

# Alaska Department of Transportation & Public Facilities

## Alaska Class Ferry: Project Overview and Change in Direction

### System Overview

The Alaska Marine Highway System (AMHS) is currently comprised of 11 ferries, each of which performs a distinct mission for the department. The fleet can be divided into three classes of service.

The larger vessels are described as “mainline” ferries and are able to do the heavy haul for public travel with a greater capacity for semi-trailers, large trucks, heavy equipment, etc. These vessels are a 24/7 operation when in service and are manned with multiple crews and crew quarters. The vessels provide all the amenities the system can offer: staterooms, dining rooms, movie rooms, a large car deck, etc. These vessels are the: M/V Columbia, M/V Malaspina, M/V Matanuska, M/V Kennicott, M/V Tustumena and M/V Taku.

A second class of vessel is the Aurora Class, which includes the M/V LeConte and M/V Aurora, both of which are 235 feet long and can transport 34 standard vehicles and up to 300 passengers. These vessels are designed to provide public transportation to smaller communities and fill in for mainliners when required and where possible. The vessels have the capability to operate 24/7 with multiple crews and crew quarters onboard. There are no staterooms available for travelers and food service is similar to what is available on mainline vessels. Currently the M/V Aurora operates with multiple watch crews in Prince William Sound and the M/V LeConte serves Lynn Canal and Icy Straits within the work/rest requirements for one crew.

The last vessel class is the “shuttle ferries.” These are home ported in one community, make a trip to another community and return each night for overnight moorage. The M/V Lituya, FVF Fairweather, FVF Chenega and the non AMHS entity Inter-Island Ferry Authority M/V Prince of Wales are examples of this vessel class. These vessels do not have staterooms for crew or passengers, are minimally crewed and are operated on routes where the sailing can be completed within 12 hours. The 12-hour criterion is important because operations over this length of time require additional crews and the inclusion of crew quarters and eating facilities add operating and capital costs. These vessels offer the most efficient service but are limited to their use in that they can only serve communities distanced less than 12 hours apart from the time the crew begins in the morning and ends their shift each night.

### Brief History

On June 28, 2006 the Alaska Department of Transportation and Public Facilities (DOT&PF) issued a statement of services for a shuttle ferry class of vessel described as “Southeast Shuttle Ferry” with the purpose to:

“Select Naval Architecture and Marine Engineering Firm to modify a concept ferry boat design to meet Alaska Marine Highway Systems operational and performance requirements for a new class of Southeast Alaska Shuttle Ferries.”

The statement of services specified that the vessel design must meet the following criteria:

- Vessel Type: Roll On-Roll Off Passenger Ferry
- Overall Length: 255ft to 305ft

- Passenger Capacity: 450 (interior seating for 300 passengers)
- Vehicle Capacity: 48-60 plus
- Loading Ability: Bow, Stern and Side
- Cruise Speed: 18 knots (20 knot sprint speed)
- Operation: Day Boat Operations (12 hours)

This began the process toward building the Alaska Class Ferry (ACF), which would be the first AMHS stern/bow roll on-roll off (RORO) vessel since the M/V Bartlett. The stern/bow RORO would enable the most efficient vehicle loading and unloading capabilities. It was estimated in 2006 that the cost to build a vessel that met the above criteria to be approximately \$25 to \$30 million.

The naval architect firm, Elliott Bay Design Group, was selected to begin working with DOT&PF to design the vessel that would fulfill the criteria in the statement of services.

As the concept developed, there were several changes made that differed from the criteria in the statement of services. One of the most important changes was the elimination of a bow door, which decreased the ability of vehicles to roll on and roll off in an efficient manner. Less time in port and more time underway was an important characteristic for a Southeast Alaska Shuttle Ferry, especially for routes that were on the edge of being completed in less than 12 hours. A second major change to the concept design was the inclusion of crew quarters, which conflicted with the “day boat operations” specification in the original statement of services. The vessel was also lengthened to 350 feet during this process. The ACF Design Study Report was completed in 2009 and included these changes to the original vision of the vessel; the cost estimate increased to \$120 million.

The 2010 Alaska State Legislature appropriated \$60 million of state general funds toward building the first Alaska Class Ferry. The appropriation matched \$68 million in Federal Highway Administration funds. Later that year, Governor Parnell “defederalized” the ACF project and the department transferred approximately \$1.5 million that had been expended for design to other state transportation projects. Defederalizing the ACF project allowed the state more flexibility to choose where and how the ACF would be designed and constructed. This aligned with the Governor’s and legislature’s intent that the vessel be built in Alaska for Alaskan jobs. The federal funds were later redistributed to other transportation projects in Alaska; the funds were not lost or permanently sent back to the federal government.

The 2011 Alaska State Legislature appropriated an additional \$60 million to the project. DOT&PF continued working with Elliott Bay Design Group to design an ACF that could be built within the \$120 million appropriated budget.

