



**Juneau Access Improvements Project
Final Supplemental
Environmental Impact Statement
2017 Update to Appendix L
Noise Technical Report**

Prepared for:

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& Public Facilities
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Acronyms and Abbreviations

ACF	Alaska Class Ferry
AMHS	Alaska Marine Highway System
CFR	Code of Federal Regulations
dBA	A-weighted decibels
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FVF	Fast Vehicle Ferry
JAI	Juneau Access Improvements
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHS	National Highway System
PNHV	Peak-noise-hour-vehicles
SADT	Summer Average Daily Traffic
SEIS	Supplemental Environmental Impact Statement
TNM®	Traffic Noise Model

1. Introduction

This report updates the 2005 *Noise Technical Report*, which was prepared by the Alaska Department of Transportation and Public Facilities (DOT&PF) as Appendix L of the Juneau Access Improvements (JAI) Project Supplemental Draft Environmental Impact Statement (EIS), 2005. The 2005 report analyzed the noise impact of Alternatives 2, 2A, 2B, 2C, 3, 4B, and 4D. Traffic noise level predictions were made with the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM®) Version 2.1 (FHWA 2003), Version 2.5 (FHWA 2004), and TNM® Version 1.0 Lookup Program (FHWA 1998). The traffic noise levels associated with Alternatives 2, 2A, 2B, and 2C were all based on predicted traffic volumes for Alternative 2, which were the highest predicted traffic volumes of the four alternatives, representing a worst case scenario for traffic noise.

During the development of the JAI Project 2006 Final EIS (FEIS), the FHWA and DOT&PF responded to comments on the 2005 JAI Project Supplemental Draft EIS, incorporated new data and further analysis for some resources, and incorporated additional mitigation measures to reduce impacts to wildlife and habitat. The FHWA and DOT&PF also made some changes to Alternative 2B and eliminated Alternatives 2, 2A, and 2C from consideration as reasonable alternatives. Many of these changes required updates to supporting technical reports, which DOT&PF prepared and compiled in Appendix W of the 2006 Final EIS. The FHWA and DOT&PF updated the 2005 *Noise Technical Report* to provide noise impacts based on predicted traffic volumes specific to Alternative 2B, which were 23 to 28 percent lower than the predicted peak traffic volumes for Alternative 2. The update noise levels for Alternative 2B were presented in Addendum to Appendix L – *Noise Technical Report, 2005* in Appendix W of the 2006 Final EIS (included as Attachment A to this report).

Seven years have passed since the 2006 Final EIS and Record of Decision (ROD) were published, and the FHWA and DOT&PF recognized the need to update previous technical reports as part of the JAI Project **Final** Supplemental Environmental Impact Statement (SEIS). Updates are needed to reflect changes in regulations, new information related to the potentially affected environment or conditions, updated analysis, evaluation of the newly added Alternative 1B, and changes in the design or alignment for Alternatives 2B and 3. Three key components that affected changes to the design and alignment of Alternative 2B since the 2006 ROD are: changes during the U.S. Army Corps of Engineers permitting process to further avoid and minimize impacts to wetlands and reduce the extent of rock sidecast areas, changes based on advanced geotechnical survey information, and recent changes in 2012 in response to updated bald eagle nest survey data. Minor alignment shifts also were made to Alternative 3 in response to updated bald eagle nest survey data.

This update to the 2005 *Noise Technical Report* and its addendum provides a summary of the changes in the regulatory environment, a summary of the updated traffic forecasts, changes in project alternatives, and a qualitative evaluation of the validity of the previous noise impact analysis based on new regulations and new traffic forecasts.

1.1 Project Description

As required by the National Environmental Policy Act (NEPA), this technical report considers the following reasonable alternatives.

1.1.1 Alternative 1 – No Action

The No Action Alternative (Alternative 1) includes a continuation of mainline ferry service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs). The Alaska Marine Highway System (AMHS) would continue to be the National Highway System (NHS) route from Juneau to Haines and Skagway, and no new roads or ferry terminals would be built. In addition to the Day Boat ACFs, programmed improvements 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 as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. This alternative is based on the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner is on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal.

