APPENDIX L

Ferry System Operations and Challenges

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Southwest Transportation Plan Update

Marine

Southcoast Region Planning

August 2015

The Southwest Alaska Transportation Plan Update provides guidance for public transportation infrastructure development in Southwest Alaska over the next 20 years. This plan is a component of the State's Long Range Transportation Plan, Let's Get Moving 2030, which sets policies, procedures, and priorities for public transportation planning and development throughout the state.

Contents

EXECUTIVE SUMMARY:

Southwest Alaska is a large roadless, rural area with scattered small communities. It has a few commercial centers, such as, Dillingham, Unalaska, and Kodiak. Transportation in the region is provided by air carriers serving a network of remote, very small, community airports. The Alaska Marine Highway System (AMHS) serves Kodiak Island communities and provides seasonal service to communities along the south side of the Alaska Peninsula and Aleutian Islands as far west as Unalaska. Several barge lines and freight carriers also serve the area.

A 1980 transportation study provided a list of challenges; they remain valid:

Small, isolated populations	Little to no population growth
Severe weather	Long distances
Little demand	Little infrastructure
Limited resources	No urgent need

A. Maintain existing southwest service: RECOMMENDED

1. Operate the *Tustumena* and supplement year-round service with the *Kennicott*.
2. Replace the *Tustumena* with a "newer" state-of-the-art ferry (*Tustumena* Replacement Vessel - TRV) and supplement year-round service with the *Kennicott*.

Recommended				Annual M&O ($millions)[1]	
Existing	2015-2020	*Tustumena*	40 weeks	$13,197.3	**$20.2M**
		Kennicott	12 weeks	$7,045.8	
	2021-203_	TRV	40 weeks	$13,966.5	**$21.0M**
		Kennicott	12 weeks	$7,045.8	

The following additional service alternatives are not recommended.

B. Additional AMHS service around Kodiak Island: NOT RECOMMENDED

C. New Pribilof Islands service: NOT RECOMMENDED

D. New Central Aleutians service: NOT RECOMMENDED

E. New Bristol Bay service, AMHS or commercial: NOT RECOMMENDED

[1] Costs are planning level estimates.

Southwest Alaska Transportation Plan Update: Marine

General: The Southwest Alaska Transportation Plan Update provides guidance for public transportation infrastructure development in Southwest Alaska over the next 20 years. This plan is a component of the State's Long Range Transportation Plan, Let's Get Moving 2030, which sets policies, procedures, and priorities for public transportation planning and development throughout the state.

The Existing AMHS Transportation System

1) In terms of nautical miles, the distance is approximately 530 miles from Kodiak to False Pass, 160 miles from False Pass to Unalaska, 400 miles from Unalaska to Adak, 240 miles from Unalaska to Saint Paul, and 430 miles from Unalaska to Naknek. There are approximately 25,000 residents of the Lake and Peninsula Borough, Kodiak Island Borough, Bristol Bay Borough, Aleutians East Borough, Aleutians West Borough, and Pribilof Islands. Southwest Alaskans are distributed throughout the region in isolated communities on the mainland and major islands, separated by mountains and water. Travel between the communities within the region is restricted by geography, weather, and lack of connecting roads.

2) Distances (trackline* nautical miles):

From:	To:	Miles (Nautical)
Kodiak	False Pass	530
False Pass	Unalaska	160
Unalaska	Adak	400
Unalaska	Saint Paul	240
Unalaska	Naknek	430

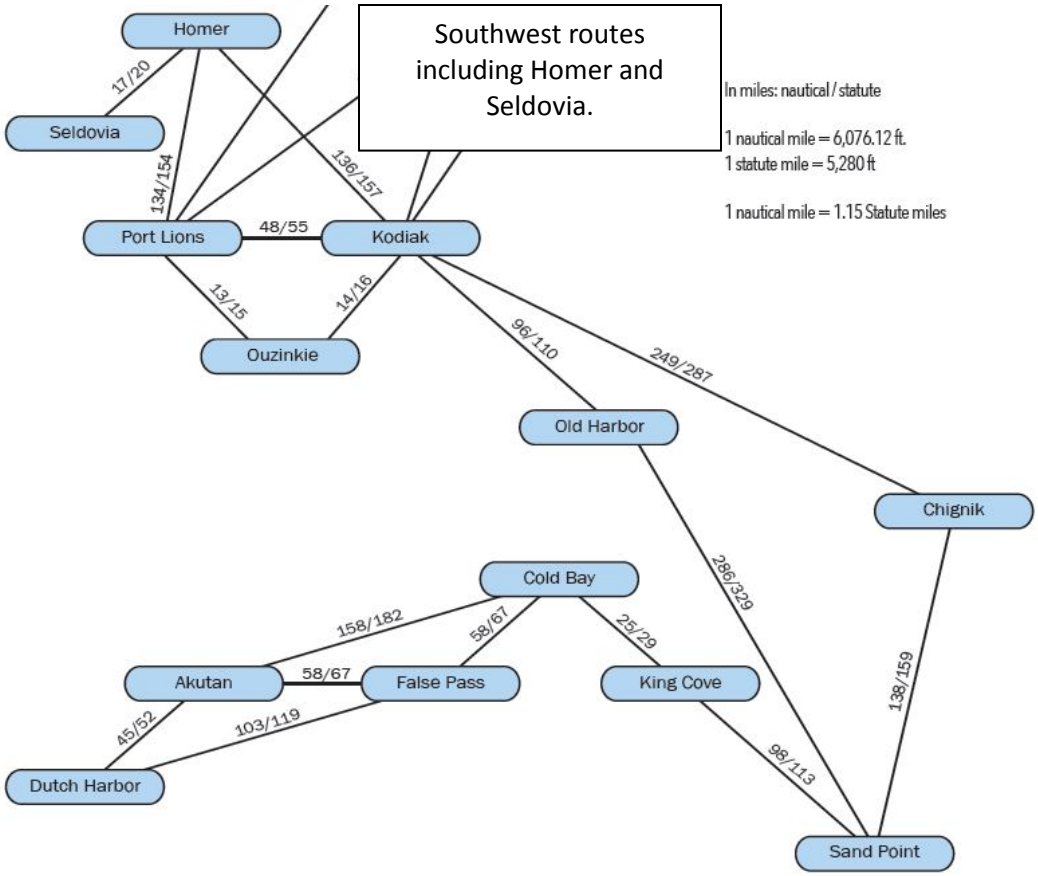
*Path on a chart that a ship intends to follow from one point to another

3) Facilities:

ADOT&PF maintains a transportation system that provides for travel between some communities on Kodiak Island, the southern Alaska Peninsula, and eastern Aleutian Islands. It also connects the region with the rest of the state and the continental transportation system. See Appendix A.

4) Routes:

The AMHS operates two ferries and serves 11 locations in plan area, and connects these locations to Homer on the Kenai Peninsula.



The Motor Vessel (M/V) *Tustumena* is one of two AMHS ferries certificated for ocean service. The other is the M/V *Kennicott* serving Southeast and Cross-Gulf routes. Thus their schedules must be meshed when overhauls, layups, or federal capital improvement projects take them out of revenue service.

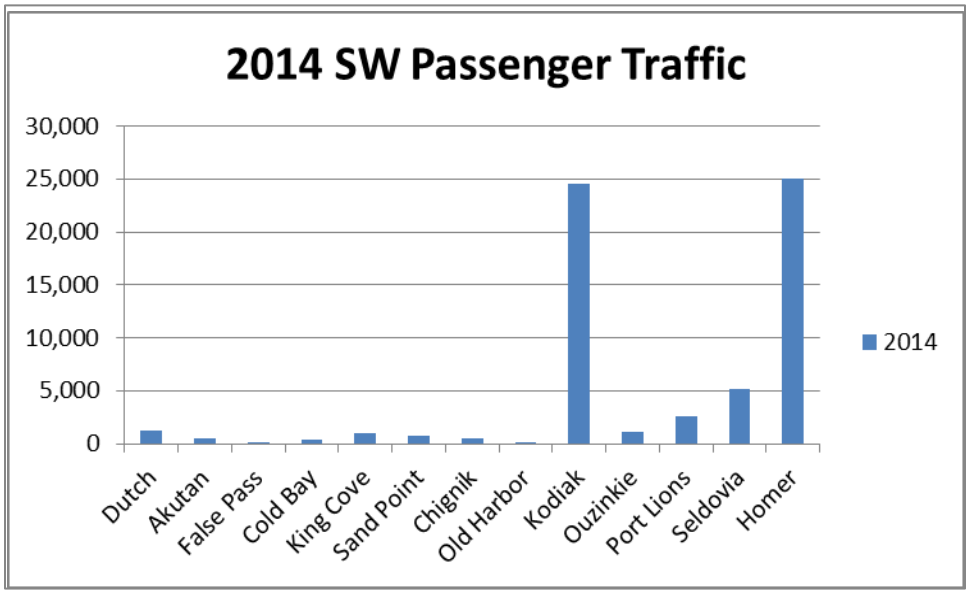
Tustumena makes seasonal (May-September) trips every two weeks through the area to Unalaska and while not "out west" runs a continuous circuit between Homer, Seldovia, Kodiak, Ouzinkie, and Port Lions. During the winter she runs a continuous circuit Kodiak, Ouzinkie, Port Lions, Seldovia, and Homer. She also makes several Cross-Gulf trips to relieve *Kennicott*.

