STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
OFFICE OF THE COMMISSIONER

SEAN PARNELL, GOVERNOR

☐ Anchorage Office: 4111 Aviation Avenue
☐ Juneau Office: 3132 Channel Drive

P.O. Box 112500
JUNEAU, ALASKA 99811-2500

PHONE: (907) 465-3901
FAX: (907) 586-8365
WEB: dot.state.ak.us

February 16, 2012

Dear Legislators:

Please find attached an analysis of the Alaska Marine Highway System (AMHS) that was recently completed by the Alaska University Transportation Center, Institute of Northern Engineering.

This study was ordered during a previous administration by a Department of Transportation and Public Facilities with a completely different leadership team than the one in place now. I view this report as one of many studies done about AMHS, with analysis, conclusions and recommendations formulated by authors acting as an independent third party. The facts, assumptions, conclusions, and recommendations in the study are solely those of the Alaska University Transportation Center.

This is not to imply the report has no value, but there have been many changes in AMHS since 2006 when the data used to form the foundation of the report was collected. These changes include management actions taken to bend the cost curve downward. AMHS staff works daily to find efficiencies within the system to reduce operating costs. One example is the installation of an automated fuel management system on seven of our ships. We are monitoring the performance of these systems and anticipate some modest fuel savings as a result. In addition, recent labor cost increases have been held at levels below previous annual wage and benefit increases.

There are two important lessons we glean from this report. First, the State of Alaska and my department are committed to maintaining and operating the Alaska Marine Highway System in a safe and reliable manner that will continue to serve hundreds of thousands of passengers and multiple communities. Second, the Alaska Marine Highway System is not, and will not be, a profit generating operation. It will continue to require ongoing state fiscal support to provide this important transportation mode of service to the traveling public. Therefore, it is critical to reasonably contain costs while serving our communities and residents. Efficiency is the key to success in achieving that goal.

If you have questions regarding the study, please do not hesitate to call me at 465-3901 or the study's author, Dr. Paul Metz.

Sincerely,

Marc Luiken
Commissioner

"Get Alaska Moving through service and infrastructure."

Alaska Marine Highway System Analysis

Phase I: Establishment of System Baseline (Chapters 1 - 7, with updated Chapter 5)
Phase II: Alternatives Analysis (Chapter 8)
Phase III: Public Involement and Analysis (Chapter 9)

Prepared for:

Alaska Marine Highway System
Alaska Department of Transportation
Office of the Commissioner

Prepared by:

Alaska University Transportation Center
Institute of Northern Engineering
University of Alaska Fairbanks

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CO-AUTHORS:

UNIVERSITY OF ALASKA

DR. PAUL METZ, PRINCIPAL

MR. MARK TAYLOR, P.E.

HDR

MR. TOM BRIGHAM

MR. STEPHANE LAROCQUE

INFORMATION INSIGHTS, INC.

MS. JANA PIERCE

MCDOWELL GROUP, INC.

MS. ASHLEIGH ARLEDGE

MR. JIM CALVIN

MS. ERIN HARRINGTON

MR. SCOTT MILLER

VAN HORNE INSTITUTE

MR. BOB LINGWOOD

MR. DAVE MARSHALL

MS. TERESA WATTS

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PREFACE

The systems analysis of the Alaska Marine Highway System (AMHS) describes the AMHS mission, reports performance, and presents financial and operating scenarios that examine intermediate (five to ten years) and long-term (more than ten years) outcomes. The analysis considers the multi-modal transportation needs of AMHS users, the needs of the coastal communities of Alaska served by the AMHS, and the resources available to fulfill these needs. The first of three reports, the Phase I report establishes baseline data and identifies potential options to reconfigure AMHS resources and assets to improve operating efficiencies and promote the long-term health of the system.

This systems analysis is being prepared for The Alaska Department of Transportation and Public Facilities (DOT&PF), which will use the information provided at its discretion. The planning process and the future drafting of a planning document are responsibilities of DOT&PF.

Of the 11 vessels in service that served 32 ports in 2007, only four vessels are less than ten years old (*Kennicott, Fairweather, Lituya,* and *Chenega*). The four oldest vessels were constructed in 1963 (*Malaspina, Matanuska, and Taku*) and in 1964 (*Tustumena*). The aging fleet requires constant maintenance to keep it afloat, and these maintenance requirements often result in unpredicted downtimes, which affect the dependability of the system. Dependability is essential to attracting and maintaining traffic and revenue. The timely replacement and refurbishment of old vessels will require funding sources in addition to the federal programs relied on in the past.

From 2007 through 2009, AMHS has made many positive changes that have resulted in improvements to the service provided. The following comments by AMHS staff describe these accomplishments:

- "AMHS has recently revised the operating plan for FY 2009, which we believe focuses on user needs by providing regular and convenient schedules. Eight of the eleven vessels in the fleet are deployed on set daily or weekly schedules that are consistent, convenient times. This schedule is endorsed by MTAB and, as our base schedule, will be in place for at least 3 years. AMHS has balanced efficient deployment of vessels with fiscal responsibility. AMHS will continue to seek input from MTAB on schedule development. We have a very good relationship with the MTAB."

- "We have improved service in Lynn Canal, including Haines and Skagway, by redeploying the *Malaspina* from the Bellingham run. This reinstates the connection between Haines and Skagway. Additionally it is this deployment of the *Malaspina* that allowed for the *Fairweather* to provide the increased service that Sitka has been requesting for several years. We are also working to have dock modifications made in Angoon so the *Fairweather* can provide fast ferry service to this community that has also been complaining of lack of connectivity."

- "The communities of Cordova and Valdez in Prince William Sound have had and will have again great service once the *Chenega* gets back on line and the *Aurora* returns to service from her overhaul."

- "Metlakatla service with the *Lituya* is excellent."

- "We are adding an additional Aleutian run this spring in response to the need of the fishing community."

- "We are responsive to communities by routinely working with mayors to consider school and community events and activities in our scheduling efforts."
- "Ridership is growing, and much of that growth is due to the fact that we are providing better service for Alaskans. We are preparing a study on fares to determine if they are appropriate and/or what fares need to be adjusted."
- "Over the past 2 years, AMHS has curtailed spiraling operating costs while striving to improve levels of service provided to our customers. AMHS has also been engaged in labor negotiations with three shipboard unions since October 2007. We are also engaged in a Systems Analysis that will aid in charting the course of AMHS for the next 30 years. This effort will address problems associated with our aging fleet, and will include a vessel replacement plan."

The AMHS plays a pivotal role in transportation for many coastal communities, but it does so at significant cost. The system generates approximately $50 million in annual revenues, but requires an annual operating subsidy approaching $100 million. This subsidy does not include the full life-cycle costs to the State of Alaska of owning and operating the system.

Options available to AMHS to reduce costs include providing day boat service only (which lessens crew overtime), replacing and modifying vessels to improve efficiency, laying up vessels, selling vessels, eliminating low-ridership routes, eliminating "tourist" routes, expanding revenue generating routes, and investing in smaller and/or less-expensive vessels. Many of these options would result in a significant decrease in ferry service and greater reliance on air, barge, and roads. It must be recognized that public transportation systems generally require a subsidy. Therefore, it is important that all options considered weigh service needs against corresponding ownership and operational costs in the interest of developing a transportation system that delivers service most efficiently.

EXECUTIVE SUMMARY

The Alaska Department of Transportation and Public Facilities (DOT&PF) has contracted with a team of consultants, led by the University of Alaska Fairbanks, to conduct a comprehensive analysis of the Alaska Marine Highway System (AMHS) and make recommendations that will further its mission and objectives.

The analysis has involved:

- Comparative analysis of British Columbia Ferry Services and AMHS historical financial, passenger and service offering data;
- A comprehensive, life cycle costing of six service options and associated socio-economic analysis; and
- A public involvement program.

State controlled ferry service is now in its 7th decade. Over this period the mission of for the service has remained very similar. The first reference to a mission, published in 1960, remains much the same as the current mission that is set out below:

> "The mission of the Alaska Marine Highway System is to provide safe, reliable, and efficient transportation of people, goods, and vehicles among Alaska communities, Canada, and the "Lower 48," while providing opportunities to develop and maintain a reasonable standard of living and high quality of life, including social, education, and health needs."

The AMHS service has grown and evolved since its inception. Today 11 vessels serve 32 ports transporting more than 300,000 passengers, 100,000 cars and 3,400 freight vehicles annually. Routes stretch over 3,700 miles serving Southeast Alaska, Prince William Sound, Kodiak Island and the Aleutian Islands. AMHS plays an important role in the economies of these regions and in Alaska's transportation system.

The cost of living in rural communities served by AMHS is significantly reduced because of the relatively inexpensive cost of transporting goods on the AMHS and the opportunity for rural residents to travel to regional hubs for goods and services. The AMHS also provides infrastructure necessary for many businesses, contributing to local economic development.

In Fiscal Year (FY) 2007, AMHS funding consisted of $96 million in general funds from the State of Alaska and $48 million from FY 2007 AMHS revenues. Eighty percent of FY 2007 funds ($115 million) were spent within the state.

Direct economic impacts of AMHS included 960 jobs for Alaska residents, with $84 million in payroll (including benefits). Additionally, the AMHS spent $26 million in support of system operations and another $5 million in capital expenditures. The indirect impacts, or circulation of direct expenditures throughout the Alaska economy, accounted for an additional 480 jobs and $58 million in spending, including payroll expenditures — a multiplier of 1.5. Therefore, the total economic contribution of the system to the State economy is estimated at $173 million.

The socio-economic analysis indicates the important role that AMHS service plays in sustaining many coastal communities. It also concludes that increased service is not a key factor in the generation of new economic activity.

Alaska's ferry service also faces several challenges. Much of the fleet is old and in need of major capital investment or replacement. Labor costs that account for 48% of total expenditures have grown 36.5% over the past 7 years, 4.1% per year or 1.7 times the growth of the CPI. Expenditures for fuel have increased rapidly and are subject to significant price fluctuations.

AMHS is highly subsidized and fares are low, in economic terms, to generate travel and socio-economic benefits derived from the movement of people and goods. Revenue has not kept pace with expenditures, leading to subsidies in excess of 70% of total AMHS System costs and ongoing pressure for further increases.

In October 2007 the Alaska Marine Highway management team prepared a Short-Term Operating Alternative Analysis. The entire Alternative Analysis is attached as an Appendix to this Chapter. The Short-Term Operating Alternative Analysis was predicated on the premise that AMHS service provided for Fiscal Year 2008 would be duplicated for Fiscal Year 2009 plus an additional $9.6 in FY 09 for ship Capital Improvement Projects (CIP).

The implementation of Option 4 of the Short-Term Alternatives, reduction of cross-gulf service has not only provided AMHS with the opportunity to demonstrate cost control within projections but has resulted in the maintenance of consistent vessel schedules. These consistent schedules have resulted in increased user satisfaction as demonstrated by decreased complaints to staff and management as well as to the Marine Transportation Advisory Board.

The selected Short-Term Operating plan for FY09 had a projected budget of $138.0 million. The actual FY09 Operating Budget was $142.0 million. The variance of approximately $4.0 million was a function of higher fuel costs, higher travel costs, and higher shore-side costs than projected. The variance was within 3% of the projected budget. Thus the AMHS management and staff demonstrated the ability to control costs even in a period of significant economic uncertainty.

Service changes implemented in FY 09 reduced expenditures and checked the rapid subsidy growth over previous years. However, long-range financial analysis concludes that there will be continued pressure for subsidy growth to maintain the current service.

Sensitivity analysis has shown that annual tariff increases of 10% for each of the next 10 years would increase the recovery of expenditures from business revenues from 35% to 50%. It is equally important to note that such increases deter a significant number of trips (a 22% decline in ridership is projected), thus defeating the broader socio-economic objectives. This result demonstrates the extent to which AMHS operates in an expenditure-control rather than a revenue-driven business paradigm.

Given this paradigm, it is important to improve the sophistication of cost control and performance reporting techniques and systems; as well as, undertaking comprehensive, longer-term analysis for all service and tariff proposals.

Work Program

The contracted work divides into the following three phases.

Phase I (Chapters 1-7) establishes baseline data and identifies options that may improve operating efficiencies and promote the long-term health of the system. The financial and operating conditions of the FY 09 service plan are examined as well as management and planning practices.

The Phase 1 analysis, completed in September 2008, provides a preliminary life cycle cost analysis utilizing the data and assumptions available at that time. After the completion of Phase 1 and during the research and analysis for Phase 2 several refinements were made to the schedule and process to complete the work; therefore, some dates and actions referred to in the Phase 1 document were not carried out as described. Likewise, new data and updated data were used in Phase 2. The feedback received on the Phase 1 report assisted with the refinement of several modeling assumptions.

Editorial changes have not been made to the Phase 1 report. In any instances where the reader finds differences between Phase 1 and Phase 2 information, the latter provides the most accurate result.

Phase II (Chapter 8) provides a comprehensive life cycle cost analysis of six service options.

Another notable variation between Phase I and Phase II regards the Juneau Access Highway assumptions and their potential impact on the Marine Highway System. The basic conditions surrounding the proposed Highway have changed since Phase I. Therefore, the Phase 2 analysis does not include discussion of the Juneau Access Highway.

Phase II and Phase III are conducted concurrently. Phase III (Chapter 9) addresses public input on the six service scenarios.

Service Scenarios and Life Cycle Costing

The life cycle costing model, employed by consulting firm HDR, is a powerful analytical tool and provides DOT&PF with its first comprehensive life cycle costing of the AMHS.

Six service options were selected for detailed financial and preliminary socio-economic analysis. Five of the six options are fundamental scenarios, illustrating the long-term ramifications of maintaining the current service program, reducing service or expanding service with the existing fleet. The remaining option considers a larger fleet with the addition of Alaska Class ferries and increased service in Southeast Alaska, mainly in the Lynn Canal.

Status Quo: AMHS implemented a new service plan in FY09 based on extensive stakeholder input, analysis by AMHS professionals and debate in the legislature. It is referred to as the Status Quo. This plan reduced service from previous levels and successfully contained total expenditures and State subsidy while maintaining a large proportion of passengers and the associated revenue. A very similar service plan was repeated in FY10.

Understanding the longer term affordability of the current service offering is an important starting for DOT, given the rate at which AMHS labor costs have been increasing, the volatile nature of the fuel prices and the upward pressure on subsidies.

To ascertain the implications of a fleet replacement, a variation of the Status Quo was modeled replacing Malaspina with a new Alaska Class ferry in FY14, Option 1B.

The life cycle cost analysis of the Status Quo estimates a total annual average subsidy, in today's dollars, of $206.4 million. Option 1B, where the Malaspina is replaced with a new Alaska Class ferry, results in an almost identical average annual subsidy, $206.8 million; however, service reliability is likely to be enhanced.

The anticipated operating savings of the new ship, as compared to Malaspina are offset by the need to use Columbia and Kennicott to a greater extent delivering trips that cannot be made by the Alaska Class. The uncertainty in estimating the cost of major refurbishment of the Malaspina also lends support for its retirement and replacement.

Service Reduction Options: Option 2A models the retirement of Malaspina, AMHS' highest priority ship retirement and Option 2B models the retirement of Kennicott, the ship with the highest operating cost.

Analysis of the economics of the AMHS operation and that of other ferry companies shows that material cost reductions only occur when service is reduced to the point where one or more ships, their crews and associated overhead expenses become redundant.

Both service reduction options (retirement, without replacement of either Malaspina or Kennicott) have a material, positive impact on the level of State subsidy. From the perspective of the Total AMHS system, the analysis projects reductions in the average annual financial assistance of $24.6 million or $20.5 million for Options 2A and 2B, respectively. The average annual financial assistance required to support AMHS operations is projected to be $10.8 million lower than in the Status Quo if Malaspina is retired and $16.0 million with the retirement of Kennicott. Such service decisions must be made within the context of the overall service delivery objectives and alternate transportation modes available to the affected communities.

Service Expansion: The next scenario, Option 3 Service Expansion, models the service plan delivered in FY06 for a 20-year period. This option maximizes the use of the existing fleet with an additional 26 weeks of service, as compared to the Status Quo. The result is an average annual increase to the State subsidy to support AMHS operations of $6.4 million while offering limited added socio-economic benefit.

Transportation Plan Option: The final scenario has its genesis in the 2004 Southeast Alaska Transportation Plan but only considers the introduction of additional Alaska-Class vessels and a service increase in the Southeast. Transportation planners have assisted the consulting team to refine ferry and road combinations based on changes that have occurred since the plan's publication. Option 4 entitled "Multiple Alaska-Class Ferries" sees the replacement of two mainline vessels with three Alaska-Class Ferries to provide service within Lynn Canal between Haines, Skagway and Juneau as well as between Prince Rupert and Ketchikan.

Conclusions

Five primary conclusions have resulted from the comparative analysis of AMHS historical data and BCFS, the socio-economic analysis and the life cycle costing.

1. The 12 year period from FY95 to FY07, described under "AMHS Business Paradigm', experienced a 96% growth in total expenses, a 15% growth in revenue that resulted in a 340% increase in State subsidy. Service changes implemented in FY08 significantly moderated this trend. However, the historic growth in the gap between expenditures and revenue will continue under the Status Quo option.

2. A material reduction in subsidy necessitates service reductions to the point where a ship can be retired and sold. Due to the different operating characteristics of the AMHS fleet, the community impact varies with each specific ship disposal and requires more detailed consideration in any ongoing evaluation of options involving ship disposal.

3. Regular, significant fare hikes are required to increase the system's cost recovery. Rate increases of three times CPI are not sufficient to absorb anticipated wage increases, let alone other cost escalation. Yet major fare increases will result in a loss of ridership. For AMHS to transition to a business model that recovers the majority of expenditures from user revenue requires a significant adjustment to both service and price.

4. Ship replacement of one or more existing vessels with Alaska Class ships will increase the subsidy requirement, particularly in Option 4 where the fleet size increases. In subsidized businesses, the replacement or addition of major assets is more costly than refurbishment. Intuitively, new ships are more reliable than old refurbished vessels; however, supporting data is difficult to obtain. A notable investment must be made to either replace or extend the life of ships. The decision is based on the need to maintain reliability and the social and economic benefits of the service rather than the cost containment. When replacing vessels, AMHS must pay careful attention to the longer-term service requirements and the expenditure and the subsidy implications of the investment to ensure that the desired service levels are affordable.

5. Service expansion will not generate revenue sufficient to recover the added expenditure. The socio-economic impacts of more general expansions are relatively minor. Service expansion must be strategic, focused on specific markets, and designed to achieve specific purposes.

The detailed results of the project's analyses, the modeling of the six service scenarios and the above conclusions are designed to aid decision makers in forming longer range service and management strategies for AMHS.

Next Steps:

Public consultation is performed under phase III (Chapter 9) with a public survey of roughly 600 randomly selected households drawn from communities directly served by the AMHS. Phase III collects a variety of household and community level data related to AMHS service, including understanding of service costs, price sensitivity, service preferences, willingness to consider alternative modes, and other information. The survey also gauges public response to and support for various AMHS service alternatives (defined in terms of system structure, cost and service).

