–** Project alternatives would result in increased traffic on Mud Bay Road or on Lutak Road and in downtown Haines on Front and Main streets. Modeling indicates that this increased summer traffic in 2038 would increase noise levels in Haines by 2 to 7 dBA for Alternatives 2B and 3, and 1 to 4 dBA for Alternatives 4A through 4D relative to existing conditions. These noise increases would result in peak exterior traffic noise levels in Haines of 65 dBA within 35 feet of the highway centerline in 2038. No sensitive receptors would be impacted by this noise.

***Skagway*** **–** Traffic associated with Alternatives 2B, 3, and 4A through 4D would enter and leave Skagway via ferry the same as traffic currently traveling between Juneau and Skagway. Alternative 2B would result in the largest increase in summer traffic in Skagway among these alternatives with an estimated peak-hour increase over Alternative 1 – No Action of about 55 vehicles in 2038. This would increase peak-hour traffic noise at sensitive receptors along State Street in Skagway by about 1 to 2 dBA over Alternative 1 – No Action and 3 to 4 dBA relative to existing conditions. No sensitive receptors would receive traffic noise at a level equal to or greater than 65 dBA with this alternative. Alternatives 3 and 4A through 4D would result in traffic volumes somewhat lower than Alternative 2B and would therefore increase peak-hour traffic noise by 1 dBA or less. A 1-dBA increase in noise would not be perceptible to the average human ear.

### 4.7.8 Traffic

The traffic forecast information presented in this section for each of the alternatives is from the *Traffic Forecast Report* (see Revised Appendix AA, *Traffic Forecast Report*). The 2015 traffic data representing existing conditions is from DOT&PF's *2015 Annual Average Daily Traffic (AADT) GIS Map* (DOT&PF, 2011e–l) supplemented by information from the 2010 *Southeast Traffic and Safety Report* (DOT&PF, 2013a).

#### 4.7.8.1 Alternative 1 – No Action

**Juneau –** The recorded 2015 traffic on Glacier Highway ranged from 7,515 annual ADT near the Auke Bay Ferry Terminal to 14,698 annual ADT near the junction with Egan Drive at the Mendenhall River bridge. The 2015 traffic on Egan Drive from the bridge to downtown ranged from a high of 29,122 annual ADT near JIA to 13,267 annual ADT at Main Street. Downtown streets ranged from a high of 8,750 annual ADT on Main Street to 502 annual ADT on the upper part of Gold Street. The 2015 estimated annual ADT for vehicles traveling in Lynn Canal (i.e., between Juneau and Haines or Juneau and Skagway) was 60, which is a very small compared with the amount of the traffic on any Juneau roads. Alternative 1 – No Action annual ADT in Lynn Canal is expected to change at approximately the same rate as local traffic. Local traffic is expected to remain unchanged during the 30-year study period because of relatively flat population projections in southeast Alaska (see Revised Appendix AA, *Traffic Forecast Report*). Therefore, the projected Alternative 1 – No Action annual ADT of 80 in 2025 through 2055 would continue to be a very small component of the total amount of traffic on any road in Juneau, and is anticipated to have very little impact on traffic in Juneau.

Note: Summer (May through September) ADT counts in Lynn Canal are approximately 1.55 times higher than the annual ADT for Lynn Canal, whereas traffic counts in Juneau show less of a difference between summer and annual ADT. In 2010[74], summer ADT counts ranged from 5 to 16 percent higher than annual ADT. Based on these traffic statistics, Lynn Canal traffic has little impact on traffic in Juneau. The downtown business district of Juneau has greater activity during the summer cruise ship season and Glacier Highway near Echo Cove is used most heavily during the summer; therefore, these Juneau roads are more likely to see a higher increase in summer traffic.

**Haines** – The recorded 2015 traffic on Lutak Road from the ferry terminal to 2nd Avenue ranged from 539 to 978 annual ADT. Traffic on Main Street ranged from 876 to 1,250 annual ADT. Traffic on the Haines Highway from Union Street to the Canadian border ranged from 1,230 to 132 annual ADT. The Haines portion of the 2015 estimated annual ADT for vehicles traveling in Lynn Canal was approximately 50. The only road segment that may have been appreciably affected by this traffic was the Haines Highway near the Canadian border. Population and local traffic in Haines are predicted to remain relatively the same over the 30-year forecast period. The Haines portion of the projected Alternative 1 – No Action 2025 and 2055 annual ADT of 80 would be 50. Alternative 1 – No Action would have very little effect on traffic in Haines.

Note: Summer ADT counts at the permanent traffic recorder at 5 Mile on the Haines Highway are approximately 23 percent higher than annual ADT counts. Therefore, Lynn Canal traffic (traffic moving between Juneau and Haines or Skagway), has a somewhat greater impact on summer ADT than annual ADT. Because of the low volumes overall, the contribution of this traffic to overall traffic levels is small regardless of season.

**Skagway** – The recorded 2015 traffic on State Street ranged from 1,063 annual ADT near 1st Avenue to 1,496 annual ADT near 9th Avenue. The traffic on Broadway Street ranged from 802 to 956 annual ADT. Traffic on the Klondike Highway ranged from 1,035 annual ADT near the Skagway River bridge to 376 annual ADT near the Canadian border. The Skagway portion of the 2015 estimated annual ADT in Lynn Canal was approximately 30. Regardless of which roads in Skagway these travelers used, no road segment in Skagway was appreciably affected by Lynn Canal traffic. The Skagway portion of the projected Alternative 1 – No Action 2025 annual ADT would be 30 and would remain the same in 2055 so it would have very little effect on Skagway traffic.

Note: The summer ADT counts at the permanent traffic recorder on the Klondike Highway just past Dyea Road are 57 percent higher than the annual ADT counts. This is an indication that overall traffic in Skagway is nearly as seasonally affected as Lynn Canal traffic. Therefore, traffic impacts from Lynn Canal traffic relative to total traffic would be the same regardless of the season considered and would have very little effect.

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[74] The most recent year for which summer ADT counts are available is 2010.

#### 4.7.8.2 Alternative 1B

**Juneau –** Traffic projections for Alternative 1B reflect a 2025 and 2055 annual ADT of 135 in Lynn Canal. These traffic volumes are a small increase over the projected Alternative 1 – No Action volumes and would have very little effect on overall traffic volumes on Juneau streets.

**Haines –** Traffic projections for Alternative 1B reflect a 2025 and 2055 annual ADT between Juneau and Haines of 70. These traffic volumes are a small increase over the projected Alternative 1 – No Action volumes and would have very little effect on overall traffic volumes on Haines streets.

**Skagway –** Traffic projections between Juneau and Skagway for Alternative 1B in 2025 and 2055 are 65 annual ADT for both years. These traffic volumes represent a very small increase over Alternative 1 – No Action traffic and would have very little effect on overall traffic conditions in Skagway.

#### 4.7.8.3 Alternative 2B

**Juneau –** Traffic projections for Alternative 2B are 810 annual ADT on the East Lynn Canal Highway in the first year after construction is completed, with an annual ADT of 820 at the end of the 30-year forecast period. Nearly all of this traffic would use the existing Glacier Highway from Echo Cove to Lena Loop, the first residential area of any size. With existing traffic on Echo Cove estimated at 129 annual ADT for 2015 and an additional approximately 290 annual ADT from vehicles that may use the highway only to access Berners Bay, the additional traffic near Echo Cove could grow to 1,240 ADT. This is a substantial increase from the 2015 annual ADT of 129, but it is still low for a two-lane highway.

Approximately 45 percent of the forecasted Lynn Canal traffic under Alternative 2B is attributed to Juneau residents traveling to and from Juneau. This amount of increased traffic would not noticeably impact downtown (commercial district) streets, as most Juneau residents would not pass through the downtown area on trips to and from Haines or Skagway. Downtown traffic would be affected by somewhat less than half of the Alternative 2B traffic, as some of the travelers who do not live in Juneau would be destined for the Auke Bay Ferry Terminal or airport. Under Alternative 2B, traffic on downtown streets would go up by as much as 275 annual ADT if half of all non-Juneau resident travelers used the downtown area once on each trip to Juneau. This would have little effect on traffic conditions in the downtown area.

The 2001 CBJ *Area Wide Transportation Plan* identifies several future transportation problems in the Juneau downtown area, including an inadequate transition from four lanes to two on Egan Drive at Main Street, narrow lanes and inadequate sidewalks on some streets, inadequate parking, and traffic flow/circulation problems created by truck deliveries (CBJ, 2001). The 2001 CBJ *Area Wide Transportation Plan* is the most recent transportation plan for the CBJ.

Suggested remedies include constructing parking structures or lots outside the downtown area with frequent shuttles, expanding sidewalks, and creating seasonal auto-restricted zones on key downtown segments. The city has taken measures to increase parking capacity and enforce stricter parking regulations, such as those outlined in the *Juneau Downtown Parking Management Plan* (CBJ, 2010b), and the *Willoughby District Land Use Plan* (CBJ, 2012b). Although all of these transportation problems will occur regardless of Lynn Canal traffic, Alternative 2B would increase the number of summer vehicles and would therefore exacerbate the problem. For instance, traffic on Main Street is estimated to rise by approximately 2 percent, and the additional vehicles, particularly RVs, would increase the parking problem.

**Haines –** Under Alternative 2B, traffic to and from Haines on the Katzehin shuttle is forecast to be 420 annual ADT in 2055. With population and traffic expected to remain relatively flat, annual ADT on the shuttle by the end of the 30-year forecast period would be 455. Virtually all of this traffic would use Lutak Road; traffic increases on other Haines roads and the Haines Highway would be somewhat less. Traffic on Lutak Road near the ferry terminal would have little impact on traffic levels, increasing to as much as approximately 960 annual ADT in 2055. For downtown streets, a forecasted increase of 420 annual ADT over Alternative 1 – No Action traffic would not be a substantial increase. Even if all Lynn Canal travelers entered the Main Street area, the combined volumes of existing traffic and Alternative 2B traffic would be easily accommodated by existing facilities. The Haines Highway would see the biggest relative increase in traffic volumes. Near the Canadian border, traffic under Alternative 1 – No Action would be approximately 145 annual ADT. If half of the forecasted 420 additional annual ADT arriving at the Lutak terminal under Alternative 2B traveled to the border, traffic volumes would increase to approximately 355 annual ADT. This volume can be accommodated by the existing road and should have very little impact on overall traffic levels.

**Skagway –**In 2025, traffic in Skagway with Alternative 2B is forecasted to be 360 annual ADT. With population and traffic expected to remain relatively flat, annual ADT by the end of the 30-year forecast period would be 365. This forecast represents a 330 annual ADT increase over the projected traffic for Alternative 1 – No Action. Most of the Alternative 2B traffic would use State Street, creating a 24 to 34 percent increase in traffic (to approximately 1,425 annual ADT near 1st Avenue and 1,850 annual ADT near 9th Avenue) on this through street relative to Alternative 1 – No Action. Much of the additional traffic would travel on the Klondike Highway; Juneau residents taking additional trips to and from the Yukon would use the highway to the Canadian border. An additional 365 annual ADT would more than double the traffic near the border compared to the 2055 Alternative 1 – No Action traffic projection of 390 annual ADT. While this would be a substantial percentage increase, traffic volumes of 755 annual ADT are still very low for a two-lane highway.

Currently, traffic congestion on streets in the Skagway Unit of the Klondike Gold Rush National Historical Park presents a concern for visitors during the summer, as high numbers of pedestrians are in this area during cruise ship visits. In 2015, Broadway Street, the center street in the park unit, had traffic volumes almost as high as those of State Street, but also had a high volume of pedestrians and fully utilized on-street parking during days when multiple ships were in port. Both the Municipality of Skagway Borough and the National Park Service have expressed concern over increased traffic. The forecasted 2055 Alternative 2B traffic increase of 365 annual ADT would add 45 percent more traffic to Broadway in the Skagway unit of Klondike Gold Rush National Historic Park, if all of this traffic entered the park unit rather than staying on State Street. Given that approximately half of the projected traffic would be Juneau residents making multiple trips per year to and from Juneau, it is very unlikely that these travelers would use Broadway Street on both legs of every trip. Many of these trips would not have Skagway as the end destination, and Juneau residents are likely to be aware of the crowded conditions on Broadway Street during the summer. While Alternative 2B traffic is unlikely to be a major contributor of summer traffic-related problems in the Skagway park unit, it would contribute additional traffic and may hasten the need to take steps to limit vehicles on Broadway Street during the summer.

#### 4.7.8.4 Alternative 3

**Juneau –** Traffic projections for Alternative 3 in 2025 and 2055 are 655 annual ADT. With existing traffic on Echo Cove estimated at 129 annual ADT for 2015 and an additional approximately 230 annual ADT from vehicles that may use the highway only to access Berners Bay, the additional traffic near Echo Cove could grow to 1,015 ADT. This is a substantial increase from the 2015 annual ADT of 129, but it is still low for a two-lane highway.

Overall impact to downtown Juneau traffic would not be appreciable, considering the high local traffic volumes relative to Lynn Canal traffic. Most of the traffic in the downtown area would be local traffic, not traffic traveling between Juneau and Haines or Juneau and Skagway. Alternative 3 would add to the summer traffic in the downtown area. In 2055, if half of non-Juneau resident travelers used the downtown area once during each trip to Juneau, traffic would go up as much as 350 annual ADT; however, this would have little effect on traffic conditions in the downtown area.

**Haines –** Under Alternative 3, all traffic in Lynn Canal would pass through Haines, and virtually all of that traffic would use Mud Bay Road to get to the core area of Haines, the Haines Highway, or the ferry terminal on Lutak Road. In 2015, traffic on Mud Bay Road where Alternative 3 would intersect it was 530 annual ADT. Alternative 3 is forecasted to have an annual ADT of 655 coming onto Mud Bay Road (for a total of 1,185) from a bridge across the Chilkat Inlet, more than doubling traffic on this road segment in relation to Alternative 1 – No Action. Mud Bay Road is a 35-mph road with 11-foot driving lanes and 4-foot paved shoulders. This road can easily accommodate the increase in traffic that would occur under Alternative 3.

Closer to the main part of town, Mud Bay Road and the Old Haines Highway had much higher traffic volumes in 2015, ranging from 280 to 1,076 annual ADT. Some of the Alternative 3 traffic would use the Haines Highway, some would frequent the downtown area of Haines, and travelers heading to or from Skagway would use Lutak Road to the ferry terminal. The Alternative 3 traffic would be a relatively small component on most of the possible routes that traffic could take. The traffic to and from Skagway is projected to be 245 annual ADT during the 30-year forecast period. This traffic would raise Alternative 1 – No Action projected traffic on Lutak Road of approximately 545 annual ADT by approximately 45 percent, to 790 annual ADT. Alternative 1 – No Action projected traffic on the Haines Highway is approximately 1,236 annual ADT close to town and 138 annual ADT near the Canadian border. If all of the forecasted Alternative 3 traffic from other than Haines residents and travelers of the Skagway component travels on the Haines Highway, the Haines Highway would have an additional 230 annual ADT throughout its length. The Haines Highway and roads in the Haines area can accommodate the increase in traffic volume, so very little impact on overall traffic levels is expected.

**Skagway –**Under Alternative 3, traffic between Juneau and Skagway is forecasted to be approximately 245 annual ADT in 2025 and 2055. The projected traffic is approximately 215 annual ADT more than under Alternative 1 – No Action. Juneau residents would represent about half of the traffic volume, with Skagway and Yukon residents representing the majority of the remainder. Some but not all of this traffic would enter the Skagway Unit of the National Historic Landmark on Broadway Street, contributing to the pedestrian-vehicle traffic problems during the summer tourist season.

#### 4.7.8.5 Alternatives 4A and 4C

**Juneau** – Alternatives 4A and 4C would have small traffic impacts in Juneau. The traffic projections in Lynn Canal for 2025 and 2055 are 145 annual ADT under Alternative 4A and 95 annual ADT under Alternative 4C. This represents an increase of 65 and 15 annual ADT, respectively, over the 80 annual ADT of Alternative 1 – No Action. These traffic volumes are very low, particularly in comparison to the existing and projected local traffic on all roads that could be affected other than Glacier Highway near Echo Cove. There would be no noticeable impact on local traffic conditions in Juneau.

**Haines** – Alternatives 4A and 4C would have 2025 annual ADTs to and from Haines of 80 and 50, respectively. This traffic is projected to remain the same in 2055 for Alternative 4A and increase to 55 for Alternative 4C. These traffic volumes are a small increase over Alternative 1 – No Action volumes and would have very little effect on overall traffic volumes on the Haines streets.

**Skagway** – Alternatives 4A and 4C traffic volumes to and from Skagway would be 60 and 40 annual ADT, respectively, in 2025. In 2055, the volume would increase to 65 for Alternative 4A, while the Alternative 4C traffic is projected to remain at 40 annual ADT. These traffic volumes represent a very small increase over the modeled Alternative 1 – No Action traffic and would have very little effect on overall traffic conditions in Skagway.

#### 4.7.8.6 Alternatives 4B and 4D

**Juneau** – Alternatives 4B and 4D would have small traffic impacts in Juneau. The traffic projections in Lynn Canal for 2025 and 2055 are 240 annual ADT under Alternative 4B and 225 under Alternative 4D. These volumes are each more than double the 80 annual ADT of Alternative 1 – No Action. These traffic volumes are still very low, particularly in comparison to the existing and projected local traffic on all roads that could be affected other than Glacier Highway near Echo Cove. There would be no noticeable impact on local traffic conditions in Juneau.

**Haines** – Alternatives 4B and 4D would have 2025 annual ADTs to and from Haines of 125 and 120, respectively, in 2025. This traffic is projected to increase to 130 and 125, respectively, in 2055. These traffic volumes are a small increase over Alternative 1 – No Action volumes and would have very little effect on overall traffic volumes on Haines streets.

**Skagway** – Alternatives 4B and 4D traffic volumes to and from Skagway would be 105 and 95 annual ADT, respectively, in 2025. This traffic is projected to increase to 110 and 100, respectively, in 2055. These traffic volumes represent a very small increase over the modeled Alternative 1 – No Action traffic and would have very little effect on overall traffic conditions in Skagway.

### 4.7.9 Climate Change

There is consensus among the scientific community that the earth's climate is changing, that the change will accelerate, and that human greenhouse gas (GHG) emissions (primarily carbon dioxide [$CO_2$] emissions) are the main source of this accelerated change in climate. Climate change impacts can come in a variety of forms, from rises in sea level to an increased frequency of severe weather events. The 2010 climate change assessment for the Alaska Region (Haufler et al., 2010) contains a summary of potential impacts in southern Alaska, which include, but are not limited to: changes to sea levels, increased ocean temperatures, increased ocean acidification, loss of glaciers, and changes to stream flows and wetlands.

The 2016 *Tongass Land and Resource Management Plan, Final EIS* (USFS, 2016b, p. 3-11) discusses in detail the current conditions of the project area and the baseline anticipated changes associated with climate change. This Final SEIS analysis tiers off that discussion.

Due to the fact that Alaska is the most northerly located state, it has warmed more than twice the rate of the rest of the United States (Haufler et al., 2010); therefore, climate change impacts are much more noticeable in Alaska than in other regions of the United States. Primary threats associated with climate change include, but are not limited to: changes to sea levels, increased storm intensities, warming ocean and stream temperatures, increased retreat of glaciers, changing precipitation amounts and patterns, and changing fire regimes. Of these threats, the ones most likely to affect the JAI Project would be changes in sea level and increased storm intensity. Although changes in sea level, if great enough, could inundate low-lying human developments, "it has not been identified as a major concern in the coastal areas of southern Alaska" (Haufler et al., 2010) and is therefore not anticipated to affect project facilities (docks or roads) constructed near the shoreline. This is particularly the case in Juneau where it is projected that the relative sea-level will actually decrease between 1.0 and 3.6 feet as a result of loss of glacial ice and the resulting uplift (USFS, 2016b, p. 3-12). There is a potential that increased storm intensity could reduce access to Juneau by limiting ferry trips and causing delays due to rough sea conditions; reducing the usability of roads, as increases in windthrow could result in woody debris impeding traffic; and damaging docks through coastline battery from waves and wind; however, it is projected that impacts of this nature would not be great in the project area (Haufler et al., 2010). Current design practices address the potential impacts to infrastructure resulting from changing climate and increases in storm intensity.

An inventory of Alaska's GHG emissions found that 35 percent of all GHG emissions were from the transportation sector (Center for Climate Strategies, 2007). Other contributors include industrial activities and the fossil fuel industry (50 percent), residential and commercial fuel use (8 percent), electricity (6 percent), and waste and agriculture (1 percent). Although there is no inventory of local GHG emissions for the project area, it is likely that its sources mirror those of the State, with transportation and industrial activities being the primary contributors to total GHG emissions in the area.

The effects of GHG emissions from any source are not localized or regional due to their rapid dispersion into the global atmosphere. Even with quantification of GHG emissions, the effect on global climate change by any individual project is uncertain—it is not possible or practical to pose a meaningful quantitative link between a project's action and global climate change (USFS, 2009). However, it is clear that, worldwide, the individually small emissions of activities and projects contribute to global impacts of climate change. This would include the emissions of

Alternative 1 – No Action for this project and, to a greater degree, the emissions of any build alternative, as further discussed below.

Carbon capture and sequestration is the uptake and storage of carbon emissions (Pew, 2005). Forests play a significant part in the global carbon cycle by removing GHG emissions that contribute to climate change. Decreasing the amount of trees can potentially increase the accumulation of atmospheric carbon (Gorte, 2009). Changes in land use activities and permanent removal of forests during activities such as road construction could impact carbon sequestration. Build alternatives that require the construction of a road would create loss of carbon capture, as it requires the removal of trees to develop road corridors. Because increases in vehicle and ferry emissions, particularly $CO_2$, generated under the future traffic conditions associated with the proposed JAI Project alternatives would contribute to GHGs in the atmosphere, they are quantified here to demonstrate their overall impact on climate change.

Future $CO_2$ emissions for the JAI Project are difficult to estimate precisely because a wide variety of factors could influence $CO_2$ emissions. Some of these factors include government regulations, price and availability of fuel and alternative energy sources, and vehicle technology such as electric hybrid or fuel cell vehicles. The 2016 TLRMP Final EIS (USFS, 2016b, p. 3-11) discusses in detail the current conditions of the project area and the baseline anticipated changes associated with climate change.

To assess GHG, emissions for the JAI Project and its potential contribution to climate change, DOT&PF analysts considered the traffic projections and estimates of fuel consumption associated with ferries and vehicles for each alternative. Table 4-77 presents the energy use projections based on traffic projections and ferry operations for each alternative. Annual vehicle GHG emissions were calculated by multiplying the quantity of fuel used with each alternative by the amount of GHG produced from the combustion of one gallon of gasoline, which is the equivalent of 8.92 × 10-3 metric tons of $CO_2$/gallon of gasoline (EPA, 2013). Annual ferry GHG emissions were calculated using emissions factors and forecasted transit and engine idling times. See the *2017 Update to Appendix T – Air Quality Modeling Memorandum, Attachment 1* (in Appendix Z) for more detail.

Table 4-80 provides the calculated $CO_2$ emissions associated with travel in Lynn Canal for each alternative for a 1-year period: 2055. The emissions estimates are based on several assumptions, which are explained in the table notes. The emissions from any project alternative would be negligible when compared with current and projected State and global emissions.

**Table 4-80:**
**Estimated GHG Emissions by Alternative (2055)**

| Alternative | GHG Emissions from Vehicles ($MTCO_2e$) | GHG Emissions from Ferries ($MTCO_2e$) | Total GHG Emissions ($MTCO_2e$) |
|---|---:|---:|---:|
| 1 – No Action | 52 | 4,225 | 4,277 |
| 1B | 88 | 8,053 | 8,141 |
| 2B | 9,816 | 20,784 | 30,601 |
| 3 | 7,455 | 23,740 | 31,195 |

| Alternative | GHG Emissions from Vehicles ($MTCO_2e$) | GHG Emissions from Ferries ($MTCO_2e$) | Total GHG Emissions ($MTCO_2e$) |
|---|---|---|---|
| 4A | 95 | 28,425 | 28,520 |
| 4B | 1,959 | 25,346 | 27,305 |
| 4C | 62 | 7,699 | 7,761 |
| 4D | 1,791 | 9,818 | 11,609 |

Notes:

In addition to $CO_2$, gasoline contains other GHGs, including methane and nitrous oxide. The ratio of $CO_2$ emissions to total GHG emissions was assumed to be 0.977, according to EPA guidelines (2009).

GHG Units: metric tons of carbon dioxide equivalent ($MTCO_2e$)

The ADT for each alternative is based on information in the *Traffic Forecast Report* prepared for the JAI Project (see Revised Appendix AA, *Traffic Forecast Report*) and incorporated into the energy use calculations in Section 4.7.6.

The ferry alternatives do not account for vehicles idling on board the ferry because vehicles are assumed to be turned off during transit. Emissions by vehicles idling while waiting at the ferry terminal also are not included.

Vehicle fuel consumption assumes uniform fleet average efficiency of 21.4 miles per gallon (mpg; Source: USDOT, 2017).

Annual vehicle GHG emissions were calculated by multiplying the quantity of fuel used with each alternative by the amount of GHG produced from the combustion of one gallon of gasoline, which is the equivalent of 8.92 × 10-3 metric tons of $CO_2$/gallon of gasoline (EPA, 2013).

Annual ferry GHG emissions were calculated using emissions factors and forecasted transit and engine idling times. See the *2017 Update to Appendix T – Air Quality Modeling Memorandum,* Attachment 1 (in Appendix Z) for more detail.

## 4.8 Construction Impacts

Construction impacts are largely associated with the alternatives that involve new roadway construction: Alternatives 2B, 3, 4B, and 4D. Construction of these alternatives would require a temporary facilities, such as staging areas and possible construction camps. The specific locations and sizes of these temporary facilities would be determined by the construction contractors. These sites would be small relative to the area of clearing required for project facilities themselves and, to the extent possible, would be located within the final footprint of the project. Permanent construction-related facilities, such as borrow sites (e.g., “gravel pits”) and disposal sites for excess material, would be located within the highway ROW unless there were no other reasonable alternative. If a borrow source were needed on USFS land, DOT&PF would seek a special use permit, and understands that it would require a USFS Interdisciplinary Team process. Any such permanent need would be identified as part of the final design process.