Monthly Kodiak Service	Summer	Winter
Kodiak, Homer	15 round trips	14 round trips
Port Lions, Ouzinkie	Port Lions (6) Ouzinkie (4)	Seven round trips
Kodiak and ports southwest	Two round trips	None

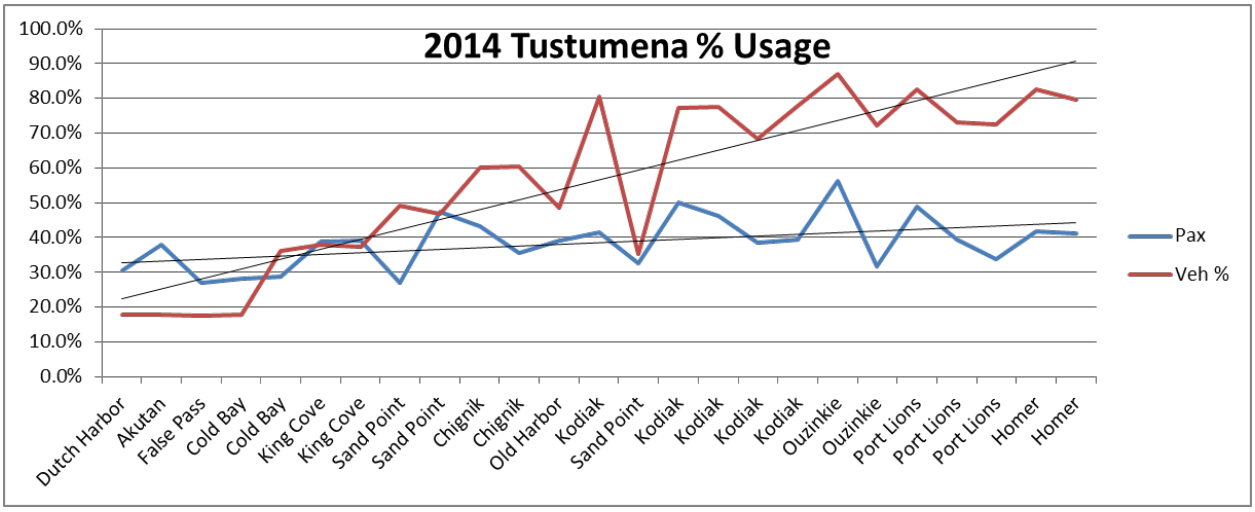
5) Link volume:

Link volume is used to establish a measure of capacity used, relative to the capacity provided. The table below shows the percent used to the different southwest

communities. A "link" is defined as a departure from one port and an arrival at the next. A complete trip usually consists of several links. For example, a passenger or vehicle going from Kodiak to Sand Point in one trip would typically travel on two links; "Kodiak to Chignik" and "Chignik to Sand Point." This passenger or vehicle would be counted as one on each of these links. Consequently, the link volume count includes both the through-traffic and the traffic embarking from the first port in the link pair.



Note: 2014 is indicative of other years with exception of 2013 when *Tustumena* was out of service.



Note: Some communities listed several times as they involve several links to different communities: ex. Cold Bay has links to False Pass and King Cove.

Link volume aboard the *Tustumena* decreases as the ship sails west and increases as she sails east. This is to be expected but leads to complaints of the people heading far west that there is no room to get on the ferry because it is full from Homer to Kodiak. AMHS is aware of the service congestion point.

See Appendix B for 2014 Southwest link volume.

6) For vessel planning purposes annual cost estimates are the sum of 40-weeks of revenue service each year along with six weeks of overhaul and six weeks of lay-up.

Recommended Ferry Service:

Preferred Alternative: Maintain existing southwest ferry service: RECOMMENDED

i. The existing southwest service provides routes from Homer to Seldovia, Kodiak, Port Lions, Ouzinkie, Old Harbor, Chignik, Sand Point, King Cove, Cold Bay, False Pass, Akutan and Dutch Harbor. Present funding levels are consistent with this alternative. The AMHS will continue to operate the *Tustumena* and supplement year-round service with the *Kennicott*.

ii. In 2021, replace the *Tustumena* with a "newer" state-of-the-art ferry (*Tustumena* Replacement Vessel - TRV) and supplement year-round service with the *Kennicott*. See further discussion on the TRV later in this study.

Existing				Annual M&O ($millions)[2]	
	2015-2020	*Tustumena*	40 weeks	$13,197.3	**$20.2M**
		Kennicott	12 weeks	$7,045.8	
	2021-203_	TRV	40 weeks	$13,966.5	**$21.0M**
		Kennicott	12 weeks	$7,045.8	

[2] Costs are planning level estimates.

Not Recommended Ferry Service Expansion

The following expansion scenarios are not recommended for consideration primarily due to lack of demand and current and future funding considerations:

1. Around Kodiak Island

   i) Kodiak communities without ferry service:

      (1) Akhiok (population 71)

      (2) Larsen Bay (population 87)

      (3) Karluk (population 37)

Communities	Distance	Time @ 12 knots
Akhiok to Kodiak	127 NM[3]	10.6 hours
Larsen Bay to Kodiak	87 NM	7.3 hours
Karluk to Kodiak	90 NM	7.5 hours
Karluk to Akhiok	72 NM	6.0 hours
Larsen Bay to Karluk	27 NM	2.3 hours

Note: 12 knots used for planning purposes to include maneuvering and mooring.

   ii) Marine Facilities: Is there a mooring facility capable of mooring an AMHS deep draft ferry?

	Dock Facilities		
Community	Dock	Estimate	Feasible
Akhiok	No	$12-20M	Yes
Karluk	No	-	No
Larsen Bay	No	$12-20M	Yes

   iii) Challenges:

      (1) Serving small, remote populations

      (2) Very little traffic demand

      (3) Service to new communities would take service from existing routes

      (4) High cost of service vessels

[3] Nautical miles

(5) Long distances between ports

(6) Personnel - Familiarization and pilotage

(7) Accessible port – Karluk is not accessible by:

(a) Deep-draft ferry

(b) Landing craft on a scheduled basis due to the exposed location of the beach and depths at the river entrance

iv) Options: Two options are available for the two villages

(1) Deep-draft, ocean-going service could be available if mooring facilities are constructed in Akhiok and Larsen Bay.

(2) Landing craft: not capable due to:

(a) Exposed waters in the Gulf of Alaska and Shelikof Strait.

(b) To slow

(c) Due to speed and rough water, unable to keep a schedule.

v) Traffic/Revenue/Cost

(1) Traffic

(a) Traffic demand is estimated based on using 10% of the village's population for passengers and for vehicles 3.3% (passenger to vehicle ratio of 3:1). Though for the three villages listed around Kodiak, continued vehicle demand is expected to be closer to zero after an initial onslaught of vehicles to the villages.

(b) AMHS Old Harbor (population 218) service shows roughly 5% of villagers travelling on the two trips to/from Kodiak and a similar percentage of vehicles. The higher vehicle count may come from the greater road miles that Old Harbor has compared to Akhiok, Larsen Bay, and Karluk.

(2) Revenue

(a) Estimated revenues could be based on the AMHS Annual Financial Report and estimated by dividing annual vessel revenues over annual vessel costs for *Tustumena* for the last 12 years which produces 38%.

(b) The reality of accurate revenue estimates for very small communities is at best a guess. Using 10% and 3.3% would provide the following for revenue traffic:

Community	Population	Passengers	Vehicles
Akhiok	71	7.1	2.3
Larsen Bay	87	8.7	2.6

(c) Ticket sales based on similar *distance* fares and a 19' vehicle and 30.2 hour circuit route Kodiak – Akhiok - Larsen Bay – Kodiak are shown below. 30.2 hour time includes inport time optimistically estimated at one hour per port (four hours total).

Community	Pax	Fare	Total	Veh	Fare	Total
Akhiok - Kodiak	8	$69	$552	3	$165	$495
Larsen Bay - Kodiak	9	$46	$414	3	$104	$312
One-way total			$966			$807
Grand Total	**$3,546 per round trip**					

(3) Cost

(a) *Tustumena*'s costs, broken down hourly equal $1,506/hour. The 30.2 hour circuit would cost approximately $45,500.

(b) Estimated loss per trip would be $42,000.

(c) This service is not cost effective for the amount of traffic she would carry.

vi) Recommendation: NOT RECOMMENDED

(1) No demand

(2) Little revenue

(3) High cost

(4) No marine facilities

(5) Anton Larsen Bay, 9-miles NW of the city of Kodiak (15 road miles), was mentioned as a possible "better" connection from the Shelikof Strait to Kodiak, but this is not possible. The bay is not suitable to safely navigate in a larger vessel as the entrance is strewn with rocks and only 150-feet wide. Extensive blasting and aids to navigation would be required. It also lacks any infrastructure and has a poor road to Kodiak. Port Lions would be the beneficiary of an Anton

Larsen service, but is already served by existing ferry service.

(6) Other transportation options are available.

Community	Airport	Air Service	Carriers
Akhiok	Gravel airstrip	To Kodiak	2
Karluk	Gravel airstrip	To Kodiak	2
Larsen Bay	Gravel airstrip	To Kodiak	2

2. Central Aleutians service

i) Communities without ferry service:

(1) Nikolski (population 18)

(2) Atka (population 68)

(3) Adak (population 283)

Community	Distance	Time @ 12 knots
Nikolski – Dutch Harbor	100 NM	8.4 hours
Atka to Dutch Harbor	308 NM	25.7 hours
Adak to Dutch Harbor	400 NM	33.3 hours
Nikolski to Atka	208 NM	17.3 hours
Atka to Adak	123 NM	10.3 hours

Note: 12 knots used for planning purposes to include maneuvering and mooring.

ii) Marine Facilities: Is there a mooring facility capable of mooring an AMHS deep draft ferry?

	Dock Facilities		
Community	Dock	Estimate	Feasible
Nikolski	No	-	No
Atka	Yes, upgrade	$10M	Yes
Adak	Yes, upgrade	$5M	Yes

iii) Challenges:

(1) Serving small, remote populations

(2) Very little traffic demand

(3) High cost of service vessels

(4) Long distances between ports

(5) Personnel - Familiarization and pilotage

(6) Accessible port – Nikolski is not accessible by a deep-draft ferry

iv) Options: One option is available for Atka and Adak.

(1) Mooring facility upgrades are required in Atka (dock extension/dolphins) and Adak (refurbishment) before ferry service may be considered.

(2) Deep-draft, ocean-going service: capable of providing service.

(a) The *Tustumena* and her replacement would be able to provide service to Atka and Adak. In rough numbers, *Tustumena*'s annual cost recovery rate for service (revenue/cost average over the last 12 years) is 38.4%. Though it is doubtful that service to the Central Aleutians would return 38%.

(b) Service would come from a revised schedule that would take service from other communities now receiving service.

v) Traffic/Revenue/Cost

(1) Traffic

(a) Traffic demand is estimated based on using 10% of the village's population for passengers and for vehicles 3.3% (passenger to vehicle ratio of 3:1). Though for the two villages, continued vehicle demand is expected to be closer to zero after an initial onslaught of vehicles to the villages.

(b) AMHS Old Harbor (population 218) service shows roughly 5% of villagers travelling on the two trips to/from Kodiak and a similar percentage of vehicles. Old Harbor, while not an identical situation to Central Aleutian service, is used in comparison as a remote community.

(2) Revenue

(a) Estimated revenues could be based on the AMHS Annual Financial Report and estimated by dividing annual vessel revenues over annual vessel costs for *Tustumena* for the last 12 years which produces 38%.

