SUMMARY

INTRODUCTION

PURPOSE OF THE EIS

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

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

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

An essential element of the NEPA process is interactive public participation, whereby a Draft EIS is published and comments are solicited from the general public and interested parties (including government entities, regulatory agencies, and Native organizations). These comments may range from simple statements of support or opposition to complex technical discussions of project alternatives, study methods, determination and characterization of impacts, and mitigation recommendations. The Final EIS documents and responds to all substantive comments. An additional 30-day review follows publication of this Final EIS, and responses to comments received will be documented in a Record of Decision.

ORGANIZATION OF THE EIS

The EIS is organized as follows:

- Summary
- Contents (including listings of all tables, figures, and appendices)
- Acronyms and Abbreviations
- Chapter 1: Purpose of and Need for Action
- Chapter 2: Alternatives
- Chapter 3: Affected Environment
- Chapter 4: Environmental Consequences
- Chapter 5: List of Preparers
- Chapter 6: EIS Distribution List
- Chapter 7: Comments and Coordination
- References
- Index

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

- Appendices:
  - A Preliminary Quantities and Cost Estimate Technical Memorandum
  - B Pennock Island and Gravina Island/Clam Cove Public Outreach Summary
  - C Conceptual Stage Relocation Study
  - D Economic Impact Assessment
  - E Wind Climatology Technical Memorandum
  - F Consequences of Various Channel Closures to Large Shipping
  - G Reconnaissance of Vessel Navigation Requirements
  - H Monte Carlo Navigation Simulation Technical Memorandum
    Supplemental Monte Carlo Navigation Simulation Study Technical Memorandum
  - I RTM STAR Center Report
  - J Real Time Navigation Simulation Study (STAR Center) Technical Memorandum
  - K Effects on Cruise Ship Operations
  - L U.S. Army COE Section 10/404 Permit Application
    404 (b)(1) Evaluation
    DOT&PF and FHWA Wetlands Finding
    COE Permit Public Notice
  - M Wetlands Evaluation Technical Memorandum
  - N Marine Environment Impact Assessment Technical Memorandum
  - O Essential Fish Habitat Assessment
  - P Hazardous Materials Investigation Report
  - Q Estimate of Air Quality Impacts
  - R Public and Agency Comment
  - S Gravina Island Plan
  - T Biological Assessment for Informal Consultation Conducted Pursuant to Section 7 of the Endangered Species Act

The basis of this document is the Draft EIS text in its entirety, with changes made as appropriate throughout the document to reflect the selection of an alternative, modifications to the project, updated information on the affected environment, changes in the assessment of impacts, the selection of mitigation measures, the results of coordination, comments received on the Draft EIS, and responses to those comments. Important changes are marked in bold for easy identification by the reader. Appendices from the Draft EIS that have been revised are appended to this Final EIS. All other appendices (i.e., those that remain unchanged from what was presented in the Draft EIS) have not been reprinted, but all appendices can be viewed on the CD version of the EIS and on the project website (www.gravina-access.com).

PROPOSED ACTION

The proposed action is to improve surface transportation between Revillagigedo Island and Gravina Island in the Ketchikan Gateway Borough of Alaska. Known as the Gravina Access Project, this project is one of 17 high-priority infrastructure projects in the State of Alaska to be federally funded under the Federal Transportation Equity Act for the 21st Century (TEA-21), enacted in 1998. The TEA-21 authorizes approximately $20 million for construction of a bridge joining Gravina Island to the community of Ketchikan on Revillagigedo Island. Current federal funds for the project require a 20 percent state match. The Alaska Department of Transportation and Public Facilities (DOT&PF) currently has the Alaska State Legislature's authority to proceed with expenditure of up to $10 million for the Gravina Access Project; additional funding would be necessary to construct any of the build alternatives.

Currently, there is no "hard link" (surface) transportation between Gravina Island and Revillagigedo Island. Public access between the islands is available via a ferry that transports vehicles, bicyclists, and pedestrians from Ketchikan across Tongass Narrows to the Ketchikan International Airport terminal on Gravina Island. The proposed action addresses the need for improved access to developable land, improved access to the airport, and long-term economic development on Gravina Island. Chapter 1 provides a detailed
of the purpose of and need for the project.

The DOT&PF, in cooperation with the Federal Highway Administration (FHWA), has examined a range of alternatives for the Gravina Access Project: four bridge alternatives that cross Tongass Narrows near the airport, two bridge alternatives that cross Pennock Island, and three ferry alternatives that would supplement the existing airport ferry service. The terminus locations on Revillagigedo Island for each of the alternatives tie into Tongass Avenue at or near (from North to South) Peninsula Point, Signal Road, the existing airport ferry, Cambria Drive, Plaza Mall, the U.S. Coast Guard (USCG) Station, and the Forest Park subdivision. On Gravina Island, each alternative has a terminal location at Ketchikan International Airport and provides access to Borough and other developable land north of the airport. With the exception of one of the ferry alternatives (Alternative G2, see Figure 2.17), all build alternatives have a terminus on Gravina Island at the northern boundary between the airport property and Borough property. The ferry alternative that does not have a terminus at the airport-Borough property boundary originates north of that boundary at Lewis Point.

All of the build alternatives include a roadway around the southern end of the airport runway connecting the airport terminal to a spine road on the west side of the airport. Preliminary engineering and environmental studies, as well as input from state and federal agencies, indicated that this southern route around the airport was the only reasonable location of this roadway because a northern route around the airport would require extensive fill in Tongass Narrows, which would have unreasonable environmental impacts to intertidal areas and other sensitive habitat.

The roadway associated with each project alternative would consist of two lanes each 11.8 feet wide, with shoulders each 7.9 feet wide; the length of roadway varies from 16,670 feet to 43,080 feet, depending on the alternative; and the associated area of the road embankment fill varies from 40 acres to 107 acres.

The project's potential for significant impacts prompted DOT&PF and FHWA to prepare an EIS. A notice of intent to prepare an EIS was published in the Federal Register in February 1999.

RELATED ACTIONS AND PROJECTS

In addition to the Gravina Access Project, there are several major actions being led by local, state, and federal agencies in the Ketchikan Gateway Borough. These actions are independent of the Gravina Access Project, but are related to the project because they could affect the same areas and resources. The four major actions and their relationship to the Gravina Access Project are described as follows.

