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Feasibility Study for a Prince William Sound Ferry Authority

PRINCE WILLIAM
SOUND

PREPARED FOR

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DISTRICT

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Formerly McDowell Group

IN ASSOCIATION WITH

Coastwise
Corporation

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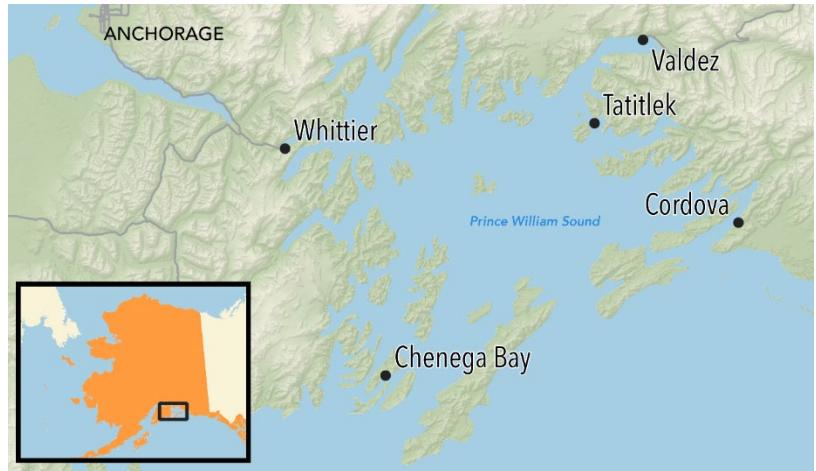
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Executive Summary

Background and Purpose

Ferry service is critical to the economic fabric of Prince William Sound communities. In light of declining state support for the Alaska Marine Highway System (AMHS) and increasing service disruptions, Prince William Sound Economic Development District (PWSEDD) engaged McKinley Research Group (MRG) to assess the viability of a regional ferry authority or similar mechanism to provide reliable and sustainable ferry service in the Prince William Sound (PWS) region to meet community needs.

The scope of work included:



- Analysis of historical AMHS traffic and revenue data for PWS
- Development of service model alternatives
- Operating and non-operating cost and revenue analysis
- Vessel construction cost estimates
- Public engagement efforts.

Five communities are served within the Prince William Sound ferry service area, shown on the map above, including the road-connected communities of Whittier and Valdez. Route distances range from 22 nautical miles (Tatitlek-Valdez) to 97 nautical miles (Cordova-Whittier).

Ferry Authority Overview

There are several possible governance structures for a locally controlled ferry service in PWS. Key criteria for a suitable governance structure include:

- Ability to access public funds
- Responsiveness to local communities' needs.

A review of the options for governance structures suggests a ferry authority would be the most feasible alternative to AMHS service that meets these criteria.

Alaska's Municipal Port Authority Act (AS 29.35.600-730) enables a municipal governing body to create by ordinance a port authority (or ferry authority) as a political subdivision of the municipality. The governing bodies of two or more municipalities may create an authority by parallel ordinances. The voters of each participating municipality must approve the ordinance.

An example of a functioning ferry authority in Alaska is the Inter-Island Ferry Authority (IFA), formed in 1997 and based on Prince of Wales Island, with five member-communities.

Opportunities and Challenges

The purpose of creating a ferry authority would be to ensure a basic, sustainable level of ferry service in PWS, should AMHS no longer have the capacity to provide that service. An optimal system would generate the highest level of service (and maximum revenue) at the lowest possible cost. It is not the intent nor expectation that a PWS ferry authority would generate revenue that fully covers costs.



Photo credit: AMHS

Shifting from state ferry service to a locally controlled ferry authority would present both opportunities and challenges. A regional ferry authority would enjoy the advantages of being a public entity - such as eligibility for public funding and tax-exempt status - while having some features that might make it nimbler than the current state system. For example:

- A ferry authority's governance structure is designed to be responsive to community needs. It also provides a buffer from the state political cycle.
- A new system may offer opportunities to "right-size" boats and reconfigure service to better meet the region's needs, and provide opportunities for innovation, partnership, and management improvements that may be difficult for a legacy system to embrace.

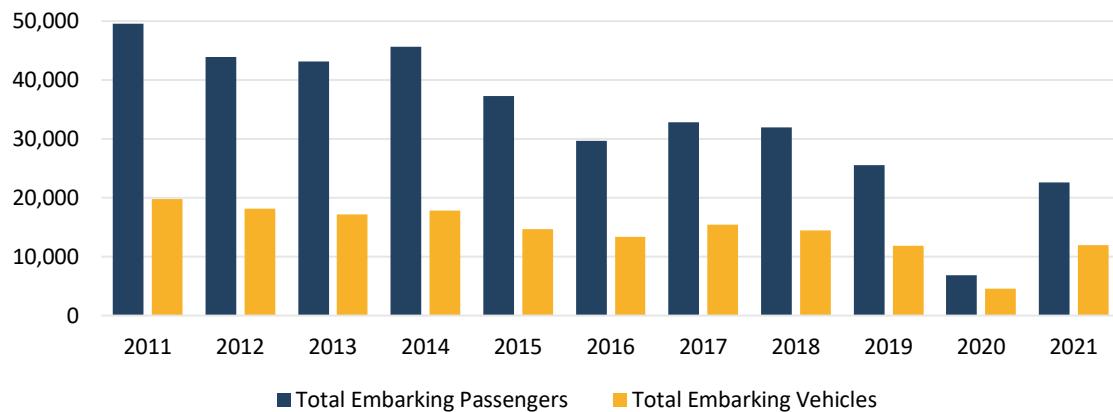
However, establishment of a new system on the scale contemplated would require enormous up-front investment of time, money, and effort. Other potential challenges include:

- A ferry authority (like the AMHS) would require ongoing financial aid. Future levels and consistency of public funding - particularly state funding - are uncertain.
- Ongoing coordination with AMHS would be needed to ensure seamless connections between PWS and ports outside the region, such as Juneau, Kodiak, and Homer.

Historic PWS Ferry Traffic and Revenue

Ferry traffic in PWS peaked in 2011 at about 50,000 passenger embarkations and 20,000 vehicle embarkations. Amidst declining service and reliability, traffic in 2021 had dropped to about half those peak levels. Over the same period, annual revenues dropped from about \$5.2 million in 2011 to \$2.3 million in 2021.

Total PWS Embarking Passengers and Vehicles, 2011-2021



Source: Alaska Marine Highway System, compiled by McKinley Research Group

PWS ferry-use fluctuates seasonally; July and August are peak travel months and together can account for one-third of annual Cordova embarkations and more than half of Valdez embarkations.

Potential Service Models

To provide ferry service that best meets current demand, a PWS ferry service would need to be able to meet peak (summer) demand, scale back winter service to cost-effectively serve off-season demand, and have scheduling flexibility to meet the needs of the smaller communities of Chenega Bay and Tatitlek. Service models that could meet these criteria include (1) a single relatively large dayboat, (2) a two-dayboat fleet, or (3) a 24-hour vessel like the AMHS' Aurora.

PWS Ferry Route Service Durations

Round Trip Hours	
Whittier to Cordova	15.24
Whittier to Valdez	12.14
Whittier to Tatitlek	10.36
Whittier to Chenega Bay	11.38

Source: Coastwise Corporation

Note: Assumptions include a vessel speed of 15 knots and 60-minute turnaround time.

U.S. Coast Guard regulations prohibit a single crew from working more than 12 hours in a 24-hour period except in an emergency. A Whittier-Cordova round trip would exceed the 12-hour service window for a dayboat, while a Whittier-Valdez round trip would likely narrowly exceed the window and might be eligible for an exemption.

The following table summarizes estimated costs and key advantages and disadvantages of each service model. Actual costs would depend on factors such as design and management decisions, fuel prices, and schedules. Revenues are more unpredictable and would likely range between \$3 million and \$5 million annually. As AMHS revenue history illustrates, revenue can vary greatly depending on the amount and type of service provided, tariff structures, and other management decisions.

Service Model Overview

Service Model	Est. Annual Operating Costs	Key Advantages	Key Disadvantages
Single Large Dayboat	\$7.6 million	Least expensive to operate Lowest vessel construction costs	May not meet peak demand No backup for maintenance and other service disruptions
Two Dayboats	\$7.7 million	Better meet peak demand Flexibility to meet fluctuating demand Provides back-up service Likely generate more revenue	Slightly more expensive to operate than single dayboat Higher vessel construction costs
24-Hour Boat	\$15.6 million	Can operate beyond 12-hour day	Most expensive to operate No backup for maintenance and other service disruptions

Source: McKinley Research Group and Coastwise Corporation analysis

Note: Operating costs for each service model include an estimated \$2 million for vessel maintenance, terminal operations, and administration.

Vessel Construction

A dayboat suitable to the single dayboat model described in this study would likely be slightly larger than the existing 280-foot Alaska class ferries (ACFs) *Tazlina* and *Hubbard*. An ACF lengthened to 300 feet could provide sufficient capacity to meet peak monthly demand of about 500 vehicles between Cordova and Whittier each way. An order-of-magnitude estimate places 2023 construction costs for such a vessel at about \$90 million. A new dayboat system would also require significant improvements to the marine terminals to enable the vessel(s) to berth overnight in each port.

In light of climate change and emissions reductions goals, there is growing interest in zero- or low-emission ferries. PWS route distances and load profiles make most existing zero- and low-emissions options impracticable. A more promising option are climate-friendly fuels such as biodiesel, which reduce carbon monoxide emissions and could potentially (in the long term) be made from kelp and fish waste. Supply and storage infrastructure would have to be developed.

Non-Revenue Fund Sources

A PWS ferry authority would be designed to serve a public need. While it may achieve greater efficiencies than AMHS, substantial ongoing aid would be essential. AMHS operating revenues in recent years cover about 30-35% of costs, and IFA operating revenues cover about 70-75% of costs. In both cases, federal and state aid provide the balance of needed operating dollars.

A variety of federal fund sources is available to support capital and operating expenses of publicly owned and operated ferry systems, including formula-based sources. State aid may be available, particularly if a ferry authority reduces state costs associated with AMHS, but would be dependent on unpredictable annual appropriations. Local, **Tribal**, and private funds might be available, but would require significant relationship building and possibly statutory changes to state enabling legislation.

Public Participation

Public input was critical to understanding service needs in PWS and provided invaluable insight into how households, businesses, and community groups use the ferry system. Public engagement efforts included development of a project website, presentations to community and **Tribal** councils, guidance from PWSEDD directors and staff, and interviews with 24 individuals representing all PWS ferry-served communities and a variety of interests.



Photo credit: AMHS

Potential Path Forward

Establishing regional ferry service in PWS would require significant investment of time and effort. Acquiring a suitable vessel or vessels – particularly if new construction is required – is likely the longest process. Factors that could extend the timeline include a need for changes to the state's port authority statute, contention among participating entities, and difficulty securing funding.

Overview of Potential Pathway to PWS Regional Ferry Service

Phase	Estimated Timeline	Key Tasks
Groundwork	Years 1-2	Planning, information gathering, building support
Establishment of ferry authority	Years 3-5	Passage of enabling ordinances, appointment of board
Establishment of ferry service	Years 5-10 or beyond	Securing funds, assets, and staff; launching service

Introduction

Project Purpose and Scope

Ferry service is critical to the economic fabric of Prince William Sound communities. In light of declining state support for the Alaska Marine Highway System (AMHS) and increasing service disruptions, Prince William Sound Economic Development District (PWSEDD) engaged McKinley Research Group (MRG) to study potential alternatives.



Photo credit: AMHS

The purpose of this project is to assess the viability of a regional ferry authority or similar mechanism to provide reliable and sustainable ferry service in the Prince William Sound (PWS) region to meet community needs.