(b) The reality of accurate revenue estimates for very small communities is at best a guess. Using 10% and 3.3% would provide the following for revenue

traffic:

Community	Population	Passengers	Vehicles
Atka	68	6.8	2.2
Adak	283	28.3	8.5

(c) Ticket sales based on similar *distance* fares and a 19' vehicle and 77 hour circuit route Dutch-Atka-Adak-Atka-Dutch. 77 hour time includes inport time optimistically estimated at one hour per port (five hours total).

Community	Pax	Fare	Total	Veh	Fare	Total
Atka to Dutch Harbor	7	$171	$1,197	3	$453	$1,359
Adak to Dutch Harbor	29	$209	$6,061	9	$548	$5,202
One-way total			$7,258			$6,561
Grand Total	**$27,638 per round trip**					

(3) Cost

(a) *Tustumena*'s costs, broken down hourly equal $1,506/hour. The 77 hour circuit would cost approximately $115,962.

(b) Estimated loss per trip would be $88,300.

(c) Service is not cost effective for the amount of traffic she would carry.

vi) Recommendation: NOT RECOMMENDED

(1) No demand

(2) Little revenue

(3) High cost

(4) No marine facilities or facilities need extensive refurbishment.

(5) Other transportation options:

Community	Airport	Air Service	Carriers
Nikolski	Gravel airstrip	To Dutch	1
Atka	Gravel airstrip	To Dutch	1
Adak	Asphalt	To Anchorage	1

3. Pribilof Islands service

   i) Communities without ferry service:

      (1) Saint George (population 102)

      (2) Saint Paul (population (479)

Community	Distance	Time @ 12 knots
Saint George to Dutch Harbor	198 NM	16.5 hours
Saint Paul to Dutch Harbor	240 NM	20.0 hours
Saint George to Saint Paul	43 NM	3.6 hours

Note: Nautical miles. 12 knots used for planning purposes to include maneuvering and mooring.

   ii) Marine Facilities: Is there a mooring facility capable of mooring an AMHS deep draft ferry?

	Dock Facilities		
Community	**Dock**	**Estimate**	**Feasible**
Saint George	No	-	No
Saint Paul	No	-	No

Due to the inability to economically build suitable ice-strengthened breakwaters and deep-water docks in either community, ferry service is not feasible.

   iii) Challenges:

      (1) Serving small, remote populations

      (2) Very little traffic demand

      (3) High cost of service vessels

      (4) Long distances between ports

      (5) Personnel - Familiarization and pilotage

(6) Accessible port – neither community has an accessible port for a deep-draft ferry

iv) Options:

(1) Mooring facilities are required in each port before ferry service may be considered.

(2) If suitable facilities are built, deep-draft, ocean-going service is possible.

(a) The *Tustumena* and her replacement would be able to provide service to the Pribilofs. In rough numbers, *Tustumena*'s annual cost recovery rate for service (revenue/cost average over the last 12 years) is 38.4%. Though it is doubtful that service to the Pribilofs would return 38%.

(b) Service would come from a revised schedule that would take service from other communities now receiving service.

v) Traffic/Revenue/Cost

(1) Traffic

(a) Traffic demand is estimated based on using 10% of the village's population for passengers and for vehicles 3.3% (passenger to vehicle ratio of 3:1). Though for the two villages, continued vehicle demand is expected to be closer to zero after an initial onslaught of vehicles to the villages.

(b) AMHS Old Harbor (population 218) service shows roughly 5% of villagers travelling on the two trips to/from Kodiak and a similar percentage of vehicles. Old Harbor, while not an identical situation to Pribilof service, is used in comparison as a remote community.

(2) Revenue

(a) Estimated revenues could be based on the AMHS Annual Financial Report and estimated by dividing annual vessel revenues over annual vessel costs for *Tustumena* for the last 12 years which produces 38%.

(b) The reality of accurate revenue estimates for very small communities is at best a guess. Using 10% and 3.3% would provide the following for revenue traffic:

Community	Population	Passengers	Vehicles
Saint George	102	10.2	3.1
Saint Paul	479	47.9	15.8

(c) Ticket sales based on similar *distance* fares and a 19' vehicle and 45.2 hour circuit route Dutch-Saint George-Saint Paul-Saint George-Dutch. 45.2 hour time includes inport time optimistically estimated at one hour per port (five hours total). An additional revenue line is included for intra-island service.

Community	Pax	Fare	Total	Veh	Fare	Total
St George to Dutch Harbor	11	$94	$1,034	4	$309	$1,236
St Paul to Dutch Harbor	48	$116	$5,568	16	$249	$3,984
St George to St Paul	59	$33	$1,947	20	$60	$1,200
One-way total			$8,549			$6,420
Grand Total	**$29,938 per round trip**					

(3) Cost

(a) *Tustumena*'s costs, broken down hourly equal $1,506/hour. The 45.2 hour circuit would cost approximately $68,100.

(b) Estimated loss per trip would be $38,100.

(c) Service is not cost effective for the amount of traffic she would carry.

vi) Recommendation: NOT RECOMMENDED

(1) No demand

(2) Little revenue

(3) High cost

(4) No marine facilities or facilities need extensive refurbishment.

(5) Other transportation options:

Community	Airport	Air Service	Carriers
St Paul	Asphalt	To Anchorage	1
St George	Asphalt	To Anchorage	1

4. Bristol Bay service
Due to the shoal channels and approaches to many of the communities a deep-draft ferry

is not the vessel of choice for service. A dedicated landing craft is the only vessel capable of providing scheduled service in Bristol Bay. Bristol Bay also offers special challenges in trying to coordinate ferry service to existing southwest AMHS ferry service.

i) Communities without ferry service:

(1) Dillingham (population 2,329)

(2) Naknek (population 432)

(3) Egegik (population109)

(4) Pilot Point (population 80)

(5) Port Heiden (population 102)

(6) Port Moller (population 0)

(7) Nelson Lagoon (population 52)

(8) Cannery Point, Herendeen Bay (population 0). Note: not a community, but a location for a ferry terminal at the site of an abandoned cannery.

Community	Distance	Time @ 12 knots
Dillingham to Naknek	84 NM	7 hours
Naknek	-	-
Egegik to Naknek	54 NM	4.5 hours
Pilot Point to Naknek	92 NM	7.7 hours
Port Heiden to Naknek	103 NM	8.6 hours
Port Moller – to Naknek	212 NM	17.7 hours
Nelson Lagoon to Naknek	212 NM	17.7 hours
Cannery Point to Naknek	230 NM	19.2 hours

Note: Nautical miles. 12 knots used for planning purposes to include maneuvering and mooring.

ii) Marine Facilities: Is there a mooring facility capable of mooring an AMHS deep draft ferry? Is there a suitable location for a landing craft facility?

	Dock	Landing Craft Facility		
Community	**Dock**	**Landing craft facility**	**Estimate landing fac.**	**Feasible**
Dillingham	No	No	$1-2M	Yes
Naknek	No	No	$1-2M	Yes

Egegik	No	No	$1-2M	Yes
Pilot Point	No	No	$1-2M	Yes
Port Heiden	No	No	$1-2M	Yes
Port Moller	No	No	$1-2M	Yes
Nelson Lagoon	No	No	$1-2M	Yes
Cannery Point	No	No	$1-2M	Yes

iii) Challenges:

(1) Serving small, remote populations

(2) Suitable deep-draft facilities are not economic to build. Landing craft facilities are required in each port before landing-craft ferry service may be considered.

(3) Very little traffic demand. Mostly seasonal. The greatest activity in the Bristol Bay area is in the summer. There is very little activity in the winter compared to the summer.

(4) In 2013, air carriers flew 5,039 passengers between Naknek (King Salmon) and Dillingham. The air traffic was somewhat seasonal, but was active all year long. A seasonal ferry (22-weeks during the summer) with the capacity of 149 passengers could carry 8,195 passengers on voyage between Naknek and Dillingham. One-way air fare is $190 and about an hour flight. The ferry passenger fare is estimated at $63 for the over seven hour voyage.

(5) Passengers using the ferry would take away (competition) from the air carriers.

(6) Transport of fish is already well-established with aircraft and packers.

(7) No hubs established. Dillingham and Naknek are the two active ports.

(8) No routes established or indicated.

(9) The great distances between communities would require a ferry with a 24-hour crew (not a 12-hour dayboat). The distances are too great for a ferry to daily "hub" from Dutch Harbor or Dillingham and serve Bristol Bay ports. None of the point-to-point round-trip routes can be served in under 12-hours. The 12-hours crew-day limit is the rough cut-off for AMHS "dayboat" crews on a ferry without crew accommodations. The next step to provide ferry service would be a ferry with a 24-hour AMHS crew requiring crew accommodations and food services.

(10) A circuit route ferry would require three days to make the circuit through all the ports southwest of Naknek and require a 24-hour crew.

(11) Naknek to Dillingham service would be a minimum 14-hour round trip.

(12) Hub and spoke service is not feasible to distances.

(13) High costs and low returns.

(14) Lack of ferry terminal facilities and additional construction funding.

(15) No shallow draft vessels available

(16) Populations in Bristol Bay are seasonal (greater in the summer) and very small. Demand is unknown. Ferry service (estimated tariffs based on similar length runs in the current AMHS) would provide an opportunity to get cars and other large products to remote locations, but barge service already does this.

(17) Fishing activity in Bristol Bay is seasonal (summer only). Salmon shippers have an efficient way to move product now. Adding a ferry for transshipping (transfer cargo from one ship or other form of transport to another) adds time. Adding more transfers is less efficient and not necessarily faster. Shipping product from Naknek to Dillingham, and then flying it to Anchorage is not as efficient as flying it directly from Naknek to Anchorage.

(18) Established transportation services already in place and functioning.

(19) High cost of service vessels

(20) Long distances between ports

(21) Marine personnel - Familiarization and pilotage

(22) Accessible ports – only by landing craft

(23) Navigation: For vessels trying to maintain a schedule, navigation in Bristol Bay is difficult with extremes in weather, currents, tides, and navigational aids.

(a) U.S. Coast Pilot No. 9 discusses navigational difficulties associated with Bristol Bay including shoal water, winds, high currents, barrier sandbars, shifting channels, and extreme tidal ranges from minus 3-feet tide to plus 25-feet tide. At times, “tramp steamers” (to several hundred feet long) may enter ports at high tide to discharge and pick-up cargo.