In parallel with the ACF development, DOT&PF in 2007 hired the University of Alaska Fairbanks (UAF) to independently analyze the Alaska Marine Highway System. The study was published in 2011 and found that there was no improvement in the overall efficiency of the AMHS by replacing the M/V Malaspina in Lynn Canal with a 350-foot ACF. When two additional ACF’s of this size were deployed (with the retirement of the M/V Taku) the study found that the average annual AMHS operating subsidy increased by approximately \$6.7 million. There was an improvement in service with deployment of two 350-foot ACF’s in Lynn Canal, but at a substantial increased cost that resulted in the highest annual AMHS subsidy of any alternative UAF analyzed.

In late 2011 DOT&PF management was concerned that the vessel design had diverged away from the original design concept described in the statement of services. Instead of a stern/bow RORO shuttle class ferry, the design had morphed into essentially a large Aurora Class vessel. Rumors within the ship building industry also indicated that the vessel would exceed the \$120 million budget. At this time the department began altering and removing design features in an effort to reduce construction costs.

In April 2012 DOT&PF contracted with Alaska Ship and Drydock (ASD) designating the shipyard as the Construction Manager/General Contractor for the design phase of the ACF project. ASD operates the Ketchikan Shipyard under a long-term private/public partnership agreement with the Alaska Industrial Development and Export Authority (AIDEA). As part of the contract with DOT&PF, ASD would have the ability to submit the first price proposal for the construction contract as the design neared completion. If the price ASD submits is acceptable to DOT&PF a contract would be initiated with ASD to construct the vessel. If a price could not be agreed upon the state would advertise the project for competitive bids which would allow firms located outside of Alaska an opportunity to construct the vessel.

In fall 2012 the conceptual design had reached a point where accurate cost estimates could be provided by both the naval architect and ASD. These estimates showed the total project cost at \$150-\$167 million – 25-39 percent higher than the \$120 million appropriated and more than five times the original 2006 estimate.

The department was now faced with a vessel design that did not meet the original intent of constructing a stern/bow RORO shuttle ferry, a study provided by the University of Alaska that cast doubt on the use of the vessel, and a cost estimate that exceeded the amount available for construction.

Armed with this information the department consulted with the Governor and received direction to reevaluate the direction the project had taken. The vessel design and purpose were reviewed and the department determined that going back to the original concept was the best course of action for service to the public. Governor Parnell announced in December 2012 to revert the design back to a stern/bow RORO concept which will cost less to build and operate, and better serve Alaskans.

### **Change in Direction**

The former ACF concept was a 350-foot ferry (about the same length as the M/V Taku) with a capacity of 60 standard cars, no passenger staterooms, and a crew of 23-28 with requisite crew quarters/galley.

The stern/bow RORO ACF will be, in comparison, a smaller vessel approximately 260-300 feet in length (longer than the Aurora Class) with a standard vehicle capacity around 50 cars. It will not have passenger or crew staterooms and will operate with fewer crewmembers than the former ACF concept. This ferry will be designed with stern and bow loading capabilities and possibly port/starboard loading doors. The new ACF's will have the capability to replace the M/V Malaspina as shuttle ferries operating in Lynn Canal between Juneau, Haines and Skagway. It is expected that with its length and a modified hull form, the vessel will have similar seakeeping characteristics as the M/V Taku. DOT&PF intends to initially build two Alaska Class Ferries within the appropriated budget.

### **Next Steps**

DOT&PF is currently amending its contract with Elliott Bay Design Group to refocus the ACF design toward the stern/bow RORO vessel concept. Because of a less complex design, the department anticipates that both the design and construction times will be faster in comparison to the previous design concept.

## **Serving Southeast Alaska**

Beside significant construction and operating cost savings, the stern/bow RORO Alaska Class Ferry provides the greatest frequency, versatility and capacity while also serving as a backup for other vessels.

### *Frequency*

One possibility is to operate two shuttle ferries to supplement mainline service in Lynn Canal. One vessel could be home ported in Haines or Skagway and the other in Juneau. The northern ACF would shuttle between Haines and Skagway. The Juneau ACF would make one or two round trips per day between Juneau and Haines. Because these vessels would have stern and bow loading capabilities and operate to a single port, the load times at each port will be significantly less in comparison to other AMHS ferries and, in turn, provide for a more efficient use of operating hours per day.

### *Versatility*

Another possibility is deploying the ferries to other Southeast communities when the traffic demand requires an additional vessel (i.e. community events, Celebration). The communities of Hoonah, Tenakee and Gustavus can all be served within a 12-hour timeframe to/from Juneau.

### *Capacity*

A minimum of 200 standard vehicles could be transported each day between Juneau and Haines as needed during peak times - a total capacity capable of transporting 67 percent more vehicles than the former ACF concept transporting 120 standard vehicles per day.

### *Backup*

With several smaller ferries, one ferry can be deployed to other Southeast communities when the M/V LeConte is not running due to required annual maintenance or breakdowns. The ACF's will also serve as a backup vessel to one another during scheduled and unscheduled maintenance days. This will allow AMHS to continue to provide a consistent level of service with the least amount of impact to the system as a whole.

### *Cost*

Preliminary analysis of total costs – capital and operating – over the life of the new vessels indicates that two smaller ACF's can yield significant cost savings over the former ACF concept. This is due to differences in operating costs of different vessels, and the opportunity to scale the use of the vessels to the very big swing in capacity required between peak and off-season.