Alternatives 1 and 1B would not require any road construction or ferry terminal modifications. There would be no construction impacts from Alternatives 1 and 1B; therefore, they are not addressed in this section.

### 4.8.1 Land Use

Construction of many of the proposed project alternatives may require establishment of at least one temporary construction camp and a number of temporary materials staging areas. For Alternative 2B, it is likely that one construction camp would be set up at Comet Landing, outside of the required ROW for the project, and one camp at the Katzehin Ferry Terminal site, potentially located on the ROW acquired for the project. For Alternative 3, a camp is likely at William Henry Bay at the proposed ferry terminal site. As with the Katzehin site, this camp could be on the ROW for the project. For Alternatives 4B and 4D, a construction staging area would be likely at the Sawmill Cove Ferry Terminal site. The number and location of other sites would depend on the contractor’s work plans/schedule and sequencing of work areas in concert with approval by DOT&PF. In the event that temporary construction camps and/or staging areas are needed outside of the permanent ROW for proposed project facilities, it would be necessary to obtain a use permit from the USFS for sites located on Tongass National Forest land, and a lease for sites on private or local government land. These requirements would apply for any material source sites or sites required for setting up rock crushers or other material processing equipment.

### 4.8.2 Visual Resources

Viewers from boats or ferries on Lynn Canal would see construction activities where they are not screened by vegetation and fugitive dust created during ROW clearing, grading, and blasting. These activities would contrast with the natural landscape and may dominate some viewsheds for a short period.

### 4.8.3 Historical and Archaeological Resources

No known National Register-eligible archaeological resources are present within the construction limits of any project alternative. The Jualin Mine Tram and the Comet/Bear/Kensington Railroad are known eligible historic resources on the alignment for Alternative 2B, and the Dalton Trail is the only known eligible historic resource on the alignment for Alternative 3. The boundaries of these historic properties would be flagged in the field to ensure that equipment operators do not inadvertently damage these resources. In the event a previously unknown cultural resource is discovered during construction, work in the vicinity of the site would cease until DOT&PF has evaluated the site, FHWA has determined its eligibility for the NRHP, and, if the site is determined to be eligible, DOT&PF, FHWA, and the SHPO have agreed to a plan to avoid or mitigate adverse impacts. If the site is determined to contain human remains subject to the provisions of the Native American Graves Protection and Repatriation Act, the appropriate tribal consultation would be conducted.

### 4.8.4 Socioeconomic Resources

Table 4-81 lists the estimated construction costs for all project alternatives and the corresponding annual labor employment required to construct each alternative. Labor employment was derived from the estimated construction cost. In major construction projects of this nature, labor constitutes from one-third to one-half of the total project cost. The total labor cost was calculated assuming it would be 45 percent of construction costs. Total labor cost was broken down into annual labor cost; construction was assumed to take approximately 6 years. Based on 2015 Quarterly Census of Employment Wages from ADOLWD, the total annual salary for highway, street, and bridge construction workers in Alaska was approximately $108,500 (ADOLWD, 2016). Total labor cost includes this annual salary plus 20 percent for benefits and other labor-related overhead, or approximately $130,200 per annual-equivalent job. The estimate of annual labor employment was determined by dividing this annual-equivalent job cost into the total estimated annual labor cost.

**Table 4-81:**
**Project Construction Phase Employment Impacts**

| Alternative | Construction Cost ($million) | Estimated Annual Employment (people) |
|---|---|---|
| 1 – No Action | 0.0 | 0.0 |
| 1B | 0.0 | 0.0 |
| 2B | 655.5 | 378 |
| 3 | 541.9 | 312 |
| 4A | 44.1 | 76 |
| 4B | 76.0 | 131 |
| 4C | 53.7 | 93 |
| 4D | 85.6 | 148 |

Note: Construction costs include only highway and ferry terminal costs; vessel construction is not included. Estimates are based on a 6-year construction period for Alternatives 2B and 3, and a 2-year construction period for Alternatives 4A through 4D.

In 2011, there were 11 firms designated as heavy construction employers in the Juneau-Haines-Skagway area with average annual employment of 135 workers (Rasmussen, personal communication 2013).

As indicated by the cost of construction and the related employment in Table 4-81, Alternatives 2B and 3 include substantially greater construction effort than the ferry alternatives, and that effort is assumed to stretch over 6 years. It is likely that the existing local workforce would not have the capacity to undertake the project without substantial labor from outside the Lynn Canal area; therefore, in the following discussion of the alternatives, additional calculations were performed to estimate the influx of construction workers from outside the region. Alternatives 4B and 4D construction may require a few workers from outside the region, but the duration is assumed to be relatively short (2 years), and it is unlikely any of the ferry alternatives would substantially alter the workforce and population of the Lynn Canal communities.

#### 4.8.4.1 Alternative 2B

As indicated in Table 4-81, construction of Alternative 2B would employ approximately 378 people per year. It is unlikely that the Juneau/Haines/Skagway region would have enough qualified workers for this construction project; therefore, workers would be needed from other areas in the state and elsewhere to construct any of these alternatives.

As the region’s commercial and population center, Juneau would receive the largest construction-related impacts under Alternative 2B. Haines and Skagway would not experience appreciable socioeconomic impacts from the alternative because they are not located on the highway alignment for this alternative. Some construction work would occur at the ferry terminals in Haines and Skagway, and local construction contractors and labor could be used for that. Skagway would have minor construction-related impacts associated with ferry terminal modifications.

It is likely that the highway and new Katzehin ferry terminal construction effort would involve construction camps. Relying on available housing in Juneau would mean long daily commutes to the construction site. Camp locations are likely at Katzehin and Comet.

The location of the major workforce concentration is important in terms of where construction-related socioeconomic impacts would occur. Regardless of location, the types of impacts that could occur include:

- Increased sales with construction equipment, rental, and repair companies
- Increased sales with food wholesalers and other businesses providing goods and services to the construction camp(s)
- Increased sales for fuel distributors
- Increased sales to businesses providing goods and services to construction workers and dependents
- Increased sales tax revenues
- Increased demand for rental and other housing
- Increased enrollment in local schools
- Increased demands on other public services such as law enforcement, fire and emergency services and health care services

The total direct and indirect construction employment and population effects of Alternative 2B would depend on the factors outlined above. The estimates of total annual employment and payroll associated with Alternative 2B construction provided in Table 4-82 are high-case estimates because indirect impacts (those associated with business spending on goods and services in support of the construction project) and induced impacts (those associated with construction workers spending their payroll) develop over time and are generally lower for short-term projects such as construction of this alternative.

**Table 4-82:**
**Construction Phase Direct and Total Employment and Payroll Effects for Alternative 2B**

| Estimated Annual Direct Employment (people) | Estimated Annual Direct Payroll ($million) | Estimated Annual Total Construction-Related Employment (people) | Estimated Annual Total Construction-Related Payroll ($million) |
|---|---|---|---|
| 378 | 41.0 | 529 | 49.2 |

Note: Estimates are based on a 6-year construction period.

Table 4-83 provides an estimate of construction-related population increases, total new housing demand, and additional school-age population projections for Alternative 2B. These estimates are based on the assumption that half of the total construction-related labor force would seek some form of housing in Juneau, including construction workers relocating to Juneau. In addition, it is assumed that 75 percent of construction workers relocating to Juneau would bring dependents, family size would average 3.1 persons, and 20 percent of the dependent population would be school age. It is also assumed that workers seeking housing in Juneau who do not have dependents would seek shared housing with other construction workers at two people per housing unit. If workers with and without dependents are considered in estimating total construction-related housing, 165 units would be needed.

**Table 4-83:**
**Construction Phase Maximum Potential Population-Related Effects for Alternative 2B**

| Total Construction-Related Population Increase (people) | Total Construction-Related Housing Demand (No. of Units) | Additional Construction-Related School Age Population (children) |
|---|---|---|
| 486 | 165 | 88 |

Note: Estimates are based on a 6-year construction period.

The estimates of increases to population and housing are based on the assumption that 50 percent of the construction jobs for Alternative 2B would be filled by workers who are not residents of Juneau. In addition, it is assumed that approximately three-quarters of the construction workers relocating to Juneau would bring dependents, family size would average 3.1 persons, and 20 percent of any given household would be of school age. These assumptions are reflected in Table 4-83Table 4-83. Juneau had approximately 646 vacant housing units in 2011. Although the construction-related housing demand associated with Alternative 2B is less than existing vacancies, some additional housing development would probably occur in anticipation of increased demand.

The effect on the school district of additional school-age residents would depend on the age and geographic distribution of the construction-related population. Total public school enrollment in Juneau has been declining over the past 5 years; therefore, the infrastructure is in place to serve the additional anticipated enrollment. Additional enrollment would also result in increased State funding, which is based in part on enrollment.

#### 4.8.4.2 Alternative 3

Construction of Alternative 3 is estimated to cost approximately $542 million. This alternative would create approximately 312 construction jobs, which is less than the construction workforce estimated for Alternative 2B. Other economic impacts for Alternative 3 in terms of annual total employment and payroll, construction-related population increase, new housing demand, and additional school-age population are shown in Table 4-84 and Table 4-85.

**Table 4-84:**
**Construction Phase Direct and Total Employment and Payroll Effects for Alternative 3**

| Estimated Annual Direct Employment (people) | Estimated Annual Direct Payroll ($million) | Estimated Annual Total Construction-Related Employment (people) | Estimated Annual Total Construction-Related Payroll ($million) |
|---|---|---|---|
| 312 | 33.9 | 437 | 40.6 |

Note: Estimates are based on a 6-year construction period.

Construction-phase impacts related to the West Lynn Canal Highway differ from an East Lynn Canal Highway in that Haines could potentially be substantially affected. Alternative 3 construction effort would likely be camp-supported, and Haines would likely play a role in staging and provision of goods and services. Potential socioeconomic effects in Haines from Alternative 3 could be similar to those estimated for Juneau under Alternative 2B depending on how many workers are housed in a camp as opposed to living in Haines.

The estimates of increases to population and housing are based on the assumption that 75 percent of the construction jobs for Alternative 3 would be filled by workers who are not residents of

Haines. In addition, it is assumed that about half of construction workers relocating to Haines would bring dependents, family size would average 3.1 persons, and 20 percent of any given household would be of school age. Taking these assumptions under consideration, it is estimated that Alternative 3 could result in a total construction-related population increase of approximately 516 residents, including those residing in a local construction camp, and an increase of 80 additional school-age children. That would represent a temporary 21 percent increase in the population of Haines (the population estimate for Haines in 2015 was 2,493). It is also assumed that workers seeking housing in Haines who do not have dependents would seek shared housing with other construction workers at two people per housing unit. If workers with and without dependents are considered in estimating total construction-related housing, 187 units would be needed. An estimate of these increases is shown in Table 4-85.

**Table 4-85:**
**Construction Phase Maximum Potential Population-Related Effects for Alternative 3**

| Total Construction-Related Population Increase (people) | Total Construction-Related Housing Demand (no. of units) | Additional Construction-Related School-Age Population (children) |
|---|---|---|
| 516 | 187 | 80 |

Note: Estimates are based on a 6-year construction period.

There are approximately 480 vacant housing units in Haines, of which about 137 may be available for year-round rental. As many as approximately 187 additional housing units could be required in Haines, depending on how many workers may be based in construction camps. This estimate is more than the reported year-round number of units available; some additional housing units would probably be constructed in anticipation of increased demand.

The estimated construction-related population increase under Alternative 3 would increase public school enrollment by approximately 80 new students in all grades. Physical facilities in the Haines school district are adequate to meet this demand; however, depending on the distribution of students among grades, it may be necessary to hire one or more teachers.

#### 4.8.4.3 Alternatives 4A through 4D

The only in-state construction expenditures associated with Alternatives 4A and 4C would be minor reconfiguration of the Auke Bay Ferry Terminal, requiring about 76 and 93 workers, respectively. This construction would have no appreciable effect on the Juneau economy. Construction for Alternatives 4B and 4D would include the Sawmill Cove Ferry Terminal and the highway between Echo Cove and Sawmill Cove, requiring approximately 131 and 148 workers, respectively. The estimated annual employment for these alternatives would equal between 56 percent (Alternative 4A) and 110 percent (Alternative 4D) of the existing heavy construction workforce (135) in the region. The economic effects to Juneau, Haines, and Skagway from this increase in construction jobs over a 2-year period would be negligible.

### 4.8.5 Transportation

AMHS may set up interim ferry service during construction of Alternative 3. For Alternative 3, interim ferry service to Haines and Skagway could be instituted from Sawmill Cove after construction of the ferry terminal and the highway from Cascade Point. This service could be provided by the Day Boat ACFs. This would reduce the overall running time and cost of operation.

### 4.8.6 Hydrology and Water Quality

During construction of the highway segments of Alternatives 2B, 3, 4B, and 4D, small non-anadromous fish streams with perennial flow would need to be diverted during placement of culverts. Diversions would not be required for anadromous fish streams and rivers to be spanned by bridges.

Diversion of streams would be done during low-flow periods to avoid downstream water quality impacts using standard procedures to minimize water quality impacts. Depending on flows, water may be pumped around the site where the culvert is being placed, or the stream may be diverted to a temporary lined channel. When the culvert is in place and the stream is re-established in its natural channel, there would be a short-term, one-time increase in turbidity. Based on past experience, this short-term increase in turbidity would not change stream profiles or result in a long-term degradation of fish habitat.

Bridges crossing streams would be built from shore. No temporary roads would be established in streambeds. This would minimize turbidity caused by bridge construction.

Bridges crossing major rivers would require placement of piers in the river bed. This construction activity would be timed to periods of low flow to minimize turbidity; however, there would be a short-term increase in turbidity during this activity. Based on past experience, this short-term increase in turbidity would not change river profiles or result in a long-term degradation of fish habitat.

Construction of the proposed ferry terminals at Katzehin (under Alternative 2B) and Sawmill Cove (under Alternatives 3, 4B, and 4D) would require dredging to approximately 25 feet below mean lower low water. The proposed William Henry Bay Ferry Terminal for Alternative 3 would not require dredging. The new terminals proposed for the project alternatives would require placement of in-water fill. Alternative 2B would also require in-water fill in intertidal/subtidal areas for highway construction. Dredging and in-water fill placement would result in short-term (hours or days) localized increases in turbidity. Based on past studies of dredging impacts conducted by the USACE, fish would avoid the dredge or fill sediment plume. Benthic invertebrates that cannot rapidly move away from the sediment as it settles out of the water column would be buried and killed. Kelp and aquatic vegetation in close proximity to dredging would be covered with sufficient sediment to hamper photosynthesis and some of this vegetation may die. Areas affected by sediment deposition would be expected to recolonize within one to two seasons. The fill used for the project would be shot-rock generated during highway construction; therefore, no pollutants would be introduced into marine waters from this fill material.

Highway and ferry terminal construction would involve earth-moving activities. Exposed soils susceptible to erosion can be discharged to natural water bodies, resulting in short-term increased turbidity.

Fuel and lubricant spills and leaks could occur during construction. These potential pollutants could flow directly to area water bodies or be transported to them by stormwater runoff.

Debris and waste are generated during construction. If not properly managed, they can contribute to water pollution through stormwater runoff.

During design of the selected alternative, an erosion and sediment control plan would be developed to provide a general plan to minimize erosion and sedimentation during construction.

Project contractors would use this plan to develop SWPPPs for their work. Each SWPPP would detail the resources that a contractor has on-hand and the procedures and BMPs that the contractor would use to prevent construction activities from jeopardizing area hydrology or water quality. BMPs would include:

- An erosion and sediment control plan would be prepared to describe the BMPs to be used in avoiding water quality impacts to wetlands and other water bodies. This plan would be made available to resource agencies for review and comment before being included in project plans. Staking would be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area.
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- Silt fences would be used adjacent to waterways just beyond the estimated toe of fill.
- Sedimentation basins would be used, as necessary, during construction.

The APDES Stormwater General Permit for construction projects in Alaska requires the contractor to submit a project SWPPP to ADEC for review. The provisions of the General Permit require the contractor to inspect the project regularly and after rain events that are less than the 2-year, 24-hour event. Any problems must be corrected by repairing malfunctioning BMP features or altering the SWPPP. The General Permit requires that inspections and changes to the SWPPP be documented, with records available for compliance review.

The General Permit authorizes projects that will not exceed the appropriate water quality standards. All contractor and DOT&PF inspections, and most reviews by ADEC, are based on visual inspections, with a problem addressed if noticeable erosion or sedimentation is occurring.

### 4.8.7 Air Quality

Construction can be a source of dust emissions that have temporary impacts on local air quality (i.e., exceedances of the NAAQS for $PM_{10}$). Construction particulate emissions would result from drilling and blasting and use of heavy equipment involved in land clearing, ground excavation, cut-and-fill operations, and the construction of project facilities. Dust emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather. Dust emissions would be minimized by application of BMPs, such as watering exposed soil surfaces in active work areas, if necessary. Most of the study area is distant from populated areas, so dust would primarily be a concern for workers and habitat areas adjacent to the project.

In addition to particulate emissions from earth moving, there would be pollutant emissions (CO, $NO_x$, $PM_{10,}$ and reactive organic compounds) from construction equipment engines. These emissions are not expected to result in exceedances of NAAQS for any pollutant because of the low background levels of pollutants in the study area and the relatively small amount of construction equipment.

### 4.8.8 Noise

The evaluation of construction noise was based on typical noise levels from public works projects, such as road construction, developed by the EPA. Using that information, the overall noise level generated on a construction site for proposed project alternatives was estimated to average 88 dBA (±8 dBA for rock drills) at 50 feet, except where blasting is to be done, which would produce higher short-term noise levels. Noise levels generated by construction equipment would decrease at a rate of approximately 6 decibels (dB) per doubling of distance away from the source (Diehl, 1973) for hard sites (i.e., unvegetated, open water), and approximately 7.5 dB per doubling distance away from the source for soft (i.e., vegetated) sites. For all build alternatives, typical noise from project construction (i.e., non-blasting activities) would drop to background levels at about 3,300 feet from the construction site. In many places, the noise would attenuate over much shorter distances because of terrain.

Because of the different phases of construction (e.g., clearing, grading, cut and fill, etc.), no single location would experience a long-term period of construction noise. Instead, construction activities and associated noise would move along the ROW as construction proceeds.

DOT&PF would include specific noise abatement requirements in the construction contracts for the proposed project. Those requirements would include proper maintenance of noise control equipment like mufflers.

### 4.8.9 Wetlands

Highway construction for Alternatives 2B, 3, 4B, and 4D require work in wetland areas. Excavation, grading, and cut-and-fill activities could alter local hydrologic patterns, which could affect these wetlands. The erosion and sediment control plan developed by DOT&PF for implementation by construction contractors would contain specific BMPs to avoid construction impacts to wetlands including:

- Embankment heights and side slopes would be minimized during design to reduce fill footprints in wetlands.
- Separate identification of slope limits to insure workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.
- Construction camps, borrow pits, and waste areas would be located in upland areas and stabilized during and after use to avoid water quality impacts to wetlands and water bodies.

The SWPPP (see Section 4.8.6) would include provisions to avoid contaminating these wetlands. Wetland fill limits would be separately identified to raise the awareness of workers on the need to avoid impacts beyond the toe of the slope.

No borrow sites, disposal sites for excess material, or construction camps would be located in wetlands. No storage areas or truck turnaround areas are anticipated to be in wetlands other than within the actual footprint of the highway. The locations for these activities would be further evaluated during design.

### 4.8.10 Terrestrial Habitat

As discussed in the impact assessment for all project alternatives, the permanent loss of terrestrial habitat associated with the JAI Project would be a small percentage of the total area of similar habitats available in the Lynn Canal region. Clearing of remote temporary construction facilities would not substantially affect terrestrial habitats, and those areas outside the footprint of the project would be temporarily stabilized, then allowed to revegetate naturally.

Construction activities have the potential to introduce invasive plant species to the Lynn Canal region. There are three pathways for this potential impact. Construction equipment brought to the project site from other areas could contain seeds or plant parts that could then be spread to the construction site. Seed mixtures used to vegetate exposed soils could contain invasive species. Soil containing invasive species excavated from one area could be moved to another area, thus spreading the invasive species. Table 4-86 provides a list of existing invasive species in Southeast Alaska. See Section 5.4 of this Final SEIS for information on mitigating these potential impacts.

**Table 4-86:**
**Southeast Alaska Invasive Plants**

| Scientific Name | Common Name |
|---|---|
| *Acroptilon repens* | Russian knapweed |
| *Alliaria petiolata* | Garlic mustard[3] |
| *Bromus tectorum* | cheatgrass[4] |
| *Cardaria draba* | Hoary cress |
| *Centaurea maculosa* | Spotted knapweed |
| *Cerastium fontanum* | Common mouse-ear[1] |
| *Chrysanthemum leucanthemum* | Oxeye daisy |
| *Cirsium arvense* | Canada thistle[2] |
| *Cirsium vulgare* | Bull thistle[4] |
| *Convolvulus arvensis* | Field bindweed |
| *Crepis tectorum* | Narrow-leaf hawksbeard |
| *Cytisus scoparius* | Scotch broom[2] |
| *Dactylis glomerata* | Orchard grass[2] |
| *Elytrigia repens* | Quackgrass |
| *Euphorbia esula* | Leafy spurge |
| *Galeopsis tetrahit* | Hempnettle[2] |
| *Galinsoga parviflora* | Smallflower galinsoga |
| *Hieracium aurantiacum* | Orange hawkweed[2] |
| *Hordeum jubatum* | Foxtail barley |
| *Hypericum perforatum* | Common St. John's Wort[2] |
| *Hypochaeris radicata* | Hairy catsear[4] |
| *Impatiens glandulifera* | Himalayan balsam[2] |
| *Lactuca pulchella* | Blue lettuce |
| *Linaria vulgaris* | Butter and eggs[1] |
| *Lythrum salicaria* | Purple loosestrife |

| Scientific Name | Common Name |
|---|---|
| *Melilotus albus* | White sweetclover[2] |
| *Myriophyllum spicatum* | Eurasian watermilfoil |
| *Onopordum acanthium* | Scotch thistle |
| *Phalaris arundinacea* | Reed canarygrass[2] |
| *Polygonum convolvulus* | Wild buckwheat |
| *Polygonum cuspidatum* | Japanese knotweed[2] |
| *Ranunculus repens* | Creeping buttercup[1] |
| *Rorippa austriaca* | Austrian fieldcress |
| *Senecio jacobaea* | Tansy ragwort[2] |
| *Solanum carolinense* | Horsenettle |
| *Sonchus arevensis* | Perennial sowthistle |
| *Spergula arvensis* | Corn spurry |
| *Tanacetum vulgare* | Common tansy[4] |
| *Tragopogon dubius* | Western salsify[4] |
| *Vicia cracca* | Tufted vetch |

[1] These species were detected in the project area during the JAI Project sensitive plant surveys (see Appendix Q of the 2005 Supplemental Draft EIS).

[2] These invasive species have become established in some areas in the Tongass National Forest (Foster Wheeler Environmental Corporation, 2003) and southeast Alaska (Borchert, 2003; CNIPM, 2003).

[3] This species has already appeared in Juneau (Foster Wheeler Environmental Corporation, 2003).

[4] From USFS, 2007.

### 4.8.11 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

Construction of ferry terminals for Alternatives 2B, 3, 4B, and 4D would result in a short-term increase in turbidity near the construction sites. This turbidity could result in the loss of some Pacific herring eggs in the vicinity of the Sawmill Cove Ferry Terminal site (under Alternatives 3, 4B, and 4D), sculpin eggs at the William Henry Bay terminal site (under Alternative 3), and has the potential to affect migrating anadromous and/or resident species located near the Katzehin Ferry Terminal site (Alternative 2B). Timing of in-water construction to avoid the peak migratory, spawning and egg maturation period would avoid this impact. Increased turbidity could also result in the loss of some benthic organisms. These impacts would not have population-level effects on any benthic species, fish, or crab species in Lynn Canal.

Temporary barge landings for Alternatives 2B, 3, 4B, and 4D would be used to transport construction equipment and personnel for the road construction and would affect EFH along the shoreline of Lynn Canal. Shortening the distance required for delivery of equipment and materials with these landings would provide the contractor flexibility and opportunities to shorten the construction duration. Tug boats and associated underwater noise would occur within EFH and could temporarily diminish the quality of the habitat for juvenile fish species, such as salmonids and eulachon. These impacts would be short term.

Debris from blasting and other construction activities could potentially reach Lynn Canal and disturb nearshore habitat areas. Disturbances are expected to be short term and would not result in long-term effects to EFH or aquatic species. To minimize this potential, the contractor would be required to implement control measures during initial surface blasts, production blasting, and other construction activities for areas that have the potential to reach Lynn Canal.

Construction of multi-span bridges across the Antler (Alternative 2B), Berners/Lace (Alternative 2B), Katzehin (Alternative 2B), Sullivan (Alternative 3), Endicott (Alternative 3), and Chilkat (Alternative 3) rivers would require placement of support structures in the river channels. A falsework[75] would be erected to provide a platform for equipment, and thereby eliminate the need for equipment to actively work in the river below ordinary high water levels. Impacts within the river could occur due to noise and vibration generated during pile driving and increased turbidity (at the crossing and downstream) as the falsework is erected.

The vast majority of pile driving will take place using vibratory hammers. Impacts on fish or other aquatic organisms have not been observed in association with the use of vibratory hammers. For this reason, vibratory driving of piles is generally considered less harmful to aquatic organisms and is the preferred pile installation method of federal resource agencies (i.e., USFWS and NMFS; WSDOT, 2013). For piles that are weight-bearing (such as those that support bridges), following initial vibratory installation, piles would be driven with an impact hammer to ensure that they are stable and at adequate depths. This is called “impact proofing.”