(b) Aids to Navigation (ATON) are maintained by the U.S. Coast Guard and are placed in two categories: year-round lights and buoys; and seasonal (May 1 –

Sep 30) lights and buoys. Requests for more/new ATON in Bristol Bay would go to the U.S. Coast Guard 17th Coast Guard District. This would take several years.

	ATON	
Location	**Lights**	**Buoys**
Dillingham (Kuskokwim River)	Yes	Seasonal
Naknek River	Yes	No
Egegik Bay	No	No
Pilot Point (Ugashik Bay)	No	No
Port Heiden	No	No
Port Moller	Yes	Year round
Hague Channel	No	Year round
Herendeen Bay, Johnston Channel	No	No
Cannery point	No	No
Nelson Lagoon	Yes	No

(24) Preliminary review of use of specific ships to serve ports in Bristol Bay has been done.

(a) Deep draft ferries similar to *Tustumena* (and replacement) draw too much water for shallow channels in Bristol Bay ports and approaches to ports and are not suitable for this service.

(b) Landing craft – good potential, but limited in speed, seakeeping, and passenger and crew accommodations. Seasonal service due to ice and extreme winter weather.

iv) Options: Around Bristol Bay service:

(1) In 1992, AMHS used a 125-foot contract landing craft, the M/V *Nunaniq*, for service between Homer and Kodiak, 136 nautical miles. The landing craft had a "passenger-pod" with airline-style seating, vending machines, and coins machines installed under the bridge.

(2) Bristol Bay requires a stand-alone ferry system needing a one-of-a-kind shallow draft ferry. A suitable ferry would be a landing craft, similar in size, capacity, and crew to a U.S. Army LCU-2000 (175' x 42' x 9', crew of 13) carrying 15 vehicles and 149 passengers. This class was investigated as they are ocean rated and built to U.S. Coast Guard standards. Modifications would be required to a surplus LCU. Currently, there are no suitable U.S. built landing craft available and no shipyards are building them. Estimated annual cost would be $4.2M.

(3) Coordinating a "stand-alone" Bristol Bay system with the existing southwest AMHS system might be as "simple" as building an 11-mile very-low volume road from Cannery Point, Herendeen Bay (vicinity Port Moller) to Albatross Anchorage, Balboa Bay (17-miles north of Sand Point) and building one dock at the end of the road in Albatross Anchorage. The Cannery Point terminus would use an improved beach landing. Connecting the Bristol Bay ferry route to the current AMHS route south of the Alaska Peninsula would require a connection every two weeks to form a continuous marine system to southcentral and southeast Alaska as well as the Lower 48:

(a) 11-mile, very-low volume road link with turn-outs from the north side of the Alaska Peninsula to south side (Herendeen Bay to Albatross Anchorage) following the 100-yr old foot path.

(b) Ferry terminal at each end:

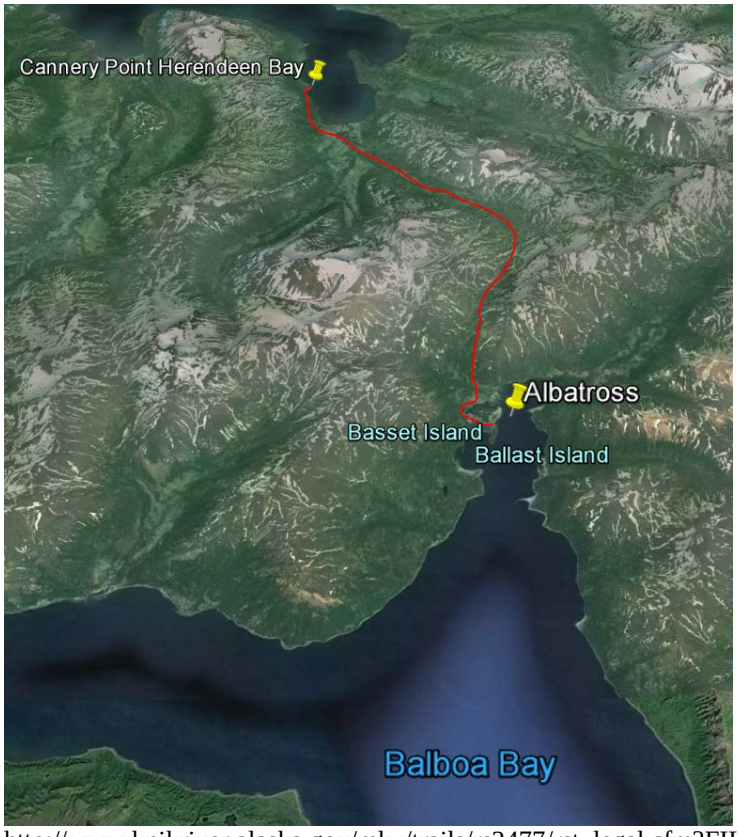
(i) Cannery Point – improved beach launch ramp at the site of a late 1910s-1920s cannery.

(ii) Albatross Anchorage (west side) – dock suitable for AMHS deep draft ferry.

(c) The Bristol Bay landing craft would drop off customers at Cannery Point and they would travel to Albatross Anchorage ferry terminal for pickup by the AMHS ferry or other service to Sand Point (17 miles) to await current AMHS service. The two week schedules would need coordination.

(4) A very rough estimate for the connection:

Facility	Estimated cost
Albatross Anchorage Dock	$12-20M
Cannery Point Landing	$1-2M
11-mile very low volume road @ $1.6M/mile	$17.6M
Total	**$30.1-39.6M**



http://www.knikriver.alaska.gov/mlw/trails/rs2477/rst_legal.cfm?FILE_NUMBER=397

v) Traffic/Revenue/Cost

(1) Traffic

(a) Traffic demand is estimated based on using 10% of the village's population for passengers and for vehicles 3.3% (passenger to vehicle ratio of 3:1). Though for the remote communities, continued vehicle demand is expected to be closer to zero after an initial onslaught of vehicles.

(b) AMHS Old Harbor (population 218) service shows roughly 5% of villagers travelling on the two trips to/from Kodiak and a similar percentage of vehicles. Old Harbor, while not an identical situation to Bristol Bay service, is used in comparison as a remote community.

(2) Revenue

(a) Estimated revenues could be based on the AMHS Annual Financial Report and estimated by dividing annual vessel revenues over annual vessel costs for *Tustumena* for the last 12 years which produces 38%.

(b) The reality of accurate revenue estimates for very small communities is at best a guess. Using 10% and 3.3% would provide the following for revenue traffic (* are estimates):

Community	Population	Passengers	Vehicles
Dillingham	2,329	43.2*	14.3*
Naknek	432	43.2	14.3
Egegik	109	10.9	3.6
Pilot Point	80	8.0	2.6
Port Heiden	102	10.2	3.4
Port Moller	0	5.0*	0*
Nelson Lagoon	52	5.2	1.7
Cannery Point**	0	10.0*	3.3

* Estimated traffic based on Naknek.
** Cannery Point pax/veh are transfers from the south side.

(c) Naknek-Dillingham service: Homeported in Naknek, service Naknek-Dillingham ticket fares are based on similar *distance* fares and a 19' vehicle and day costs for the ferry route. 15 hour round trip time includes inport time optimistically estimated at one hour per port. Cost $11,500/day. Revenues equal $8,500 for the round trip. Loss each trip ~$3,000.

(d) Naknek-Cannery Point service: Homeported in Naknek, service Naknek-Cannery Point and communities in between ticket fares are based on similar *distance* fares and a 19' vehicle and day costs for the ferry route. 96 hour round trip time includes inport time optimistically estimated at one hour per port with the exception of Cannery Point where the ferry would await passengers and vehicles driving over from the Albatross Anchorage ferry terminal. Cost $11,500/day = $46,000. Revenues equal $12,400 for the round trip. Loss each trip ~$33,600.

Community	Passenger		Fare	Total		Vehicle		Fare	Total
Dillingham - Naknek	43.2		$63	$2,722		14.3		$107	$1,530
Naknek - Dillingham		43.2	$63	$2,722			14.3	$107	$1,530
				$5,443					$3,060
			Round trip	$8,503					

Community	Passenger		Fare	Total		Vehicle		Fare	Total	
	NE bound	SW bound		NE bound	SW bound	NE bound	SW bound		NE bound	SW bound
Egegik - Naknek	5.5		$35	$193		1.8		$72	$130	
Naknek-Egegik		5.5			$193		1.8			$130
Egegik - Cannery	5.5		$116	$638		1.8		$309	$556	
Cannery - Egegik		5.5			$638		1.8			$556
Pilot Point - Naknek	4.0		$72	$288		1.3		$174	$226	
Naknek - Pilot Point		4.0			$288		1.3			$226
Pilot Point - Cannery	4.0		$116	$464		1.3		$309	$402	
Cannery - Pilot Point		4.0			$464		1.3			$402
Port Heiden - Naknek	5.1		$53	$270		1.7		$121	$206	
Naknek - Port Heiden		5.1			$270		1.7			$206
Port Heiden - Cannery	5.1		$69	$352		1.7		$165	$281	
Cannery - Point Heiden		5.1			$352		1.7			$281
Port Moller - Naknek	2.5		$116	$290		0.0		$309	$0	
Naknek - Port Moller		2.5			$290		0.0			$0
Port Moller - Cannery	2.5		$35	$88		0.0		$66	$0	
Cannery - Port Moller		2.5			$88		0.0			$0
Nelson Lagoon - Naknek	2.6		$116	$302		0.9		$309	$278	
Naknek - Nelson Lagoon		2.6			$302		0.9			$278
Nelson Lagon - Cannery	2.6		$35	$91		0.9		$66	$59	
Cannery - Nelson Lagoon		2.6			$91		0.9			$59
Cannery - Naknek	5.0		$116	$580		1.7		$309	$525	
Naknek Cannery		5.0			$580		1.7			$525
				$3,555	$3,555				$2,663	$2,663

NE Bound	$6,218		$12,435
SW Bound		$6,218	

(3) Cost

(a) The landing craft costs equal ~$11,500 per day or for the entire year ~$4,217,000.

(b) Estimated revenues per year would be ~$595,900.