1. The Ketchikan Gateway Borough is engaged in a planning effort called *Ketchikan 2020* concurrent with the Gravina Access Project. This planning project includes an update of the *Comprehensive Plan*, a *Gravina Island Development Plan*, a *Coastal Management Program Update*, and a *Wetland Development Plan*. To date, the Borough has published a draft *Gravina Island Development Plan*, prepared an internal Borough draft of the *Coastal Management Program Update*, and developed a work plan for completing the *Wetland Development Plan.* The Borough has not started its update of the *Comprehensive Plan*.

   The final public review draft of *Gravina Island Development Plan* is intended to guide future development of Gravina Island in tandem with the selection of the preferred alternative for the Gravina Access Project identified by the local community as well as DOT&PF and FHWA; however, fulfillment of the plan is not dependent on the selection of any one alternative in particular. The plan identifies three areas as planning units based on land ownership, current land use, and accessibility (including existing and potential road corridors).

2. The DOT&PF updated its master plan in June 2003 for Ketchikan International Airport. The updated Ketchikan International Airport Master Plan includes recommendations for extension of the runway; improvements to the passenger terminal facility; development of a remote facility (i.e., on Revillagigedo Island), which would include key functional elements of a passenger terminal such as parking, ticketing, baggage check-in, and car rental; and a new general aviation apron. The selection of any of the build alternatives will require revisiting the master plan's recommendation for the development of a remote facility.

   Because the airport terminal is one of the termini of the Gravina Access Project, development of project alternatives was closely coordinated with the airport master planning effort. The master plan recommendations include options that provide for improved access to Gravina Island, but are not dependent on the development of any one of the Gravina Access Project build alternatives.

3. The U.S. Forest Service (USFS) has prepared a Draft EIS for the Gravina Island Timber Sale to evaluate the impacts of a timber sale and increased access for recreational pursuits. The *Gravina Island Timber Sale Draft Environmental Impact Statement* was released in January 2001. Following the comment period on the Draft EIS, preparation of the Final EIS was put on hold pending resolution of the USFS rulemaking on roadless area conservation. On December 23, 2003, it was announced that the Tongass National Forest would be granted a temporary exemption to the roadless rule. The USFS is

therefore now in the final stages of EIS preparation and it is anticipated that the Final EIS will be available to the public in late spring of this year. [2]

The preferred alternative presented in the Gravina Island Timber Sale Draft EIS involves construction of 22.6 miles of new road on Gravina Island to facilitate logging activities. The new logging road would tie into the Borough's proposed gravel road between the airport and the Pacific Log and Lumber timber processing facility north of the airport. After the logging, the main portion of the road (approximately 16 miles) would remain open for recreational purposes.

Note that all of the alternatives presented in the Gravina Island Timber Sale Draft EIS are independent of the Gravina Access Project. The Timber Sale Draft EIS does not address a future condition where access to Gravina Island would be improved through a bridge or additional ferry service. Although the Gravina Access Project EIS examines the potential cumulative effects of improving access to Gravina Island and developing new roads for the timber sale on the natural and human environments (Section 4.27), improved access for timber harvest is not a part of the purpose and need of the Gravina Access Project.

4. **Before and during the development of Gravina Access Project, the Ketchikan Gateway Borough was separately planning development of a new road around the west side of the airport to the Lewis Reef development area. All build alternatives include construction of a spine road around the west side of Ketchikan International Airport to serve many of the same general purposes the Borough had planned. The Borough continued planning for its road as the Gravina Access Project Draft EIS was produced, with the assumption that it would be built before the EIS was completed. As this Final EIS goes to press, the Borough has completed its road design and independently secured a Section 404 permit from the U.S. Army Corps of Engineers. The alignment in this document is slightly different than the Borough's alignment. If the Record of Decision for the Gravina Access Project selects any of the build alternatives for construction and if it is signed before construction begins on the Borough road, DOT&PF would work with the Borough to construct the alignment presented in this Final EIS. Should the Borough advance construction of its road prior to the Record of Decision, DOT&PF would construct the alternative selected in the Record of Decision to the point at which it would connect to the Borough's spine road alignment. The Borough's spine road would connect to other developable lands north of the airport consistent with the Gravina Access Project purpose and need.**

SUMMARY OF GRAVINA ACCESS PROJECT ALTERNATIVES CONSIDERED

The Gravina Access Project EIS presents and analyzes the following alternatives:

No Action Alternative—Existing Ferry Between Airport Ferry Terminals

Alternative C3(a)—200-foot Bridge Between Signal Road and South of Airport Terminal

[2] Robert Reeck, District Planning Staff Officer, Tongass National Forest, U.S. Forest Service, personal communication with K. Maines, Planner, HDR Inc. March 11, 2004.

Alternative C3(b)—120-foot Bridge Between Signal Road and Airport Terminal

Alternative C4—200-foot Bridge Between Tongass Avenue (North of Cambria Drive) and South of Airport Terminal

Alternative D1—120-foot Bridge Between Tongass Avenue (near Existing Ferry) and Airport Terminal

Alternative F1 (DOT&PF and FHWA Preferred Alternative)**—**Bridges (200-foot East and 120-foot West) Between Tongass Avenue and Airport, via Pennock Island

Alternative F3—Bridges (60-foot East and 200-foot West) Between Tongass Avenue and Airport, via Pennock Island

Alternative G2—Ferry Between Peninsula Point and Lewis Point

Alternative G3—Ferry Between Downtown and South of Airport

Alternative G4—Ferry with New Terminals Adjacent to Existing Terminals

Following are brief descriptions of the alternatives, with additional detail on the DOT&PF and FHWA Preferred Alternative: Alternative F1. Chapter 2 includes more detailed descriptions of each alternative. **Note that in the DEIS, "life-cycle costs" were characterized as 50-year life cycle costs, but in reality, are 20-year life-cycle costs.**

No Action Alternative

Under the No Action Alternative, no bridge would be constructed and no additional ferry service would be provided between Revillagigedo Island and Gravina Island (see Figure 2.5). The only public access between the two islands would continue to be provided by the existing airport ferry service across Tongass Narrows, private boats, and floatplanes. On Revillagigedo Island, the existing ferry terminal is located 2.8 miles north of downtown Ketchikan; on Gravina Island, the terminal is on the waterfront, just east of the airport terminal. The Borough operates the airport ferry service. The ferry service would continue to operate 16 hours per day and the frequency of service would remain the same, with departures every 30 minutes in winter and every 15 minutes in summer.