The extent of injury-producing underwater noise for fish species was determined using input for the maximum sound pressures anticipated to result from impact proofing of the largest piles to be driven as part of the project. Based on the size of the piles anticipated to be used for many in-water structures associated with this project (48-inch diameter), small fish less than 2 grams in size could be injured within 131 feet of the pile being proofed; fish greater than 2 grams in size could be injured within 72 feet of the pile.

Construction in the river channels would also result in short-term turbidity that could affect migrating fish and smother fish eggs. Although bridge construction in these rivers may lead to some mortality of resident or anadromous fish, the full width of each river would not be affected at once and construction would be timed to avoid periods when anadromous fish are active in the area. For these reasons, turbidity should not result in the loss of spawning, rearing, or migratory habitat since non-turbid areas would likely be available to individuals present. Further, due to the high levels of ambient turbidity in Antler, Berners/Lace, and the Katzehin rivers, it is not anticipated that turbidity increases would result in behavioral modifications or abandonment of habitat where in-river construction occurs.

Runoff during construction could contain sediments, heavy metals, and organic compounds from construction equipment; however, as noted in Section 4.8.6, BMPs would be used to avoid impacts from runoff. No direct mortality or disturbance of anadromous and resident fish would occur from runoff.

In summary, construction-related impacts on marine and freshwater species and habitat (including EFH) would be temporary. Ferry terminal construction would not have population-level effects on any benthic species, fish, or crab species in Lynn Canal and bridge construction is not expected to result in long-term population-level effects on resident or anadromous fish.

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[75] A falsework is a temporary structure on which a permanent bridge is wholly or partly built and supported until the bridge is strong enough to support itself.

### 4.8.12 Wildlife

#### 4.8.12.1 Marine Mammals

Marine mammals would be affected during construction of the alternatives as described in the following paragraphs. Harbor seals may be disturbed by loud noises caused by highway and ferry terminal construction activities near the shore. It is likely that harbor seals would perceive active construction areas in or immediately next to the water from a distance and avoid the area if noise levels are bothersome. Harbor seals haul out on sandbars in Berners Bay and at the Katzehin River delta. They have also been observed to haul out on the west side of Taiya Inlet at the base of Halutu Ridge. On the west side of Lynn Canal, harbor seals haul out in protected waters near the Sullivan River, Davidson Glacier delta, and Pyramid Island. Construction noise caused by any of the alternatives may cause harbor seals to temporarily abandon some haulout sites. However, they are likely to return to those sites after the noise has ceased. In addition, there are numerous haulout sites that seals use throughout Lynn Canal. This temporary disturbance would not result in population-level effects on this species.

Debris from blasting and other construction activities could potentially reach Lynn Canal and disturb hauled-out or nearshore marine mammals. Disturbances are expected to be short term and would not result in long term affects marine mammals. To minimize this potential, the contractor would be required to implement control measures during initial surface blasts, production blasting, and other construction activities for areas that have the potential to reach Lynn Canal.

Construction impacts are not expected to occur for minke whales, Dall’s porpoise, harbor porpoise, killer whales, or sea otters with any of the proposed alternatives.

#### 4.8.12.2 Marine Birds

Project construction could result in flushing some marine birds, such as marbled murrelets, yellow-billed loons, and harlequin ducks, resting or feeding in nearshore waters. These short-term displacements would cost birds a small amount of energy and time but would not affect reproductive success or survival.

Disturbance of nesting birds could decrease their chances of reproductive success for the season or could cause them to abandon their nests. The waterfowl and herons in the study area begin breeding activities in late April or early May and some do not fledge their young until the middle of August. Marbled murrelets nest in OG forest, the most common habitat type crossed by the proposed highway alignments on the east and west sides of Lynn Canal. Therefore, marbled murrelets may be the species most affected by highway construction. Clearing in OG areas for Alternatives 2B or 3 would be spread over more than one season. Alternatives 4B and 4D would affect a 2.3-mile-long, 100-foot-wide strip of vegetation. For any of the build alternatives, only a small portion of available habitat would be affected during any nesting season.

Road construction in rocky shore habitat could inhibit black oystercatchers from nesting in those areas or disturb the birds after nesting has occurred, which would decrease their chances of reproductive success for the season. Black oystercatchers are uncommon in the project area; therefore, the impacts described would likely affect only a few individuals and would not have a population-level effect on the species.

As Aleutian terns and dusky Canada geese are not documented in Lynn Canal and are unlikely to be present, construction of the alternatives is not likely to affect either species.

Disturbance of nesting birds would not have population-level effects on waterfowl and herons in Lynn Canal. Highway construction (Alternatives 2B, 3, 4B, and 4D) would proceed in stages over the alternative alignments. Construction would not take place over the entire length of any alignment in one season with the possible exception of the relatively short extension of Glacier Highway to Sawmill Cove for Alternatives 4B and 4D. Therefore, only a small area of nesting habitat relative to the amount available throughout the region would be disturbed during any one breeding season.

#### 4.8.12.3 Terrestrial Mammals

Some species of terrestrial mammals such as bears, wolves, river otters, and martens give birth in dens during the winter or spring. It is possible that highway construction under Alternatives 2B, 3, 4B, and 4D could cause some direct mortality of adults and young in dens inadvertently destroyed during clearing operations in the early spring. However, only a few individuals are expected to be affected and therefore construction would not result in population-level effects on any species in the Lynn Canal region. To reduce the likelihood of affecting denning wolves, a den survey would be conducted (see Section 5.9).

Black and brown bears typically avoid human activity. However, they are attracted to human garbage and food supplies, which often brings them into conflict with humans and results in bears being shot and killed in defense of life or property. This is often a problem for remote construction camps and remote campers and hunters (McLellan, 1989). To minimize bear-human interactions, BMPs for food and waste disposal would be implemented for construction camps, highway pullouts, and day-to-day construction activities.

The noise produced during winter construction has the potential to disturb denning brown bears, which could lead them to abandon their dens (Swenson et al., 1997). An ADF&G study of the JAI Project corridor (Flynn et al., 2012) involved visits to six denning sites, all of which were in closed, forested areas at high elevations, far up major river drainages away from all project alternatives. It is not likely that these sites would be disturbed. Noise from construction may also cause brown bears to avoid feeding areas in or near the project area during daytime hours when human disturbance is greatest. A shift to nighttime feeding could reduce the bears' feeding efficiency in some areas, as light becomes a limiting factor prior to hibernation (Ordiz et al., 2012). However, due to the large home ranges of brown bears in Berners Bay (Flynn et al., 2012) and an abundance of feeding areas away from the project site, it is unlikely that construction noise would significantly affect bear populations along east Lynn Canal.

Noise from construction and human disturbances may cause moose to avoid feeding areas in or near the project area during daytime hours when human disturbance is greatest. However, moose are known to adapt to human disturbances and construction noise, reducing the likelihood that moose would be adversely displaced or disturbed by construction noise and human presence during construction.

Construction areas may create temporary paths for moose to escape deep snow or move to different areas, increasing the potential for construction vehicles to collide with moose, especially near lower Berners Bay and the Katzehin River valley. Construction vehicles, however, operate at relatively slow speeds, and generate loud noise, which greatly reduces the likelihood of collisions with moose because moose would move away from the vehicles and noise.

Mountain goat summer habitat is at high elevations throughout Lynn Canal and is unlikely to be disturbed by construction noise from any of the alternatives during the summer. In the winter, when goats move to lower elevations closer to or within the project area, the noise generated by machinery and blasting may disturb animals nearby. Wildlife observers would examine the nearby area for the presence of mountain goats prior to construction rock blasting and, if necessary, haze them in an attempt to have them depart the area. Mountain goats disturbed by construction noise may move away from high-quality winter habitat to more marginal areas, which could increase energetic demands on individuals and result in increased mortality.

With Alternatives 2B and 3, avalanche control activities would likely occur during the early spring to ensure the project area is safe for construction of the proposed highway and associated facilities. The control activities could result in mortality to mountain goats because avalanche chutes are in steep habitat preferred by goats and are occasionally used for winter forage (White et al., 2012b). No mitigation is proposed for the impacts of the avalanche control activities on mountain goats.

Construction of the project alternatives would not likely have an impact on wolverines or their populations in southeast Alaska. This is due to their low densities near the project area, their low site fidelity, and their propensity to avoid areas of human influence (Banci, 1994).

#### 4.8.12.4 Terrestrial Birds

Project construction effects on terrestrial birds are similar to those described for marine birds. Loud noises from construction activities are likely to disturb birds within 0.25 to 0.5 mile of the alignment. If the birds are feeding or resting, they would fly away from the disturbance and resume their normal behavior in another location. Disturbance of nesting birds would decrease their chances of reproductive success for the season and would be avoided to the extent practicable. It is not expected that project construction would have population-level effects on terrestrial birds in Lynn Canal. As explained above, highway construction would proceed in stages over the alternative alignments. Construction would not take place over the entire length of any alignment in one season except for the relatively short extension of Glacier Highway to Sawmill Cove for Alternatives 4B and 4D. Therefore, only a small area of nesting habitat relative to the amount available throughout the region would be disturbed during any one breeding season. A pre-construction goshawk nest study would be conducted to ensure that there are no impacts to nesting goshawks.

#### 4.8.12.5 Amphibians

Project construction could result in the loss of individual frogs and toads in the wetlands crossed by the highways for Alternatives 2B, 3, 4B, and 4D. No palustrine emergent wetlands or open water would be filled by Alternatives 2B, 4B, and 4D. Alternative 3 would require fill in palustrine emergent wetlands. A pre-construction survey would be conducted to confirm that no amphibian breeding areas would be affected. Therefore, the loss of individuals is not expected to have population-level effects on any species in the Lynn Canal region, as the area disturbed is small relative to the total regional habitat available to amphibians.

#### 4.8.12.6 Bald Eagles

As discussed in Section 4.1.15, the National Bald Eagle Management Guidelines recommend maintaining a buffer of at least 660 feet between project activities and an active nest if the activity will be visible from the nest site. The buffer is intended to restrict all vegetation clearing, external construction, and landscaping activities within 660 feet of the nest to outside the bald eagle nesting season. If the nest is not visible from the construction activity, a buffer of 330 feet should be maintained.

For blasting and other loud construction noises, a 0.5-mile buffer should be maintained.

Bald eagles are sensitive to visual and auditory disturbances, especially during the early part of the nesting cycle (e.g., nest building, incubation, and the first 5 weeks of nestling life). The presence of humans or construction noise near bald eagle nests has been found to cause changes in almost all aspects of eagle breeding behavior. Responses to disturbances include frequently flushing from the nest, not leaving the nest to feed, expending energy on defending the nest rather than maintaining the nest, and abandoning the nest (Steidl and Anthony, 2000).

Construction along the alignments of Alternatives 2B and 3 would be staged; therefore, construction would not occur along the entire alignment in any one season. In addition, not all eagle nests are actively used each year. New bald eagle nests are built each year and some older nests may be destroyed each winter from storms and snow loads, or remain unused for a long period of time. Non-nest trees slated for removal under Alternatives 2B, 3, 4B, and 4D that could be suitable for nesting in the future represent less than 1 percent of available nesting habitat for bald eagles in Lynn Canal. As a result, construction of Alternatives 2B, 3, 4B, and 4D would not affect the overall population of bald eagles in Southeast Alaska. Based on the current design of the alternatives, the DOT&PF does not anticipate the removal of a bald eagle nest tree.

Communal roosting areas are not known to occur along the highway alignments. Seasonal concentrations of eagles feed in Berners Bay, the Katzehin River, the Endicott River, and the Chilkat River during spring spawning aggregations of eulachon and Pacific herring. Eagle concentrations also occur in the tributaries of these systems during summer runs of salmon. Preferred or specific resting areas have not been identified along the highway alignments. It is anticipated that potential disruption during feeding activities or while resting would be short term during construction activities. This is not expected to result in a significant reduction in the eagle population in the Lynn Canal.

Depending on the selected alternative for the JAI Project, the DOT&PF would need to apply for an eagle Disturbance Permit for nests within 660 feet of the cut and fill limits and for active nests within 0.5 mile of blasting activities and other loud construction noises. As a requirement of the permit program, the applicant must consult with the USFWS prior to construction and, if required, update aerial bald eagle nest surveys to determine the current status of the nests (i.e., which nests are still active and whether there are any additional nests in the project area that may be affected by construction activities). An additional requirement of the permit program is post-construction monitoring. Depending on the magnitude of the anticipated disturbance, USFWS may require DOT&PF to provide post-construction monitoring to determine whether the nest sites, communal roosts, or important foraging areas continue to be used by eagles for up to 3 years following completion of the permitted activity (USFWS, 2009).

In addition to the USFWS regulations, the CBJ Land Use Code states that development is prohibited within 330 feet of an eagle nest on public land within the CBJ. The DOT&PF would need a variance from the CBJ for the JAI Project if the selected alternative requires construction within 330 feet of a bald eagle nest within the CBJ.

### 4.8.12.7 Threatened and Endangered Species

Construction activities for Alternative 2B have the potential to affect Steller sea lions and humpback whales. As described in Section 4.3.17, FHWA determined that Alternative 2B may affect and is likely to adversely affect the western DPS of Steller sea lions and Mexico DPS humpback whales, and initiated formal consultation with NMFS. Additional information regarding Section 7 consultation with NMFS is described in Section 7.5.2. In general, the new alignment of Alternative 2B would likely have fewer impacts to Steller sea lions than the alignment in the 2006 ROD because portions of the highway would be shifted inland. Near the Gran Point haulout, the alignment would be shifted uphill and redesigned to go through two tunnels to avoid a rockfall area and to avoid cutting through slopes. This alignment modification would move the road farther away from the Gran Point haulout: approximately 100 to 600 feet horizontally and 50 to 100 feet vertically, depending on location. Near the Met Point haulout, a portion of the road alignment (roughly 1,500 feet) would be shifted 25 to 100 feet closer to Lynn Canal. The remaining road alignment would be relatively unchanged.

Based on the analysis of noise levels, noise associated with typical highway construction activities within 1,000 feet of the Gran Point and Met Point haulouts would likely be above estimated ambient noise levels at the haulouts (background noise levels at remote shorelines in Berners Bay have been measured at 47 to 52 dBA). This means that Steller sea lions would likely hear construction noise at the haulouts. However, most construction-related noise at the haulouts would fall well below the 100 root mean square decibels ($dB_{RMS}$) in-air disturbance threshold for Steller sea lions established by NMFS (NMFS, N.d.). Therefore, Steller sea lions would not be exposed to noise levels exceeding the NMFS in-air disturbance threshold for all activities except blasting.

Blasting would be audible at Gran Point and Met Point haulouts. Rock blasting may result in temporary abandonment of Met Point or Gran Point by Steller sea lions. The duration of displacement from each haulout would depend upon individual tolerance and resilience following blast events. Some individuals may become tolerant to disturbances over time. Although blast noise would potentially displace hauled-out Steller sea lions, such disturbance would not result in population-level effects.

Flying debris from blasting and other construction activities could potentially reach Gran Point and Met Point haulouts and disturb hauled-out Steller sea lions. Disturbances would be temporary and would not result in population-level effects. To minimize this potential, the contractor would be required to implement control measures during initial surface blasts, production blasting, and other construction activities for areas within 500 feet of Gran Point or Met Point that have the potential to reach the haulout.

In the 2006 ROD, commitments required that helicopters used during construction, including surveying activities, avoid operating within the 3,000-foot critical habitat radius of Steller sea lion haulouts when they were occupied. This was considered a feasible measure, based on earlier visual and video camera monitoring that indicated an absence of Steller sea lions in late summer. Based on more recent data collected, Steller sea lions are present year round and it is no longer feasible to avoid operating helicopters when Steller sea lions are present. It is common for fixed-wing and rotary-wing aircraft transiting the Lynn Canal corridor to regularly fly over the 3,000-foot critical habitat air-radii around Met Point and Gran Point, with the highest numbers of aircraft during the May to September tourist season. These activities have not been reported as factors that limit the use of Steller sea lion haulouts in the action area, based on the several years of monitoring data collected at Gran Point by DOT&PF. Construction-related helicopter use within 3,000 feet of Gran Point or Met Point would occur at a minimum altitude of 1,500 feet (when weather conditions permit), and a minimum distance of 1,000 feet from each haulout. No direct flights over the haulouts would be conducted. Flights at this distance would ensure that noise associated with helicopters would not exceed the in-air disturbance threshold for hauled-out Steller sea lions (100dB$_{RMS}$). This altitude is also consistent with NMFS guidelines for viewing marine mammals from a helicopter, which state to "maintain a 1,500 foot minimum altitude when viewing marine mammals from the air" (NMFS, 2012).

For construction of Alternative 2B, temporary barge landings would be used to transport construction equipment and personnel for the road construction. Shortening the distance required for delivery of equipment and materials would provide the contractor flexibility in operations and opportunities for efficiencies to shorten the construction duration. Tug boats and associated underwater noise could disturb individual Steller sea lions, causing them to avoid the general area of activity during the landing and "undocking" process.

One notable change to Alternative 2B since the 2006 ROD is the proposed tunnel construction upslope of the Gran Point haulout, which would require blasting. The closest tunnel blasting activities to the Gran Point haulout would be approximately 550 feet (northeast of Gran Point); excavation blasting at the Met Point haulout would occur within 300 feet of the haulout. Blasting associated with the use of 20-pound charges for tunnel/slope excavation would create loud, instantaneous noise anticipated to be 126dBA at 50 feet, but would likely vary depending on the substrate, charges per delay, and weather conditions. These noise levels would likely attenuate to background levels (existing levels of 47 dBA) within 2 to 3 miles. It is possible that individuals from the western DPS would be subject to in-air noise levels above the threshold of 100dB$_{RMS}$ and hauled-out individuals could temporarily abandon the haulout. Blasting activities are anticipated to be short-term in duration and are not anticipated to result in long-term abandonment of either Gran Point or Met Point. Steller sea lions may react to loud or unfamiliar sounds by diving into the water from land or by submerging when they are in the water. Generally, they return to their previous behavior within an hour or so after the disturbance. However, their tolerance for this kind of disturbance would depend on its continuity. Steller sea lions may abandon a haulout for longer periods of time if a disturbance continues (NMFS, 2005b). Regardless, construction-related noise disturbance would not result in population-level effects to the western DPS of Steller sea lions, particularly because so few of them are anticipated to occur in the action area. (Konya and Walter, 2003).

Construction activities for Alternatives 2B, 3, 4A/4C, and 4B/4D that could affect Steller sea lions also include underwater noise generated by construction of barge landings, in-water fill placement, pile driving, and dredging. Placement of fill at the ferry terminal sites in Sawmill Cove, the Katzehin River, and William Henry Bay is not expected to generate substantial in-water noise, as this activity is generally done from shore during lower tides. Dredging would take place between October 1 and March 1 when there are no spawning activities of Steller sea lion and humpback whale prey species in the project area. Driving of piles would be done with vibratory hammers to the extent possible to reduce the intensity of sound generated. During all piling installations (vibratory or impact driving), a trained observer would monitor for the presence of marine mammals and pile driving would be halted if any marine mammal comes within 660 feet of the activity. Similar to blasting, construction noise would be temporary in nature and would not be expected to result in long-term abandonment of either Gran Point or Met Point. Steller sea lions may react to construction noise by diving into the water from land or by submerging when they are in the water, but are expected to return to their previous behavior shortly after the disturbance.

Construction of new ferry terminals and reconstruction of the ferry terminal in Auke Bay would result in a short-term increase in turbidity near the construction site. This turbidity could result in the loss of the eggs of some Steller sea lion prey species, such as Pacific herring, at the proposed ferry terminal site. In-water construction work would occur between October 1 and March 1 to avoid the spawning and egg maturation period. These impacts would not have population-level effects on Steller sea lion and humpback whale prey species in Lynn Canal. Construction requiring placement of fill would affect intertidal and subtidal marine habitat. This temporary loss of potential habitat for prey species would not likely affect the population of prey species available in Lynn Canal.

Humpback whales near shore may hear or feel construction activities that take place at ferry terminal sites or on highway alignments close to shore. The reaction of humpback whales to underwater noise would depend on how far away they were from the disturbance and what they were doing at the time. In some cases, whales change course and speed to avoid a noisy ship. In other cases, especially when they are feeding in an area of high prey availability, whales tolerate very loud noises. To minimize construction impacts to whales, trained observers would be on-site in areas with a high probability of noise impacts, including pile driving at ferry terminals and bridge sites, to watch for the presence and/or disturbance of whales. No pile driving would occur when humpback whales and other marine mammals are within 660 feet. The short-term disturbance due to construction noise would not affect the humpback whale population in Lynn Canal.

## 4.9 Cumulative Impacts

The geographic area for the cumulative effects assessment encompasses the following areas:

- Auke Bay Ferry Terminal and Echo Cove within the CBJ for all resources, and the Glacier Highway in Juneau for noise impacts
- Echo Cove, around Berners Bay, and north along the east side of Lynn Canal and Taiya Inlet to Skagway
- Municipality of Skagway Borough
- Haines Borough
- William Henry Bay to Mud Bay Road in Haines, on the west side of Lynn Canal

Baseline conditions and current actions within the study area were evaluated in 2003, and reevaluated in 2005 and 2012. The time frame for past actions ranged from the nineteenth century, when the earliest mining operations began, to 2012. The time frame for reasonably foreseeable actions extends to 2055 and includes projects that are funded or have been permitted by a regulatory or resource agency.

As discussed below, most of the reasonably foreseeable projects that have been identified for the cumulative effects assessment are located in the vicinity of Juneau. One of them is near Haines.

The cumulative impact discussion presented in this section updates the cumulative impact analysis presented in the 2006 Final EIS and is based on updated technical analyses and research conducted in support of this Final SEIS.

### 4.9.1 Past, Present, and Reasonably Foreseeable Projects

Past, present, and reasonably foreseeable actions in the project area were identified using planning documents, personal communications with resource agency representatives, NEPA documentation, current events reported in the local and regional news, best professional judgment, and comments received during the 2012 scoping period for this SEIS. Sections 4.9.1.1 through 4.9.1.4 explain the actions included in this analysis. Past, present, and reasonably foreseeable actions considered in this analysis include projects on private and public lands. Section 4.9.1.5 lists actions not included in the analysis and the basis for their exclusion. Actions considered "reasonably foreseeable" are those that are funded or that have acquired permits and that would occur with or without the JAI Project.

#### 4.9.1.1 Mining

On the east side of Lynn Canal, the project study area lies within a large mineral region known as the Juneau Mining District, which has produced large quantities of gold, silver, and lead since 1869. The larger-scale mining activities have occurred primarily outside the project corridor, to the southeast of the project, near Juneau. The proposed alignment for Alternative 2B, however, runs through areas of prospects, claims, and historic and current mines. Mining and prospecting within the project corridor have been primarily for copper, gold, silver, and zinc, with the primary area of historic mining activity along Berners Bay at the Jualin and Kensington Mines.

Mining has been minimal along the west side of Lynn Canal with the exception of the Alaska Endicott Mine, near William Henry Bay, and the Dream Prospect, on the mainland across from Sullivan Island. The former Alaska Endicott Mine is approximately 1 mile southwest of the beginning of the proposed Alternative 3 alignment at William Henry Bay. It was mined from the early 1900s to 1924 for copper and incidental amounts of gold and silver. The Dream Prospect was extensively explored for zinc and copper with no significant mineral recovery. Several other mineral occurrences, prospects, and mines are in the project study area on the west side of Lynn Canal. No mining is taking place or has been permitted on the west side of Lynn Canal in the project area.

Coeur Alaska, a mining company based in Idaho, acquired the Kensington and Jualin Mines in the 1990s and received all permits required to begin construction and operations following publication of the *1997 Kensington Gold Project Final Supplemental Environmental Impact Statement* and issuance of a USFS ROD in 2004 (USFS, 1997a and 2004). In an effort to increase efficiency and reduce disturbance in the area, Coeur Alaska submitted an amended Plan of Operations, which was approved in the USFS 2004 ROD. The mine opened in 2009 and began production in 2010 (ADNR, 2012). Land ownership of the site influences the permitting strategy for additional mineral exploration. The USFS approved Coeur's *Final Plan of Operations for the Kensington Gold Project* in 2005. An environmental compliance audit, required by the 2013

Reclamation and Closure Plan, was completed in January 2018.[76] This audit will be used by Coeur and the State of Alaska to assist in updating, renewing, or issuing authorizations and permits; updating policies, plans, and procedures; and determining compliance with permits and authorizations. For example, it will be used for updates to and approval of the Reclamation and Closure Plan, which expires in December 2018[77].

Note: The 2025 and 2055 population forecasts discussed in previous sections of this document were calculated using demographic and migration trends, rather than information on specific projects or developments. For purposes of this cumulative impact assessment, any population increase associated with a reasonably foreseeable future action is considered as an addition to those forecasts.

#### 4.9.1.2 Timber Harvests

In 1997, 1999, and 2000, Goldbelt conducted timber harvests in the Cascade Point/Echo Cove area. Although there is some potential for further logging around Echo Cove, Goldbelt has no plans for logging in that area at this time (Loiselle, 2012). A 40-acre site that was clean cut in 1999–2000 is now permitted (by CBJ; see Section 4.9.1.3 below) for use as a rock quarry. In 2005, the ROW for the Glacier Highway Extension was logged. There are no plans for timber harvest on national or State forest lands in the project area. Management plans for these lands are unlikely to change in the foreseeable future. There are also no current plans to harvest timber on private or trust lands in the project area.

The only logging that is reasonably foreseeable in a quantitative evaluation of cumulative impacts is the logging associated with continuing Kensington Gold Mine development, and land clearing associated with potential, but not scheduled, Goldbelt development at Cascade Point (Loiselle, 2012).

#### 4.9.1.3 Development

**State Development –** Major projects developed by the State within the project area have included construction of the State of Alaska Auke Bay, Haines, and Skagway Ferry Terminals; the 3-mile pioneer road from the north end of the Glacier Highway from Echo Cove to Cascade Point in 2006 and the Glacier Highway Extension in 2011; and the Echo Cove boat ramp. The Echo Cove boat ramp and access road were designed in 1996 and built by DOT&PF. The facility consists of a 16-foot-by-192-foot concrete ramp and a parking area. The CBJ maintains the facility.