(c) Loss each year would be ~$3,621,100 per year

(d) Service is not cost effective for the amount of traffic she would carry.

vi) Recommendation: NOT RECOMMENDED

(1) No demand

(2) Little revenue

(3) High cost

(4) No marine facilities or facilities need extensive refurbishment.
   (a) Estimated landing craft facility $7M – 14M

   (b) Herendeen Bay to Albatross Anchorage connection $31.1M - $39.6M

   (c) Suitable landing craft – no estimate

(5) Passenger comfort for two-day trip from Naknek to Cannery Point:

   (a) Airline-style seating

   (b) Vending machines and micro-wave food

   (c) No staterooms

   (d) Limited facilities

(6) Other transportation options:

Community	Airport	Air Service	Carriers
Dillingham	Asphalt	To various	Various
Naknek (King Salmon)	Asphalt	To various via King Salmon	Various
Egegik	Gravel airstrip	To King Salmon	1
Pilot Point	Gravel airstrip	To King Salmon	1
Port Heiden	Gravel airstrip	To King Salmon	1
Port Moller	Gravel airstrip	To Cold Bay	1
Nelson Lagoon	Gravel airstrip	To Cold Bay	1

5. Southern Alaska Peninsula service

   i) Communities without ferry service:

   (1) Chignik Lake (population 73)

   (2) Chignik Lagoon (population (78)

(3) Perryville (population 113)

(4) Ivanof Bay (population 7)

	Distance to Sand Point	Time @ 12 knots
Chignik Lagoon	125 NM	10.4 hours
Chignik Lake	-	-
Perryville	65 NM	5.4 hours
Ivanof Bay	59 NM	4.9 hours
Albatross Anchorage	17 NM	1.4 hours

Note: Nautical miles. 12 knots used for planning purposes to include maneuvering and mooring.

ii) Marine Facilities: Is there a mooring facility capable of mooring an AMHS deep draft ferry?

	Dock Facilities		
Community	**Dock**	**Estimate**	**Feasible**
Chignik Lake	No	-	No
Chignik Lag	No	-	No
Perryville	No	$12-20M	Yes
Ivanof Bay	No	$12-20M	Yes

iii) Challenges:

(1) Serving small, remote populations

(2) No traffic demand

(3) High cost of service vessels

(4) Long distances between ports

(5) Personnel - Familiarization and pilotage

(6) Accessible port – Due to the inability to safely transit the waterways to Chignik Lake and Chignik Lagoon, ferry service is not contemplated.

iv) Options:

(1) Mooring facilities required in Perryville and Ivanof Bay before ferry service may be considered.

(2) If suitable facilities are built, deep-draft, ocean-going ferries is possible.

(a) The *Tustumena* and her replacement would be able to provide service along the south side of the Alaska Peninsula.

(b) Service would come from a revised schedule that would take service from other communities now receiving service.

v) Traffic/Revenue/Cost

(1) Traffic

(a) Traffic demand is estimated based on using 10% of the village's population for passengers and for vehicles 3.3% (passenger to vehicle ratio of 3:1). Though for the two communities, continued vehicle demand is expected to be closer to zero after an initial onslaught of vehicles.

(b) AMHS Old Harbor (population 218) service shows roughly 5% of villagers travelling on the two trips to/from Kodiak and a similar percentage of vehicles. Old Harbor, while not an identical situation to Pribilof service, is used in comparison as a remote community.

(c) The reality of the situation is that service would be infrequent and would come at a cost to other larger communities that would receive less service.

(2) Revenue

(a) Estimated revenues could be based on the AMHS Annual Financial Report and estimated by dividing annual vessel revenues over annual vessel costs for *Tustumena* for the last 12 years which produces 38%.

(b) The reality of accurate revenue estimates for very small communities is at best a guess. Using 10% and 3.3% would provide the following for revenue traffic:

Community	Population	Passengers	Vehicles
Chignik Lake	73	-	-
Chignik Lagoon	78	-	-
Perryville	113	11.3	3.7
Ivanof Bay	7	1	0

(c) Ticket sales based on similar *distance* fares and a 19' vehicle.

To Sand Point:

Community	Pax	Fare	Total	Veh	Fare	Total

Perryville	12	$35	$420	4	$72	$288
Ivanof Bay	1	$35	$35	0	$72	0
One-way total			$455			$288
Grand Total	**$1,426 per round trip**					

To Kodiak

Community	**Pax**	**Fare**	**Total**	**Veh**	**Fare**	**Total**
Perryville	12	$171	$2,052	4	$453	$1,812
Ivanof Bay	1	$171	$171	0	$453	0
One-way total			$2,223			$1,812
Grand Total	**$8,070 per round trip**					

(3) Cost

(a) *Tustumena*'s costs would not increase as these communities are along her scheduled route. Several hours would be needed in each port, but these could be made up by reducing inport times at other communities.

(b) Estimated profit per trip would be $9,496.

(c) Service could be included if mooring facilities were built.

vi) Recommendation: NOT RECOMMENDED

(1) No marine facilities. Construction of marine facilities is not cost effective for these small communities.

(2) No demand

(3) Some revenue

(4) Other transportation options:

Community	**Airport**	**Air Service**	**Carrier**
Chignik Lagoon	Gravel airstrip	King Salmon	1
Chignik Lake	Gravel airstrip	King Salmon	1
Perryville	Gravel airstrip	King Salmon	1
Ivanof Bay	Seaplane base	Charter	0

Southwest Marine Alternatives:

Alternative 1 – Preferred: Maintain Existing service:

Operate *Tustumena* as scheduled and have *Kennicott* provide service when *Tustumena* is in a federal capital improvement project.

2021 - Replace *Tustumena* with the *Tustumena* Replacement Vessel – TRV.

2015-2020:
52 weeks of existing service:
- *Tustumena* 40-weeks Homer to Dutch Harbor
- *Kennicott* 12-weeks relief for *Tustumena* Homer to Kodiak

- Estimated operations and maintenance ship cost for this service is: $20,200,000 per year.

2021-2035:
52 weeks of existing service:
- TRV, 40-weeks Homer to Dutch Harbor
- *Kennicott* 12-weeks of relief for TRV Homer to Kodiak.

- Estimated operations and maintenance ship cost for this service is: $21,000,000 per year.

Alternative 2 – *Tustumena* and *Tustumena* Replacement Vessel - TRV

Expanding the system, particularly between Kodiak and Homer with a dedicated second ferry was not considered a viable alternative. Operating both *Tustumena* and the *Tustumena* Replacement Vessel – TRV is not feasible due to:

1. *Tustumena* is at the end of her service life. There has been much discovery work on *Tustumena* in all of her recent yard visits (for example: open and inspect an item and find greater deterioration than expected). She will be retired from service when her replacement arrives.

2. There is no affordable identified need for a second southwest ferry

3. If *Tustumena* remains, she would also need immediate replacement requiring another new ferry.

4. Continually growing the fleet size by replacing, but then not retiring the replaced vessel, is inconsistent with the current budget climate.

5. While it does allow more service to be provided, it does not help the system contain cost and become more self-sustaining.

Alternative 3 – Bristol Bay

Bristol Bay Service is not recommended due to lack of demand and present and future budget considerations.

Procure a landing craft for 22-weeks of summer service in Bristol Bay ports.

- 22 weeks of operations	$2,314,900
- 2 weeks overhaul	$79,200
- 28 weeks lay-up	$817,600
- Risk management, leave, other	$1,005,300

- Estimated operations and maintenance ship cost for this service is:
$4,217,000 per year.

Issues and challenges of private commercial ferry service in Bristol Bay

1. Challenges for a private commercial ferry are identical to a state provided system

    i) Expected low traffic projections based on the small population centers.

    ii) There is no existing infrastructure in place and a private ferry operator would have to establish service locations and get appropriate permits for infrastructure and operations.

    iii) Private ferries, as well as AMHS, would likely lack redundancy in operational vessels. It is likely that only one ferry would be used as keeping a second ferry available in a "lay-up" status would not be cost effective. If ferry service was lost due to unscheduled maintenance or a major casualty to the vessel there would be no back-up.

    iv) Scheduling.

2. Exceptions would be:

    i) Vessel would be available for other service in the off season. The operator may find use for the vessel in other locations in Alaska or elsewhere.

    ii) Procurement regulations may be easier.

    iii) U.S. Coast Guard manning regulations may be the same.

    iv) Union or non-union requirements may create different manning standards.

Barge service

Barge service is still the most efficient means of moving vehicles to remote communities in Bristol Bay. Additionally, in the *Southwest Transportation Plan Update: Phase 1 Report*, a barge operator stated that additional barge service was available, but there was no demand.

Barge

Northland		**Vehicle (19')**	**Pax/Air**	**Cabin/Hotel**	**Food**	**Total**
Seattle	Naknek	$2,984.08	$487.00	$0.00	$60.00	$3,531.08
Vehicle arrival 10-15 days. Passenger flies in 1 day. Food @ $60 per diem rate.						

Ferry

AMHS		**Vehicle (19')**	**Pax**	**Cabin/Hotel**	**Food**	**Total**
Seattle	Kodiak	$1,783.00	$667.00	$168.00	$330.00	$2,948.00
Kodiak	Albatross	$453.00	$171.00	$181.00	$90.00	$895.00
Cannery	Naknek	$309.00	$116.00	-	$90.00	$515.00
		$2,545.00	$954.00	$349.00	$510.00	$4,358.00
Minimum 9.5-day trip and unknown lay-over in Kodiak. Food @ $60 per diem.						

Barge Service Western Alaska

	Samson	**AML**	**Northland**	**Crowley**
Kodiak	Bi-weekly			
King Cove	Bi-weekly			
Dutch Harbor	Bi-weekly	Varies		
Port Moller		Seasonal		
Egegik		Seasonal		
Naknek		Varies		Fuel
Villages			Seasonal	

Motor Vessel (M/V) *Tustumena* replacement project

M/V *Tustumena* Refurbishment/Replacement: The operating conditions along the Gulf of Alaska and the Pacific Ocean limit vessel types that can serve the area. The *Tustumena* is well-suited for the area but has been in service since 1964, raising concerns about increasing maintenance costs and service interruptions. Any replacement vessel would also need to be accommodated at existing docking facilities, or facilities would need to be improved to match new vessel requirements. The AMHS has one aging, dedicated, ferry for Southwest, the *Tustumena* (built 1964). A replacement ferry is already in the works:

http://www.dot.state.ak.us/amhs/tusty_replace/doc/tusty_design_study.pdf

AMHS' current plans for replacement of the *Tustumena* are available:

http://www.dot.state.ak.us/amhs/tusty_replace/index.shtml
http://www.dot.state.ak.us/amhs/tusty_replace/doc/tusty_recon_report.pdf
http://www.dot.state.ak.us/amhs/tusty_replace/doc/tusty_replace_present.pdf

The Department is currently designing the *Tustumena* replacement vessel. The ship serves the communities of South Central, Kodiak Island and Southwest Alaska. It is one of two ocean class vessels in the Alaska Marine Highway System (AMHS) fleet. Because of its size and design, it is the only AMHS vessel that is capable of serving all 13 ports of call between Homer and Unalaska. Retiring and replacing the *Tustumena* with a vessel that is equally, if not more, versatile and seaworthy will provide reliable marine transportation service well into the future for the communities, residents and businesses in South Central, Kodiak Island and Southwest Alaska.

