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BRIEFING REPORT

March 24, 1999

TO: Members of the Joint Legislative Audit and Review Committee (JLARC)

FROM: Bob Thomas, Principal Management Auditor/Supervisor
Michael J. Huddleston, Consultant to JLARC

SUBJECT: Follow-up Work on Washington State Department of Transportation Ferry System (WSF) Performance Audit prepared by Booz-Allen & Hamilton (BAH)

JLARC adopted the BAH Ferries System report on October 6, 1998. In all, the report listed 28 recommendations; JLARC took no position on Recommendations 25-28. An itemized list of the specific recommendations and response status (prepared by Paul Green, WSF CEO, in a March 1, 1999, response to Senator Oke) is being distributed to the JLARC membership under separate cover.

On June 4, 1998, in anticipation of the need to monitor audit responses and gather additional information to follow-up on the BAH report, JLARC instructed Committee staff to review the long-range WSF capital planning process, evaluate financial planning methodology, and further study vessel condition and safety issues.

This briefing report discusses progress made on the long-range plan, and how plan elements compare and contrast with audit report findings. Information provided by WSF indicates that both the Governor's and the Transportation Commission's budget proposals would begin to address terminal and support facility problems, and implement international safety management for the ferry fleet. However, current budget proposals prioritize passenger-only ferry implementation over new vehicle ferries in contrast to capacity utilization forecasts in the BAH report. This briefing report further discusses WSF's financial plan, and why it is not possible to fully evaluate that plan due to the current unavailability of information in several critical areas, including the results of testing the condition of vessel steel. The discussion of the financial plan also includes the status of WSF and Transportation Commission actions related to vessel safety.

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I. Long-Range WSF Capital Planning Process

The 1998 BAH audit recommended that WSF “Conduct a ‘clean slate’ fleet and service optimization study to identify and evaluate benefits-costs of an unconstrained fleet and compare to the current 20-year plan.” The ferry system has recently prepared an update to its 20-year service plan, which was adopted by the Transportation Commission in December 1998. JLARC received some comments from ferry system stakeholders and service communities throughout the performance review process. The following summarizes the status of service plan issues raised by JLARC:

- **The adopted WSF service plan still anticipates that the international route (Anacortes/Sidney) will transfer to another operator after 2008; however, larger vessels are assigned to the San Juan domestic route and the Mukilteo/Clinton route to respond to service deficiencies on those routes.** The City of Anacortes provided testimony to JLARC during the performance review process on these two issues. Anacortes opposes the elimination of the international route from the WSF service package; Anacortes requested larger ferries to serve the San Juan domestic route.
- **The revised plan calls for building two Millennium class vessels instead of a single Jumbo Mark II.** Neither the Governor’s nor Transportation Commission’s proposed budgets include capital funding to begin designing these Millennium class vessels. According to WSF, the minimum time needed to plan and construct a new vessel class would be 8–10 years. **The plan also calls for construction of two additional passenger-only vessels.** In comparison and in contrast to the plan, specific BAH audit findings on future fleet needs included:

Current WSF fleet capacity is adequate for passengers, but not for vehicles, over the next 20 years. (BAH Audit Report, Chapter VIII, Finding 3, Page 8-7.)

WSF’s current fleet capacity is insufficient to support the 20-year demand for vehicles at current service standards. (BAH Audit Report, Chapter VIII, Finding 3.1, Page 8-7.)

Ferry capacity utilization is defined as the actual activity level, in passengers or vehicles, divided by fleet capacity. Passenger capacity utilization for passenger-vehicle ferries in FY 1997 averaged less than 15 percent for the year, rising to 23 percent during peak operating hours. In contrast, vehicle capacity utilization for 1997 averaged nearly 71 percent for the year and on many routes operated at 100 percent utilization consistently during peak operating hours. (BAH Audit Report, Chapter VIII, Page 8-7.)

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BOOZ-ALLEN AUDIT: EXHIBIT VIII-3 Daily Vessel Passenger Capacity Utilization (in thousands) for 20-year Passenger Demand Forecast (1997-2017)

Fleet Capacity Measure	1997	2002	2007	2012	2017
Passenger Capacity:					
- Daily Avg.	458	558	576	603	603
- Peak (4 Hrs.)	114	139	144	151	151
Capacity Utilization:					
- Daily Avg.	15%	14%	15%	17%	19%
- Peak (4 Hrs.)	23%	22%	24%	26%	29%

Source: WSF Planning Department, Booz-Allen analysis.