The Marine Transportation Advisory Board (MTAB) plays a role in decision-making for AMHS future directions and development of the preferred service alternatives. This eleven member board, was established by Executive Order in 2003 and was later mandated by a state statute in 2008 (House Bill 294). The Board is charged with providing nonbinding recommendations to the commissioner of DOT&PF on public policy related to marine transportation functions. MTAB will independently evaluate service alternatives identified by DOT&PF during this systems analysis and report its findings and its own recommendations to the commissioner and the public.

The Commissioner of DOT&PF and his staff will thoroughly review this report, its accuracy and technical merit. Following this vetting, the Commissioner shall make a determination as to the role of this report and its economic model within the department's regular transportation planning processes. This report is intended to serve as a tool available to state decision makers in formulating long term planning and investment strategies for AMHS and its support infrastructure.

CHAPTER 1

REVIEW OF MISSION STATEMENTS AND PERFORMANCE MEASURES, 1960 TO 2008

1.1 SYSTEMS ANALYSIS OVERVIEW

The Alaska Department of Transportation and Public Facilities (DOT&PF) has asked a diverse study team to prepare a systems analysis that provides review of various aspects of the Alaska Marine Highway System (AMHS). The work consists of identifying system financial and operation challenges, examining management and planning practices, and recommending methods and tools to ensure safe, reliable ferry service in keeping with the mission and objectives of the AMHS. Headed by the University of Alaska Fairbanks, the project team for the system analysis includes the McDowell Group, Information Insights, HDR Alaska, Inc., and the Van Horne Institute.

The goals of the systems analysis are to develop a mission statement, performance indices, and intermediate (five- to ten-year period) and long-term (greater than ten-year period) financial and operational scenarios for the AMHS. The analysis considers the multi-modal transportation needs of AMHS users, the needs of the coastal communities of Alaska served by the AMHS, and the resources available to fulfill these needs.

The systems analysis is being completed in three major phases. Phase I, presented in this report, is a review of the history of the development of the AMHS and a compilation of data on the current state of the system. In addition to presenting baseline data, this report identifies potential options to reconfigure AMHS resources and assets to improve operating efficiencies and promote the long-term health of the system.

Phase II will build on the preliminary list of options from Phase I, developing additional alternatives. During Phase III of the systems analysis, public input on the entire spectrum of financially and operationally rational scenarios for the operation of the AMHS will be solicited. Phase II and Phase III will be conducted concurrently and in an iterative fashion; new alternatives will be developed from public input as the Phase II internal analysis of the scenarios continues. These scenarios will be compared as a function of their respective total life-cycle costs. Decision-makers within the State Administration and the State Legislature will then have the data to select a preferred alternative or alternatives for the intermediate- and long-term operation of the AMHS within the context of the State's ability and willingness to support the level of subsidy for those alternatives.

1.2 MISSION STATEMENTS

The first and most fundamental step in the final design of a functioning system is the development of a succinct and measurable mission statement. For public systems, identification of a mission statement requires input from the public, the administrators of the system, and the governance of the jurisdiction (in this case the State Administration and the Legislature of the State of Alaska).

The Phase I report does not attempt to pre-empt the State Administration, the State Legislature, or the public in the definition of a succinct and measurable mission statement. A specific mission statement to serve the current

and future AMHS was not developed; Phase II and Phase III activities will provide important input for identification of a practicable and measurable mission statement for AMHS.

Throughout its life, the AMHS has been subject to a variety of guiding statements, objectives, goals, and measures of performance. To understand why the system grew from a single-vessel fleet and developed into its current form, it is useful to review the legacy of guiding doctrine.

As part of the Phase I focus on reviewing the history of AMHS development, historical mission statements and other guidance on system purpose were compiled. The text below provides verbatim excerpts from relevant sources.

1.2.1 Circa 1960 Document

The mission of the Alaska Marine Highway System is to provide safe, reliable and efficient transportation of people, goods, and vehicles among Alaska communities, Canada, and the "lower 48" while providing opportunities to develop and maintain a reasonable standard of living and high quality of life, including social, education and health needs.

1.2.2 1960 Southeast Conference

The mission of the Alaska Marine Highway System is to serve the communities of Alaska where development of a land highway system to meet their needs would not be feasible. It is to be developed and operated as a dynamic part of the intermodal transportation system of the State, Federal, and International Highway Systems. It shall accommodate passengers, freight, and vehicle transportation needs between designated ports.

Specifically, the Alaska Marine Highway System shall:

A. Link community transportation systems with highways throughout the State and the North American continent. In addition, the marine highway should be coordinated to enhance and complement airports and other public and private sector transportation services. Connecting transportation links shall be considered when scheduling the AMHS.

B. Give highest priority service to dependent communities. All management decisions regarding levels, equipment, shore-based improvements and schedules shall be responsive to the essential transportation needs of the user communities.

C. Use of the system shall be maximized through full utilization of available resources to obtain the highest level of services based on individual community needs. Finally, the State of Alaska is committed to continuing the AMHS as a basic and essential transportation service to the user communities. Maintenance, improvement and expansion of equipment and facilities will be provided to accommodate changes in basic transportation needs and patterns of user communities.

1.2.3 1986 Southeast Alaska Transportation Plan (DOT&PF), 1990 AMHS Draft System Plan

The mission of the AMHS is to provide passenger and vehicle transportation among the Alaskan communities in lieu of a cost-prohibitive land highway system that meets the social, educational, health and economic needs of

Alaskans. The plan notes that, Operating policy guidelines (see "Other Relevant Guidelines," below) required to implement the AMHS mission were derived from legislation, relevant literature, and interviews with key individuals in the Executive branch of State government. They establish guidelines for determining a need for service, AMHS' ability to provide service and the criteria for increasing or decreasing existing service. ...If AMHS did not exist, it is not likely that any private sector operation would provide the range of service provided by AMHS to the geographic area it now serves without a subsidy of some sort.

1.2.4 1986 AMHS Draft Master Plan, 1989 AMHS House Transportation Committee

The AMHS serves as a marine mode alternative in lieu of a land highway system, and provides basic access among and between the communities which it serves and the continental surface transportation network. To the extent that capacity and fiscal capability is available to provide services at a level beyond basic access to Alaskan communities, service will be provided to spread system costs over a larger traffic base permitting better service to Alaskans and supporting local economic development.

1.2.5 1991, 1995 AMHS Master Plans

The mission of the Alaska Marine Highway System is to serve Alaskan communities by providing passenger, freight (van), and vehicle transportation among communities where development of a land highway system that will meet social, educational, health, and economic needs of Alaskans is not feasible.

1.2.6 1999, 2000 AMHS Annual Traffic Volume Reports

The mission of AMHS is to serve Alaskan communities by providing passenger, freight (van), and vehicle transportation service between communities without land highway connections. This service helps meet the social, educational, health, and economic needs of Alaskans.

1.2.7 2001 Summary of the Legislative and Fiscal History of the AMHS (Legislative Research Report)

According to DOT&PF publications, the current mission of the AMHS is to provide safe, reliable, and efficient transportation to the people, goods, and vehicles among Alaska communities, Canada, and the "Lower 48," while providing opportunities to develop and maintain a reasonable standard of living and high quality of life, including social, education, and health needs.

1.2.8 2003-2006 AMHS Annual Traffic Volume Reports

The Alaska Marine Highway System (AMHS) serves Alaskan communities by transporting passengers and vehicles between coastal communities. This service helps meet the social, educational, health, and economic needs of Alaskans.

1.2.9 2007 AMHS Website

The mission of the Alaska Marine Highway System is to provide safe, reliable, and efficient transportation of people, goods, and vehicles among Alaska communities, Canada, and the "Lower 48," while providing

opportunities to develop and maintain a reasonable standard of living and high quality of life, including social, education, and health needs.

NOTE: Many of the documents listed above (at least as early as 1991) include the statement below:

> The AMHS is designed to provide basic transportation services to these communities--transportation that allows community access to health services, commodities, legal services, government services and social services; transportation that meets the social needs of isolated communities; and transportation that provides a base for economic development.

1.3 OTHER RELEVANT GUIDELINES

1.3.1 GOALS OF THE 1986 SOUTHEAST ALASKA TRANSPORTATION PLAN (DOT&PF):

Goal: To provide a means of serving the transportation demands of Alaskan residents, and to provide the transportation services necessary to support the regional economy, while recognizing that these aims must be accomplished in a fiscally responsible manner.

Objectives: The objective in defining the plan was to find a balance between service levels and cost where service levels included:

- providing capacity to meet demand;
- maximizing service frequency;
- minimizing travel time;
- minimizing travel cost;

and cost objectives included:

- minimizing capital expenditures;
- minimizing system operating deficits.

Policies:

- Ensure that all residents of Southeast Alaska have access to at least a minimum transportation service.
- Encourage the provision of transportation in the Region by private operators where they are able to provide an adequate and competitive service.
- Define potential transportation/utility corridors and encourage the U.S. Forest Service and mining interests to construct future resource road development within these corridors where practical.
- Avoid duplication of transportation service by the State except in the interest of public safety or service reliability requirements.
- Avoid duplication of public and private transportation operations.

- Promote the concepts that different modes will offer a natural competitive advantage in different regions and encourage development of modes best suited to the community's specific needs.
- Provide opportunity for effective public participation in transportation decisions.

1.3.2 1993 Long-Range AMHS Business Planning Analysis (Erickson & Associates)

The Alaska Marine Highway System has a proud tradition of cost-effective service to Alaska, first as the primary surface transportation link to the Southeast and Southwest Alaska communities lacking mainland highway connections, and—in a role of increasing economic importance to the state as a whole—as a gateway for visitors.

1.3.3 Goals of the Current (2004) Southeast Alaska Transportation Plan (DOT&PF)

Goal 1: Transportation System Efficiency – Provide regional transportation facilities and services in the most efficient and cost-effective way possible

Objectives:

- Implement transportation improvements that reduce overall regional system operating costs.
- Develop ferry route options and road-shuttle ferry combinations to improve service at lower cost to the user and the state.
- Develop airport and seaplane facility improvements that improve the efficiency of air transportation.
- Provide public infrastructure and services in support of a healthy competitive commercial environment in the provision of commercial air, marine, and land transportation services in Southeast Alaska.
- Utilize ferries designed to serve specific travel markets in the most efficient manner.

Performance Measures:

- Travel time between communities.
- Cost to travel between communities.
- Transportation costs for person trips and for goods movement.

Goal 2: Transportation Mobility and Convenience – Improve the mobility and convenience of the regional transportation system in Southeast Alaska

Objectives:

- Provide more frequent transportation services that reduce duration between opportunities to travel between communities.
- Reduce the time required to travel between communities through faster modes of transportation.

- Provide more choices of transportation modes or options for travel between communities at convenient times of the day.
- Improve reliability of service.
- Improve connections and scheduling between transportation modes to reduce waiting times.
- Provide convenient "real time" information to travelers so that they can plan their travel more efficiently.

Performance Measures:

- Average time required to travel between communities in Southeast Alaska.
- The likelihood that travelers in any community in Southeast Alaska can make the journey to and between the communities of Ketchikan, Juneau, or Sitka in one day, without having to spend the night en route.
- Frequency and timing of regional transportation connections between communities.
- (Examples include the number of ferry stops per week, number of commercial flights per week, schedule of arrivals and departures of ferries and air service, and ability to drive between communities.)

Goal 3: Economic Vitality – Support local economic development and strength through the provision of adequate and affordable transportation for people, goods, and vehicles

Objectives:

- Develop transportation improvements that reduce user costs, increase mobility, and improve level of service.
- Provide public infrastructure and services in support of a healthy competitive commercial environment for the provision of commercial air, marine, and land transportation services in Southeast Alaska.
- Provide public transportation services to bridge transportation gaps that are uneconomic for commercial carriers to serve.

Performance Measures:

- Reduction in user costs.
- Improvements in level of service.
- Changes in the amount of travel to and from individual communities following transportation system improvements.
- Post-construction economic impacts of transportation investments in local communities.

Goal 4: Transportation System Safety – Improve the overall safety and reliability of the regional transportation system in Southeast Alaska

Objectives:

- Implement improvements in air and marine navigation systems.
- Implement safety improvements to the regional airport and highway infrastructure.
- Provide pilot and driver education safety programs.
- Support safety inspections of aircraft, vehicles, and marine vessels.
- Increase modal choices.

Performance Measures:

- Accident rates per 100,000 people by transportation mode.
- Frequency of incidents that interrupt inter-community travel in Southeast Alaska.
- Frequency of opportunities for isolated community residents to travel to health care providers.

Goal 5: Long-Term Funding Stability – Secure stable long-term funding to implement the Southeast Alaska Transportation Plan

Objectives:

- Pursue federal funding to the fullest extent possible in support of implementation of Southeast Alaska Transportation Plan (SATP) transportation improvements.
- Ensure that funds generated by specific transportation facilities and services are returned to support the operation and maintenance of that facility or service.
- Foster partnerships among local communities (public and private sectors) to provide inter-community transportation facilities and services.

Performance Measures:

- Total transportation resources by source available for Southeast Alaska.
- Stability and predictability of funds over time.

Goal 6: Consultation with Affected Communities, Tribal Entities, Business, and the Public and Provision of the Opportunity for Public Comment – Inform and provide opportunity for community, tribal, business, and public input

Objectives:

- Consider affected community, tribal, business, and public interests in decisions about transportation system needs and investments.

- Encourage participation by affected communities, tribes, businesses, and the public in review and comment on the development and provision of transportation facilities and services.
- Encourage participation by governmental resource agencies and conservation groups in review and comment on the development and provision of transportation facilities and services.

Performance Measures:

- Number of meetings and opportunities for local government, community, tribal, business, and public input into the planning and project development process.
- Number of opportunities and media utilized to inform community, tribal, business, and public interests.

Goal 7: Continuation of the Planning Process – As appropriate, integrate political and project (environmental and design study) decisions into the SATP by amendment

Objectives:

- Maintain a continuing and dynamic regional planning process.
- Carry out detailed social, economic, and environmental studies of regional system plan components during project planning and development phase.
- Periodically update the SATP in response to the findings, recommendations, and decisions issuing from project planning, environmental, and design studies.
- Periodically update the SATP as appropriate in response to political decisions with respect to improving the regional transportation system and providing state transportation services.

Performance Measures:

- Up-to-date content of the SATP.
- Timely amendments to incorporate new information between periodic updates.

CHAPTER 2

A HISTORY OF THE ALASKA MARINE HIGHWAY SYSTEM AND DESCRIPTION OF THE CURRENT SYSTEM, 1951 TO 2008

As this chapter explains, marine highway service to territorial Alaska communities began in 1949, and the name Alaska Marine Highway System was formally adopted in 1983. AMHS is a department within the DOT&PF, and the term has also come to mean the service, vessels, and other infrastructure of the Alaska marine highway.

2.1 TERRITORIAL FERRY SERVICE

In 1949, a privately owned company, the Chilkoot Motorship Lines began operating a small, surplused amphibious assault ship, the *M/V Chilkoot*, between Juneau, Haines, and Skagway. By 1951, the ferry run was failing economically. The Territory of Alaska purchased the ship and continued the service.[1] In 1957 the Territory replaced the aging *Chilkoot* with the *M/V Chilkat*, a ship that would go on to be the very first State-owned ferry. When Alaska entered into statehood in 1959, the *Chilkat* was transferred to the new state along with other territorial assets.

2.2 NEW STATE VOTES TO FINANCE A MARINE HIGHWAY SYSTEM

The first Alaska Legislature, meeting in 1959, approved the Alaska Ferry Transportation Act.[2] The act authorized the new Department of Public Works to acquire ferry terminals and to regulate ferry operators. Through this legislation, the State continued the territorial practice of leasing the *Chilkat* to a private contractor, who operated it, while government handled the maintenance, insurance, ticketing, and ferry agents. It would be another four years before the new state formally established the Division of Marine Transportation in 1963.

In November of 1960, the Alaska Legislature put a general obligation bond issue before voters, proposing to finance investment in a marine highway system.[3] The voters were asked to decide whether the State should spend $15 million to acquire three ferries and seven docking facilities for the Southeast Alaska system, and $3 million for a ferry and docking facilities in Southwest Alaska.[4] The bond to finance the ferry system, "Bond Proposition 2," won by a margin of 2,400 votes out of the 52,000 ballots cast. The Alaska Legislature authorized the Department

[1] The Territory reportedly made a profit of $277 in that first year. However, by 1952 the Territory began losing approximately $43,000 per year on the tiny ferry system due to ferry repair, maintenance, and terminal upkeep.
[2] Chapter 189 of the Session Laws of Alaska 1959. The exact language was, " Acquire ferry terminals, issue certificates of public convenience and necessity to ferry operators, provide standards for rates and services of ferry operators, provide enforcement by the Department, and authorize expenditures."
[3] The lead ferry advocacy group at the time was Southeast Conference, formed in 1958 as an association of communities to advocate for establishment of the Alaska Marine Highway System. The Southeast Conference remains in existence today.
[4] Chapter 170 of the Session Laws of Alaska 1960.

of Public Works to have ferries constructed.[5] These two pieces of legislation led to the formation of the AMHS as it is known today.

2.3 THE ALASKA MARINE HIGHWAY BEGINS OPERATIONS

Operations of the Alaska marine highway began in 1963. Three of the voter-approved vessel additions to Alaska's one-ferry fleet were delivered and began serving Alaska communities in 1963. These included the *M/V Malaspina* in January of 1963, the *M/V Taku* in April of 1963, and the *M/V Matanuska* in June of 1963. They became Alaska's "mainline" ferries, operating between Prince Rupert and Skagway.[6] Because the *Tustumena* had yet to be built, service in the first year was limited to Southeast Alaska. Communities served included Skagway, Haines, Juneau, Sitka, Petersburg, Wrangell, Ketchikan, and Prince Rupert.

The *M/V Tustumena* was delivered to Alaska in July of 1964 for Southwest Alaska marine operations. Also during that year, the *Chilkat* was moved north to serve Prince William Sound. By the end of 1964, Southwest service included the communities of Homer, Seldovia, Kodiak, Seward, Valdez, Cordova, Anchorage, and Ellamar (near Tatitlek).

With the addition of service in Southwest Alaska, Alaska's marine highway was in place, with 5 ferries and 16 ports of call. In 1964, the first year of service to both Southeast and Southwest Alaska, more than 100,000 passengers embarked on the ships, along with nearly 22,000 vehicles. By 1968, traffic levels exceeded 130,000 passengers and 39,000 vehicles. Financially, the mainline service in Southeast Alaska was "breaking even" (revenues roughly matching vessel operating expenditures) and the overall system was recovering almost 90 percent of vessel operating expenditures from revenues.

2.4 SYSTEM EMERGENCE

The southern terminus of the original ferry route was in Prince Rupert. The State of Alaska did not initially establish Seattle as its southernmost port because Canadian ferries already provided connecting service between Prince Rupert and Seattle. However, deterioration of Canadian service led to an extension of the ferry system to Seattle in 1967.

