2 PROJECT ALTERNATIVES

This chapter describes the reasonable alternatives evaluated in this Draft 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 Build Alternative. (The 2004 No Action Alternative M&O cost estimates were unknown at the time of this screening.)
    - Element 5 – Reduce User Cost. An alternative should have a lower one-way travel cost 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 in the 2005 Supplemental Draft EIS can be found in the *Alternative Screening Report* (Appendix A).

2.2 Alternatives Determined Not Reasonable

2.2.1 Taku River Valley Highway

This alternative would construct a 118-mile-long highway from the end of Thane Road in Juneau, northeast along the Taku Inlet, across the Alaska-Canada border, up the Taku River Valley, along the Sloko and Pike River Valleys, and connecting to Canadian Highway 7 south of Atlin, 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[1] (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, while requiring all Juneau traffic to travel to Haines by ferry, is primarily a Haines-Skagway access project. The 2004 *Southeast Alaska Transportation Plan* identified the *M/V Aurora* as available for the Haines-Skagway shuttle service in 2005. In 2006, AMHS planned for the *M/V Aurora* to begin Haines-Skagway service in 2007; however, subsequently, one of the fast ferries was moved to the Sitka route and the *M/V Malaspina* was made a summer day boat in Lynn Canal, providing excess capacity between Haines and Skagway. The current AMHS plan for Lynn Canal service, including the Haines-Skagway shuttle, is captured in the No Action Alternative.

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

[1] This SEIS is based on the 2006 Final EIS and substantive changes have been highlighted in gray for easy identification by the reader.

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 Build 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.

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 6.0 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 *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

East Lynn Canal Highway with Berners Bay Shuttle (2005 Supplemental Draft EIS Alternative 2A) – This alternative would construct a 5.2-mile 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 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 to Skagway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway, the shuttle ferry service across Berners Bay, and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

East Lynn Canal Highway with Shuttle to Haines from Skagway (2005 Supplemental Draft EIS Alternative 2C) – This alternative would construct a 68.5-mile 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 *M/V 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.

2.2.10 Alternative Added to this Draft SEIS

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 (by a 2 to 1 vote) because the 2006 Final EIS did not include an alternative that would improve transportation using existing assets.

As a result of these legal proceedings, the DOT&PF and FHWA initiated preparation of this 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. In keeping with the Court order, DOT&PF and FHWA developed an alternative 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 the No Action Alternative
- Adjust schedules and increase frequency as compared to the No Action Alternative
- Reduces travel time as compared to the No Action Alternative
- 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 substantial initial 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 to reflect the following events:

- In 2006, AMHS began the process toward building a new class of ferry to provide day boat shuttle service[2] in the southeast part of the system. As the design developed over time, the length of the vessel, designated as the Alaska Class Ferry (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, and will travel at 15.5 knots. The 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 two new programmed ferries would be available for use in Alternative 1B, instead of just one[3].
- In March 2013, litigation regarding recurrent problems with the engines of the *M/V Fairweather* and *M/V Chenega* was resolved[4]. Essentially the engines were not 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 Fast Vehicle Ferry (FVF) make only one round trip per day (which it could easily do) was considered unreasonable since there are other vessels that can also make one trip per day and there are other routes that need the speed of the FVF. Extending the operating day beyond 12

[2] 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).

[3] 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 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 end berth.

[4] 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.

hours is not possible without crew quarters[5]. Based on this development, DOT&PF and FHWA determined that their earlier consideration to use the *M/V Fairweather* as part of Alternative 1B needed to be revised.

- During scoping, many commenters expressed concern over the loss of fast ferry service to Sitka and Petersburg that would result from using the *M/V Fairweather* in Lynn Canal. Many believed that the use of the *M/V 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 bullet two above, contributed to removing the *M/V Fairweather* from Alternative 1B.

The resulting alternative is described in Section 2.3.2.