- Downtown Seattle/Southworth direct vehicle ferry was eliminated (passenger-only service remains).
- Both the service plan and the Governor's/Transportation Commission's capital plans address the antiquated facilities at Eagle Harbor. In 1997, the Eagle Harbor Repair Facility accounted for more than 55 percent of total maintenance expenses for the ferry system.

Eagle Harbor plays a key role in WSF's ability to effect timely repairs, but operates with antiquated facilities and requires better management and controls. (BAH Audit Report, Chapter VI, Finding 4, Page 6-14.)

- Both the service plan and the Governor's/Transportation Commission's capital budget submittals address the deficiencies at WSF terminal facilities. The audit concluded:

WSF's terminal capacity is insufficient to support demand growth over 20 years without significant expansion. (BAH Audit Report, Chapter VIII, Finding 4.3, Page 8-14.)

- The final plan has changed the financing assumptions to incorporate the impact of Referendum 49 during the first six years. The final plan assumes Referendum 49 funds are available in lieu of the first increment of the three-quarter of one-cent gas tax.

II. Financial Planning and Safety Issues

The follow-up evaluation of WSF's long-range planning was to include an evaluation of the WSF financial plan process and, if possible, identify potentially unfunded or underfunded future expenses. Based on information developed in the BAH audit report, JLARC staff believes that a useful and reasonably accurate financial model could be developed only after five critical areas are quantified:

- a. Outstanding claims against the ferry system for construction/renovation;

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- b. Estimated costs to implement International Safety Management systemwide;
- c. Condition of vessel steel and estimated costs for steel replacement in the vessel refurbishment and vessel preservation program;
- d. Estimated system operating costs, including new passenger-only ferry service; and
- e. Estimated capital costs to implement the 20-year plan for terminal improvements, Eagle Harbor Repair Facility enhancements, and construction of new vessels.

a. Outstanding claims against the ferry system for construction/renovation

In cooperation with ferry system managers, JLARC has developed sufficient information regarding outstanding claims to evaluate financial model inputs. According to WSF:

- More than 700 Condition Problem Reports (CPR's) have been issued by Todd Pacific Shipyards (Todd) or Washington State Ferries (WSF) during the performance of the Jumbo Mark II Project. WSF is auditing the Todd work in accordance with the contract. Todd's net total claim is approximately \$40 million. (*February 24, 1999, letter from Terry McCarthy, WSF.*)
- The refurbishment work on the M.V. Kaleetan will not be completed by mid-March 1999. The contract will increase between \$1.0 million to \$2.5 million over the current contract price of \$19.3 million. The original estimate for steel work was \$1.4 million. The current estimate of the virtually completed steel work is \$1.6 million. (*February 18, 1999, letter from Terry McCarthy, WSF.*)
- In January 1996, J.M. Martinac Shipbuilding Corporation (JMM) did submit to WSF a Direct Cost and Impact Request for Equitable Adjustment (REA) relating to lead-based paint abatement on the M.V. Klahowya. It appears that the Martinac claims will not exceed \$4.3 million. WSF and JMM unsuccessfully attempted to mediate a settlement in May 1998. Trial has now been set for December 2000. (*February 24, 1999, letter from Terry McCarthy, WSF.*)

b. Estimated costs to implement International Safety Management (ISM) systemwide

JLARC staff does not have sufficient information on this cost center to complete the financial model evaluation and will not be able to review the information until it is available mid-year. On March 10, 1999, JLARC staff met with Dr. Jack Harrald, the consultant retained by the Washington State Transportation Commission's 'Blue Ribbon Panel on Ferry Safety' to determine the status of the Commission's safety study. Dr. Harrald stated that while the report and program recommendations would not be completed until early

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summer, 1999, much of the safety review's emphasis will be on crew training and other (undetermined) ISM-related implementation costs. The Commission's safety study will likely result in recommendations for additional ferry system operating costs (i.e., crew training) and might include capital costs (i.e., terminal improvements, security, vessel safety features).