1.1.2 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 ferry service in Lynn Canal; the AMHS would continue to be the NHS route from Juneau to Haines and Skagway; no new roads or ferry terminals would be built; and in addition to the Day Boat ACFs, programmed improvements 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 as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. Service to other communities would remain the same as Alternative 1 – No Action Alternative. Alternative 1B keeps the *M/V Malaspina* in service after the second Day Boat ACF is brought online to provide additional capacity in Lynn Canal. Enhanced services included as part of Alternative 1B are a 20 percent reduction in fares for trips in Lynn Canal and extended hours of operations for the reservation call center.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, the *M/V Malaspina* would make one round trip per day five 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-Auke Bay-Haines-Skagway). One Day Boat ACF would make one round trip between Auke Bay and Haines seven days per week. The other Day Boat ACF would make two round trips per day

between Haines and Skagway six days per week; it would not sail on the seventh day because the mainliner would be on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week.

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

Alternative 2B would construct the East Lynn Canal Highway (50.8 miles, including 47.9 miles of new highway and widening of 2.9 miles of the existing Glacier Highway) from Echo Cove around Berners Bay to a new ferry terminal 2 miles north of the Katzehin River. Ferry service would connect Katzehin to Haines and Skagway. In addition, this alternative includes modifications to the Skagway Ferry Terminal to include a new end berth and construction of a new conventional monohull ferry to operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 2B would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer months, one Day Boat ACF would make eight round trips per day between Haines and Katzehin, a second Day Boat ACF would make six round trips per day between Skagway and Katzehin, and the Haines-Skagway shuttle ferry would make two trips per day. During the winter, one Day Boat ACF would make six round trips per day between Haines and Katzehin, and a second Day Boat ACF would make four round trips per day between Skagway and Katzehin. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzehin and transfer ferries.

1.1.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 would upgrade/extend the Glacier Highway (5.2 miles, including 2.3 miles of new highway and widening of 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay. New ferry terminals would be constructed at Sawmill Cove in Berners Bay and at William Henry Bay on the west shore of Lynn Canal, and the Skagway Ferry Terminal would be modified to include a new end berth. A new 38.9-mile highway would be constructed from the William Henry Bay Ferry Terminal to Haines with a bridge across the Chilkat River/Inlet connecting into Mud Bay Road. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 3 would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer, two Day Boat ACFs would make six round trips per day between Sawmill Cove and William Henry Bay (total of 12 trips each direction), and the Haines-Skagway shuttle ferry would make six round trips per day. During the winter, one Day Boat ACF would make four round trips per day between Sawmill Cove and William Henry Bay, and the Haines-Skagway shuttle ferry would make four round trips per day.

1.1.5 Alternatives 4A through 4D – Marine Alternatives

All four marine alternatives would include continued mainline ferry service in Lynn Canal with a minimum of two trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. Each marine alternative includes a new conventional monohull shuttle that would make two round trips per day between Haines and Skagway six days a week in the summer and a minimum of three round trips per week between Haines and Skagway in the winter. The AMHS would continue to be the NHS route from Juneau to Haines and Skagway. These alternatives assume the following improvements will have been made independent of the JAI Project before the alternative comes on-line: 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 expansion of the Haines Ferry Terminal to include new double bow berths.

1.1.5.1 Alternative 4A – Fast Vehicle Ferry Service from Auke Bay

Alternative 4A would construct two new fast vehicle ferries (FVFs). No new roads would be built for this alternative, and the Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. The FVFs would make two round trips between Auke Bay and Haines and two round trips between Auke Bay and Skagway per day in the summer. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.2 Alternative 4B – Fast Vehicle Ferry Service from Berners Bay

Similar to Alternative 4A, Alternative 4B would construct two new FVFs. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and widening of 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. In the summer, the FVFs would make two round trips between Sawmill Cove and Haines and two round trips between Sawmill Cove and Skagway per day. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.3 Alternative 4C – Conventional Monohull Service from Auke Bay

Alternative 4C would use Day Boat ACFs to provide additional ferry service in Lynn Canal. No new roads would be built for this alternative. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. In the summer, one Day Boat ACF would make one round trip per day between Auke Bay and Haines, and one Day Boat ACF would make one round trip per day between Auke Bay and Skagway. During the winter, one Day Boat ACF

would alternate between a round trip to Haines one day and a round trip to Skagway the next day.