Adding Seattle required the acquisition of a new ship.[7] In 1966, a second bond package of $15.5 million was put before the voters to construct two more ferries. Not long after the passage of this bond package, the *M/V Wickersham* was purchased in Norway and added to the fleet in 1968.[8] Along with the addition of Seattle, port calls in Vancouver, Port Lions, Tatitlek, and Whittier were also added by 1968.

Unfortunately, because the *Wickersham* was of foreign origin, U.S. cabotage laws (commonly referred to as the Jones Act), passed in 1920, prohibited the vessel from carrying goods or people between U.S. ports. It was thus

[5] Chapter 50 of the Session Laws of Alaska 196. Many believed that the $18 million investment would be the extent of necessary funding for the system. Analysts predicted that the Southeast ferry system would see revenues after only three years, and that after four years the system would "be a big money-maker, with an initial net profit of 14.3 percent." While revenues were actually higher than predicted, so were operating expenses.

[6] Skagway did not have a land highway connection to Canada until 1978.

[7] The route from Prince Rupert to Seattle was classified as "oceangoing" and none of the three mainline Alaskan ferries was considered legal for ocean routes. The State solved this problem by sending a ferry to Seattle and then asking the federal government to reclassify the route as inland passage, which it did. But the State still wanted a new ferry that would better handle the open water along some of the route.

[8] The original plan was to build a ferry, but the three-year construction period and $10 million dollar price tag of a new ship led the State to buy an existing vessel. The second ferry purchased with 1966 bond funds was the M/V Bartlett which joined the fleet in 1969.

required to stop in Prince Rupert, in addition to Seattle, thereby increasing the expense of the route considerably. Purchase of the new ship was completed with the understanding that it would receive a waiver to this law, or that the law would be repealed altogether. However, neither event happened, and the waiver was enacted only after the State of Alaska promised to build a replacement vessel (the *M/V Columbia*). This meant an early end for the Wickersham, which was put up for sale in 1973 and finally sold in 1974 for $7.5 million.

In 1968, a third ferry bond package was placed before voters. This time the proposition failed. George Rogers commented, "The system unfortunately suffers from a failure to approximate the public expectations, which were grossly over-inflated during its initial promotional stage. Too many Alaskans expected it to be self-sustaining in spite of the fact that even private common carriers require subsidies." In 1970, advocates of the ferry system tried again, and pushed forward another bond proposal. This time the measure, "Bond Proposition 10," passed by a narrow margin, and provided an additional $21 million for the marine highway system. The purpose of these funds was to lengthen mainliner ships, purchase two smaller ferries for shuttle service in Southeast Alaska, and construct terminal facilities.

2.5 SYSTEM GROWTH AND EXPANSION

Thanks to passage of the 1966 and 1970 bonds, funds from the sale of the *Wickersham*, and Federal-Aid Highway funds, four more vessels and several new terminals were added between 1969 and 1977, and several vessels were lengthened. New ships included the *M/V Bartlett* in 1969, the *M/V LeConte* in 1974, the *M/V Columbia* in 1974, and the *M/V Aurora* in 1977. The *Tustumena*, *Malaspina* and *Matanuska* were each lengthened by 56 feet (in 1969, 1972, and 1978, respectively).[9] New ships and increased capacity meant new ports of call. The communities of Hoonah, Metlakatla, Kake, Hollis, Pelican, Angoon, Tenakee, Sand Point, King Cove, False Pass, Thorne Bay, and San Juan were added in the 1970s.

By 1980, the marine highway system had nine ships and served 30 communities. Ridership had also increased from the marine highway's early days. The system served more than 325,000 embarking passengers and more than 77,000 embarking vehicles in 1980.

2.6 SYSTEM MATURATION

Following the acquisition of the *Aurora* in 1977, no additions were made to the fleet for the next 20 years. Few changes were made to the list of communities visited by Alaska State ferries during this period. Chignik, Unalaska (Dutch Harbor), Cold Bay, and Hyder were added as stops in the 1980s. Seattle service was replaced with service to Bellingham in 1989, thus shortening the sailing time by ten hours. In 1990, the *M/V Chilkat*, Alaska's first State ferry, was sold.

Other administrative changes also took place. In 1983, the Division of Marine Transportation was changed to the Alaska Marine Highway System (AMHS), and relocated within the DOT&PF. In 1990 the legislature established

[9] The *Tustumena* was lengthened to overcome design flaws. The *Malaspina* and the *Matanuska* were lengthened to increase carrying capacity by 20 percent each, without purchasing new vessels.

two funds intended to improve financial management of the system: the Vessel Replacement Fund[10], and the AMHS Fund, also known as the Stabilization Fund.[11]

In the late 1990s, the ferries became part of an international dispute between the United States and Canada over the Pacific Salmon Treaty and allocation of salmon resources. Canadian fishermen felt that Alaska fishermen were harvesting three to four times as much salmon as allowed by the treaty. In 1997, roughly 200 British Columbian fishermen blocked the *M/V Malaspina* from leaving Prince Rupert's harbor for three days. Ferry service to Prince Rupert was suspended for 138 days, from July to December 1997.

The number of people and vehicles served by AMHS continued to grow each year, until service peaked in 1992. In that year, more than 420,000 passengers used the system, along with nearly 113,000 vehicles. From 1992 to 2006, when the most recent data was reported, the system lost both passenger and vehicle traffic on its Southeast routes, which comprise the bulk of AMHS service. There are several theories as to why ridership has declined. In 1992, the Alaska Canadian Highway celebrated a well-marketed 50th year anniversary. Significant improvements to the road that connects Alaska to the lower 48 were completed during that year. The last section of original gavel road was paved in 1992. Traffic on the Southwest route, however, has remained more stable, and vehicle traffic has continued to grow.

2.7 NEW VESSELS

2.7.1 *M/V KENNICOTT*

By the 1990s, several vessels were reaching what officials believed to be the "end of their useful lives." The most pressing need was for a mainliner to replace the *Malaspina*. However, the State wanted more than just a new large passenger ship. State officials wanted a vessel that could travel across the Gulf of Alaska to finally tie together Southeast and Southwest service. They also wanted a ship that could respond to oil spills, something that was missing during the 1989 *Exxon Valdez* disaster, and by meeting this need they could tap into federal emergency vessel funds to build the ship.

The resulting *M/V Kennicott* was completed in Mississippi by Halter Marine in 1998 at a cost of nearly $80 million. The *Kennicott* proved to be a very seaworthy vessel, and for the first time in the history of the AMHS, passengers could travel from Washington State all the way to Southcentral Alaska via ferry. According to the *Milepost*, the *Kennicott* saved motorists up to 2,000 miles in driving. However, controversy followed the construction. Halter Marine sued the state, and the state countersued over issues such as cost overruns, late delivery, mechanical defects, and design revisions. Three years later, the State reached a $1.2 million settlement with a Halter Marine subcontractor.

2.7.2 FAST VEHICLE FERRIES

Another goal of those running the ferry system was to modernize the fleet in an effort to improve service and obtain cost savings. This modernization took the form of fast vehicle ferries. It was theorized that fast vehicle

[10] Established by Chapter 145, SLA 90.

[11] Established by Chapter 193, SLA 90. Instead of AMHS revenues being deposited into the General Fund, as they had been in the past, the AMHS Fund set up an account to return the revenues to AMHS directly, while the Vessel Replacement Fund was intended to be a way to fund vessel-related expenses.

ferries would have less operating costs than conventional ferries because their crews are smaller and because they operate only part of each day or week. The new ships promised to increase the "frequency, consistency and reliability" of Alaska ferry service. A transportation plan was created that focused on the interconnectedness of four new fast vehicle ferries serving shorter routes.[12] Construction of the first two of the four ferries was authorized. Most of the funding to build the *M/V Fairweather* and *M/V Chenega* was obtained through federal sources, including the Federal Transit Administration and the Federal Highway Administration.

Controversy surrounded the fast ferries soon after the *Fairweather* was delivered to Alaska in 2004, and continued after the *Chenega* came online in 2005. The labor negotiations for the first all-aluminum high-speed vehicle and passenger ferry built in the United States, as well as the first vehicle ferry built in the United States to comply with the stringent International High Speed Craft code, were "lengthy and tough." Also, the ships began to experience mechanical difficulties immediately, including having occasional logs sucked into their propulsion systems. Cracks developed in all four of the cylinder liners of the *Fairweather*'s engines. The vessels also had difficulty operating in rough sea and weather conditions, which resulted in more canceled sailings than originally expected, posing a problem for winter scheduling. Also, the fast ferries used more fuel than traditional ferries, and escalating fuel prices meant operations costs that were much higher than originally expected. Finally, the fast ferries were better-suited to longer runs with greater passenger loads.

Governor Murkowski considered selling the fast ferries because their operating costs were too high. Although the ferries were not sold, the two additional ferries that were needed to complete the proposed four-ship system were not authorized by the legislature.

In addition to the fast ferries, ferry officials also added a smaller, less technical ship to the fleet. The *M/V Lituya* began operating between Ketchikan and Metlakatla in 2004. This was the fleet's first ship dedicated to a single shuttle route. Another change to AMHS around this time included moving the headquarters of the system from Juneau to Ketchikan, along with 44 jobs in 2004. Some port call changes were made during this time period. In 2000, service to Hyder was stopped due to expense and lack of ridership. In 2002, service to Hollis was discontinued when the Inter-Island Ferry Authority's *M/V Prince of Wales* began service between Ketchikan and Hollis. At the time, Hollis service represented traffic of approximately 40,000 passengers and 10,000 vehicles per year. Service to Seward was discontinued in 2005 and rerouted to Whittier.

2.8 CURRENT DAY CHALLENGES

In 2008, AMHS faces many obstacles it did not have in its early days that prove to be both expensive and time consuming. Many of the system's earliest vessels had planned retirement dates that have long passed, meaning that the system must continue to operate, maintain, and update an aging fleet. Additionally, the mix of vessels, in terms of age, design, and crew, as well as the various lines of service, creates a significant level of operational complexity that is not seen in most other large-scale transportation providers.

In order to sail to Prince Rupert, B.C., AMHS vessels must continue to be certified under the demanding International Maritime Organization's Safety of Life at Sea (SOLAS) regulations. Security regulations post-September 11, 2001, include new federal rules requiring changes to the physical terminal infrastructure, along with crew training. Creating an efficient, cost-effective ferry schedule that offers high levels of service is

[12] Part of the larger Southeast Alaska Transportation Plan, or SATP.

complicated by current fleet maintenance schedules, labor agreements, Coast Guard regulations, and calls from the legislature for decreased operations spending.

In 2008, nearly 340,000 passengers and 110,000 vehicles traveled along the Alaska marine highway. System routes included 33 regularly scheduled port calls, served by a fleet of 11 vessels.

In recent years, efforts by AMHS to increase ridership have met with some success. System ridership increased steadily from 2006 through 2008, with Southwest traffic reaching historical highs for both passengers and vehicles in each of those years. Southeast traffic also showed steady increases. System-wide, AMHS carried nearly 100,000 vehicles in 2008, a volume that rivals the peak operating years of the early 1990's.

Table 2.1
Ports with Scheduled AMHS Service, 1963 to Present

Operational AMHS Ports	Year Added to AMHS System
Haines, Juneau, Ketchikan, Petersburg, Prince Rupert, Sitka, Skagway, Wrangell	1963
Cordova, Homer, Kodiak, Seldovia, Valdez	1964
Port Lions, Tatitlek, Whittier	1967
Hoonah	1970
Kake, Metlakatla, Yakutat	1974
Pelican	1976
Angoon, False Pass, King Cove, Sand Point, Tenakee	1977-1978
Chignik, Cold Bay, Dutch Harbor	1983-1984
Bellingham	1989
Akutan	1993
Chenega Bay	1996

Note: Discontinued ports are not included in this table. Some communities, such as Yakutat and Tatitlek, have not been continuously served by AMHS since being added to the system.

Figure 2.1a
Embarking AMHS Passengers and Vehicles, 1963 to 2008
Southeast and Mainline System

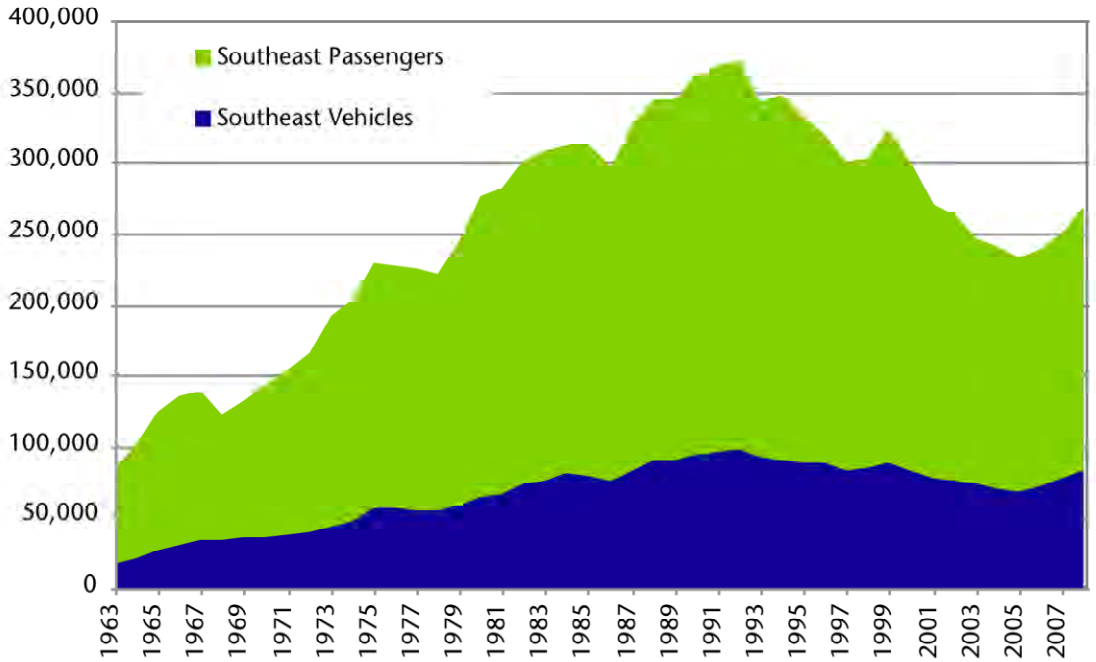

Figure 2.1b
Embarking AMHS Passengers and Vehicles, 1963 to 2008
Southwest System
(Note Scale Difference)

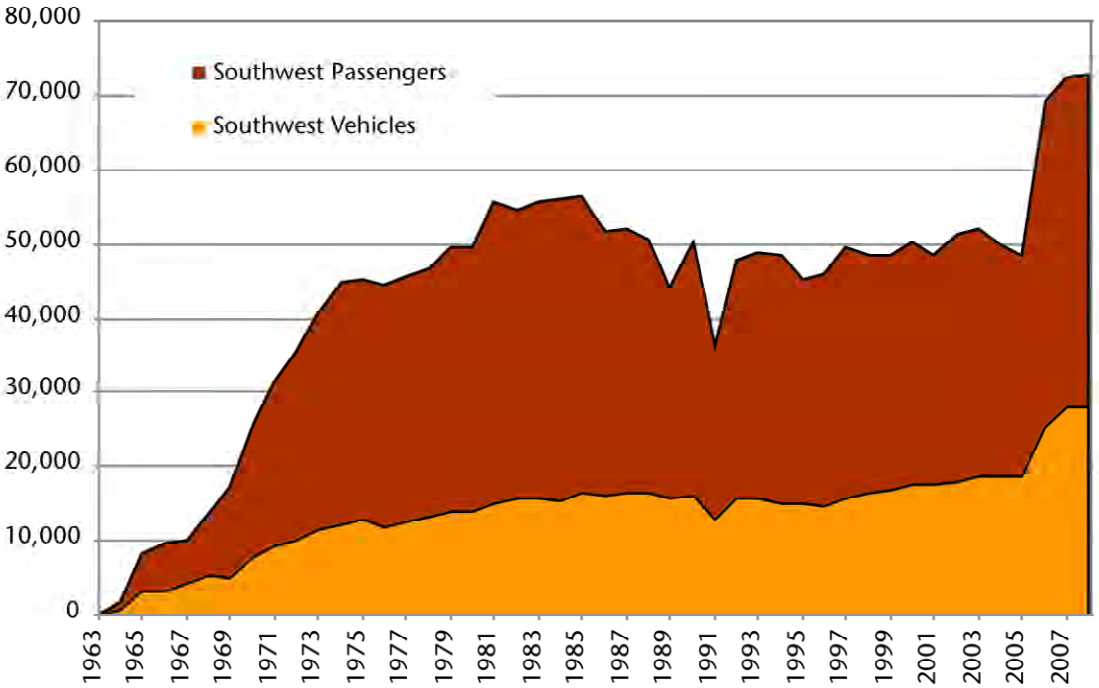

Table 2.2 AMHS Traffic, 1963 to 2008

Year	Southeast Passengers	Southeast Vehicles	Southwest Passengers	Southwest Vehicles	Total Passengers	Total Vehicles
1963	83,975	16,289	0	0	83,975	16,289
1964	101,488	21,378	1,630	547	103,118	21,925
1965	123,722	26,819	8,209	3,184	131,931	30,003
1966	134,560	30,249	9,784	3,289	144,344	33,538
1967	138,063	33,586	9,997	4,176	148,060	37,762
1968	122,285	34,219	13,679	5,238	135,964	39,457
1969	131,298	35,003	17,317	5,017	148,615	40,020
1970	141,885	36,096	25,875	7,838	167,760	43,934
1971	154,441	37,426	31,737	9,250	186,178	46,676
1972	165,801	39,920	35,583	9,886	201,384	49,806
1973	191,154	43,873	40,670	11,339	231,824	55,212
1974	201,962	47,276	44,844	12,256	246,806	59,532
1975	229,455	55,506	45,175	12,810	274,630	68,316
1976	227,777	55,856	44,605	11,834	272,382	67,690
1977	224,964	54,766	45,614	12,526	270,577	67,291
1978	222,150	53,675	46,622	13,217	268,772	66,892
1979	244,678	58,196	49,375	13,858	294,053	72,054
1980	275,778	63,167	49,463	14,021	325,241	77,188
1981	281,632	65,641	55,779	15,058	337,411	80,699
1982	299,538	73,234	54,507	15,606	354,045	88,840
1983	307,782	75,445	55,520	15,911	363,302	91,356
1984	311,459	79,966	55,791	15,544	367,250	95,510
1985	313,147	79,757	56,282	16,509	369,429	96,266
1986	296,070	75,996	51,799	16,029	347,869	92,025
1987	326,644	83,451	52,047	16,524	378,691	99,975
1988	344,209	90,672	50,432	16,642	394,641	107,314
1989	344,389	89,793	44,202	15,743	388,591	105,536
1990	363,122	94,730	50,271	16,310	413,393	111,040
1991	368,780	95,173	36,248	12,860	405,028	108,033
1992	372,680	97,239	47,756	15,656	420,436	112,895
1993	342,613	92,598	48,678	15,696	391,291	108,294
1994	347,998	90,758	48,545	15,245	396,543	106,003
1995	332,712	88,942	45,373	15,031	378,085	103,973
1996	318,864	87,863	46,053	14,809	364,917	102,672
1997	300,653	82,451	49,450	15,878	350,103	98,329
1998	303,076	84,328	48,337	16,490	351,413	100,818
1999	323,540	88,068	48,505	16,954	372,045	105,022
2000	301,176	82,614	50,284	17,521	351,460	100,135
2001	270,443	76,384	48,448	17,562	318,891	93,946
2002	263,040	74,409	51,369	17,994	314,409	92,403
2003	245,818	72,386	52,147	18,586	297,965	90,972
2004	240,666	69,993	49,959	18,620	290,625	88,613
2005	233,667	67,938	48,569	18,580	282,236	86,518
2006	237,965	71,609	69,255	25,461	307,220	97,070
2007	249,310	77,000	72,299	27,913	321,609	104,913
2008	267,927	82,022	72,011	27,809	339,938	109,831