With planning level estimates, *Tustumena*'s replacement will be slightly larger in size and capacity. She will also have a higher service speed. Revenues are arguable as some would argue "more room = more traffic = economic development = more revenue" while others might argue "level population = no change in frequency = no change". Population trends over the next 20-years are expected flat (Alaska Department of Labor and Workforce Development).

The Department will accept public comments at any time throughout the *Tustumena* Replacement Project. To submit your comment, please email dot.amhs.tustumenareplacement@alaska.gov.

The Department recently accepted public comment specifically regarding the Tustumena Replacement Vessel Design Study Report through January 9, 2015. All comments received will be reviewed and incorporated into the final design to the extent feasible.

This time frame was established so that public comments can be used in development of the project. Please submit any future comments to the email address above.

The preliminary project schedule moving forward is:

i) Reconnaissance Report — March 2014

ii) Public Participation — April-May 2014

iii) Environmental Document — Summer 2014

iv) Design Study Report — Fall 2014

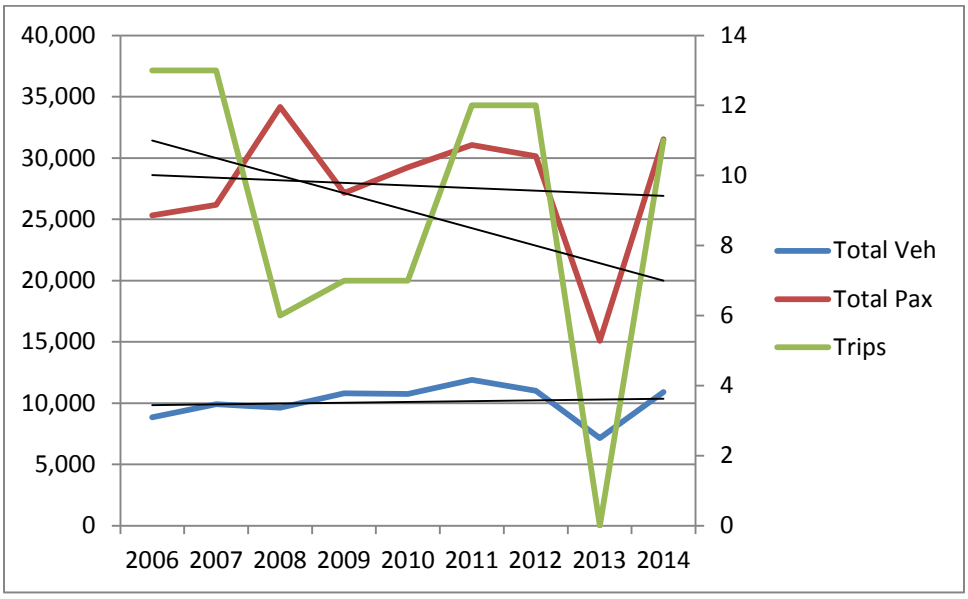
v) Final Design Completion — December 2015

Concept drawing

General information of the replacement vessel.

Mission Requirements	*Tustumena*	*Kennicott*	*Tustumena Replacement Vessel*	Notes
Overall Vessel				
Length	296'	382'	330'	
Beam	59'	85'	70'	72' over the guards
Draft	14'5"	17'6"	15'-10" as built and 16'-6" keel draft at end of service life	Includes an allowance for service life weight growth.
Air Draft	77'	92'-3"	77'	Set a maximum design criteria of 90'
Speed (cruising speed in weather)	13.8 kts	16.75 kts	15-16 kts at Sea State 4, 85% MCR	Increasing speed to better maintain sailing schedule and/or increase frequency of service.
Range	3300 nm	4500 nm	4000 nm	
Deadweight Capability	900 LT	1219 LT	1595 LT	Based on estimated lightship
Displacement	3067 LT	7503 LT	5595 LT	

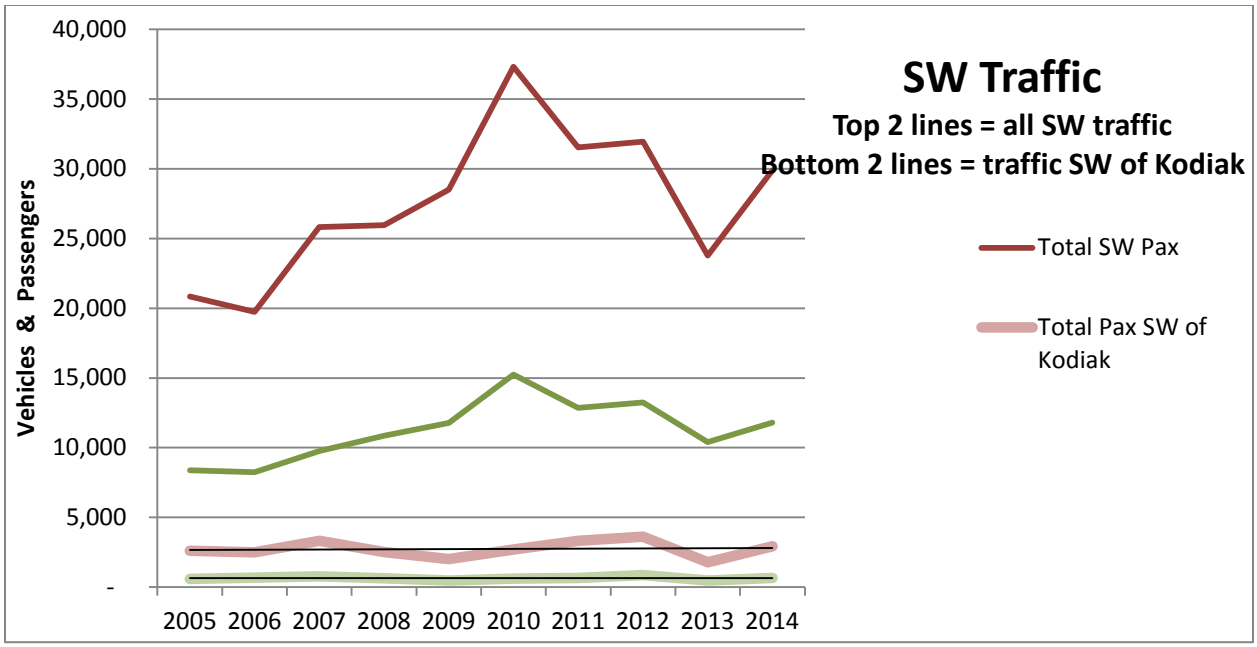
2006-2014 Traffic:

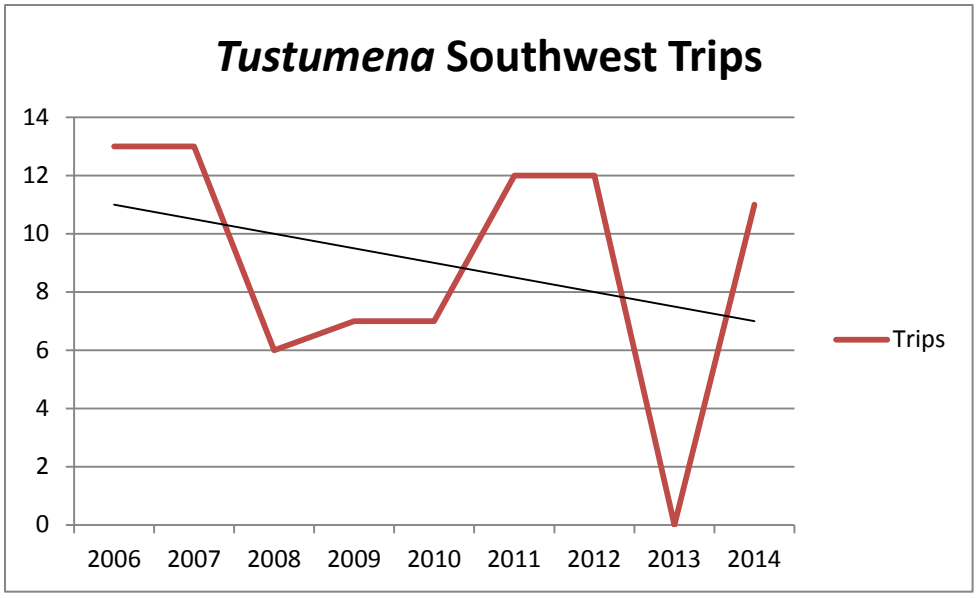


Note: Due to construction delays for the Tustumena's federal project in 2012-2013 only three trips were made to Dutch Harbor and the Southwest in 2013. The 2013 information was significantly lower and doesn't provide an accurate depiction.

