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	REFERENCES		

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DEPARTMENT OF THE ARMY

US Army Corps of Engineers

Akutan/Akun Alaska
Ferry Analysis

DRAWN BY:	CHECKED BY:
CRG & TLL	GWB
DATE:	BHGI PROJ #:
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MARINE DESIGN CENTER

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MARINE DESIGN CENTER
CORPS OF ENGINEERS

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References

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I. Executive Summary

The U.S. Army Corps of Engineers (USACE) Marine Design Center (MDC) has contracted Bristol Harbor Group, Inc. (BHGI) to prepare a feasibility and cost evaluation for the operation of a conventional monohull passenger vessel to replace the current mode of transporting passengers to and from the city of Akutan to the Akun Airport, which has been by helicopter since 2014. The transit is about seven nautical miles across the Akun Strait, separating the islands of Akutan and Akun in the Aleutian Island Chain of Alaska. This feasibility study is a high-level review of the commercial business opportunity and technical aspects of a ferry operation.

As part of these efforts, potential ferry operator candidates that could set up an operation between Akutan and Akun were sourced and contacted for an informal interview to discuss and gauge interest in the project. To date, responses from these candidates ranged, however, from limited to lacking.

Additional efforts included evaluating the possibility of a lower operational cost for a vessel relative to the helicopter operation with sustainability of the operation, which is a primary impetus of this report. The cost structure is also an initial evaluation to assist in determining the viability of building a new jetty and dock in Surf Bay, Akun Island to serve the ferry and airport. Note that the project's Scope of Work (Ref. 1) does not include current meteorological data, wind and wave climatology, nor detailed engineering aspects of a used or new vessel. The business model does not consider any depreciation or other possible tax issue or structure of a potential contract. It is strictly a cost analysis based on current acquisition estimates for a new or used vessel and its supporting operational functions.

As initially outlined in BHGI Correspondence 23703-002M (Ref. 2), the ideal vessel for the expected sea state in the area of operation and desired speed was determined to be similar to a fishing vessel in hull form and 78 ft in length. However, following discussion, direction was provided by USACE to reduce length to a 58-ft vessel due to this size's lower estimated total economic cost; this is despite it being relatively less suited for rough conditions compared to a similar, but longer, hull. From there, two 58-ft length options were evaluated: a new-build U.S. Coast Guard (USCG) Subchapter T inspected vessel for 28 passengers, and a converted used inspected vessel for 28 passengers. Acquisition and annual operating costs were calculated for these options, with Table 1 showing a comparison for the first year of operation.

The estimated acquisition and annual costs of a 58-ft converted used vessel, certified and inspected to Subchapter T for 28 passengers, is lower than a new-build vessel of the same length and certification. However, the converted vessel carries risks that could impact the annual cost estimate including the relatively high age of the fleet of potentially suitable existing vessels on the market, regulatory (i.e., USCG) acceptance, and potential unforeseen additional costs during the conversion process that are related to the condition of the specific used vessel purchased. Note, it is recommended that intended vessel conversion plans be submitted to USCG Marine Safety Center (MSC) for determination of acceptability early in the planning processes to help mitigate potential cost and schedule difficulties, and that due consideration be given for redundancy of major systems to help mitigate the risk of becoming stranded in Alaskan waters.

Table 1: 58' Vessel – Comparison between New & Converted Used Options

Cost	Vessel Options 58-Ft New	58-Ft Converted
Purchase Price		$ 1,500,000
Shipyard Contract Price	$ 8,600,000	$ 4,300,000
Total	$ 8,600,000	$ 5,800,000
	Annual	*Annual*
Operating Expense	$ 1,946,596	$ 1,617,847
Admin Expense	$ 143,345	$ 143,345
10% Profit on Expenses	$ 208,994	$ 176,119
Total Operating Cost	$ 2,298,935	$ 1,937,311

II. Task I – Evaluate Current & Historical Information

The review of a 2009 Glosten Associates report (Ref. 3) has relative information with which BHGI agrees, based on investigative information and professional knowledge, specifically, the requirements for anti-rolling criteria for a new-build monohull and modifications for a used monohull vessel. Additionally, Glosten reviewed a small waterplane area twin hull ("SWATH") vessel, which is relatively more favorable from a motion sickness standpoint but is also more complex and expensive to build. Note that most of the operators BHGI has spoken with, as part of Task 2, operate typical catamarans, which are relatively less favorable from a motion sickness standpoint, compared to monohulls and SWATH vessels.

Glosten also mentioned one of the main points to consider with used vessels: that lower acquisition costs must be analyzed versus conversion costs, based upon a non-optimal design, a non-Subchapter T vessel, and most importantly, the vessel's age.

BHGI's review of the Glosten report regarding wind and wave climatology from 1980 to 2007 provided guidance for sea state and motion sickness incidence (MSI).

At a design meeting with USACE on 23FEB23, 10-ft waves and 40-kt winds were noted. BHGI assumed this means 10-ft maximum waves and 40-kt gusts. Significant wave height is approximately half of the maximum, and thus using a maximum of 10 ft gives a significant wave height of 5 ft, which roughly equates to Beaufort Sea State 5 (SS5). (See Table 2 for sea state wind and wave descriptions.) Note that if the assumption is that the 40-kt wind is sustained, the equivalent sea state would be SS8, which is not reasonable for operations of passenger vessels, even up to 100 ft.

Review of small vessel design guidance in Ref. 4 indicates that displacement hull vessels of 80-100 ft can conduct operations in SS4 with limited work in SS5. Ref. 5 notes that vessels under 65 ft are only expected to operate in up to SS3 and survive SS4; however, this guidance is for naval small boats, generally less than 50 ft in length. With an experienced captain knowledgeable about the area of operation, a steel monohull similar to a fishing boat under 65 ft that is designed for rougher conditions can reasonably be expected to be able to operate in elevated SS5 conditions, as an upper bound. This is consistent with Ref. 5 which allows "coxswain skills" and "specific boat performance capabilities" to be used as factors to be considered.

Table 2: Sea State Descriptions

Beaufort Sea State	Sustained Wind Speed	Wave Height
3	7-10 kt	2 ft (max 3 ft)
4	11-16 kt	3 ft (max 5 ft)
5	17-21 kt	6 ft (max 8 ft)
8	34-40 kt	18 ft (max 25 ft)

A. Suggested Schedule

Table 3 proposes a suggested sample schedule, which is for two roundtrips per day, based on a Monday through Saturday service week, with no operations on Sunday except for emergencies.

The schedule is based on four one-way trips per day departing Akutan, transiting Akun Strait, and arriving at a yet-to-be-built new jetty and dock on Akun Island, approximately a 7-nm run. The first trip would be in the morning and would take about 46 minutes to transit at a speed of 10 kt. The departure time from Akutan is based on the fixed-wing plane air service from Dutch Harbor to the Akun Airport

(Ref. 6). This flight time is approximately 15 to 20 minutes. Weather is the major logistical variable for daily service. The vessel would leave 1 hour and 40 minutes in advance of the aircraft's scheduled arrival in Akun. The return trip would depart Akun 30 minutes after the aircraft's arrival. Even with an intended daily schedule, communication and coordination between the air service and ferry operators are essential to adapt to the variable conditions.

The vessel is assumed to be capable of carrying up to 28 passengers as well as mail and light general cargo.

Review of the Grant Aviation and Maritime Helicopter data from 2014 through 2022 provided by USACE (Ref. 7) shows an average of 8 passenger trips per day. Peak average passenger trip per day was 12, and the helicopter averaged 26 operational days per month. The average cargo and mail weight during the same period was 180,416 lb per year, an average of 15,035 lb per month. This data was utilized for the revenue projections in the model.

Table 3: Sample Daily Ferry Schedule, Monday through Saturday

MON	TUE	WED	THU	FRI	SAT
Akutan to Akun	**Akutan to Akun**	**Akutan to Akun**	**Akutan to Akun**	**Akutan to Akun**	**Akutan to Akun**
8:40	9:55	8:40	9:55	8:40	9:55
15:40	15:40	15:40	15:40	15:40	15:40
Akun to Akutan	**Akun to Akutan**	**Akun to Akutan**	**Akun to Akutan**	**Akun to Akutan**	**Akun to Akutan**
10:50	12:05	10:50	12:05	10:50	12:05
17:50	17:50	17:50	17:50	17:50	17:50

III. Task 2 – Potential Provider Survey

Potential candidates for the ferry operation have been sourced by identifying current companies operating Subchapter T vessels as ferries or tourist operations. They are asset owners of the vessels. These companies are in Alaska and range from small businesses to large corporations and specifically are Alaskan Native Tribe Public Corporations. In our research for potential operators, we utilized contacts with Foss Maritime and Cook Inlet Tug & Barge, to name a few, that helped identify and make contacts with some of the candidates. The potential candidates are as follows:

1. Allen Marine Tours
2. Major Marine Tours/Catalyst Marine
3. Goldbelt Transportation
4. Seldovia Village Tribe
5. Alaska Fjordlines
6. Bristol Wave/Bristol Bay Native Corp.

Additionally, BHGI reached out to Hoverlink which operated the initial ferry system for the airport run.

The initial contact was by telephone, with an informal discussion about the project. This was followed up with an email request (see Appendix A) giving a high-level overview of the project and asking for feedback and some specific questions to gauge their interest. Currently, BHGI has had discussions with four out of the six companies. To date, BHGI has only received one response to the email inquiry. Highlights from the discussions held to date with the various companies are included below.

A. Allen Marine Tours

Allen Marine, which also owns and operates Alaska Dream Cruises, is a boat builder with over 55 passenger vessels built. BHGI spoke with Jammey Cagle, the primary principal, who was somewhat intrigued with the project. Considering that they are operators and builders of catamarans, they are biased toward this type of vessel. He stated that they have a laid-up 105-ft catamaran that is an ex-San Francisco Bay Subchapter T ferry with a displacement hull drawing around 6 to 9 ft. He did not have further details at hand. He wanted to know who was issuing the contract and for how long, the fuel status, and accommodation on Akutan. BHGI sent the follow-up email to him to review but has not received any further comments to date.

B. Major Marine Tours/Catalyst Marine

Catalyst Marine is a substantial family-owned operation in the ship and boat repair business, with Major Marine Tours operating catamarans and one monohull vessel of Subchapters T & K. Major Marine is owned by Tom Tougas, with whom BHGI did not speak. Instead, BHGI spoke with his son, Joe Tougas, the owner of Catalyst Marine. During two discussions, J. Tougas was very informative and possibly interested in the project. BHGI sent a follow-up email but has not received any response to date.