The two-phase scope of work for this study includes the following tasks:

Phase 1

- Analysis of historical AMHS traffic and revenue data for PWS
- Preliminary analysis of PWS ferry service and ferry authority operating costs
- Preliminary analysis of potential non-operating revenues
- Preliminary development of potential service models
- Public outreach including public meetings and targeted stakeholder interviews

Phase 2

- Refinement of ferry service models and ferry authority operating cost analysis
- Operating and non-operating revenue analysis
- Pro forma annual cashflow and risk analysis
- Vessel construction/acquisition costs
- Continued engagement with PWSEDD staff and board

Phase 2 was conducted in association with Coastwise Corporation, an Alaska-based marine engineering and naval architectural firm.

This document is the final report and presents integrated findings of both project phases.

Study Area

Five communities are within the Prince William Sound ferry service area, shown on the map below, including the road-connected communities of Whittier and Valdez. Cordova is the largest market for ferry service, with a 2022 population of 2,566. The villages of Chenega Bay (population 59) and Tatitlek (population 81) are also roadless and depend on ferry services. The communities' total 2022 population was about 6,700, with growth of just under 2% since 2010.

Table 1. Prince William Sound Community Populations and Trends, 2022

Year	Chenega Bay	Cordova	Tatitlek	Valdez	Whittier	Total
2022	59	2,566	81	3,950	253	6,709
Change since 2010	-22%	+15%	-8.0%	-0.1%	+13%	+1.7%

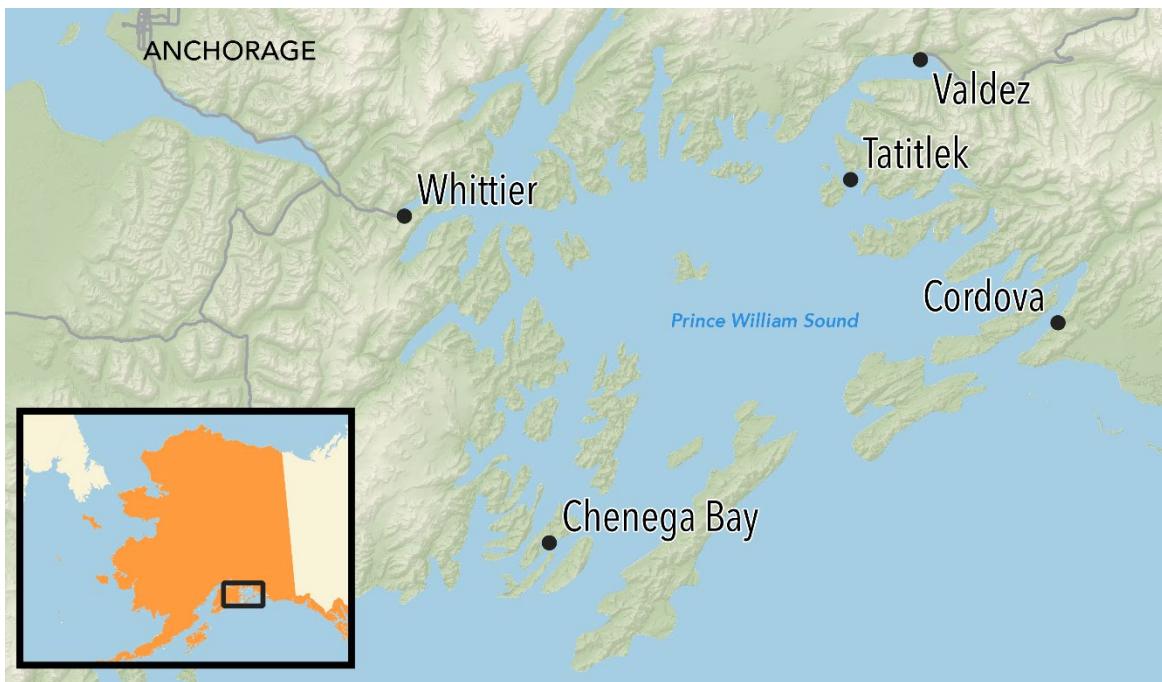
Source: Alaska Department of Labor & Workforce Development, calculations by McKinley Research Group

Note: An additional 105 residents live outside the communities listed in the table and are excluded from the total.

Table 2. Route Distances Between PWS Communities

Port Pair	Nautical Miles	Statute Miles
Cordova-Whittier	97	112
Valdez-Whittier	78	90
Cordova-Valdez	74	85
Chenega Bay-Whittier	67	77
Tatitlek-Valdez	22	25
Tatitlek-Cordova	50	58

Source: Alaska Marine Highway System



Ferry Authority Overview

Alaska's Municipal Port Authority Act (AS 29.35.600-730) enables a municipal governing body to create by ordinance a port authority as a political subdivision of the municipality. The governing bodies of two or more municipalities may create an authority by parallel ordinances. The voters of each participating municipality must approve the ordinance.

Purpose of an Authority

The purpose of creating a ferry authority would be to ensure a basic, sustainable level of ferry service in PWS (should AMHS no longer have the capacity to provide that service) and to do so at the lowest cost possible. Recognizing that a regional ferry authority would not be self-supporting, the financial feasibility of an authority would depend on finding a sustainable balance between operating costs, operating revenues, and non-operating revenues.

An optimal system would be designed to generate the highest level of service (and maximum revenue) at the lowest possible cost. While there are advantages to optimizing revenue generation relative to costs, it is not the intent nor expectation that a shift to a ferry authority would result in revenue generation that fully covers costs.

There are several possible governance structures for a locally controlled ferry service in PWS, including an agency within local government (municipally owned/operated system), an agency within Tribal government, a nonprofit corporation, a public-private partnership, or a port (ferry) authority. With respect to operating a ferry service in Alaska, key criteria for a suitable governance structure include:

- **Ability to access public funds:** Because an independent ferry service in PWS is not expected to generate operating revenues sufficient to cover operating costs, let alone generate reserves for capital projects, access to federal and state aid is critical.
- **Responsiveness to local communities' needs:** The community (or communities) must retain some control to ensure service meets local needs for reliable, safe, affordable, and adequate marine transportation; and that the service's primary purpose is to provide a public benefit.

A review of the various options for governance structures suggests a ferry authority would be the most feasible alternative to AMHS service to meet the criteria noted above.¹

¹ *Lynn Canal Ferry Service: Exploring a Locally Controlled System*, prepared for Municipality of Skagway by McDowell Group, October 2019.

Municipal Port Authority Act

Key provisions of Alaska's Municipal Port Authority Act include:

- If authorized in the enabling ordinance, an authority may borrow money and may issue bonds.
- An authority may exercise the power of eminent domain within its physical boundaries.
- An authority may not levy an income or other tax.
- An authority is governed by a board of directors, with the enabling ordinance specifying the number, qualifications, manner of appointment or election, and terms of members of the board.
- The board appoints a chief executive officer of the authority who serves at the pleasure of the board.
- An authority is subject to state open meetings and public records laws.
- An authority is tax exempt.
- The state and municipalities are not liable for the debts of the authority. Bonds issued by the municipality are payable solely from revenues of the authority and do not constitute an obligation of the state or a municipality.
- The authority is required to submit to its governing body a development plan for the service the authority would operate. Each participating municipality must approve the development plan. The authority may not undertake construction or acquisition of a project unless the project is included in an approved development plan.
- Collective bargaining agreements for employees of the state or its political subdivisions that transfer to an authority remain in effect for the term of the agreement or for a period of one year, whichever is longer, and are binding on the authority unless the parties agree otherwise.
- Legislative approval is required for conveyance or transfer of any AMHS asset or other state asset to an authority.
- The enabling ordinance must provide procedures for dissolution. If an authority ceases to exist, its assets are distributed to participating municipalities proportionate to their contributions less any outstanding debt or obligation to the authority, after satisfying any obligations to bondholders.

An example of a functioning ferry authority in Alaska is the Inter-Island Ferry Authority (IFA), formed in 1997 and based on Prince of Wales Island, with five member-communities. The IFA receives state and federal funding and serves as a helpful model in multiple respects for a potential PWS ferry authority.

Regional Authority: Opportunities and Challenges

Shifting from state ferry service to a locally controlled ferry authority would present both challenges and opportunities. This chapter notes some of the major potential benefits and challenges of establishing a ferry authority in Prince William Sound, and documents ideas for innovation and improvement that might be feasible under a regional ferry authority.

Potential Benefits and Challenges

Benefits of a Ferry Authority

A ferry authority enjoys advantages of being a public entity – such as eligibility for public funding and tax-exempt status – while having some features that might make it nimbler than the current state system.

- A ferry authority's governance structure – which includes representatives of each participating community on the authority's governing body – is designed to be responsive to community needs.
- A ferry authority would offer the region greater management and operational autonomy than the current system.
- Under an authority, responsibility is shared across municipalities and municipalities are shielded from liability.
- A ferry authority's governance structure provides a buffer from the state political cycle.
- Ferry authorities are eligible for state and federal funding and are tax exempt.
- A new and smaller ferry system may provide opportunities for innovation, partnership, and management improvements that may be difficult for a legacy system to embrace.
- The IFA provides an Alaska-based model and lessons for a PWS authority.
- A new system may offer opportunities to “right-size” boats and reconfigure service to better meet the region’s needs.

Challenges of a Ferry Authority

- Establishment of a new system on the scale contemplated would require enormous up-front investment of time, money, and effort.
- Only municipalities may join a Port Authority (absent statutory changes). This excludes potential partners such as Tribal entities, which could potentially contribute valuable knowledge, funding, and community connections.

- Establishing and maintaining alignment and cooperation between participating municipalities requires time and political effort.
- If employees from AMHS formally transfer to a PWS authority, maintaining existing contracts for a term of one year or longer could initially limit flexibility.
- A ferry authority (like the AMHS) would require ongoing financial aid. Future levels and consistency of public funding – particularly state funding – are uncertain; this uncertainty also impacts AMHS, but may be greater for a new system.
- Ongoing coordination with AMHS would be needed to ensure seamless connections between PWS and ports outside the region, such as Juneau, Kodiak, and Homer.
- Carving out a region from AMHS could potentially weaken the state ferry system.

Opportunities for Innovation and Improvement

One appealing aspect of transitioning to a ferry authority is the potential for innovation and improvement in a new and smaller system. The more manageable scale of a regional system, the opportunity to build carte-blanche service, and local governance – among other features – present a unique opportunity to make changes that the current legacy system may be ill-suited to implement.

This section documents a wide range of ideas and suggestions gleaned from interviews, past studies, and research on other ferry systems. Inclusion of these ideas does not necessarily mean they are recommended; analysis of the feasibility or cost-benefit tradeoff of each idea is beyond the scope of this project.

Ideas are grouped into three buckets: partnership opportunities; operational opportunities; and management considerations. There are overlaps among the categories.

PARTNERSHIP OPPORTUNITIES

- Partner with local businesses, nonprofits and/or Tribal or government entities to develop reliable ground transportation links, particularly in Whittier, timed around the ferry schedule.
- Partner with artists or cooperatives to display art on board and sell it for a commission (possibly via digital sales, e.g., QR codes). Benefits include opportunities for Alaska artists, additional revenues to the ferry system, and an enhanced experience for ferry riders.

- Partner with communities or Tribes to help address backhaul of waste and recyclables, especially during winter when there tends to be extra cargo space.²
- Partner with communities or Tribes to provide cost-effective freight delivery.
 - One interviewee said: "You could fill up a trailer with freight and move it on and off in communities, and get out to some of the smaller communities that don't have a hardware store."
- Explore potential partnerships with communities to avoid duplicative costs, such as sharing dock space or providing security while docked.
- Partner with businesses and associations to create and market packaged trips and tours. Include those in nonport communities connected to the system (such as Girdwood and Anchorage).
- Think creatively about enhancing efficiency through partnerships. For example, IFA's contract for galley service enables the system to count galley staff as a deckhand. IFA provides necessary training and certification to galley staff.
- Look into grants and partnerships to help subsidize costs for low-income riders or special populations.
 - For example, IFA receives federal Veterans Travel Grant funds passed through the State Department of Military and Veterans' Affairs. These funds enable IFA to provide free passenger and vehicle transportation to qualifying veterans using the service to access health care.