**CBJ –** The CBJ expanded the boat launch and related facilities at Statter Harbor in Auke Bay. The CBJ's project area included the existing Statter Harbor facility and DeHart's Marina, both owned by the CBJ, and was tourism-driven by such things as whale watching excursions (Hart and Chaney, 2012). The $8.3 million project replaced the gangway, headwalk, and DeHarts floats in Statter Harbor (CBJ, 2012). Repairs to the existing floats and breakwater were also part

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[76] The Kensington Mine *2017 Environmental Audit* (this audit is required per the *2013 Reclamation and Closure Plan Update for the Kensington Gold Project, Borough of Juneau, Alaska* (http://dnr.alaska.gov/mlw/mining/largemine/kensington/pdf/kens2013recplan.pdf) was completed in January 2018 and is posted on the State of Alaska website (http://dnr.alaska.gov/mlw/mining/largemine/kensington/; direct link to document http://dnr.alaska.gov/mlw/mining/largemine/kensington/pdf/kens_coeurak_envaudit2017.pdf) .

[77] The Reclamation and Closure Plan was to expire in May 2018; however, following the submittal of a plan update in March 2018, the expiration was extended to December 31, 2018 (http://dnr.alaska.gov/mlw/mining/largemine/kensington/pdf_2018/kens_rpa_j20133158extension.pdf).

of the project. The first phase of construction was completed in May 2013 and the second phase was completed in June 2016 (CBJ, 2016).

**Municipality of Skagway –** The Municipality of Skagway, the Alaska Industrial Development and Export Authority, and the Government of Yukon are moving forward with the Gateway Project, a cooperative project intended to attract and maintain the business of existing customers to the Skagway Ore terminal. The project includes modernizing the ore ship loader and making other improvements to facilitate containerized cargo shipment. To enhance tourism and the related visitor industry in Alaska and the Yukon, the Gateway Project will also provide a dock that can accommodate the largest cruise ships entering the Alaska market (Municipality of Skagway, 2013).

**Alaska Glacier Seafoods Company –** Alaska Glacier Seafoods constructed 12,000 square feet of office space and a processing plant next to the Auke Bay Ferry Terminal at 12-Mile Glacier Highway in 2005. In addition, the company constructed a timber dock and a saltwater intake system for the processing facility.

**Goldbelt –** Goldbelt prepared a master plan for its Echo Cove landholdings, comprising approximately 1,400 acres, but has indicated that although there is potential for development, no plans are in place to proceed with any type of development at this site (Loiselle, 2012). The master plan includes industrial and commercial uses related to transportation and recreation.

Goldbelt obtained a CBJ Conditional Use Permit in November 2004 to reopen and expand an existing rock quarry on its land near Echo Cove. This quarry was permitted for use during construction of the road extension to Cascade Point, but it does not appear to have been used for this purpose—Goldbelt representatives indicated that there is currently no market for these aggregates (Loiselle, 2012). Goldbelt could expand the existing 1.5-acre quarry to a total of 3 acres under this permit.

In May 2005, Channel Construction obtained a CBJ Conditional Use Permit to develop a new quarry nearby on a previously clear-cut 40-acre parcel of Goldbelt land. To date, this quarry has not been built.

As part of Goldbelt's contracting businesses, it shuttles Kensington Mine employees by bus to Yankee Cove and then by ferry to the mine's dock at Slate Creek. With the Glacier Highway Extension to Cascade Point, Goldbelt plans to construct a dock at Cascade Point and make it the new southern terminus of the shuttle ferry to Slate Creek. Moving the transit point to Cascade Point will enhance the safety of the ferry crews and passengers and will make travel across Berners Bay more reliable. The proposed dock at Cascade Point has been fully permitted; however, Goldbelt has not scheduled construction (Duncan, 2013).

**Other –** There are Alaska Mental Health Trust, Native allotments, and other private lands on both the east and the west sides of Lynn Canal. A highway would increase the likelihood of development of these lands, but nothing specific is reasonably foreseeable. Therefore, these lands are not discussed further in this cumulative analysis. DOT&PF controls access to any State highway. The location and configuration of driveways off of a State highway would conform to DOT&PF standards.

West of the Lace River, the highway for Alternative 2B would intersect an existing unpaved road that runs from the dock at Slate Cove to the Jualin mine. This road is a public road that was upgraded as part of Coeur Alaska's proposal to build a deepwater floating dock at Slate Cove.

The State of Alaska funded part of the road upgrade as an Industrial Roads Project. If Coeur Alaska and the State of Alaska develop a cooperative use agreement for the Slate Cove dock under Alternative 2B, DOT&PF could use the dock and road to provide temporary ferry service during any extended road closures. This would not be applicable to any other project alternatives.

As discussed in Sections 4.3, 4.4, and 4.6, USFS has indicated that trails at several pullouts are reasonably foreseeable if a highway is constructed on the east or west side of Lynn Canal for either Alternative 2B or 3. If either Alternative 4B or 4D is selected, only a trail at the pullout at Sawmill Creek would be reasonably foreseeable. A separate environmental analysis would be completed by USFS for these trails prior to their construction. The potential cumulative impacts of these trails in conjunction with the JAI Project are included in this analysis.

#### 4.9.1.4 Utilities

Alaska Power and Telephone Company (AP&T) completed and began operating the 6-acre, 3-megawatt hydroelectric project, called the Kasidaya Creek (formerly Otter Creek) Hydroelectric Project on USFS land at Kasidaya Creek in Taiya Inlet, 3 miles south of Skagway in 2008 (AP&T, 2009). Major infrastructure for the project includes a diversion dam; a 3,700-foot-long, 40-inch-diameter penstock; a 24-foot by 48-foot steel powerhouse with an adjacent staging area and transformer pad; a 75-foot-long tailrace; and a jetty. Power from this facility is sent to Haines and Skagway (Brady, 2008). The CBJ operates three wastewater treatment plants, all of which have NPDES permits (Juneau – Douglas, Mendenhall, and Auke Bay). The Auke Bay Wastewater Treatment Plant discharges effluent to Auke Bay at 30 feet below mean low water after secondary treatment. The Auke Bay Ferry Terminal also discharges effluent to Auke Bay after treatment at 20 feet below mean lower low water.

#### 4.9.1.5 Actions Not Considered

The following actions were determined not to be reasonably foreseeable actions or pertinent present actions and, therefore, were not evaluated in the cumulative effects analyses.

**Timber Sales –** There are no timber sales currently planned by any of the major landholders in the project area in the next 10 years. The cumulative impact analysis includes the logging described in Section 4.9.1.2.

**Cape Fox Land Entitlement Adjustment Act of 2003 –** This bill, and subsequent bills introduced up to 2007, would give approximately 2,700 acres of USFS lands in the Johnson and Slate Creek drainages to Cape Fox Corporation and 9,300 acres of land in the Johnson, Sherman, and Sweeny Creek drainages to Sealaska Corporation. In exchange, the USFS would get 3,000 acres of private lands near Ketchikan. If the land exchange is executed, it is expected that Cape Fox Corporation will use its new land to develop support services for the Kensington Gold Project (U.S. Senate Bill 1354; U.S. Congress, 2003). This land exchange was not used in the analysis because the bill and subsequent bills were either tabled or sent to committee, where no action was taken. To date, these bills have not been passed; therefore, no detailed potential impacts are reasonably foreseeable.

**Herbert Glacier Project –** CBJ granted an exploration permit for this project that was effective through February 2013 (Grand Portage Resources, 2012). The project consists of 91 unpatented lode claims located 20 miles north of Juneau and 25 miles south of Coeur Alaska´s Kensington gold mine. Since 2010, all holes drilled at Herbert Glacier have encountered gold mineralization.

Grande Portage and Quaterra Resources are conducting the permitted exploration (Quaterra Resources, Inc., 2012). As this project is in the exploration stage, it is not being considered part of reasonably foreseeable future actions.

**Palmer Project –** Explorations are ongoing by Constantine Metal Resources at the Palmer Project mine site in the upper Chilkat River valley, as authorized by ADNR (exploration permit application number J20145690; ADNR, 2014a). According to Haines Borough managers (Earnest, 2013; Sosa, 2014), Constantine Metal Resources has made no commitment to go into production and, according to ADNR, there are no current applications to mine (ADNR, 2014b); therefore, any potential mine development or mineral production associated with this property is highly speculative. As this project is in the exploration stage, it is not being considered part of reasonably foreseeable future actions.

**Lace River Hydroelectric Project –** Green Power Development, LLC, received a conventional preliminary permit with the Federal Energy Regulatory Commission (FERC) to develop a hydroelectric project on a tributary of the Lace River. The Lace River Hydroelectric Project would have a capacity of 4,995 kilowatts. Kensington Mine could be a major purchaser of power from this project once it is developed (Hart and Chaney, 2012). The FERC preliminary permit was valid from September 15, 2010, through August 31, 2013. With the permit expired, this project is not being considered part of reasonably foreseeable future actions.

**Schubee Lake Hydroelectric Project –** AP&T received a FERC preliminary permit on November 30, 2010 (FERC, 2011), and completed a reconnaissance report in March 2012 for the Schubee Lake Hydroelectric Project, a small hydroelectric project located approximately 7 miles south of Skagway on the east side of Taiya Inlet. AP&T is still in the process of applying for a license and released an economic analysis of the project in March 2013 (AP&T, 2013). With no permit or license, this project is not being considered part of reasonably foreseeable future actions.

### 4.9.2 Cumulative Impact Analysis

Alternatives were analyzed to determine if they would have either direct or indirect effects on area resources. Numerous past, present, and reasonably foreseeable impacts were identified that, in combination with direct or indirect impacts, would result in cumulative impacts. Resources that would not have direct or indirect impacts from project alternatives were not evaluated for cumulative impacts. Further, resources that could potentially have direct or indirect impacts from project alternatives, but were not affected by any past, present, or reasonable foreseeable actions, were not evaluated for cumulative impacts. Potential cumulative effects were identified for the following resource areas: land use, visual resources, historical and archaeological resources, economics, social effects, water quality, air quality, noise, wetlands, marine fish habitat, terrestrial habitat, wildlife, bald eagles, and threatened and endangered species. The cumulative impact analysis is projected to the year 2055.

#### 4.9.2.1 Land Use

**Alternative 1B –**Alternative 1B would improve opportunities for access to recreation in the vicinity of Haines and Skagway by increasing the frequency of travel, but would not provide new locations for recreational access. It would not provide access to large areas of Lynn Canal in the same way as Alternatives 2B and 3. The USFS would not likely add trails along the east or west side of Lynn Canal if this alternative was pursued.

**Alternatives 2B and 3 –** Alternatives 2B and 3 would make the east side or west side of the Lynn Canal substantially more accessible to recreational uses such as hunting, fishing, hiking, boating, and camping. The USFS envisions trails from DOT&PF pullouts and has indicated that the following trails are reasonably foreseeable (Dilger, 2012):

- Alternative 2B
    - Sawmill Creek Trail
    - Slate Creek Cove to Comet Cove Trail
    - Yeldagalga Creek Trail
    - Katzehin River Trail
- Alternative 3
    - Sawmill Creek Trail
    - Expanded day use facilities, trailhead and trail at William Henry Bay
    - Sullivan River Trail
    - Glacier River/Davidson Glacier Trail

Outdoor recreation is a principal leisure time activity for Juneau, Haines, and Skagway residents. The improved access provided by Alternatives 2B and 3 and USFS trails, and the increase in visitors to the region expected with these highway alternatives would increase the use of the recreational resources along the coastline of either the east side or the west side of Lynn Canal. It is also likely to increase commercial ventures related to outdoor activities such as recreational equipment retail stores and guide services. These direct and indirect effects on recreational activity would contribute to a cumulative effect on land use in the area by contributing to an increase in the amount of users.

The Kensington Mine presently employs about 250 mine workers and 100 contractors. Coeur Alaska built employee bunkhouses that sleep up to 216 to accommodate a work schedule for employees who work 4 days on and 3 days off, or 2 weeks on followed by a week off (Stigall, 2012). If the mine's employment grows, however, it is possible that some population growth could occur in Lynn Canal and increase use of recreational lands.

Alternative 2B, in combination with Goldbelt development between Echo Cove and Cascade Point and USFS trails at Sawmill Creek and Slate Cove, would change the remote character of recreation in the Berners Bay area. The introduction of these facilities would increase boat and plane traffic in the bay area, introduce automobile traffic, and increase the number of hikers and campers in the region. While recreation in most of the Berners Bay area would remain largely a remote experience, it would not have the characteristics that currently exist.

The cumulative effect of improved access to recreational opportunities associated with Alternative 2B or 3 and increased population brought to the area by the reasonably foreseeable future actions would likely be perceived as a negative impact by those who enjoy the existing primitive nature of the region, including some outfitters who currently provide wilderness trips there. Those who would take advantage of the new outdoor recreation opportunities, however, would perceive increased access as beneficial.

**Alternatives 4A through 4D –** Alternatives 4A through 4D would improve opportunities for recreation in the vicinity of Haines, Skagway, and in the case of Alternatives 4B and 4D the southern end of Berners Bay, but would not improve recreational access to large areas of Lynn

Canal in the same way as Alternatives 2B and 3. The potential for Goldbelt developments from Echo Cove to Cascade Point and the planned USFS trail at Sawmill Creek would provide additional recreational opportunities. The direct and indirect effects of Alternatives 4B and 4D on recreation in Berners Bay could contribute to a cumulative effect with the proposed Goldbelt dock at Cascade Point, USFS trail, and increased population brought to the area by the reasonably foreseeable future actions. This effect would likely be perceived as a negative impact by those who enjoy the existing natural setting of the area. However, those who would take advantage of the new recreational opportunities would perceive increased access as beneficial.

#### 4.9.2.2 Visual Resources

Alternatives 2B, 3, 4B, and 4D would increase the visual presence of man in primarily a natural landscape, most noticeably in views from ferries and boats. The Goldbelt Cascade Point dock would be visible from a few locations in Berners Bay. The 40-acre clear cut on Goldbelt land, the Kensington Gold Mine’s Slate Cove marine facility, and the Kasidaya Creek (formerly Otter Creek) Hydroelectric Plant on Kasidaya Creek are visible from the water and parts of Glacier Highway; the 40-acre clear cut on Goldbelt land would be more visible if the permitted quarry is developed. These views of the coastline would be minor in relation to the number of views that would include a highway paralleling the coastline, particularly along the east side of Lynn Canal, where a highway would be visible at many locations because of topography and vegetative cover. The cumulative visual effect for any of these alternatives would be substantial, but the contribution from other reasonably foreseeable projects would be small because little commercial development other than mining is active in the region and the planned developments would be visible from only a few locations in Berners Bay.

#### 4.9.2.3 Historical and Archaeological Resources

The increased number of visitors associated with the improved access of either Alternative 2B or 3, in combination with the potential increase in population and USFS trail developments, would boost independent and guided outdoor recreation in the Lynn Canal region. These activities would increase the potential for discovery of currently unknown historic and prehistoric cultural sites or the loss of cultural resources through souvenir hunting at known and unknown sites. The cumulative effect on cultural sites for any of these alternatives would be beneficial if new sites were located and reported undamaged, but the effect would be negative if known or unknown sites are looted by artifact hunters. This incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

None of the proposed project alternatives would have a direct adverse effect on the historical mining districts in the region that would contribute to a cumulative effect. The population growth and increased visitors associated with Alternatives 2B and 3 combined with potential population growth in Juneau and Haines and improved access could result in cumulative effects to elements of the District through vandalism or artifact hunting.

#### 4.9.2.4 Economics

In the 2006 Final EIS, Kensington Mine was identified as a reasonably foreseeable future action that would contribute to the cumulative socioeconomic effects in the area, particularly with respect to increased population. With the mine now operational, the anticipated population effects have been less than expected because of the number of employees who commute to the area from outside Lynn Canal (Hart and Chaney, 2012). Kensington presently employs 350 mine workers (Zigarlick, 2012). Bunkhouses are available onsite and can accommodate up to 216 people. Employees work in multiple-day to 2-week shifts, returning to their homes in Southeast Alaska or outside the area during their time off work (Stigall, 2012).

**Alternative 1B –** In 2055, Alternative 1B is estimated to add about 15 new jobs in Juneau and increase population by 23, add 10  new jobs in Skagway and increase population by 15. Five new jobs are estimated to be added in Haines and population would increase by 8. Alternative 1B would not substantially influence population growth in the region. These increases could contribute to a cumulative increase in population growth should continuing Kensington Gold Mine development bring new jobs and new residents to the Lynn Canal communities. Alternative 1B would not contribute to a cumulative effect on population in Haines.

Alternative 1B is expected to increase visitor spending and generate additional sales tax dollars in Juneau, Haines, and Skagway. No other reasonably foreseeable action is anticipated to have an effect on sales tax revenue in the area as a result of increased population. The CBJ and the State of Alaska expect to receive approximately $10.1 million from Kensington Gold Mine taxes over the 10-year life of that project.

**Alternative 2B –** Alternative 2B is projected to create about 130 new jobs in Juneau in 2055. The new jobs could result in a population increase of about 195 residents in Juneau. Job growth from Alternative 2B would also lead to population growth in Haines and Skagway of 90 and 120 residents, respectively. These increases could contribute to a cumulative increase in population growth should continuing Kensington Gold Mine development bring new jobs and new residents to the Lynn Canal communities.

Alternative 2B is expected to increase visitor spending, which would generate additional sales tax dollars in Juneau, Haines, and Skagway of more than $1.3 million annually in the three communities. No other reasonably foreseeable action is anticipated to have an effect on sales tax revenue in the area as a result of increased population. The CBJ and the State of Alaska expect to receive approximately $10.1 million from Kensington Gold Mine taxes over the 10-year life of that project.

**Alternative 3 –** Alternative 3 is projected to provide 105 new jobs in Juneau, resulting in an increase of about 158 by 2055. Job growth from Alternative 3 would also lead to population growth in Haines and Skagway of 23 and 75 residents, respectively. These increases could contribute to a cumulative increase in population growth should continuing Kensington Gold Mine development bring new jobs and new residents to the Lynn Canal communities.

Alternative 3 is expected to increase visitor spending, which would generate additional sales tax dollars in Juneau, Haines, and Skagway of nearly $1.1 million annually in the three communities combined, most of which would be generated in Juneau. No other reasonably foreseeable action is anticipated to have an effect on sales tax revenue in the area as a result of increased population. The CBJ and the State of Alaska expect to receive approximately $10.1 million from Kensington Gold Project taxes over the 10-year life of that project.

**Alternatives 4A, 4B, 4C, and 4D –** Alternatives 4A, 4B, 4C, and 4D are estimated to add about 5 to 40 new jobs in Juneau by 2055, resulting in an increase of about 8 to 60 people in Juneau by 2055. In Haines, Alternatives 4A, 4B, and 4D are estimated to add 5 to 20 new jobs and 8 to 30 new residents. Alternative 4C is not expected to increase the number of jobs or population in

Haines. In Skagway, Alternatives 4A, 4B, 4C, and 4D would increase the number of jobs by about 5 to 25 and the number of new residents by 8 to 38. These increases could contribute to a cumulative increase in population growth should continuing Kensington Gold Mine development bring new jobs and new residents to the Lynn Canal communities.

Increased visitor spending would generate between $36,000 and $401,000 per year in additional sales tax for the three communities combined. No other reasonably foreseeable action is anticipated to have an effect on sales tax revenue in the area as a result of increased population. The CBJ and the State of Alaska expect to receive approximately $10.1 million from Kensington Gold Mine taxes over the 10-year life of that project.

#### 4.9.2.5 Social Effects

The increased population and visitors associated with improved access, particularly with Alternatives 2B and 3, the now operating Kensington Gold Mine, and the reasonably foreseeable Goldbelt developments near Echo Cove, would reduce the isolation of Juneau, Skagway, and Haines and provide economic stimulation. Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to the quality of life by some. Others would feel that their quality of life is diminished by reducing their isolation and bringing more people into the region.

#### 4.9.2.6 Water Quality

The proposed project alternatives and reasonably foreseeable projects would have the greatest cumulative water quality effects in Berners Bay. The Kensington Gold Mine has increased marine traffic and associated hydrocarbon discharges in Berners Bay. The mine and reasonably foreseeable Goldbelt developments near Echo Cove have the potential to introduce stormwater runoff and treated wastewater discharges to the bay. Alternative 2B could add to pollutant loading in Berners Bay from stormwater runoff. Based on stormwater runoff studies in Alaska, this cumulative contribution to water quality impacts would not be measurable. Alternatives 3, 4B, and 4D would further increase marine traffic in Berners Bay. Based on the existing water quality of the bay and past evidence of water quality impacts associated with marine traffic in Lynn Canal, the cumulative increase in marine traffic associated with Alternatives 3, 4B, and 4D in combination with current and reasonably foreseeable projects is not expected to exceed AWQS in Berners Bay.

#### 4.9.2.7 Air Quality

**Alternative 1B –** This alternative could result in some increases in air pollutants and particulates due to marine emissions.

**Alternatives 2B and 3 –** These alternatives could result in some increases in air pollutants and particulates due to vehicular and marine traffic emissions.

**Alternatives 4A through 4D –** These alternatives could result in some increases in air pollutants and particulates due to marine emissions.

**Air Quality Cumulative Effects –** Area air quality has been affected by several past and present events, including marine vessel operations, urban area emissions (e.g., motor vehicle emissions, heating systems, and fugitive emissions), mining, and timber harvesting, but lingering effects are not observable. Alaska does not have a statewide air toxics emission inventory to assess the impact of these urban environments to the air quality of Lynn Canal. However, the air quality within the northern Lynn Canal area is considered very good due to the low level of air pollution sources. On rare occasions, elevated concentrations of $PM_{10}$ may exist in the project area when smoke from forest fires is carried south from the Yukon under northerly winds. The Kensington Gold Mine contributes to air pollutant emissions with its six diesel-powered generators as its primary power supply, smaller generator units at various facilities, and vehicles (Zigarlick, 2012). In addition, the mine contributes to particulate emissions from the tailings facility, borrow pits, rock crushing, and mine haul roads. These emissions were modeled as part of the Kensington Gold Project Supplemental EIS; the resulting pollutant concentrations were found to be below federal and State air quality standards and Prevention of Significant Deterioration requirements for the build alternatives.

Reasonably foreseeable actions, including mining, Goldbelt developments, logging, and increased urban emissions with population growth, would affect air quality within the project region. Potential Goldbelt land development and construction would cause localized, short-term increases in air emissions in the area (e.g., particulates or CO). Potential development in the area would also increase air pollutant emissions from other sources, such as combustion from heating of buildings, aircraft and watercraft use, and wood burning.

The limited amount of logging projected over the 30-year study period would primarily contribute to particulate matter from logging equipment operating in the woods and on unpaved logging roads. There would also be a relatively small increase in air pollutant emissions from the engines of logging equipment.

The reasonably foreseeable projects in the Lynn Canal region are located several miles apart and therefore would not have a cumulative impact for non-reactive pollutants, such as most particulates and CO. Where the highway associated with Alternative 2B passes by the Kensington Gold Mine and the area of potential Goldbelt developments, concentrations of particulates and CO would be increased by a few percent, but would still be well below air quality standards. The volume of reactive pollutants such as $NO_x$ and reactive organic gases from the proposed project and reasonably foreseeable projects would be too small in combination with background concentrations to result in the formation of substantial concentrations of $O_3$.

Some comments on the 2014 Draft SEIS requested additional analysis of air quality impacts resulting from new ferry vessels idling at active marine centers. One comment suggested that additional ferry operations at existing ports could contribute to a cumulative effect on air quality at those locations. DOT&PF conducted a Ferry Vessel Air Quality Analysis to investigate the potential effects of ferry emissions associated with each JAI Project alternative on ambient air quality at port and terminal locations (see Attachment 1 of the *2017 Update to Appendix T – Air Quality Modeling Memorandum* in Appendix Z).

The Ferry Vessel Air Quality Analysis estimated annual ferry vessel emissions for each of the alternatives within 25 miles of each port or ferry terminal, accounting for the duration of the trip on arrival, idling in port, and the duration of the trip on departure. For origins and destinations within a distance of less than 25 miles from each another, such as Haines and Skagway, the durations of vessel trips between the two ports were split evenly. Haines and Skagway are the only active marine centers where the project alternatives would increase marine traffic and potentially contribute to a cumulative air quality impact from marine vessel operations. The *Alaska Rural Communities Emission Inventory* (ADEC, 2007) provides estimates of total annual marine vessel emissions for Haines and Skagway-Angoon. These emissions are compared to the ferry vessel emissions estimates for each alternative in Table 4-87.

The estimated ferry emissions of Alternative 1 – No Action are included in the existing conditions emissions totals for Haines and Skagway; therefore, the emissions associated with each potential action alternative would displace the emissions of Alternative 1 – No Action in the total emissions values. As indicated in Table 4-87, the amount of ferry vessel emissions under each alternative would be a small portion of the existing marine vessel emissions for each of these communities and would not contribute substantially to a cumulative air quality impact.

**Table 4-87:**
**Alternative Ferry Vessel Emissions Compared to Total Marine Vessel Emissions in Haines and Skagway (tons/year)**

| Port/ Community[1] | Alternative | Pollutant | | | | |
|---|---|---|---|---|---|---|
| | | CO | $NO_x$ | VOC | PM | $SO_x$ |
| **Haines** | Total Marine Vessel Emissions[1] | 46.45 | 285.32 | 6.426 | 12.69 | 103.75 |
| | Alternative 1 – No Action | 0.76 | 10.80 | 0.11 | 0.13 | 0.01 |
| | Alternative 1B | 1.28 | 18.18 | 0.18 | 0.22 | 0.02 |
| | Alternative 2B | 1.75 | 28.04 | 0.28 | 0.36 | 0.03 |
| | Alternative 3 | 2.09 | 37.67 | 0.38 | 0.51 | 0.04 |
| | Alternative 4A | 2.15 | 44.67 | 0.45 | 0.63 | 0.05 |
| | Alternative 4B | 2.78 | 55.27 | 0.55 | 0.77 | 0.06 |
| | Alternative 4C | 0.74 | 15.00 | 0.15 | 0.21 | 0.02 |
| | Alternative 4D | 1.63 | 24.47 | 0.25 | 0.30 | 0.03 |
| **Skagway-Angoon[2]** | Total Marine Vessel Emissions[1] | 204.84 | 1379.81 | 38.682 | 78.69 | 570.64 |
| | Alternative 1 – No Action | 1.13 | 13.56 | 0.14 | 0.15 | 0.02 |
| | Alternative 1B | 2.05 | 29.74 | 0.30 | 0.36 | 0.03 |
| | Alternative 2B | 7.03 | 78.72 | 0.80 | 0.82 | 0.09 |
| | Alternative 3 | 2.05 | 34.33 | 0.34 | 0.45 | 0.04 |
| | Alternative 4A | 7.12 | 91.65 | 0.93 | 1.05 | 0.10 |
| | Alternative 4B | 4.16 | 65.99 | 0.66 | 0.84 | 0.07 |
| | Alternative 4C | 2.31 | 27.69 | 0.28 | 0.30 | 0.03 |
| | Alternative 4D | 2.22 | 27.09 | 0.27 | 0.30 | 0.03 |

[1] From ADEC (2007).