Alternative C3(a): 200-foot Bridge Between Signal Road and South of Airport Terminal

Alternative C3(a) includes a bridge across Tongass Narrows approximately 1,600 feet north of the airport terminal (see Figure 2.6). The bridge would be 5,690 feet long, and have a maximum height of approximately 250 feet. The main span of this bridge would have a vertical navigational clearance of 200 feet above high tide and a horizontal navigational clearance of approximately 550 feet.[3]

[3] Navigational clearances were determined based on consultation with the U.S. Coast Guard, discussions with cruise ship operators, review of current ship traffic in Tongass Narrows, International Navigation Association conceptual methods for channel widths, American Association of State Highway Transportation Officials (AASHTO) guidelines, computer simulations, and real-time simulations.

On Revillagigedo Island, the alternative would connect to Signal Road at North Tongass Avenue. From this terminus, the alternative alignment would traverse the hillside southward, gain elevation and turn southwestward to cross Tongass Avenue and Tongass Narrows, and then turn southward to parallel the airport runway and touch down (reach the ground surface) on Gravina Island south of the terminal. A 0.4-mile-long airport return loop road would connect the airport terminal and the bridge terminus. The main road would continue around the southern end of the airport runway and then arc northward, extending parallel to and west of the airport runway approximately 2.2 miles to the northern end of the Airport Reserve zone. At the southern end of the runway, the road would be constructed at a grade low enough to accommodate the planned future expansion of the runway, with the runway extended as an overpass of the road.

Alternative C3(b): 120-foot Bridge Between Signal Road and Airport Terminal

The Alternative C3(b) bridge would be approximately 4,250 feet long, and have a maximum height of approximately 195 feet. The main span of this bridge would have a vertical navigational clearance of 120 feet above high tide and a horizontal navigational clearance of approximately 500 feet. Horizontal clearances were determined pursuant to footnote 4.

Alternative C3(b) would have the same general alignment on Revillagigedo and Gravina Islands as Alternative C3(a); however, with a lower bridge profile, the position of the C3(b) bridge over Tongass Narrows and at its touchdown on Gravina Island (near the airport terminal) would be north of the C3(a) alignment (see Figure 2.7). This alternative would not need an airport return loop road because the bridge would touch down in front of the airport terminal.

Alternative C4: 200-foot Bridge Between Tongass Avenue North of Cambria Drive and South of Airport Terminal

The Alternative C4 bridge would be approximately 4,980 feet long and have a maximum height of approximately 250 feet. The main span of this bridge would have a vertical navigational clearance of 200 feet above high tide and a horizontal navigational clearance of approximately 550 feet. Horizontal clearances were determined pursuant to footnote 4.

On Revillagigedo Island, the alternative alignment would connect to Tongass Avenue north of Cambria Drive, across from the access to the existing ferry terminal (see Figure 2.8). From this terminus, it would extend northward and traverse the hillside around the quarry. The bridge would cross over Tongass Avenue and Tongass Narrows, turn southward to parallel the airport runway, and then touch down on Gravina Island south of the airport terminal. A 0.4-mile-long airport return loop road would connect the airport terminal and the bridge terminus. The main road would continue around the southern end of the airport runway and then arc northward, extending parallel to and west of the airport runway approximately 2.2 miles to the northern end of the Airport Reserve zone. At the southern end of the runway, the road would be constructed at a grade low enough to accommodate the planned future expansion of the runway, with the runway extended as an overpass of the road.

Alternative D1: 120-foot Bridge Between Tongass Avenue at Cambria Drive and Airport Terminal

The Alternative D1 bridge would cross Tongass Narrows directly east of the airport terminal. The bridge would be approximately 3,220 feet long and have a maximum height of

approximately 160 feet. The main span of this bridge would have a vertical navigational clearance of 120 feet above high tide and a horizontal navigational clearance of 500 feet. Horizontal clearances were determined pursuant to footnote 4.

On Revillagigedo Island, the alternative alignment would connect to Tongass Avenue at Cambria Drive near the existing airport ferry terminal and rise along the hillside (see Figure 2.9). The bridge would cross over Tongass Avenue and Tongass Narrows, and then turn southward to parallel the shoreline on Gravina Island and touch down south of the airport terminal. A 0.4-mile-long airport return loop road would connect the airport terminal and the bridge terminus. The main road would continue around the southern end of the airport runway and then arc northward, extending parallel to and west of the airport runway approximately 2.2 miles to the northern end of the Airport Reserve zone. At the southern end of the runway, the road would be constructed at a grade low enough to accommodate the planned future expansion of the runway, with the runway extended as an overpass of the road.

Alternative F1: (DOT&PF and FHWA Preferred): Bridges (200-foot East and 120-foot West) Between Tongass Avenue and Airport Terminal, via Pennock Island

Alternative F1 would cross Tongass Narrows via Pennock Island with two bridges (see Figure 2.10). One bridge would cross the East Channel and the other would cross the West Channel. The East Channel bridge would be approximately **3,610** feet long and have a maximum height of approximately 250 feet. The bridge would have a vertical navigational clearance of 200 feet above high tide and a horizontal navigational clearance of approximately 550 feet. The West Channel bridge would be approximately **2,690** feet long and have a maximum height of approximately 160 feet. The bridge would have a vertical navigational clearance of 120 feet above high tide and a horizontal navigational clearance of approximately 500 feet. Bridge heights over East and West Channels are designed to allow existing vessel traffic in Tongass Narrows to continue as it does today: cruise ships would use East Channel and other large vessels, such as Alaska Marine Highway System (AMHS) ferries and barge traffic, would continue to use the West Channel, predominantly. Horizontal clearances were determined pursuant to footnote 4.