1.1.5.4 Alternative 4D – Conventional Monohull Service from Berners Bay

Alternative 4D would use Day Boat ACFs to provide additional ferry service in Lynn Canal. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and widening of 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. This alternative includes construction of a new conventional monohull ferry that would operate between Haines and Skagway. In the summer, the Day Boat ACFs would make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. During the winter, a Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and to Skagway the next day.

2. Regulatory Update

In April 2011, the DOT&PF approved a new Noise Policy as part of the *Alaska Environmental Procedures Manual* (DOT&PF 2011). The new Noise Policy was developed in response to changes in the FHWA noise regulations contained in 23 CFR § 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. Under 23 CFR § 772, noise impacts occur when traffic noise levels approach or exceed the FHWA Noise Abatement Criteria (NAC) for specific land use types, or when the predicted traffic noise levels substantially exceed the existing noise levels. 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 A-weighted decibel (dBA) of the FHWA NAC, or if there is a substantial (defined as 15dBA or greater) noise level increase above existing noise levels. 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 FHWA made a significant change to the land use activity categories with respect to the NAC in the regulations. This change split several activity categories into multiple categories and added new types of land use to be considered in the analysis. The NAC remained the same for most of the land uses. One notable change is Activity Category E. Motels and hotels, which were previously included in Category B with residential uses and had an NAC of 66 dBA (including the 1 dBA “approach” level), now in Category E are grouped with office, restaurant, and other developed lands with a revised NAC of 71 dBA.

The DOT&PF NAC are contained in Table 2-1.

Table 2-1: DOT&PF Noise Abatement Criteria

Activity Category	dBA $L_{eq(h)}$ ^b	Description of Land Use
A	56 (exterior)	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.
B	66 (exterior)	Residential
C	66 (exterior)	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.
D	51 (interior)	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	71 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.

Activity Category	dBA L_{eq(h)}^b	Description of Land Use
F	NA	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.
G	NA	Undeveloped lands that are not permitted for development.

^aThe DOT&PF NAC presented in this table factor in the “approach” level of 1 dBA below the FHWA NAC.

^bThe 1-hour equivalent loudness in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period.

Sources: 23 CFR § 772, DOT&PF 2011

3. Updated Noise Impact Assessment

Traffic noise levels at a given location are directly related to traffic volumes and vehicle travel speeds. Because noise levels are measured on a logarithmic scale, a doubling of the noise source would not double the noise level. For traffic noise, a doubling of traffic volumes (the noise source) would result in a 3 dBA increase in noise levels, assuming travel speeds remain the same. Similarly, reducing the traffic volume by half would result in a 3 dBA decrease in noise levels. The average person cannot distinguish a noise level change of less than 3 dBA.

For the noise analysis, summer average daily traffic (SADT) volumes were selected as being representative of the highest noise level being produced on a regular basis. Design year/30-year projected traffic volumes have been revised for the JAI Project Final SEIS (DOT&PF, 2017). The 2017 traffic study relied on a different methodology than what was used for the 2005 JAI Project Supplemental Draft EIS and 2006 FEIS. The design year considered in the 2006 FEIS was 2038 (based on an Opening Year of 2008) and the design year for the Final SEIS traffic study is projected to be 2055 (based on an Opening Year of 2025) for all build alternatives. Traffic noise modeling is conducted using peak hour traffic volumes. For the 2005 *Noise Technical Report* and its addendum, the SADT was converted to summer peak-noise-hour-vehicles (PNHV) by factoring the SADT by 0.09; i.e., the PNHV is typically 9 percent of the SADT. Table 3-1 presents the SADT forecasts used in the 2006 FEIS, the new traffic forecasts (2017) developed for this Final SEIS, and the percent differences between the two forecasts.

Table 3-1: Design Year/30-Year SADT Traffic Forecasts

Alternative	2006 FEIS Traffic Forecasts from 2004 Traffic Forecast Report Design Year 2038	Current SEIS Traffic Forecasts from 2017 Traffic Forecast Report Design Year 2055	Percent (%) difference in 2017 vs. 2006 FEIS Design Year Traffic Forecast Volumes
1	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

In order to determine whether additional noise modeling was needed to assess how the updated traffic forecasts would affect noise levels in the project area, project analysts compared the 2038 design year SADT volumes from the 2006 FEIS with 2050 design year SADT volumes from the Final SEIS traffic forecasts. Utilizing the formula discussed above (a doubling of traffic volumes would result in a 3 dBA increase in noise levels and reducing the traffic volume by half would result in a 3 dBA decrease in noise levels), less than a 1dBA increase in noise levels would occur with two of the alternatives (Alternatives 2B and 3) and less than a 3 dBA decrease in noise levels would occur with five of the alternatives (Alternatives 1, 4A, 4B, 4C, and 4D). These changes in noise levels would be imperceptible to the human ear and would not alter the conclusions of the previous noise impact assessments or noise abatement evaluations. No new noise abatement considerations would be required based on current DOT&PF Noise Policy.