OPERATIONAL OPPORTUNITIES

- Establish schedules with more lead time, ideally at least one year ahead.
- As schedules are being developed, consult with seafood industry members to understand how to optimize timing for those moving product and how fisheries openers may impact demand.
- Develop cancellation policies that discourage "gaming" of the system but allow enough flexibility that users are not discouraged from booking passage.
 - One interviewee said: "In the past, AMHS allowed for bad actors; you could hold a container slot until about two hours before a ferry left without penalty. When they wised up, it's become a lot more Draconian. If there was a meeting in the middle it would help."
- Make customer service more friendly to freight business; for example, communicate clearly and consistently about limitations, specifications, and timing of freight drop-off.
- Reinstate a driver-rides-free promotion in winter to increase ridership and revenues and make the system more affordable and accessible for users.

² For example, the nonprofit Zender Environmental Health & Research Group works with remote communities and Tribes in Alaska to help address their waste challenges, including providing "backhaul" services. <https://zendergroup.org/>

- Multiple interviewees made this recommendation, saying it would increase ferry use in the winter and improve affordability of not only the ferry system but off-season household and business provisioning.
- Consider issuing some refunds in the form of credit; riders are not penalized but the system keeps the money and people are incentivized to use the system again.
- Consider promotions such as staircase pricing (i.e., discounts for booking a certain amount in advance, e.g., six months) and/or last-minute discounts to help fill undersold boats.
- Establish a user-friendly waitlist and/or standby system for fully booked sailings.
- Enable flexible ticketing ("reissue under way") to encourage travelers to stop at multiple ports en route.

MANAGEMENT CONSIDERATIONS

- Forecast and proactively plan for vessel maintenance and overhaul. Build in scheduled vessel maintenance time and backup plans for unscheduled maintenance.
- Plan infrastructure holistically. For example, construct "sister ships" or pairs that can both run during the high season and then trade off in winter; the ship not in service can be maintained and overhauled. Likewise, ensure boats and docks are designed to be as universal and interchangeable as possible.
- Cross-train staff so employees can serve as backup for each other, and train "one level up" to prevent staff shortages and build in redundancy.
- Offer ferry travel benefits to employees, such as IFA's staff travel benefit. In addition to being a recruitment tool, riding the ferries will enable staff (especially shore-based staff) to provide better customer service and marketing services.
- Depending on how boats are staffed and where crews are based, consider providing crew housing in layover communities. This may also be an opportunity for partnership.

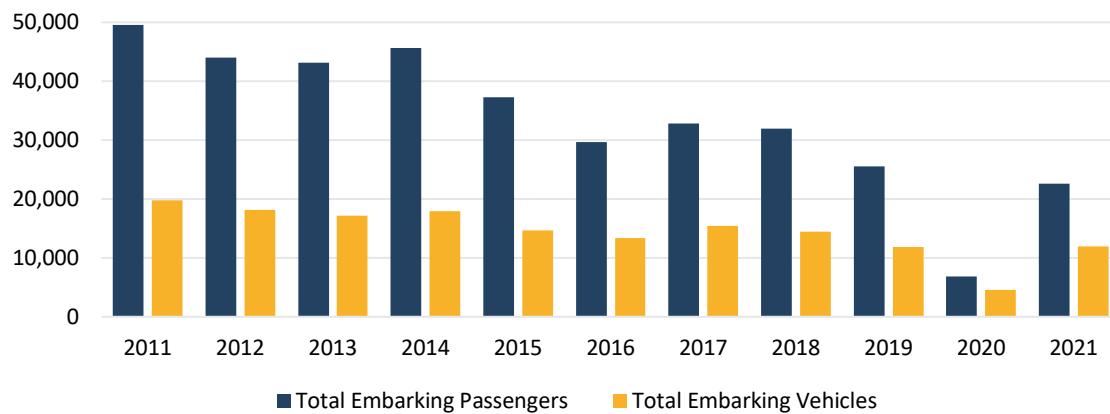
PWS Ferry Traffic and Potential Revenue

AMHS Traffic

Historical AMHS traffic data provides a measure of potential demand for ferry service in PWS and the region's potential to generate revenue to support a ferry authority and its services.

- PWS ferry traffic peaked in 2011 at approximately 50,000 passenger embarkations and 20,000 vehicle embarkations.
- As ferry service and reliability has declined, traffic has dropped to about half the 2011 peak level. In 2021, total traffic included 23,000 passenger embarkations and 12,000 vehicle embarkations.
- Passenger embarkations dropped by more than half from 2011 through 2022 while vehicle embarkations fell by about 40%.

Figure 1. Total PWS Embarking Passengers and Vehicles, 2011-2021

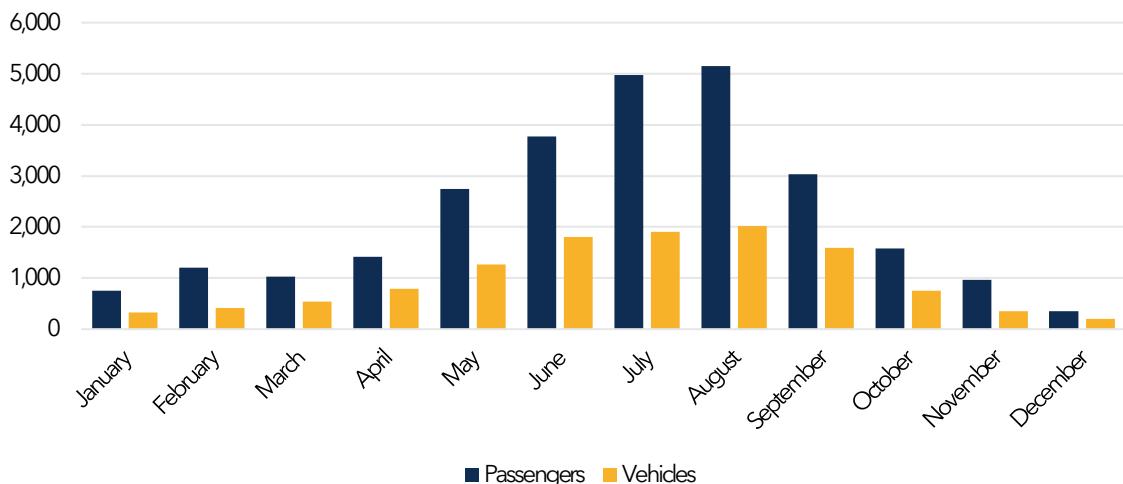


Source: Alaska Marine Highway System, compiled by McKinley Research Group

Seasonality is an important aspect of system planning in PWS. July and August are peak travel months and together can account for one-third of annual Cordova embarkations and more than half of Valdez embarkations.

Monthly traffic for 2018 is illustrated in the following chart (2018 is the latest year for which year-round service was provided). Detailed traffic data by port and year are provided as an appendix to this report.

Figure 2. Monthly PWS Embarking Passengers and Vehicles, 2018



Source: Alaska Marine Highway System, compiled by McKinley Research Group

AMHS Revenue in PWS

PWS ferry service has generated as much as \$5.3 million in annual revenues. That peak amount was earned in 2014, when fast vehicle ferry (FVF) service coupled with conventional ferry service (Aurora) provided relatively frequent and convenient service.

Annual revenue from PWS routes totaled \$2.5 million in 2019 and \$2.3 million in 2021.

AMHS Port Codes

Chenega Bay (CHB)
Cordova (CDV)
Tatitlek (TAT)
Valdez (VDZ)
Whittier (WTR)

Table 3. AMHS Revenue by Port Pair, Select Years 2011 - 2021

Port Pair	2011	2014	2015	2017	2019	2021
WTR-CDV	\$1,177,785	\$1,316,702	\$1,156,735	\$958,868	\$675,079	\$686,465
CDV-WTR	\$1,179,458	\$1,321,725	\$1,152,031	\$931,498	\$699,393	\$650,720
VDZ-WTR	\$1,362,189	\$1,377,461	\$1,034,817	\$621,862	\$443,764	\$510,342
WTR-VDZ	\$905,928	\$961,622	\$683,026	\$532,736	\$514,196	\$335,951
CDV-VDZ	\$220,644	\$140,818	\$158,583	\$100,650	\$50,451	\$30,200
VDZ-CDV	\$232,978	\$142,626	\$138,575	\$102,149	\$57,114	\$37,868
All Other	\$77,280	\$69,016	\$64,608	\$44,790	\$51,547	\$24,893
PWS Total	\$5,156,262	\$5,329,970	\$4,388,375	\$3,292,553	\$2,491,544	\$2,276,439

Source: Alaska Marine Highway System, compiled by McKinley Research Group

Note: Figures are not adjusted for inflation.

Service between Cordova and Whittier has in recent years typically accounted for 55% to 60% of total regional revenues.

Market Outlook

Population is one factor that can influence market demand on a regional ferry system. Long-range population projections prepared by the Alaska Department of Labor and Workforce Development (DOLWD) predict slight decline (about half of one percent) over the next 20 years.

Table 4. PWS Area Population Trends and Projections

	2022	2025	2030	2035	2040	2045
Chugach Census Area	7,013	7,001	6,946	6,855	6,758	6,652

Source: Alaska Department of Labor and Workforce Development

Note: Chugach Census Area includes Chenega, Cordova, Tatitlek, Valdez and Whittier.

Other factors that impact demand include tourism, particularly independent travelers. Expected growth in the number of independent visitors traveling to Alaska could offset any declines in market demand associated with declining population.

As the frequency and convenience of ferry service in PWS has declined over the past decade, Cordova air passenger traffic has increased. Between 2016 and 2019, total passenger arrivals and departures increased by about 15%, before declining sharply due to pandemic-related travel restrictions. Improved ferry service between Cordova and Whittier would likely attract some travelers who would otherwise fly to Anchorage.

Ferry and air service offer different advantages and disadvantages; for example, many users value the ability to put a vehicle on a ferry. Ferry travel is usually lower cost than air travel, particularly for passengers without vehicles, and ferries can often run in weather conditions that preclude flying. On the other hand, air travel is faster and may offer more frequent service.

Table 5. Cordova Air Passenger Arrivals and Departures, 2012 to 2021

	Passenger Departures	Passenger Arrivals	Total Passengers
2012	32,515	32,193	64,708
2013	33,478	33,252	66,730
2014	33,739	34,813	68,552
2015	34,501	34,663	69,164
2016	34,290	33,973	68,263
2017	35,353	34,805	70,158
2018	37,293	37,105	74,398
2019	39,310	39,079	78,389
2020	20,202	20,250	40,452
2021	28,656	28,293	56,949

Source: Bureau of Transportation Statistics

PWS Ferry Operating Costs

Key Assumptions and Data

This chapter estimates operating costs and potential revenues for three possible service models for a PWS ferry authority. Underlying these estimates are assumptions about service requirements, vessel characteristics, and route service duration.

SERVICE REQUIREMENTS

To provide ferry service that best meets current demand, a PWS ferry service would need to have the ability to:

- Meet peak (summer) monthly vehicle traffic of approximately 500 vehicles each way between Cordova and Whittier, and a potentially higher level of seasonal traffic between Valdez and Whittier to take full advantage of the revenue-generating potential of the visitor market.
- Scale back winter service to cost-effectively serve off-season demand, which would be less than half of peak-month demand.
- Have scheduling flexibility sufficient to provide service to Chenega Bay and Tatitlek that adequately meets the needs of those communities.

Several service models could meet these basic criteria, including a single relatively large dayboat, a fleet of two smaller day-boats, or a 24-hour vessel similar to that currently used by AMHS with *Aurora*. The operating costs of each of these models are described in this chapter.

VESSEL CHARACTERISTICS

Vessel size and classification are important aspects of crewing and crew costs. The IFA vessels are federally regulated under 46 CFR Subchapter K, Small Passenger Vessels under 100 gross registered tons carrying more than 150 passengers. The *Aurora* and Alaska class vessels are regulated under 46 CFR Subchapter H, Large Passenger Vessels. Subchapter H requires more crew and crew with higher levels of training than Subchapter K vessels. Subchapter H also has more rigorous safety, electrical, and mechanical systems requirements. Because of such requirements, subchapter H vessels have higher operating and maintenance costs.