On Revillagigedo Island, Alternative F1 would connect to Tongass Avenue south of Tatsuda's grocery store and near the southern end of the rock quarry. From this terminus, the alignment would rise to the southeast along the hillside (and east of the tank farm, the cemetery, and the above high tide Station), turn westward (skirting the southern end of the USCG Station property, north of the Forest Park Subdivision) and cross over Tongass Avenue approximately 1.4 miles south of downtown Ketchikan, then cross the East Channel to Pennock Island. The roadway would cross Pennock Island at grade. From Pennock Island, the West Channel bridge would cross to Gravina Island, touching down approximately 2.7 miles south of the airport runway. The road would continue northward approximately **5.4** miles to the northern end of the Airport Reserve zone. A 1.2-mile airport access road would be constructed at the southern end of the airport runway. The airport access roadway would be constructed at a grade low enough to accommodate the planned future expansion of the runway, with the runway extended as an overpass of the road.

Note that the alignment presented herein reflects a minor design modification from Alternative F1 as it was presented in the Draft EIS. The bridge crossings of East and West Channels have been shifted to be perpendicular to the main navigational channels (see Figure S.1). This design modification was made to Alternative F1 in response to

concerns and comments expressed by marine pilots with regard to the original alignment of Alternative F1. The analyses of impacts associated with Alternative F1 presented in Chapter 4 of this Final EIS, and all of the figures in the document, have been revised where necessary to reflect this design modification.

Alternative F3: Bridges (60-foot East and 200-foot West) Between Tongass Avenue and Airport, via Pennock Island

Similar to Alternative F1, Alternative F3 would have two bridges that cross Tongass Narrows via Pennock Island (see Figure 2.11). One bridge would cross East Channel and the other bridge would cross West Channel. The East Channel bridge would be approximately 2,065 feet long and have a maximum height of approximately 140 feet. The bridge would have a vertical navigational clearance of 60 feet above high tide (lower than any of the other bridges), and a horizontal clearance of approximately 500 feet. The East Channel bridge height is designed to approach Revillagigedo Island at the approximate grade of South Tongass Avenue (at a T-intersection) while allowing smaller vessels and USCG vessels to transit the East Channel. The West Channel bridge would be approximately 3,270 feet long and have a maximum height of approximately 250 feet. The bridge would have a vertical navigational clearance of 200 feet above high tide and a horizontal navigational clearance of approximately 550 feet. The East Channel bridge would require large vessels, those with an air draft of greater than 60 feet, to use the West Channel of Tongass Narrows. Thus, cruise ships, AMHS ferries, and other large vessels would use the West Channel to continue to make through transits of Tongass Narrows. **DOT&PF has committed to dredging approximately 184,000 cubic yards of material in the West Channel in order to improve navigational safety for large vessels.**

On Revillagigedo Island, the East Channel bridge would connect to Tongass Avenue, approximately 1.5 miles south of downtown Ketchikan between the USCG Station and the Forest Park subdivision. From this terminus, the bridge would cross the East Channel to Pennock Island. The roadway would cross Pennock Island at grade. From Pennock Island, the West Channel bridge would cross to Gravina Island, touching down approximately 2.7 miles south of the airport runway. The road would continue northward approximately **5.1** miles to the northern end of the Airport Reserve zone. A 1.2-mile airport access road would be constructed at the southern end of the airport runway. The airport access roadway would be constructed at a grade low enough to accommodate the planned future expansion of the runway, with the runway extended as an overpass of the road.

Alternative G2: Ferry Between Peninsula Point and Lewis Point

Alternative G2 would be a new ferry service for vehicles and passengers between Peninsula Point on Revillagigedo Island and Lewis Point on Gravina Island, crossing Tongass Narrows approximately 2 miles north of the airport (see Figure 2.17). The existing airport ferry would remain operational under Alternative G2.

This alternative would require construction of a new ferry terminal on each side of Tongass Narrows and two new ferry vessels. A 4.3-mile road would be constructed on Gravina Island that would extend from the ferry terminal southward approximately 2.6 miles, wrap around the southern end of the airport runway, and then turn northward to the airport terminal. The road at the southern end of the runway would be constructed at a grade low enough to allow for planned future expansion of the runway, with the runway extended as an overpass of the road.

Approximately 1,400 cubic yards of material would be removed from Tongass Narrows to provide proper navigational clearance for ferries.

The hours of operation (16 hours a day) and crossing frequency for the new ferry would be similar to the existing airport ferry schedule, with one vessel operating every 30 minutes in the winter months and two vessels operating in the summer (with crossings every 15 minutes).

Alternative G3: Ferry Between Downtown and South of Airport

Alternative G3 would be new ferry service for vehicles and passengers between Ketchikan (near the Plaza Mall at the intersection of Tongass Avenue and Jefferson Street) on Revillagigedo Island and a location approximately 0.6 miles south of the airport runway on Gravina Island (see Figure 2.18). The existing airport ferry would remain operational under Alternative G3.

This alternative would require construction of a new ferry terminal on each side of Tongass Narrows and two new ferry vessels. A road would be constructed on Gravina Island from the ferry terminal northward approximately 3.0 miles to the northern end of the Airport Reserve property. A 1.2-mile airport access road would be constructed around the southern end of the airport. The road at the southern end of the runway would be constructed at a grade low enough to allow for future planned expansion of the runway, with the runway extended as an overpass of the road. **Approximately 18,600 cubic yards of material would be removed from Tongass Narrows to provide proper navigational clearance for ferries.**

The hours of operation (16 hours a day) and crossing frequency for the new ferry would be similar to the existing airport ferry schedule, with one vessel operating every 30 minutes in the winter months and two vessels operating in the summer (with crossings every 15 minutes).

Alternative G4: Ferry Between New Terminals Adjacent to Existing Terminals

Alternative G4 would be new ferry service for vehicles and passengers adjacent to the existing airport ferry route, crossing Tongass Narrows 2.8 miles north of downtown (see Figure 2.19). The existing airport ferry would remain operational under Alternative G4.