Alignment changes associated with Alternatives 2B and 3 are minor and do not occur in the vicinity of sensitive noise receptors, with the exception of the Berners Bay Cabin. The current alignment of Alternative 2B is farther away from the cabin (approximately 1,000 feet away) than the alignment was in 2006; therefore, a lower noise level would be expected.

Alternative 1B was not evaluated in the 2006 FEIS. It is similar to Alternative 1 in that it would not include new road, ferry, or ferry terminal construction. The 2017 traffic forecasts for Alternative 1B are similar to the 2006 FEIS traffic forecasts for Alternative 1 – No Action; therefore, potential noise impacts from Alternative 1B would be similar to those identified for Alternative 1 in the 2006 FEIS.

4. Conclusions

Since the 2006 JAI Project FEIS was issued, there have been changes to DOT&PF noise regulations, changes to project alternatives, and updated traffic volume forecasts for all alternatives, all of which could alter the noise analyses conducted for the 2006 FEIS. The 2017 traffic forecasts are generally similar to or lower than the traffic forecasts used in the noise impact analysis for the 2006 FEIS, ranging from approximately 11 percent higher to 46 percent lower. Less than a 1 dBA increase in noise levels would occur with two of the alternatives (Alternatives 2B and 3) and less than a 3 dBA decrease in noise levels would occur with five of the alternatives (Alternatives 1, 4A, 4B, 4C, and 4D). Alternative 1B, which was added subsequent to the 2006 JAI Project FEIS, would have traffic volumes similar to Alternative 1 – No Action as presented in the 2006 FEIS and, therefore, would have similar noise impacts. These changes in noise levels and changes in project alternatives would not alter the overall conclusions of the previous noise impact assessments or noise abatement evaluations. No new noise abatement considerations are required based on current DOT&PF Noise Policy. Therefore, no new noise modeling is necessary as part of this evaluation for the current JAI Project Final SEIS.

5. References

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Attachment A
2005 Addendum to Appendix L –
Noise Technical Report

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1.0 ENVIRONMENTAL CONSEQUENCES

This addendum includes Alternative 2B specific noise impacts. The Appendix L *Noise Technical Report* prepared for the Supplemental Draft EIS contained specific receptor impacts for Alternative 2 only. This addendum reflects results from the noise analysis done for Alternative 2B.

1.1 Noise Impacts for Alternative 2B

There are three sensitive noise receptors close to the highway alignments for project alternatives on the east side of Lynn Canal that are outside the limits of existing urban development: Echo Cove campground, Adlersheim Lodge, and the USFS cabin in Berners Bay. The *Noise Technical Report* provided a worst-case analysis of project noise impacts at these receptors in 2038 based on projected peak noise-hour traffic volumes for Alternative 2. Because this alternative has been eliminated from consideration, a new noise analysis was conducted at these sensitive receptors for Alternative 2B, the preferred alternative. Differences in projected 2038 peak noise-hour traffic volumes for Alternative 2 and 2B at these receptors are listed below.

Table 1
2038 Projected Peak Noise-Hour Traffic Volumes at Specific Sensitive Receptors

Sensitive Receptor	Alternative 2	Alternative 2B
Echo Cove Campground	228	174
Adlersheim Lodge	193	139
Berners Bay Cabin	212	153

The reduced peak noise-hour traffic with Alternative 2B also reduces the worst-case traffic noise level at the sensitive receptors by approximately 1.4 average-weighted decibels (dBA) equivalent sound level (L_{eq}). Therefore, Alternative 2B would result in the following worst-case peak noise-hour noise levels at the three sensitive receptors:

Echo Cove Campground	44 dBA L_{eq}
Adlersheim Lodge	59 dBA L_{eq}
Berners Bay Cabin	47 dBA L_{eq}

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