Table 2.3
Profile of Alaska Marine Highway Vessels

AMHS Ferries	Placed in Service	Retired	Original Cost (millions)	Location Built	Length (feet)	Beam (feet)	Domestic Gross Tons	Horsepower	Service Speed Knots	Fuel Use gallons/hour	Crew Capacity	Passenger Capacity	Total Staterooms	Total Berths	Vehicle Capacity (20ft length)	Van Capacity	2006 Embarking Passengers	2006 Embarking Vehicles
Chilkat	1957	1990	$0.33	WA	93.7	34	256	470	10	35	Na	59	0	0	11	na	Retired	Retired
Matanuska	1963		$5.0	WA	408	74	3,029	7,400	16.5	234	50	499	108	247	88	12	47,439	15,110
Taku	1963		$5.0	WA	352	74	2,624	8,122	16.5	253	42	370	44	106	69	7	38,796	13,427
Malaspina	1963		$5.0	WA	408	74	2,928	8,000	16.5	270	50	499	73	238	88	14	21,637	6,046
Tustumena	1964		$5.2	WI	296	59	2,174	5,100	13.8	151	37	174	26	68	36	10	19,164	6,946
Wickersham	1967	1974	$6.96	Norway	364	60	5,073	17,280	23.5	na	Na	1,300	Na	382	143	na	Retired	Retired
Bartlett	1969	2004	$3.2	IN	193	53	933	3,468	13.6	170	24	210	0	0	29	7	Retired	Retired
Columbia	1974		$22.0	WA	418	85	3,946	12,350	17.3	397	66	499	103	294	134	16	27,958	9,452
LeConte	1974		$5.6	WI	235	57	1,328	4,300	14.5	188	24	300	0	0	34	9	22,716	5,522
Aurora	1977		$7.7	WI	235	57	1,280	4,300	14.5	190	24	300	0	0	34	9	20,248	7,445
Kennicott	1998		$80.0	MS	382	85	9,978	13,380	16.75	354	56	499	109	320	80	20	18,554	7,843
Lituya	2004		$9.5	LA	181	50	99	2,000	11.5	55	4	149	0	0	18	2	28,302	9,432
Fairweather	2004		$36.0	CT	235	60	1,280	15,360	32	600	10	250	0	0	36	5	32,388	7,554
Chenega	2005		$34.5	CT	235	60	1,333	15,360	32	600	10	250	0	0	36	5	25,198	8,112

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CHAPTER 3

ECONOMIC BENEFITS OF THE ALASKA MARINE HIGHWAY SYSTEM

3.1 INTRODUCTION

For nearly 50 years, the AMHS has provided marine links between Alaska communities, road systems, and the Lower 48. The system currently has 11 vessels, serving 32 ports throughout Southeast Alaska, Prince William Sound, Kodiak Island, and the Aleutian Islands. AMHS supports Alaska's statewide and regional economies in a number of ways, as discussed below.

3.2 AMHS TRAFFIC IN 2007

- In 2007, AMHS carried more than 300,000 passengers, 100,000 cars and RVs, and 3,400 freight vans.
- Vessels operating in Southeast Alaska carried the bulk of passenger traffic (78 percent), followed by Prince William Sound (14 percent), and Southwest Alaska (including Kodiak, 8 percent).
- Over one-half of all AMHS traffic was made up by Alaska residents who live in communities that have ferry service.
- An additional one-tenth of traffic consisted of people living in Anchorage, the Matanuska-Susitna (Mat-Su) Borough, and Fairbanks (the Interior). In fact, the community with the fourth largest number of resident passengers was Anchorage.
- Visitors who were not Alaska residents made up one-third of all AMHS traffic.

Table 3.1
AMHS Traffic by Passenger Residence, 2007

Region of Passenger Residence	Number of Trips	Percent of All Passengers
Alaska residents	**212,701**	68
Southeast	150,703	48
Gulf Coast	31,865	10
Anchorage/Mat-Su	21,021	7
Interior	6,807	2
Southwest	1,677	1
Northern	236	<1
Unknown AK	392	<1
Non-residents	**101,574**	**32**
All AMHS traffic	**314,275**	**100%**

3.3 SOCIO-ECONOMIC BENEFITS OF AMHS

The cost of living in rural communities served by AMHS is significantly reduced because of the relatively inexpensive cost of transporting goods on the AMHS and the opportunity for rural residents to travel to regional hubs for goods and services. The AMHS also plays a key role in local economic development, providing infrastructure necessary to many businesses. Four community profiles are included later in this report as examples of the impact AMHS has on remote, coastal Alaskan towns.

Lower shipping costs and less travel interruption from weather, compared to air service, means that connections between remote, coastal communities and regional hubs in Alaska are strengthened. This is especially true of the vast majority of coastal communities that have no jet service.

- Residents, school groups, and sports teams are able to travel between communities served by AMHS more frequently and with greater safety and reliability.
- Businesses are more viable in those communities where AMHS is an option for importing and exporting goods and services reliably and cost-effectively.

The AMHS also plays an important role in the state's visitor industry.

- Between May 2006 and April 2007, more than 55,000 visitors traveled on the AMHS, spending more than $45 million on lodging, food, in-state transportation, souvenirs, activities, and other purchases, while visiting Alaska.
- Nonresident visitors make up approximately one-third of all AMHS passenger traffic, yet account for nearly one-half of fare revenue.

3.4 AMHS SPENDING AND EMPLOYMENT IN ALASKA

In fiscal year (FY) 2007, the State of Alaska invested $96 million in general funds in the AMHS.

- Another $48 million from FY 2006 AMHS revenues was added to the ferry system's FY 2007 budget, totaling approximately $140 million for that fiscal year.
- Eighty percent of FY 2007 funds ($115 million) were spent within the state.

The return on this investment included socioeconomic benefits, discussed above, and the following direct and indirect economic impacts:

- Direct AMHS employment totaled 960 jobs for Alaska residents, with $84 million in payroll (including benefits). Additionally, the AMHS spent $26 million in support of system operations and another $5 million in capital expenditures.
- The circulation of direct expenditures throughout the Alaska economy accounted for an additional 480 jobs and $58 million in indirect spending, including payroll expenditures.

- Combined, direct and indirect spending associated with AMHS in Alaska totaled approximately $173 million.

Table 3.2
Direct and Indirect Economic Impacts of AMHS in Alaska, FY 2007

	Direct Impact	Indirect Impact	Total Economic Impact
In-state employment	960	480	1,440
In-state expenditures	$115 million	$58 million	$173 million

3.5 INTRODUCTION TO AMHS TRAFFIC

The AMHS serves the unique transportation needs of coastal Alaska and also benefits the state as a whole by serving visitors and residents of Interior communities. While the ferry system's role in coastal regions is analogous to the state's overland highway system, AMHS faces a different set of logistical and economic challenges.

Advantages of the state's marine highway system go beyond transporting people and goods between coastal communities. AMHS provides jobs to hundreds of Alaskans, fuels support service businesses around the state, and plays an important role in the state's visitor industry. The purpose of this study of AMHS traffic volumes was to measure the economic benefits of the AMHS, both the obvious and the often unrecognized benefits.

Alaska voters demonstrated their support for State-operated ferry service in Southeast and Southwest Alaska with the passage of an $18 million bond issue in 1960. The product of that funding soon became known as the AMHS. As described in Chapter 2, service began in 1963 with three vessels operating in Southeast, the *M/V Malaspina*, the *M/V Matanuska*, and the *M/V Taku*. In 1964, the *M/V Tustumena* began serving Southwest Alaska.

During the first year of operations, AMHS carried 84,000 passengers and 16,000 vehicles. The system continued to add vessels and ports of call during the decades that followed, including a connection with Washington State (first in Seattle and later Bellingham). Ridership increased dramatically, and by 1992, the AMHS carried more than 420,000 passengers and nearly 113,000 vehicles. For about a decade, AMHS traffic trended downward, due in part to completion of a fully paved Alaska Highway, which made driving through British Columbia and the Yukon easier, as well as enhanced air service and intense competition from the cruise industry. In recent years AMHS traffic has again begun to increase.

The study of AMHS current conditions examined AMHS traffic characteristics, such as who is using the system and where they are going, socioeconomic benefits of the system, and more quantifiably, the system's employment and spending within Alaska. To explore the breadth of AMHS impacts, the study looked at the role of ferry service in the economies of four Alaska communities: Angoon in Southeast Alaska, Cordova in Prince William Sound, Port Lions on Kodiak Island, and Sand Point in Southwest Alaska.

3.6 AMHS TRAFFIC CHARACTERISTICS

In 2007, AMHS ferry-users made 314,300 trips on the Alaska Marine Highway. More than two-thirds of these trips (212,700 trips) were made by Alaska residents. The remaining 101,600 trips were made by the 55,300 visitors that used the Marine Highway that year, an average of 1.8 trips per visitor. While visitors to Alaska make up one-third of AMHS traffic, they contribute nearly half (45 percent) of the revenue collected from AMHS fares.

Table 3.3
AMHS Traffic by Passenger Residence, 2007

Region of Passenger Residence	Number of Trips	Percent of All Passengers
Alaska residents	**212,701**	68
Southeast	150,703	48
Gulf Coast	31,865	10
Anchorage/Mat-Su	21,021	7
Interior	6,807	2
Southwest	1,677	1
Northern	236	<1
Unknown AK	392	<1
Non-residents	**101,574**	**32**
All AMHS traffic	**314,275**	**100%**

3.6.1 ALASKA RESIDENT TRAFFIC

About 85 percent of resident use of the AMHS is by people who live in communities that have direct ferry service. However, the community with the fourth largest number of resident passengers was Anchorage. Fairbanks/North Pole and Palmer/Wasilla are the other non-AMHS ports among the 15 Alaska communities representing the most resident AMHS traffic in 2007.

Table 3.4
Fifteen Alaska Communities with the Most Trips by Residents, 2007

Community of Passenger Residence	Trips	% of All Passenger Traffic	Community of Passenger Residence	Trips	% of All Passenger Traffic
Juneau	39,223	12	Kodiak	7,336	2
Metlakatla	24,026	8	Wrangell	7,236	2
Haines	17,738	6	Hoonah	6,060	2
Anchorage	14,431	5	Skagway	5,000	2
Ketchikan	12,819	4	Angoon	4,682	1
Sitka	12,433	4	Fairbanks/North Pole	3,844	1
Cordova	10,991	3	Palmer/Wasilla	3,755	1
Petersburg	7,969	3			

3.6.2 USE BY RESIDENTS OF COMMUNITIES NOT SERVED BY AMHS

Alaskans living in communities "off" of the marine highway (no ferry service) also use the ferry system. In 2007, 15 percent of all Alaska resident passenger traffic (32,400 trips) and 18 percent of resident vehicle traffic (13,500 trips) was by residents of Alaska communities and regions that are not directly served by the AMHS. Residents of Anchorage and the Mat-Su Borough made 21,000 trips on the AMHS in 2007. This constitutes 10 percent of all resident passenger traffic and 7 percent of total AMHS passengers for the year. Another 6,800 trips were made by residents of Interior communities,[13] including Fairbanks, and residents of communities in the Gulf of Alaska not served by AMHS[14] made 3,200 trips. The remaining trips made by residents of communities not served by AMHS were by Southeast, Southwest, and Northern Alaska residents (700 trips).

Figure 3.1
AMHS Use, 2007

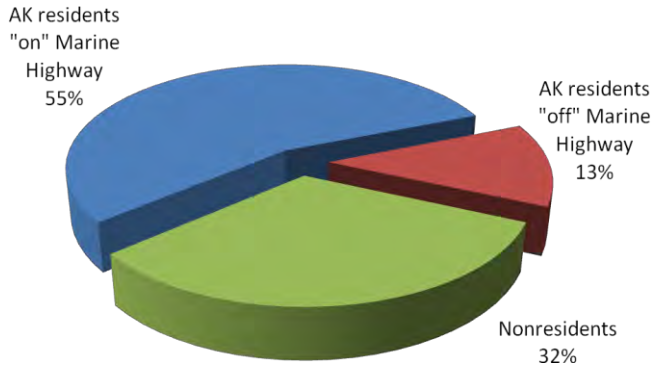
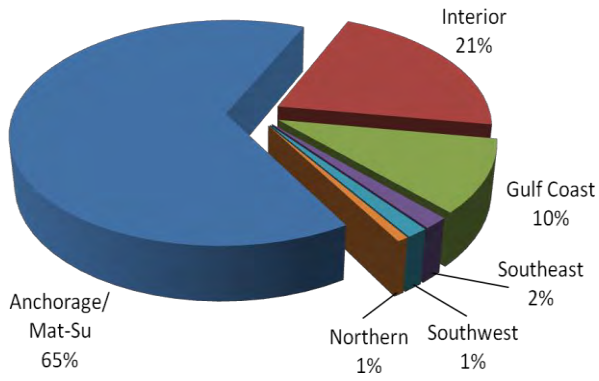


Figure 3.2
AMHS Use by Alaska Residents "off" Marine Highway (Grouped by Region), 2007



3.6.3 DESTINATIONS

Alaska residents living off the marine highway traveled widely on the system in 2007. For example, residents of Fairbanks traveled between ports in Southeast Alaska and residents of Palmer traveled between Homer and Seldovia. The most common destination ports were in Prince William Sound (36 percent), followed by ports in Southeast Alaska (33 percent), Southwest Alaska (19 percent), and ports outside the state (12 percent).

3.6.4 NONRESIDENT TRAFFIC

Non-Alaska residents made a total of 101,600 trips on AMHS in 2007. Sixty-five percent of all nonresident travel was to ports in Southeast Alaska, with Juneau, Haines, and Skagway as the top three destination ports. Approximately one-fifth of nonresident AMHS travel was to ports in Prince William Sound, led by Whittier.

[13] Alaska Department of Labor classifications were used to assign communities to different regions. An exception was made for the communities in the Copper River Basin. Though DOL classifieds these as "Gulf Coast" communities, for the purposes of this research, they are more similar to "Interior" communities and are classified as such.
[14] Residents living more than 50 road miles from an AMHS-served community were considered to be outside the service area.

3.7 SOCIOECONOMIC BENEFITS OF AMHS

A broad range of socioeconomic benefits are linked to the AMHS. In addition to providing basic transport services for people and vehicles, these benefits include lowering the cost of living for rural communities served by AMHS ferries, business and public service benefits, and strengthening the state's visitor industry.

3.7.1 IMPACT ON THE COST OF LIVING IN RURAL ALASKA COMMUNITIES

An unrecognized benefit of the AMHS is its effect on the cost of living in communities served by the system. Ferries provide residents of smaller, outlying communities with improved access to lower-priced goods and services in regional centers, as well as health care, legal, financial, and other services that may not be available in their hometowns. Ferries can accommodate large numbers of passengers on short notice for community and sports events. They are faster at moving freight than barges and much cheaper than airplanes on a dollars per pound basis. As a result, the cost of living in rural areas served by the AMHS is lower than it would be without AMHS services.

3.7.2 THE BUSINESS BENEFITS OF AMHS

As a key part of the state's transportation infrastructure, AMHS helps reduce Alaska's dependency on out-of-state goods and services. By providing a type of transportation that would be unavailable in most parts of Alaska without public sector support, AMHS encourages purchase of goods and services in-region or in-state and reduces regional and statewide economic leakage (dollars leaving a particular region of the state or the state as a whole).

AMHS fosters development of local businesses that ship heavy or bulky items that are also perishable or otherwise time constrained such as produce, seafood, frozen food, construction equipment, and various types of industrial supplies and spare parts. Inconsistent service schedules, typically a result of long routes, tidal restrictions, and vessel repairs, have been a constraint on ferry-based business development in the past. Where service schedules have been steady, such as between Ketchikan and Metlakatla, Juneau and Hoonah, or on the Inter-Island Ferry Authority route between Ketchikan and Hollis, local businesses have benefited.

3.7.3 PUBLIC SERVICE BENEFITS OF AMHS

AMHS is an important, weather-independent link between outlying villages and larger regional healthcare facilities. The system also transports student groups on field trips or in extracurricular activities at a much lower cost than for air travel, allowing for more frequent travel. The same is true for cultural and other community events. This travel facilitates interaction between people from different communities and different cultures that would be much less frequent without AMHS.

3.7.4 ROLE OF THE MARINE HIGHWAY IN ALASKA'S VISITOR INDUSTRY

Tourism has developed into one of Alaska's most important basic industries[15]. In 2006-07, nearly 1.9 million visitors traveled to Alaska. This figure is a 185 percent increase since 1985-86 and a 29 percent increase since 2001-02. Overall, the visitor industry has grown at an annual rate of about 13 percent over the past two decades.

[15] A "basic" industry is one that brings new spending into the state. In addition to tourism, Alaska's basic industries include resource extraction (mining, oil, etc.), commercial fishing, and the military.

While this growth is generally attributable to the expansion of the cruise industry in Alaska, the AMHS also plays an important role. This role is documented in the most recent Alaska Visitor Statistics Program (AVSP) research. AVSP V, conducted between May 2006 and April 2007, measured Alaska visitor volume, composition, expenditures, trip satisfaction, origin, and demographics.

3.7.5 MARINE HIGHWAY VISITORS

AMHS offers a unique mode of independent travel to, from, and within Alaska. Many visitors travel to the state either from the Bellingham, Washington, terminal or from the Prince Rupert, British Columbia, terminal. AMHS offers a flexible and "off-the-beaten path" style of travel. Ferry passengers do not use the AMHS solely for entering or exiting the state. Many visitors ferry from Prince Rupert to Ketchikan, disembark for a short visit, and then reboard the next northbound ferry for other destinations in Southeast. They may travel to Sitka or to Juneau, where they have the option to fly home, or if traveling with a vehicle, they may go on to Haines or Skagway and drive the next leg of their journey. Independent traveler research shows they consider the AMHS a pleasant alternative to the rigid travel schedules imposed on Alaska's package tour visitors.

AVSP V data indicate that 55,300 visitors traveled on the AMHS between May 2006 and April 2007. This figure represents an increase over recent years and is nearly the same number of visitors that traveled by AMHS in 1989-90 (55,400) and in 1993-94 (56,000), earlier years when visitor survey research was conducted.

