Alaska Marine Highway System - Vessel Overhaul and Rehabilitation **FY2003 Request: $5,500,000**
Reference No: 30624

AP/AL: Appropriation
Project Type: Renewal and Replacement
Category: Transportation
Location: Statewide
Contact: Tom Brigham
House District: Statewide (HD 1-40)
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Estimated Project Dates: 07/01/2002 - 12/31/2003

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:	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	Total
Gen Fund	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$33,000,000
Total:	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$5,500,000	$33,000,000

☐ 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:
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 03 Alaska Marine Highway System: Overhaul and Rehabilitation request will fund:

- The required annual overhaul of each of the nine vessels in the fleet: $4,230,000
- Ongoing maintenance of the system's twenty state-owned shore facilities: $270,000
- Shipboard safety improvements: $500,000
- Implement the maintenance management system in the remainder of the fleet: $500,000

Total request: $5,500,000

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

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Vessel Overhaul - $4,230,000

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. The addition of the Kennicott to the fleet in 1998 was a major cause of the cost increase for required work. When the Kennicott was added, no funds were added to our CIP budget to provide for its annual overhaul. We now overhaul nine vessels with an annual budget that was based on a fleet of eight vessels. Due to the more automated equipment and complex systems, the Kennicott is, and is expected to remain, one of our most expensive vessels to overhaul. Another 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 - $270,000

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. The demand for shore facilities maintenance dollars has increased in the past few years. We have added a new terminal building in Homer, replaced the Cordova building, and rebuilt the Petersburg building. Each of these improvements adds more complex heating, ventilation, alarm and emergency power, and/or electric systems and equipment to be maintained.

In FY 01 and FY 02 to date, we have used state CIP funds to initiate major shore facilities maintenance tasks totaling $582,000. This is in addition to our relatively small, routine, and ongoing maintenance and repairs.

In Auke Bay, we replaced the fresh water line, which regularly froze in the winter, with an insulated line designed for cold weather. In Cordova, we are replacing the cathodic protection system to prevent corrosion of underwater metal portions of the dock. Work is about to begin on replacing the heating system in the Skagway terminal. In Ketchikan, berths #1 and #2 have suffered years of incremental damage to the dolphins and catwalks. This is about to be repaired.

We have contracted with the manufacturer for inspection of the Synchrolifts at the Whittier, Haines, and Wrangell terminals. The Synchrolifts raise and lower the transfer bridges electrically. We are required to have every Synchrolift inspected by a manufacturer's representative every two years.

We also replaced the intermediate ramp and apron electrical controls at the Metlakatla and Clark Bay terminals. The controls were designed for use from the shore only. Since these terminals are unmanned, vessel crew had to go ashore by ladder to access them. We modified them to be usable from aboard the vessel, which is much safer for the crew.

We have also had the unexpected costs of moving the Juneau-based shore maintenance crew and their shop out of the Glacier Ave. building. The state is vacating the building entirely, and it is to be given to the City and Borough of Juneau. We contributed $200,000 in shore facilities maintenance CIP funds toward the construction of a replacement shop to be built at our 7-mile Glacier Avenue facility. Until the shop is completed, we have had to tap these funds for approximately $20,000 to lease temporary shop space.

During FY 01 and FY 02 to date, we have been able to rely on CIP reserves from previous years to fund shore facilities maintenance work. Those reserves are now depleted.

In the balance of FY 02 and in FY 03, we will need to continue our use of CIP funds for relatively small, routine, and ongoing maintenance and repairs. Much of this work results from mechanical or structural failures that we cannot specifically anticipate and schedule. In addition, the following tasks are on our worksheets:

1. Rehabilitation of the Ketchikan port engineer building needs to be completed. This is an old, prefabricated building that has been exposed to many years of Ketchikan's wet weather. The building needs extensive replacement of rotted exterior support structure, studs, insulation, and siding. Estimated cost of remaining repairs: $105,000.

2. The Ketchikan warehouse needs its oil-fired heaters repaired. Deferring this work could lead to the total loss of heat in the building. Estimated cost of repairs: $9,500.

3. 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.

4. At the Whittier, Metlakatla, and Angoon terminals, we need to replace lighting along the catwalks and transfer bridges. Estimated cost of repairs: $25,500.

5. The pipe that delivers fresh water to vessels at berth #1 in Ketchikan is subject to freezing in the winter. It needs to be replaced with an insulated line. Estimated cost: $20,000.

An additional maintenance task that we are unable to perform with our customary CIP funding level is discussed in the Unfunded Maintenance and Improvements section below.

Shipboard Safety Improvements - $500,000

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 CIP overhaul funds have 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.

An additional $500,000 in CIP 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. Crew 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.

Implement the Maintenance Management System for the remainder of the fleet- $500,000

FY 03 - $500,000

The Maintenance Management System is an integral part of vessel and shore overhaul and refurbishment. This is an overhaul of the "yellow pad/sticky note" style of maintenance management. As the Alaska Marine Highway System continues to age and begins to evolve, a system to track the maintenance needs of the vessels and shore facilities was envisioned. Many of the Marine Highway System employees are retiring, and the knowledge about each vessel and shore facility's configuration and uniqueness is being lost. Only with a computerized information system can AMHS hope to address it's maintenance and overhaul needs more efficiently and effectively.

In 1999, a federal project was funded to begin work on the Alaska Marine Highway Maintenance Management System for vessel engine departments. The resulting system is tested and running in a portion of the system. Additional implementation is needed to activate it systemwide.

The system is currently tracking all scheduled maintenance and maintenance requirements, ordering and tracking parts, and logging and tracking deferred maintenance items. It is similar to the US Navy, Coast Guard, and modern commercial ships.

During FY 2003 non federal funding is needed to:

- Install the system on the M/V Columbia, M/V Malaspina, and the first new fast vehicle ferry
- Include the deck and passenger service departments

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 03:

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.

5. Repair the Auke Bay ferry terminal's heating and ventilation system. The system was recently found to have several deficiencies. Without the needed repairs, we run the risk of having to replace the entire system. Estimated total cost: $173,000.

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.) Last year, 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. They need to be replaced with modern, environmentally safe 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.

Implement the Maintenance Management System for Personnel and Information Management- $500,000

- A personnel program that will manage crew data, including crew scheduling, certification, and employment history
- An information management program where each vessel can send and receive reports, transit and store safety records, and maintain current policies and directives on board.