[2] Note that the existing emissions for Skagway include emissions from all the smaller populated areas that are within the Skagway-Angoon inventory area and are therefore higher than what would be present only in Skagway.

**Climate Change –** Cumulative impacts on air quality are a concern with respect to GHG emissions, which contribute to global warming. Increased ocean acidification is also linked to climate change (see Section 4.7.9, Climate Change). Alaska's GHG emissions are growing at a much faster pace than those of the nation as a whole. From 1990 to 2005, Alaska's gross GHG emissions increased by 30 percent, while national gross emissions rose by 16 percent. Emission rates and growth in Alaska are driven by emissions from the industrial and transportation sectors, which are much higher per capita than the national average. From 2005 to 2025, emissions from transportation fuels are projected to rise by 0.85 percent per year. The largest percentage increase in emissions over this time period is seen in on-road diesel fuel consumption, which is projected to increase by 9 percent from 2005 to 2025 (Alaska Climate Change Sub Cabinet, 2009).

Alaska has several active initiatives to address climate change issues, reduce GHG emissions, and support clean energy. On-road transportation emissions can be reduced through a combination of policies that improve vehicle fuel efficiency, substitute gasoline and diesel with lower-emission fuels, and reduce vehicle travel. The use of alternative fuels is more challenging in Alaska than in other states because of the arctic climate and distance from the fuel production and distribution networks available in the contiguous United States. In particular, biofuels present operational challenges in cold climates. Because of these challenges, additional research on appropriate alternative fuels for use in Alaska is needed. Alaska is also adopting a policy that would reduce GHG emissions by reducing vehicle travel and providing facilities for bicyclists and pedestrians (ADEC, 2008).

Ferry emissions comprise a larger proportion of transportation emissions in Alaska than in most other states. The easiest way to reduce ferry emissions is by improving the fuel efficiency of ferry boats.

In the future, cars are expected to be developed under more stringent fuel efficiency and emissions standards. It is also expected that more efficient fuels and fuel efficiencies would be developed for marine and aviation. These improvements in emissions and fuel efficiency are expected to help reduce GHG emissions.

Trees removed from the road corridor represent a permanent loss of carbon sequestration. While the loss of trees would be negligible in the context of the Southeast Alaska coastal rainforest, this loss would contribute only in minor ways to cumulative global reduction in carbon sequestration.

The JAI Project under any alternative would result in GHG emissions because both automobiles and ferries consume fossil fuel, and the project therefore would contribute to the global cumulative effect of such emissions (see Section 4.7.9). However, it is not possible to determine the contribution of one project to climate change or its effects on ocean acidity, sea level rise, or storm intensity.

#### 4.9.2.8 Noise

The principal direct noise source from project alternatives would be highway traffic noise on those alternatives that include construction of a highway. These alternatives are discussed in the following text.

**Alternative 1B –** The amount of traffic noise associated with this alternative would be comparable to existing conditions and would not directly contribute to a cumulative effect with the reasonably foreseeable future actions, which are dispersed through the project area.

**Alternative 2B –** This alternative would introduce a new noise source in an area that is principally undeveloped, adding traffic noise to existing intermittent man-made noises from helicopters, airplanes, jet boats, and other vessels in Lynn Canal and Berners Bay. Ambient noise measurements along the shoreline of Lynn Canal ranged from 35 to 52 dBA, depending on weather conditions and proximity of streams. Taking the average of about 40 dBA and using simple noise attenuation theory (explained in Appendix L and Section 4.7.7 discussions on noise), traffic noise is estimated to be at background levels at approximately 200 to 250 feet from centerline along the coastline.

Use of haul trucks for the Kensington Gold Mine contributes vehicular traffic noise in that area. The reasonably foreseeable Goldbelt development in the Echo Cove area would generate vehicular traffic noise and, in the case of the quarry, heavy equipment, rock crushing, and excavation noise. A cumulative effect of increased noise over ambient levels would occur along the Glacier Highway Extension and at Slate Cove, where the Kensington Gold Mine access road would be close to the Alternative 2B highway alignment. No residences would be affected, and vehicular noise levels are anticipated to have negligible effects on wildlife due to the predicted volume of traffic.

Ambient noise in Berners Bay includes boat and plane noise. This would increase with the reasonably foreseeable developments in the bay, along with the addition of vehicle noise. This would further change the remote experience in Berners Bay, particularly for kayakers and other non-motorized users.

**Alternatives 3, 4B, and 4D –** The traffic noise under Alternatives 3, 4B, and 4D would be the same as discussed above for Alternative 2B from Echo Cove to Sawmill Cove. The Alternative 3 highway segment on the west shore of Lynn Canal is not discussed here because the only future foreseeable actions that would generate noise are located in Berners Bay.

#### 4.9.2.9 Wetlands

Alternative 2B would result in the loss of approximately 61 acres of wetlands. Alternative 3 would result in the loss of 27 acres of wetlands. Alternatives 4B and 4D would fill 2.5 acres of wetlands. The majority of the wetlands filled by any of the project alternatives would be palustrine forested wetlands. Specific breakdowns of wetland types by alternative and sub-region are presented in Sections 4.3.12, 4.4.12, and 4.6.12. Indirect effects could occur due to the introduction of invasive plant species from increased access, accidental spills from vehicles, and damage caused by ORVs.

The USFS and USACE identified past projects that have resulted in the loss of approximately 11 acres of palustrine wetland on the east side of Lynn Canal (USFS, 2003; USACE, 2005). The Kensington Gold Mine resulted in the loss of 36 acres of wetlands (and 24 acres of open water habitat) with all but 7 acres of wetland to be restored at the end of the project. Development of the Glacier Highway Extension resulted in the loss of approximately 5 acres of forested wetland. The acreage of wetland losses as a result of reasonably foreseeable future actions is unknown but the types of wetlands lost would be primarily on forested and scrub-scrub wetlands.

**Wetland Cumulative Effects –** The maximum known cumulative loss of approximately 100 acres of wetlands from , Alternative 2B and past activities in the corridor constitute approximately 1 percent of the total wetlands on the east side of Lynn Canal. The affected wetlands are relatively abundant within the Lynn Canal region and Berners Bay, and there are no known adverse effects on threatened, endangered, or sensitive species or habitats. The loss of these wetlands would not adversely affect the overall diversity of regional wetland habitats.

#### 4.9.2.10 Marine Fish Habitat (Including Essential Fish Habitat)

**Alternative 1B –** Alternative 1B would operate from existing terminals in Auke Bay, Lutak Inlet, and Taiya Inlet and would not have additional physical impacts to marine fish habitat and

EFH from construction. This alternative, therefore, would not contribute to a cumulative effect on these resources. Additional ferry operations associated with Alternative 1B would have a negligible cumulative effect on these resources.

**Alternatives 2B, 3, 4B, and 4D – Lynn Canal and Berners Bay** – Alternatives 2B and 3 would fill a total of 28 and 11.6 acres of marine habitat in Lynn Canal, respectively. The Goldbelt dock at Cascade Point would fill about 1.3 acres of beach/intertidal habitat. The Kensington Gold Mine marine facility in Slate Cove filled approximately 2 acres of intertidal habitat. The cumulative loss of marine habitat in Lynn Canal would total about 14.6 to 31.3 to 14.9 acres with Alternatives 2B and 3, respectively. From the standpoint of the entire Lynn Canal region, this would be a relatively small cumulative impact.

Alternatives 3, 4B, and 4D would fill approximately 1.9 acres of intertidal and subtidal habitat in Sawmill Cove. Dredging would occur in 1.2 acres of subtidal habitat for the Sawmill Cove mooring basin. In addition, the proposed Goldbelt dock would dredge approximately 1.4 to 1.6 acres of subtidal habitat in Berners Bay. If Alternative 3, 4B, or 4D were chosen and the Goldbelt Cascade Point terminal was constructed, there would be approximately 4.7 acres of marine habitat affected by filling and dredging in the Berners Bay area. This loss would not appreciably alter fish or invertebrate populations in Berners Bay or Lynn Canal.

The Goldbelt dock at Cascade Point and the proposed DOT&PF Sawmill Cove Ferry Terminal (Alternatives 3, 4B and 4D) would affect Pacific herring spawning habitat, and operations of these facilities would displace some Pacific herring eggs and larvae in the immediate vicinity of the facilities. The footprint of the Sawmill Cove Ferry Terminal impact is approximately 300 feet (0.06 mile) of shoreline at mean lower low water, which is equivalent to less than 2 percent of the alongshore herring spawning length (approximately 3 miles) observed in Berners Bay in 2003. The footprint of the Cascade Point dock would cover 400 feet of shoreline. Combined with Alternative 3, 4B, or 4D, the cumulative loss of herring spawning habitat in Berners Bay would be 4.4 percent.

NMFS, EPA, and ADF&G have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternatives 3, 4B, and 4D in conjunction with Kensington Gold Mine and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock. Both NMFS and ADF&G believe special conservation measures, including no operations during the herring spawning period, would be necessary.

It should be noted that DOT&PF has committed to investigating a joint use facility at Cascade Point if Goldbelt’s marine facility appears imminent and the selected project action requires a ferry terminal in Berners Bay. This facility would reduce the potential cumulative impact to herring spawning habitat and EFH.

**Alternatives 4A through 4D – Auke Bay** –Alternatives 4A through 4D in combination with the Alaska Glacier Seafoods Plant and Statter Harbor facility improvements would result in the loss of about 5.6 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. Other marine facilities have been constructed in Auke Bay including the Auke Bay Ferry Terminal, a boat launch ramp, several marinas, including fueling facilities, a harbor master’s office, associated parking, and residential and commercial wastewater discharge facilities. Although the acreage of affected intertidal and subtidal habitat has not been computed, development occurs all along the waterfront of Auke Bay. A larger proportion of most of the facilities is on the surface of the water away from the nearshore habitat (such as the finger float system of a marina), and parts of the facilities occupy a smaller portion of intertidal or subtidal habitat (such as a staging dock and access ramp). In such instances, the amount of the nearshore habitat affected is not commensurate with the size of the entire development. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

#### 4.9.2.11 Terrestrial Habitat

The maximum terrestrial habitat loss associated with the proposed project is approximately 430 acres under Alternative 2B. Past impacts to terrestrial habitat have occurred due to timber harvests and mine developments, including 120 acres at the Kensington Gold Mine. The Kasidaya Creek Hydroelectric Project affected about 6 acres of terrestrial habitat. The Glacier Highway Extension removed approximately 36 acres of terrestrial habitat. The reasonably foreseeable actions by Goldbelt in the Echo Cove area could result in clearing approximately 14 acres of terrestrial habitat. Channel Construction’s proposed 40-acre quarry in the Echo Cove area would remove all vegetation from previously clear-cut lands. The proposed USFS trails would result in the direct loss of an unknown area of terrestrial habitat, primarily forested and shrub vegetation. Together, these losses result in a cumulative loss of approximately 640 acres of terrestrial habitat. This cumulative loss represents about 0.5 percent of the estimated 117,000 acres of terrestrial habitat in the Lynn Canal region. This loss would not represent a substantial loss of terrestrial habitat and it would not adversely affect any rare or unique vegetation community types or any known rare or sensitive plant species.

About 240 acres of the terrestrial habitat that would be affected by past, present, and reasonably foreseeable future actions are located around Berners Bay. This would represent less than 3 percent of the estimated 8,030 acres of terrestrial habitat in the Berners Bay area. However modest, the loss of OG forest and other terrestrial habitat as a result of the project, in conjunction with past and future losses, would be a cumulative effect.

Alternative 3 would affect about 400 acres of terrestrial habitat primarily on the west side of Lynn Canal. The proposed USFS trails would result in the direct loss of an unknown but small area of terrestrial habitat, primarily shrub vegetation. This alternative would provide access for possible logging on private land and land owned by the University of Alaska on the west side of Lynn Canal. Even if all of this private and University land were cleared, the cumulative loss would still represent a small percentage of the terrestrial habitat in the Lynn Canal region because of the small area of private and University land along the highway alignment (see Figures 3-1 and 3-2).

#### 4.9.2.12 Wildlife

**Marine Mammals** – Alternatives 3, 4B, and 4D would increase the marine traffic in Berners Bay with shuttle ferries. In addition, increased access would increase the recreational use of Berners Bay. Although no boat ramp facilities would be constructed at Sawmill or Slate coves, personal craft could be launched at these locations. Disturbance from increased recreational and commercial marine traffic and increased recreational uses of beaches may cause harbor seals to periodically leave some haulouts. The Kensington Gold Mine shuttle ferry may disturb harbor seals. However, harbor seals use a variety of haulouts. There are alternative spots for them to rest if they are temporarily displaced from a particular location. Therefore, the cumulative increase in disturbance at haulouts is not likely to affect the survival or reproductive success of this species. Increased marine traffic would increase the risk of vessel collisions with minke whales and sea otters. This increased risk is not likely to affect populations of these species in Lynn Canal.

**Marine Birds –** Marine birds nest in wetlands and OG forest in Berners Bay. Alternatives 2B, 3, 4B, and 4D highway maintenance activities and vehicle traffic are likely to inhibit marine birds from nesting, resting, or foraging near the highway. The Glacier Highway Extension and Kensington Gold Mine facilities likely have an effect on use of the area by marine birds. The maximum area of terrestrial habitat that would be cumulatively affected by the JAI Project and reasonably foreseeable projects is about 640 acres. Much of this would be OG forest including forested wetlands. Approximately 240 acres of the affected habitat would be in Berners Bay. This would represent less than 1 percent of the nesting, resting, and foraging habitat in Lynn Canal and less than 3 percent of these habitats in the Berners Bay area. Therefore, the cumulative effect is not expected to have population-level effects on any marine bird species.

**Terrestrial Mammals –** Cumulative effects to terrestrial mammals, including black and brown bears, mountain goats, wolverines, wolves, and moose, would occur as a result of habitat loss and fragmentation. As indicated, the maximum cumulative terrestrial habitat loss associated with the proposed project and reasonably foreseeable projects is approximately 640 acres under Alternative 2B. This loss represents about 0.5 percent of the estimated 117,000 acres of terrestrial habitat in the Lynn Canal region. The direct loss of habitat for terrestrial mammals from the proposed project would be minor compared with the overall available habitat.

About 240 acres of the terrestrial habitat that would be cumulatively affected is located in Berners Bay. This would represent less than 3 percent of the estimated 8,030 acres of terrestrial habitat in Berners Bay. Berners Bay is important habitat for numerous species of terrestrial mammals, particularly black and brown bears that come to the area to feed during salmon spawning season. The direct loss of this habitat would also be minor compared with the overall available habitat in the bay region.

A more important factor than direct habitat loss is the potential for the highway to fragment habitat for species sensitive to human presence. In Lynn Canal, species such as black bears, brown bears, and moose move seasonally between higher elevation and lower elevation foraging habitat, and tend to avoid highway traffic. The highway could present a barrier to wildlife movement, resulting in the loss of important lower-elevation habitats such as salt marsh vegetation and concentrations of salmon at river mouths. For Alternative 2B, the highway could reduce the habitat capability of the east side of Lynn Canal for species such as brown bear by 26 percent compared to present conditions. Alternative 3 would also present a similar barrier to wildlife movement on the west side of the canal. Because the highway for Alternatives 4B and 4D is relatively short (2.3 miles of new highway), habitat fragmentation for wildlife would be minor.

Of the past, present, and reasonably foreseeable projects in the Lynn Canal area, the Kensington Gold Mine development, when combined with Alternative 2B or 3 would contribute to cumulative impacts to brown bears. The Kensington Gold Mine development resulted in the loss of approximately 120 acres of habitat. A relatively small amount of that habitat loss was concentrated at higher elevations than the Alternative 2B alignment and would not contribute to substantial habitat fragmentation. The habitat affected by the Kensington Gold Mine is small relative to the amount that would be affected by Alternative 2B. The majority of the impact of

Alternatives 2B and 3 would be from the creation of a potential barrier for wildlife moving between wintering habitat and important spring and fall coastal habitats. This impact would be partially mitigated by wildlife underpasses included in the design of the Alternative 2B highway alignment.

The Kensington Gold Mine development, when combined with Alternatives 2B or 3, would also have a cumulative impact on mountain goats. The Kensington Gold Mine removed some mountain goat foraging habitat on the east side of Lynn Canal. Alternatives 2B and 3 would create a barrier to movement of goats to rocky bluffs on the coast in winter. This impact would be partially mitigated by monitoring in order to ensure that the combination of legal hunting, the road, and mining does not have population-level effects.

Alternatives 2B and 3 would result in increased human-wildlife interactions, hunting, and trapping. The Jualin Road improvements and proposed USFS trails create the potential for a cumulative increase in human-wildlife interactions, resulting in increased pressure on wildlife populations.

**Terrestrial Birds –** Terrestrial birds nest in wetlands and OG forest in Berners Bay. Alternative 2B, 3, 4B, or 4D highway construction would decrease available habitat. Construction and maintenance activities as well as vehicle traffic are likely to inhibit terrestrial birds from nesting, resting, or foraging near the highway alignment. The reasonably foreseeable future actions that involve clearing of terrestrial habitat would cause similar impacts. The area of terrestrial habitat that would be cumulatively affected by the JAI Project and reasonably foreseeable projects is about 640 acres. Much of this would be OG forest, including forested wetlands. Approximately 240 acres of the affected habitat would be in Berners Bay. This would represent a small percentage of the nesting, resting, and foraging habitat in Lynn Canal and the Berners Bay area. Therefore, this cumulative effect would not have population-level effects on any terrestrial bird species.

#### 4.9.2.13 Amphibians

The project alternatives avoid wetlands and open water that amphibians use. By avoiding breeding habitat, the alternatives may affect individual amphibians but would not measurably affect population levels. Therefore, the project would not have a cumulative impact on amphibian populations.

#### 4.9.2.14 Bald Eagles

Past, present, and reasonably foreseeable projects in combination with the proposed project would result in the loss of a small amount of habitat, no loss of known nest trees for bald eagles, and no measurable loss of food sources. In light of the ability for bald eagles to habituate to human presence, the cumulative impact of increased human presence in the region is not likely to have a population-level effect on bald eagles.

#### 4.9.2.15 Threatened and Endangered Species

**Humpback Whales –** The humpback whale recovery plan prepared for NMFS identifies a number of factors that could affect the reproductive success and survival of whales (NMFS, 1991). These factors include incidental take in fishing gear, collisions with ships, disturbance and displacement from commercial and recreational boat traffic, introduction of pollution and pathogens from runoff and waste disposal, disturbance and/or pollution from resource development, and effects on whale prey species from coastal development and fisheries. The JAI Project alternatives and the past, present, and future foreseeable projects in Lynn Canal include many of these factors and could contribute to a cumulative effect on Mexico DPS humpback whales.

Alternative 2B would increase stormwater runoff into Berners Bay. It could also intermittently increase marine traffic in Berners Bay. This could occur in the summer over two to three years if temporary AMHS summer ferry service is provided from Kensington Gold Mine's proposed Slate Cove terminal until the highway is completed between Slate Cove and the Katzehin terminal. It could also occur during winter road closures if the AMHS shuttle ferries run between Slate Cove and Skagway/Haines. The increased stormwater runoff associated with the highway would not substantially contribute to cumulative water quality impacts in Berners Bay. AMHS ferry operations in Berners Bay associated with Alternative 2B would, at most, only occasionally occur during the late April and early May herring and eulachon spawning periods; these ferry operations would not contribute to impacts on prey for threatened and endangered marine mammals.

Alternatives 3, 4B, and 4D would increase marine traffic in Berners Bay. This would be in addition to marine traffic created by the Kensington Gold Mine and existing commercial fishing vessels, tour vessels, and personal watercraft. This increased traffic would increase the risk of collisions between boats and humpback whales. Alternatives 4B and 4D would involve a high-speed ferry, which would further increase the risk of collisions with humpback whales (Laist et al., 2001). In the Biological Opinion on the Kensington Gold Mine, NMFS indicated that the use of observers during vessel operations and slow vessel speeds (speeds of 12 to 13 knots) during the spring foraging period should eliminate two of the primary factors associated with ship strikes (NMFS, 2005b).

Alternatives 3, 4B, and 4D in combination with the Kensington Gold Mine and reasonably foreseeable future Goldbelt development at Echo Cove may alter distribution of juvenile and adult forage fish in Berners Bay, which would pose potential risks to the humpback whales that forage in the bay. Individual whales may alter their behavior as a result of this effect and vessel noise in the bay, and in some cases reduced fitness of individuals may result. Because only a small number of whales are known to use Berners Bay (no more than about 18), NMFS did not expect that the Kensington Gold Mine would jeopardize population viability (NMFS, 2005b). However, as indicated in Sections 4.4.17.2 and 4.6.17.2, NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternatives 3, 4B, and 4D may adversely affect Mexico DPS humpback whales and would require formal consultation to determine whether cumulative impacts would jeopardize the species.

**Steller Sea Lions –**The effects of Alternative 2B on Steller sea lions could contribute to a cumulative effect on the species when considered with the effects of the reasonably foreseeable future actions that would introduce additional vessel traffic into Berners Bay and Lynn Canal, and have the potential to adversely affect water quality in the action area due to runoff from roads and sedimentation from in-water construction associated with marine-related infrastructure (i.e., pile driving, dredging, and in-water material placement in habitat for prey species). In addition, non-point and septic outfalls associated with increased development in the area (e.g., ground clearing activities and residential development) may affect aquatic prey species for Steller sea lions.

Based on information in the NMFS Biological Opinion for the Kensington Gold Mine, Alternatives 3, 4B, and 4D, in combination with reasonably foreseeable projects, including commercial fishing, recreational, and commercial marine traffic in the Berners Bay area, are likely to cause acute stress responses in some Steller sea lions exposed to this vessel traffic and noise. According to the conclusion of the NMFS Biological Opinion for the Kensington Gold Mine, this is not likely to impair the health of sea lions by depleting their energy reserves. However, NMFS is concerned that Alternatives 3, 4B, and 4D in combination with other reasonably foreseeable projects in Berners Bay could substantially affect populations of forage fish such as herring and eulachon. Such an impact may result in a depletion of energy reserve for some individual Steller sea lions. For example, in response to a reduction in the availability of herring or eulachon, Steller sea lions may have to behaviorally compensate by dedicating more time to foraging on species with less energetic value, which may result in a greater expenditure of energy for the same or less energy gain, or by relocating to other areas to feed which would also incur an energetic cost. In its Biological Opinion on the Kensington Gold Mine, NMFS concluded that the Kensington Gold Mine, in combination with an East Lynn Canal Highway (Alternative 2B) and Goldbelt development in the Echo Cove area, would not have a subpopulation or population effect on Steller sea lions (NMFS, 2005b). However, as indicated in Sections 4.4.17.1 and 4.6.17.1, NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternatives 3, 4B, and 4D may adversely affect Steller sea lions and would require formal consultation to determine the alternatives cumulative impact on this species.

### 4.9.3 Summary of Cumulative Impacts

#### 4.9.3.1 Alternative 1B

Alternative 1B would have few direct and indirect impacts to create cumulative impacts in Lynn Canal. Alternative 1B is not expected to contribute to a cumulative impact on Juneau’s current and future population.

Increased vessel traffic associated with Alternative 1B in combination with other foreseeable projects in the region would increase the volume of pollutants entering Lynn Canal, but this is unlikely to cause an exceedance of AWQS.

#### 4.9.3.2 Alternative 2B

Alternative 2B in combination with reasonably foreseeable development would change the remote character of recreation in Berners Bay. Boat, plane, and automobile traffic would increase in the region, as well as the number of hikers and campers. The visual presence of humans would increase, primarily in views from boats in the bay. Ambient boat and plane noise would increase with the reasonably foreseeable developments, along with the addition of vehicle noise. This would further change the remote experience in Berners Bay, particularly for kayakers and other non-motorized users.

The increased population and visitors associated with Alternative 2B and reasonably foreseeable development coupled with improved access would increase the potential for discovery of currently unknown cultural resource sites and increase the potential for adverse impacts to known and unknown cultural resources through vandalism. This incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

Most cumulative socioeconomic impacts would occur in Juneau and Haines as a result of increased visitor spending, new jobs, and increased sales tax revenue.

Cumulative development in Lynn Canal would reduce the sense of isolation and geographic separateness of Juneau, Skagway, and Haines. Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to quality of life by those that view the current degree of isolation as negative. It would be perceived as a reduction in the quality of life by those that value the current degree of isolation and separateness.

Increased marine traffic from the Kensington Gold Mine shuttle ferry, stormwater runoff from the Alternative 2B highway, the Kensington Gold Mine operations, and Goldbelt development at Echo Cove would result in a cumulative increase in pollutant loads to Berners Bay; however, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS.

The amount of air pollutant emissions would also increase in the Berners Bay region as a result of cumulative development. The amount of increase would not exceed NAAQS or AAAQS.

Alternative 2B would contribute to a cumulative loss of wetlands, representing about 1 percent of the total wetlands on the east side of Lynn Canal. The cumulative loss of wetlands in Berners Bay would be approximately 1.4 percent of the total wetlands in this area.