2.3 Reasonable Alternatives

The remaining alternatives that passed the 2003 screening criteria and 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. This Draft SEIS also includes a court-ordered alternative (designated as Alternative 1B), which was not evaluated in the 2006 Final EIS. For information about how Alternative 1B was developed, see Appendix CC of this Draft SEIS, the 2014 *Development of Alternative 1B – Enhanced Service with Existing Alaska Marine Highway System Assets*.

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

- The *M/V Fairweather* no longer operates in Lynn Canal on a regular schedule. It is, however, used in Lynn Canal in summer to support special events, roughly one or two times per month, May through September.
- The AMHS planned to have the *M/V Aurora* start Haines-Skagway shuttle service in 2007; however, when one of the fast ferries 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* has remained in Prince William Sound.
- Two new Day Boat ACFs are planned and programmed as additions to the AMHS fleet. 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 as a replacement for the *M/V Malaspina*. The reasonable alternatives have been updated to incorporate the Day Boat ACFs where appropriate.

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

[5] According to U.S. Coast Guard 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 these activities can be performed. To perform these activities in Haines or Skagway, the terminals would need to be upgraded.

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. To best meet the 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 2050 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 2050 average summer daily traffic, see the 2014 *Traffic Forecast Report* (Appendix AA). See the 2014 *Marine Segments Technical Report* (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 this Draft 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 2013 estimates. All maintenance, operation, and total project life cost[6] values are expressed in 2013 dollars.

[6] 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

The No Action Alternative includes a continuation of mainline[7] ferry service in Lynn Canal and incorporates two Day Boat ACFs already programmed for construction by AMHS. See Figure 2-5. The No Action Alternative 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. The following assumptions are incorporated in the No Action Alternative:

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. Programmed improvements[8] that are part of the No Action Alternative 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.
    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[9] for bow loading/unloading of the Day Boat ACFs.
3. The *M/V Malaspina*, which currently operates as a summer day boat in Lynn Canal, would no longer operate in Lynn Canal.
4. Mainline ferries would continue to serve northern Lynn Canal.
5. 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.[10] 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. Winter mainline ferry service would be provided by 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

[7] 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.

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

[9] 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.

[10] 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.

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 the No Action Alternative 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

Route	Travel Time (hours)	
	Mainline Ferry	Day Boat ACF
Auke Bay-Haines	7.2	5.9
Auke Bay-Skagway	9.1	7.6

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

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 $15.4 million: $5.2 million for mainline ferry service, $6.0 million for Day Boat ACF service between Auke Bay and Haines, and $4.1 million for Haines-Skagway shuttle service.[11] The estimated total project life cost is $669 million. The out-of-pocket user cost for the No Action Alternative for a one-way trip would be $216 between Juneau and Haines and $286 between Juneau and Skagway. The State cost per vehicle would be $210.[12]

The No Action Alternative includes some approved projects that have not yet been constructed as of the printing of this Draft 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 the No Action Alternative 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 Canal using existing AMHS assets. This is a new alternative that was not evaluated in the 2006 Final EIS. Figure 2-6 illustrates Alternative 1B.

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 the No Action Alternative). 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. Hours of operation for the reservation call center would be extended by 4 hours per day (20 hours 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[13] would be determined by a combination of Day Boat ACF, mainline ferry, and *M/V Malaspina*[14] 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 *Matanuska/Malaspina* class ferry (88-vehicle capacity) and one *M/V Columbia* (134-vehicle capacity) trip per week. Winter mainline ferry

[11] Due to rounding, numbers may not add up precisely to the total.
[12] Out-of-pocket user cost is based on a family of four in a standard-size pickup, reflecting fares and gasoline consumption.
[13] 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.
[14] 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.

service is assumed to be provided by a *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 2-5 presents the capacity of Alternative 1B based on these assumptions.

Table 2-5:
Daily Traffic Capacity for Alternative 1B

Route	Number of Vehicles
Auke Bay-Haines	
Summer	129
Winter	42
Auke Bay-Skagway[1]	
Summer	201
Winter	28

[1]For the purposes of calculating capacity, the capacity of the *M/V Malaspina* and the mainline ferry was used in the summer. In the 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 2-6. 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*.

