Alaska Marine Highway System - Vessel Overhaul and Rehabilitation | **FY2004 Request: $4,900,300** | **Reference No: 30624**

AP/AL: Appropriation
Project Type: Renewal and Replacement
Category: Transportation
Location: Statewide
Contact: Tom Briggs
House District: Statewide (HD 1-40)
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Estimated Project Dates: 07/01/2003 - 12/31/2004

Brief Summary and Statement of Need:
Annual maintenance and overhaul on vessels and at terminals, particularly component or system failures which will impact service in the short term.

Funding:	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	Total
Gen Fund	$4,900,300	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$32,400,300
Total:	$4,900,300	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$32,400,300

☐ State Match Required ☐ One-Time Project ☐ Phased - new ☐ Phased - underway ☑ On-Going
0% = Minimum State Match % Required ☐ Amendment ☐ Mental Health Bill

Operating & Maintenance Costs:

	Amount	Staff
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	
Totals:	0	0

Additional Information / Prior Funding History:
FY2003 - $5,000,000; FY2002 - $4,239,365; FY2001 - $4,200,000; FY2000 - $4,390,600; FY - 1999 - $4,000,000. This has been an annual Capital Program.

Project Description/Justification:
The FY 04 *Alaska Marine Highway System: Overhaul and Rehabilitation* request will fund:

The required annual overhaul of each of the nine vessels in the fleet:	$4,500,000
Ongoing maintenance of the system's twenty state-owned shore facilities:	250,000
Shipboard safety improvements:	100,300
Completion of the maintenance management system:	50,000
Total request:	$4,900,300

This request is insufficient to fund numerous deferred maintenance tasks and improvements we need to make to the vessels. These are itemized in the Unfunded Maintenance and Improvements section at the end.

Vessel Overhaul - $4,500,000

Vessel overhaul uses the lion's share of the funds. Overhaul consists of inspection, repair, and maintenance that cannot be performed while the vessels are operating. An overhaul period of approximately six weeks is set aside every year for each ship, and the ship is brought to a shipyard for this work. In performing overhaul work, AMHS must meet the exacting inspection requirements and standards of safety and seaworthiness of two agencies, the American Bureau of Shipping (ABS) and the United States Coast Guard (USCG). None of this work is discretionary. At the end of the overhaul period, the vessel must pass a USCG inspection in order to obtain a Certificate of Inspection. This certificate permits the vessel to operate for the next year.

Overhaul work is costly. Putting a vessel into drydock, which must be done annually on most vessels to allow mandatory inspections and work to be performed, can cost about $20,000 base cost plus $1,000 for each day it remains in drydock. Dismantling a main propulsion engine solely to permit ABS inspections requires the work of several skilled engineers for several weeks. These are costs we incur simply to enable inspections to be made and routine maintenance to be done.

In addition to work required by ABS and the USCG, we perform work recommended by equipment manufacturers and work that our port engineers determine to be sound equipment maintenance practice. While we have no choice in work required by ABS and USCG, and consequently we cannot control these costs, we have some discretion about the work that is merely prudent. For example, painting the hull is not required, and we could sail with badly deteriorated paint. However, paint protects the hull from deterioration. In the long term, the value of asset protection greatly outweighs the cost of the painting.

In the past few years, we have had to focus our CIP overhaul funds increasingly on the required items and defer much of the discretionary work. The cost of required work has increased. Our CIP budget has not kept up.

In FY 04 this capital appropriation must bear the added weight of a new vessel. We anticipate taking the M/V E. L. Bartlett out of operation in October 2003, but in spring 2004 we will accept the first of our new fast vehicle ferries, the M/V Fairweather, to provide daily service between Sitka and Juneau. Although our total number of vessels will remain the same, we will be replacing a vessel that is relatively inexpensive to maintain for one that will immediately draw heavily on these funds. While the M/V Fairweather will be in shipbuilder's warranty for 18 months after delivery, AMHS is still responsible for providing routine maintenance and for outfitting the new shore support center in the vessel's homeport of Sitka with maintenance tools and equipment. Those costs will need to come from this appropriation. We have added $270,000 to last year's overhaul request to account for these one-time start-up costs for the M/V Fairweather.