The permanent cumulative loss (dredged areas remain as habitat, but would be of lower value after dredging) of marine habitat in Lynn Canal would total about 31 acres. This impact is small and would be spread over about 40 miles of coast. There would be no cumulative impact to the marine habitat in Berners Bay resulting from Alternative 2B. For these reasons, the cumulative loss of marine habitat is unlikely to result in a substantial impact to fish or marine mammals.

The maximum area of terrestrial habitat that would be cumulatively affected by Alternative 2B and reasonably foreseeable projects is about 640 acres. Much of this would be OG forest. Approximately 240 acres of the terrestrial habitat that would be cumulatively affected is located in Berners Bay. This would have little impact on marine or terrestrial birds because it represents less than 1 percent of the terrestrial habitat available on the east side of Lynn Canal (3 percent in Berners Bay).

Alternative 2B in combination with reasonably foreseeable projects would result in cumulative impacts to terrestrial wildlife, primarily as a result of habitat fragmentation caused by the highway, increased access associated with Alternative 2B, and increased population associated with all of the reasonably foreseeable projects. Cumulative wildlife impacts of these actions would be focused primarily on Berners Bay. Habitat fragmentation would have the greatest impact on species sensitive to human presence, such as the brown bear. Alternative 2B in combination with reasonably foreseeable projects could have a population-level effect on brown bear in Berners Bay. Increased hunting and trapping would result from improved access to Berners Bay and increased population in Juneau. Increased hunting pressure, habitat loss, and habitat fragmentation would affect mountain goats in the Lynn Canal region. This impact is not anticipated to have a population-level effect due to population monitoring and corresponding hunting management.

#### 4.9.3.3 Alternative 3

The increased access and population growth associated with Alternative 3 and reasonably foreseeable development would increase the use of the recreational resources along the Lynn Canal coastline, particularly along the west side of the canal. The visual presence of humans in the region would increase, primarily in views from boats.

The increased population and visitors associated with Alternative 3, present development, and reasonably foreseeable development coupled with improved access would increase the potential for discovery of currently unknown cultural resource sites and increase the potential for adverse impacts to known and unknown cultural resources through vandalism. The incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

Most cumulative socioeconomic impacts would occur in Juneau and Haines as a result of increased visitor spending, new jobs, and increased sales tax revenue.

Cumulative development in Lynn Canal would reduce the sense of isolation and geographic separateness of Juneau, Skagway, and Haines. Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to quality of life by those that view the current degree of isolation as negative. It would be perceived as a reduction in the quality of life by those that value the current degree of isolation and separateness.

Increased marine traffic associated with Alternative 3, the Kensington Gold Mine, Goldbelt development at Echo Cove, stormwater runoff, and treated wastewater discharges from these developments would result in a cumulative increase in pollutant loads to Berners Bay; however, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS.

Alternative 3 would increase the amount of air pollutant emissions in Berners Bay with increased vessel traffic; however, considering existing and reasonably foreseeable future vessel emissions and other sources, the cumulative emissions of criteria pollutants would not exceed NAAQS or AAAQS.

The bulk of the wetland impacts caused by Alternative 3 would be on the west side of Lynn Canal. The cumulative impact of Alternative 3 and reasonably foreseeable development would include wetlands on the west side of Lynn Canal and Berners Bay. The maximum cumulative loss of wetlands in Berners Bay would be approximately 68 acres, or about 1.5 percent of the total wetlands in this area.

Alternative 3 in combination with other reasonably foreseeable marine development in Berners Bay would result in the filling and dredging of about 6 acres of marine habitat in Berners Bay. This impact is small relative to the total marine habitat available in the bay. However, NMFS, EPA, and ADF&G have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternative 3 in conjunction with Kensington Gold Mine and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock and forage fish important to Steller sea lions and humpback whales.

Most of the terrestrial habitat affected by Alternative 3 would be on the west side of Lynn Canal. This alternative would provide access for possible logging on private lands and lands owned by the University of Alaska on the west side of Lynn Canal. The cumulative loss of terrestrial habitat would represent a small percentage of the terrestrial habitat in the Lynn Canal region.

#### 4.9.3.4 Alternatives 4A and 4C

Alternatives 4A and 4C would have few direct and indirect impacts to create cumulative impacts in Lynn Canal. Alternative 4A would have a minor contribution to a cumulative impact on jobs and population growth. Increased vessel traffic associated with Alternatives 4A and 4C in combination with other foreseeable projects in the region would increase the volume of pollutants entering Lynn Canal, but this is unlikely to cause an exceedance of AWQS.

Alternatives 4A and 4C in combination with the Statter Harbor facility improvements and Alaska Glacier Seafoods Plant would result in the cumulative loss of about 5.6 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. This habitat is used for rearing by juvenile salmon, prey species, and crabs. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

#### 4.9.3.5 Alternatives 4B and 4D

Upgrading the Glacier Highway from Echo Cove and extending it to Sawmill Cove in combination with reasonably foreseeable projects would increase vessel use in Berners Bay. The visual presence of humans would increase in Berners Bay, affecting recreational boaters. Alternatives 4B and 4D would have a minor contribution to a cumulative impact on jobs and population growth.

Increased marine traffic associated with Alternatives 4B and 4D, the Kensington Gold Mine, Goldbelt development at Echo Cove, stormwater runoff and treated wastewater discharges from these developments would result in a cumulative increase in pollutant loads to Berners Bay; however, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS.

Alternatives 4B and 4D would increase the amount of air pollutant emissions in Berners Bay with increased vessel traffic; however, considering existing and reasonably foreseeable future vessel emissions and other sources, the cumulative emissions of criteria pollutants would not exceed NAAQS or AAAQS.

Alternatives 4B and 4D in combination with the Kensington Gold Mine and potential Goldbelt development at Echo Cove would result in the loss of about 6 acres of marine habitat in Berners Bay. This impact is small relative to the total marine habitat available in the bay. However, NMFS, EPA, and ADF&G have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternatives 4B and 4D in conjunction with the Kensington Gold Mine and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock and forage fish important to Steller sea lions and humpback whales.

Alternatives 4B and 4D in combination with construction of the Alaska Glacier Seafoods Plant and the improvements at Statter Harbor would result in the cumulative loss of about 5.6 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. This habitat is used for rearing by juvenile salmon, prey species, and crabs. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

## 4.10 The Relationship between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The build alternatives would permanently convert a maximum of approximately 680 acres of natural habitat, principally OG forest, to transportation facilities. This overall loss of habitat represents less than 1 percent of the natural habitat that exists in the Lynn Canal region.

The increase in population and visitors associated with improved transportation facilities in Lynn Canal would result in increased pressure on fish and wildlife species, principally big game and furbearing species such as bears, moose, deer, mountain goats, martens, and river otters, and game fish such as Pacific salmon, steelhead, and Dolly Varden, as a result of recreational hunting and fishing and collisions with vehicles. Project-related effects on populations of these species can be controlled through management plans implemented by ADF&G.

The long-term productivity of Lynn Canal region would be enhanced by a better transportation system to move goods, services, and people. Based on household surveys conducted in Juneau, Haines, and Skagway in 1994 and 2003 and the growth in traffic on transportation corridors adjacent to Lynn Canal, there is latent travel demand in the Lynn Canal corridor that cannot be met by existing AMHS service. In addition to serving local needs, the build alternatives would improve tourist/recreation travel and intra-regional movement, which could result in economic benefits to Juneau, Haines, and Skagway.

The long-term benefit of improved access in Lynn Canal is recognized in the State and local comprehensive planning for the region. Improving surface transportation in the region is consistent with the comprehensive plans of the CBJ (2008), the Municipality of Skagway Borough (2009), and the Haines Borough (2012a).

## 4.11 Irreversible and Irretrievable Commitments of Resources

Depending on the alternative selected, up to approximately 680 acres of land and intertidal and subtidal habitat would be committed to the proposed project. Construction of transportation facilities would result in the permanent commitment of energy, concrete, aggregate, asphalt, water, and other construction materials. For alternatives requiring construction, project construction costs ranging from $78 million to $680 million would be committed; these costs would be offset by savings in travel time and energy use and the economic stimulus of improved access to the communities of the Lynn Canal region.

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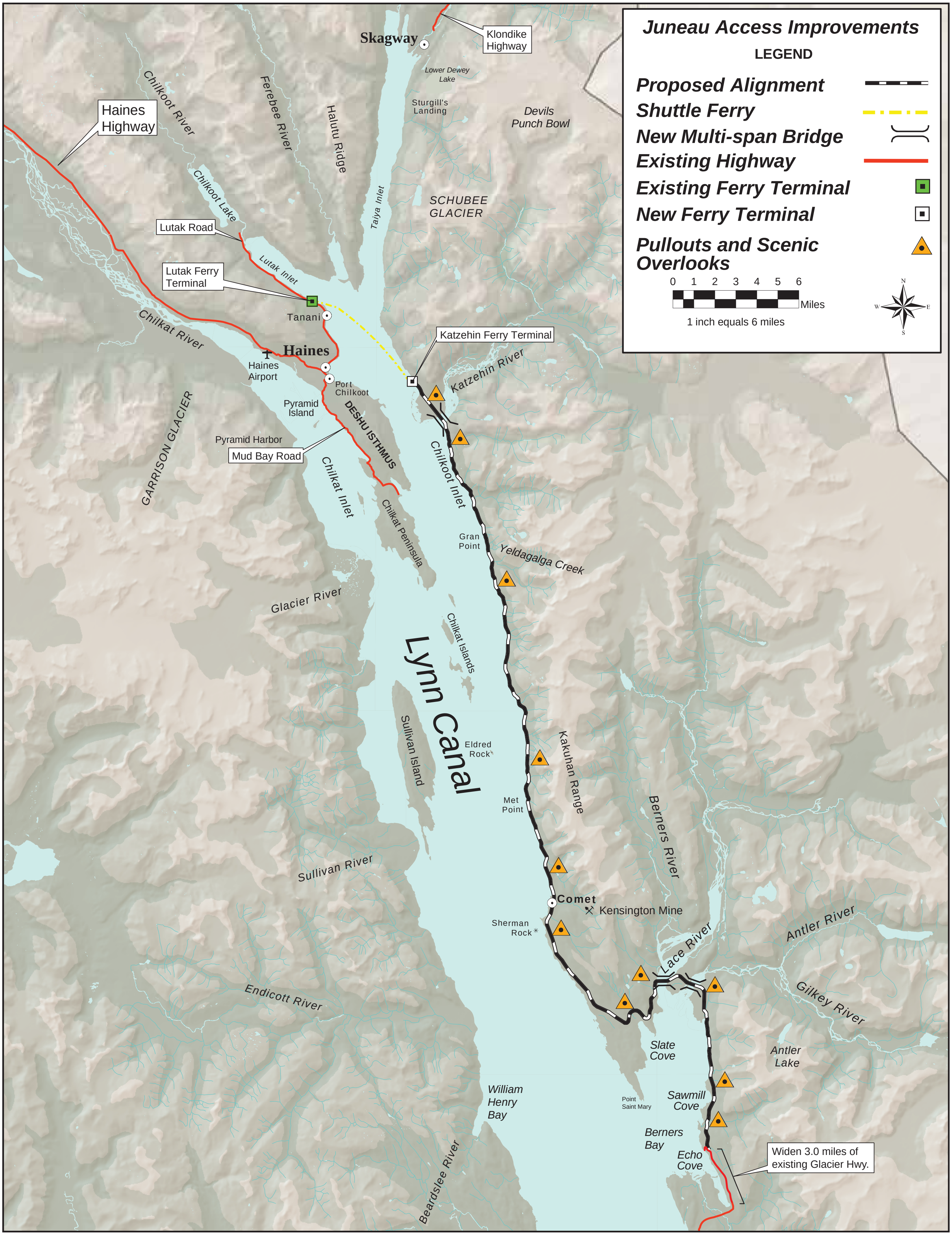

**Figure 4-1**
**Proposed Pullouts and Scenic Overlooks for Alternative 2B**

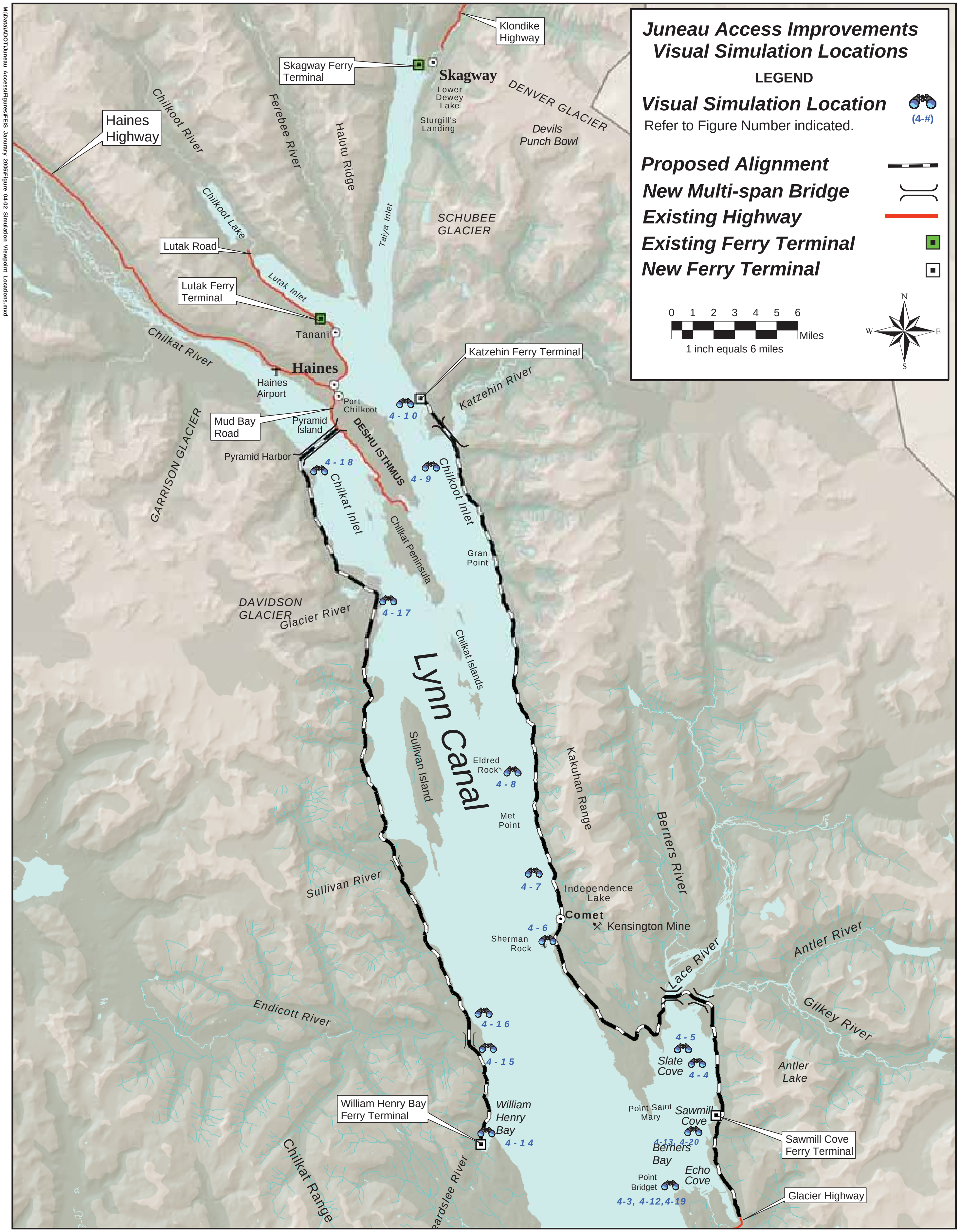

Figure 4-2
Visual Simulation Locations in Lynn Canal

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

**Figure 4-3**
**Visual Simulation of Alternatives 2B and 3**
**from Point Bridget Looking East**

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

Figure 4-4
Visual Simulation of Alternative 2B from
Berners Bay South of Antler River Looking East

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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**Figure 4-5**
**Visual Simulation of Alternative 2B from Berners Bay at Antler, Lace, and Berners River Delta Looking North**

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

**Figure 4-6**
**Visual Simulation of Alternative 2B from Lynn Canal at Sherman Point Looking East**

**AFFECTED ENVIRONMENT**

**ENVIRONMENTAL CONSEQUENCES**

See Figure 4-2 for location

Figure 4-7
Visual Simulation of Alternative 2B from Lynn Canal North of Comet Looking East

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

**Figure 4-8**
**Visual Simulation of Alternatives 2B from Lynn Canal at Eldred Rock Looking East**

AFFECTED ENVIRONMENT

ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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Figure 4-9
Visual Simulation of Alternatives 2B from Lynn Canal South of Katzehin River Looking East

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

Figure 4-10
Visual Simulation of Alternative 2B and Katzehin Ferry Terminal from Chilkoot Inlet Looking East

Document Path: Z:\07072 DOT&PF\174682 JAI SEIS\GIS\Map_Docs\Final\SEIS\Ch4\Fig4-11 Bald Eagle Nest Distances.mxd

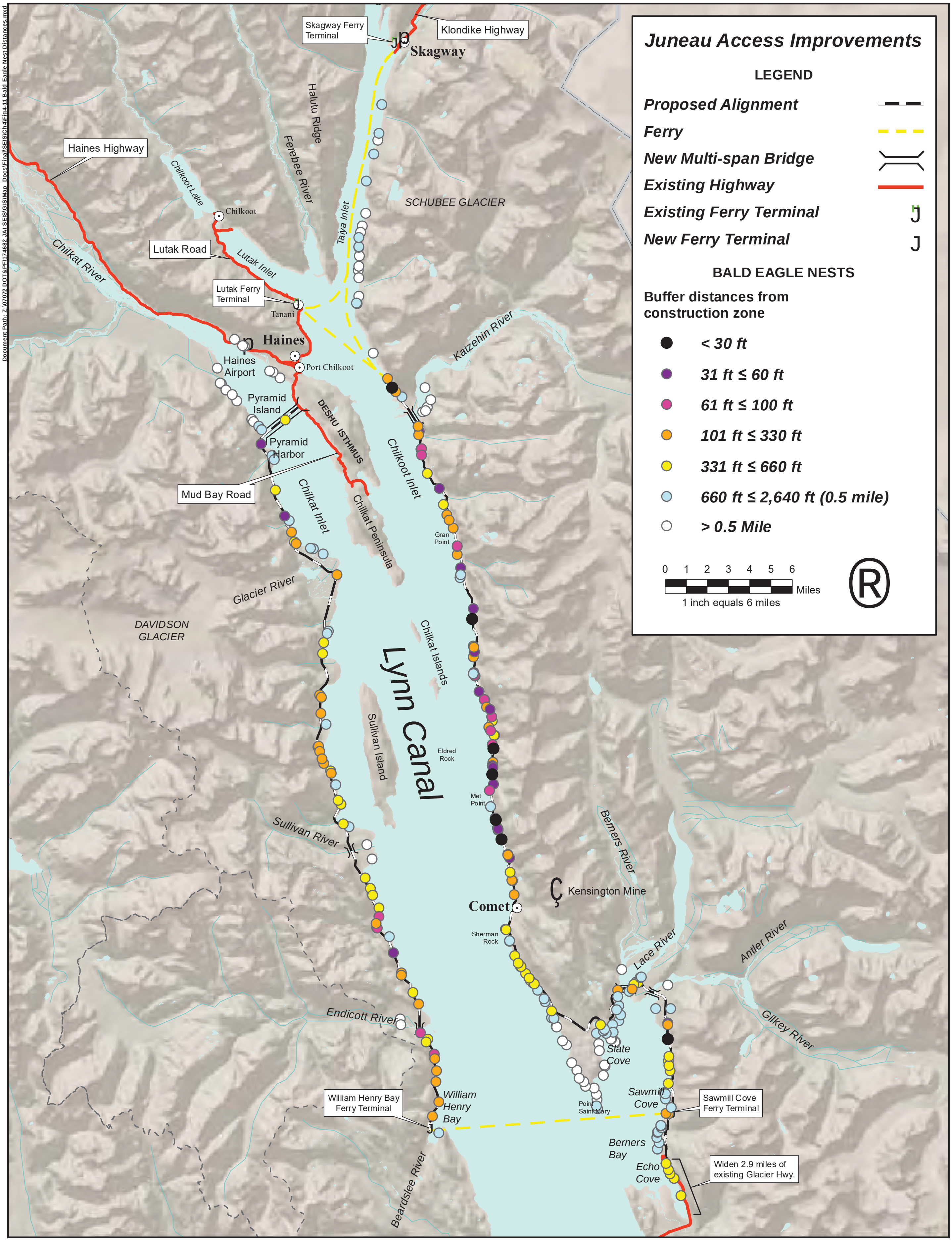

Figure 4-11

Bald Eagle Nest Distances from Alignment Centerline

M:\Data\ADOT\Juneau_Access\Figures\FEIS_Janurary_2006\Figure_04-11_westside_overlooks.mxd

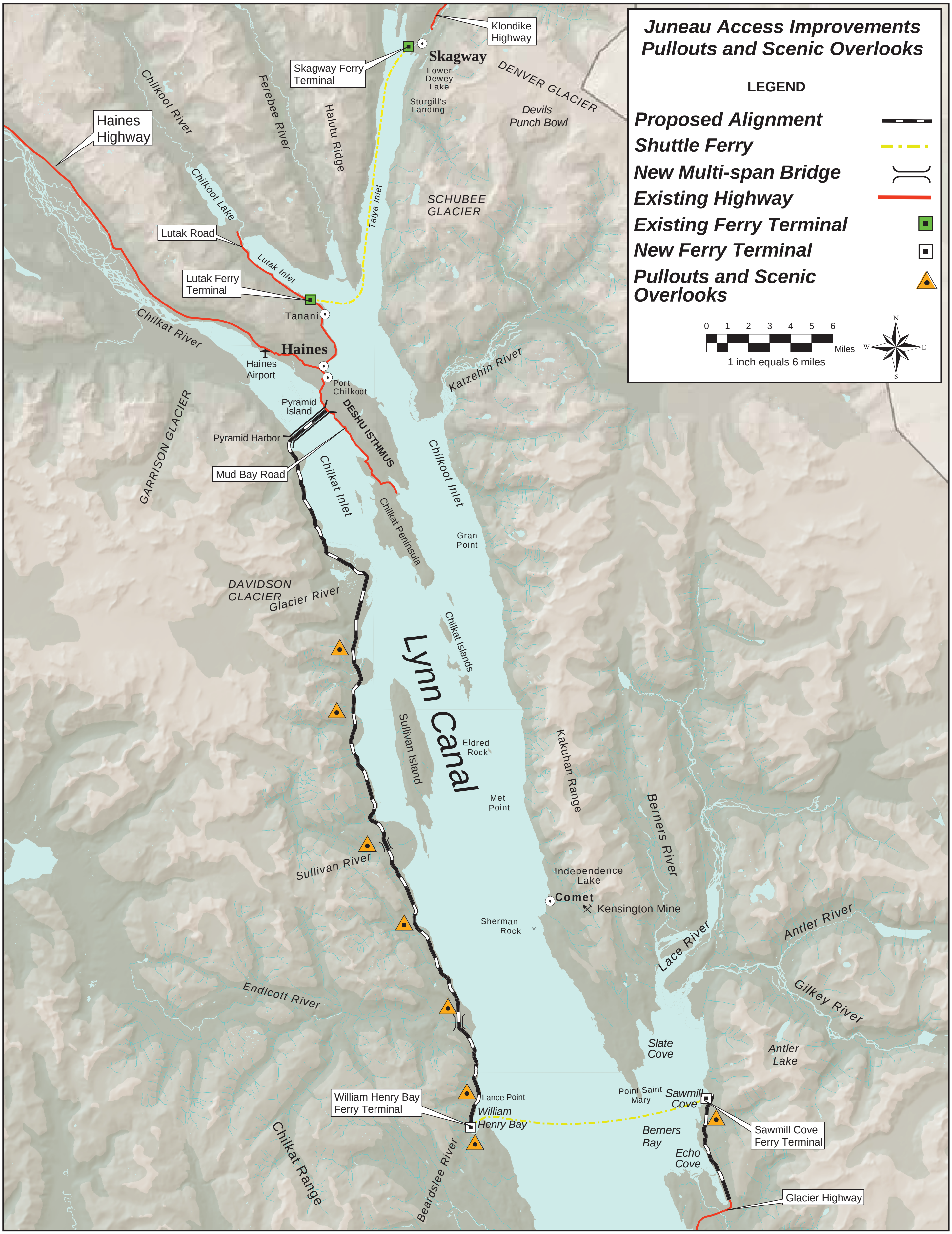

**Figure 4-12**
**Proposed Pullouts and Scenic Overlooks for Alternative 3**

**AFFECTED ENVIRONMENT**

**ENVIRONMENTAL CONSEQUENCES**

See Figure 4-2 for location

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**Figure 4-13**
**Visual Simulation of Alternative 3**
**from Point Bridget Looking East**

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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Figure 4-14
Visual Simulation of Alternative 3
from Berners Bay at Sawmill Cove Looking East

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

Figure 4-15
Visual Simulation of Alternative 3 William Henry Bay
Ferry Terminal from William Henry Bay Looking West

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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Figure 4-16
Visual Simulation of Alternative 3 from Lynn Canal at William Henry Mountain Looking West

**AFFECTED ENVIRONMENT**

**ENVIRONMENTAL CONSEQUENCES**

See Figure 4-2 for location

Figure 4-17
Visual Simulation of Alternative 3 from Lynn
Canal at Endicott River Delta Looking West

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

Figure 4-18
Visual Simulation of Alternative 3 from Lynn Canal at Davidson Glacier Looking West

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

Figure 4-19
Visual Simulation of Alternative 3 from Chilkat Inlet South of Pyramid Island Looking North

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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**Figure 4-20**
**Visual Simulation of Alternatives 4B and 4D from Point Bridget Looking East**

## AFFECTED ENVIRONMENT

## ENVIRONMENTAL CONSEQUENCES

See Figure 4-2 for location

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**Figure 4-21**
**Visual Simulation of Alternatives 4B and 4D from Berners Bay at Sawmill Cove Looking East**

# 5 PROPOSED MITIGATION AND COMMITMENTS

The Alaska Department of Transportation and Public Facilities (DOT&PF) would make a number of commitments and implement a variety of mitigation measures to address the potential impacts of a build alternative if one is selected for the Juneau Access Improvements (JAI) Project. The preliminary alignments for highway segments of all alternatives have been adjusted several times over the course of environmental and preliminary engineering studies to avoid impacts to wetlands, marine areas, wildlife, and cultural resources. Specific commitments and mitigation measures for the JAI Project build alternatives[1] are described by resource area in Sections 5.1 through 5.11. As explained in Sections 5.1 through 5.11, most of these commitments and mitigation measures apply to any of the build alternatives; some apply only to road alternatives or certain ferry alternatives. However, because Alternative 1 - No Action has been identified as the preferred alternative, no mitigation is required or proposed.