The BAH audit also addressed the ISM issue:

Extend the ISM effort to include WSF domestic routes and terminal operations, including the development of documentation defining policies, procedures, and responsibility across the WSF organization. (BAH Audit Report, Chapter V, Recommendation 10, Page 5-12.)

c. Condition of vessel steel and estimated costs for steel replacement in the vessel refurbishment and vessel preservation program

Conflicting evidence presented during the BAH audit process concerning the condition of vessels pointed to the need for more conclusive information. The audit addressed safety and steel maintenance issues at length:

2.3 The WSF fleet currently maintains no U.S. Coast Guard operating waivers. However, single compartment issues present a long-term safety concern. (BAH Audit Report, Chapter VI, Page 6-7.)

The audit did not make a determination of the safety of one-compartment vessels and their adequacy to continue operations. However, numerous TRAC members indicated that the replacement of these vessels should be a priority and that an independent technical or engineering inspection of these vessels to arrest any concern regarding their condition and seaworthiness would be prudent. The Steel Electric vessels are currently scheduled to be reassigned or retired by 2010. (BAH Audit Report, Chapter VI, Page 6-8.)

Finally, while there are no audit findings to suggest that WSF ferries are unsafe (see section 4, below), this audit recommends that the single-compartment vessels (i.e., Steel Electric class and M/V Rhododendron) – and perhaps those over 40 years old – receive independent surveys. Such surveys would be an added precaution to ensure the safety of these vessels and allay public concerns. Surveys should be conducted in concert with each vessel's next scheduled dry-docking. (BAH Audit Report, Executive Summary, Page iv.)

Implement a more systematic and formal Steel Maintenance Program and, as part of this program, the older single-compartment ferries should be subject to an independent survey. (BAH Audit Report, Chapter VII, Recommendation A, Page 7-19.)

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In addition, costs for major renovation of older vessels have exceeded initial engineering estimates. The WSF renovation/refurbishment/preservation program was evaluated in the BAH report:

The refurbishment program may not result in the greatest return on capital investment as expenditures for some refurbishments have exceeded 67 percent of new construction costs. In the past, WSF used a "two-thirds" rule of thumb when deciding whether to renovate or build new, i.e., a renovation is only cost-effective if the total cost does not exceed two-thirds (66-2/3 percent) of what it would cost to build a comparable new vessel. As Exhibit VII-5 makes clear, in WSF's experience the concept of major renovation has proven not to be cost-effective. (BAH Audit Report, Chapter VII, Finding 3.1, Page 7-10.)

**EXHIBIT VII-5: BAH Audit Report
 Comparison of Refurbishment Costs to Cost of New
 Construction(1997 Dollars in Millions)**

Vessels	Cost of Refurbishment	Cost of New Construction	Refurbishment Cost as Percent of New Construction Costs
Steel Electrics*	\$64.9	\$73.0	89%
M/V Rhododendron	\$16.5	\$20.9	79%
M/V Elwha	\$27.4	\$53.0	52%
M/V Tillikum	\$18.9	\$34.7	54%
M/V Klahowya	\$22.7	\$32.7	69%
M/V Klahowya**	\$27.1	\$32.7	83%

Source: WSF and Booz·Allen analysis.
 Note (*): Three vessels: Illahee, Nisqually, and Quinault.
 Note (**): If shipyard claim of \$4.4 million is paid.

The exhibit shows the costs of major refurbishments completed in the last 12 years. Of the eight vessels shown (Steel Electrics include three vessels), only two meet the "two-thirds" test. Therefore, assuming acceptance of the "two-thirds" rule of thumb, the conclusion can be drawn that major renovation is not cost-effective. However, the effectiveness of this rule is limited. Buy versus build decisions should only be based on a detailed life-cycle cost analysis which incorporates both operating and capital expenditures over time. Nevertheless, in four of the six cases shown in the exhibit, it appears that it would have been more prudent to construct new versus refurbish, if financial resources were available at the time of refurbishment for new construction. In these four cases, the state's money probably would have realized a greater return on investment by building new vessels. (BAH Report, Chapter VII, Page 7-11.)

JLARC staff suggested ultrasonic testing of hull steel be conducted by WSF on an accelerated basis until more lengthy and comprehensive inspections could be completed for the entire fleet. This effort was intended to help estimate the amount (if any) needed for a major steel replacement reserve fund in the financial model.