	SW less PWS (From Open Reports)		Kodiak and Northeast of Kodiak		SW of Kodiak				
Year	Total SW Pax	Total SW Veh	Pax	Veh	Total Pax SW of Kodiak	Total Veh SW of Kodiak	Homer - Dutch Trips	Percent SW of Kodiak Pax	Veh
2005	20,844	8,373	18,247	7,790	2,597	583	9	12%	7%
2006	19,737	8,242	17,240	7,565	2,497	677	9	13%	8%
2007	25,829	9,766	22,510	8,986	3,319	780	14	13%	8%
2008	25,967	10,869	23,445	10,245	2,522	624	10	10%	6%
2009	28,518	11,773	26,504	11,291	2,014	482	8	7%	4%
2010	37,312	15,234	34,605	14,615	2,707	619	12	7%	4%
2011	31,533	12,846	28,210	12,179	3,323	667	11	11%	5%
2012	31,950	13,243	28,340	12,391	3,610	852	13	11%	6%
2013*	23,780	10,407	21,993	9,931	1,787	476	7	8%	5%
2014	29,894	11,799	26,973	11,135	2,921	664	11	10%	6%

**Tustumena* out of service for most of 2013


SW Traffic
Top 2 lines = all SW traffic
Bottom 2 lines = traffic SW of Kodiak
Vehicles & Passengers
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
-
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
Total SW Pax
Total Pax SW of Kodiak


Tustumena Southwest Trips
14
12
10
8
6
4
2
0
2006 2007 2008 2009 2010 2011 2012 2013 2014
Trips

Appendices

A. Southwest Docking Facilities

B. 2014 Southwest Traffic

C. U.S. Army LCU-2000 information

D. Time / Distance / Speed

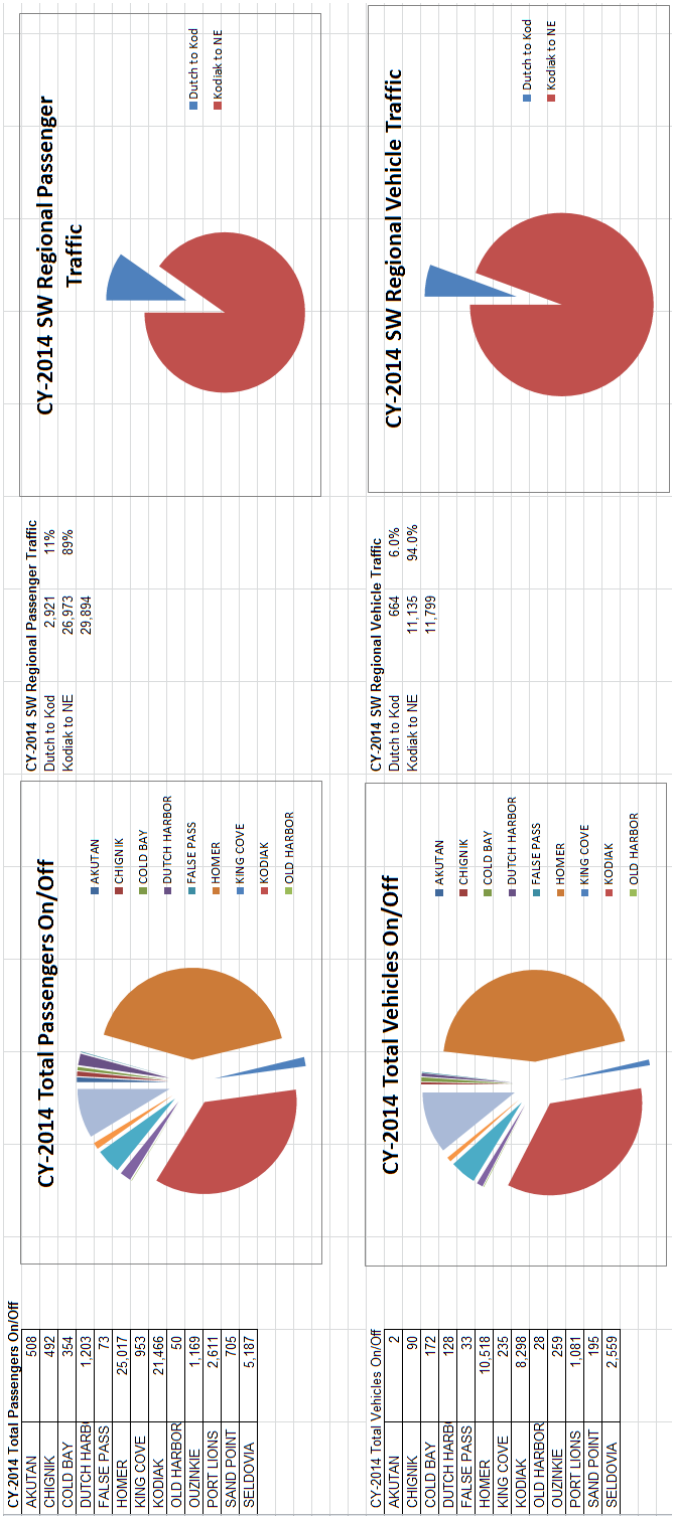
Appendix A. Southwest Docking Facilities

The following list describes the docking facilities in southwest Alaska.

Community	Facility	Built	Owner	Condition	Comments
Adak	Dock	~1943	City of Adak	Fair	
Akutan	Dock	1982	Aleutians East Borough	Fair	Refurbishment project underway 2015
Atka	Dock	2012	Aleutians West Census Area		
Chignik	Dock	~1960	Trident Seafoods	Poor	Discontinue use with completion of new City Dock.
Chignik	Dock (under construction)	-	Lake & Peninsula Borough	New	New dock construction anticipated to start 2015.
Cold Bay	Dock	1978	Aleutians East Borough	Good	Refurbishment project underway 2015. However, plans to replace portions or entire dock will be needed within 10+ years.
False Pass	Dock	1993	Village of False Pass	Good	
King Cove	Dock	1993	Aleutians East Borough	Fair	
Kodiak City Dock (Pier 1)	Dock	~1960	City of Kodiak	Fair	Replacement underway but will not be completed until 2016
Kodiak Pier 2	Dock	1988	City of Kodiak	Good	

Nikolski	None	-	-	-	
Old Harbor	Dock	2012	City of Old Harbor	New	
Ouzinkie	Dock	2012	City of Ouzinkie	New	
Port Lions	Dock	2014	City of Port Lions	New	
Sand Point	Dock	1983	City of Sand Point	Fair	New dock in planning – estimate construction in 2017.
Unalaska (Dutch Harbor)	Dock	~1960	City of Unalaska	Good	City has $7.5M earmark for construction (2005 SAFETEA-LU).

Appendix B. 2014 Southwest Traffic



CY-2014 Total Passengers On/Off	
AKUTAN	508
CHIGNIK	492
COLD BAY	354
DUTCH HARB	1,203
FALSE PASS	73
HOMER	25,017
KING COVE	953
KODIAK	21,466
OLD HARBOR	50
OUZINKIE	1,169
PORT LIONS	2,611
SAND POINT	705
SELDOVIA	5,187

CY-2014 SW Regional Passenger Traffic		
Dutch to Kod	2,921	11%
Kodiak to NE	26,973	89%
	29,894	

CY-2014 Total Vehicles On/Off	
AKUTAN	2
CHIGNIK	90
COLD BAY	172
DUTCH HARB	128
FALSE PASS	33
HOMER	10,518
KING COVE	235
KODIAK	8,298
OLD HARBOR	28
OUZINKIE	259
PORT LIONS	1,081
SAND POINT	195
SELDOVIA	2,559

CY-2014 SW Regional Vehicle Traffic		
Dutch to Kod	664	6.0%
Kodiak to NE	11,135	94.0%
	11,799	

From calendar year 2014 AMHS traffic data

Appendix C. U.S. Army LCU-2000 landing craft

1) A landing craft similar to the U.S. Army's LCU-2000 Class U.S. Army landing craft (35 in service) would have great seasonal potential for Bristol Bay. Regrettably, none are currently available as surplus. Contacts with the Alaska Congressional delegation might make one available for a summer demonstration project.

   - 24-hour operation, built to USCG standards

   - Ocean service

   - Fairly small crew

   - Good capacity

2) The *Runnymede* class large landing craft (Lead vessel of the LCU 2000 class) are operated by the United States Army (USA). They transport rolling and tracked vehicles, containers, and outsized and general cargo from ships offshore to shore, as well as to areas that cannot be reached by oceangoing vessels (coastal, harbor, and inter-coastal waterways). They can be self-deployed or transported aboard a float-on/float-off vessel. They are classed for full ocean service and one-man engine room operations and built to U.S. Coast Guard standards. The vessels can sustain a crew of 2 warrant officers and 11 enlisted personnel for up to 18 days, and 10,000 miles. This class is also equipped with an aft anchor to assist in retracting from the beach.

3) Using estimated costs for a USA LCU-2000 Class landing craft in Bristol Bay a 22-week summer season, 2-week annual overhaul, and 28-week lay-up would have annual costs of approximately $4.2M (~$11,500/day).

4) Estimated capacity: 150 passengers, 15 20' vehicles.

5) LCU crewing total – 13

Station	Watches	Duration	Total crew needed
Master	On duty		1
Bridge watch (helm and lookout)	2	6-on, 6-off	4
Engine room	1	6-on, 6-off	2
Galley/steward	1	6-on, 6-off	2
Deck	2	6-on, 6-off	4

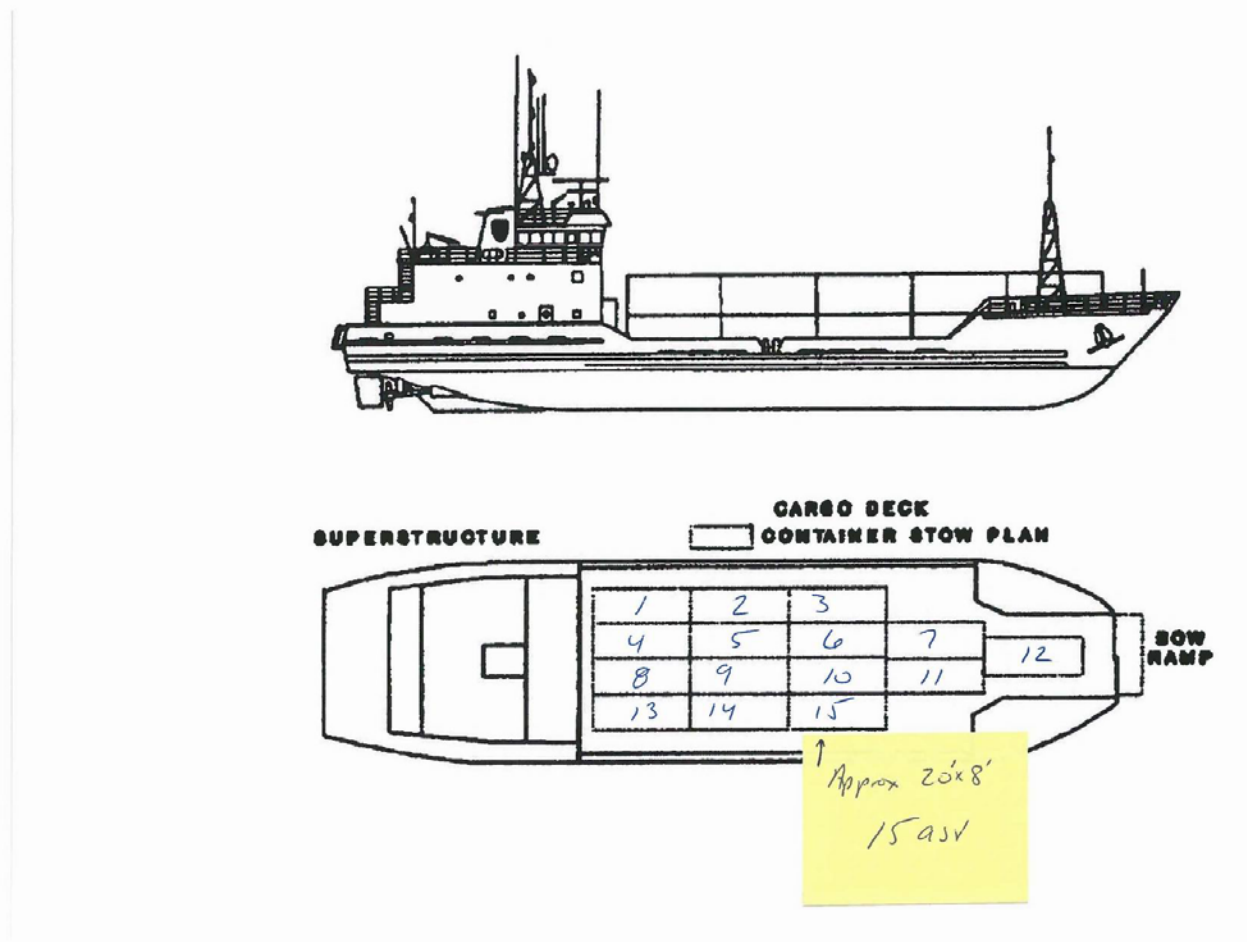
6) The LCU crew quarters would need modification. The passenger area would be created on the first deck (01) using airline style assigned seating and a small, simple fast-food type galley with very limited selection or vending machines.