Table 2-6:
Travel Times for Alternative 1B

Route	Travel Time		
	Mainline Ferry (hours)	**Day Boat ACF** (hours)	***M/V Malaspina*** (hours)
Auke Bay-Haines	7.2	5.9	NA
Auke Bay-Skagway	9.1	7.6	6.8

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 2-7.

Table 2-7:
Travel Frequency for Alternative 1B

Route	Round Trips per Day	Round Trips per Week
Auke Bay-Haines		
Summer	1.2	8
Winter	0.7	4
Auke Bay-Skagway		
Summer	1.3	9
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 $23.8 million: $5.2 million for mainline ferry service, $6.0 million for Day Boat ACF service between Auke Bay and Haines, $4.1 million for Day Boat ACF service between Haines and Skagway, and $8.3 million for *M/V Malaspina* summer shuttle service, plus the cost to extend the hours of operation for the reservation call center, which is estimated at $125,000 annually. [15] The estimated total project life cost is $1.0 billion. The out-of-pocket user cost under Alternative 1B for a one-way trip would be $173 between Juneau and Haines and $223 between Juneau and Skagway. The State cost per vehicle would be $321.

2.3.3 Alternative 2B (Preferred) – 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 mph[16]. 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.

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

[16] 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.

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[17]] and the *2014 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 direct 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 Haines-Skagway shuttle. 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[18]. Summer service would consist of three ferries; two Day Boat ACFs that would sail between Katzehin and Haines-Skagway and a third 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. During the winter, no direct Haines-Skagway shuttle would operate; 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 2-8.

Table 2-8:
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 2-9. 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.

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

[18] 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 2-9:
Travel Times for Alternative 2B

Route	Travel Time (hours)
Auke Bay-Haines	3.0
Auke Bay-Skagway	3.4

Note: For consistency, the travel times for each alternative starts at Auke Bay.

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 2-10.

Table 2-10:
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 $574 million, including $523 million for highway design and construction, approximately $22 million for vessel acquisition, approximately $20 million for the Katzehin Ferry Terminal improvements, and approximately $9 million for the Skagway Ferry Terminal improvements. Annual M&O costs are estimated to be approximately $20.4 million: $2.8 million for the highway (including avalanche control costs) and $17.6 million for the shuttle ferry operations. The estimated total project life cost is $1.1 billion. The out-of-pocket user cost for Alternative 2B for a one-way trip would be $47 between Juneau and Haines and $67 between Juneau and Skagway. The State cost per vehicle would be $52.

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 *2014 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 500 feet uphill of the cabin site. 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 to maintain a natural screen between the haulouts and the highway. Where this is not possible, screening structures would be constructed. 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 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 41-vehicle capacity. The daily traffic volumes that would be accommodated by Alternative 3 are provided in Table 2-11.

Table 2-11:
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 2-12. 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 2-12:
Travel Times for Alternative 3

Route	**Travel Time** (hours)
Auke Bay-Haines	3.0
Auke Bay-Skagway[1]	5.5 NB/5.2 SB

Note: For consistency, the travel times for each alternative start at Auke Bay. NB = northbound; SB = southbound.

[1]The number of daily through trips between Juneau and Skagway is a function of the lower frequency of the Haines-Skagway shuttle. The travel time is different for Skagway travelers because the delay is determined from the scheduled departure times for the first eight boats that leave Sawmill Cove for William Henry Bay. Skagway travelers would not take any of the remaining four boats from Sawmill Cove to William Henry Bay because they would not make a connecting ferry from Haines to Skagway. The average wait time is longer for northbound Skagway travelers than for southbound Skagway travelers because there are more crossings between Sawmill Cove and William Henry Bay than between Haines and Skagway. Typically, northbound Skagway travelers would have a maximum wait of approximately 2.2 hours for the connecting ferry in Haines.

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. The estimated trip frequency for Alternative 3 is provided in Table 2-13.