This alternative would require construction of a new ferry terminal on each side of Tongass Narrows, adjacent to the existing airport ferry terminals, and two new ferry vessels. A 3.2-mile road would be constructed on Gravina Island that extends southward from the airport ferry terminals; the roadway would wrap around the southern end of the airport runway, and then turn northward, extending parallel to and west of the airport runway approximately 2.2 miles to the northern end of the Airport Reserve property. The road at the southern end of the runway would be constructed at a grade low enough to allow for future planned expansion of the runway, with the runway extended as an overpass of the road. **Approximately 15,200 cubic yards of material would be removed from Tongass Narrows to provide proper navigational clearance for ferries.**

The hours of operation (16 hours a day) and crossing frequency for the new ferry would be similar to the existing airport ferry schedule, with one vessel operating every 30 minutes in the winter months and two vessels operating in the summer (with crossings every 15 minutes).

DOT&PF and FHWA Selection of their Preferred Alternative

Based on the analyses in the EIS and public and agency input, the DOT&PF and FHWA determined Alternative F1 to be the Preferred Alternative. Of the alternatives carried forward for detailed evaluation, Alternative F1 best satisfies the purpose of and need for the project while minimizing impacts on aviation, navigation, marine habitat, and the local economy. Alternative F1 would:

- Meet the need for improved convenience and reliability of access to Ketchikan International Airport and developable and recreation lands on Gravina Island;
- Promote environmentally sound, planned, long-term development on Gravina Island in conformance with Borough plans;
- Allow the continued safe passage of large cruise ships northbound and southbound through Tongass Narrows and East Channel;
- Allow continued separation of cruise ship traffic (East Channel) from the AMHS ferries and other marine traffic (West Channel);
- Avoid impact on floatplane facilities at Ketchikan International Airport and waterways designated for floatplane take-offs and landings in Tongass Narrows;
- Not intrude into the airspace of Ketchikan International Airport; and
- Avoid impacts to Ketchikan's tourism economy and local revenues.

Alternative F1 provides the additional benefit of improved access to Pennock Island, which contains a substantial amount of the Borough land base.

The DOT&PF received considerable input from the Ketchikan community strongly supporting Alternative F1 and, in January 2003, the Borough Assembly and the Ketchikan City Council both passed resolutions endorsing this alternative.

The USCG has indicated that closing East Channel to large vessel traffic likely would not meet the reasonable needs of navigation in Tongass Narrows. Alternative F1 is preferable to the other alternatives from a navigation safety standpoint because it would not contribute to conflicts at the navigational choke point next to Ketchikan International Airport and Alaska Ship and Drydock (as would Alternatives C3[a], C3[b], C4, and D1) and it would not require additional ship maneuvers, or the increased risk of such maneuvers, for cruise ships transiting West Channel (as would Alternative F3). In addition, the National Oceanographic and Atmospheric Administration (NOAA), which is proposing to homeport the research vessel *Fairweather* in Ketchikan at the USCG base, has voiced strong support for an alternative that provides for large vessel transits in East Channel.

Alternative F1 would result in adverse impacts to wetlands and upland habitat; would change the character of Pennock Island, which has historically been a community that values its physical separation from the larger Ketchikan community; and would increase traffic through the downtown core. There are two cultural properties, one on Pennock Island and one on Gravina Island, near Alternative F1. The Pennock Island cultural property includes two cabins on the eastern side of the island. The cultural property on Gravina Island includes a large barge, a cabin, a large engine, and a boatway cleared of rocks. DOT&PF and FHWA have determined that these two cultural properties are eligible for placement in the National Register of Historic

Places under Criterion D because of their information potential, **that they are in the area of potential visual effects but not physical effects**, and that Alternative F1 would not affect these properties.

Alternative F1 is preferable to the other alternatives because it would not affect cruise ship access and operations nor would it affect Part 77 airspace. Alternative F1 also has beneficial impacts by creating a "hard link" (bridge) to Gravina Island and providing access to developable land there. Alternative F1 is the most expensive alternative.

All reasonable alternatives under consideration (including the No Action Alternative) have been developed to a comparable level of detail in this EIS and their comparative merits have been evaluated. **Based on the evaluation of impacts of the alternatives and comments on the EIS and from public hearings, DOT&PF and FHWA have identified Alternative F1 as the preferred alternative for improving access to Gravina Island.**

SUMMARY OF BENEFICIAL AND ADVERSE IMPACTS

The following table, "Summary of Impacts by Alternative," presents the major environmental impacts, both beneficial and adverse, associated with each alternative.

IMPACT CATEGORIES	GRAVINA ACCESS PROJECT ALTERNATIVES									
	No Action	C3(a)	C3(b)	C4	D1	F1	F3	G2	G3	G4
Cost Factors										
Construction and Project Development ($ million)[1]	0	200	170	195	135	230	205	60	70	60
O&M ($ million)[1]	2.09	0.15	0.16	0.15	0.13	0.11	0.11	4.98	4.98	4.97
Life-Cycle ($ million)[1]	10	160	135	160	105	190	170[2]	90	100	90
Purpose and Need Factors										
Reliability of Access										
-Hours of operation per day[2]	16	24	24	24	24	24	24	16	16	16
-Trips per hour (summer/winter)	4/2	unlimited	unlimited	unlimited	unlimited	unlimited	unlimited	8/4	8/4	8/4
-Hours of downtime per day[2]	8	0	0	0	0	0	0	8	8	8
-Restrictions to hazmat transport and oversized/overweight[3] vehicles? (Y/N)	Y	N	N	N	N	N	N	Y	Y	Y
Efficiency & Convenience of Access										
Vehicular travel time (in minutes) to airport from:										
-Downtown Ketchikan	27	14	12	11	11	13	13	42[4]	35[4]	25[4]
-Carlanna Creek	19	6	4	3	3	21	21	34[4]	34[4]	17[4]
-Ward Cove	25	8	6	9	7	27	27	34[4]	40[4]	23[4]
Vehicular travel time (in minutes) to developable land from:										
-Downtown Ketchikan	NA[5]	17	17	15	14	7	7	34[4]	29[4]	29[4]
-Carlanna Creek	NA[5]	9	9	7	6	15	15	26[4]	28[4]	21[4]
-Ward Cove	NA[5]	11	11	13	10	21	21	26[4]	34[4]	27[4]
Economic Development										
Projected development on Gravina Island (in acres)										
-Residential	15	287	287	287	287	383	383	50	50	50
-Industrial/commercial	5	22	22	22	22	22	22	22	22	22
Projected development on Pennock Island (in acres)										
-Residential	0	0	0	0	0	75	75	0	0	0
-Industrial/commercial	0	0	0	0	0	1	1	0	0	0
Social and Economic Impacts										
-Number of neighborhoods bisected	0	0	0	0	0	0	0	0	0	0
-Residential relocations	0	1	2	0	0	0	0	0	0	0