They operate roughly 25 vessels, primarily in the Kenai Fjords National Park. They have a ferry operation from Juneau to Greens Creek Mine on Admiralty Island that appears to be about 45-nm run. They service the mine with twice daily runs year-around, using a high-speed catamaran of 105 ft. They built the vessel specifically for this service and customer over 20 years ago. The initial contract period was for 10 years, with the client paying for the vessel but not owning it, due to liability issues, and paying a contract fee to the operators who owned the vessel after the first 10-year contract. It has since been renewed for an

additional 10-year period, and they are currently discussing two 5-year contracts with the potential for building a new vessel. They did not share further details on this contract.

It should be acknowledged that they had some preliminary discussions with the Borough of Akutan before the Hovercraft was an option. They are somewhat informed of the local issues surrounding the airport and Trident Seafood.

J. Tougas commented on the following areas of interest for the future of this project: he would like to see a proposal concerning the acquisition and operation of this ferry before committing to embarking on the project. He did say that if it was simply operational and crewing contract, that a 5-year term would be of interest.

Concerns are finding qualified and motivated crew for the vessel; he also believes it will be difficult to find people wanting to live on Akutan. He said licensed captains are in short supply, but captains with 100 GT License are a little easier to find. Most captains come from the continental U.S. His comment about utilizing fishing boat captains is due to most not having a USCG license. He was concerned with the maneuvering operations in Surf Bay regardless of the breakwater, specifically embarkation and disembarkation of passengers. He confirmed the information the USACE spoke about concerning Trident contracting a vessel out of Dutch Harbor to carry workers to the Akutan plant. He said it is a very old vessel and questioned the operation.

Regarding converting an older fishing vessel, J. Tougas said it would be a challenge, and he does not think the USCG would be very receptive, but he did say that USCG is excellent to work with in their area. He thought accommodations for crew on the vessel might be a good solution to shore-based accommodations, and as long as it was not for passengers, that it should not be a problem with Subchapter T rules.

C. Goldbelt Transportation

Goldbelt is an interesting company, having operations in addition to the transportation business. They are an Alaskan Native Public Corporation and appear to be growing. BHGI had a conversation with the general manager and one of the captains of the two vessels they run; these vessels are catamarans of 65 and 75 ft, operating in southeast Alaska. The general manager commented that while the project was interesting, he believed they are too small an operation to take on a project such as this at this time. He was also sent our email for feedback and has not yet responded. BHGI's opinion is that, having not received any feedback, it may require developing a relationship on a corporate level.

D. Seldovia Village Tribe

Seldovia Ferry has not responded to the email or returned phone calls to date.

E. Alaska Fjordlines

Alaska Fjordlines responded in writing and declined, as the founder is retiring, and the new owners (family members) are currently focusing on the continuation of the business.

They did make an interesting comment, which is that they would use two boats, "one heavy deep draft heavy weather vessel for larger loads and heavy weather, and [one] light, uninspected vessel for touring and light, less than six passenger trips..." BHGI understood this to mean they might not only run the ferry but market some type of tour operation, if they were to operate in this area.

F. Bristol Wave

Bristol Wave has not responded to the email or returned phone calls to date.

G. Hoverlink

BHGI spoke with Hoverlink, the former operators of the hovercraft used as the initial ferry system for the airport run. Marty Robbins is the general manager for Hoverlink. They ran the vessel for 18 months before it was determined that it was too expensive to operate based on the ridership. The vessel was approved for 50 passengers, and they charged $100 per one-way ticket. Reportedly, the largest number they ever carried was 40 passengers, and it gradually fell off after they started operations.

During the 18 months of operation, the hovercraft had a crew of four stationed in Akutan rotating monthly. The crew requirement of the hovercraft is more specialized than a traditional monohull or catamaran vessel. They came in from the continental U.S.

Accommodation was a major issue for them during the period operation, and they were going to ship a man-camp, storage, and office to Akutan and set up near the old sea-plane landing. This informed BHGI's model, which includes this cost and is not dependent on the local availability of housing.

H. Conclusions

Summarizing the companies contacted to date, BHGI's recommendation is to continue to pursue Allen Marine, Major Marine/Catalyst Marine, and Goldbelt Transportation in a further effort to discuss the project. They have experience with managing assets and personnel, complying with USCG regulations, and, most importantly, safely operating with passengers.

IV. Task 3 – Risk Analysis

A risk analysis was conducted for this project and consists of reviewing the discussions held with local area businesses from Task 2 and the geographic area of Akutan and Akun. A summary of this assessment is as follows.

The population of Akutan presents unique challenges, with a permanent population of approximately only 100 to 120 people, and with variable ridership and timing of when people (both permanent and temporary residents) will be traveling. Maintaining 24/6 service due to this variability in ridership may be challenging financially for an operator, assuming their profit structure is significantly based on ridership.

BHGI's investigation of local operators interested in this project indicated that further development would be needed with more specific details than what exist at this time. These companies, and specifically the three that would have the ability to perform on a contract, appear to have thriving businesses now, and this would be an opportunity that they would have to evaluate on a financial basis as well as fit into their existing business operations.

Based on the limited discussion, a contract period of 10 years likely would have to be proposed. Maintaining a consistent crew living in Akutan is expected to be expensive and a risk given the remote, harsh conditions. Regarding operators and having vessels to bring into this operation, research indicates this is not a viable option. Their vessels are employed in their main business, and finding a match for the operating parameters required for this project has not identified any available Subchapter T vessels.

Trident Seafood's announcement in May 2022 (Ref. 8), stating that they are considering moving the operations from Akutan to Dutch Harbor, will be of concern to any operator.

V. Task 4 – Develop Cost Environment

BHGI calculated estimated costs to acquire and operate a new vessel. These estimates include notional sizing and performance, new construction costs, modification costs, and recurring annual costs. The cost structure and model have been developed based on a commercial ferry operation to and from Akutan and Akun Islands in the Aleutians.

A. Sizing & Assumed Conditions

With provided operational conditions in the band for SS5 based on the evaluation of information gathered as part of Task 1, initially, a vessel length in the upper range of 65 to 80 ft was considered. The vessel hull form was assumed to be similar to a fishing vessel, to better handle in the rough conditions expected in the area of operation.

However, a vessel length of 58 ft was selected for this analysis following discussion and feedback from USACE due to this size's lower estimated total economic cost. This is despite this sized vessel being relatively less suited for SS5 operational conditions and relatively worse seakeeping characteristics that could induce increased passenger motion sickness, compared to a longer vessel of a similar hull form.

B. Acquisition Costs

Acquisitions costs were estimated for the following design options:

Case 1: 58x18.3x9.3 ft New-Build Steel Monohull
Case 2: 100x24x11 ft New-Build Steel Monohull (for reference)
Case 3: 58x18.3x9.3 ft Converted Steel Monohull
Case 4: 100x24x11 ft Converted Steel Monohull (for reference)

Labor rates are based on construction in the Pacific Northwest. Material costs are based on a proven 2017 cost model, escalated in accordance with Bureau of Labor Statistics data. The estimate has a confidence window of ±20%.

Note that acquisition costs account for sheltered passenger areas, a deck anti-icing system, and a 60-ft ADA compliant ramp (as part of the "Vertical & Inclined Ladders" item category estimate) for on and off boarding from a fixed dock due to accommodating the expected tide ranges (5 ft at Adak and 4 ft at Akun, per correspondence with USACE). Icebreaking capabilities are not considered in the vessel options as ice is typically not expected in this area due to water temperature.

Full construction cost details are available in Appendix B.

Modified vessel purchasing costs were informed from the used market with the following examples:

- 1997 Built 58'x24'x8' steel vessel asking $1,195,000.
- 1989 Built 58'x19'x8.5' steel vessel asking $1,250,000.
- 1980 Built 72'x22'x10' steel vessel asking $2,500,000.
- 1975 Built 78'x22.6'x11' steel vessel asking $850,000.
- 1973 Built 89'x24'x11.7" steel vessel asking $880,000.
- 1975 Built 100'x24'x11' steel vessel asking $1,350,000.

C. Recurring Annual Costs

The cost projections presented herein are based on building a new 58-ft vessel (Subchapter T with cost of inspection, COI) suitable in the operating conditions for the safe transportation of passengers with a maximum capacity of 28 people. Similar cost projections for a converted used 58-ft vessel (Subchapter T for 28 passengers) were also developed.

The performance, for the sake of this analysis, is anticipated to be two round trips per day, six days a week. (If more trips are desired, the vessel size would likely need to be increased to achieve a faster transit speed, and corresponding estimated annual costs would increase.) The weather criteria are based on the ability of a fixed-wing aircraft to fly and land at Akun Island airport under FAA Visual Flight Rules. Additionally, the evaluation is based on expenditures and includes revenue and income projections.

The ferry project has been approached as a commercial venture based on what a potential operator would require to establish a new service. The potential qualified operators in Alaska for this project appear to be limited to several companies with passenger service experience, based on the results of Section III.

Recurring annual costs for operations, administration, etc. are based on current market data with a 3% annual escalation for following years. Costs are for construction in and transit from the Pacific Northwest, two (2) crew, accommodations at Akutan, and an assumed 10% profit margin.

As noted above, ideal operational days assume six days per week, 52 weeks per year, for a total of 312 days per year. Assuming the vessel is suitable for SS5 (17-21 kt of wind), this would correspond to an operational window of about seven months, or 58% of the year based on the historical average wind speed in Akutan. Based on the Maritime Helicopters data, they experienced weather and mechanical cancellations on 101 days on average out of 312 operational days, or 32% of operational days. For the sake of this report, weather cancelations of 30% of the operational period are assumed, or about 93 days. This is based upon the Maritime Helicopters cancelations and review of NOAA weather records. Another assessment is the captain's local knowledge of the area of operation and weather. While portions of a day may not be suitable, there may be times that the passage can be made safely.

It should be noted that the only drydocking options in the area are as follows. In Dutch Harbor (an approximately 45-50 nm transit), Resolve operates a drydock that can accommodate any vessel being considered for this project. This is a floating drydock, and the basic expense for in and out is approximately $16,000-18,000 or more, depending on work required. The alternative is a new 150-ton travel lift in Sand Point on Popof Island (a transit of about 220-230 nm). The cost for this travel-lift has not been obtained. The 15-ton travel-lift in King Cove, which has been downgraded, charges $22.00 per ft, plus additional yard charges. While the transit to Sand Point would consume a fair amount of fuel and time for a haul out, it would be significantly less than the Dutch Harbor option. Once a specific vessel is selected, an accurate budget and time frame could be analyzed for cost impacts at Sand Point compared to a floating drydock.