If PWS ferry service could be safely and adequately provided by Subchapter K vessels, operating costs would be lower (as would construction costs, if new vessel construction is warranted). The *Lituya* is regulated under 46 CFR Subchapter T, Small Passenger Vessels under 100 gross tons,

carrying fewer than 150 passengers. The following table summarizes characteristics of select vessel types.

Table 6. Select Vessel Characteristics

Vessel	Length	Service Speed (knots)	Crew	Fuel (gal/hour)	Passenger Capacity	Vehicle Capacity (20-ft veh)	Vessel Class (46 CFR Subchapter)
AMHS							
<i>Aurora</i>	235	14.5	24	190	300	33	H
<i>Lituya</i>	181	11.5	5	55	149	15	T
<i>Tazlina/Hubbard</i>	280	16.5	10-14	250	297	53	H
Fast Vehicle Ferry	235	32	10	600	250	31	n/a
IFA							
<i>Prince of Wales</i>	198	15	5	130	160	30	K
<i>Stikine</i>	198	15	5	130	190	30	K

Source: Alaska Marine Highway System, IFA, and *Lynn Canal Ferry Service: Vessel Comparison Report for Dayboats on Lynn Canal Routes*, prepared by EBDG for Municipality of Skagway, August 2020

Note: Fast Vehicle Ferries (*Fairweather* and *Chenega*) are no longer in AMHS service.

ESTIMATED ROUTE SERVICE DURATIONS

Another important consideration is the length of time required to complete routes. The table below provides estimates of the total time required to serve various routes in PWS. Assumptions include a vessel speed of 15 knots and 30-minute load/unload time (60-minute turnaround).

Table 7. PWS Ferry Route Service Durations

Round Trip Hours	
Whittier to Cordova	15.24
Whittier to Valdez	12.14
Whittier to Tatitlek	10.36
Whittier to Chenega Bay	11.38

Source: Coastwise Corporation

U.S. Coast Guard regulations applicable to PWS ferry service prohibit a single crew from working more than 12 hours in a 24-hour period except in an emergency. Vessels that serve routes longer than 12 hours are typically required to have crew quarters to accommodate off-duty crew. This analysis refers to boats that can operate for up to 12 hours in a 24-hour period as dayboats, and to boats that can operate for longer than 12 hours in a 24-hour period as 24-hour boats.

Summary Analysis

The following table provides a high-level summary of this chapter's key findings. It is important to note these are estimates; actual costs and revenues would likely fall within a range around

these figures and will depend on factors such as design and management decisions, fuel prices, fares, schedules, and market demand.

Table 8. Service Model Overview

Service Model	Est. Annual Operating Costs	Key Advantages	Key Disadvantages
Single Large Dayboat	\$7.6 million	Least expensive to operate Lowest vessel construction costs	May not meet peak demand No backup for maintenance and other service disruptions
Two Dayboats	\$7.7 million	Better meet peak demand Flexibility to meet fluctuating demand Provides back-up service Likely generate more revenue	Slightly more expensive to operate than single dayboat Higher vessel construction costs
24-Hour Boat	\$15.6 million	Can operate beyond 12-hour day	Most expensive to operate No backup for maintenance and other service disruptions

Source: McKinley Research Group and Coastwise Corporation analysis

Note: Operating costs for each service model include an estimated \$2 million for vessel maintenance, terminal operations, and administration.

Single Dayboat Service Model

The IFA's 198-foot vessels *Prince of Wales* and *Stikine* illustrate the cost to provide daily dayboat service over a relatively short route (34 miles). IFA's 2023 vessel operations budget of \$2.4 million indicates average costs of approximately \$47,000 per week. Due to sea conditions in PWS, a vessel larger than IFA's would be required to provide year-round service in PWS and, as described in more detail elsewhere in this report, the much longer routes in PWS prohibit daily roundtrip service between Cordova and Whittier (absent relocation of Cordova's terminal).

Other AMHS vessels potentially capable of providing PWS ferry service include the new Alaska class ferries (ACFs) *Tazlina* and *Hubbard*. Although these vessels were designed and constructed as dayboats, AMHS added crew quarters. With little operating history, limited operating cost data is available for these vessels. In FY2020, the *Tazlina* operated for 33 weeks at a weekly cost of approximately \$180,000. While a 280-foot ACF is large enough to operate safely and reliably in PWS, the vessel lacks the car deck capacity to meet peak-month demand (if operated as a dayboat).

The smallest vessel in the AMHS fleet, the *Lituya* (which now provides service five days per week between Annette Island and Ketchikan), has weekly operating costs of approximately \$22,000, with total annual costs of about \$1.1 million. A lengthened version of the 181-foot *Lituya* could be suitable for providing supplemental summer service in PWS.

Fast vehicle ferries (FVF) are no longer part of the AMHS fleet. Two high-speed catamarans (*Fairweather* and *Chenega*) entered AMHS service in 2004 and were sold in 2021. FVF service generated the highest revenue years in PWS. However, high-speed ferries are more heavily regulated than conventional hull ferries, and have higher maintenance costs, higher fuel costs, and specialized crew training requirements. The resulting very high operating costs make high-speed ferry service in PWS impracticable for a regional ferry authority.

Cost to Operate a Single, Purpose-Built Dayboat in PWS

This analysis considers operating costs and potential revenues associated with service provided by a single relatively large, purpose-built dayboat. This service model avoids the comparatively high cost of 24-hour crewing and therefore would likely be the ferry service model with the lowest operating cost that meets the basic traffic criteria outlined above.

PWS presents significant challenges for conventional-hull dayboat service. Round-trip service between Cordova and Whittier (97 nautical miles each way) at an average speed of 15 knots requires about 15 hours including load/unload time.

The principal advantage of dayboat service is lower crewing costs than a 24-hour boat. However, the route distance between Cordova and Whittier means dayboat crews would not be able to complete a round trip in a day and would need to overnight away from their home port. Resulting housing and per diem costs would reduce the cost advantage of dayboat service.

Though a single-dayboat ferry system would be unable to provide service levels needed to support peak regional traffic demand seen in the past (which was generated by FVF service), it could provide a basic level of service at the lowest possible cost. It would also likely have the lowest gap between operating revenues and expenses.

A single dayboat large enough to meet peak month demand in PWS would have to be larger than the ACFs. With a 20-foot extension, car deck capacity could be increased from 53 to 58 standard vehicles. At that capacity, an "extended ACF" could be operated seven days a week in PWS to meet peak month demand, but not necessarily peak week or peak day demand based on historic traffic.

A single boat would mean there would be no service during planned vessel maintenance as well as any unplanned service disruptions. As is currently the case, back-up service could potentially be contracted with private providers, and would likely be limited to passenger-only service.

Dayboat Operating Costs

With a 300-foot ACF homeported in Whittier and operated seven days per week with two crews, summer service could include two round trips per week to Cordova (requiring two days for each roundtrip) and two or three round trips per week from Whittier to Valdez (each roundtrip

completed in a day). Chenega Bay and Tatitlek could be served on a less frequent basis (e.g., every other week or monthly) via single-day round trip service in place of a Valdez trip.

Winter service would include two round trips per week to Cordova, with occasional calls in Chenega Bay and Tatitlek. Valdez would not be served in winter.

Based on modeling conducted by Coastwise Corporation, the cost to operate this vessel would be approximately \$5.6 million annually. Key assumptions include:

- Fuel cost of \$4 per gallon, with fuel consumption at about 280 gallons per hour
- Crew of 10, with two crews employed full-time in summer operating the vessel seven days per week, and one crew in winter operating four days per week
- Summer and winter seasons of 26 weeks each

Table 9. PWS Single Dayboat Annual Operating Costs

Expense Category	Summer	Winter	Annual Total
Labor	\$1,360,000	\$790,000	\$2,150,000
Fuel	\$1,710,000	\$820,000	\$2,530,000
Other*	-	-	\$910,000
Total	\$3,080,000	\$1,600,000	\$5,590,000

Source: Coastwise Corporation. *Includes layover, crew per diem, and maintenance costs.

The estimated annual cost to operate a single dayboat in PWS is \$5.6 million, or about double the cost of IFA's dayboat service between Hollis and Ketchikan. A larger vessel, more crew, and longer route distances (requiring more fuel as well as overnight costs) account for the difference.

In addition to vessel operating costs, a regional ferry authority would incur terminal operations costs and administration costs. These costs total an estimated \$2 million annually, placing a PWS ferry authority's total annual operating cost, operating a single large dayboat, at more than \$7 million.

Single Dayboat Revenues

Revenues are more difficult to estimate than costs. As AMHS revenue history illustrates, revenues can fluctuate significantly (for example, 2011 AMHS revenues in PWS were more than double 2021 revenues). Factors that impact revenue include the amount of service provided, routes served, tariff structure, marketing effort, and market demand. Revenue estimates provided for each service type should be viewed as likely midpoints of a range of revenue possibilities.

The following assumptions were used to estimate annual revenues associated with the service described above:

- Six-month (26 week) summer and winter seasons.

- Summer total car deck capacity for approximately 3,000 vehicles each way between Whittier and Cordova. Total summer car deck capacity between Whittier and Valdez for 4,500 vehicles each way. Winter car deck capacity for 2,550 vehicles between Whittier and Cordova each way.
- Car deck utilization of 75% in the summer and 35% in the winter, for Cordova and Valdez routes. Summer utilization rates are intended to be the average of higher rates during peak months (June, July and August) and lower rates during shoulder months.
- Passenger-per-vehicle rates of 2.0 for Cordova and 2.85 for Valdez (rates consistent with past AMHS rates).
- Passenger and vehicles fares about equal to current AMHS fares.

Based on these assumptions, annual revenue would total \$3.6 million, including \$3.0 million in summer revenue and \$600,000 in winter revenue.³ An increase in fares would likely result in higher total annual revenues without measurably constraining traffic.

Two-Dayboat Fleet Model

A two-dayboat fleet would be ideal in terms of service capacity, flexibility to increase and reduce service as demand warrants, and for providing planned and unplanned service back-up. While a two-ferry system would carry more traffic and generate more revenue, operating costs would be higher.

A two-vessel fleet could take one of several forms, including twin vessels, both capable of year-round service. While wave height and vessel suitability analysis are beyond the scope of this study, it is likely that a vessel of about 230 feet is at or near the minimum required to provide reliable and comfortable passenger service year-round in PWS.

A lower-cost variation of this two-dayboat model could include one larger vessel capable of providing reliable year-round service along with a smaller seasonally operated vessel. Modeling conducted for this study examines the year-round cost of operating a ferry with capacity for 40 vehicles and a second seasonally operated vessel with capacity of 20 vehicles.

³ These estimates have not been adjusted to account for occasional service to Chenega Bay and Tatitlek, which will result in lower revenues than regular Valdez service.

Table 10. PWS Two Dayboat Fleet Annual Operating Costs

Expense Category	Summer	Winter	Annual Total
Labor	\$1,730,000	\$740,000	\$2,470,000
Fuel	\$1,500,000	\$580,000	\$2,080,000
Other*	\$0	\$0	\$1,240,000
Total	\$3,230,000	\$1,320,000	\$5,790,000

Source: Coastwise Corporation. *Includes layover and maintenance costs.

Under this model, one vessel would be homeported in Whittier, the other in Cordova. The larger vessel would operate with two crews in the summer and one crew in the winter. The smaller summer-only vessel would operate with one crew. The larger vessel would operate with a crew of 8, the smaller with a crew of 6. The two vessels together would have estimated annual operating costs of about \$5.8 million. Annual operating costs associated with the two-vessel fleet including 40-vehicle and 20-vehicle ferries are only slightly above annual operating costs of a larger single vessel described above. While crew costs are slightly higher for the two-boat fleet, fuel consumption and fuel costs would be lower.

As with a single dayboat, an estimated \$2 million annually would be needed for terminal operations, and administration.