Visitors that use the AMHS during their trip to Alaska travel to a wide range of communities, including many not served by AMHS vessels. According to AVSP V, visitors who traveled by ferry at some point during their trip, also visited Anchorage, Fairbanks, Talkeetna, Glennallen, Palmer, Wasilla, and Nome, among others. The average length of stay in Alaska for ferry visitors is 15.7 nights, compared to 9.1 nights for visitors overall.

The following table shows the communities visited by nonresident travelers who used the AMHS at some point during their trip in summer 2006. For example, a visitor who gets on a ferry in Bellingham, disembarks in Juneau, flies to Anchorage, and then travels around the Kenai Peninsula will be recorded as visiting Juneau, Anchorage, and whichever communities he or she visited on the Kenai Peninsula.

Table 3.5
Communities Visited by Non-residents
Traveling on the AMHS, Summer 2006

Communities	% of AMHS Visitors	Communities	% of AMHS Visitors
Southeast	**86**	**Southcentral**	**64**
Juneau	55	Anchorage	58
Skagway	52	Seward	36
Ketchikan	46	Whittier	29
Haines	35	Valdez	28
Sitka	21	Homer	23
Wrangell	17	Kenai/Soldotna	23
Petersburg	16	Palmer/Wasilla	22
Hoonah	7	Talkeetna	21
POW Island	6	Girdwood	14
Interior	**57**	**Southwest**	**6**
Denali/Healy/ Cantwell	44	Kodiak	4
Fairbanks	39	**Far North**	**9**
Tok	28	Nome	1
Glennallen	22		

3.7.6 TRIP SATISFACTION

AVSP V survey data reveal that roughly three-fourths of AMHS visitors felt very satisfied with their overall Alaska experience and the remaining one-fourth felt satisfied. These satisfied ferry travelers are more likely to spread "word of mouth" positive information about their trip to Alaska. Nearly all (98 percent) said they are likely or very likely to recommend Alaska to others as a vacation destination. Furthermore, nearly three-fourths of AMHS visitors (72 percent) said they plan to return to Alaska at some point in the next five years, compared to 63 percent of all visitors.

As part of the AVSP V survey, visitors were asked to rate their levels of satisfaction with various aspects of their trip. These ratings were also high among AMHS visitors. The majority of these travelers were satisfied or very satisfied with all aspects of their trip. Sightseeing, tours and activities, and friendliness of residents received particularly high ratings. High satisfaction levels among ferry visitors are part of the reason many return to Alaska for future vacations. Approximately 40 percent of ferry visitors surveyed had been to Alaska on a previous vacation.

3.7.7 AMHS VISITOR EXPENDITURES

Between May and September 2006, nonresident visitors who used the AMHS spent roughly $63 million throughout the state, not including spending on transportation to and from Alaska. The largest single expenditure was in-state transportation, including AMHS fares, but excluding airfare in and out of the state ($25.1 million),

followed by lodging ($11.5 million), and food and beverage ($10.1 million). With approximately 51,000 visitors during the summer of 2006, the average AMHS visitor spent an estimated $1,200 per person per trip, averaging $80 per person per day. (Expenditure data from the remaining 4,300 visitors who came to Alaska during the fall, winter, or spring seasons are not included because spending patterns differed significantly.) The following table details expenditures by AMHS visitors during the summer of 2006.

Table 3.6
AMHS Visitor Expenditures by Type, Summer 2006

Expenditure Type	
Transportation	$25,135,000
Lodging	$11,500,000
Food/beverage	$10,067,000
Gifts/souvenirs/clothing	$6,798,000
Tours/activities/entertainment	$6,389,000
Other	$2,709,000
Total spending	**$62,599,000**
Spending per person per trip	**$1,200**
Spending per person per day	**$80**

3.8 THE ROLE OF THE AMHS IN SELECTED ALASKA COMMUNITY ECONOMIES

It is difficult to generalize about the role of AMHS in local economies. That role varies depending, in part, on the size of the community, the types of local industries, proximity to regional "hub" communities, and availability of alternative transportation modes. Historical social and cultural ties between communities, or lack thereof, are also a factor.

Typically, ferries are the lowest user-cost option for passengers and vehicles moving between villages and hub communities in coastal Alaska. They are also a cost-effective way to move freight for which barges are too slow, or not available, and air is too expensive. This cost efficiency is particularly true of heavy freight, because AMHS charges by the size of the van, rather than the weight. For example, AMHS has been used to transport fresh chum salmon, because this freight must move quickly, but is not valuable enough to ship by air. AMHS is sometimes used to ship fresh halibut, which has a somewhat longer shelf-life than salmon. However, halibut shipping is becoming rarer, as the market value of halibut has increased sharply in recent years, making air shipment viable.

For some communities, AMHS is an important shipping method for groceries, particularly for perishables in communities without jet service. AMHS offers the only regular shipping option between some smaller coastal communities that is suitable for heavy loads (i.e., heavier than may be accommodated by small planes).

3.8.1 ANGOON

With a 2007 population of 478, Angoon is the only permanent, year-round community located on Admiralty Island in Southeast Alaska. The community is primarily Tlingit, and many residents support themselves through commercial fishing and subsistence lifestyles. Local government, education, and health care are key sources of wage and salary jobs, and tourism provides a number of jobs during the summer months. According to the U.S. Census Bureau, in 2000 the median income of Angoon households was $29,861, 60 percent of the statewide average ($51,571).

Transportation to and from the community is limited. Without an airport, Angoon is accessible only by floatplane or boat. Passenger transport is available by scheduled and charter floatplane services and by AMHS ferry service. During winter months, air travel is more tenuous due to strong winds and rough seas. Freight arrives by barge and ferry.

3.8.1.1 Role of AMHS in Angoon

According to a 2004 McDowell Group community survey of Northern Panhandle communities in Southeast Alaska, the most common reason many Angoon residents preferred ferry travel to air travel was because they could bring their vehicle and/or freight. Additional reasons for ferry preference included lower cost and more reliable mode of transport in bad weather.

In 2004, Angoon residents made approximately 4.8 trips per person to Juneau by ferry, with a primary trip purpose of shopping. Alternatively, work was the primary purpose for air travelers, who made roughly 4.6 trips per person to Juneau. A logical assumption is that ferry travel is preferred for personal trips because it is less expensive than air travel.

Freight service is another key role that AMHS serves in small, remote communities such as Angoon. With no scheduled barge service to the community, the Angoon Trading Company receives freight shipments via the AMHS one to two times weekly, depending on the time of year. Company staff report that weekly ferry service is vital to the business, which is the only retail provider in Angoon.

3.8.1.2 Frequency of Ferry Service

In 2007, there were 105 AMHS ferry departures from Angoon. (This is significantly fewer than the five-year average (2002-2006) for departures from Angoon, which was 241.) Ferry passengers (and their vehicles) departing *from* Angoon in 2007 traveled primarily to Juneau, and occasionally to Hoonah. Similarly, those traveling *to* Angoon departed primarily from Juneau, while a few departed from Hoonah. In 2006, Angoon passengers traveled to/from many more communities. The table below shows the number of passengers and vehicles traveling from and to Angoon in 2006 and 2007.

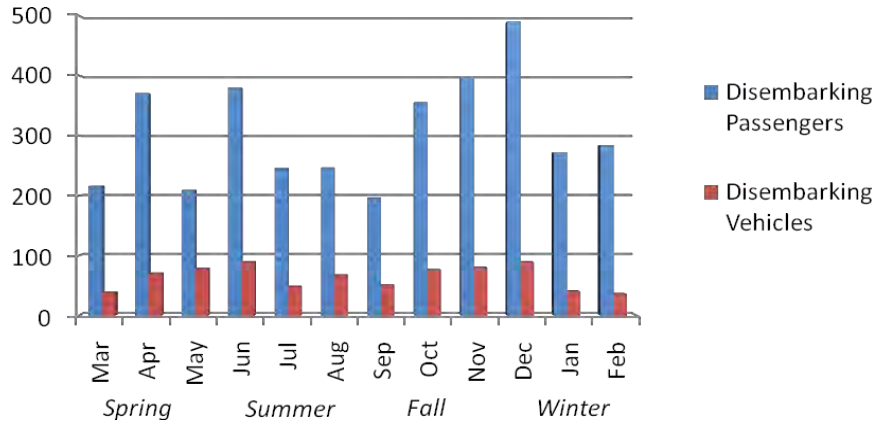
Table 3.7
AMHS Passenger and Vehicle Service to/from Angoon, 2006 and 2007

Community	Passengers, from Angoon to:		Passengers, to Angoon from:		Vehicles, from Angoon to:		Vehicles, to Angoon from:	
	2006	2007	2006	2007	2006	2007	2006	2007
Juneau	2,799	3,294	2,925	3,658	502	740	543	755
Sitka	473	-	502	-	31	-	34	-
Hoonah	59	3	100	6	2	2	1	6
Kake	44	-	20	-	-	-	1	-
Petersburg	16	-	12	-	1	-	2	-
Tenakee	13	-	201	-	-	-	-	-
Haines	3	-	3	-	1	-	2	-
Skagway	2	-	12	-	2	-	1	-
Ketchikan	1	-	-	-	-	-	-	-

3.8.1.3 Seasonality of Ferry Travel

Passenger ferry traffic to/from Angoon is quite seasonal. Peak ferry travel occurs during the fall and winter months, when weather can make air travel unreliable. Summer is the slowest season for ferry travel to/from Angoon.

Figure 3.3
Seasonality of AMHS Passenger and Vehicle Service to/from Angoon, 2007



3.8.2 CORDOVA

Cordova is an isolated community, located at the southeastern end of Prince William Sound in the Gulf of Alaska. In 2007, the community had a population of 2,192. Commercial fishing and seafood processing are central to Cordova's economy and culture. Nearly half of all households have at least one person working in commercial harvesting or processing. Other key industries in the community include various levels of government, education, health care, and tourism. The U.S. Forest Service and the U.S. Coast Guard maintain personnel in Cordova. The

median income of Cordova households was $50,114 in 2000, according to the U.S. Census Bureau, only slightly under the statewide average at that time.

Access to Cordova is fairly good, considering its isolated location; transportation is available by plane or boat. The community has two airports operating three airstrips, with daily scheduled jet service and air taxi services. AMHS ferry service and barge services are available year-round.

3.8.2.1 Role of AMHS in Cordova

AMHS service to Cordova plays an important role in the community's visitor industry. Over one-half of ferry passengers traveling to the community are not residents of Cordova, including visitors to the community and people traveling to work in the seafood industry, and nearly one-fifth are not residents of the state.

Additionally, ferry service plays a unique role in the shipment of freight to and from Cordova. While much of the freight arriving in the community is shipped via barge service from the Lower 48, Cordova retailers use AMHS service to ship freight from Anchorage. Residents also use the ferry system for the movement of individual goods and large items, such as furniture and cars, between the community (via Valdez) and the state's central road system.

3.8.2.2 Frequency of Ferry Service

The community of Cordova has seen an increasing number of annual ferry departures in recent years. In 2007, there were 302 ferry departures from Cordova, compared to an annual average of 215 between 2002 and 2006. Nearly all passenger and vehicle traffic traveled between Cordova and Whittier or Cordova and Valdez. A very small number traveled to or from Tatitlek or Chenega Bay.

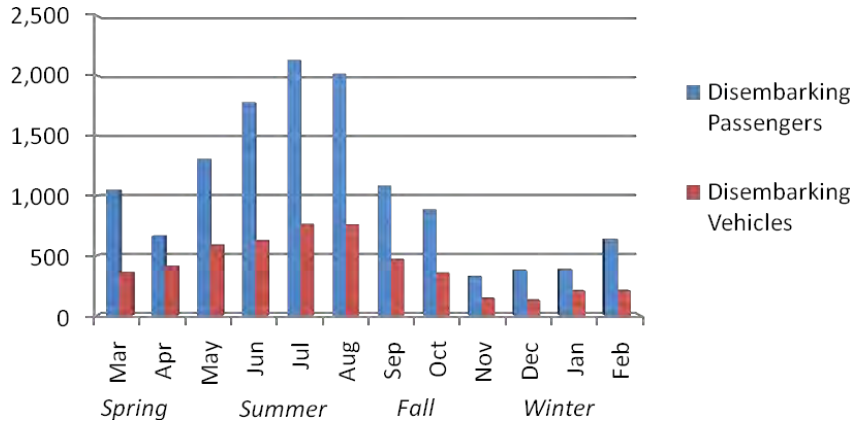
Table 3.8
AMHS Passenger and Vehicle Service to/from Cordova, 2006 and 2007

Community	Passengers, from Cordova to:		Passengers, to Cordova from:		Vehicles, from Cordova to:		Vehicles, to Cordova from:	
	2006	2007	2006	2007	2006	2007	2006	2007
Whittier	7,924	8,501	8,207	8,585	3,183	3,693	3,333	3,849
Valdez	3,558	4,043	3,375	3,956	960	1,106	987	1,120
Tatitlek	46	45	59	65	6	6	6	4
Chenega Bay	2	2	9	1	1	-	2	-

3.8.2.3 Seasonality of Ferry Travel

Unlike Angoon, peak ferry travel to/from Cordova occurs during the summer months, when tourism and the seafood industry are in full swing. The community receives a number of Alaska resident and out-of-state visitors every summer, many of whom travel there via AMHS ferry.

Figure 3.4
Seasonality of AMHS Passenger and Vehicle Service to/from Cordova, 2007



3.8.3 PORT LIONS

Port Lions is a small, isolated community on the northwest coast of Kodiak Island and was home to 179 residents in 2007. Most residents participate in subsistence activities, and the community's economy is primarily based on commercial fishing, fish processing, and tourism. According to the U.S. Census Bureau's 2000 Census, the median household income in Port Lions was $39,107, equivalent to 76 percent of the statewide average.

Transportation to Port Lions is available by plane and boat. Scheduled and charter flights from Kodiak use the community's gravel airstrip, and the city dock is used by seaplanes. Scheduled barge service to Port Lions was discontinued, but AMHS service has been increased and now includes year-round ferry service between Kodiak and Port Lions.

3.8.3.1 Role of AMHS in Port Lions

With no scheduled barge service, Port Lions relies almost exclusively on the AMHS for movement of freight into and out of the community. The four visitor lodges located in the community use the ferry heavily during the spring and fall months to stock up on goods from Anchorage and Kodiak. With no retail providers in the community, Port Lions residents also rely heavily on the AMHS to transport personal goods to and from the community.

3.8.3.2 Frequency of Ferry Service

There were 119 AMHS ferry departures from Port Lions in 2007. The five-year average for ferry departures from the community was 75 between 2002 and 2006. The majority of Port Lions ferry traffic travels to/from the city of Kodiak; other traffic begins or ends the trip in Homer, located on the road system in Southcentral Alaska. Both passenger and vehicle traffic from Port Lions have increased significantly between 2006 and 2007.

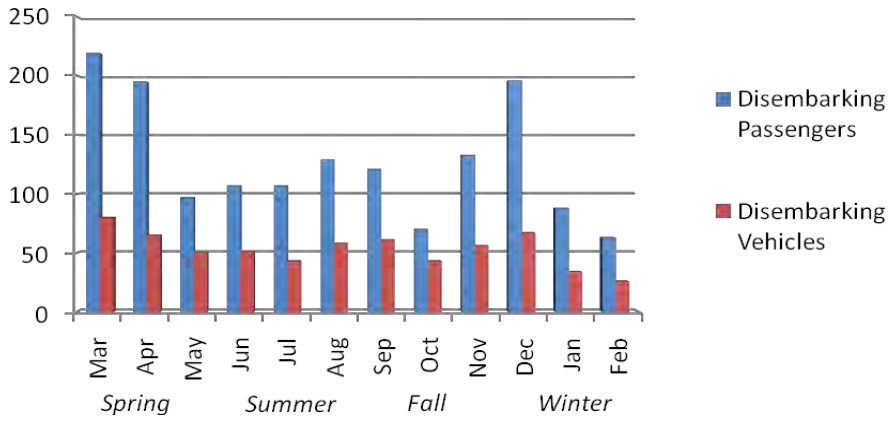
Table 3.9
AMHS Passenger and Vehicle Service to/from Port Lions, 2006 and 2007

Community	Passengers, from Port Lions to:		Passengers, to Port Lions from:		Vehicles, from Port Lions to:		Vehicles, to Port Lions from:	
	2006	2007	2006	2007	2006	2007	2006	2007
Kodiak	742	1,155	864	1,191	285	423	325	464
Homer	278	303	308	334	134	142	157	170
Seldovia	-	10	-	-	-	-	-	-
Dutch Harbor	-	1	-	-	-	-	-	-
King Cove	-	-	4	-	-	-	-	-

3.8.3.3 Seasonality of Ferry Travel

In 2007, March, April, and December were the peak months for passenger and vehicle traffic to/from Port Lions.

Figure 3.5
Seasonality of AMHS Passenger and Vehicle Traffic to/from Port Lions, 2007



3.8.4 SAND POINT

Sand Point is a community of 992 (2007 population), located on Popof Island off the southeast coast of the Alaska Peninsula. Home to the largest fishing fleet in the Aleutian Islands Chain, Sand Point has a commercial fishing-based economy. A large seafood processing plant provides jobs to a sizeable transient population, which arrives in the community each summer for fishing and cannery work. For year-round residents, about half of whom are Aleut, subsistence is another important part of the local culture and economy. In 2000, the median income for Sand Point households was $55,417, just above the statewide average.

Sand Point is accessible by plane and boat. A fairly new airport provides for direct flight service to Anchorage, in addition to more localized charter services. In 2006 and 2007, AMHS operated bimonthly ferry service between May and October. Regular barge service is available year-round from the Lower 48.

3.8.4.1 Role of AMHS in Sand Point

Businesses in Sand Point say that the most valued role of the AMHS in Southwest Alaska is providing a link for both people and goods between communities along the Aleutian Chain and Anchorage (or the road system in general), and between Aleutian Chain communities themselves. Air travel, while considerably faster, is more costly and cannot provide for the movement of large goods, such as furniture or vehicles. According to Sand Point retailers, barge service is the primary mode of transport for shipping large quantities of goods to the community, but is only available from the Lower 48. AMHS ferry service is primarily used for shipping goods from Anchorage to the community and between communities along the Aleutian Chain. For example, the local grocery/home goods store receives most of its freight as weekly barge service and smaller shipments via AMHS whenever possible. The bed and breakfast in Sand Point primarily depends on barge service for freight shipments, but notes that nearly 20 percent of its clientele arrive via the ferry.

3.8.4.2 Frequency of Ferry Service

Sand Point has recently received increased service from the AMHS. In 2006 and 2007, there were 26 ferry departures annually, compared to prior years of 14 ferry departures annually. Sand Point passengers travel to/from a number of communities throughout Southwest and Southcentral Alaska. In 2006 and 2007, over half went to King Cove. Vehicle traffic more commonly connects to Homer because that community is connected to the state's road system.