These annual expenses are based on the following:

- 20-year amortization at the current WSJ prime rate (see the project's Scope of Work, Ref. 1, Section 2.4)
- 5-year contract (see the project's Scope of Work, Ref. 1, Section 2.3)

- Operators of this service must have previous or ongoing operation of passenger vessels in Alaska.
    - The obvious reasons for experience are critical. From an underwriter's perspective it will have significant impact if it is a singular operation versus a multiple vessel operation.

Note that while commercial feedback indicates preference toward a 10-year contract, the cost model assumes a 5-year contract because the variables for this operation are very difficult to extend out for a longer projection. This is due to the uniqueness of the area of operation, thorough analytical review of historical cost projections, and most importantly, the sustainability of ridership. This project requires additional feedback from operators and options for grants and subsidies.

Insurance estimate details are provided in Appendix C.

Full recurring annual cost details are available in Appendix D.

D. 58-Ft Vessel Options

This analysis of a 58x18.3x9.3 ft vessel compares the following options:

Case 1: New-Build Steel Monohull: Certified & Inspected to Subchapter T for 28 Passengers
Case 3: Converted Steel Monohull: Certified & Inspected to Subchapter T for 28 Passengers

Note, case numbering aligns with those in Section V.B

E. Results

1. Vessel Size & Performance

The selected notional vessel is a 58x18.3x9.3 ft steel single screw ferry. This is one of the design points of the two new-build length options used in Appendix B. (The 100-ft vessel options' acquisition costs only are included for reference.) Since the selected vessel length is below 79 ft, Load Line regulations do not apply. The hull is derived from the lines of slightly larger crab fishing vessels currently serving in the envisioned ferry area of operation.

Consultation with ABS, USCG, and other designers of similar vessels in other areas provided general guidance that a vessel of this size may be restricted to a lower sea state in the range of SS3 or SS4. However, with a hull form based on a fishing boat that is designed to handle in rough conditions, and with a knowledgeable and experienced captain, it is reasonable to assume such a vessel may be able to operate in SS5, as an upper bound (though possibly at the expense of potentially increased passenger discomfort and motion sickness.)

The vessel is sized such that accommodations can be designed for handicap access (i.e., ADA head and wheelchair tiedowns). However, based on refraction swells expected at Surf Bay, even with a breakwater, a handicap access ramp may not be possible in all conditions.

Vessel speed is assumed to be between 9 and 11 kt; the limit of a displacement hull at this size is approximately 10 kt (based on the relationship of Vessel Speed = $1.34 \times \sqrt{(LWL)}$).

2. Acquisition & Recurring Annual Costs

The two options for a 58' vessel as listed in Section V.D were evaluated for their associated acquisition and recurring annual costs (including vessel operating expenses, administration expenses, and profit margin). A summary table of costs for the first year of operation of these options are included in Table 4.

See Appendices B & D for full details of acquisition costs and recurring annual costs, respectively.

(Note that the 100x24x11 ft options are included in Appendix B for reference only.)

Table 4: Total Economic Cost Comparison for 58-Ft Ferry

Cost	Vessel Options	
	58-Ft New	58-Ft Converted
Purchase Price		$ 1,500,000
Shipyard Contract Price	$ 8,600,000	$ 4,300,000
Total	$ 8,600,000	$ 5,800,000
	Annual	*Annual*
Operating Expense	$ 1,946,596	$ 1,617,847
Admin Expense	$ 143,345	$ 143,345
10% Profit on Expenses	$ 208,994	$ 176,119
Total Operating Cost	$ 2,298,935	$ 1,937,311

3. Discussion

Per our analysis, a 58-ft converted used vessel, inspected to Subchapter T, is estimated to have the minimum annual cost, compared to a similar new-build vessel.

However, given the state of the market for used vessels of the size and form best suited to this service, a new build acquisition gives the better path to provide a vessel that has all of the desired performance characteristics. Converted or unmodified existing vessels will have more limited lifespans and may incur additional recurring annual costs for insurance, maintenance, etc. Furthermore, unforeseen costs may be incurred depending on the condition of the as-purchased used vessel, and warranties for equipment and machinery may have already expired.

One primary reason for a new build over an existing vessel and conversion is vessel age. The used-market review of vessels suitable for this project are in the 30-40-year range with some approaching 50-plus years. "Most vessels operating in Alaska were built between 1970 and 1989," according to a September 2014 study for the Alaska State Commerce Department (Ref. 10).

Additionally, any potential contractor will likely want a purpose-built vessel for the service, as opposed to a converted vessel. Section II lists two companies that have built new vessels for specific operations. If tour operators are included as well, most of their used vessels are employed in more sheltered operating areas or are being retired and replaced with purpose-built vessels.

Also, the conversion of a used vessel to meet Subchapter T requirements carries higher regulatory risk than building new. In their Plan Review Guidance (Ref. 11), USCG MSC recommends that "vessel owners seek a determination early in the planning process for any significant vessel alterations that are planned" to help mitigate potential cost and schedule difficulties. Requests for determinations should include, at a minimum, submitting documentation such as an outboard profile, general arrangement, estimated

weight changes, and a detailed description of the proposed alterations, with before and after conditions of the vessel illustrated. Further consideration should be given to compare Subchapter C and Subchapter T requirements for major differences, as well as given to redundancy of vessel systems (e.g., steering, propulsion, electrical) to help mitigate the risk of becoming stranded in Alaskan waters.

F. Conclusions

The vessel size is a significant driver for both acquisition and recurring costs. Based on USACE direction, a steel monohull vessel of 58-ft length is selected for providing ferry operations to and from Akutan and Akun Islands, Alaska. It is noted that a vessel of 58-ft length may require restricting the operating conditions below the commonly anticipated SS5 in this area; however, this is dependent upon the captain's knowledge and experience, specific meteorological conditions, and terminal facilities' designs.

Based on our assumptions and analysis, a 58-ft converted used vessel is the minimum annual cost case for a vessel certified and inspected to Subchapter T for 28 passengers, compared to a similar new-build vessel. However, a used vessel is expected to have a shorter lifespan, especially when considering the age of the existing vessel fleet, would carry comparatively high regulatory risk, and may incur additional costs depending on the condition of the specific used vessel purchased for conversion.

VI. Task 5 – Cost Model, Estimate, & Report

The Akutan Ferry is a unique situation in an extreme weather environment with visibility, wind, currents, and wave conditions to challenge this operation. The logistical challenges for coordinating schedules with a separate operator of an aircraft are significant as well as maintaining a base of operations on this remote island with limited service by ship from the mainland.

For any ferry operations to get underway, a suitable vessel must be acquired. Acquisition costs of such vessels are estimated in Appendix B. From there, the underlying and main challenges and risks are the operational costs for a ferry to transport a small population of full-time residents with a sustainable service. From a commercial business aspect, the potential ridership also has limited opportunities for growth due to the remoteness of the operation. Based on the discussions with operators and having researched the businesses that may be interested in this operation, there is a limited experienced operator's pool in Alaska. Further investigation into other qualified private operators in Alaska and the continental U.S. is recommended to have more options for this service.

The annual operating cost model in Appendix D that has been developed is broken up into tabs for easy refence and further manipulation by the USACE. The Revenue and Cost Summary is projected out for 5 years with a 3% increase per year. The acquisition cost and commissioning of the ferry are amortized over twenty years as this would be more acceptable by general business standards.

Profitability is subjective, and each operator will have their own threshold of what they think is fair depending on the duration of the contract and terms. There is a great deal of liability in the operation of this type of service, and as stated earlier, it is a unique operation. While this project's profitability is not a margin or a mark-up, it is strictly a percentage of expense. The basis for a 10% profit on expenses with everything considered is reasonable.

Appendix A: Potential Ferry Operator Email Template

We are requesting feedback and potential interest for a ferry operation in the Aleutian Islands of Alaska.

The proposed service is a ferry between Akutan and Akun Islands. We would appreciate your comments, feedback, and thoughts on the following information.

- Twice daily service from the City Docks of Akutan to a yet to be built dock on Akun Island's Surf Bay.
- The distance is approximately seven nautical miles in each direction.
- This would be a six day per week operation, with year-round service. The basic schedule is to meet an aircraft capable of carrying 8 to 28 passengers depending on season and demand. The City of Akutan has a permanent population of approximately 100 to 120 people, and Trident Seafood can increase the population up to 1400 people, depending on the factory's fish processing demand. Currently Grant Aviation has a schedule of twice daily flights weather permitting. This aircraft is restricted to FAA Visual Flight Rules. From Akun to Akutan the passengers are ferried by a Bell-206 Helicopter, limited to four passengers. This is operated under Grant Aviation by Maritime Helicopters.
- The USACE is currently reviewing options for building a new breakwater and dock in Surf Bay, this is only at the feasibility stage now. One option is for a 450' breakwater with a 290' x 12' pile supported dock, 120'x 120' turning basin and a dredge depth of -13ft (MLLW). Ideally, they want a vessel that does not draft over 8ft.
- Vessel sizing has been based on Sea State criteria. Our review has been strictly focused on a monohull type vessel; an example would be a Crabber or Seiner type fishing boat, either new or converted. A 65' vessel would be expected to operate in SS3 and limited work in SS4. A vessel range of 80' to 100' would be expected to operate in SS4 with limited work in SS5. In addition, this vessel would have to be a Sub Ch. T with a COI.
- Currently the type of structure for this operation is under review as to terms of contract and who will be the actual stakeholders and parties to the contract. Contract terms of 5-years and 10-years have been discussed, and several types of structures are being reviewed. An all-private operation, all-public operation, or public/private operations are options. Thoughts and comments are requested on what type of contract and term would be of interest to an operator/service provider.
- The historical data from the helicopter operation is broken down into two categories: passengers, and cargo/mail annually.
    - 2014 to 2022: average annual passenger count is 2,643 people.
    - 2014 to 2022: average annual cargo/mail count is 180,416 lbs.
- Weather conditions for operating will be restricted to when the fixed-wing aircraft can land at the Akun Airstrip and the helicopter can safely transit between the islands. We have assumed that any ice flowing through the strait will be a constraint on the vessel's operation as well.
- Does your company operate any vessels that would be suitable for this type of operation, or does the company have a potential vessel that could be converted?
- We would appreciate comments on the operational aspects of this type of project based on your local knowledge. How difficult is it to get licensed and credentialed crew members? What type of rotational period would the crew be expected to work; vessel maintenance and repairs, fueling requirements, housing, and meal requirements?

Please feel free to contact me at any time to discuss this project and thank you in advance for your interest and help.