Revenues from Two-Dayboat Service

The following assumptions were made to estimate revenue associated with a two-dayboat fleet:

- Six-month (26 week) summer and winter seasons.
- The larger (40 ASV) vessel would provide two round trips per week between Whittier and Cordova year-round. In the summer, that vessel would also provide three round trips per week between Whittier and Valdez. The smaller (20 ASV) ferry would provide two round trips per week between Cordova and Whittier in the summer.
- Total summer capacity between Whittier and Cordova for 3,100 vehicles each way. Same summer capacity (3,100 vehicles) between Whittier and Valdez. Winter capacity for 1,760 vehicles each way between Whittier and Cordova.
- Summer car deck utilization of 85% for the larger vessel and 90% for the smaller vessel (for Cordova and Valdez routes). The larger vessel is assumed to have 65% car deck utilization in the winter.
- Passengers per vehicle rates of 2.0 for Cordova and 2.85 for Valdez (consistent with past AMHS rates).
- Passenger and vehicles fares about equal to current AMHS fares.

Under these assumptions, annual revenue would total \$3.7 million, including \$3.0 million in summer revenue and \$700,000 in winter revenue. Actual revenues are difficult to project and are likely to fall within a range around this estimate.

24-Hour Vessel Operating Cost

PWS has been and continues to be served primarily by the *Aurora*. Crewed for 24-hour operations, the *Aurora* has weekly operating costs of approximately \$208,000. It is possible that a regional ferry authority could operate a 24-hour vessel at somewhat lower cost. At \$208,000 per week, a 48-week operating year would have a total annual cost of \$10 million. This does not include maintenance costs.

Table 11. Aurora Weekly Operating Costs, 2022

Expense Category	Weekly Cost
Labor	\$154,758
Fuel	\$36,674
Travel	\$1,800
Services	\$4,200
Commodities	\$11,000
Total	\$208,432

Source: Alaska Marine Highway System

Modeling conducted for this study indicates even higher operating costs for a 24-hour vessel. In the model, labor and fuel costs total just under \$13 million. Fuel costs of \$4/gallon are likely higher than the actual costs reflected in the AMHS data. In addition, the model assumes a full crew of 24, which may be somewhat higher than actual practice for *Aurora* in 2022.

Table 12. PWS 24-Hour Vessel Annual Operating Costs, Labor and Fuel

Expense Category	Summer	Winter	Annual Total
Labor	\$5,680,000	\$4,370,000	\$10,050,000
Fuel	\$1,660,000	\$1,280,000	\$2,940,000
Other*	\$0	\$0	\$600,000
Total	\$7,340,000	\$5,650,000	\$13,590,000

Source: Coastwise Corporation. *Includes layover and maintenance costs.

Adding an estimated \$2 million for terminal operations and administration costs, a PWS ferry authority using a 24-hour vessel would likely cost more than \$15 million annually.

Revenues under this model would not likely be significantly greater than \$3 million. As operated over the last several years in PWS, *Aurora* generated less than \$3 million in annual revenues.

Other Operating Costs

The IFA provides a model for understanding the costs of operating a ferry authority, particularly administrative and other shoreside costs. Vessel operations account for only about half of IFA's annual budget.

Administration and Terminal Operations Costs – IFA Example

IFA's annual operating budget includes \$945,000 in administration expenses, mainly comprised of \$852,000 in personnel costs. Contracted services, totaling \$27,000, are budgeted separately and include accounting, legal, and IT services. Marketing expenses are also budgeted separately and total \$25,000.

Engineering and maintenance activities, budgeted at \$776,000, include vessel and terminal maintenance and repair as well as \$121,000 in vessel marine insurance. IFA owns two vessels, though only one operates at any given time.

IFA terminal operations are budgeted at about \$375,000 annually. Labor costs account for 75% of the terminal operations budget, for staff at the Hollis and Ketchikan terminals. The IFA terminal operations budget also includes expenses associated with reservation systems, utilities, and supplies.

Table 13. IFA Annual Operating Budget Details, FY2023

Cost Category	2023
Vessel Operational Expense	\$2,420,126
Administrative Activities	\$945,331
Engineering & Maintenance Activities	\$775,587
Terminal Activities	\$373,842
Marketing Activities	\$25,059
Contracted Services Activities	\$27,235
Total Expenses	\$4,567,180

Source: Inter-Island Ferry Authority

A PWS ferry authority could anticipate somewhat higher administration-related costs than those incurred by IFA. A PWS authority would oversee a more complex ferry system with more routes and route-miles and broader marketing, IT, and other management responsibilities.

Terminal operation costs for a PWS ferry authority would depend mainly on service frequency and scheduling. It is likely that three terminals (in Whittier, Valdez, and Cordova) would require shore-based staffing. Ticketing in Chenega Bay and Tatitlek could likely be handled by on-board staff.

Analysis of IFA costs suggests that a PWS authority would likely have administration and terminal costs totaling \$1.5 million to \$2 million annually. Erring on the conservative side, the higher end of the range (\$2 million) is used for purposes of estimating total operating costs in this report.

Vessel Construction Costs

Purpose-Built Vessel Construction

As PWS considers the viability of a regional ferry authority, it will be useful to consider the cost to construct one or more purpose-built ferries, that is, vessels designed and built specifically for service in PWS.

An extended Alaska class ferry (ACF), lengthened from 280 to 300 feet, would provide sufficient car deck capacity to meet peak monthly demand (about 500 vehicles between Cordova and Whittier, each way). This purpose-built vessel would be operated as a dayboat, but could have crew quarters to house crew when overnighting away from home.

To provide a rough approximation of the cost to construct such a vessel, ACF costs were updated to 2023 dollars. AMHS's two 280-foot (53 vehicle capacity) ACFs were constructed at Vigor's Ketchikan Shipyard and delivered in 2019 at a total cost of \$120 million. Starboard loading doors were subsequently added at a total cost of \$4.4 million (for both ships). Crew quarters were installed on the *Hubbard* at a cost of \$15 million. The cost to add crew quarters to the *Tazlina* has been estimated at \$18 million.

Actual ACF construction costs were updated to current dollars using various equipment, materials, and labor cost indices published by the U.S. Bureau of Labor Statistics. Detailed cost analysis is provided in Appendix 3 and summarized in the following table. Total 2023 construction costs are estimated at \$93 million.

Table 13. Estimate of 2023 Costs to Construct an Alaska Class Ferry

Description	Cost
Engineering & Yard Services	\$6,460,000
Hull Structure	\$26,140,000
Propulsion	\$11,140,000
Electric Plant	\$4,880,000
Command and Surveillance	\$3,700,000
Machinery, General	\$14,880,000
Outfit & Furnishings	\$15,390,000
Planning, Engineering & Management	\$9,270,000
Production Support	\$820,000
Total Estimate	\$92,670,000

Source: Coastwise Corporation

An extended ACF would have higher vessel construction costs, but crew quarters would likely cost less when installed as part of the original construction program (rather than retrofitted). Further, crew accommodations on a PWS ferry, if included with the vessel, would be less extensive than those installed on the *Hubbard*, which include eight single-person staterooms and eight two-person staterooms plus installation of a galley, scullery, and crew mess spaces.

More detailed system and service planning would be required to develop more precise vessel construction cost estimates. Nevertheless, the costs estimates provided here provide guidance on the resources required to build new ferries in the U.S.

Ferry Terminal Considerations

Terminal Needs

The U.S. DOT Maritime Administration recently awarded \$28.2 million to PWSEDD to improve ferry terminals in Cordova, Chenega Bay, and Tatitlek. Tatitlek's \$10.5 million project includes new end-loading ferry dock structures, with a vehicle transfer bridge and bridge support float. At a cost of \$12.6 million, Chenega Bay terminal improvements include a new terminal facility, a pile-supported approach dock structure, vehicle transfer bridge, bridge support float, and mooring dolphins. Cordova's \$6.2 million in improvements include construction of fixed-fender mooring dolphins and catwalks and modifications to better accommodate stern-loading vessels.⁴

These improvements will increase the utility and versatility of each community's ferry terminal. However, further terminal development may be required in Cordova and Whittier to serve dayboats, if placed in PWS service. Where dayboats overnight or are otherwise moored while not in service, separate overnight berths may be required.

Terminal Relocation

The 15-hour round-trip between Whittier and Cordova prohibits daily round-trip service with a single crew. Only a major extension of the Cordova road system to a new terminal location would make daily round trip service possible. Terminal locations as distant as Windy Bay or Bomb Point would be needed to sufficiently reduce voyage duration. The cost of roads, bridges or even shuttle ferries would likely be highly relative to the economic benefits. Further, year-round road maintenance costs and construction-related environmental impacts would need to be considered. Relocating the ferry terminal to Shepard Point would not be expected to reduce running times sufficient to support roundtrip dayboat service between Whittier and Cordova.

⁴ <https://dot.alaska.gov/comm/pressbox/arch2022/PR22-0047.shtml>

Low-Emission Ferry Considerations

While it is beyond the scope of this study to assess the feasibility of using various zero-emission or low-emission propulsion systems in PWS, it is likely that any new ferry constructed with federal funding would be required to include features to reduce carbon emissions relative to the fleet of AMHS and IFA ferries now serving Alaska. Reduced-emissions vessels can also offer benefits such as reduced pollution and contribution toward climate goals.

Ferry systems in Washington State and British Columbia are operating low-emission ferries as part of long-term strategies to reduce their carbon footprint. BC Ferries' 350-foot (138 vehicle capacity) Salish Class vessels, delivered in 2016 and 2017, are powered by dual fuel engines capable of burning diesel or LNG. Two of BC's 550-foot (358 vehicle capacity) Spirit Class vessels were converted in 2018 and 2019 to diesel/LNG dual fuel systems.⁵ BC's fleet of six 265-foot (47 vehicle capacity) Island Class vessels are powered by diesel-electric hybrid systems. These ferries will transition to full electric operations as shoreside infrastructure is developed.

Washington State Ferries is just beginning a transition to a hybrid electric fleet, including construction of 16 new hybrid ferries and conversion of six existing vessels over the next 15 to 20 years. Vessels will be powered by lithium-ion batteries with diesel generator back-up.⁶ The cost to build the new ferries, convert the old, and develop necessary shoreside infrastructure at 17 terminals is estimated at \$4 billion.

A study recently completed by Elliott Bay Design Group (EBDG) and Southeast Conference for Alaska DOTPF provides an assessment of prospects for zero- or low-emission ferry operations in Alaska.⁷ The report considers various low-emission ferry service options, including all-electric, hybrid, alternative fuels, and biodiesel.

All-electric (battery-powered) ferry service is most suitable where routes are short and serviceable at relatively low speeds. PWS's long route distances and speed requirements of 15 knots or more preclude all-electric ferry service between any of the region's ports. Routes in Alaska potentially suitable for all-electric ferry service are between Haines and Skagway (13 nautical miles), Metlakatla and Ketchikan (8 nm), and between Homer and Seldovia (17 nm). A

⁵ https://www.bcferry.com/web_image/h11/h06/8798775509022.pdf

⁶ <https://wsdot.wa.gov/sites/default/files/2021-11/WSF-SystemElectrificationPlan-December2020.pdf>

⁷ *Alaska Low Emission/Electric Ferry Research Analysis, Cultivating a Systems Approach to Sustainable Transportation by Implementing Climate Responsive Ferry Vessel Operations.* Prepared by Elliott Bay Design Group and Southeast Conference for Alaska Department of Transportation and Public Facilities, Draft Report, January 17, 2023.

concept vessel that could serve these routes is 198 feet, with capacity for 20-23 vehicles, and a cruising speed of 10 to 14 knots.

A hybrid ferry is one with an engine and batteries. Batteries can either be charged by onboard generators (which are powered by diesel engines) or shore-side power. A hybrid ferry can be powered primarily with diesel engines, supplemented by battery power to allow engine operations at their most fuel-efficient power level. Alternatively, a hybrid ferry can be operated primarily by battery power, with standby diesel power available for service on longer routes. Again, PWS is not well-suited for hybrid ferry service because of speed and route distance constraints, which would require full-speed operations (rather than speeds at the most fuel-efficient levels) to maintain a dayboat schedule.