Table 2-13:
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 $516 million, including $422 million for highway design and construction, approximately $49 million for vessel acquisition, approximately $45 million for ferry terminal development. Annual M&O costs are estimated to be approximately $21.7 million: $2.3 million for the highway (including avalanche control costs) and $19.4 million for the shuttle ferry systems. The estimated total project life cost is $1.1 billion. The out-of-pocket user cost for Alternative 3 for a one-way trip would be $59 between Juneau and Haines and $108 between Juneau and Skagway. The State cost per vehicle would be $62.

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 *2014 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 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 *2014 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. These alternatives are based on a minimum of two mainline ferry trips per week in the summer and one per week in the winter. The Haines-Skagway ferry service would be provided by a new conventional monohull ferry because the Day Boat ACFs programmed under the No Action Alternative are much too large for the demand on this route or would already be in use under that alternative. 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 the No Action Alternative while minimizing operating costs. Various combinations of the following are proposed to reduce travel times: faster boats, shorter summer routes, and port-to-port operations (travel to one port, then return to origin). Crew shifts with minimal overtime would reduce operating costs.

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 Draft 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.

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. A new conventional monohull ferry would be constructed for use between Haines and Skagway (the Day Boat ACFs programmed under the No Action Alternative 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[19]. 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 2-14.

Table 2-14:
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 2-15. 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.

[19] 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 2-15:
Travel Times for Alternative 4A

Route	Travel Time (Hours)	
	Mainline Ferry	FVF
Auke Bay-Haines	7.2	3.8
Auke Bay-Skagway	9.1	4.0

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 2-16.

Table 2-16:
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 $228 million, including approximately $187 million for vessel acquisition and approximately $41 million for ferry terminal construction at Auke Bay. Annual M&O costs are estimated to be approximately $33.7 million: $5.2 million for mainline ferry service, $26.5 million for Lynn Canal shuttle service, and $2.0 million for the Haines-Skagway shuttle. The estimated total project life cost is $1.6 billion. The out-of-pocket user cost for Alternative 4A for a one-way trip would be $216 between Juneau and Haines and $286 between Juneau and Skagway. The State cost per vehicle would be $333.

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 *2014 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. This alternative would construct two new FVFs to provide service between Sawmill Cove and Haines/Skagway in the

summer[20] and between Auke Bay and Haines/Skagway in the winter[21]. 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[22]. Alternative 4B would have two FVFs, each with a 53-vehicle capacity providing service to/from 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 2-17.

Table 2-17:
Daily Traffic Capacity for Alternative 4B

Route	Number of Vehicles
Auke Bay-Haines	
Summer	250
Winter	121
Auke Bay-Skagway	
Summer	237
Winter	116

Travel Time – The one-way trip times for Alternative 4B are shown in Table 2-18. 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.

[20] 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.

[21] 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.

[22] 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 2-18:
Summer Travel Times for Alternative 4B

Route	Travel Time (Hours)	
	Mainline Ferry	FVF
Auke Bay-Haines	7.2	3.5
Auke Bay-Skagway	9.1	3.7

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 2-19.

Table 2-19:
Travel Frequency for Alternative 4B

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 4B would be approximately $287 million, including $8 million for highway design and construction, approximately $219 million for vessel acquisition, approximately $60 million for ferry terminal design and construction at Auke Bay and Sawmill Cove. Annual M&O costs would be $32.0 million: $5.2 million for mainline service, $24.8 million for Lynn Canal shuttle service, $2.0 million for the Haines-Skagway shuttle, and $45,000 for highway maintenance. The estimated total project life cost is $1.6 billion. The out-of-pocket user cost for Alternative 4B for a one-way trip would be $132 between Juneau and Haines and $190 between Juneau to Skagway. The State cost per vehicle would be $195.

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 *2014 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

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 use between Haines and Skagway. The Skagway Ferry Terminal would be modified to include a new end berth to accommodate the Haines-Skagway shuttle ferry. 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.[23] 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 2-20.

Table 2-20:
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 2-21. 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.

[23] 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 2-21:
Travel Times for Alternative 4C

Route	Travel Time (Hours)	
	Mainline Ferry	Day Boat ACF
Auke Bay-Haines	7.2	5.9
Auke Bay-Skagway	9.1	6.3

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 2-22.