Appendix B: 3485-A045-01 R1 Construction Cost Estimates

Akutan / Akun Alaska Ferry Project

Cost Estimates for Alternate Construction / Conversion Scenarios

The enclosed pricing / information is provided in response to a request from Bristol Harbor Group, Inc to develop cost estimates for either the construction or modification of two (2) sizes of vessels in support of their analysis, selection, and recommendation of a vessel for the Akutan / Akun Alaska Ferry project.

The vessels proposed for purposes of this early-stage cost estimate consist of a hull form which is consistent with the stern trawlers used in the fishing industry. All mechanical and electrical systems estimated are typical of vessels utilized in industrial / commercial marine industry. The estimates do not include any electric, hybrid, or all battery drive and propulsion systems.

The program and owner cost are not included as well as the acquisition cost for the Case 3 and Case 4 are not included and are to be added by others.

Based on the information available and scope detailed, the estimated costs for each case are in the +/- 20% range.

The vessel sizes and their respective costs are provided:

	CASE 1	CASE 2	CASE 3	CASE 4
NEW / CONVERTED	NEW	NEW	CONVERTED	CONVERTED
SIZE	58'x18.3'x9.3'	100'x24'x11'	58'x18.3'x9.3'	100'x24'x11'
PRESUMED SHIPYARD LOCATION	PACIFIC NW	PACIFIC NW	PACIFIC NW	PACIFIC NW
SHIPYARD CONTRACT PRICE	**$8.6M**	**$12.1M**	**$4.3M**	**$4.6M**

In addition, the following table is provided which outlines the major scope assumptions for each of the cases:

	CASE 1	CASE 2	CASE 3	CASE 4
STRUCTURE	FISHING VESSEL HULL FORM WITH ADDED SHELTER DECK FOR PASSENGERS. DAYBOAT ONLY WITH NO OVERNIGHT ACCOM.		FISHING VESSEL HULL FORM WITH ADDED SHELTER DECK FOR PASSENGERS. DAYBOAT ONLY WITH NO OVERNIGHT ACCOM. ALLOWANCE FOR TONNAGE FRAMES.	

	CASE 1	CASE 2	CASE 3	CASE 4
MACHINERY	NEW 1 X 500HP ENGINE WITH 1 X SHAFT AND RUDDER.	NEW 2 X 500HP ENGINE WITH 2 X SHAFT AND RUDDER.	EXISTING 1 X 500HP ENGINE WITH 1 X SHAFT AND RUDDER. ALLOWANCES MADE FOR OPEN/INPSECT, SHAFT CLEARANCES, ETC	EXISTING 2 X 500HP ENGINE WITH 2 X SHAFT AND RUDDER. ALLOWANCES MADE FOR OPEN/INPSECT, SHAFT CLEARANCES, ETC
ELECTRICAL	1 X NEW 60KW GENERATOR WITH OUTFITTING FOR CREW AND PASSENGER AREAS	2 X NEW 175KW GENERATOR WITH OUTFITTING FOR CREW AND PASSENGER AREAS	1 X EXISTING 60KW GENERATOR WITH OUTFITTING FOR NEW PASSENGER AREAS	2 X EXISTING 175KW GENERATOR WITH OUTFITTING FOR NEW PASSENGER AREAS
ALARMS, NAVIGATION	NEW COMM, NAV, ETC	NEW COMM, NAV, ETC	EXISTING COMM, NAV, ETC WITH ADDED GA AND FIRE DETECTION	EXISTING COMM, NAV, ETC WITH ADDED GA AND FIRE DETECTION
AUXILIARY SYSTEMS	PIPING AND AUX SYSTEMS FOR DAY BOAT CREW AND PASSENGERS	PIPING AND AUX SYSTEMS FOR DAY BOAT CREW AND PASSENGERS	EXISTING SYSTEMS WITH ADDED SYSTEMS FOR PASSENGER AREA IN SHELTER DECK	EXISTING SYSTEMS WITH ADDED SYSTEMS FOR PASSENGER AREA IN SHELTER DECK
FISHING EQUIPMENT	N/A	N/A	REMOVED	REMOVED
JOINER AND PAINT	NO OVERNIGHT ACCOMMODATIONS. OUTFIT OF CREW AND PASSENGER AREAS. COATING OF ENTIRE VESSEL.	NO OVERNIGHT ACCOMMODATIONS. OUTFIT OF CREW AND PASSENGER AREAS. COATING OF ENTIRE VESSEL.	REMOVAL OF OVERNIGHT ACCOMMODATIONS. OUTFIT OF CREW AND PASSENGER AREAS. COATING OF ENTIRE VESSEL.	REMOVAL OF OVERNIGHT ACCOMMODATIONS. OUTFIT OF CREW AND PASSENGER AREAS. COATING OF ENTIRE VESSEL.

The estimated could be considered a bottoms-up approach methodology which relied upon an existing, proven detailed cost estimate developed in 2017. To address escalation of material costs, the cost of the raw materials and equipment were escalated using Bureau of Labor Statistics data for each line item of the detailed estimate. The categories addressed were:

CAT	BLS CODE
ELECTRICAL	WPU117
ENGINEERING	PCU54135413
GENERAL SY	WPU14310301
INSURANCE	PCU9241269241267
MACHINERY	WPU114
PAINT	PCU32551032551072
PIPE	WPU101706
STEEL	PCU3311103311107
COPPER	WPU102301

Hourly labor costs were estimated assuming the shipyard location will be in the Pacific Northwest along with the assumption that the work force will include contract labor which will include a higher labor rate due to per diem for the temporary labor.

The following tables provide the pricing for the WBS-1 group level for each of the cases previously discussed:

Case 1:

CASE 1 - 2023							
VESSEL CONSTRUCTION ESTIMATE							
GROUP	DESCRIPTION	LABOR (HOURS)	MATERIALS ($)	SUBTOTAL ($)	MATERIAL MARKUP ($)	TOTAL ITEM ($)	PERCENT
0	GENERAL	9,649	793,377	1,605,000	119,000	1,724,000	20.2%
1	SCIENTIFIC	1,601	279,658	414,000	42,000	456,000	5.3%
2	ARRANGEMENTS	160	17,989	31,000	3,000	34,000	0.4%
3	STRUCTURE	9,292	253,015	1,035,000	38,000	1,073,000	12.6%
4	OUTFIT	6,402	1,275,681	1,814,000	191,000	2,005,000	23.5%
5	MISSION EQUIPMENT	0	0	0	0	0	0.0%
6	MACHINERY	6,443	1,497,861	2,040,000	225,000	2,265,000	26.5%
7	ELECTRICAL	2,773	630,601	864,000	95,000	959,000	11.2%
8	SPARE PARTS	0	29,204	29,000	4,000	33,000	0.4%
	SUBTOTAL	36,319	$4,777,386	$7,832,000	$717,000	$8,549,000	
	LABOR RATE - 2019	$84.12	PER HOUR				
	MATERIAL MARKUP	15%		$717,000			
	TOTAL			$8,550,000			

Case 2:

CASE 2 - 2023							
VESSEL CONSTRUCTION ESTIMATE							
GROUP	DESCRIPTION	LABOR (HOURS)	MATERIALS ($)	SUBTOTAL ($)	MATERIAL MARKUP ($)	TOTAL ITEM ($)	PERCENT
0	GENERAL	13,198	1,148,105	2,253,000	172,000	2,425,000	20.1%
1	SCIENTIFIC	1,844	286,663	441,000	43,000	484,000	4.0%
2	ARRANGEMENTS	160	17,989	31,000	3,000	34,000	0.3%
3	STRUCTURE	20,742	550,677	2,287,000	83,000	2,370,000	19.7%
4	OUTFIT	7,833	1,416,901	2,073,000	213,000	2,286,000	19.0%
5	MISSION EQUIPMENT	0	0	0	0	0	0.0%
6	MACHINERY	8,094	2,069,237	2,747,000	310,000	3,057,000	25.4%
7	ELECTRICAL	3,814	902,915	1,222,000	135,000	1,357,000	11.3%
8	SPARE PARTS	0	33,434	33,000	5,000	38,000	0.3%
	SUBTOTAL	55,687	$6,425,920	$11,087,000	$964,000	$12,051,000	
	LABOR RATE - 2019	$83.73	PER HOUR				
	MATERIAL MARKUP	15%		$964,000			
	TOTAL			$12,060,000			

Case 3:

CASE 3 - 2023							
VESSEL CONVERSION ESTIMATE							
GROUP	DESCRIPTION	LABOR (HOURS)	MATERIALS ($)	SUBTOTAL ($)	MATERIAL MARKUP ($)	TOTAL ITEM ($)	PERCENT
0	GENERAL	6,421	431,596	969,000	86,000	1,055,000	24.6%
1	SCIENTIFIC	1,245	251,338	356,000	50,000	406,000	9.5%
2	ARRANGEMENTS	0	0	0	0	0	0.0%
3	STRUCTURE	5,976	78,216	578,000	16,000	594,000	13.8%
4	OUTFIT	3,938	784,816	1,114,000	157,000	1,271,000	29.6%
5	FISHING SYSTEMS, REMOVAL	3,040	32,000	286,000	6,000	292,000	6.8%
6	MACHINERY	1,555	303,459	434,000	61,000	495,000	11.5%
7	ELECTRICAL	751	94,981	158,000	19,000	177,000	4.1%
8	SPARE PARTS	0	0	0	0	0	0.0%
	SUBTOTAL	22,925	$1,976,408	$3,895,000	$395,000	$4,290,000	
	LABOR RATE - 2023	$83.67	PER HOUR				
	MATERIAL MARKUP	20%		$395,000			
	TOTAL			$4,290,000			

Case 4:

CASE 4 - 2023							
VESSEL CONVERSION ESTIMATE							
GROUP	DESCRIPTION	LABOR (HOURS)	MATERIALS ($)	SUBTOTAL ($)	MATERIAL MARKUP ($)	TOTAL ITEM ($)	PERCENT
0	GENERAL	6,862	440,714	1,015,000	88,000	1,103,000	23.9%
1	SCIENTIFIC	1,260	251,338	357,000	50,000	407,000	8.8%
2	ARRANGEMENTS	0	0	0	0	0	0.0%
3	STRUCTURE	7,771	94,754	745,000	19,000	764,000	16.5%
4	OUTFIT	4,449	799,833	1,172,000	160,000	1,332,000	28.8%
5	FISHING SYSTEMS, REMOVAL	3,360	32,000	313,000	6,000	319,000	6.9%
6	MACHINERY	1,651	318,459	457,000	64,000	521,000	11.3%
7	ELECTRICAL	751	94,981	158,000	19,000	177,000	3.8%
8	SPARE PARTS	0	0	0	0	0	0.0%
	SUBTOTAL	26,103	$2,032,080	$4,217,000	$406,000	$4,623,000	
	LABOR RATE - 2023	$83.69	PER HOUR				
	MATERIAL MARKUP	20%		$406,000			
	TOTAL			$4,630,000			

The following table provides a finer level of detail for each of the cases and allows better insight into the scope for each case.