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Vessels proposed for inspections included those that have not been tested within the past five years and vessels that were already scheduled for inspections in late 1998 and early 1999. JLARC and WSF estimated the cost to test each vessel at approximately \$12,000 to \$15,000 per ferry and staff met in August 1998 to discuss the ultrasonic testing program and to identify candidate vessels. Ultimately, WSF decided it was not prudent to remove individual ferries from service for the 12-24 hours needed for the testing so this accelerated data collection effort was not completed.

JLARC and WSF staff did meet to determine the status of vessel testing and to identify candidate ferries for an accelerated testing process:

STEEL MAINTENANCE PROGRAM *GAUGING STATUS*

VESSEL	NEXT EXAM	LAST EXAM	PRIOR EXAM
CATHLAMET	1999	1992	1991
CHELAN	2004	1999	1992
CHINOOK	2007	1997 (new)	N/A
*ELWHA	2002	1997	1992
*EVERGREEN STATE	2003	1997	1988 (renovated)
HIYU	1999	1991	1986
HYAK	2003	1998	1992
ILLAHEE	1999	1986 (renovated)	N/A
ISSAQUAH	2000	1992	1989
KALAMA	1999	1989 (new)	N/A
KALEETAN	1999	1992	1987
KITSAP	2004	1999	1989
KITTITAS	2003	1998	1989
KLAHOWYA	2005	1995 (renovated)	N/A
KLICKITAT	2003	1998	1992
NISQUALLY	1999	1987 (renovated)	N/A
PUYALLUP	2009	1999 (new)	N/A
QUINALT	1999	1985 (renovated)	N/A
RHODODENDRON	2000	1990 (renovated)	N/A
SEALTH	2003	1998	1995
SKAGIT	1999	1989 (new)	N/A
SPOKANE	2003	1998	1992
TACOMA	2007	1997 (new)	N/A
TILLUCUM	2004	1994 (renovated)	N/A
TYEE	2003	1993 (renovated)	N/A
WALLA WALLA	1999	1992	1989
WENATCHEEE	2008	1998 (new)	N/A
YAKIMA	1999	1992	1987

* Gauging taken ten years after major renovation or construction date, then at five-year intervals thereafter.

* Note: U.S. Coast Guard requires specific gaugings at six years for Safety of Life at Sea (SOLAS) vessels.

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Steel maintenance and replacement is still a significant unknown factor in the evaluation of the WSF financial model. Without further data on the condition of vessels as proposed in the accelerated testing program, JLARC staff have no reasonable basis for estimating the need or size for a steel maintenance/replacement reserve amount in the financial model. WSF has not accelerated the ultrasonic gauging testing as suggested by JLARC. However, WSF does conduct testing of vessels based on the drydocking schedule. Vessels gauged since August 1998 are: M.V. Hyak, M.V. Kitsap, and M.V. Kittitas. (*February 8, 1999, Letter from Terry McCarthy, WSF.*)

d. Estimated system operating costs, including new passenger-only ferry service

Data was not available until recently – or will not be available for several months – concerning the proposed 1999-01 Biennial operating information and Referendum 49 budget impacts and assumptions. JLARC and WSF continue to correspond and meet to put together the needed information. JLARC staff can not evaluate the financial model without more detailed operating system cost data. WSF has difficulty providing some of the information requested because of the relatively limited experience in providing some service packages, such as passenger-only ferries. All of the data needed could be collected over the next two to three months, assuming WSF has the resources to gather the needed information.

e. Estimated capital costs to implement the 20-year plan for terminal improvements, Eagle Harbor Repair Facility enhancements, and construction of new vessels

As discussed above for the operating information, data are not available for the capital program pending legislative action on the 1999-01 Biennial Budget. The 20-year plan adopted in December, 1998, by the Transportation Commission calls for development and construction of a new vessel class – the ‘Millennium Ferry’ – for which there is no design or technologically developed concept. JLARC and WSF can develop these estimates within 1-2 months of the end of the 1999 Legislative Session.

This section has touched on the financial implications of vessel condition and vessel safety issues. The follow-up work directed by JLARC also anticipated a programmatic and policy review to determine consistency with the 1998 BAH audit. As discussed in some detail above, the safety issue is a work in progress.

We appreciate the assistance of WSF and the Transportation Commission in providing information to our numerous sets of questions.