In the spring of 2004, we also hope to take delivery of a new Metlakatla shuttle vessel. This new vessel should not draw on our FY04 capital appropriation, but funds for its maintenance will be needed soon thereafter.

Another continuing source of increased costs for required work is maintenance of new systems and equipment (primarily safety related) required to be added to the vessels by the International Maritime Organization's Safety of Life at Sea (SOLAS) regulations and similar U.S. Code of Federal Regulations Subchapter "W" provisions. While federal funds provide the systems and equipment, state CIP funds must be used to maintain them. Perhaps the greatest cause of increased overhaul costs is the simplest: as vessels age, the amount and cost of required maintenance increases.

Our deferred maintenance items have begun to accumulate. Year by year, we opt not to perform all prudent preservation. For example, ballast tanks need to be recoated as rust develops and the steel wastes. We have been recoating ballast tanks on a reduced schedule that does not adequately protect them from further wasting. We often remove and replace engine parts that are economical to rebuild and have ready for issue when urgently needed, yet for lack of funds, we place them in storage without rebuilding them. Car decks used to be routinely painted every year. We no longer paint them at all; car decks rust very slowly. Year by year, we allow the appearance of the vessels to deteriorate. On many vessels, passenger areas that are subject to heavy traffic have torn or heavily patched furniture and wall coverings.

As for improvements, state CIP funds for significant improvements and modernization of our vessels dropped from the budget sheet many years ago.

Shore Facilities Maintenance - $250,000

Our twenty state-owned shore facilities, scattered from Homer to Ketchikan, consist of the terminal buildings, transfer bridges (hydraulic vehicle ramps), mooring structures, and staging areas. Like our vessels, our shore facilities are subject to hostile weather and the corrosive effects of salt air and water. Maintenance of these complex facilities is necessary to

ensure passenger and vehicle safety, protection of the state's assets, and compliance with the Americans with Disabilities Act.

We rely on our annual capital appropriation for both routine maintenance and larger repair projects. These repair projects are planned for FY 04:

1. At the Wrangell terminal, we will replace the hydraulic cylinder that raises and lowers the ramp on the transfer bridge. Deferring this work could lead to loss of ferry service in Wrangell. Estimated cost of repairs: $17,500.

2. The HVAC controls in the Auke Bay terminal building are old and in need of replacement. Estimated cost of repairs: $35,000.

3. The shoreside electrical cable that delivers power to our vessels moored at Berth 2 in Ketchikan needs to be upgraded. It is faulty and intermittently fails. Estimated cost of repairs. $45,000.

4. The carpeting in the heavy traffic areas of the Ketchikan terminal building needs to be replaced. It is coming up from the floor and has created a tripping hazard. Estimated cost of repairs: $15,000.

5. In the Skagway terminal building, tile flooring in the restrooms needs to be replaced. The existing tile flooring is no longer bonded to the concrete floor below. Exterior doors at this terminal are corroded and pitted from years of exposure to the salt water spray. They can no longer be salvaged with a paint job; they need to be replaced. Estimated cost of repairs: $45,000.

6. Repaint the exteriors of the terminal buildings in Skagway, Auke Bay, Wrangell, Ketchikan, and Hoonah. Estimated cost of repairs: $30,000.

In FY 02 and FY03 to date, we have used funds from this capital appropriation to complete the following work:

1. In Auke Bay, we recalibrated the existing pneumatic controls and replaced circulating pumps in an effort to extend the useful life of the heating system. This was only a temporary fix that will give us another year or two before we will have to replace the antiquated controls at this terminal.

2. In Haines we rebuilt the water treatment system that services the terminal. The existing system no longer met the current DEC regulations for safe drinking water in a public facility.

3. In Skagway we replaced the entire heating system and controls.

4. In Ketchikan, Berths 1 and 2 had suffered years of incremental damage to the dolphins and catwalks. We recently completed a project that corrected these problems.