		PRICE			
ITEM	ITEM TITLE	CASE 1	CASE 2	CASE 3	CASE 4
C000	GENERAL	$ -	$ -	$ -	$ -
C001	PROJECT OVERVIEW	$ 178,189	$ 230,000	$ 74,375	$ 74,375
C002	CONTRACT OVERVIEW	$ -	$ -	$ -	$ -
C003	STANDARDS	$ -	$ -	$ -	$ -
C004	CLASSIFICATION & CERTIFICATION	$ 164,620	$ 244,497	$ 99,393	$ 99,393
C006	VESSEL IDENTIFICATION & PRINCIPAL CHARACTERISTICS	$ -	$ -	$ -	$ -
C010	DEFINITIONS	$ -	$ -	$ -	$ -
C025	CONTRACTOR QUALITY STANDARDS	$ 872,405	$ 1,244,458	$ 554,503	$ 602,468
C040	SCOPE OF WORK	$ 508,874	$ 706,510	$ 326,915	$ 326,936
C100	SCIENTIFIC	$ -	$ -	$ -	$ -
C105	HULL GEOMETRY	$ -	$ -	$ -	$ -

		PRICE			
ITEM	**ITEM TITLE**	**CASE 1**	**CASE 2**	**CASE 3**	**CASE 4**
C115	WEIGHT ESTIMATE	$ 51,121	$ 60,938	$ 52,110	$ 52,116
C130	TANK CAPACITIES	$ -	$ -	$ -	$ -
C145	TONNAGE MEASUREMENT	$ 12,651	$ 13,201	$ 11,479	$ 11,479
C170	DOCKING PLAN	$ -	$ -	$ -	$ -
C180	NOISE & VIBRATION	$ 111,947	$ 116,218	$ 83,053	$ 83,053
C185	TESTS & TRIALS	$ 280,564	$ 293,716	$ 259,162	$ 260,383
C200	ARRANGEMENTS	$ -	$ -	$ -	$ -
C201	CONFIGURATION	$ -	$ -	$ -	$ -
C205	OUTBOARD PROFILE	$ -	$ -	$ -	$ -
C215	GENERAL ARRANGEMENTS	$ -	$ -	$ -	$ -
C233	PILOTHOUSE ARRANGEMENT	$ -	$ -	$ -	$ -
C255	CONSOLE ARRANGEMENT	$ 34,147	$ 34,084	$ -	$ -
C300	STRUCTURE	$ 25,458	$ 37,335	$ 45,593	$ 45,603
C301	GENERAL REQUIREMENTS	$ -	$ -	$ -	$ -
C305	HULL STRUCTURE - TONNAGE FRAMES	$ 779,902	$ 2,029,006	$ 100,028	$ 270,138
C315	DECK HOUSE - SHELTER DECK	$ 193,575	$ 192,901	$ 422,858	$ 422,952
C316	STACKS	$ -	$ -	$ -	$ -
C317	MASTS	$ 10,382	$ 10,343	$ -	$ -
C320	TANKS	$ 14,798	$ 14,764	$ -	$ -
C325	SEACHEST	$ 9,446	$ 9,432	$ 25,387	$ 25,391
C330	FOUNDATIONS	$ 39,082	$ 76,299	$ -	$ -

		PRICE			
ITEM	**ITEM TITLE**	**CASE 1**	**CASE 2**	**CASE 3**	**CASE 4**
C400	OUTFIT	$ -	$ -	$ -	$ -
C404	CORROSION PREVENTION	$ 12,314	$ 16,418	$ 12,849	$ 12,849
C405	CATHODIC PROTECTION	$ 4,276	$ 7,189	$ 4,294	$ 7,248
C406	COATING SYSTEM	$ 253,562	$ 323,007	$ 239,182	$ 280,705
C410	HULL OUTFIT	$ 24,761	$ 45,609	$ -	$ -
C415	DOORS, WINDOWS, HATCHES & MANHOLES	$ 272,925	$ 293,818	$ 30,694	$ 30,696
C420	DECK FITTINGS	$ 107,166	$ 128,561	$ -	$ -
C427	VERTICAL & INCLINED LADDERS	$ 211,829	$ 211,720	$ 187,826	$ 187,826
C430	DECK COVERINGS	$ 105,691	$ 141,575	$ -	$ -
C436	INSULATION, SHEATHING, JOINER WORK & CEILINGS	$ -	$ -	$ -	$ -
C437	FURNITURE & FURNISHINGS	$ 734,353	$ 830,593	$ 659,364	$ 675,779
C445	LIFESAVING & SAFETY	$ 68,577	$ 68,506	$ 58,877	$ 58,880
C455	DECK CRANE	$ 157,654	$ 157,521	$ 6,978	$ 6,978
C460	NAMEPLATES, NOTICES & MARKINGS	$ 52,464	$ 60,841	$ 71,168	$ 71,181
C500	FISHING SYSTEMS, REMOVAL	$ -	$ -	$ 292,754	$ 319,602
C600	MACHINERY	$ -	$ -	$ -	$ -
C601	GENERAL REQUIREMENTS	$ 9,194	$ 9,157	$ 9,199	$ 9,201
C605	PROPULSION SYSTEM	$ 491,672	$ 889,501	$ 60,149	$ 86,186
C606	PROPELLERS	$ 22,623	$ 45,196	$ -	$ -

		PRICE			
ITEM	**ITEM TITLE**	**CASE 1**	**CASE 2**	**CASE 3**	**CASE 4**
C610	SHAFTING	$ 116,891	$ 233,575	$ -	$ -
C612	RUDDERS	$ 61,435	$ 122,795	$ 1,767	$ 1,767
C615	STEERING SYSTEM	$ 174,202	$ 212,542	$ 15,593	$ 15,594
C620	BOW THRUSTER	$ 41,379	$ 55,799	$ 8,928	$ 8,929
C630	FUEL OIL SYSTEM	$ 161,529	$ 172,586	$ -	$ -
C635	LUBE OIL SYSTEM	$ 10,481	$ 10,465	$ -	$ -
C637	WASTE OIL SYSTEM	$ 3,775	$ 3,771	$ -	$ -
C640	GENERATOR ENGINE COOLING SYSTEM	$ 192,028	$ 223,910	$ -	$ -
C650	GENERATOR ENGINE EXHAUST SYSTEM	$ 118,461	$ 174,154	$ -	$ -
C660	BILGE & BALLAST SYSTEM	$ 104,717	$ 112,973	$ -	$ -
C665	POTABLE WATER SYSTEM	$ 70,476	$ 81,359	$ 41,648	$ 41,653
C667	SEWAGE SYSTEM	$ 89,503	$ 112,283	$ 51,153	$ 51,157
C670	VENTS, SOUNDS, OVERFLOWS & FILLS	$ 15,797	$ 15,756	$ -	$ -
C675	FIREMAIN SYSTEM	$ 36,864	$ 36,807	$ 17,436	$ 17,437
C677	FIXED FIRE EXTINGUISHING SYSTEM	$ 74,220	$ 74,179	$ 77,019	$ 77,021
C678	FIRE DETECTION & ALARM SYSTEM	$ 29,892	$ 29,860	$ 12,209	$ 12,210
C679	FIRE SAFETY EQUIPMENT	$ 2,140	$ 2,137	$ 2,200	$ 2,200
C685	HEATING, VENTILATION,	$ 246,465	$ 247,962	$ 57,824	$ 57,832

		PRICE			
ITEM	**ITEM TITLE**	**CASE 1**	**CASE 2**	**CASE 3**	**CASE 4**
	AND AIR-CONDITIONING				
C690	COMPRESSED AIR SYSTEM	$ 56,831	$ 56,732	$ -	$ -
C698	DECK ANTI-ICING SYSTEM	$ 133,951	$ 133,887	$ 139,104	$ 139,108
C701	GENERAL REQUIREMENTS	$ -	$ -	$ 11,032	$ 11,034
C702	ELECTRICAL EQUIPMENT & CABLING MARKING	$ -	$ -	$ -	$ -
C705	AC ELECTRICAL SYSTEM	$ -	$ -	$ -	$ -
C706	DC ELECTRICAL SYSTEMS	$ 41,046	$ 69,649	$ 7,056	$ 7,057
C710	LOAD ANALYSES	$ -	$ -	$ -	$ -
C715	FAULT CURRENT ANALYSIS, PROTECTIVE DEVICE COORDINATION STUDY, ARC FLASH HAZARD ANALYSIS & ELECTRICAL EQUIPMENT HAZARDOUS AREA PLAN	$ -	$ -	$ -	$ -
C720	ONE-LINE DIAGRAMS	$ -	$ -	$ -	$ -
C725	CABLING REQUIREMENTS	$ 198,514	$ 284,203	$ 55,700	$ 55,707
C730	LIGHTING & RECEPTACLES	$ 103,416	$ 126,634	$ 32,576	$ 32,579
C733	ELECTRICAL POWER PLANT	$ 107,261	$ 278,175	$ -	$ -
C740	SWITCHBOARD & POWER CONTROL	$ 156,532	$ 211,298	$ 20,761	$ 20,762
C745	DISTRIBUTION PANELBOARDS	$ 28,045	$ 28,007	$ -	$ -
C750	MOTORS & CONTROLLERS	$ 21,022	$ 29,399	$ 8,676	$ 8,676

		PRICE			
ITEM	**ITEM TITLE**	**CASE 1**	**CASE 2**	**CASE 3**	**CASE 4**
C755	TRANSFORMERS	$ 14,000	$ 13,991	$ 11,147	$ 11,148
C760	SHORE POWER SERVICE	$ 8,331	$ 8,327	$ -	$ -
C765	COMMUNICATION EQUIPMENT	$ 22,862	$ 22,843	$ 15,439	$ 15,440
C770	NAVIGATION EQUIPMENT	$ 106,536	$ 106,509	$ -	$ -
C780	ALARM SYSTEM	$ 150,889	$ 178,717	$ 14,384	$ 14,386
C800	SPARE PARTS	$ 33,585	$ 38,449	$ -	$ -
GRAND TOTAL		$ 8,549,297	$ 12,052,647	$ 4,289,842	$ 4,623,115

Appendix C: Insurance Estimate Details

Table 1 provides details of the estimate for insurance costs for both a new build as well as a converted used (existing) vessel.