## 5.1 Water Quality

1. An erosion and sediment control plan would be prepared to describe the Best Management Practices (BMPs) to use to avoid water quality impacts to wetlands and other water bodies. Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments. Staking would be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area.
2. In wetland areas, the roadway would be constructed using the minimum-width fill footprint necessary (see Figure 2-7b). In wetland and other sensitive areas, the roadway would be constructed with a low-profile embankment to limit the fill footprint, to the extent practicable. Rock would be used to stabilize the toes of slopes at ponds and stream crossings.
3. Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area and to the extent certified seeds are available, would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover. No grubbing would be done outside of the fill footprint and the only clearing done beyond the 10-foot vegetation clearing limit (shown in Figure 2-7b) would be for individual trees that might pose a safety hazard to the traveling public.
4. Sediment barriers would be used to control sediment transport during construction. Sediment basins would be used, as necessary, during construction.
5. Culverts would be installed through fill slopes in appropriate locations to maintain natural flow patterns for surface water.

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[1] This Final Supplemental Environmental Impact Statement (SEIS) is based on the 2014 Draft SEIS, and substantive changes have been highlighted in gray for easy identification by the reader.

## 5.2 Hazardous Materials

Mitigation may be necessary should contaminated material be unearthed at the Auke Bay Ferry Terminal during structural modifications of the terminal with development of Alternative 4A, 4B, 4C, or 4D.

If waste rock disposal on U.S. Forest Service (USFS) lands outside the easement limits becomes necessary, DOT&PF would test the rock for acid-generating potential and total metals content to determine appropriate disposal. Hazardous materials would not be disposed of on USFS property.

## 5.3 Wetlands

1. DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignments. The roadway would be constructed using the minimum-width fill footprint necessary (see Figure 2-7b). During final engineering design of the selected alternative, DOT&PF would investigate ways to further minimize encroachment on wetlands.
2. Embankment heights and side slopes would be minimized during design to reduce wetland footprints.
3. During construction, slope limits in wetlands areas would be separately identified to ensure that workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.
4. Construction camps, borrow pits, and waste areas would be located in upland areas and stabilized during and after use to avoid water quality impacts to wetlands and water bodies.

## 5.4 Terrestrial Habitat

1. Only certified seed mixtures would be used to seed exposed soils.
2. No non-mineral soil from outside the project boundaries would be imported to the project site. Any soil within areas disturbed by construction of the project identified as containing invasive species would not be transported to other areas of the project.
3. Construction equipment would be pressure washed prior to use on the project.
4. To the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility.
5. DOT&PF, in cooperation with the University of Alaska Fairbanks Cooperative Extension Service, has identified practices to prevent the spread of invasive species in *Best Management Practices – Controlling the Spread of Invasive Plants during Road Maintenance* (UAF 2014). These BMPs would be used by DOT&PF during routine maintenance activities along the road system, concentrating on high-priority invasive plant species, such as reed canarygrass and knotweed.

## 5.5 Intertidal and Subtidal Areas

1. During design, DOT&PF would investigate ways to further reduce intertidal fills, including alignment shifts and steepened slopes. To the extent practicable, temporary beach access points would be chosen to take advantage of existing landings, previously disturbed sites, or locations of planned fill. Additional necessary access points identified during construction would be sited to minimize impacts to habitat. These access points would be restored after project completion to conditions similar to those that existed previously.
2. In-water work for fill placement, dredging, or pile driving would be timed to avoid impacts to spawning and migrating fish species in accordance with the Title 16 fish habitat permits.
3. Breakwaters at the ferry terminals would be constructed with gaps or large culverts to allow passage of juvenile fish near shore.
4. Shuttle ferries would have wastewater holding tanks to avoid discharge of waste while moored at the new terminal sites.
5. Specific to ferry operations under Alternatives 4B and 4D, ferries would not operate in Berners Bay in winter and spring, from October 1 to May 15. This would cover the herring spawning season, which ends in early May.

## 5.6 Anadromous and Resident Fish Streams

1. All anadromous fish streams would be crossed by bridges. Anadromous fish streams that can be crossed with 130-foot or shorter bridges would not have any structure or fill in the stream channel. Anadromous fish streams that require pier supports would have the fewest possible piers using 130-foot spacing, placed to reduce impact to the streams.
2. Streams identified as having resident fish, or the potential to have resident fish, would have culverts placed to provide fish passage, in accordance with the Memorandum of Agreement between the Alaska Department of Fish and Game (ADF&G) and DOT&PF titled “Design, Permitting, and Construction of Culverts for Fish Passage.”
3. In-water work at anadromous and resident fish streams would be timed in accordance with fish habitat permits. To avoid impacts to outmigrant salmonids and spawning eulachon, construction of all river crossings with in-stream piers would not occur from March 15 through June 15.

## 5.7 Bald Eagles

1. On-the-ground nest surveys would be conducted before clearing takes place to confirm the location of trees with eagle nests. Construction activities in the vicinity of bald eagle nests would be coordinated with the U.S. Fish and Wildlife Service (USFWS) to determine the need for alignment changes, blasting plan changes, or other measures to avoid impacts to eagles.

2. In areas where clearing would occur within 100 feet of a nest tree, DOT&PF and USFWS would jointly assess the potential for windthrow and stabilize the tree or adjacent trees, if determined necessary.
3. During construction, DOT&PF and USFWS would assess the sufficiency of natural screening between the highway and any eagle nests below the elevation of the road within the 330-foot zone. Additional screening would be developed if necessary.
4. DOT&PF would continue to fund USFWS aerial surveys for a period of 5 years after the JAI Project is open to traffic to assess the impact, if any, of the project on the Southeast Alaska bald eagle population.
5. DOT&PF would apply for bald eagle Disturbance Permits for nests located within 660 feet of work limits and for nests within 0.5 mile of blasting activities. Under alternatives that require the widening of 2.9 miles of the existing Glacier Highway, DOT&PF would obtain Disturbance Permits for construction activities within 660 feet of eagle nest trees as determined necessary in consultation with the USFWS.

## 5.8 Migratory Birds

In appropriate habitats, nesting surveys for Queen Charlotte goshawk would be conducted prior to construction. Clearing would be avoided in the vicinity of active nests. No clearing of vegetation would occur during the USFWS-approved nesting window without a pre-nesting survey. Pre-nesting surveys would be conducted by a qualified biologist immediately prior to clearing activities.

## 5.9 Wildlife

1. Planning for any camps necessary during construction of the project would be developed in consultation with ADF&G and would include BMPs for handling food, trash, and other potential wildlife attractants to reduce impacts.
2. In areas where established wildlife crossings are noted and ADF&G requests, side slopes along the road alignments would be designed to provide easier access across the road for wildlife.
3. Pile driving at ferry terminals and multi-span bridge construction sites would be done with vibratory hammers to the extent practicable to minimize impacts to marine mammals. Impact proofing[2] necessary for weight-bearing piles would be accomplished as quickly as practicable to reduce acoustic impact.
4. During all piling installations, a trained observer would monitor for the presence of marine mammals, and pile driving would be halted if any marine mammal comes within 660 feet of the activity unless a different distance is set in a Marine Mammal Protection Act authorization.
5. Preconstruction wolf den surveys would be conducted in consultation with the ADF&G. Identified active dens would be avoided during clearing to the extent practicable.

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[2] Impact proofing: The number of blows necessary to move the piles a set distance to confirm piles can bear the intended load.

6. Roadway signs indicating wildlife presence would be placed in areas of high brown bear, moose, and mountain goat use to reduce potential vehicle collisions with wildlife.
7. In areas of high moose use as identified by the ADF&G, roadside seeding would use only non-palatable species to discourage browsing near the roadways. Roadside alder growth would be cut regularly to reduce browsing by moose and mountain goats, and to maintain adequate sight distances to avoid vehicle collisions with wildlife.
8. The project would incorporate adequate sight lines in the final design to enable drivers to see moose and mountain goats that are in proximity to the road (particularly relevant in conifer forest areas).
9. Bridges that span waterways or other geographical features likely to be used as wildlife passages would be constructed to facilitate the movement of brown bears. The distance between the proposed bridge abutments/supports and water bodies would be lengthened to provide travel corridors for brown bears and other wildlife.
10. Wildlife observers would examine the nearby area for the presence of mountain goats prior to construction rock blasting and, if necessary, haze them in an attempt to have them depart the area.
11. All construction personnel on site would be required to attend wildlife awareness training and orientation.
12. DOT&PF would work with ADF&G to develop a wildlife interaction plan prior to the start of construction for use by all personnel on site during construction to protect both people and wildlife. The plan would include topics such as safety measures for on-site personnel, (e.g., use of bear guards and bear spray); proposed storage and disposal of construction materials and trash; wildlife orientation training for on-site personnel; description of the handling of people/wildlife interactions, including contingencies in the event wildlife does not leave the site (e.g., hazing by trained staff); description of the layout of temporary buildings and work areas to minimize interactions between humans and bears/moose (e.g., use of electric fencing); and requirement to document and communicate the sighting of bears/moose on site or in the immediate area to all shift employees.
13. During construction, all garbage would be properly disposed of in closed bear-proof containers to avoid attracting bears and other wildlife.
14. To the extent practicable, snow drifts or piles that could conceal bears would be kept cleared away from buildings and fences at construction camps.
15. Procedures to control sediment runoff, fugitive dust fallout, and wastewater during construction would be followed to avoid or minimize impacts on salmon-spawning streams, which provide important seasonal food for bears.
16. To minimize the potential for flying debris during blasting and construction activities, the contractor would be required to implement control measures during initial surface blasts, production blasting, and other construction for areas that have the potential to reach Lynn Canal.

## 5.10 Cultural Resources

1. Known archaeological and historical resources in the vicinity of the project would be identified in the construction plans to ensure that the contractor is aware of the need to avoid impacts to these resources.
2. Cultural resources within the project limits would be flagged in the field to ensure that staging and construction activities do not inadvertently damage these resources.
3. If a previously unknown cultural resource were discovered during construction, work in the area would cease and DOT&PF would contact the Federal Highway Administration and the State Historic Preservation Officer and develop an approved plan before proceeding.

## 5.11 Recreation and Visitor Facilities

Any ferry terminals constructed for the project would include Americans with Disabilities Act accessible restrooms that would be available to highway users as well as ferry customers.

# 6 SECTION 4(f)

## 6.1 Introduction

Section 4(f) of the Department of Transportation Act (codified at 49 U.S. Code [USC] [1] 303 and 23 USC 138) states that the FHWA may not approve the use of land from a significant publicly owned public park, recreation area, wildlife and waterfowl refuge, or any significant historic site unless a determination is made that there is no feasible and prudent alternative to use of land from the property and that the action includes all possible planning to minimize harm to the property resulting from such use, or unless the impact is determined to be a "*de minimis*" impact.[2] Use is defined as permanently incorporating land into a transportation facility or having proximity impacts that are so severe that the protected activities, features, or attributes are substantially impaired. The latter is termed "constructive use" and occurs only when the protected activities, features, or attributes are substantially diminished.

In order to comply with this regulation, the Department of Transportation and Public Facilities (DOT&PF) and Federal Highway Administration (FHWA) inventoried potentially protected sites in the project vicinity and determined Section 4(f) applicability. This section of this Final Supplemental Environmental Impact Statement (SEIS) details the step-by-step process followed and the applicability determinations made.

## 6.2 Parks and Recreation Areas

### 6.2.1 Designated Parks and Recreation Areas

Section 3.1.1.7 provides general information on the parks and recreation areas in the project area. Municipal parks in the project area include Molly Walsh Park and Pullen Creek Shoreline Park, both in Skagway (Figure 3-5). State parks and recreation areas in the vicinity include Point Bridget State Park, Sullivan Island State Marine Park, Chilkat Islands State Marine Park, Chilkat State Park, Portage Cove State Recreation Site, and Chilkoot Lake State Recreation Site (Figures 3-1 and 3-2). The only federal park in the project area is the Skagway unit of the Klondike Gold Rush National Historical Park in downtown Skagway (Figure 3-5).

No park land would be required for any of the alternatives under consideration, nor would proximity impacts create a constructive use.

### 6.2.2 Other Lands Managed for Recreation

Several alternatives would require State and/or federal land not specifically designated as parks or recreation areas, but administered under land management plans. These management plans were evaluated to determine if any of the land units were significant public recreation areas.

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[1] This SEIS is based on the 2014 Draft SEIS and substantive changes have been highlighted in gray for easy identification by the reader.

[2] The *de minimis* impact criteria and associated determination requirements are specified in Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). *De minimis* impacts related to historic sites are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the National Historic Preservation Act. *De minimis* impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource.

#### 6.2.2.1 State Land

Alternative 3 would pass through three parcels in the Northern Southeast Area Plan, LT02, H28, and HT11. None of these lands are designated for or function as recreation other than dispersed activities. FHWA regulations (23 Code of Federal Regulations [CFR] 774.11) state that where public land is managed for multiple uses, Section 4(f) applies only to those portions of the land which function for, or are designated in the management plans as being for, significant park, recreation, or wildlife and waterfowl purposes. FHWA guidance, based in part on case law, further states that land designated or used for dispersed recreational activities is not protected by Section 4(f) [Section 4(f) Policy Paper, Question 1A, FHWA, 2012].

Alternative 3 would pass through a land management unit of the Haines State Forest, Unit 6. Unit 6 of the Haines State Forest is classified as Public Recreation Land. The Haines State Forest Plan (Alaska Department of Natural Resources [ADNR], 2002b) states that this land "will primarily be managed…for public recreational uses." However, the plan also states "the Haines State Forest will be managed for multiple use, consistent with the establishment of the State Forest (AS 41.15.300)." The statute recognizes the importance of continuing traditional uses. The plan specifically allows personal timber harvest in sub-unit 6a and salvage timber harvest in both sub-units a and b. Mineral extraction is allowed under certain circumstances. Based on the review of the plan and the points noted above, FHWA has determined that this land is multiple use. Currently, the unit is used for dispersed recreation; the only specific significant recreation facility is a trail that was under construction at the time the Final EIS was issued. Construction of the trail, which would extend from the Lynn Canal shoreline to Davidson Glacier Lake, was not completed; however, it is still a planned facility (Josephson, 2012). FHWA has determined that the trail, once constructed and in use, would be subject to Section 4(f) protection. Alternative 3 would avoid use of land from this trail by bridging over the trail. No constructive use would occur. The trail would still provide access to the Davidson Glacier Lake, and although the trail experience would be altered, no substantial diminishment of its qualifying activities, features, or attributes would occur. A parking area and trail connection would be provided as an enhancement.

The ADNR has concurred that the only specific recreational facilities on State land in the project area are the Sturgill's Landing Trail (near Skagway and distant from any alternative currently under consideration) and the Davidson Glacier Lake Trail (Irwin, 2004).

FHWA has determined that Alternative 3 would pass through State of Alaska land but would not require the use of any State of Alaska land protected by Section 4(f).

#### 6.2.2.2 Federal Land

All build alternatives with highway segments would pass through federal land under management of the U.S Forest Service (USFS). As explained in Section 3.1.1.1, the 2016 Tongass Land and Resource Management Plan (TLRMP) assigns Land Use Designations (LUDs) to land to identify management goals and policies (Figure 3-3). Alternative 2B would pass through the following LUDs: Scenic Viewshed, LUD II, Semi-Remote Recreation, Old-growth Habitat, and Modified Landscape. Alternative 3 would pass through multiple LUDs, including Scenic Viewshed, LUD II, Semi-Remote Recreation, Modified Landscape, and Old-growth Habitat. Alternatives 4B and 4D would pass through land designated as Scenic Viewshed, LUD II, and Semi-Remote Recreation.

A review of the management policies for these LUDs indicates that all of them meet the definition of multiple use areas and the recreation activities that occur and are envisioned as dispersed. Another aspect of the 2016 TLRMP further support the determination that none of the LUDs crossed are in themselves protected under Section 4(f). The TLRMP includes a LUD entitled Special Interest Area that specifically includes designated recreation areas (USFS, 2016a, p. 3-39). In instances when the USFS has determined that an area larger than a specific facility should be reserved for recreation or refuge purposes, the Special Interest Area LUD is used. No land in the project vicinity is designated as a Special Interest Area.

As with municipal and State land, after determining that the broad land designations are multiple use areas, further investigation and consultation with the land manager occurred to determine which portions or specific facilities, if any, function or are designated for significant recreation.

The TLRMP contains a Recreation Places Inventory that delineates “areas of small to moderate size that have one to several features that are particularly attractive to people engaging in recreation activities and receive recurring use.” (Although described as “small to moderate size,” in some cases the inventory identifies areas that include multiple LUDs; for instance, the area identified around Berners Bay covers approximately 150 square miles.) The inventory further identifies some of these areas as important for commercial recreation and tourism. Within Recreation Places, there are often specific sites such as cabins, shelters, picnic areas, trails, and campgrounds. The USFS has confirmed that Recreation Places as identified by the Inventory are areas of dispersed recreation, including hunting (Vaughan, 2004a; confirmed by Grossman, 2012). There are no specific recreational sites or facilities on USFS land on the west side of Lynn Canal. The only specific recreational sites or facilities on USFS land in the project study area on the east side of Lynn Canal are the Berners Bay cabin, Sturgill’s Landing Trail, and Sturgill’s Landing Day Use Area. The USFS has identified all of these features as significant for recreation purposes (Griffin, 2004; confirmed by Grossman, 2012), and the FHWA has determined them to be subject to Section 4(f) protection. None of the alternatives would impact the Sturgill’s Landing Day Use Area or the trail to it.

The USFS has indicated that the Berners Bay cabin is a water-oriented cabin, and therefore the zone of influence applies to the shoreline rather than the hillside behind the cabin (Ouderkirk, 2004). The USFS has also indicated that the recreation facility is the cabin itself, not the land it occupies, as the cabin could be relocated (Vaughan, 2004b), and in fact was placed with the knowledge that it may be moved in the future. The USFS determined that a handicap-accessible cabin on the Juneau road system would be a desirable development and requested that DOT&PF design the alignment of applicable alternatives such that a handicap-accessible trail could be constructed from the highway to the cabin. In its April 2006 Record of Decision (ROD) for the Juneau Access Improvements (JAI) Project identifying Alternative 2B as the selected alternative, the FHWA stated:

> The highway will be located as far from the USFS cabin in Berners Bay as the topography allows, but no less than 100 feet from mapped use areas. A handicap-accessible trail will be constructed from the highway parking area to the cabin.

If Alternative 2B were selected, DOT&PF and FHWA would provide a trail from the highway to the cabin. However, since the 2006 ROD was issued, the alignment of Alternative 2B has been shifted farther east and uphill from the cabin. The nearest point of disturbance (the toe of the highway fill slope) now would be more than 800 feet from discernible use areas (e.g., trails, outbuildings, cleared areas) at the cabin. The centerline of the alignment would now be approximately 1,000 feet east of the cabin at an elevation approximately 500 feet above the cabin, making construction of a handicap-accessible trail from the highway to the cabin impractical. Previously, the nearest point of disturbance (toe of slope) would have been approximately 100 feet from this boundary, resulting in approximately 200 feet between the highway and closest use area other than the access trail itself.

FHWA has determined that the construction of a highway in the vicinity of the cabin would not be a constructive use. The experience at the cabin would change, but this change would not be so severe as to create a substantial impairment of the protected activities, attributes, or features of the facility. Visitors could continue to access the site by small boat or float plane and could access the site by trail from the highway; however, the remote character of the site would be diminished by the presence of the road. Rather than hearing only boat, plane, or helicopter noise, visitors would also hear vehicle traffic noise. The fact that the USFS was interested in providing access to the cabin from the road is an indication that substantial impairment would not occur. As noted in Sections 5.11 and 5.12.1 of the 2014 Draft SEIS, if Alternative 2B were selected, DOT&PF would provide for a new water-accessed cabin to be owned and managed by the USFS at a location selected in consultation with the USFS as general mitigation for impacts to Berners Bay users desiring a remote, water-access experience.

The USFS concurred that the Berners Bay cabin, Sturgill’s Landing Trail, and Sturgill’s Landing Day Use Area are the only designated recreational sites on USFS land in the project study area (Griffin, 2004). The USFS also concurred that no alternatives would take land from a recreation site (Griffin, 2004).

FHWA has determined that Alternatives 2B, 3, 4B, and 4D would pass through USFS land but would not require use of land protected by Section 4(f).

## 6.3 Refuges

There are no designated or functioning significant wildlife or waterfowl refuges in the project vicinity. As described in Section 3.1, State and federal land management plans applicable to the project area include designations such as Shoreline Use and Habitat (ADNR), Transportation and Habitat (ADNR), and Old-Growth Habitat LUD (USFS). Review of these designations indicates that these are multiple-use designations. No specific areas function as wildlife or waterfowl refuges. Both ADNR and USFS have concurred that no refuges exist in the project vicinity (Irwin, 2004; Griffin, 2004).

## 6.4 Significant Historic Sites

Section 4(f) applies to significant historic sites. This includes all properties on or eligible for the National Register of Historic Places (NRHP).

### 6.4.1 Berners Bay Historic Mining Districts

Alternative 2B would pass through the Berners Bay Historic Mining District (BBHMD). This alternative also would pass through two smaller historic mining districts located within the BBHMD: the Jualin and the Comet/Bear/Kensington. The BBHMD also includes a third historic mining district, the Ivanhoe/Horrible, as well as some contributing properties that are not part of any of the three smaller districts (Figure 3-6). No land would be required from any contributing property within these historic districts. Alternative 2B would bridge over the Jualin Mine Tram. The alignment of Alternative 2B has been shifted and no longer crosses the Comet/Bear/ Kensington Railroad. With the exception of the crossing of the tram, the only lands affected within the districts are undeveloped natural areas and Comet Landing, an historic site determined to be ineligible for the NRHP (see Section 4.3.4).

To decide if land within a historic district is protected by Section 4(f), FHWA must first determine if the land is individually historic or contributes to the factors that make the district historic [Section 4(f) Policy Paper, Question 2B, FHWA, 2012]. FHWA has determined the undeveloped natural land areas that would be crossed are not individually historic, are not an integral part of the historic district, and do not contribute to the factors that make the district historic.

FHWA has determined that construction of a highway over the Jualin Mine Tram would not result in a constructive use. Although a highway bridge would have an effect on the property, the effect would not be so severe as to substantially impair its qualifying activities, features, or attributes. The Jualin Mine Tram does not derive a substantial part of its significance from its setting. In addition, the State Historic Preservation Officer (SHPO) concurred with the FHWA determination that Alternative 2B would have no adverse effect on this property (Bittner, 2005). In subsequent correspondence, the SHPO agreed that its concurrence remains valid (Bittner, 2012).

### 6.4.2 Skagway and White Pass District National Historic Landmark

The boundaries of the Skagway and White Pass District National Historic Landmark (NHL; Figure 3-5) include natural areas surrounding Skagway and the Klondike Highway. As noted in Section 2.2.9, Alternatives 2, 2A, and 2C, which were evaluated in the 2005 Supplemental Draft EIS for the JAI Project, passed through natural areas within the NHL.

In its comments on the 2005 Supplemental Draft EIS, the Office of the Secretary, U.S. Department of the Interior, made clear the National Park Service's (NPS) position that all natural areas within the NHL contribute to the factors that make the landmark historic (Taylor, 2005). Furthermore, NPS believes that this contribution is documented in the Boundary Justification of the 1999 nomination. The Boundary Justification states, in part: "sufficient natural areas have been included so as to provide an understanding for the physical setting and cultural landscape that defined the historic corridor" (NPS, 1999). Based on this language, the NPS position on its meaning, and existing FHWA guidance, FHWA has determined that natural areas within the NHL are protected by Section 4(f). Because these natural areas within the NHL were integral to Alternatives 2, 2A, and 2C and could not be avoided by these alternatives, and because several other reasonable alternatives are under consideration and do not use Section 4(f) property, Alternatives 2, 2A, and 2C were dropped from the range of reasonable alternatives.

### 6.4.3 Dalton Trail

Alternative 3 would cross the Dalton Trail on Green Point north of Pyramid Harbor (Figure 3-1). This portion of the Dalton Trail is within the Haines State Forest in an area designated for dispersed recreation (see Section 6.2.2.1). The trail is not maintained as a hiking trail. A bridge would be constructed over the trail (continuing across Chilkat Inlet); neither the bridge abutment to the west nor the first pier would require land from the trail. Only air rights would be acquired for the bridge above the trail.

FHWA has determined that construction of a highway associated with Alternative 3 would not result in a constructive use of the Dalton Trail. Although a highway bridge would have an effect on the trail, it would not be so severe as to substantially impair its activities, features, or attributes. This historic property does not derive a substantial part of its significance from its setting.

# 7 PUBLIC AND AGENCY COORDINATION

The Department of Transportation and Public Facilities (DOT&PF)[1] developed and implemented a consultation and coordination program to ensure that the public; tribal entities; and federal, State, and local agencies were contacted, consulted, and given an adequate opportunity to be involved in the environmental analysis and Supplemental Environmental Impact Statement (SEIS) process.