Biodiesel, which produces lower emissions than regular diesel, has the best long-term potential for use in Alaska ferries. Marine engines that can burn biodiesel are available. Biodiesel can be produced from kelp and fish waste. It is possible to imagine a future in which ferries in Alaska are powered by biodiesel produced from kelp and/or fish waste. At present, however, biodiesel is not available in Alaska. Most biodiesel produced in the U.S. is made from soybean oil. Corn oil is also an important input to biodiesel production. Biodiesels are sometimes blended with petroleum diesel. The cost to establish supply and storage infrastructure would be substantial. In the meantime, any new vessels constructed for service in PWS could be built with engines capable of using petroleum diesel or biodiesel.

Other potential alternative fuels include methanol, methane (LNG), ammonia, and hydrogen. However, significant design, operational, safety, and cost challenges are associated with using these fuels on passenger ferries. None offer a reasonable alternative for a PWS ferry in the foreseeable future.

Non-Revenue Funding Sources

IFA illustrates the financial challenges associated with running a ferry system in Alaska. Relative to what would be required in PWS, IFA has a simple and efficient service model. IFA provides daily round-trip service between Hollis and Ketchikan (a route distance of 31 nautical miles). IFA covers about 70-75% of its operating costs with fare revenues.⁸ Federal and state aid provide the balance of needed operating dollars, together accounting for \$1.3 million in funding for IFA's FY2023 total budget of \$4.6 million.

As described elsewhere in this report, a PWS ferry authority, with a much larger service area and more ports, would have a more complex and more costly mission than IFA. Substantial ongoing non-operating revenue support would be essential for a PWS ferry authority.

Potential outside sources of aid include federal funds; state funds; and local, Tribal or private funds. This section focuses primarily on federal fund sources. A variety of federal fund sources is available to support capital and operating expenses of publicly owned and operated ferry systems.

While state aid may be available, federal transportation aid tends to be more predictable, with multi-year formula-based program authorizations for ferry systems or rural transportation programs. Local, Tribal, and private funds may be most speculative, and would require significant relationship building and meaningful collaboration to develop and sustain these sources of support. In some cases, statutory changes to the Alaska Municipal Port Authority Act might be warranted.

Federal Funds

The following table summarizes federal funding sources described in this section. Funds are subject to federal appropriations and congressional and regulatory guidelines. Most programs listed were reauthorized in the 2022 Bipartisan Infrastructure Law through federal fiscal year 2026. Tribal Transit Grants are listed for reference only; as written, the Alaska Municipal Port Authority Act does not provide a mechanism for Tribal government participation.

The table is not exhaustive, and inclusion in the table does not necessarily mean a PWS ferry authority would be eligible for the funds. Additional research is warranted to understand the potential availability of these and other fund sources to a PWS ferry authority.

⁸ For comparison, AMHS farebox recovery peaked in the early 1990s just above 60% and in recent years has ranged from about 30% and 35%.

Table 15. Select Potential Federal Fund Sources for a PWS Ferry Authority

Fund	Eligibility	Purpose/Uses	Federal Share	Distribution	Notes
Formula Grants for Rural Areas - 5311 (FTA)	State & local govt authorities, nonprofits, operators of public transportation services in areas with <50K people	Transportation capital projects, operating activities, project administration, training	90.97% (capital) 56.86% (operating)	Formula	Most significant government fund source for IFA
Ferry Boat Program (FHWA)	Publicly owned and operated (or majority publicly owned and operated) ferry facilities*	Ferry and terminal construction, operating costs newly allowed	80%, higher in some cases	Formula based on passengers (35%), vehicles (35%), route miles (30%)	AMHS, IFA, & Ketchikan Gateway Borough receive FBP aid
Ferry Service for Rural Communities (FTA)	States providing ferry service to two or more rural areas >50 miles apart*	Ferry operating and capital costs	80% (capital) 50% (operating), higher in some cases	Competitive	New fund source, \$200M to \$400M/year for FY2022-2026
Electric or Low-Emitting Ferry Pilot Program (FTA)	Eligibility for 5311 funds	Purchase of electric or low-emitting ferries and reduction of emissions from existing ferries	80%, higher in some cases	Competitive with special set-asides	New fund source, \$50M to \$100M/year for FY2022-2026
Surface Transportation Block Grant (FHWA)	State and local government entities	Flexible fund source to meet transportation needs	90.97% (capital) 56.86% (operating)	State apportionment by formula	Approx. funding of \$14B/year for FY2022-2026

Source: McKinley Research Group from publicly available information.

*Service must be "existing" for two years; clarification is needed on the definition of existing service.

FTA FORMULA GRANTS FOR RURAL AREAS (5311)

Administered by the Federal Transit Administration (FTA), the Formula Grants for Rural Areas (5311) program provides capital, planning, and operating aid to rural public transportation providers. "Rural" is defined as areas with populations of less than 50,000. Funds are distributed to states and federally recognized tribes, then to subrecipients including state and local government authorities, nonprofit organizations, and operators of public transportation services. A 20% match is required for capital and planning projects and 50% match for operating

assistance;⁹ however, Alaska's match is reduced due to a provision in federal code raising the federal share for states with high proportions of designated public lands. Alaska's federal share is 90.97% for capital grants and 56.86% for operating grants.¹⁰

Four categories of expenditures are eligible for funding: capital projects, operating activities, project administration, and training. IFA has regularly received funding through this program for administrative costs. Qualifying administrative costs include salaries of administrative staff, marketing expenses, office supplies, and other expenditures. IFA's FY2022 and 2023 budgets include \$1.1 million each year in FTA 5311 grant funding.

FERRY BOAT PROGRAM

The Ferry Boat Program (FBP) provides federal funding for construction of ferries and ferry terminals and projects that extend the useful life of ferries and ferry facilities. Notably, the federal Infrastructure Investment and Jobs Act of 2022 (IIJA) added operating costs to allowable uses of FBP funds. The IIJA may also be referred to as the Bipartisan Infrastructure Law (BIL). The program is administered by Federal Highways Administration.

The FBP requires a 20% match. The match may be reduced to 15% for projects that reduce emissions by replacing or retrofitting a diesel fuel ferry vessel. Other matching flexibilities such as donations and "soft match" may be considered.

The FBP distribution formula is based on the number of ferry passengers (35%), number of vehicles carried (35%), and total route nautical miles (30%). In Federal Fiscal Year 2022, Alaska received \$36.4 million; 98% went to AMHS, and the remainder to Ketchikan Gateway Borough (for its airport ferry) and the Inter-Island Ferry Authority.¹¹

FBP funds cannot be used to establish new ferry service.¹² To be eligible, ferry service must be in operation through at least one Bureau of Transportation Statistics biennial National Census of Ferry Operators (NCFO) reporting cycle and have provided data for the NCFO.

⁹ See Federal Transit Administration, "Formula Grants for Rural Areas - 5311," <https://www.transit.dot.gov/rural-formula-grants-5311>.

¹⁰ See Federal Transit Administration, "Formula Grants for Rural Areas: Program Guidance and Application Instructions" (Nov. 24, 2014), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Circular_9040_1Gwith_index - Final Revised - vm 10-15-14%281%29.pdf.

¹¹ U.S Department of Transportation, Federal Highway Administration, Federal-aid Programs and Special Funding: Ferry-Boat Program [CFDA No. 20.205]. <https://www.fhwa.dot.gov/specialfunding/fbp/220804.cfm>.

¹² It is unclear whether a new provider serving existing routes would qualify as an existing or new service. Clarification has been requested.

FERRY SERVICE FOR RURAL COMMUNITIES

Administered by the FTA, this is a new program created by the IIJA. The program provides funding to states for existing scheduled ferry service serving at least two rural areas more than 50 miles apart.¹³ The bill appropriated \$200 million per year for five years (2022-2026) and authorized another \$200 million per year, subject to appropriations. Funding is allocated on a competitive basis and can be used for operating or capital needs. There is a 20% match requirement for capital costs and a 50% match for operating costs. Both may be reduced in certain circumstances.

ELECTRIC OR LOW-EMITTING FERRY PILOT PROGRAM

Also newly created by the IIJA and administered by the FTA, this program provides funding for the purchase of electric or low-emitting ferries or the modification of existing ferries. The IIJA appropriated \$50 million per year for five years (2022-2026) and authorized another \$50 million per year, subject to appropriations. There is a 20% match requirement, which may be reduced.

SURFACE TRANSPORTATION BLOCK GRANT PROGRAM

This federal aid program promotes flexibility in state and local transportation decisions and provides flexible funding to best address state and local transportation needs.¹⁴ The program was reauthorized for five years (2022-2026) by the IIJA and provides an estimated \$14 billion in 2023. Ferry boats and terminal facilities qualify for this fund source. The money can be used for a broad array of planning and construction activities and limited operating activities. The program is administered by Federal Highways Administration.

Funds are granted for a period of up to four years. A match of 20% is required, but Alaska's match is reduced due to a provision in federal code raising the federal share for states with high proportions of designated public lands. Alaska's federal share is 90.97% for capital grants and 56.86% for operating grants. Funds may be used at 100% federal share for federal-aid highways within Indian reservations, national parks, and monuments.

State Aid

As a purely political matter, it is not possible to predict the availability of State of Alaska general fund support for a PWS ferry authority. Such decisions would be subject to annual appropriations by the Legislature (and subject to gubernatorial veto). Because a PWS ferry authority would

¹³ It is unclear whether a new provider serving existing routes would qualify as an existing or new service.

¹⁴ Federal Highway Administration, Implementation Guidance for the Surface Transportation Block Grant Program (STBG) as Revised by the Bipartisan Infrastructure Law. June 1, 2022 Memorandum.
https://www.fhwa.dot.gov/specialfunding/stp/bil_stbg_implementation_guidance-05_25_22.pdf

reduce AMHS responsibilities and costs, it is reasonable to expect some level of state support, but it is difficult to predict and is subject to year-to-year fiscal and political considerations.

It could be in the state's interest to contract with a ferry authority to provide PWS ferry service, if such a contract arrangement was less costly than the current cost to provide AMHS service in the region. In sum, there would be risk for an authority to rely on state funding from annual legislative appropriation. It is unclear whether this risk would be greater or less than the current risk AMHS faces.

Other Potential Sources and Partnerships

Financial support from local governments, Tribes, and private entities for a regional ferry service may be an option. While it is unlikely that PWS communities would be able to provide significant aid, municipalities could offer in-kind or low-cost support, such as marketing support, facilities maintenance, sharing of dock space, or professional services support. Mutually beneficial partnerships with corporate, nonprofit, and other private entities likewise merit exploration.

PWS TRIBES

Although the Alaska Municipal Port Authority Act does not provide for Tribes to be formal members in a municipal port authority, Tribes are important stakeholders in any regional PWS ferry service, and there may be avenues for partnership. Potential Tribal partnership pathways range from informal consultation to full membership in an authority. Statutory changes to the Alaska Municipal Port Authority Act would be required to enable Tribal governments to be members of an authority.

In 2022, PWS Tribes (Native Village of Eyak, Native Village of Chenega, and Native Village of Tatitlek) received a combined \$455,000 in FHWA Tribal Transportation Program formula funds, called Tribal Shares.¹⁵ The distribution formula is based on eligible road miles, Tribal population, and previous years' distributions. Among other projects, the funds can be used for operation and maintenance of transit programs and facilities that are located on or provide access to Tribal land or are administered by a Tribal government.

In addition to the formula program, Alaska Tribes in 2022 received \$2 million in transit program discretionary (competitive) grant funds ranging in size from \$25,000 to \$1.6 million. Discretionary grant funding may be used for "capital projects; operating costs of equipment and facilities for use in public transportation; and the acquisition of public transportation services, including service agreements with private providers of public transportation services."

¹⁵ See U.S. Dept. of Transportation, Office of Tribal Transportation - Finance, "Tribal Shares for FY22 Full Year," <https://highways.dot.gov/sites/fhwa.dot.gov/files/images/Tribal%20Shares%20for%20FY22%20Full%20Year-Corrected%202011%20Data.pdf>.