Table 1: Insurance Estimates

	Conversion of Existing Vessel		New Build		Comments
	Hull TIV: $2,000,000	Hull TIV: $5,000,000	Hull TIV: $5,000,000	Hull TIV: $7,000,000	
Hull & Machinery	$ 50,000	$ 97,500	$ 87,500	$ 105,000	Deductible will vary based upon the final Hull Total Insured Value (TIV). Anticipate the deductibles to be between $25k - $75k.
Protection & Indemnity (P&I) including Cew and 4/4ths	$ 37,500	$ 37,500	$ 37,500	$ 37,500	Assumes 3 Crew members plus 8 - 28 passengers.
Vessel Pollution	$ 2,500	$ 2,500	$ 2,500	$ 2,500	Assumes Gross Registered Tonnage (GRT) of 100 or less.
Marine General Liability (MGL)	$ 15,000	$ 15,000	$ 15,000	$ 15,000	Picks up shore side liability exposures not covered via P&I
Bumbershoot/Excess Liability ($5M xs Primary)	$ 25,000	$ 25,000	$ 25,000	$ 25,000	Excess Liability sits above primary, P&I, Vessel Pollution, MGL, etc.
Estimated Total:	**$ 130,000**	**$ 177,500**	**$ 167,500**	**$ 185,000**	

The above premiums are subject to the following details:

- Favorable condition and valuation survey
- Confirmation of vessel's GRT
- Business plan including contracts with acceptable indemnity and insurance provisions
- Resumes of captain and company principals

The above premium estimates are based on limited underwriting data and current market conditions. "Singleton" vessels are not favored by most underwriters, so if there are future growth plans, it would be beneficial to include a general picture of what that may entail. If determined that a formal quote for the insurance program is desired to be pursued, BHGI can assist in developing a full underwriting submission.

Coverages not included above that the company may want to consider include the following:

- Workers' Compensation/Employers Liability (shoreside employees)
- Longshore and Harbor Workers Compensation (dockside employees)
- Contingent Maritime Employers Liability
- Auto Liability/Auto Physical Damage
- Property/Business Personal Property

In order to estimate premiums for these lines of coverage, additional underwriting details (i.e., payroll by class code, vehicle details, and property schedules) are required.

Appendix D: 3485-A045-02 R1 Recurring Annual Cost Estimates

Cost estimates were completed for the following 58x18.3x9.3 ft vessel options:

CASE 1: New-Build Steel Monohull: Certified & Inspected to Subchapter T for 28 Passengers

CASE 3: Converted Steel Monohull: Certified & Inspected to Subchapter T for 28 Passengers

Case 1: 58x18.3x9.3 ft New-Build Steel Monohull, Certified & Inspected to Subchapter T for 28 Passengers

Revenue & Cost Summary

Estimated Revenues From Scheduled Operations	Year 1	Year 2	Year 3	Year 4	Year 5
Passenger Revenue	$ 264,000.00	$ 271,920.00	$ 280,077.60	$ 288,479.93	$ 297,134.33
General Cargo & Mail Revenue	$ 90,210.00	$ 92,916.30	$ 95,703.79	$ 98,574.90	$ 101,532.15
Total Revenue From Operations	$ 354,210.00	$ 364,836.30	$ 375,781.39	$ 387,054.83	$ 398,666.48

Operating Expenses	Year 1	Year 2	Year 3	Year 4	Year 5
Crew Comp, Benefits & Travel	$ 365,340.30	$ 376,300.51	$ 387,589.52	$ 399,217.21	$ 411,193.72
Fuel & Lubes	$ 296,074.49	$ 304,956.73	$ 314,105.43	$ 323,528.59	$ 333,234.45
Insurance P&I & H&M	$ 209,000.00	$ 215,270.00	$ 221,728.10	$ 228,379.94	$ 235,231.34
Vessel Maintenance & Repair	$ 86,953.05	$ 89,561.64	$ 92,248.49	$ 95,015.95	$ 97,866.43
Vessel Expense	$ 868,167.61	$ 868,167.61	$ 868,167.61	$ 868,167.61	$ 868,167.61
Crew Housing & Meal Allowance	$ 62,780.00	$ 64,663.40	$ 66,603.30	$ 68,601.40	$ 70,659.44
Dockage	$ 52,280.80	$ 53,849.22	$ 55,464.70	$ 57,128.64	$ 58,842.50
Equipment est.	$ 6,000.00	$ 6,180.00	$ 6,365.40	$ 6,556.36	$ 6,753.05
Total Operating Expenses	**$ 1,946,596.25**	**$ 1,978,949.11**	**$ 2,012,272.55**	**$ 2,046,595.70**	**$ 2,081,948.54**

Administrative Cost	Year 1	Year 2	Year 3	Year 4	Year 5
Admin Salaries incl. payroll tax	$ 105,358.40	$ 108,519.15	$ 111,774.73	$ 115,127.97	$ 118,581.81
Professional and Contracting	$ 17,000.00	$ 17,510.00	$ 18,035.30	$ 18,576.36	$ 19,133.65
Alaska Worker Compensation Est., Crew & Admin Personnel	$ 7,294.99	$ 7,513.84	$ 7,739.26	$ 7,971.43	$ 8,210.58
Office Rent/HQ Allocation	$ 3,432.00	$ 3,534.96	$ 3,641.01	$ 3,750.24	$ 3,862.75
Travel & Exp (3 time per year)	$ 8,760.00	$ 9,022.80	$ 9,293.48	$ 9,572.29	$ 9,859.46
Office Supplies	$ 600.00	$ 618.00	$ 636.54	$ 655.64	$ 675.31
Utilities	$ 900.00	$ 927.00	$ 954.81	$ 983.45	$ 1,012.96
Total Administrative Expenses	**$ 143,345.39**	**$ 147,645.75**	**$ 152,075.12**	**$ 156,637.38**	**$ 161,336.50**

		Year 1	Year 2	Year 3	Year 4	Year 5
Total Expense		**$ 2,089,941.64**	**$ 2,126,594.86**	**$ 2,164,347.68**	**$ 2,203,233.08**	**$ 2,243,285.04**
Profit as a percentage of expenses	**10%**	$ 208,994.16	$ 212,659.49	$ 216,434.77	$ 220,323.31	$ 224,328.50
Total Economic Cost Less Revenue		**$ 1,944,725.80**	**$ 1,974,418.05**	**$ 2,005,001.06**	**$ 2,036,501.56**	**$ 2,068,947.07**

Notes:
Revenue has a 3% annual increase calculated

CapX & Ins.

Capital Expenditure		
Vessel Cost		$ 8,600,000.00
Vessel Modification		$ -
Navigation & Electronics		$ -
Commissioning Cost		$ 212,647.21
Interest rate		7.75%
Payments per year		12
Loan period years		20
Grant		$ -
Down payment		$ -
Per Month Payment		$72,347.30
Per Day Cost		$ 2,378.54
Annual Exp.	12	**$ 868,167.61**

Insurance				
Ins Est. H&M		1.5%	$	129,000.00
P&I Crew & PAX	1	$37,500.00	$	37,500.00
Vessel Pollution (VP)	1	$2,500.00	$	2,500.00
Marine General Liability	1	$15,000.00	$	15,000.00
Bumbershoot/Excess Liability ($5M xs Primary)	1	$25,000.00	$	25,000.00
Total Annual Ins Exp.			**$**	**209,000.00**

Comments
H&M: Deductible will vary based upon the final Hull Total Insured Value (TIV). Anticipate the deductibles to be between $25K -$75K.
P&I: Assumes 2 Crew Members plus 8-28 PAX
VP: Assumes Gross Registered Tonnage (GRT) of 100 or
MGL: Picks up shore side liability exposures not covered via P&I
EX: Excess Liability sits above primary, P&I, Vessel Pollution, MGL, and etc.

Commissioning & Start-Up Costs

Delivery			
Portland, OR to Akutan, AK	Nautical Miles		1771
	Speed Knots		8
Day equals hours			24
Travel Days			3
Sea Days			9.22
Total Delivery Time			**12.22**
Fuel & Lube			$ 8,753.14
Provisions per person per day		$ 50.00	$ 2,444.79
Travel Expense air & hotel per person		$ 1,600.00	$ 6,400.00
Total			**$ 17,597.93**

Crew		Hourly Rate	Total Day
Captain	1	$ 30.00	$ 720.00
Mechanic -Watch Keeper	1	$ 18.75	$ 450.00
Deck Hand-Watch Keeper	2	$ 15.00	$ 720.00
Crew Total per Day	4		**$ 1,890.00**
TTL Delivery Crew Cost			**$ 23,103.28**
Total Delivery			**$ 40,701.21**

Land Base & Accommodations	
Bunkhouse &Appliances	$ 25,000.00
Storage Unit	$ 4,473.00
Office Unit & Equipment	$ 22,473.00
Misc. Set up exp., est.	$ 5,000.00
Transportation	$ 40,000.00
Total	**$ 96,946.00**

Start-Up Cost	
Reporting Software, Web-Site, etc.	$ 75,000.00
Land Base Operations	$ 96,946.00

Total Commissioning & Start-Up	**$ 212,647.21**

*****Ferry Crew based on Subchapter T - Small Passenger Vessels (Under 100 Gross Tons)*****

Variables	Amount
Accumulated vacation time for Master/Captain in days	14
Working days per year	182
Working Shift Time	12
Meals and Break Time	1
Meal Allowance Per crew member	$ -
Accommodation Cost per day per crew member	$ -
Travel stipend for trip in and out for two week schedule*	$ 1,881.00
Master/Captain Cost per hour	$ 51.19
Credentialed STCW Deck Hand Cost Per hour	$ 28.63
Deck Hand Cost per Hour	$ 26.23

Crew Cost Per Shift-Straight Time			
Master/Captain	1	$	614.28
Credentialed STCW Deck Hand Cost Per hour	1	$	343.56
Deck Hand	0	$	-
Meals	2	$	-
Shore Side Accommodation Cost	2	$	-
Travel	2	$	20.67
Vacation Days Accumulated per Captain per Day	0.08	$	47.25
Vacation Days Accumulated per Deck Hand per Day	0.08	$	26.43
Vacation Days Accumulated per Deck Hand per Day	0.08	$	-
Federal Soc. Sec.	12.4%	$	118.77
Total Per Day		**$**	**1,170.96**
Total Annual	312	**$**	**365,340.30**

Crew Housing & Meal Allowance		Total
Days	365	
Housing per day	$ 10.00	
Meal Allowance per day	$ 76.00	
Crew Members	2	**$ 62,780.00**

*Notes
Travel based SEA to DUT, Grant to Akutan Round Trip
Captain basis 100 ton USCG Lic.., per 12hr day, Non-Union. Cost basis State of AK (AMHS) & MMP Agreement Exp. 6/30/2025
Credentialed STCW Deck Hand, 12 hr. day, Non-Union. Cost basis of AMHS AB Seaman, Inlandboatmen's Union Agreement with State of AK.
Deck Hand, 12 hr. day, Non-Union. Cost basis of AMHS OS Seaman, Inlandboatmen's Union Agreement with State of AK.
Meal Allowance is based upon a per diem plus transportations cost of 1 x 20' Ctr per Qtr. of non-non-perishable items. Est. of $6500.00 per Qtr., $26,000 annually /365 days / 2 crew = $36.00 per day.