IMPACT CATEGORIES	GRAVINA ACCESS PROJECT ALTERNATIVES									
	No Action	C3(a)	C3(b)	C4	D1	F1	F3	G2	G3	G4
-Business relocations	0	0	0	1	1	0	0	1	6	0
-Estimated number of affected parcels	0	23	28	15	14	30	27	13	15	14
-Total construction jobs[6]	NA	360	310	390	290	470	460	250	270	250
-Annual O&M jobs[7]	16	2	2	2	1	1	1	51	51	51
-Reductions in cruise-related spending ($ million)	0	0	2.2	0	2.2	0	0	0	0	0
-User economic benefits ($ million)	0	55.2	62.3	64.2	70.0	27.1	22.6	-0.2	-0.2	2.0
Transportation Impacts										
Miles of new roadway	NA	3.8	4.0	3.7	3.4	8.2	6.9	3.6	3.8	3.2
Intrusion into Part 77 airspace (Y/N)	N	Y	Y	Y	Y	N	N	N	N	N
Number of floatplane flights per year potentially eliminated due to loss of the SVFR exemption (assuming 2,000 SVFR current operations annually)	0	**1,800**	**1,800**	**1,800**	**1,800**	**200[18]**	**100[8]**	0	0	0
Percentage of large ships diverted from Ketchikan	0	0	2	0	2	0	0	0	0	0
Natural Resources Impacts										
Number of waterbody crossings	0	8	8	8	8	14	14	8	10	8
Upland habitat losses (acres filled)	0.0	5.1	9.1	10.4	8.6	10.7	4.8	7.6	7.0	4.7
Wetland habitat losses (acres filled)	0.0	44.0	42.3	38.8	36.1	96.5	85.1	42.5	47.6	35.4
Essential Fish Habitat losses (acres)	**0.0**	**6.3**	**7.1**	**6.9**	**4.3**	**0.2**	**16.2**	**0.7**	**3.8**	**1.6**
Cultural Resources Impacts										
Eligible historic/archaeological properties in area of potential effect	0	0	0	0	0	2	2	0	0	0

[1] Rounded to nearest 5 million due to the variable and preliminary nature of engineering. **Note that in the DEIS, "life-cycle costs" were characterized as 50-year life cycle costs, but in reality, are 20-year life-cycle costs.**
[2] Hours of operation and downtimes would be the same for all ferries.
[3] Ferry service is typically limited to vehicles less than 20 feet in length. The weight limit is 30,000 pounds.
[4] Values provided represent travel times using new ferry facility only. Travel time for the existing airport ferry would the same as for the No Action alternative.
[5] Not applicable – the No Action Alternative does not include access to developable land.
[6] Assumes a three-year construction period. Jobs can be full-time, part-time, or seasonal.
[7] Number of jobs represents one full-time employee.
[8] The Federal Aviation Administration's preliminary analysis of Alternatives F1 and F3 indicated that, although the alternatives appear to be outside the Exemption 4760 boundaries, some modification of the boundaries may be required. The analysis also indicates that a Pennock Island crossing would be "less disruptive" to floatplane operations than the other bridge alternatives. For purposes of this analysis, HDR assumed 10 percent and 5 percent reductions in special visual flight rules (SVFR) operations for Alternatives F1 and F3, respectively.

SUMMARY OF PROPOSED MITIGATION COMMITMENTS

The following presents DOT&PF's and FHWA's commitments to mitigate impacts that would result from the development of Alternative F1. In many cases, the construction contractor would implement the mitigation measures. Other mitigation measures would be implemented during final design of Alternative F1. Mitigation measures related to the other alternatives evaluated in this EIS are described in each section of Chapter 4, and a complete compilation of mitigation measures appears at the end of Chapter 4 (Section 4.30).

Mitigation of Direct Impacts

Land Use—DOT&PF would build fencing along the roadway embankment adjacent to the USCG Station and enclose the firing range on the USCG property so that safe use of the range can continue. Further consultation with the USCG would take place to ensure no impact to the planned relocation of a magazine.

Water Quality—Water quality protection features and management practices would be incorporated into the design of the bridges and roadway, including measures to minimize the fill footprint and to prevent erosion over the long term by use of erosion-resistant materials and revegetation. Storm water treatment would be included in the road and bridge design. See also "Wetlands" and "Water Bodies and Wildlife" below for commitments related to water quality.

- **Where practicable, the angle of fill slopes would be increased to reduce encroachment into adjacent wetlands.**
- **The roadway would be designed and constructed with a low-profile embankment to minimize the fill footprint.**
- **Rock would be used to stabilize toes of slopes at pond and stream crossings to limit the erosion of fine-grained material into adjacent waters and wetlands.**
- **To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that nonnative, non-invasive annual grasses may be used to provide rapid, initial soil cover to prevent runoff of fine-grained material into adjacent wetlands. Topsoil would be applied to the surface of road slopes to aid in the reseeding process.**
- **Roadside swales would be designed to keep surface water within the natural drainage basins to allow sediment-laden water to clear before its discharge to adjacent wetlands and waters.**
- **At all stream crossings (both culverts and bridge crossings), stream banks would be re-contoured to approximate original conditions and re-seeded with native vegetation to minimize erosion.**

Wetlands—Wetlands were avoided to the extent practicable during preliminary design and such consideration would continue in final design. The design features and management practices outlined for "Water Quality" (above) also protect wetlands. DOT&PF proposes to compensate for unavoidable adverse impacts to wetlands by paying $248,400.00 as a fee in lieu of wetland restoration, enhancement, or preservation. The monetary value has been determined using historical values for DOT&PF Southeast Alaska projects. The per-acre costs used are $2,800 for forested, shrub/scrub, and

muskeg wetlands; $50,000 for bodies of fresh water; and $20,000 for marine waters. This fee will be provided to a land trust and is to be directed to wetland creation, restoration, enhancement, and preservation or land acquisition. It is important to note that the fee includes a reduction of $30,800 in anticipation that the Ketchikan Gateway Borough's proposed "Lewis Reef Road" will be realigned to match the alignment shown in this EIS. The borough has already resolved compensation for wetland impact and holds a permit, but has not begun construction. The borough, with support from DOT&PF, is applying to modify its permit to account for the alignment shift. Therefore, the 11 acres of impact anticipated under the borough's Lewis Reef Road project were removed from the 96.5 acres anticipated in this EIS.