The following table describes two major Tribal transportation fund sources, shared for illustrative purposes only. Formula-based Tribal Shares to PWS Tribes would not increase if Tribes expanded the scope of their services.¹⁶

Table 16. Select Tribal Transportation Fund Sources

Fund	Eligibility	Purpose/Uses	Federal Share	Distribution	Notes
Tribal Transit Program Grants (FTA)	Federally recognized Tribes providing public transportation on Tribal lands	Capital, operating, planning & admin expenses for public transit projects that meet needs of rural Tribal communities	100%	Competitive	25 Alaska Tribes received \$2M total in FY2022
Tribal Transportation Program 'Tribal Shares' (FHWA)	See above	See above	100%	Formula	FY2022 Tribal Shares to 3 PWS tribes totaled \$455K

¹⁶ Matthew Bird, Finance Manager, Office of Tribal Transportation, Federal Highway Administration, Feb. 2023 interview.

Public Input

Public involvement is a key component of this project. Public outreach activities focused on (1) informing the public about the project's purpose and scope, and (2) targeted interviews to inform the study team's understanding of the types of service, schedules, and vessels that would best meet the region's business and household needs. Activities included:

- Development of a project website hosted on PWSEDD's website.
- Presentations to community councils of Cordova, Valdez, and Whittier about the project and to the Native Village of Eyak Tribal Council.¹⁷
- Ongoing guidance from PWSEDD staff and board of directors, including three meetings with the board.
- Interviews with 24 business and community members representing all PWS ferry-served communities.

Interview Findings

Effort was made to identify and reach a broad cross-section of people who could speak to how their household, business, or organization uses or does not use PWS ferry service and why; how current service supports or does not support their business and household needs; and what type of service, schedules, routes, and pricing would best meet their needs.

Interviewees included 10 people from Cordova, three from Valdez, three from Whittier, three from Chenega Bay, two from Tatitlek, and four individuals who work in or for PWS communities and live elsewhere. Interviewees represented fisheries, tourism, and other commercial enterprises; local government and Tribal entities including school districts; AMHS; health care and nonprofit organizations. [Participants are listed in Appendix 2.]

Interviewees described a diversity of ways they interact with the ferry system, including moving product and materials; moving customers, clients, or staff; and recreation and personal needs. Each of these uses and each community expressed slightly different needs. Several high-level observations are shared below:

Frequency and reliability of service: Interviewees overwhelmingly identified frequency of service and reliability of service (i.e., sailing when scheduled) as the most important factors in meeting their needs. Relatedly, interviewees also prioritized publication of schedules with

¹⁷ Presentation offers were made to several additional community and Tribal councils.

greater lead time. Virtually all interviewees suggested longer scheduling lead time and increased reliability would make the system more useful.

Sailing schedules and routes: PWS communities vary in size, access to the road system, and economic drivers, creating a complex constellation of needs and preferences for ferry service. Interviewees provided valuable insight into how they use the system and shared their thoughts on optimal routing and frequency, seasonal variations, and timing of sailings and layovers.

User costs: Most did not identify cost of ferry travel as the limiting factor in their use of the ferry, particularly compared to the cost of air travel. Some said costs for vehicles constrained their use or noted that costs limited access for low-income community members. Many suggested reinstating the offseason free driver promotion. Some said they would be willing to pay more if the system were more reliable and predictable.

Road-system communities: Valdez and Whittier interviewees were more likely than others to say they had not personally ridden the ferries recently, but they described how the ferry system served their business, local economy, and/or the region.

Passenger-only service: Most interviewees said passenger-only service would not meet their needs or their communities' needs. Many said they use their vehicle to move business or household goods (i.e., Cordova residents who stock up in Anchorage) or to bring vehicles and heavy equipment to Anchorage for service. For passenger-only service to work, some said, reliable and affordable ground transit options would need to be developed between Whittier and Anchorage.

Stability: Many interviewees alluded to a need for greater consistency and predictability in year-to-year schedules, policies, boats, and funding. For example, some business owners built their business model around the fast ferries and had to scramble when that service was curtailed. Several described how instability has eroded confidence in the system, leading to reduced use.

Select illustrative quotes follow:

*Air freight space is really tough out of Cordova so we really depend on the ferry system.
... We would use it even more if it ran more frequently. - Fisheries interviewee*

Tour operators plan a year in advance. ... A consistent schedule and getting it out timely is probably priority one. - Business owner

People need to stop thinking of the ferry like a cruise ship and think about it like a public bus. It's transportation that's needed to help commerce. It's a public service. - Community leader

The IRA Council uses the ferry to send out our runway equipment to be serviced in the summer and that way we can rely on it a lot better throughout the winter. We also use it to send out vehicles for maintenance. - Tribal leader

When the ferry stopped running reliably, it was like responding to a disaster. - Business leader

The biggest issue for us is predictability of schedule. You can plan itineraries if you know what's there. ... There are people who would like to rely on it, and they just can't plan on it. - Business owner

Sometimes the council and the corporation will have vendors come in with buildings supplies. Chenega Corp. brings in box vans almost every other ferry. It's definitely a big help for getting supplies in and out if we're building or anything like that. - Tribal employee

Smaller communities don't have health care resources and they rely on it to be able to get to doctors' appointments and medical procedures. - Public-sector employee

Improving service would be contemplating ways to get people from Whittier to Anchorage. That might allow [passenger-only] vessels to fill more of a need. - Community leader

Every chance I get, I'll take the ferry - mainly for medical maintenance. We don't have a store here. We have to go to Anchorage to do our bulk shopping. - Village resident

The time we used it the most was when we had the fast ferries. We had reconfigured our business and were marketing that three-hour trip over from Whittier. - Tourism owner

Potential Pathway to a Ferry Authority

This chapter explores the path to establishing a regional ferry service in Prince William Sound, should a decision be made to pursue this route. Estimated timelines are included. The five- to 10-year timeline assumes active, dedicated leadership and no significant delays. Vessel construction – including the process of securing funding for design and construction – is likely the most significant factor in the timeline. Factors that could extend the timeline include a decision to seek changes to the state’s port authority statute, significant contention among participating local governments, and challenges securing funding.

Table 47. Overview of Potential Pathway to PWS Regional Ferry Service

Phase	Estimated Timeline	Key Tasks
Groundwork	Years 1-2	Planning, information gathering, building support
Establishment of ferry authority	Years 3-5	Passage of enabling ordinances, appointment of board
Establishment of ferry service	Years 5-10 or beyond	Securing funds, assets, and staff; launching service

GROUNDWORK – YEARS 1-2

Committed leadership and ongoing communication across PWS communities will be needed to build and maintain the trust and collaborative partnership required for a successful regional ferry system.

Establish transition working group. A small, dedicated team of individuals will be needed to plan and oversee the effort to transition to a regional ferry authority. It is assumed that this group will lead the tasks described in this section.

Meet with local government and Tribal leadership in PWS communities. Establish strong communication to build alignment and trust, and to ensure clear and timely sharing of information.

Analyze Alaska Municipal Port Authority Act and assess need for any statutory changes. If statutory changes are warranted, work with lawmakers to secure passage of needed legislation.

Meet with key state officials to begin dialog about establishing a regional ferry authority in PWS. Suggested officials include the DOTPF commissioner, AMHS director, and OMB director. Questions may include:

- Under what conditions would the state convey a vessel or vessels to an authority? What vessels might be conveyed?
- What other infrastructure assets might be conveyed?

- When could this conveyance take place? What modifications or maintenance would the state complete before conveyance?
- What synergies might be achievable between AMHS and a regional ferry authority?
- How amenable are state officials to requesting ongoing state and federal operating funds for a regional ferry authority?
 - Note: State officials cannot commit funds as appropriations are subject to annual legislative approval; further, priorities may change under future administrations.

Reach out to the Alaska Marine Highway Operations Board (AMHOB), the citizen advisory board providing AMHS oversight, to communicate plans and build support.

Meet with key legislative leaders to build legislative understanding and support for a regional ferry authority. Key leaders likely include PWS lawmakers, House and Senate transportation and finance committee leadership, and representatives of other AMHS-served communities.

Familiarize PWS communities with the purpose and structure of a ferry authority.

Recommended strategies include

- Provide information on the web and via social media
- Offer community council and Tribal council presentations
- Host public meetings (including options for remote participation)
- Share relevant documents, including this report.

Develop a proposal for a regional ferry authority in Prince William Sound.

- Create a business plan.
- Identify assets needed.
- Identify key fund sources.
- Outline the legal framework for the proposed ferry authority.

ESTABLISHMENT OF AUTHORITY – YEARS 3-5

Draft and adopt enabling ordinances in accordance with AS 29.35.605. The governing body of each participating municipality must adopt parallel ordinances specifying the powers, boundaries, and limitations of the port authority.¹⁸ The ordinances must specify the number of board members, the manner in which board members are appointed, and their terms of office.

Secure voter approval. Voters of each participating municipality must approve the ordinance for the authority to be established.

¹⁸ If the Alaska Municipal Port Authority Act is amended to include Tribal or other entities, establishment of an authority may include such entities.

Appoint Board of Directors in accordance with enabling ordinances to govern the authority.

- Board adopts bylaws and regulations consistent with enabling ordinances to carry out its functions and purposes.
- Board hires a chief executive officer to run the authority.

ESTABLISHMENT OF FERRY SERVICE – YEARS 5-10 OR BEYOND

A new regional authority will be responsible for all aspects of establishing ferry service. Major tasks include:

- Develop plans and policies.
- Secure operating and capital funds.
- Secure vessels. These may be conveyed by the state, purchased from another entity, or purpose-built.
- Secure any necessary permits and regulatory approvals.
- Hire and train staff.
- Publish schedules, routes, and tariff structures.
- Launch service.



Photo credit: AMHS

Acknowledgments

We thank Ron Curtis at Inter-Island Ferry Authority, Ian Roskam and Matt McLaren at Alaska Marine Highway System, and Matthew Bird at Federal Highway Administration for sharing data and answering questions. Photos in this report were provided by AMHS. We are grateful to the staff and board members of PWSEDD for their guidance and vision, and to the PWS community members who took time to share with us how they use the ferry system, what they value, and ideas for improvement.

Appendix 1: PWS Historical AMHS Traffic

Table 18. Monthly PWS Embarking Passenger Traffic, 2018

Month	Chenega Bay	Cordova	Tatitlek	Valdez	Whittier	Total
January	9	364	1	23	359	756
February	0	411	0	317	474	1,202
March	0	466	0	79	482	1,027
April	9	439	1	158	813	1,420
May	8	793	90	478	1,378	2,747
June	13	662	3	1,289	1,811	3,778
July	22	899	1	1,671	2,378	4,971
August	61	1,053	14	1,577	2,445	5,150
September	17	1,002	1	712	1,299	3,031
October	0	804	0	118	652	1,574
November	0	473	0	87	405	965
December	0	175	0	28	153	356

Source: Alaska Marine Highway System, compiled by McKinley Research Group

Table 19. Monthly PWS Embarking Vehicle Traffic, 2018

Month	Chenega Bay	Cordova	Tatitlek	Valdez	Whittier	Total
January	3	155	0	10	161	329
February	2	165	0	54	188	409
March	1	233	0	35	274	543
April	9	273	1	71	439	793
May	1	440	16	192	617	1,266
June	5	397	0	465	937	1,804
July	11	397	0	513	986	1,907
August	21	422	6	521	1,045	2,015
September	10	505	0	276	805	1,596
October	0	377	0	40	340	757
November	0	174	0	18	154	346
December	0	96	0	16	91	203

Source: Alaska Marine Highway System, compiled by McKinley Research Group

Appendix 2: Interview List

We are grateful to the individuals who took time to share their experiences and thoughts about PWS ferry service with us (including two who provided responses in writing). Interviews were conducted in fall 2022. Participants are listed alphabetically by first name.