## 7.1 Previous Public and Agency Coordination

Scoping is defined as "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action" (40 Code of Federal Regulations [CFR] 1501.7). Council on Environmental Quality (CEQ) Guidance also states that "[t]he scoping process should identify the public and agency concerns; clearly define the environmental issues and alternatives to be examined in the EIS including the elimination of non-significant issues" (CEQ, 1984).

The earliest scoping activities for the Juneau Access Improvements Project (JAI) Project occurred in 1993 and 1994 during the preparation of the Reconnaissance Engineering Study (DOT&PF, 1994b). Public and agency scoping for the 1997 Draft Environmental Impact Statement (EIS) was ongoing throughout the development of that document and was initiated again in 2003 for the 2005 Supplemental Draft EIS. In addition to public outreach, the Federal Highway Administration (FHWA) and DOT&PF coordinated with local, State, and federal agencies during the scoping processes for both the 1997 Draft EIS and the 2005 Supplemental Draft EIS. Those scoping efforts included presentations to community groups, radio broadcasts, newspaper articles and newsletters, public scoping meetings, and meetings with borough assemblies and local officials. Agency coordination meetings held in 2003 and 2004 helped clarify issues, identify agency concerns, determine appropriate methods of analysis, and characterize potential impacts.

Government-to-Government coordination was another element of the scoping process for the 1997 Draft and 2005 Supplemental Draft EISs. In compliance with the federal laws and regulations regarding cultural resources, DOT&PF sent letters to local federally recognized tribes[2] and other Native entities inviting them to participate in the process of identifying cultural properties (prehistoric and historic) and determining the effects of the alternatives on such properties for the 2005 Supplemental Draft EIS. In August 2004, FHWA sent letters to the same Native organizations inviting them to comment on FHWA's determination of historic property eligibility for the National Register and determination of potential effects on historic properties in the APE.

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[1] This SEIS is based on the 2014 Draft SEIS and substantive changes have been highlighted in gray for easy identification by the reader.

[2] The National Historic Preservation Act (NHPA) requires federal agencies to consult with federally recognized tribes. Federally recognized tribes and Native entities consulted under Section 106 of the NHPA for the JAI Project include Sealaska Corporation, Sealaska Heritage Institute, Douglas Indian Association, and Goldbelt Corporation. Auk Kwan is not a federally recognized tribe. As part of the NEPA process, the members of Auk Kwan have been given multiple opportunities to provide input on the project. Comments from Auk Kwan members on the 2014 Draft SEIS have been considered and are addressed in this Final SEIS.

The *Juneau Access Improvements Project 1997 and 2003 Comment Analysis Report* (DOT&PF, 2003d) provides a public and agency comment summary and analyzes the substantive comments made during 2003 scoping. A summary of 2003 scoping comments was also included in the 2005 Supplemental Draft EIS. The 2003 *Juneau Access Supplemental Draft Environmental Impact Statement Scoping Summary Report* contains copies of all of the scoping comments (DOT&PF, 2003e).

Responses to substantive comments received during the 1997 Draft EIS comment period were presented in Appendix V of the 2005 Supplemental Draft EIS: *Responses to Comments*.

A Notice of Availability of the 2005 Supplemental Draft EIS for the JAI Project was published in the *Federal Register* on January 24, 2005. DOT&PF held numerous public coordination meetings in which it presented an overview of the 2005 Supplemental Draft EIS and, in February 2005, DOT&PF held public hearing sessions in Juneau, Haines, and Skagway. Public input was solicited and oral testimony recorded at the public hearings. Comments were also submitted via letter, e-mail, hand delivery, or fax to the DOT&PF project office. The public review and comment period ended on March 21, 2005. All comments received or postmarked by or on March 21, 2005, were analyzed in the *Supplemental Draft EIS Comment Analysis Report*, which was published on the project website in June 2005 (DOT&PF, 2005c). Comments from State and federal agencies and DOT&PF responses were included in Chapter 7 of the 2006 Final EIS. Responses to comments received during the 2005 public comment period were presented in Appendix Y of the 2006 Final EIS: *Responses to Supplemental Draft EIS Comments*.

## 7.2 Scoping for this SEIS

FHWA requires that a formal scoping process be conducted for an EIS in order to identify significant issues to be addressed in the development of the document; however, 23 CFR 771.130(d) states that formal scoping is not required for an SEIS. In this instance, FHWA, in collaboration with DOT&PF, decided to conduct focused scoping for the JAI Project SEIS to address only those changes or new information that is the basis for preparing this Final SEIS and were not included in the 2006 Final EIS.

## 7.3 Notice of Intent to Prepare an SEIS

On January 12, 2012, FHWA began the scoping process for the SEIS by publishing a Notice of Intent (NOI) in the *Federal Register* to formally announce the initiation of the JAI Project SEIS (*Federal Register*, Volume 77, Number 8, 1973). The NOI summarized the project background and purpose and need, listed the alternatives to be studied, described scoping plans and materials, and announced the intent to hold agency scoping meetings.

## 7.4 SEIS Scoping and Public Coordination

Between January 12 and February 20, 2012, a variety of tools and activities were used to inform, as well as to solicit and obtain input from, the public. These tools included newspaper advertisements and an informational insert, a newsletter and postcard, and website postings.

### 7.4.1 Newspaper Display Advertisements

Newspaper display advertisements were published in four newspapers in January 2012: *Juneau Empire*, *Sitka Sentinel*, *Skagway News*, and *Chilkat Valley News* (Table 7-1). These are the primary newspapers in or near the project area. The display ads announced the initiation of the JAI Project SEIS, public scoping schedule, website address, and the point of contact to submit comments.

**Table 7-1:**
**Newspaper Ad Publication Schedule**

| Publication Date | Newspaper | Total Circulation |
|---|---|---|
| January 15, 2012 | *Juneau Empire* | 7,500 |
| January 17, 2012 | *Sitka Sentinel* | 2,500 |
| January 18, 2012 | *Skagway News* | 900 |
| January 19, 2012 | *Chilkat Valley News* | 1,200 |

### 7.4.2 Newsletter/Newspaper Insert

The DOT&PF developed a newsletter/newspaper insert to announce scoping for the JAI Project SEIS, provide project and alternatives information, and solicit comments. The piece was published in January 2012 as a newspaper broadsheet insert in locally distributed copies of the *Juneau Empire* (5,200 inserts), *Sitka Sentinel* (2,500 inserts), *Skagway News* (600 inserts), and *Chilkat Valley News* (1,000 inserts; total newspaper inserts: 9,300). The publication was also mailed as a newsletter to individual box holders in Skagway, Haines, Juneau, the Chilkat Valley (Haines and Klukwan), and Sitka (approximately 24,000 residential box holders). The newsletter (reformatted for printing and online readability) was also posted on the project website.

### 7.4.3 Postcard

On January 26, 2012, DOT&PF mailed 394 postcards to the JAI Project mailing list. The purpose of the postcard was to announce the initiation of the JAI Project SEIS and its intent, share the project website address, provide project contact information, and request that the recipient return the "reply" postcard with comments and/or a request to remain on the project mailing list.

A postcard and e-mail notifications were sent to individuals on the project mailing list in August 2013 to announce updates to the project.

### 7.4.4 Website

The website for the JAI Project SEIS (www.juneauaccess.alaska.gov) is maintained by the DOT&PF Southcoast Region and updated regularly by project staff. The website address was included on all project scoping material (postcards, newspaper advertisements, and newsletter/newspaper insert). The website provides the following information:

- Juneau Access Improvements Project home page:
    - Project status (including the Governor's selection of the preferred alternative)
    - Project purpose and need
    - FHWA Approval Process for the SEIS

    - Project timeline
    - Project overview
- Project Documents:
    - 2018 Final SEIS and supporting documents
    - 2014 Draft SEIS and supporting documents
    - 2012 scoping documents
    - Archive
        - Financial plans
        - Geotechnical reports 2006 Final EIS and supporting documents
        - Permits and approvals
    - Project Resources
        - 2017 alternative descriptions
        - Maps
        - Contact
        - Request a copy

## 7.5 SEIS Agency Coordination

### 7.5.1 Agency Scoping

Agency coordination and scoping was conducted through telephone contacts and conferences, letters, and individual agency meetings, most of which transpired from January through March 2012. During the scoping process, 13 federal, State, and local agencies were invited to participate by submitting written comments and were provided an opportunity to attend meetings with project staff to discuss the JAI Project SEIS.

In addition, FHWA sent letters to the following six federal agencies on January 17, 2012, inviting their continued participation as Cooperating Agencies on the JAI Project SEIS:

- National Marine Fisheries Service (NMFS)
- U.S. Army Corps of Engineers (USACE)
- U.S. Coast Guard (USCG)
- U.S. Environmental Protection Agency (EPA)
- U.S. Forest Service (USFS)
- U.S. Fish and Wildlife Service (USFWS)

Each of these invited agencies served as a Cooperating Agency for the previous EIS. EPA, USACE, USCG, and USFS agreed to continue as Cooperating Agencies for the JAI Project SEIS.

Scoping meetings were conducted with five federal agencies between February 1 and February 14, 2012. A scoping meeting was conducted with the Alaska Department of Environmental Conservation (ADEC) on February 2, and a scoping meeting with City and Borough of Juneau department heads was held on February 7, 2012. Scoping comments were received from 10 federal, State, and local government representatives throughout February and March. Table 7-2 summarizes scoping activities with federal, State, and local government representatives.

**Table 7-2:**
**Federal, State, and Local Government Representative Participation in Scoping**

| Agencies | Meeting Date | Scoping Comment Letter Received |
|---|---|---|
| NMFS | February 14, 2012 | March 27, 2012 |
| USACE | February 13, 2012 | March 29, 2012 |
| USCG | - | - |
| EPA | February 9, 2012 | February 21, 2012 |
| USFS | February 1, 2012 | Feb 17, 2012 / March 1, 2012 |
| USFWS | February 1, 2012 | February 28, 2012 |
| ADEC | February 2, 2012 | - |
| Alaska Department of Fish and Game (ADF&G) | - | March 5, 2012 |
| Alaska Department of Natural Resources (ADNR) | - | - |
| City and Borough of Juneau | February 7, 2012 | February 29, 2012 |
| City and Borough of Sitka | - | February 17, 2012 |
| Haines Borough | - | February 27, 2012 / February 29, 2012 |
| Municipality of Skagway Borough | - | February 29, 2012 |

Meetings included the presentation of a project overview, summary of key agency issues in regard to the 2006 Final EIS, post-Record of Decision (ROD) updates (e.g., regulatory and requirement changes, data updates, new permitting requirements), an agency status discussion, information exchange, updated issues discussions, and summary of next steps.

### 7.5.2 Subsequent Agency Coordination

A meeting was held with NMFS in January 2013 to discuss questions related to Section 7 of the Endangered Species Act (ESA). Specific issues included the delisting status for the eastern Distinct Population Segment of Steller sea lions, potential critical habitat designation changes, new data regarding year-round presence of the western Distinct Population Segment Steller sea lions, and future formal consultation. In March and August 2014, NMFS provided comments on the draft Revised Biological Assessment for the JAI Project.

In August 2013, Cooperating Agencies received notification from FHWA regarding the JAI Project alternative changes due to Day Boat ACF changes, as well as FHWA’s intent to identify a preferred alternative in the Draft SEIS and to combine the Final SEIS and ROD.

## 7.6 Summary of 2012 Scoping Comments

The 2012 *Scoping Summary Report* (DOT&PF, 2012b) contains copies of all the scoping comments received during the SEIS scoping process and provides an overview of all of the substantive issues and concerns identified. A summary of the most frequent scoping comments received during the 2012 scoping process and responses to those comments is included in Chapter 7 of the 2014 Draft SEIS.

## 7.7 Relevant Correspondence Involving Local Government, Federal, and State Agencies and Organizations

Relevant correspondence in 2012 and 2013 related to issues other than scoping was provided at the end of Chapter 7 of the 2014 Draft SEIS.

## 7.8 Cooperating Agency Review of the Preliminary Draft SEIS

In January 2014, Cooperating Agencies were requested to review the preliminary Draft SEIS. Their comments and FHWA responses were included in Chapter 7 of the 2014 Draft SEIS.

## 7.9 Draft SEIS Public Comment Period

A Notice of Availability of the 2014 Draft SEIS for the JAI Project was published in the *Federal Register* on September 19, 2014. At that time, copies of the 2014 Draft SEIS were made available at the Juneau, Douglas, Mendenhall, Haines, and Skagway public libraries, as well as the Alaska State Library. Printed copies were distributed to cooperating agencies and local governments. Compact discs (CDs) were distributed to individuals and interested organizations that requested to be on the mailing list. Printed copies of the 2014 Draft SEIS and CDs were available by request from the DOT&PF Southeast (now Southcoast) Region office. The 2014 Draft SEIS and appendices also were made available for review or download from the project website: http://dot.alaska.gov/sereg/projects/juneau_access/documents.shtml. Public notices about the availability of the 2014 Draft SEIS and appendices, as well as dates of public hearing sessions and locations, were placed in the *Juneau Empire* on September 21 and 24, and October 6 and 7, 2014; *Chilkat Valley News* on September 25 and October 9, 2014; and *Skagway News* on September 26 and October 10, 2014.

In October 2014, a project newsletter was mailed to postal customers in Southeast Alaska. The mailer included information on the purpose and need of the proposed project, the proposed alternatives, the project schedule, the public hearing schedule, locations where hard copies and CDs of the 2014 Draft SEIS and appendices were available, and a request for public comment.

During the Draft SEIS review and comment period, public input was solicited and oral testimony recorded at public hearing sessions held in Juneau on October 14, in Haines on October 15, and in Skagway on October 23, 2014. An open house session before each public hearing session provided the public an opportunity to review project information and display boards, ask questions of the project staff, and provide oral or written comments. Comments were also submitted via letter and e-mail (hand delivery and fax) to DOT&PF. The public review and comment period, initially scheduled to end November 10 (providing a 52-day comment period, exceeding the 45-day minimum), was extended by 15 days (67 days total) to November 25, 2014. The FHWA Division Administrator extended the comment period due to requests from multiple parties. All comments received or postmarked by or on November 25 were analyzed.

## 7.10 2014 Draft SEIS Comments and Responses

Comments and testimony were received from the public; organizations and businesses; cooperating agencies; other local, State, and federal agencies; and tribes and other Native entities during the public comment period. These comments were analyzed in a multi-stage process that included coding, sorting, and summarizing all comments and testimony received. Each substantive comment was assigned a unique code number. Each comment was then assigned to an issue category that best reflected the substance of the comment, such as socioeconomic effects or wetland concerns. Similar comments were grouped together, and a summary comment was generated to capture the concerns of the comments in the group. These summary comments and FHWA's responses to them are provided in Appendix JJ, *Responses to Draft Supplemental Environmental Impact Statement Comments*.

Communications from cooperating agencies and comment responses from FHWA are included in Appendix JJ, Attachment A. In addition, Attachment B of Appendix JJ includes communications from local, State and federal agencies, as well as tribes and other Native entities. Attachment C of Appendix JJ includes communications from organizations, with embedded responses. These communications included extensive comments on multiple topics regarding the 2014 Draft SEIS, for which FHWA prepared individual responses.

## 7.11 Agency Coordination after the Draft SEIS Public Comment Period

A meeting was held with USFS in April 2015 to discuss old-growth reserve modifications, the forest plan amendment, the Roadless Rule process, subsistence, and the Biological Evaluation. Follow-up meetings were held to coordinate and facilitate USFS's analysis of the old-growth reserve modification. DOT&PF provided material referenced in the 2014 Draft SEIS covering subsistence and Biological Evaluation topics to USFS at its request.

Meetings and phone calls were coordinated periodically with USACE during which its comment letter on the 2014 Draft SEIS and DOT&PF Section 404/Section 10 permit application was discussed.

DOT&PF consulted several times with the State Historic Preservation Officer (SHPO) staff to discuss their comments on the 2014 Draft SEIS regarding cultural resources. In February 2016, FHWA, SHPO, and DOT&PF had meetings with Sealaska Corporation, Sealaska Heritage Institute, Douglas Indian Association, and Goldbelt Corporation to address their comments. No previously unidentified sites of cultural or historic importance were identified during the meetings.

DOT&PF consulted several times with ADF&G staff to seek additional information related to their comments on the 2014 Draft SEIS.

## 7.12 Relevant Correspondence after the Draft SEIS Comment Period

With DOT&PF's and FHWA's identification of Alternative 1 - No Action as the preferred alternative for the JAI Project, there is no longer a need to obtain permits and approvals for construction. On December 20, 2016, DOT&PF notified USACE that it was withdrawing its Section 404/10 Permit Application for the JAI Project (included as *2014 Update to Appendix X – Draft Section 404/10 Application and Draft Section 404(b)(1) Analysis* in Appendix Z of the 2014 Draft SEIS). On January 19, 2017, FHWA notified NMFS that no improvements would be made under Alternative 1 - No Action, the preferred alternative; therefore, no impacts to EFH would occur and no further mitigation is proposed. On February 15, 2017, FHWA notified NMFS that it was withdrawing the Biological Assessment Addendum and request for formal consultation under ESA Section 7 for the JAI Project. These letters are included in Attachments A and B of Appendix JJ.

## 7.13 Cooperating Agency Review of the Preliminary Final SEIS

The Preliminary Final SEIS was provided to the cooperating agencies for review on August 31, 2017. Of the cooperating agencies, only EPA provided a response. This response letter is provided in Attachment A of Appendix JJ. USACE, USCG, and USFS provided no comments on the Preliminary Final SEIS.

# 8 LIST OF PREPARERS

| **Name and Education** | **EIS Responsibility** | **Professional Experience** |
|---|---|---|
| Gary Hogins<br>B.S., Civil Engineering | Project Management | DOT&PF, Project Manager, 32 years of design and construction experience |
| Jason Bluhm<br>B.A., Computer and Video Imaging | Project Coordination | DOT&PF, Project Coordinator, 4 years of program development experience |
| Keith Karpstein<br>B.S., Civil Engineering | Technical Alignment Report | DOT&PF, Design Group Chief, 20 years of design and construction experience |
| Greg Patz<br>M.S., Business Management | Maintenance & Operations Cost Estimate | DOT&PF, Maintenance Superintendent, 18 years of experience |
| Reuben Yost<br>M.S., Zoology<br>B.S., Education | EIS and Technical Report Review | Technical Advisor to DOT&PF, 22 years of environmental and project development experience |
| Tim Haugh<br>B.S., Wildlife Science | Project Management and EIS Review | FHWA, Environmental Program Manager, 25 years of environmental and project development experience |
| Kevin Doyle<br>B.S., Agriculture, Environmental Engineering | Project Management, EIS and Technical Studies Review | HDR, Sr. Project Manager, NEPA Transportation Professional, 31 years of experience |
| Carol Snead<br>M.S., Geology<br>B.S., Geology | EIS Preparation and Technical Studies Review | HDR, Sr. Environmental Project Manager, 27 years of experience |
| John McPherson, AICP<br>M.A., Urban and Regional Planning<br>B.A., Economics / Mathematics | Transportation, Land Use, Socioeconomics, Travel Model Analysis, QC | HDR, Sr. Planner, 26 years of experience |
| Laurie Cummings, AICP CTP, ENV SP<br>M.U.P., Urban Planning<br>Graduate Diploma of Business Administration<br>B.A., Geography | Alternatives, Socioeconomics, Land Use, Visual Resources, Transportation and Travel Model Analysis | HDR, Planner, 19 years of experience |
| Leandra Cleveland<br>B.S., Environmental Planning | Natural Resource Technical Report Lead, SEIS Author,<br>Natural Environment: Marine and Freshwater Habitat including Essential Fish Habitat, Terrestrial Habitat, Marine and Anadromous Fish and Shellfish, Wildlife, Proposed Mitigation and Commitments | HDR, Environmental Scientist, 17 years of experience |

| Name and Education | EIS Responsibility | Professional Experience |
|---|---|---|
| John Wolfe<br>B.A., Writing / Literature / Northern Environmental Studies | Land Use, Old Growth Habitat, and Inventoried Roadless Areas. Tongass National Forest, Inventoried Roadless Areas, Section 4(f): Parks and Recreation Areas, Refuges, and Significant Historic Sites | HDR, NEPA / Environmental Planner, 23 years of experience |
| Vanessa Bauman<br>M.A., Geography<br>B.A., Geography | GIS | HDR, Senior GIS Analyst, 14 years of experience |
| Sirena Brownlee<br>B.S., Ecology | Bald Eagles | HDR, Wildlife Biologist, 17 years of experience |
| Mac Salway<br>M.S., Environmental Science and Engineering<br>B.S., Natural Science / Biology | Wetlands | HDR, Wetlands Scientist, 14 years of experience |
| Simon Wigren<br>B.S., Wildlife Biology | Wildlife | HDR, Environmental Scientist, 11 years of experience |
| Elizabeth Grover<br>M.A., Anthropology<br>B.A., Anthropology | EIS Preparation, Technical Editing, Copy Editing, Document Formatting | HDR, Environmental Planner/ Editor, 18 years of experience |
| Nikki Navio<br>B.A., Political Science | EIS Preparation, Technical Editing, Document Formatting | HDR, Planner, 2 years of experience |
| Tina Adair<br>B.S., Communications | EIS Preparation, Technical Editing, Copy Editing, Document Formatting | HDR, Editor, 30 years of experience |
| Julie Jessen<br>M.S., Historic Preservation<br>B.A., History | Public Involvement | HDR, Sr. Public Involvement Specialist, 18 years of experience |
| Becky Holloway<br>M.S., Biology and Genetics<br>B.S., Marine Biology | Steller Sea Lion Technical Report, Biological Assessment QC | HDR, Biologist, 18 years of experience |
| Tracie Krauthoefer<br>M.A., Historic Preservation<br>B.A., Anthropology | Historical and Archaeological Resources, Subsistence | Corvus Culture, Cultural Resources Specialist, 20 years of experience |
| Marcus Hartley<br>M.S., Agricultural and Resource Economics<br>B.A., History | Coordinator of Existing Economic Conditions Team, and Coordinator of Historic Ferry Traffic and Ferry Elasticity Analyses | Northern Economics, Inc., Vice President and Principal Economist, North Pacific Fishery Management Council, Sr. Economist and Staff Economist, 27 years of experience |
| Robert Dugan<br>B.A., Geology | Geologic Hazard Summary | Golder Associates, Principal Engineering Geologist, 41 years of experience |
| Bill Glude<br>B.S., Geology | Avalanche Report | Alaska Avalanche Specialists, 37 years of experience |

| Name and Education | EIS Responsibility | Professional Experience |
|---|---|---|
| Donald Samdahl, P.E.<br>M.S., Transportation Engineering<br>B.S., Civil Engineering | Travel Demand Forecasting, Technical Appendix and SEIS Review, and Project Management | Fehr & Peers, Principal, 38 years of experience |
| Jerry Walters<br>M.E., Transportation Engineering<br>B.S., Engineering Science | Travel Demand Forecasting, Technical Appendix and SEIS Review | Fehr & Peers, Principal, 41 years of experience |
| Robert Cervero, Ph.D.<br>Ph.D., Urban Planning and Management<br>M.S., Civil Engineering<br>Master of City Planning<br>A.B., Geography and Economics | Technical Advisor to Fehr & Peers | Department of City and Regional Planning, University of California, Berkeley, Faculty Member, 41 years of experience |
| James Calvin<br>M.S., Mineral Economics<br>B.S., Geology | User Benefit Analysis Traffic Analysis and Review | McDowell Group, Principal, 30 years of experience |
| Milton Barker<br>M.B.A.<br>B.A. Math & Economics | User Benefit Analysis | MB Barker, LLC, 45 years of experience |
| Patrick Eberhardt, P.E.<br>M.S., Naval Architecture<br>B.S., Marine Engineering | Update Marine Segments Report | Coastwise Corporation, Principal Engineer, 33 years of experience |
| Bruce L. Hutchison, P.E.<br>M.S.E., Civil Engineering / Ocean Engineering<br>B.S., Engineering | Ocean Engineering | The Glosten Associates, Principal, 45 years of experience |

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# 9 FINAL SUPPLEMENTAL EIS DISTRIBUTION LIST

This Final Supplemental Environmental Impact Statement (SEIS) will be distributed to the listed groups, and commenters on the 2014 Draft SEIS will be notified of its publication and availability.

## 9.1 Federal Agencies

Advisory Council on Historic Preservation

Federal Highway Administration

National Marine Fisheries Service

U.S. Army Corps of Engineers, Regulatory Branch, Alaska District

U.S. Coast Guard

- Commander, 17th Coast Guard District

U.S. Department of the Interior

- National Park Service, Alaska Region

U.S. Environmental Protection Agency

- Alaska Operations Office, Region 10
- Office of Federal Activities, EIS Filing Section

U.S. Fish and Wildlife Service

- Juneau Fish and Wildlife Field Office

U.S. Forest Service

- Region 10, Alaska Region Office
- Juneau Ranger District
- Tongass National Forest

## 9.2 State Agencies

Alaska Department of Commerce, Community and Economic Development

Alaska Department of Environmental Conservation

Alaska Department of Fish and Game

- Habitat Division

Alaska Department of Natural Resources

- Division of Forestry

- Division of Mining, Land, and Water
- Division of Parks and Outdoor Recreation
- Office of Project Management and Permitting
- State Historic Preservation Officer

Alaska Department of Public Safety

Alaska Department of Transportation and Public Facilities

- Alaska Marine Highway System
- Southcoast Region Design and Construction

## 9.3 Local Governments

City and Borough of Juneau

Municipality of Skagway Borough

Haines Borough

## 9.4 Native Organizations

Chilkat Indian Village

Chilkoot Indian Association

Douglas Indian Association

Goldbelt, Inc.

Hoonah Indian Association

Klukwan, Inc.

Sealaska Corporation

Sealaska Heritage Institute

Skagway Traditional Council / Skagway Village

Central Council Tlingit and Haida Tribes of Alaska

# 10 REFERENCES

References added since the 2014 Juneau Access Improvements Project Draft Supplemental Environmental Impact Statement (Draft SEIS) are highlighted in gray. Those references that are not, were included in the 2014 Draft SEIS and are used in this Final Supplemental EIS (Final SEIS). References included in the 2006 Final EIS that were not utilized in this Final SEIS are not included.

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