Water Bodies and Wildlife—Clear-span bridges and fish passage culverts sized for expected flood flows would avoid and minimize impact to freshwater bodies and the fish within them. For essential fish habitat, including marine habitat and anadromous fish habitat, the following conservation measures would be implemented:

- **Stream banks would be re-contoured and re-seeded to minimize erosion.**
- **A Storm Water Pollution Prevention Plan (SWPPP) would be required of the construction contractor to define best management practices (BMPs) that would be employed to minimize the introduction of sediment and siltation during construction and fill placement. The contractor would be required to include the BMPs listed under "Water Quality" above, listed below (in this same list), and also listed below under construction impacts ("Water Quality"). The plan would follow DOT&PF's SWPPP Guide.**
- **All anadromous fish stream crossings would be designed to provide passage for the salmon present in any given stream, per DOT&PF's memorandum of agreement with the Alaska Department of Fish and Game.**
- **In-water work in Tongass Narrows would be restricted, as follows. General use of boats and barges could occur year round for general survey and work on bridge structures above water. Except for blasting, dredging, and pile driving, other work in marine waters could occur July 1-February 28. Blasting, dredging, and pile driving could occur only November 1-February 28, with the possible exception of mid-channel locations, based on further consultation with the Alaska Department of Natural Resources (DNR), NOAA Fisheries, U.S. Army Corps of Engineers (COE), and U.S. Fish and Wildlife Service (USFWS).**
- **A vibratory hammer would be used for pile driving.**
- **Construction at anadromous fish streams would take place June 15 to August 7 and would avoid the period from August 8 to June 14.**
- **Blasting would be performed such that ground vibration (particle velocity) would not exceed 2.0 inches per second and peak water overpressure (instantaneous pressure change) would not exceed 2.7 pounds per square inch.**
- **The contractor would be required to prepare a blasting plan prior to these activities. The plans would include a pre-blasting survey for fish schools and monitoring for fish kills. Measures will be used to dampen blast impact.**

- **Dredged debris would be disposed of on land. Only under Alternative F3, which could require substantial removal of sediment and rock, would ocean disposal be necessary. These operations for Alternative F3 would be consistent with the regulations of Clean Water Act, Section 404(b)(1) (disposal of dredged materials into waters of the U.S.) and Marine Protection, Research, and Sanctuaries Act, Sections 102 and 103. Dredging activities will avoid the entire months of March through October.**

Fueling and servicing operations would occur at least 100 feet from water bodies, and fuel storage would occur at least 100 feet from all water bodies.

- **All necessary permits and agency approvals will be obtained prior to construction, and any permit stipulations will be incorporated into the contract specifications.**
- **Perimeter staking would be required on the outside of the disturbance area prior to construction to ensure no additional impact from construction activities.**
- **Silt fences would be used adjacent to Essential Fish Habitat (EFH) stream channels, just beyond the estimated toe of fill.**
- **Gravels and streambed material would be used in the bottoms of fish-passage culverts, per Tier I design in a fish passage agreement between ADF&G and DOT&PF.**
- **Riprap and bioengineering would be used along stream banks to maintain stream bank integrity and improve habitat.**

Mitigation of Construction Impacts

Land Use—Affected private property and established land uses would be protected. This would include maintaining access during construction. Careful coordination with the USCG would occur throughout construction on and adjacent to USCG property.

Aviation Transportation—Access to the airport terminal would be maintained during construction, including construction of a new parking garage at the airport. Measures would be taken to minimize service disruption for helicopter and floatplane operators. Continued access to floatplane service would be provided for floatplane customers at the airport, even if it were to become necessary to temporarily relocate the floatplane dock (Alternatives C3[a], C3[b], C4, and D1).

Marine Transportation—Bridge construction would be timed to minimize disruption of marine traffic during the busy summer season and focus major activities in the off-season to the extent practical. Advance notice of temporary closures of portions of Tongass Narrows while placing bridge components would be provided.

Vehicular Transportation—Construction that might cause lane closures would be timed for low-traffic periods. Temporary roads and driveways would be employed where necessary to ensure continued mobility during construction.

Pedestrians and Bicyclists—A traffic maintenance and parking plan will include provisions for maintaining pedestrian and Bl traffic and safety through construction areas. To the maximum extent possible, access would remain available.

Geological Resources—An erosion and sediment control plan would be prepared to minimize erosion and prevent failure of disturbed slopes.

Air Quality—Measures such as watering would be implemented to control dust at construction sites, as needed.

Noise and Vibration—Construction activities near residences would be prohibited between 11:00 p.m. and 6:00 a.m. Some exceptions might be requested from the City of Ketchikan during special construction activities. Blasting, if required, would be controlled to avoid damage of nearby structures and to meet the requirements of the local noise ordinance. In-water blasting, pile driving, and/or drilling would be controlled to ensure that the pressure waves generated did not pose a consistent, adverse threat to fish and other marine resources.

Water Quality—The erosion and sediment control plan would minimize contamination via construction runoff. Runoff from the construction area would be controlled by BMPs to minimize erosion and transport of sediment, to prevent any accidental leaks of oil or fuel from equipment from contaminating creeks or Tongass Narrows, and to contain any such leaks. The storm water pollution prevention plan would incorporate BMPs, including limiting the construction staging area, using silt fences, fueling away from water, and ensuring spill cleanup material is readily available. Some of the BMPs that would be used include:

- **DOT&PF would hold meetings at the beginning of construction with the construction contractor and agencies to ensure implementation of mitigation commitments.**
- **Staking the planned outside limits of disturbance prior to construction to limit impacts to that area.**
- **Limiting clearing and grubbing outside of the fill footprint to the extent practicable to control physical disturbance of wetlands.**
- **Installing silt fences adjacent to waterways just beyond the estimated toe of fill to capture fine-grained material contained in runoff.**
- **Installing ditch checks to reduce bank erosion.**
- **Using sedimentation basins, as necessary (based on the potential volume of storm water runoff) to limit sedimentation of adjacent wetlands and other waters.**
- **Fueling and servicing of construction vehicles at least 100 feet away from water bodies. Staging and storage of fuel and related products would occur at least 100 feet from wetlands as well as water bodies.**
- **Having spill response equipment readily available and ensuring that construction personnel are trained in spill response to contain accidental leaks of oil or fuel from construction equipment.**

Wetlands—In addition to the measures listed above for "Water Quality," temporary impacts to wetlands would be minimized by placing equipment and temporary fill on mats.