Table 2-22:
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 $63 million, including approximately $22 million for vessel acquisition and approximately $41 million for ferry terminal construction at Auke Bay. Annual M&O costs are estimated to be approximately $20.0 million: $5.2 million for mainline ferry service, $12.8 million for Lynn Canal shuttle service, and $2.0 million for the Haines-Skagway shuttle. The estimated total project life cost is $861 million. The out-of-pocket user cost for Alternative 4C for a one-way trip would be $216 between Juneau and Haines and $286 between Juneau and Skagway. The State cost per vehicle would be $277.

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 *2014 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 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 Haines-Skagway shuttle ferry. 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.[24] 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 2-23.

Table 2-23:
Daily Traffic Capacity for Alternative 4D

Route	Number of Vehicles
Auke Bay-Haines	
Summer	250
Winter	68
Auke Bay-Skagway	
Summer	237
Winter	63

Travel Time – The one-way travel times in summer are provided in Table 2-24. 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.

[24] 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 2-24:
Summer Travel Times for Alternative 4D

Route	Travel Time (Hours)	
	Mainline Ferry	Day Boat ACF
Auke Bay-Haines	7.2	4.8
Auke Bay-Skagway	9.1	5.2

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 2-25.

Table 2-25:
Travel Frequency for Alternative 4D

Route	Round Trips per Day	Round Trips per Week
Auke Bay-Haines		
Summer	2.3	16
Winter	0.6	4.5
Auke Bay-Skagway		
Summer	2.3	16
Winter	0.6	4.5

Cost – Total final design and construction costs for Alternative 4D would be approximately $90 million, including $8 million for highway design and construction, approximately $22 million for vessel acquisition, approximately $60 million for ferry terminal design and construction at Auke Bay and Sawmill Cove. Annual M&O costs would be $20.8 million: $5.2 million for mainline service, $13.6 million for Lynn Canal shuttle service, $2.0 million for the Haines-Skagway shuttle, and $45,000 for highway maintenance. The estimated total project life cost is $905 million. The out-of-pocket user cost for Alternative 4D for a one-way trip would be $132 between Juneau and Haines and $190 between Juneau and Skagway. The State cost per vehicle would be $92.

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 *2014 Update to Appendix D – Technical Alignment Report* (in Appendix Z).

2.4 Identification of the Preferred Alternative

The 1997 Draft EIS did not identify a preferred alternative for the State of Alaska. After the comment period ended in December 1997, DOT&PF analyzed the comments, developed a list of the substantive issues, and identified the additional information that was necessary to address the substantive comments. In March 1999, a report was prepared by an independent marine consultant to verify the costs and benefits of Alternatives 4A through 4D (Glosten, 1999). At the same time, a summary document was prepared with information on substantive issues, traffic capacity, travel time, trip frequency, capital costs, M&O costs, and user costs for the five build alternatives from the 1997 Draft EIS and four additional proposals based on Draft EIS comments.

In late March 1999, a review team composed of FHWA and non-Southeast Region DOT&PF engineers and planners evaluated the information in the summary document and rated the alternatives based on the Purpose and Need elements. Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, was rated the highest of all alternatives and proposals.

In April 1999, the summary document and the results of the review team's rating were combined in a presentation entitled DOT&PF PAR. The PAR was given to Governor Knowles and contained DOT&PF's recommendation that the State identify Alternative 2 as the preferred alternative. This recommendation was based on the assessment that Alternative 2 would meet corridor traffic demand, provide the greatest flexibility and opportunity to travel, result in the greatest reduction in travel time, have the lowest operating cost, and result in the lowest user cost for the traveler.

In January 2000, then-Governor Knowles declared Alternative 2, the East Lynn Canal Highway, the State's preferred alternative. At the same time, Governor Knowles stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued. In February 2000, the DOT&PF Commissioner confirmed the State's selection of Alternative 2 as the preferred alternative to FHWA, along with a plan to continue obtaining specific data that would be crucial to completing the EIS at a later date.