7) The only information available for AMHS SW operations comes from *Tustumena* sailing long distances from port-to-port dropping off and picking up passenger and vehicles in remote, low population areas. Bristol Bay has long distances, small populations that swell in the summer, and no real marine transportation system (one would have to be created). Looking at *Tustumena*'s link volume percentages in the 2014 Annual Traffic Volume Report she averages 33.1% passenger capacity and 59.1% vehicle capacity. That averages to 2.6 passengers for each vehicle carried. A LCU-2000 carrying 15 vehicles might carry 40 passengers. At the start of a fishing season, the ferry might run 100% full in one direction, but nearly empty in the other direction (50% combined). At the end of the season the same may be true. The SWTP update Phase 1 Report had one public comment that said Naknek swelled to 6-7,000 people, up from 544, in the summer (Appendix E, page 45, Ted Meyer, Bristol Bay). Airfares from Anchorage to King Salmon and Anchorage to Dillingham are roughly the same (~$535, but "deals" may sometimes be found). If flying to Dillingham an additional transit by boat to Naknek is required costing additional time and money (single passenger cost based on other AMHS fares for similar length voyages = $37-$89, ~ 8 hour voyage).

8) Looking at optimistic daily numbers, a LCU costing $4.2M per year would cost ~$11,500/day. Using similar length route miles and fares for a Naknek to Dillingham route, if passenger fares were $63 (average of $37 and $89) per adult and the capacity was 150 passengers (but daily average 50% full which is above *Tustumena*'s 38.4% average), the ferry might have revenues for passengers of $9,450 per day. Fifteen 19' vehicle fares might be $107 (average of $91-$123) per vehicle and have revenues of $3,210 per day if 100% full both ways (well above *Tustumena*'s 68.7% average). Daily *profit* might be $1,100. The Naknek-Dillingham run would be the greatest revenue generator; all other Bristol Bay routes would lose more per day.

U.S. Army LCU-2000 Class overview	
Name:	LCU 2000 class
Operators:	United States Army
General characteristics	
Displacement:	575 long tons (584 t) light 1,087 long tons (1,104 t) full load
Length:	174 ft (53 m)

Beam:	42 ft (13 m)
Draft:	9 ft (2.7 m) light 8 ft (2.4 m) loaded 4 ft (1.2 m) beaching draft at the bow
Range:	10,000 nmi (19,000 km) at 12 kn (22 km/h) light 6,500 nmi (12,000 km) at 10 kn (19 km/h) loaded
Capacity:	350 short tons (318 t) (15 C-141 loads) 3 × M1 main battle tanks *or* 12 × (24 double-stacked) 20-foot (6 m) ISO containers **Approximately 15 20-ft Alaska Standard Vehicles (ASV)**
Complement:	**13**


CARGO DECK
SUPERSTRUCTURE
CONTAINER STOW PLAN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
BOW RAMP
Approx 20'x8'
15 asv


LCU 2025


US ARMY
LCU 2017

Appendix D. Time / Distance / Speed

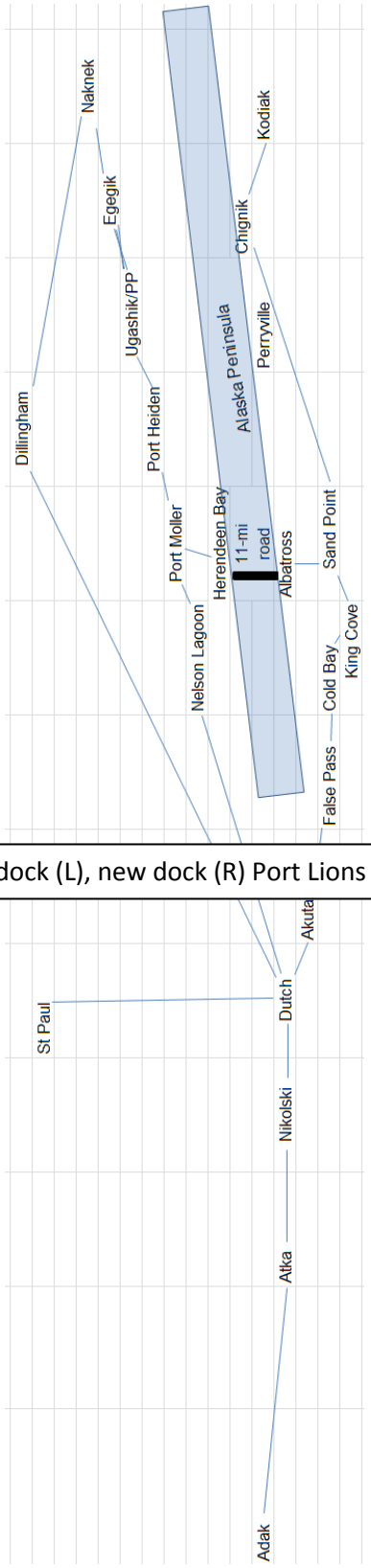
	Population	Kodiak to:	Speed	Time	Round Trip +1	Exposure	Facilities
Karluk	27	90	12	7.5	16.0	Exposed	None
Larsen Bay	90	87	12	7.3	15.5	Protected	Cannery dock
Ouzinkie	193	15	12	1.3	3.5	Protected	Dock
Old Harbor	192	94	12	7.8	16.7	Semi-protected	Dock
Akhiok	44	127	12	10.6	22.2	Protected	Cannery

	Population	Kodiak to:	Speed	Time	Round Trip +1	Exposure	Facilities
Karluk	27	90	14	6.4	13.9	Exposed	None
Larsen Bay	90	87	14	6.2	13.4	Protected	Cannery dock
Ouzinkie	193	15	14	1.1	3.1	Protected	Dock
Old Harbor	192	94	14	6.7	14.4	Semi-protected	Dock
Akhiok	44	127	14	9.1	19.1	Protected	Cannery dock

	2010 Population	Facilities
Dutch Harbor	4,376	AMHS scheduled route
Atka	68	Dock
Adak	283	Protected. Old U.S. Navy facility/dock
Port Moller		Peter Pan Seafoods May-Sep
Port Heiden	102	Beach, 3 nm through shallow water
Egegik	109	Beach, cannery dock, very shoal water approach, 13 nm to sea buoy
Naknek	544	Beach, cannery dock, very shoal water approach, 3.5 nm to deep water
Dillingham	2,329	Dock, long river channel, private aids to navigation
Albatross Anchorage	0	None, need dock and 11-mile road to Herendeen Bay
St Paul	479	Very exposed approach. Very small harbor.
St George	102	Very exposed approach. Very small harbor.
Ugashik/Pilot Point	80	Beach, very shallow, no charts, 11 nm to sea buoy
Nelson Lagoon	52	Small dock, beach, very shallow, 3.5 nm to open water

Bristol Bay to mid-Aleutians											
	Dutch	Atka	Adak	Port Moller	Port Heiden	Egegik	Naknek	Dillingham	St Paul	Ugashik/PP	Nelson Lagoon
Dutch Harbor											
Atka	308										
Adak	407	132									
Port Moller											
Port Heiden				102							
Egegik											
Naknek	432					53					
Dillingham	430			211	137	74	84			104	220
St Paul	238										
Ugashik/Pilot Point					67	62					
Nelson Lagoon	242			24							
Herendeen Bay				24				238			
Herendeen Bay to Albatross - New 11 mi road following foot path											
Sand Point to Albatross = 16 nm											

	Dutch	Atka	Adak	Port Moller	Port Heiden	Egegik	Naknek				
14-knot conventional ferry								Adak and Atka would be ~3-day run to the west of Dutch Harbor for *Tustumena*. Trip would have to arrive in Albatross Anchorage ferry terminal to coordinate with landing craft arrival into Herendeen Bay Cannery Point ferry terminal.			
Dutch Harbor											
Atka	22.0										
Adak	29.1	9.4									
11.5-knot landing craft (optimistic)		**11.5**	← Change speed								
Port Moller											
Port Heiden				8.9							
Egegik											
Naknek	37.6					4.6					Nelson Lagoon
Dillingham	37.4			18.3	11.9	6.4	7.3	0.0	0.0	9.0	19.1
St Paul	20.7										
Ugashik/Pilot Point					5.8	5.4					
Nelson Lagoon	21.0			2.1							
Herendeen Bay				2.1				20.7			
	Total distance ~ 636 nm round trip. 12-knots ~56 hours. 8 port calls 1-2 hours. Round trip in 3.5 days. Ship needs crew quarters. Ship start/stop Herendeen Bay, meet up with *Tustumena* schedule. **Use surplus U.S. Army LCU-2000 Class.**							Dillingham			



Old dock (L), new dock (R) Port Lions 2014.