Water Bodies and Wildlife—Construction activity in any water body would adhere to applicable state and federal permit conditions. In-water blasting, pile driving, and/or drilling would be controlled to ensure that the pressure waves generated would not pose a consistent, adverse threat to fish and other marine resources. Blasting within half a mile of an eagle nest, and other construction activity within 100 meters (approximately 328 feet), would not take place during nesting season. The USFWS would be consulted to review construction plans. For EFH, including marine habitat and anadromous fish habitat, and marine mammal habitat, the following conservation measures would be implemented:

- **The EFH work window for in-water work in Tongass Narrows would be followed for marine mammals as well.**
- **When blasting and dredging, the project would ensure use of trained and NOAA Fisheries-approved observers to indicate when mammals are within a 50 m zone.**
- **An in-water warning sound would be issued prior to blasting to allow any marine mammals to move to a comfortable distance.**
- **If design should change, an incidental harassment authorization might need to be obtained from NOAA Fisheries.**
- **Mitigation measures would be finalized during the permitting process with input from DNR, NOAA Fisheries, COE, and USFWS.**
- **See also the list of measures for Essential Fish Habitat, above.**

All migratory birds are protected under the Migratory Bird Treaty Act, which makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. Bald eagles are protected by the Bald Eagle Protection Act of 1940 as amended. In accordance with USFWS guidelines, DOT&PF would establish a construction activity buffer surrounding active bald eagle nests that could be affected by construction activities. USFWS will be consulted prior to construction to review and comment on the proposed buffer area(s) and to identify additional measures to prevent abandonment of a nest during the breeding season.

Historic and Archaeological Resources—Prior to construction, a qualified archaeologist would conduct a reconnaissance level survey of the alignment once it was staked to make sure no historic or archeological resources were overlooked. Consultation with the State Historic Preservation Officer and tribal entities would continue during design and construction as needed.

Hazardous Materials—A spill prevention and response plan would be prepared.

AREAS OF CONTROVERSY

Issues raised by the public and agencies are outlined in Chapter 7 of the EIS. The primary areas of controversy among the public have related to costs of project construction; effects on

marine navigation, the cruise ship industry, and the economy; encroachment into Part 77 airspace; impacts on floatplane facilities and operations; increased traffic through the downtown core; and impacts on cultural resources on Pennock Island.

MAJOR UNRESOLVED ISSUES

The Federal Aviation Administration (FAA) may adjust the Exemption 4760 airspace to include the area of Alternative F1, which would affect Special Visual Flight Rules (SVFR) operations there.[4]

FEDERAL ACTIONS NECESSARY

Alternative F1 would require a Section 404 permit from the U.S. Army Corps of Engineers (COE) for impacts to waters of the United States, including wetlands, subject to Section 404 jurisdiction. Alternative F1 **also would require a Section 10 permit from the COE for work in navigable waters. A Section 10/404 permit application is attached to the Final EIS in Appendix L, along with a COE public notice. The permit public review period is concurrent with the EIS review period.**

A Section 9 Bridge Permit from the USCG would be required for any bridge constructed over navigable waters, which includes Tongass Narrows.

The EPA would require a National Pollutant Discharge Elimination System (NPDES) construction permit for all construction activities that would result in ground disturbance of 1 acre or greater.

The EIS considers, and the project complies with, the following federal laws and executive orders, which are the primary federal laws that apply to the project:

- Clean Air Act
- Clean Water Act, Section 401
- Clean Water Act, Section 404
- Coastal Zone Management Act
- Endangered Species Act
- Fish & Wildlife Coordination Act
- Magnuson-Stevens Fishery Conservation & Management Act (Essential Fish Habitat)
- Marine Mammal Protection Act
- Marine Protection, Research, and Sanctuaries Act, Section 102/103
- Migratory Bird Treaty Act
- National Historic Preservation Act, Section 106
- Rivers and Harbors Act, Section 9
- Rivers and Harbors Act, Section 10
- Executive Order 11988 Floodplain Management
- Executive Order 11990 Protection of Wetlands
- Executive Order 12898 Environmental Justice
- Executive Order 13175 Consultation and Coordination with Tribes

[4] FAA Exemption 4760 permits commercial air taxi and commuter pilots to operate below a 500-foot minimum altitude in Ketchikan's Class E airspace (Class E airspace encompasses the area used by all aircraft departing from or arriving at Ketchikan International Airport and Ketchikan area floatplane facilities, and aircraft passing through Tongass Narrows airspace) when visibility and ceiling minimums drop below the minimum requirements for operating under normal visual flight rules. The SVFR of Exemption 4760 control the number of aircraft in the airspace when flying conditions are particularly challenging, ensure that pilots receive appropriate traffic advisories from the Ketchikan Flight Service Station, and separate aircraft flying under instrument flight rules (e.g., commercial aircraft) from those operating under visual flight rules.

Sections 3.13 and 4.13 provide additional information about the federal laws and regulations applicable to the Gravina Access Project.

EIS AVAILABILITY

The entire EIS is available free of charge on compact disk (CD) for viewing electronically. The document is also available for viewing on the project web site at www.gravina-access.com. Bound versions of the document are available for public review at the following locations:

Ketchikan Public Library
629 Dock Street, Ketchikan, Alaska

Ketchikan Gateway Borough Department of Planning and Community Development
344 Front Street, Ketchikan, Alaska

DOT&PF Southeast Region
6860 Glacier Highway, Juneau, Alaska

For information on obtaining a CD or bound version of the EIS, contact Mark Dalton at HDR Alaska at (907) 644-2000, or visit the project website at http://www.gravina-access.com/.