- Alex Russin, Cordova School District (Cordova)
- Billy Green, Copper River Seafoods (Cordova/Anchorage)
- Brian O'Leary, OBI Seafoods (Cordova)
- Cathy Renfeldt, Cordova Chamber of Commerce (Cordova)
- Colleen Stephens, Stan Stephens Cruises (Valdez)
- Costa Alton, Alaska Marine Highway System (Whittier)
- David Totemoff, Sr., retired (Tatitlek)
- Doug Penn, Chugach School District (Anchorage)
- Dr. Hannah Sanders, Cordova Community Medical Center (Cordova)
- Helen Howarth, City Manager, City of Cordova (Cordova)
- Jeremy Talbott, Ports & Harbors, City of Valdez (Valdez)
- Jim Hunt, City Manager, City of Whittier (Whittier)
- Kelly Bender, Lazy Otter Charters and Greater Whittier Chamber of Commerce (Whittier)
- Larry Evanoff, Chenega Tribe (Chenega Bay)
- Lloyd Kompkoff, Chenega Future, Chenega Council, and Chenega Corp. (Anchorage)
- Nanci Robart, Native Village of Tatitlek (Tatitlek)
- Rich Wheeler, 60 North Seafoods (Cordova/WA)
- Steve Kashevarof, community member (Chenega Bay)
- Ted Wright, Native Village of Eyak (Anchorage)
- Terri Michener, Chenega Tribe (Chenega Bay)
- Tommy Sheridan, UAF Blue Economy Center and maritime/fisheries entities (Cordova)
- Tu Trinh Dillon, Alaska Wild Seafoods (Cordova)
- Wendy Ranney, Orca Adventure Lodge (Cordova)

Appendix 3: Vessel Construction Cost Estimate

The following construction cost estimate was provided by David A. Nicholson, PE of NWE, LLC, a consultancy offering shipbuilding and shipyard cost estimates.¹⁹

I. BACKGROUND

A request was made by Coastwise Corporation, Inc., to provide a ROM cost estimate for the construction of a car passenger ferry for use in the surrounding water of the Alaska region. The vessel is expected to be similar to the Alaska Class Ferry contracted by Alaska Marine Highway Systems with Vigor Alaska, LLC.

The cost estimate will address the replacement cost, in 2023 dollars, of an Alaska Class Ferry as constructed plus certain regulatory and operational upgrades and modifications.

A separate description is provided to provide the basis for each of the elements of the following estimates:

- Alaska Class Ferry Replacement
- EPA Tier IV Propulsion Engines
- Overnight Crew Quarters
- Forward Cargo Door

II. ALASKA CLASS FERRY - 2023 PRICE

- a. The methodology used to develop the replacement cost will rely on an existing cost estimate with the addition of escalation to address changes in the cost of construction materials and labor.
- b. In 2014 an estimate was prepared to construct the Alaska Class Ferry. This estimate was used as the basis to which the following components are addressed from an escalation standpoint.
 - i. Labor Cost Rate
 - ii. Equipment costs – foreign and domestic
 - iii. Commodity cost

¹⁹ <https://nwe-llc.com/>

- c. The update of cost due to escalation relied upon the following:
 - i. Labor Cost
 - 1. Occupational Employment and Wage Statistics (OEWS) for NAICS code 336611 from years 2014 and 2023.
 - ii. Equipment & Subcontractor Cost
 - 1. Foreign escalated costs address the change in escalation of the country of origin's a) Producer Price Index and b) foreign exchange rates.
 - 2. Domestic equipment escalated costs relied on Bureau of Labor Statistics data based on the indices of December 2014 and January 2023.
 - iii. Commodity Cost
 - 1. Commodity item escalated costs relied on Bureau of Labor Statistics data based on the indices of December 2014 and January 2023.
- d. Design Changes and Notes
 - i. The 2014 shipyard contract excluded the cost of the EPA Tier III main engines as the State provided those to satisfy a regulatory cut-off date related to emissions requirements.
 - ii. The cost for the Tier III main engines will be included in the 2023 estimate.
 - iii. Tier IV engine costs will be included as a separate cost in a later section of the report.
 - iv. Owner's program costs, design license, or fees are not included.
 - v. An increase was made to the engineering budget to address the development of a contract design to support a competitive bid process.
 - vi. No assumption of learning curve from previous construction was reflected in the estimate.
- e. Price
 - i. Price in 2023 for an ALASKA CLASS FERRY as described in Section II is provided as follows:

HULL ONE - 2023			
VESSEL CONSTRUCTION ESTIMATE			
ITEM	DESCRIPTION	TOTAL ITEM (\$)	PERCENT
000	ENGINEERING & YARD SERVICES	\$ 2,520,200	3.5%
100	HULL STRUCTURE	\$21,612,700	30.1%
200	PROPULSION	\$10,209,300	14.2%
300	ELECTRIC PLANT	\$ 4,105,200	5.7%
400	COMMAND AND SURVEILLANCE	\$ 3,418,700	4.8%
500	MACHINERY, GENERAL	\$12,794,100	17.8%
600	OUTFIT & FURNISHINGS	\$ 9,409,600	13.1%
700	WEAPONS & ARMAMENT	\$ -	0.0%
800	PLANNING, ENG, WORK MANAGEMENT	\$ 7,016,100	9.8%
900	PRODUCTION SUPPORT	\$ 726,400	1.0%
	ROM TOTAL	\$71,812,300	

Figure 1 - ACF Replacement - 2023 Price

III. EPA TIER IV ENGINES - 2023 PRICE ADDER

- a. Current regulations require engines to comply with a lower level of emissions. When the vessel was contracted in 2014, EPA Tier III engines were acceptable. Regulations in 2023 require that EPA Tier IV engines be utilized.
- b. With Tier IV engines there will be additional structural, electrical, and mechanical scope added.
- c. No escalation was required in this instance.
- d. Price
 - i. The price adder in 2023 for a TIER IV engines, additional systems integration, and associated design & engineering support as described in Section III is provided as follows:

HULL ONE - 2023			
TIER IV PROPULSION ENGINES ESTIMATE - ADDER			
ITEM	DESCRIPTION	TOTAL	PERCENT
		ITEM (\$)	
000	ENGINEERING & YARD SERVICES	\$ 192,300	14.4%
100	HULL STRUCTURE	\$ -	0.0%
200	PROPULSION	\$ 926,300	69.5%
300	ELECTRIC PLANT	\$ -	0.0%
400	COMMAND AND SURVEILLANCE	\$ -	0.0%
500	MACHINERY, GENERAL	\$ 160,000	12.0%
600	OUTFIT & FURNISHINGS	\$ 54,900	4.1%
700	WEAPONS & ARMAMENT	\$ -	0.0%
800	PLANNING, ENG, WORK MANAGEMENT	\$ -	0.0%
900	PRODUCTION SUPPORT	\$ -	0.0%
	ROM TOTAL	\$1,333,500	

Figure 2 – Tier IV Propulsion Engines Adder - 2023 Price

IV. RETROFIT OF CREW QUARTERS - 2023 PRICE ADDER

- a. The original Alaska Class Ferry design did not include crew accommodations; however, a decision was made to add accommodations after commencement of the construction of the vessels.
- b. The work to accomplish the modification was awarded to Vigor Alaska, LLC, after a competitive bid process in 2021.
- c. The basis for the estimate of the addition of the Crew Quarters is the Bid Abstract from the 2021 bid SAMHS00394 / 9500160 on 11/23/2021.
- d. A SWBS group was assigned to each line of the bid abstract to organize the cost for comparative purposes.
- e. The average price of the Engineer's Estimate along with the two (2) prices of the bidders was used as the basis for the escalation.
- f. Escalation was calculated and applied to develop an estimate for the work to be accomplished in 2023.
- g. The methodology to calculate the escalation as described in Section II of this report was repeated with the only change being the start date of escalation of 2021.
- h. Price
 - i. The price adder in 2023 for overnight crew accommodations, systems integration, and associated design & engineering support as described in Section IV is provided as follows:

HULL ONE - 2023			
OVERNIGHT CREW QUARTERS ACCOMMODATIONS ESTIMATE - ADDER			
ITEM	DESCRIPTION	TOTAL ITEM (\$)	PERCENT
000	ENGINEERING & YARD SERVICES	\$ 3,695,083	21.6%
100	HULL STRUCTURE	\$ 3,484,816	20.3%
200	PROPULSION	\$ -	0.0%
300	ELECTRIC PLANT	\$ 611,420	3.6%
400	COMMAND AND SURVEILLANCE	\$ 251,471	1.5%
500	MACHINERY, GENERAL	\$ 1,910,660	11.2%
600	OUTFIT & FURNISHINGS	\$ 5,340,648	31.2%
700	WEAPONS & ARMAMENT	\$ -	0.0%
800	PLANNING, ENG, WORK MANAGEMENT	\$ 1,748,113	10.2%
900	PRODUCTION SUPPORT	\$ 92,967	0.5%
	ROM TOTAL	\$17,135,179	

Figure 3 – Overnight Crew Quarters Adder - 2023 Price

V. FORWARD CARGO DOOR - 2023 PRICE ADDER

- a. The original Alaska Class Ferry design did not have the means to load/unload vehicles from the starboard side of the vessel; however, a decision was made to add a forward cargo door after commencement of the construction of the vessels.
- b. The work to accomplish the modification was accomplished by Vigor Alaska, LLC in 2020 after delivery of the vessels.
- c. The estimate for the addition of the cargo door is predicated on information reported in an article from the Ketchikan Daily News on 9 February 2021. Based on the article the overall cost for two (2) shipsets of cargo doors and modifications was \$4.44m dollars in 2021.
- d. Using the reported prices, an estimate was developed to a) create man-hour and material amounts that supported the reported prices and b) estimate the cost of escalation associated with the performing the work in 2023 as in the previous sections.
- e. Price
 - i. The price adder in 2023 for the forward cargo door, systems integration, and associated design & engineering support as described in Section IV is provided as follows:

HULL ONE - 2023			
BOW DOOR INSTALLATION ESTIMATE - ADDER			
ITEM	DESCRIPTION	TOTAL ITEM (\$)	PERCENT
000	ENGINEERING & YARD SERVICES	\$ 54,700	2.3%
100	HULL STRUCTURE	\$ 1,038,500	43.5%
200	PROPULSION	\$ -	0.0%
300	ELECTRIC PLANT	\$ 164,900	6.9%
400	COMMAND AND SURVEILLANCE	\$ 27,000	1.1%
500	MACHINERY, GENERAL	\$ 12,500	0.5%
600	OUTFIT & FURNISHINGS	\$ 583,000	24.4%
700	WEAPONS & ARMAMENT	\$ -	0.0%
800	PLANNING, ENG, WORK MANAGEMENT	\$ 505,400	21.2%
900	PRODUCTION SUPPORT	\$ 3,200	0.1%
ROM TOTAL		\$2,389,200	

Figure 4 – Bow Door Installation Adder - 2023 Price

VI. SUMMARY AND TOTAL PRICE TABLE - 2023

- a. The above prices are to be considered preliminary and are only a Rough Order of Magnitude (ROM) at this point.
- b. Due to variation in commodity pricing, use of these estimates beyond two (2) months is discouraged.
- c. Estimated prices exclude any owner inspection and/or program management costs, preliminary transportation studies, engineering/equipment license fees, etc.
- d. The following table summarizes each of the above prices.

HULL ONE - 2023			
REPLACEMENT + TIER IV + CREW MODS + BOW DOOR			
ITEM	DESCRIPTION	TOTAL	PERCENT
		ITEM (\$)	
000	ENGINEERING & YARD SERVICES	\$ 6,462,283	7.0%
100	HULL STRUCTURE	\$26,136,016	28.2%
200	PROPULSION	\$11,135,600	12.0%
300	ELECTRIC PLANT	\$ 4,881,520	5.3%
400	COMMAND AND SURVEILLANCE	\$ 3,697,171	4.0%
500	MACHINERY, GENERAL	\$14,877,260	16.1%
600	OUTFIT & FURNISHINGS	\$15,388,148	16.6%
700	WEAPONS & ARMAMENT	\$ -	0.0%
800	PLANNING, ENG, WORK MANAGEMENT	\$ 9,269,613	10.0%
900	PRODUCTION SUPPORT	\$ 822,567	0.9%
	ROM TOTAL	\$92,670,179	

Figure 5 – Total Price - 2023 Price

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