In December 2002, newly elected Governor Murkowski directed DOT&PF to aggressively pursue completion of the JAI Project EIS. In February 2003, the DOT&PF Commissioner, after reviewing the Draft EIS and the reevaluation that called for a supplemental Draft EIS, stated that Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, continued to be the State's preferred alternative.

The 2005 Supplemental Draft EIS identified Alternative 2 as the State's preferred alternative, based on its ability to meet the Purpose and Need elements. After the 2005 Supplemental Draft EIS comment period ended, all comments were evaluated and considered. Based in part on comments from the National Park Service (NPS) with regard to the contributing status of natural areas within the Skagway and White Pass District NHL, FHWA determined that these areas were protected by Section 4(f) of the Transportation Act. Alternatives that would require the use of Section 4(f) protected lands within the NHL were determined to be not reasonable, in accordance with the original alternative screening criteria.

On August 10, 2005, the Commissioner of DOT&PF announced the State had changed its preferred alternative, citing the NPS position and the resultant FHWA Section 4(f) applicability determination. The 2006 Final EIS identified Alternative 2B, East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway, as the preferred alternative. Alternative 2B was also the selected alternative in the April 3, 2006 Record of Decision (ROD) signed by David C. Miller, Division Administrator for FHWA.

After careful review and consideration of the updated information and analyses conducted in support of this Draft SEIS, FHWA and DOT&PF continue to prefer Alternative 2B. This preference is based on the findings of this Draft SEIS that show, when compared with the other alternatives, Alternative 2B would:

- generate and accommodate the greatest projected traffic demand
- provide substantially greater flexibility and opportunity to travel
- provide the shortest travel times
- have the lowest user costs
- have the lowest cost to the State on a per-vehicle basis.

The preferred alternative would be designed and constructed in stages. The first construction projects are anticipated to be from Cascade Point to the Antler River and from the west side of the Lace River to Independence Lake. There is sufficient funding available in 2015 for these construction segments. Other segments are anticipated to be constructed over the next 6 years as the designs are finalized and funds become available. See Section 2.5 for a discussion on project funding.

All reasonable alternatives evaluated in this Draft SEIS are under consideration and have been evaluated to a comparable level of detail[25]. The selected alternative will be identified in a new ROD.

Table 2-26:
Alternatives Data Summary

	Alt 1	Alt 1B	Alt 2B	Alt 3	Alt 4A	Alt 4B	Alt 4C	Alt 4D
Projected Summer Capacity (vehicles per day)								
Auke Bay-Skagway	61	201	636	456	149	237	131	237
Auke Bay-Haines	93	129	848	816	162	250	144	250
Summer Travel Time								
Auke Bay-Skagway[1]	7.6	6.8	3.4	5.5 NB/ 5.2 SB	4.0	3.7	6.3	5.2
Auke Bay-Haines[1]	5.9	5.9	3.0	3.0	3.8	3.5	5.9	4.8
Summer Travel Frequency (average number of ferry round trips per week)								
Auke Bay-Skagway	8	9[2]	42	42	16	16	9	16
Auke Bay-Haines	8	8	56	84	16	16	9	16

[25] 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 the ROD, DOT&PF continued work to acquire permits, approvals, and other activities necessary for the implementation of Alternative 2B.

	Alt 1	Alt 1B	Alt 2B	Alt 3	Alt 4A	Alt 4B	Alt 4C	Alt 4D
State Cost (per vehicle)								
Lynn Canal	$210	$321	$52	$62	$333	$195	$277	$92
User Cost (out-of-pocket)[3]								
Auke Bay-Skagway	$286	$223	$67	$108	$286	$190	$286	$190
Auke Bay-Haines	$216	$173	$47	$59	$216	$132	$216	$132
Initial[4] Capital Costs (Preliminary Design, Final Design and Construction) $Millions in 2013								
Final Design and Highway Construction[5]	0	0	523	422	0	8	0	8
Total Ferry Vessel Acquisition[5]	0	0	22	49	187	219	22	22
Ferry Terminal[5]	0	0	29	45	41	60	41	60
Total Final Design and Construction Costs[5]	0	0	574	516	228	287	63	90
Preliminary Design Including EIS[6]	27	27	27	27	27	27	27	27
Total Initial Capital Cost	27	27	601	542	254	314	90	117
Annual Maintenance and Operations Costs ($Millions)								
Highway M&O[5]	0	0	2.8	2.3	0	0.05	0	0.05
Marine M&O[7]	15.4	23.8	17.6	19.4	33.7	32.0	20.0	20.8
Total	15.4	23.8	20.4	21.7	33.7	32.0	20.0	20.8
Total Project Life Costs[8] ($Millions)								
	669	1,030	1,093	1,125	1,556	1,605	861	905