5. In Cordova, we replaced the cathodic protection system to prevent corrosion of underwater metal portions of the dock.

6. In Ketchikan, we repaired the oil-fired heaters in the warehouse.

7. In Juneau, we incurred the unexpected costs of moving the shore maintenance crew from the now demolished Glacier Ave. building to a new facility at 7-mile. We contributed $200,000 in funds from our capital appropriation toward the construction of this new building. While the shop was being built, we had to tap these funds for approximately $20,000 to lease temporary shop space.

8. In Sitka, we repainted the exterior of the terminal building.

9. At all terminals, we restriped the vehicle parking and vehicle staging areas.

Shipboard Safety Improvements - $100,300

While the U.S. Coast Guard ensures that our vessels meet standards of safety and seaworthiness established by federal regulation and international treaties, those standards do not generally extend to the passenger and crew working areas of the vessel. It is the state's responsibility to ensure these areas are safe. Our capital appropriation has been increasingly committed to meeting the USCG standards and thus achieving our annual certificate of inspection, which permits us to sail. Work mandated by the USCG always comes first. Nonmandated safety concerns have come second. As the cost of USCG-required work has increased fleetwide and funding hasn't kept up, the funds available for safety improvements have evaporated. As a result, we have a significant backlog of shipboard safety work that goes undone.

These capital funds would allow us to address these issues:

1. Safety handrails. These are needed for the Kennicott bridge window cleaning platform, and for the top of the vehicle elevator king posts on the Tustumena.

2. Guards on ladders. These open metal enclosures surround the ladder and permit the user a second chance in case of a fall. From one to five such ladders per ship need to be retrofitted with guards.

3. Nonskid protection on walkways. Nonskid treads need to be installed on stairways used by passengers and crews on all vessels. Currently only some stairways on some vessels have nonskid treads. On all vessels, a nonskid coating needs to be applied or reapplied to vehicle deck walkways that pedestrians use to transit from the ramp to the vessel elevator or stairways. Nonskid material wears out with use and must be reapplied routinely.

4. Modifications to existing Americans with Disabilities Act (ADA) ramps. Some of our installed ramps are steeper than the 1:12 slope requirement set by the ADA. These ramps have caused problems for disabled passengers and added workload for our crews who must assist them.

5. Replacement of temporary access ladders. Crews currently use household type ladders to access high places. The area around the exhaust stacks on the Malaspina is an example. We need to install permanent, fixed-rung ladders with safety harness rails for work in these areas.

6. Additional video cameras on the vehicle decks. Currently we have video cameras trained on the vehicle doors so officers on the bridge can monitor the doors to ensure that they are latched when the vessel leaves the dock and that they remain latched while the vessel is under way. More cameras would allow the bridge to monitor the safety of passengers on the vehicle deck, check for the unauthorized presence of passengers on the vehicle deck, and ensure greater security of vehicles and their contents.

Completion of the Maintenance Management System - $50,000

Total funding of $750,000 is needed: FY 04 - $50,000, FY 05 - $350,000, FY 06 - $350,000.

Completion of this fleetwide installation is the last remaining AMHS action item from the famous Ackers Report of 1989 by which the legislature charged AMHS with numerous corrective actions including: hiring of senior managers with significant marine backgrounds; incorporation of a ship maintenance report (SMR) system by which vessel crews could request assistance for repairs and upgrades beyond the capability of vessel crews, etc. AMHS has successfully adopted all other Ackers Report recommendations.

A $470,000 federally funded project accomplished by AMHS laid the groundwork for a computer-based maintenance management system (MMS) for both vessels and shore facilities. Funds for this project have been exhausted, but the work is far from done. An additional $750,000 over three years will allow us to complete the work and obtain a fleetwide useful product.

A computer-based maintenance management system, as used by most major cruise ship and cargo vessel companies, records and tracks proposed and actual purchases of goods and services, records and controls vessel inventory, provides status reports on scheduled equipment maintenance, and records equipment maintenance history. The U.S. Navy and Coast Guard have effectively used their automated systems for over thirty years. With additional software features, our MMS system can also complete a fleetwide record keeping and document control system. Such computer-

based maintenance management systems have become an industry norm on commercial ships. The federal project has given us AMOS, an Oracle-based database. With funds to complete its implementation, AMHS vessels will truly enter the 21st century and reap a significant improvement in the planning, scheduling, accomplishment, and documentation of fleet vessel maintenance.