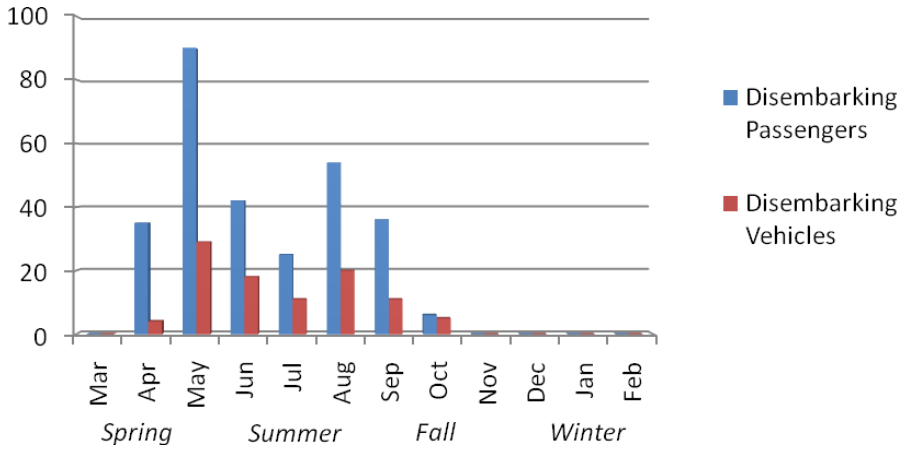
Table 3.10
AMHS Passenger and Vehicle Service to/from Sand Point, 2006 and 2007

Community	Passengers, from Sand Point to:		Passengers, to Sand Point from:		Vehicles, from Sand Point to:		Vehicles, to Sand Point from:	
	2006	2007	2006	2007	2006	2007	2006	2007
King Cove	226	229	247	178	35	25	33	26
Homer	59	34	49	33	51	25	75	46
Dutch Harbor	37	24	58	25	1	2	11	6
False Pass	22	6	-	14	4	2	-	2
Kodiak	21	19	12	15	25	9	12	9
Cold Bay	20	17	17	13	9	10	7	9
Akutan	13	42	7	10	-	-	-	-
Chignik	7	2	8	-	1	1	2	-
Seldovia	-	1	-	-	-	-	-	-

3.8.4.3 Seasonality of Ferry Travel

AMHS service to Sand Point is provided between April and October only. Ferry traffic tends to peak during the beginning and end of the service period when seasonal fisheries workers typically arrive and depart. Traffic dips during June and July, the height of the regional fishing season, when many residents are too busy working to leave the community.

Figure 3.6
Seasonality of AMHS Passenger and Vehicle Service to/from Sand Point, 2007



3.9 AMHS EMPLOYMENT AND SPENDING IN ALASKA

In FY 2007, the State of Alaska invested $96 million in general funds for AMHS operations. This sum was combined with $48 million in revenue from the previous fiscal year, for a total FY 2007 budget of $140 million.

3.9.1 AMHS EMPLOYMENT AND PAYROLL

AMHS employs 960 Alaskan residents and 50 nonresidents, for a total workforce of 1,010 people. AMHS employees earned a total of $59 million in payroll and $31 million in benefits in FY 2007. Because 93 percent of the AMHS workforce are Alaska residents, it is estimated that residents earned approximately $55 million in payroll and $29 million in benefits.

In-state spending of these payroll dollars has an indirect impact on the state's economy. Spending by AMHS employees and their dependents, and the public services required by these residents, create jobs in Alaska's support sector: in grocery stores, gas stations, banks, other retail businesses, health care facilities, schools, and other service organizations.

Based on generally accepted Alaska employment multipliers, the indirect employment impact of AMHS operations includes several hundred additional support sector jobs. A more detailed discussion of economic multiplier effects follows.

3.9.2 IN-STATE SPENDING ON AMHS OPERATIONS

Non-payroll spending in support of AMHS operations creates business opportunities for Alaska's service and supply sectors. During FY 2007, AMHS spent $26 million on operational goods and services in 56 communities throughout the state. Much of this spending occurred in Seward, Cordova, Anchorage, Ketchikan, and Juneau.

With the rising cost of oil in 2007, it is not surprising that, of all operational expenditures, AMHS' single largest non-payroll expenditure was fuel. In-state fuel purchases totaled $20 million paid to Alaska fuel vendors. Other

significant operating expenditures with Alaska businesses include insurance premiums, annual routine overhaul expenditures, supplies for onboard food service, and other miscellaneous contractual expenditures.

3.9.3 IN-STATE CAPITAL EXPENDITURES

The A invests millions of dollars each year in maintaining and modernizing its fleet. Capital spending varies depending on the condition of the ships and available funding. In FY 2007, AMHS spent approximately $5 million on capital projects performed by Alaska businesses. These expenditures included vessel and shoreside capital projects such as dock construction and improvements, as well as vessel maintenance and refurbishments. Significant spending, ranging from $250,000 to $2.9 million per community, occurred with businesses based in Juneau, Ketchikan, and Craig. Additional spending occurred in communities throughout the state, from Anchorage and Fairbanks to communities throughout Southeast and on the Kenai Peninsula.

3.10 INDIRECT BENEFITS

As described above, AMHS direct spending in FY 2007 amounted to $115 million ($55 million in Alaska payroll, $29 million in payroll benefits, $26 million in supplies and $5 million in capital projects performed in Alaska). This spending also has secondary or indirect impacts on the state economy.

The indirect impacts of economic activity can be measured in several ways. The most common include employment and/or payroll multipliers, personal income multipliers, and output multipliers. Calculating a multiplier specific to AMHS is beyond the scope of this study. Still, sufficient research has been done on multipliers in Alaska to provide a good indication of the multiplier effects of AMHS spending.

Available economic models estimate the economic multiplier for industrial spending in Alaska at approximately 1.5. This multiplier means that $1 in direct spending results in an additional $0.50 in indirect economic impacts. The other $0.50 of that original dollar is not recirculated in-state, but rather “leaks” outside Alaska in the form of payments to non-Alaska businesses. In terms of employment, a 1.5 multiplier means that for every AMHS job in Alaska, another 0.5 job is created in various support-sector businesses around the state.

The simplest way to think about AMHS indirect impacts is that, in FY 2007, AMHS directly accounted for about $115 million in spending in Alaska. Based on a multiplier of 1.5, that spending resulted in $58 million of additional economic activity in the state, for a total spending impact of approximately $173 million. Note that these indirect economic impacts are limited to the effects of AMHS spending. They do not capture the role of ferry transportation infrastructure in supporting economic and business development around Alaska.

3.11 PROFILES OF COMMUNITIES SERVED BY THE ALASKA MARINE HIGHWAY SYSTEM

Table 3.11
Profile of Communities Served by the Alaska Marine Highway System, Southeast Region

	Total Embarking Passengers			Total Embarking Vehicles		Port Departures		Population	Per Capita Personal Income
Southeast Community	1999	2006	Summer 2006	1999	2006	1999	2006	2006	Census 2000
Angoon	4,012	3,410	1,284	716	539	273	239	482	$11,357
Bartlett Cove	--	461	461	--	--	--	4	441	$21,089
Bellingham	14,924	15,294	9,640	4,570	5,721	54	74	--	--
Haines	41,329	31,249	20,428	14,441	11,448	597	612	1,492	$22,505
Hollis	21,656	83	--	5,729	21	352	--	156	$17,278
Hoonah	6,331	4,891	1,877	1,630	1,399	284	319	829	$16,097
Hyder	473	--	--	167	--	15	--	92	$11,491
Juneau	79,567	65,269	40,216	19,881	18,361	678	988	30,650	$26,719
Kake	1,869	1,708	560	383	368	159	170	536	$17,411
Ketchikan	54,421	36,736	17,477	15,009	11,291	1,007	1,014	7,662	$22,484
Metlakatla	6,530	13,278	4,811	1,762	4,539	236	510	1,323	$16,140
Pelican	730	607	496	67	64	24	24	106	$29,347
Petersburg	12,109	9,965	5,234	2,677	2,623	537	523	3,129	$25,827
Prince Rupert	20,321	11,551	8,545	6,311	4,105	167	170	--	--
Sitka	15,161	12,853	7,574	3,868	3,537	325	323	8,833	$23,622
Skagway	34,725	21,826	17,201	9,120	5,672	298	311	854	$27,700
Tenakee	1,160	1,209	612	28	11	187	111	109	$20,483
Wrangell	8,222	7,446	3,915	1,709	1,843	428	470	1,911	$21,851
Yakutat	68	129	107	37	--	10	20	609	$21,330
Total	**323,608**	**237,965**	**140,438**	**88,101**	**71,609**	**5,631**	**5,885**	**59,214**	**--**

Table 3.12
Profile of Communities Served by the Alaska Marine Highway System, Southwest Region

	Total Embarking Passengers			Total Embarking Vehicles		Port Departures		Population	Per Capita Personal Income
Southwest Community	**1999**	**2006**	**Summer 2006**	**1999**	**2006**	**1999**	**2006**	**2006**	**Census 2000**
Akutan	34	325	188	--	--	8	26	741	$12,259
Chenega Bay	62	69	26	12	20	27	44	69	$13,381
Chignik	180	303	264	28	34	14	26	85	$16,166
Cold Bay	37	150	95	49	89	14	26	87	$20,037
Cordova	5,088	11,532	7,574	1,744	4,151	161	340	2,211	$25,256
Unalaska	346	642	579	64	94	7	13	3,940	$24,676
False Pass	11	44	44	3	15	7	14	54	$21,465
Homer	7,847	11,029	7,415	3,158	4,316	148	261	5,454	$21,823
King Cove	187	537	388	55	138	14	26	807	$17,791
Kodiak	6,684	8,754	5,694	2,673	3,295	132	195	5,937	$21,522
Port Lions	427	1,020	379	164	419	77	116	211	$17,492
Sandpoint	209	405	316	59	126	14	26	890	$21,954
Seldovia	2,216	2,710	1,845	905	1,138	64	110	379	$23,669
Seward	4,044	--	--	1,831	--	86	--	2,627	$20,360
Tatitlek	94	112	20	14	24	71	58	117	$13,014
Valdez	12,874	13,434	11,302	3,874	4,223	227	372	3,690	$27,341
Whittier	8,097	18,189	14,138	2,288	7,379	117	419	189	$25,700
Total	**48,437**	**69,255**	**50,266**	**16,921**	**25,461**	**1,188**	**2,072**	**29,494**	**--**

3.12 RESIDENCY OF PASSENGERS ON SELECTED AMHS ROUTES

Table 3.13
Legend of AMHS Port of Call Codes

SOUTHEAST PORTS		SOUTHWEST PORTS		ALEUTIAN ISLAND PORTS	
Angoon	ANG	Chenega Bay	CHB	Akutan	AKU
Bellingham	BEL	Cordova	CDV	Chignik	CHG
Haines	HNS	Homer	HOM	Cold Bay	CBY
Hoonah	HNH	Kodiak	KOD	False Pass	FPS
Juneau	JNU	Port Lions	ORI	King Cove	KCV
Kake	KAE	Seldovia	SDV	Sand Point	SDP
Ketchikan	KTN	Tatitlek	TAT	Unalaska	UNA
Metlakatla	MET	Valdez	VDZ		
Pelican	PEL	Whittier	WTR		
Petersburg	PSG				
Prince Rupert	YPR				
Sitka	SIT				
Skagway	SGY				
Tenakee	TKE				
Wrangell	WRG				
Yakutat	YAK				

Table 3.14
Southeast Alaska Port-to-Port Passenger and Vehicle Traffic Numbers, Year 2007

	PAX	%	VEHICLES	%
BEL-HNS				
Alaskans	784	24%	488	29%
Southeast Residents	146	4%	90	5%
Other Alaska	638	19%	398	24%
Non-Alaska	2,524	76%	1,170	71%
Total	3,308		1,658	
BEL-JNU				
Alaskans	1,074	28%	685	41%
Southeast Residents	776	20%	516	31%
Other Alaska	298	8%	169	10%
Non-Alaska	2,818	72%	998	59%
Total	3,892		1,683	
BEL-KTN				
Alaskans	1,710	46%	846	55%
Southeast Residents	1,611	43%	798	52%
Other Alaska	99	3%	48	3%
Non-Alaska	2,015	54%	685	45%
Total	3,725		1,531	
YPR-KTN				
Alaskans	2,264	45%	800	47%
Southeast	2,175	44%	766	45%
Other Alaska	89	2%	34	2%
Non-Alaska	2,722	55%	906	53%
Total	4,986		1,706	

	PAX	%	VEHICLES	%
JNU-SGY				
Alaskans	7,427	53%	2,083	65%
Southeast	6,825	49%	1,921	60%
Other Alaska	602	4%	162	5%
Non-Alaska	6,511	47%	1,098	35%
Total	13,938		3,181	
JNU-SIT				
Alaskans	7,435	77%	2,117	86%
Southeast	7,100	74%	2,019	82%
Other Alaska	335	3%	98	4%
Non-Alaska	2,218	23%	341	14%
Total	9,653		2,458	
JNU-WTR				
Alaskans	559	24%	505	45%
Gulf Coast	118	5%	92	8%
Other Alaska	441	19%	413	37%
Non-Alaska	1,742	76%	622	55%
Total	2,301		1,127	
JNU-PSG				
Alaskans	2,326	87%	634	92%
Southeast	2,262	85%	613	89%
Other Alaska	64	2%	21	3%
Non-Alaska	348	13%	54	8%
Total	2,674		688	
JNU-HNH				
Alaskans	4,711	92%	1,543	97%
Southeast	4,596	90%	1,513	95%
Other Alaska	115	2%	30	2%
Non-Alaska	399	8%	50	3%
Total	5,110		1,593	
JNU-HNS				
Alaskans	15,977	76%	5,195	85%
Southeast	14,363	68%	4,538	74%
Other Alaska	1,614	8%	657	11%
Non-Alaska	5,022	24%	919	15%
Total	20,999		6,114	

Table 3.15
Southwest Alaska Port-to-Port Passenger and Vehicle Traffic Numbers, Year 2007

	PAX	%	VEHICLES	%
HOM-KOD				
Alaskans	5,273	75%	2,260	82%
Gulf Coast	3,977	56%	1,610	59%
Other Alaska	1,296	18%	650	24%
Non-Alaska	1,766	25%	488	18%
Total	7,039		2,748	
SDV-HOM				
Alaskans	2,198	85%	1,110	94%
Gulf Coast	1,507	58%	790	67%
Other Alaska	691	27%	320	27%
Non-Alaska	397	15%	71	6%
Total	2,595		1,181	
WTR-CDV				
Alaskans	7,203	86%	3,320	91%
Gulf Coast	4,824	57%	2,346	64%
Other Alaska	2,379	28%	974	27%
Non-Alaska	1,212	14%	338	9%
Total	8,415		3,658	
WTR-VDZ				
Alaskans	1,898	30%	596	28%
Gulf Coast	492	8%	178	8%
Other Alaska	1,406	22%	418	20%
Non-Alaska	4,526	70%	1,546	72%
Total	6,424		2,142	
YPS-WTR				
Alaskans	61	19%	31	23%
Gulf Coast	27	8%	13	10%
Other Alaska	34	10%	18	14%
Non-Alaska	266	81%	101	77%
Total	327		132	

Table 3.16
Aleutian Islands Port-to-Port Passenger and Vehicle Traffic Numbers, Year 2007

	PAX	%	VEHICLES	%
HOM-CHG				
Alaskans	131	93%	42	98%
Southwest	79	56%	23	53%
Other Alaska	52	37%	19	44%
Non-Alaska	10	7%	1	2%
Total	141		43	
HOM-SDP				
Alaskans	26	79%	44	96%
Southwest	8	24%	26	57%
Other Alaska	18	55%	18	39%
Non-Alaska	7	21%	2	4%
Total	33		46	
HOM-KCV				
Alaskans	74	97%	77	99%
Southwest	31	41%	45	58%
Other Alaska	43	57%	32	41%
Non-Alaska	2	3%	1	1%
Total	76		78	
HOM-CDY				
Alaskans	21	84%	28	76%
Southwest	8	32%	8	22%
Other Alaska	13	52%	20	54%
Non-Alaska	4	16%	9	24%
Total	25		37	
HOM-FPS				
Alaskans	25	96%	16	94%
Southwest	14	54%	9	53%
Other Alaska	11	42%	7	41%
Non-Alaska	1	4%	1	6%
Total	26		17	

	PAX	%	VEHICLES	%
HOM-AKU				
Alaskans	15	94%	-	
Southwest	13	81%	-	
Other Alaska	2	13%	-	
Non-Alaska	1	6%	-	
Total	16		-	
HOM-UNA				
Alaskans	120	40%	30	79%
Southwest	11	4%	10	26%
Other Alaska	109	36%	20	53%
Non-Alaska	179	60%	8	21%
Total	299		38	
TOTAL CHAIN RUN				
Alaskans	*412*	*67%*	*237*	*92%*
Southwest	*164*	*27%*	*121*	*47%*
Other Alaska	*248*	*40%*	*116*	*45%*
Non-Alaska	*204*	*33%*	*22*	*8%*
Total	*616*		*259*	

Figure 3.7
Percentage of Passenger Traffic by Itinerary-Holder Residence
Regional (Southeast) Resident, Other Alaska Resident, and Non-Resident
Selected Southeast Routes – calendar year 2007

Figure 3.8
Percentage of Passenger Traffic by Itinerary-Holder Residence
Regional (Gulf of Alaska Coast) Resident, Other Alaska Resident, and Non-Resident
Selected Southwest Routes – calendar year 2007