Operating Costs

Estimated Operating Time One-Way	
Distance NM	7
Speed in Kts	**10**
Maneuvering Time in min., both load & discharge	10
Passenger Number, Max 28	**8**
Weather & Delay Factor Percentage	10%
Estimated Start of Day Precheck Time, per min.	30
Estimated Load time per person incl. baggage, per min.	1
Estimated discharge per person incl. baggage, per min.	2
Estimated load time for freight and mail, per min.	15
Estimated discharge time for freight and mail, per min.	15
Shift length per day in hours	12
Meal and Breaks per shift in hours	1
Estimated Transit Time in min.	46
Maneuvering Time	11
Load Pax & Freight	23
Discharge Pax & Freight	31
Estimated Time Per Trip in Minutes	111
Total Estimated Time With Precheck in Minutes	**141**
Estimated one way trip per shift	**5.67**

Diesel Fuel & Lube Consumption		
Main Engine Burn		19.5
Aux. Generator Burn		2.4
Main Engine Run Time		3.81
Aux. Generator Run Time		12
Lube Oil Usage Per gal/Per da		0.25
Diesel Price per gal.	$	4.56
Lubes per gal.	$	32.55
Annual operating days		312
Number of Main Engines		2
Number of Aux. Generators		2
Daily cost of Diesel Fuel	$	940.82
Daily cost of lube	$	8.14
Total Fuel & Lube Cost	**$**	**948.96**
Operation days per week		6
Annual Cost Est.	**$**	**296,074.49**

Notes
Fuel Price is based on 3/1/23 quoted retail price for marine diesel incl. of tax, Delta Western Petroleum.

Vessel Maintenance Estimated Budget		
(P) Vessel Purchase Price, Est.	$	8,600,000.00
Annual Working Days		312
(HA) Actual annual vsl hours, basis 6 days a week at 12hrs p		1685
(HN) Nominal annual vsl hours		1000
Est. Annual Maintenance % of Vsl Price		1%
(M) Est. Annual Maintenance Cost as % of Vsl Price - 3.5%	$	86,000.00
Est. Fixed Annual Maintenance % of Vsl Price		0.6
(F) Fixed Maintenance Cost as % of vsl price	$	51,600.00
(V) % of Maintenance Cost that varies with vsl hours		0.4
Annual Estimated Variable M & R Cost	**$**	**86,953.05**
Per Day Cost	**$**	**278.70**

Notes
Preventative Maintenance, issues identified from daily pre-check inspection
Predictive Maintenance, programed based on manufactures recommended schedules
Repair, unexpected issues and identified issues that are not urgent
Survey, yearly USCG - COI
Haul Out, 5-year schedule

Vessel Dockage and Additional Service Charges					
Vessel Length	58				
Akutan Dockage at Fishing Basin (Overnight)/Month	$ 1,670.00			$	55.67
Akutan Dockage at Public Dock	$ 0.90			$	52.20
Akun Dockage at Ferry Terminal	$ 0.90			$	52.20
Holding Tank Pump-out	$ 25.00	per MO	30	$	0.83
Hazardous Waste Disposal Est.	$ 200.00	per MO	30	$	6.67
Vessel Dockage TTL per Day				**$**	**167.57**
Annual Days	312			**$**	**52,280.80**

Equipment Estimate		
Annual Equipment Estimate	**$**	**6,000.00**

Administration Expense Detail Cost Worksheet

						Total
Admin Salaries incl. payroll tax and benefits for Operations Manager	Salary	$ 75,256.00	Benefit	1.4	$	**105,358.40**

Professional and Contracting						
General Counsel Attorney	Rate	$ 250.00	Annual Hrs.	40	$	10,000.00
IT Specialist & Maintenance	Rate	$ 125.00	Annual Hrs.	40	$	5,000.00
Misc. Contracting	Rate	$ 100.00	Annual Hrs.	20	$	2,000.00
Total Professional and Contracting					**$**	**17,000.00**

Other Admin Expenses						
Alaska Worker Compensation Est., Crew & Admin Personnel	Basis	$ 374,102.08	Rate	$ 1.95	**$**	**7,294.99**
Office Rent/HQ Allocation	Per Mo.	$ 286.00	Months	12	**$**	**3,432.00**
Travel & Exp (3 time per year)	Per Trip	$ 2,920.00	Trips per Yr.	3	**$**	**8,760.00**
Office Supplies Est.	Per Mo.	$ 50.00	Months	12	**$**	**600.00**
Utilities / HQ Allocation Est.	Per Mo.	$ 75.00	Months	12	**$**	**900.00**

Total Admin Expenses	**$ 143,345.39**

Notes
Admin Salary based on Salary.com for Marine Operations Manager and benefit are based on U.S. Bureau of Labor
Professional and Contracting fees are based on actual business owners agreements.
Rent Allocation based on national average od class B and 144 sqft office at $24.00 annual.
Travel & Exp is based on commercial airfare from SeaTac to DUT and Grant Aviation to Akutan, Bay View Plaza Hotel and Meal allowance per day. Alaska Airline and Grant RT $1890, Hotel $750 wk., allowance $40 per day.

Estimated Revenue & Income

Avg. No. PAX Per Month		Price		Total
Passenger (PAX) Revenue	220	$ 100.00	$	22,000.00
Avg. LBS Gen. Cargo & Mail Per Month		**Price**		**Total**
Cargo & Mail Revenue	15,035	$ 0.50	$	7,517.50
Total Revenue per month			$	29,517.50
Total PAX Rev per year	12		**$**	**264,000.00**
Total Cargo & Nail Rev per year	12		**$**	**90,210.00**

Notes:
PAX, Cargo & Mail data is from Maritime Helicopter data, 2014-2022 average.
PAX price is the published airfare one-way.
Cargo is and estimate based on other carriers fees and a revenue split with the fixed wing operator.

Case 3: 58x18.3x9.3 ft Converted Steel Monohull, Certified & Inspected to Subchapter T for 28 Passengers

Revenue & Cost Summary

Estimated Revenues From Scheduled Operations	Year 1	Year 2	Year 3	Year 4	Year 5
Passenger Revenue	$ 264,000.00	$ 271,920.00	$ 280,077.60	$ 288,479.93	$ 297,134.33
General Cargo & Mail Revenue	$ 90,210.00	$ 92,916.30	$ 95,703.79	$ 98,574.90	$ 101,532.15
Total Revenue From Operations	$ 354,210.00	$ 364,836.30	$ 375,781.39	$ 387,054.83	$ 398,666.48

Operating Expenses	Year 1	Year 2	Year 3	Year 4	Year 5
Crew Comp, Benefits & Travel	$ 365,340.30	$ 376,300.51	$ 387,589.52	$ 399,217.21	$ 411,193.72
Fuel & Lubes	$ 296,074.49	$ 304,956.73	$ 314,105.43	$ 323,528.59	$ 333,234.45
Insurance P&I & H&M	$ 184,400.00	$ 189,932.00	$ 195,629.96	$ 201,498.86	$ 207,543.82
Vessel Maintenance & Repair	$ 58,642.76	$ 60,402.04	$ 62,214.10	$ 64,080.52	$ 66,002.94
Vessel Expense	$ 592,328.89	$ 592,328.89	$ 592,328.89	$ 592,328.89	$ 592,328.89
Crew Housing & Meal Allowance	$ 62,780.00	$ 64,663.40	$ 66,603.30	$ 68,601.40	$ 70,659.44
Dockage	$ 52,280.80	$ 53,849.22	$ 55,464.70	$ 57,128.64	$ 58,842.50
Equipment est.	$ 6,000.00	$ 6,180.00	$ 6,365.40	$ 6,556.36	$ 6,753.05
Total Operating Expenses	**$ 1,617,847.24**	**$ 1,648,612.79**	**$ 1,680,301.30**	**$ 1,712,940.47**	**$ 1,746,558.82**

Administrative Cost	Year 1	Year 2	Year 3	Year 4	Year 5
Admin Salaries incl. payroll tax	$ 105,358.40	$ 108,519.15	$ 111,774.73	$ 115,127.97	$ 118,581.81
Professional and Contracting	$ 17,000.00	$ 17,510.00	$ 18,035.30	$ 18,576.36	$ 19,133.65
Alaska Worker Compensation Est., Crew & Admin Personnel	$ 7,294.99	$ 7,513.84	$ 7,739.26	$ 7,971.43	$ 8,210.58
Office Rent/HQ Allocation	$ 3,432.00	$ 3,534.96	$ 3,641.01	$ 3,750.24	$ 3,862.75
Travel & Exp (3 time per year)	$ 8,760.00	$ 9,022.80	$ 9,293.48	$ 9,572.29	$ 9,859.46
Office Supplies	$ 600.00	$ 618.00	$ 636.54	$ 655.64	$ 675.31
Utilities	$ 900.00	$ 927.00	$ 954.81	$ 983.45	$ 1,012.96
Total Administrative Expenses	**$ 143,345.39**	**$ 147,645.75**	**$ 152,075.12**	**$ 156,637.38**	**$ 161,336.50**

Total Expense	**$ 1,761,192.63**	**$ 1,796,258.54**	**$ 1,832,376.43**	**$ 1,869,577.85**	**$ 1,907,895.32**
Profit as a percentage of expenses **10%**	$ 176,119.26	$ 179,625.85	$ 183,237.64	$ 186,957.79	$ 190,789.53
Total Economic Cost Less Revenue	**$ 1,583,101.89**	**$ 1,611,048.09**	**$ 1,639,832.68**	**$ 1,669,480.81**	**$ 1,700,018.38**

Notes:
Revenue has a 3% annual increase calculated

CapX & Ins.