[1]Travel Time – vehicles and 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.

[2]An additional six trips could be made by taking the Day Boat ACF from Auke Bay to Haines and transferring ferries.

[3] Out-of-pocket user cost is based on a family of four in a standard-sized pickup, reflecting fares and gasoline consumption.

[4]Initial capital costs are those that occur up to and including the opening of the facility. Subsequent costs are captured in the cost analysis. Due to rounding, numbers may not add up precisely to the total.

[5] See the *Technical Alignment Report* (Appendix D of the 2005 Supplemental Draft EIS) and *2014 Update to Appendix D - Technical Alignment Report* (in Appendix Z of this Draft SEIS). The No Action Alternative includes improvements that have not been made as of the printing of this Draft 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 any JAI Project alternative.

[6] The costs of EIS/SEIS preparation and preliminary design are included in the cost of every alternative, including the No Action Alternative, as they represent federal aid funding expended, regardless of which alternative is selected.

[7] See –the 2014 *Marine Segments Technical Report* (Appendix GG of this Draft SEIS).

[8] The total project life cost 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.

2.5 Funding Considerations

The 2006 Final EIS identified several potential funding sources for construction and operation of build alternatives. Capital funding sources included the State's excess apportionment funds, supplemental federal allocations (congressional earmarks), programmed and reallocated federal

highway funds (from NHS section of the Statewide Transportation Improvement Program), ferry boat discretionary funds, and State matching funds.

M&O for new highway segments would be funded out of the State of Alaska General Fund (GF), as with all existing highways in Alaska (vehicles driven on highway segments would pay State fuel tax and therefore would generate State revenue; fuel used by State ferries is exempt from this tax). Fares on marine links, along with State general funds, would fund M&O for those links. No tolls are included in the economic analysis of the alternatives; the projected fares used in the analysis are based on a combination of projected costs and reasonable rates based on past practice.

Current planning for funding construction of the preferred alternative is based on a combination of a project-specific congressional earmark, funding from applicable categories in the State's Federal-aid Highway Program, and specific GF allocations (as opposed to GF match for federal-aid funds). Currently, the following funding sources have been identified:

Highway Construction ($523 million):

- Safe, Accountable, Flexible and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) (AK077 congressional earmark)[26] — $7 million
- 2006 GF appropriation — $43 million
- 2011 and 2012 Equity Bonus funding[27] — $110 million
- 2014 GF appropriation — $10 million
- 2015 GF appropriation separate from State match — $5 million
- 2014–2020 NHPP funding[28]/State match — $348 million

Ferry terminal construction ($29 million):

- 2018 Ferry Boat Program/NHPP funding[29] — $29 million

New Vessel Construction ($22 million):

- 2018 Ferry Boat Program/NHPP funding[30] — $22 million

[26] These federal funds provide a federal share of 90.97 percent: therefore, 9.03 percent of the amount shown will come from a GF match.

[27] Equity Bonus funds were appropriated under SAFETEA-LU. These federal funds provide a federal share of 90.97 percent: therefore, 9.03 percent of the amount shown will come from a GF match.

[28] These federal funds provide a federal share of 90.97 percent: therefore, 9.03 percent of the amount shown will come from a GF match.

[29] These federal funds provide a federal share of 90.97percent: therefore, 9.03 percent of the amount shown will come from a GF match.

[30] These federal funds provide a federal share of 90.97percent: therefore, 9.03 percent of the amount shown will come from a GF match.