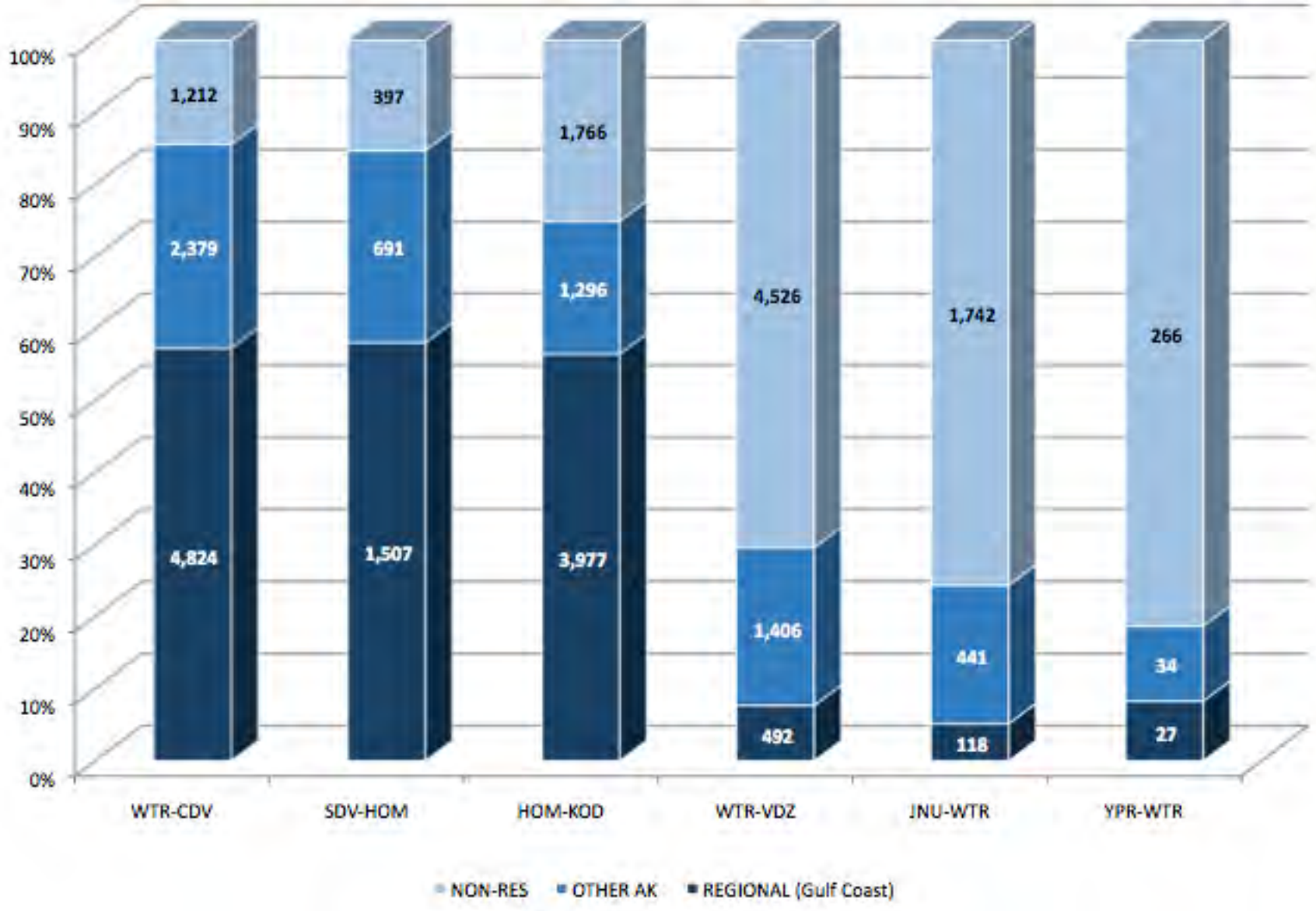


Figure 3.9
Percentage of Passenger Traffic by Itinerary-Holder Residence
Regional (Southwest) Resident, Other Alaska Resident, and Non-Resident
Aleutian Chain Run (Outbound/Westward) – calendar year 2007

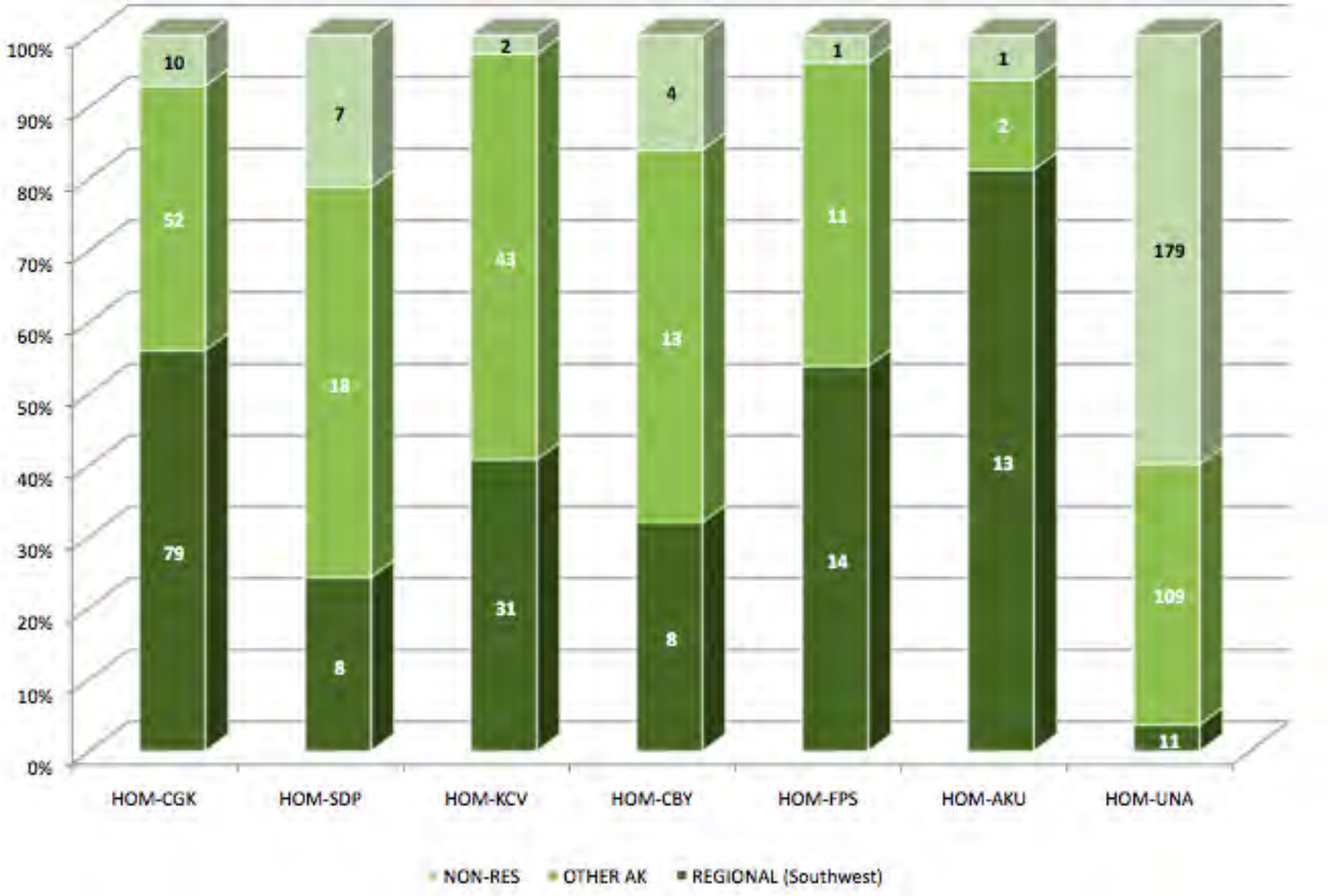


Figure 3.10
Passenger Counts by On-Off Pairs, calendar year 2007

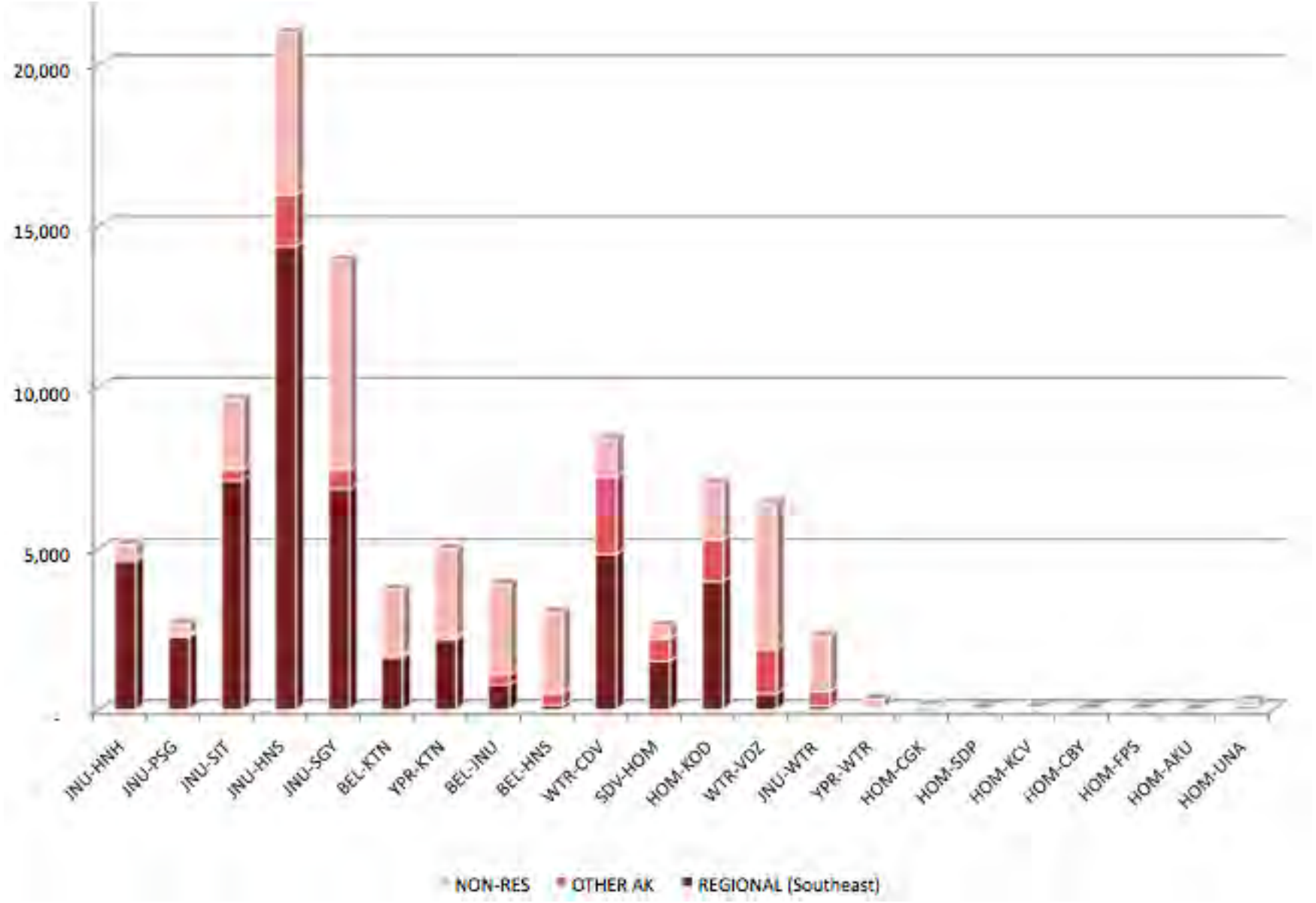


Figure 3.11
Percentage of Vehicle Traffic by Itinerary Holder Residence
Regional (Southeast), Other Alaska Passengers, and Non-Resident Passengers
Selected Southeast Routes – calendar year 2007

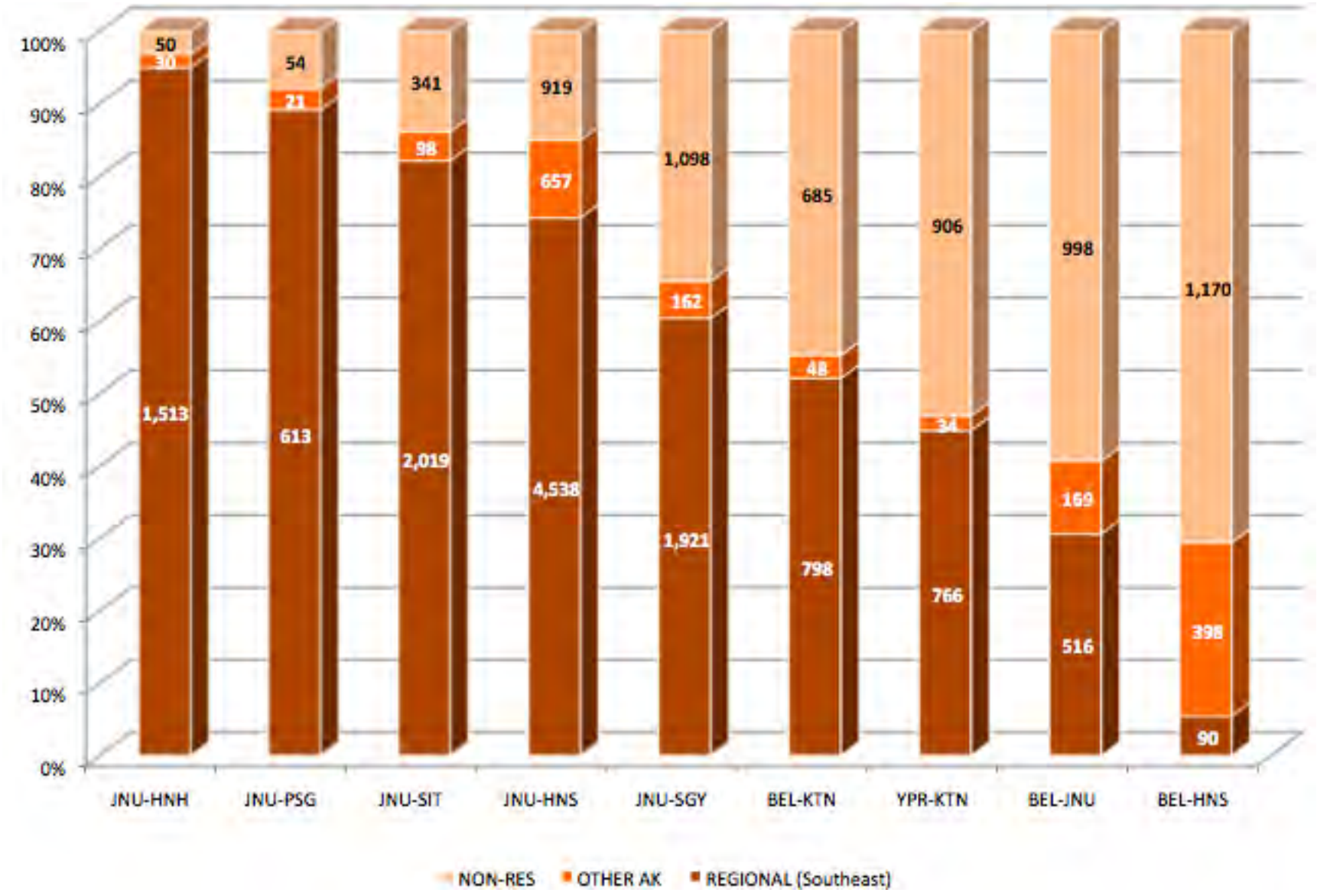


Figure 3.12
Percentage of Vehicle Traffic by Itinerary-Holder Residence
Regional (Gulf of Alaska Coast) Resident, Other Alaska Resident, and Non-Resident
Selected Southwest Runs – calendar year 2007

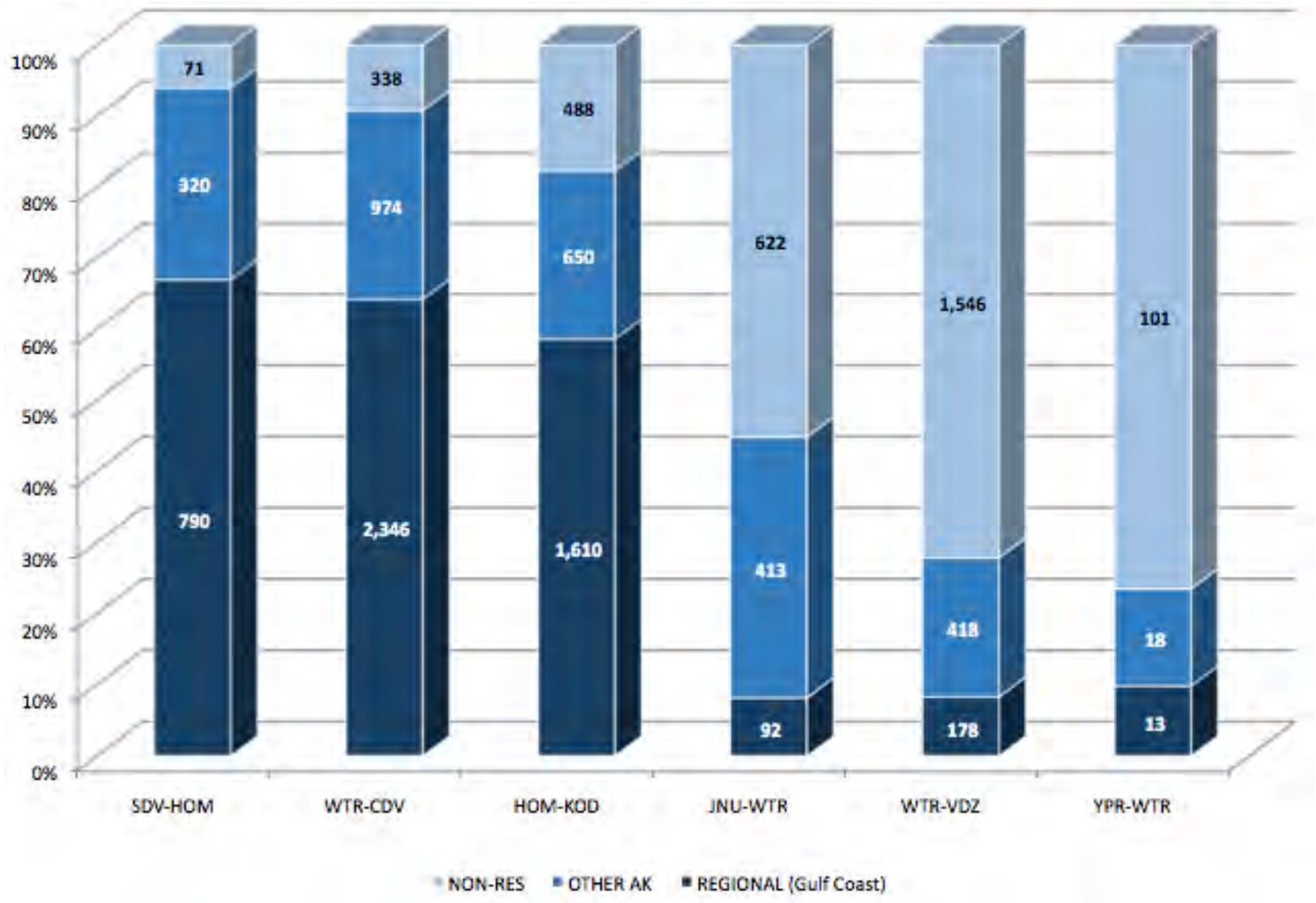


Figure 3.13
Percentage of Vehicle Traffic by Itinerary-Holder Residence
Regional (Southwest) Residents, Other Alaska Residents and Non-Residents
Aleutian Chain Run (Outbound/Westward) – calendar year 2007