Capital Expenditure		
Vessel Cost		$ 1,500,000.00
Vessel Modification		$ 4,300,000.00
Navigation & Electronics		$ -
Commissioning Cost		$ 212,647.21
Interest rate		7.75%
Payments per year		12
Loan period years		20
Grant		$ -
Down payment		$ -
Per Month Payment		$49,360.74
Per Day Cost		$ 1,622.82
Annual Exp.	12	**$ 592,328.89**

Insurance				
Ins Est. H&M		1.8%	$	104,400.00
P&I Crew & PAX	1	$37,500.00	$	37,500.00
Vessel Pollution (VP)	1	$2,500.00	$	2,500.00
Marine General Liability	1	$15,000.00	$	15,000.00
Bumbershoot/Excess Liability ($5M xs Primary)	1	$25,000.00	$	25,000.00
Total Annual Ins Exp.			**$**	**184,400.00**

Comments
H&M: Deductible will vary based upon the final Hull Total Insured Value (TIV). Anticipate the deductibles to be between $25K -$75K.
P&I: Assumes 2 Crew Members plus 8-28 PAX
VP: Assumes Gross Registered Tonnage (GRT) of 100 or
MGL: Picks up shore side liability exposures not covered via P&I
EX: Excess Liability sits above primary, P&I, Vessel Pollution, MGL, and etc.

Commissioning & Start-Up Costs

Delivery			
Portland, OR to Akutan, AK	Nautical Miles		1771
	Speed Knots		8
Day equals hours			24
Travel Days			3
Sea Days			9.22
Total Delivery Time			**12.22**
Fuel & Lube		$	8,753.14
Provisions per person per day	$ 50.00	$	2,444.79
Travel Expense air & hotel per person	$ 1,600.00	$	6,400.00
Total		**$**	**17,597.93**

Crew		Hourly Rate	Total Day
Captain	1	$ 30.00	$ 720.00
Mechanic -Watch Keeper	1	$ 18.75	$ 450.00
Deck Hand-Watch Keeper	2	$ 15.00	$ 720.00
Crew Total per Day	4		**$ 1,890.00**
TTL Delivery Crew Cost			**$ 23,103.28**
Total Delivery			**$ 40,701.21**

Land Base & Accommodations	
Bunkhouse &Appliances	$ 25,000.00
Storage Unit	$ 4,473.00
Office Unit & Equipment	$ 22,473.00
Misc. Set up exp., est.	$ 5,000.00
Transportation	$ 40,000.00
Total	**$ 96,946.00**

Start-Up Cost	
Reporting Software, Web-Site, etc.	$ 75,000.00
Land Base Operations	$ 96,946.00

Total Commissioning & Start-Up	**$ 212,647.21**

*****Ferry Crew based on Subchapter T - Small Passenger Vessels (Under 100 Gross Tons)*****

Variables	Amount
Accumulated vacation time for Master/Captain in days	14
Working days per year	182
Working Shift Time	12
Meals and Break Time	1
Meal Allowance Per crew member	$ -
Accommodation Cost per day per crew member	$ -
Travel stipend for trip in and out for two week schedule*	$ 1,881.00
Master/Captain Cost per hour	$ 51.19
Credentialed STCW Deck Hand Cost Per hour	$ 28.63
Deck Hand Cost per Hour	$ 26.23

Crew Cost Per Shift-Straight Time			
Master/Captain	1	$	614.28
Credentialed STCW Deck Hand Cost Per hour	1	$	343.56
Deck Hand	0	$	-
Meals	2	$	-
Shore Side Accommodation Cost	2	$	-
Travel	2	$	20.67
Vacation Days Accumulated per Captain per Day	0.08	$	47.25
Vacation Days Accumulated per Deck Hand per Day	0.08	$	26.43
Vacation Days Accumulated per Deck Hand per Day	0.08	$	-
Federal Soc. Sec.	12.4%	$	118.77
Total Per Day		**$**	**1,170.96**
Total Annual	312	**$**	**365,340.30**

Crew Housing & Meal Allowance		Total
Days	365	
Housing per day	$ 10.00	
Meal Allowance per day	$ 76.00	
Crew Members	2	**$ 62,780.00**

*Notes
Travel based SEA to DUT, Grant to Akutan Round Trip
Captain basis 100 ton USCG Lic.., per 12hr day, Non-Union. Cost basis State of AK (AMHS) & MMP Agreement Exp. 6/30/2025
Credentialed STCW Deck Hand, 12 hr. day, Non-Union. Cost basis of AMHS AB Seaman, Inlandboatmen's Union Agreement with State of AK.
Deck Hand, 12 hr. day, Non-Union. Cost basis of AMHS OS Seaman, Inlandboatmen's Union Agreement with State of AK.
Meal Allowance is based upon a per diem plus transportations cost of 1 x 20' Ctr per Qtr. of non-non-perishable items. Est. of $6500.00 per Qtr., $26,000 annually /365 days / 2 crew = $36.00 per day.

Operating Costs

Estimated Operating Time One-Way	
Distance NM	7
Speed in Kts	**10**
Maneuvering Time in min., both load & discharge	10
Passenger Number, Max 28	**8**
Weather & Delay Factor Percentage	10%
Estimated Start of Day Precheck Time, per min.	30
Estimated Load time per person incl. baggage, per min.	1
Estimated discharge per person incl. baggage, per min.	2
Estimated load time for freight and mail, per min.	15
Estimated discharge time for freight and mail, per min.	15
Shift length per day in hours	12
Meal and Breaks per shift in hours	1
Estimated Transit Time in min.	46
Maneuvering Time	11
Load Pax & Freight	23
Discharge Pax & Freight	31
Estimated Time Per Trip in Minutes	111
Total Estimated Time With Precheck in Minutes	**141**
Estimated one way trip per shift	**5.67**

Diesel Fuel & Lube Consumption		
Main Engine Burn		19.5
Aux. Generator Burn		2.4
Main Engine Run Time		3.81
Aux. Generator Run Time		12
Lube Oil Usage Per gal/Per da		0.25
Diesel Price per gal.	$	4.56
Lubes per gal.	$	32.55
Annual operating days		312
Number of Main Engines		2
Number of Aux. Generators		2
Daily cost of Diesel Fuel	$	940.82
Daily cost of lube	$	8.14
Total Fuel & Lube Cost	**$**	**948.96**
Operation days per week		6
Annual Cost Est.	**$**	**296,074.49**

Notes
Fuel Price is based on 3/1/23 quoted retail price for marine diesel incl. of tax, Delta Western Petroleum.

Vessel Maintenance Estimated Budget		
(P) Vessel Purchase Price, Est.	$	5,800,000.00
Annual Working Days		312
(HA) Actual annual vsl hours, basis 6 days a week at 12hrs p		1685
(HN) Nominal annual vsl hours		1000
Est. Annual Maintenance % of Vsl Price		1%
(M) Est. Annual Maintenance Cost as % of Vsl Price - 3.5%	$	58,000.00
Est. Fixed Annual Maintenance % of Vsl Price		0.6
(F) Fixed Maintenance Cost as % of vsl price	$	34,800.00
(V) % of Maintenance Cost that varies with vsl hours		0.4
Annual Estimated Variable M & R Cost	**$**	**58,642.76**
Per Day Cost	**$**	**187.96**

Notes
Preventative Maintenance, issues identified from daily pre-check inspection
Predictive Maintenance, programed based on manufactures recommended schedules
Repair, unexpected issues and identified issues that are not urgent
Survey, yearly USCG - COI
Haul Out, 5-year schedule

Vessel Dockage and Additional Service Charges					
Vessel Length	58				
Akutan Dockage at Fishing Basin (Overnight)/Month	$ 1,670.00			$	55.67
Akutan Dockage at Public Dock	$ 0.90			$	52.20
Akun Dockage at Ferry Terminal	$ 0.90			$	52.20
Holding Tank Pump-out	$ 25.00	per MO	30	$	0.83
Hazardous Waste Disposal Est.	$ 200.00	per MO	30	$	6.67
Vessel Dockage TTL per Day				**$**	**167.57**
Annual Days	312			**$**	**52,280.80**

Equipment Estimate		
Annual Equipment Estimate	**$**	**6,000.00**

Administration Expense Detail Cost Worksheet

						Total
Admin Salaries incl. payroll tax and benefits for Operations Manager	Salary	$ 75,256.00	Benefit	1.4	$	**105,358.40**

Professional and Contracting						
General Counsel Attorney	Rate	$ 250.00	Annual Hrs.	40	$	10,000.00
IT Specialist & Maintenance	Rate	$ 125.00	Annual Hrs.	40	$	5,000.00
Misc. Contracting	Rate	$ 100.00	Annual Hrs.	20	$	2,000.00
Total Professional and Contracting					**$**	**17,000.00**

Other Admin Expenses						
Alaska Worker Compensation Est., Crew & Admin Personnel	Basis	$ 374,102.08	Rate	$ 1.95	**$**	**7,294.99**
Office Rent/HQ Allocation	Per Mo.	$ 286.00	Months	12	**$**	**3,432.00**
Travel & Exp (3 time per year)	Per Trip	$ 2,920.00	Trips per Yr.	3	**$**	**8,760.00**
Office Supplies Est.	Per Mo.	$ 50.00	Months	12	**$**	**600.00**
Utilities / HQ Allocation Est.	Per Mo.	$ 75.00	Months	12	**$**	**900.00**

Total Admin Expenses	**$**	**143,345.39**

Notes
Admin Salary based on Salary.com for Marine Operations Manager and benefit are based on U.S. Bureau of Labor
Professional and Contracting fees are based on actual business owners agreements.
Rent Allocation based on national average od class B and 144 sqft office at $24.00 annual.
Travel & Exp is based on commercial airfare from SeaTac to DUT and Grant Aviation to Akutan, Bay View Plaza Hotel and Meal allowance per day. Alaska Airline and Grant RT $1890, Hotel $750 wk., allowance $40 per day.

Estimated Revenue & Income

Avg. No. PAX Per Month		Price		Total
Passenger (PAX) Revenue	220	$ 100.00	$	22,000.00
Avg. LBS Gen. Cargo & Mail Per Month		**Price**		**Total**
Cargo & Mail Revenue	15,035	$ 0.50	$	7,517.50
Total Revenue per month			$	29,517.50
Total PAX Rev per year	12		**$**	**264,000.00**
Total Cargo & Nail Rev per year	12		**$**	**90,210.00**

Notes:
PAX, Cargo & Mail data is from Maritime Helicopter data, 2014-2022 average.
PAX price is the published airfare one-way.
Cargo is and estimate based on other carriers fees and a revenue split with the fixed wing operator.