Federal funds were used to implement the MMS for the engine departments on six vessels in FY 02 and one scheduled for FY 03. Additional state CIP funds will allow us to:

1. Implement the MMS on the two other vessels. As vessels are retired and new ones take their place, licenses will be transferred to the new vessels.

2. Expand data input to include the deck and passenger services departments of the vessels, and to add a shore facilities function.

3. Add a personnel program that will manage crew data, including crew scheduling, training records, and employment history. This would enable more efficient and timely communication of personnel data between the shoreside offices and the vessels.

4. Add an information management program. Each vessel will be able to send and receive reports, transmit and store safety records, and maintain current policies and directives on board. This will allow AMHS to have instant and uniform accountability and implementation of state policies.

Unfunded Maintenance and Improvements

Priority deferred maintenance that we would like to address if state CIP funds in addition to what is requested above are made available in FY 04:

1. Increase the frequency of ballast tank recoatings sufficiently to halt deterioration. Estimated annual cost: $200,000.

2. Repair and rebuild major spare parts, including main shafts and propellers in our storage warehouse so that parts are ready for use when needed. Estimated total cost: $200,000.

3. Remove asbestos from the vessels. Most of our vessels still have significant areas of asbestos remaining from their original construction. We would start removal efforts with the worst areas, such as the pipe insulation in the exhaust stack areas. The high vibration in these areas can create asbestos dust, which can drift into work areas occupied by engine crew. Estimated total cost: $500,000 per year for the next five to six years.

4. Clean the ventilation air ducts on all vessels. In the past, each vessel was on a schedule of cleaning one third of its ducts every year. Duct cleaning has been completely eliminated in the past four years due to insufficient funds. There are areas on all vessels that have not been cleaned for at least six years. Estimated annual cost: $300,000.

Priority improvements we would like to make if state CIP funds in addition to what is requested above are made available in FY 03:

1. Upgrade the vessels' sewage systems to take advantage of the lessons the manufacturer has learned since the original systems were installed in the vessels. These upgrades would reduce maintenance and better treat the effluent that we are pumping overboard. (In the case of the Taku, we have requested that a federally funded project be established to replace the existing type I system with a USCG-required type II system, at an estimated cost of $1.5 million.) Estimated total cost: $500,000.

2. Establish a second source of heat to passenger areas on the Aurora, LeConte, Taku, and Tustumena. These vessels have only a single boiler to heat the entire ship. (Vessels normally have two or more of vital equipment items – two engines, two steering gears, two propellers, many generators, etc.) In 2001, the Tustumena was taken out of service and all passengers and crew were put ashore in Seward when a boiler burner failed and there was no heat on the ship. Estimated total cost: $300,000.

3. Upgrade the remaining refrigeration units that use Freon 12 and Freon 22. These older refrigerants deplete the ozone layer and are no longer available for purchase in the U.S. They need to be replaced with modern, environmentally safe and available refrigerants. Estimated total cost: $100,000.

4. Humidify the vessel air systems. All vessels (except the Kennicott) were constructed with a direct steam injection system for controlling humidity in the living areas, particularly during winter sailings when vessel heating systems dry out interior air and most exterior doors are closed. These systems were disabled when concerns arose over breathing the chemicals present in the routine treatment of the steam. We need to install new systems that inject only humidity and no treatment chemicals. Estimated total cost: $480,000.

5. Complete the construction of the Kennicott. Unfinished or inadequate work that came to our attention during the warranty phase (now over) has still not been completed. Examples of needed work: corrections to the bus tie circuit between the main switchboard and the emergency switchboard; installation of an alarm monitoring system repeater in the chief engineer's office; modification of toilet vent piping to prevent odors from the sewage tanks. Estimated total cost: $200,000.