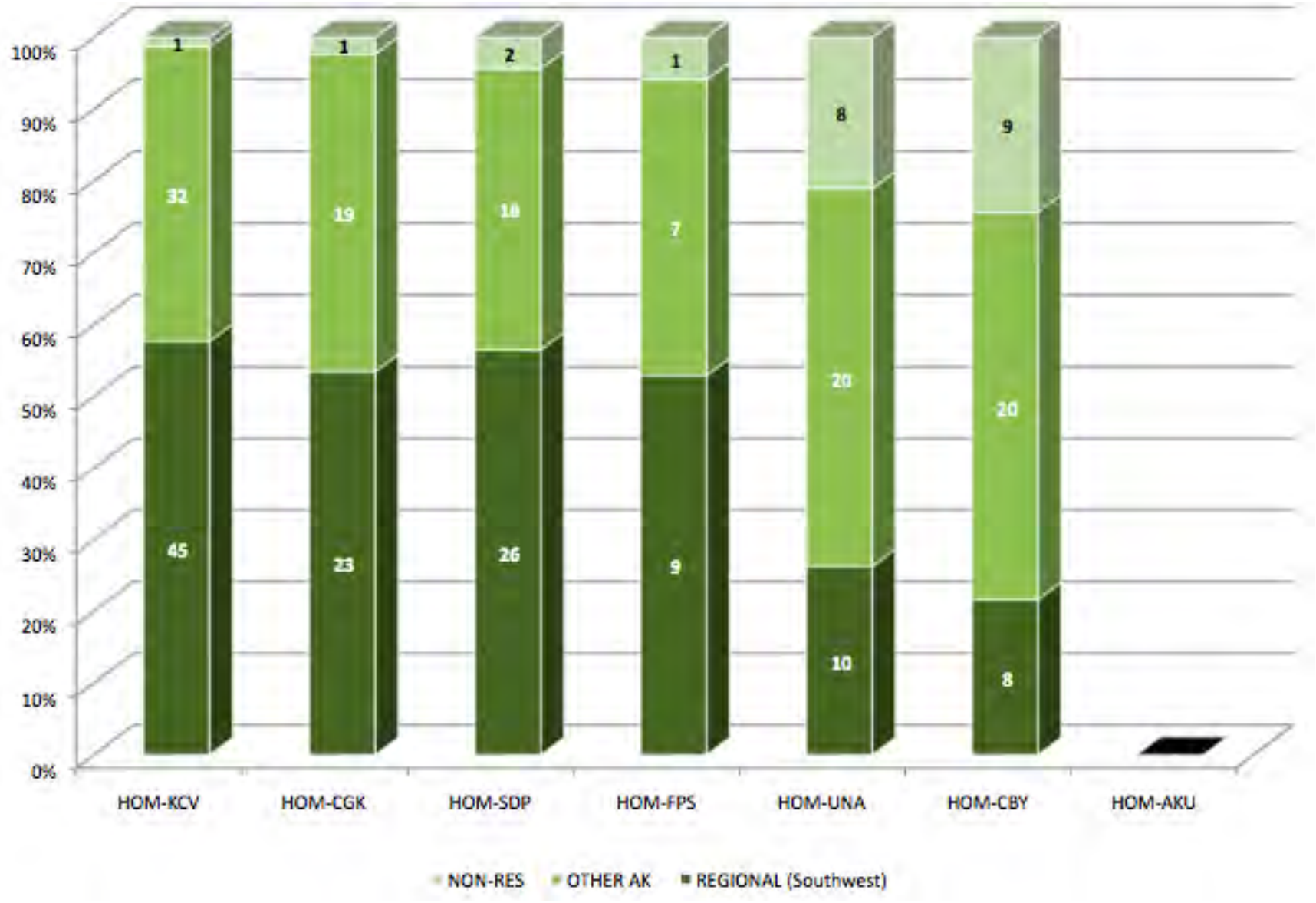
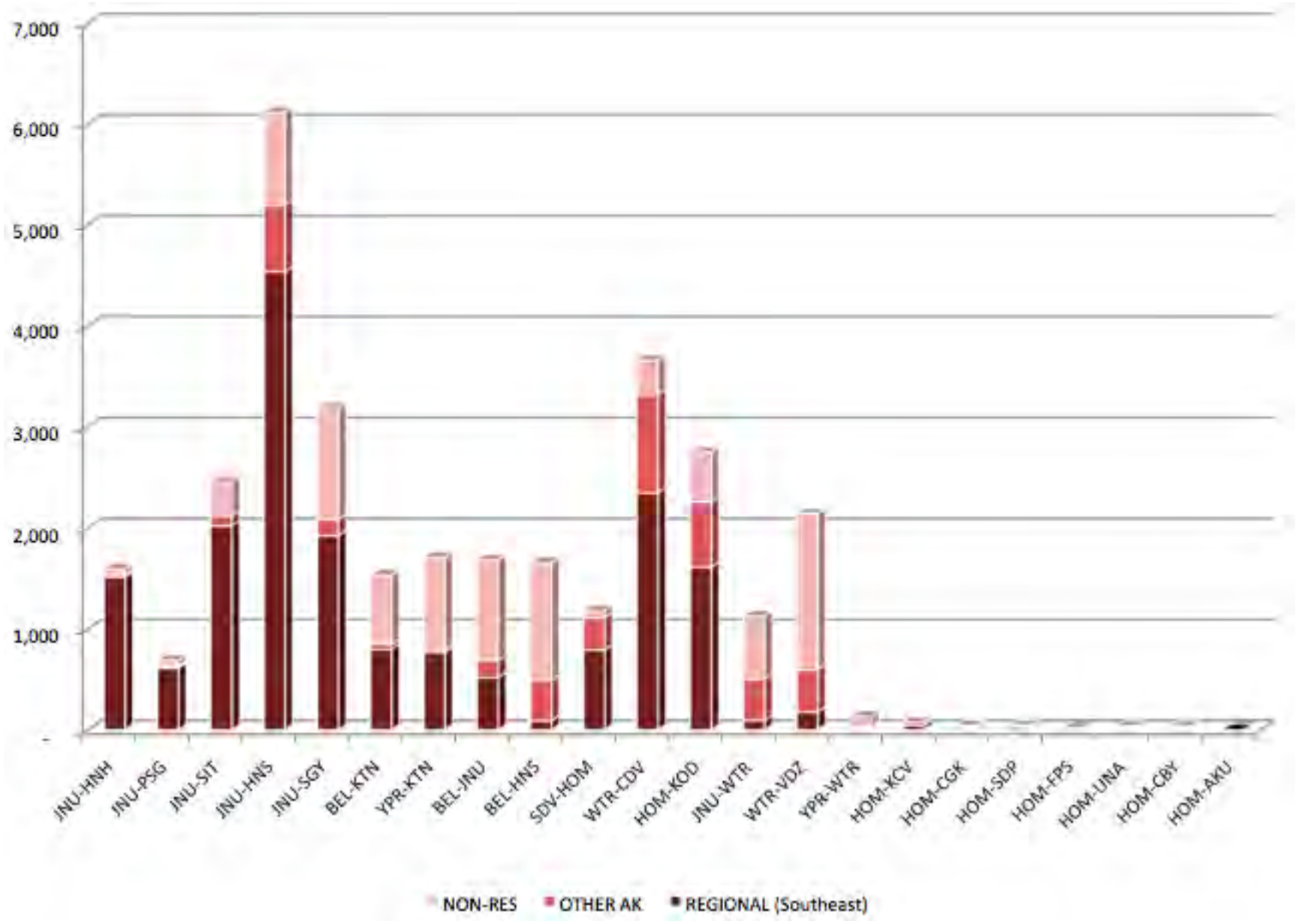


Figure 3.14
Vehicle Counts by On-Off Pairs, calendar year 2007



3.13 SEASONALITY OF PASSENGER RESIDENCY ON SELECTED AMHS ROUTES

The following charts and graphs depict ridership on specific port pairs as a function of the season. The data further define the percentage of traffic by residency.

Figure 3.15
Percentage of Passenger Traffic by Season
Regional (Southeast) Residents, Other Alaska Residents and Non-Residents
Bellingham – Haines, calendar year 2007

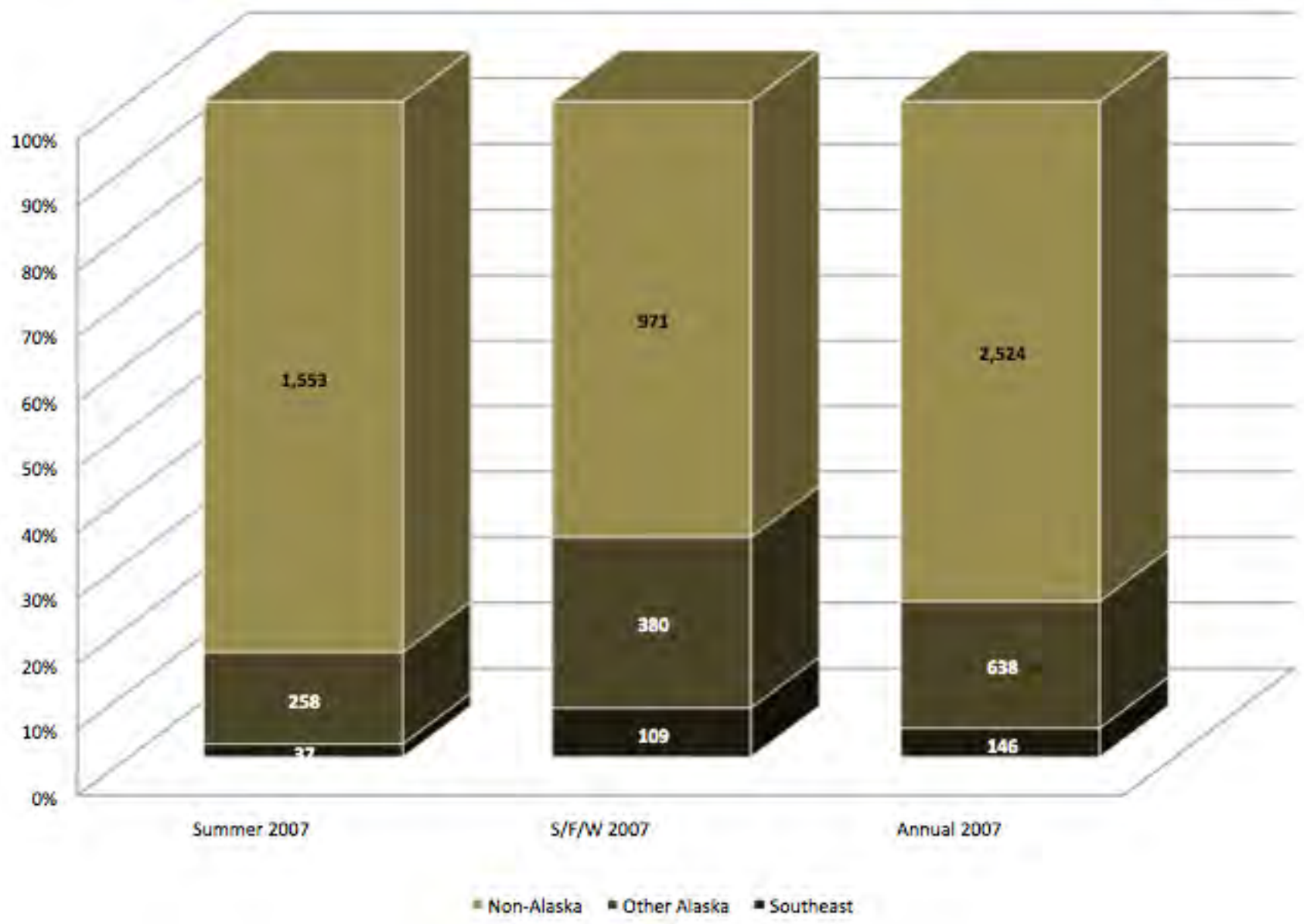


Figure 3.16
Percentage of Passenger Traffic by Season
Regional (Southeast) Residents, Other Alaska Residents and Non-Residents
Bellingham – Juneau, calendar year 2007

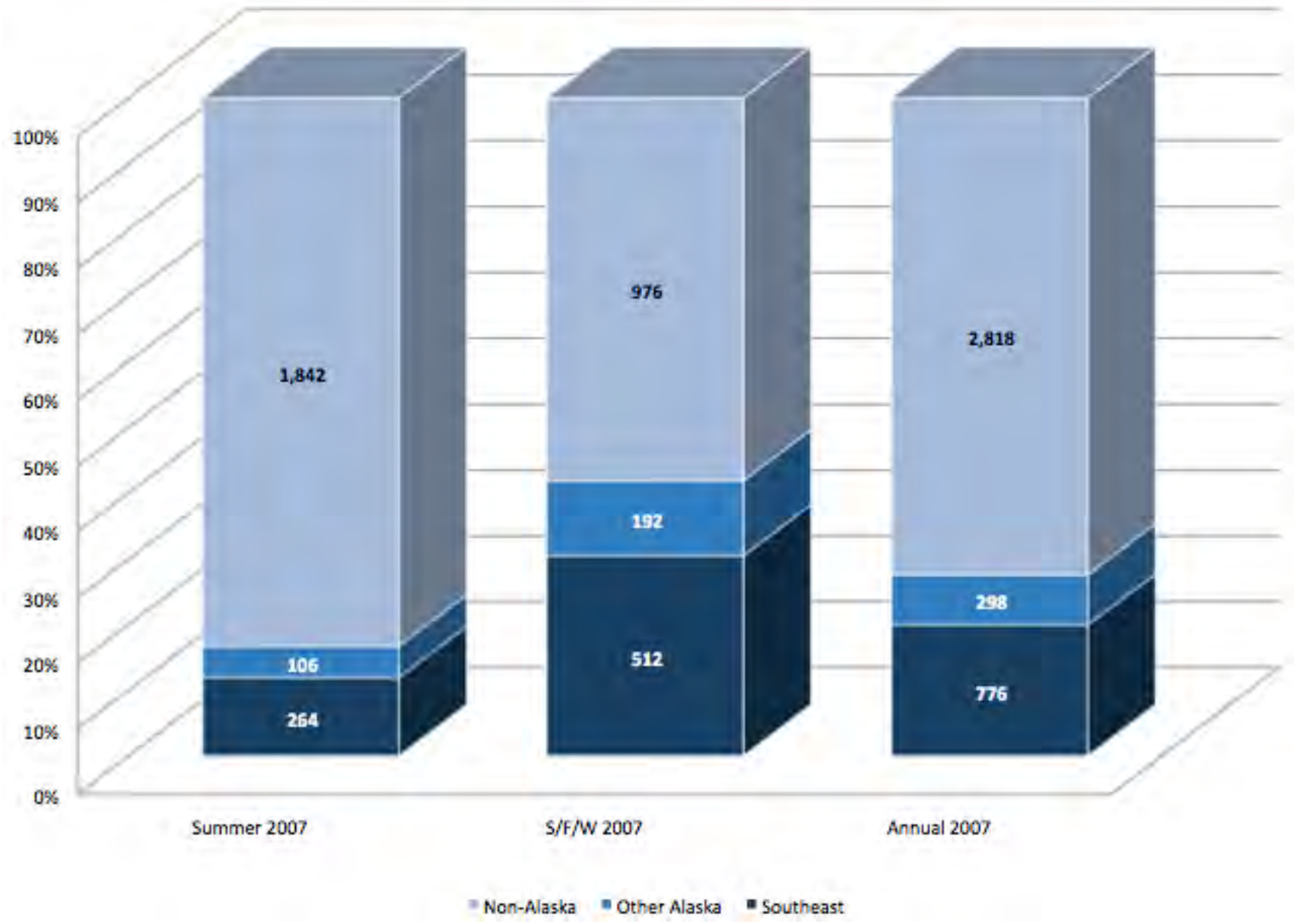


Figure 3.17
Percentage of Passenger Traffic by Season
Regional (Southeast) Residents, Other Alaska Residents and Non-Residents
Ketchikan – Bellingham, calendar year 2007

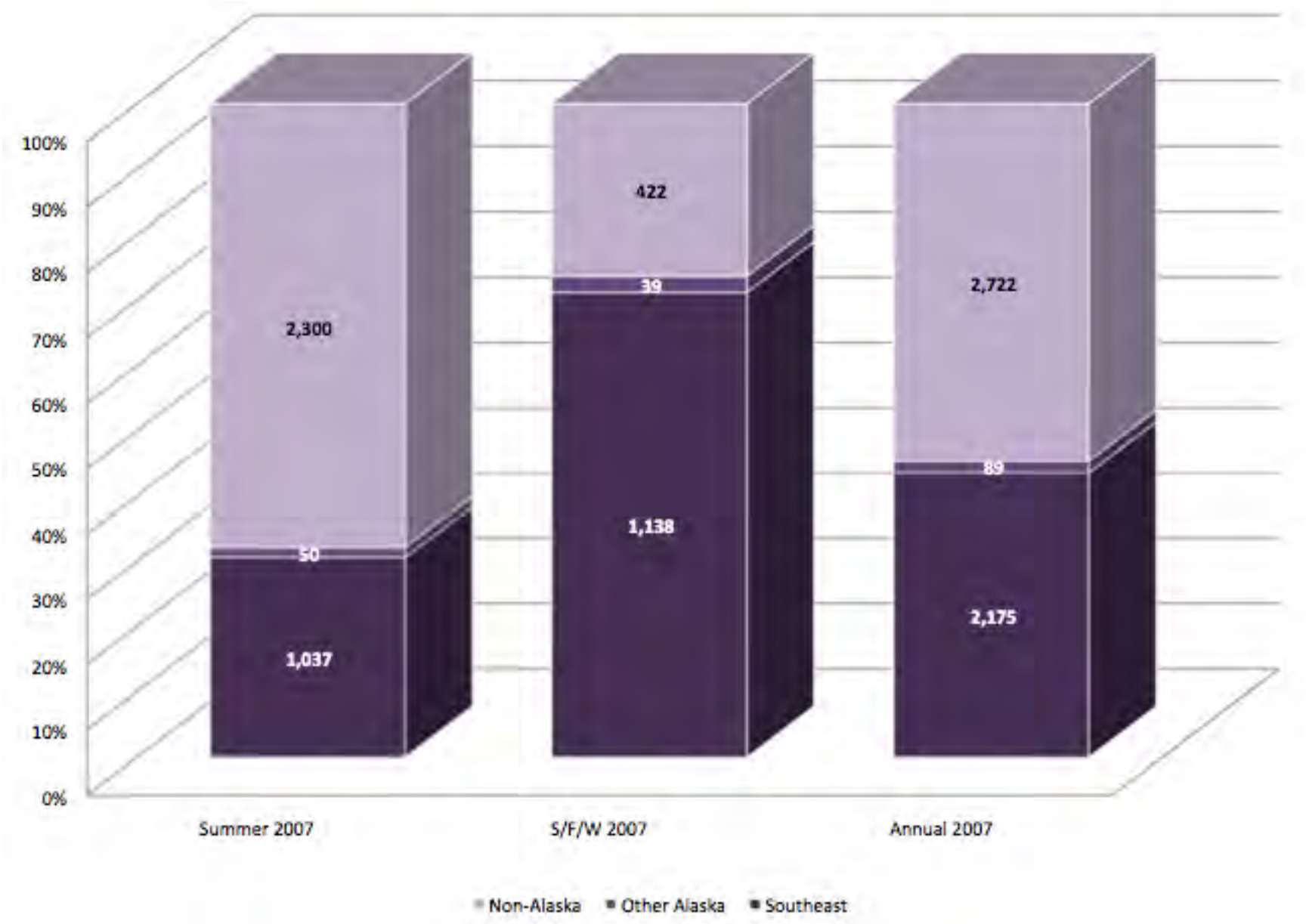


Figure 3.18
Percentage of Passenger Traffic by Season
Regional (Southeast) Residents, Other Alaska Residents and Non-Residents
Juneau – Skagway, calendar year 2007

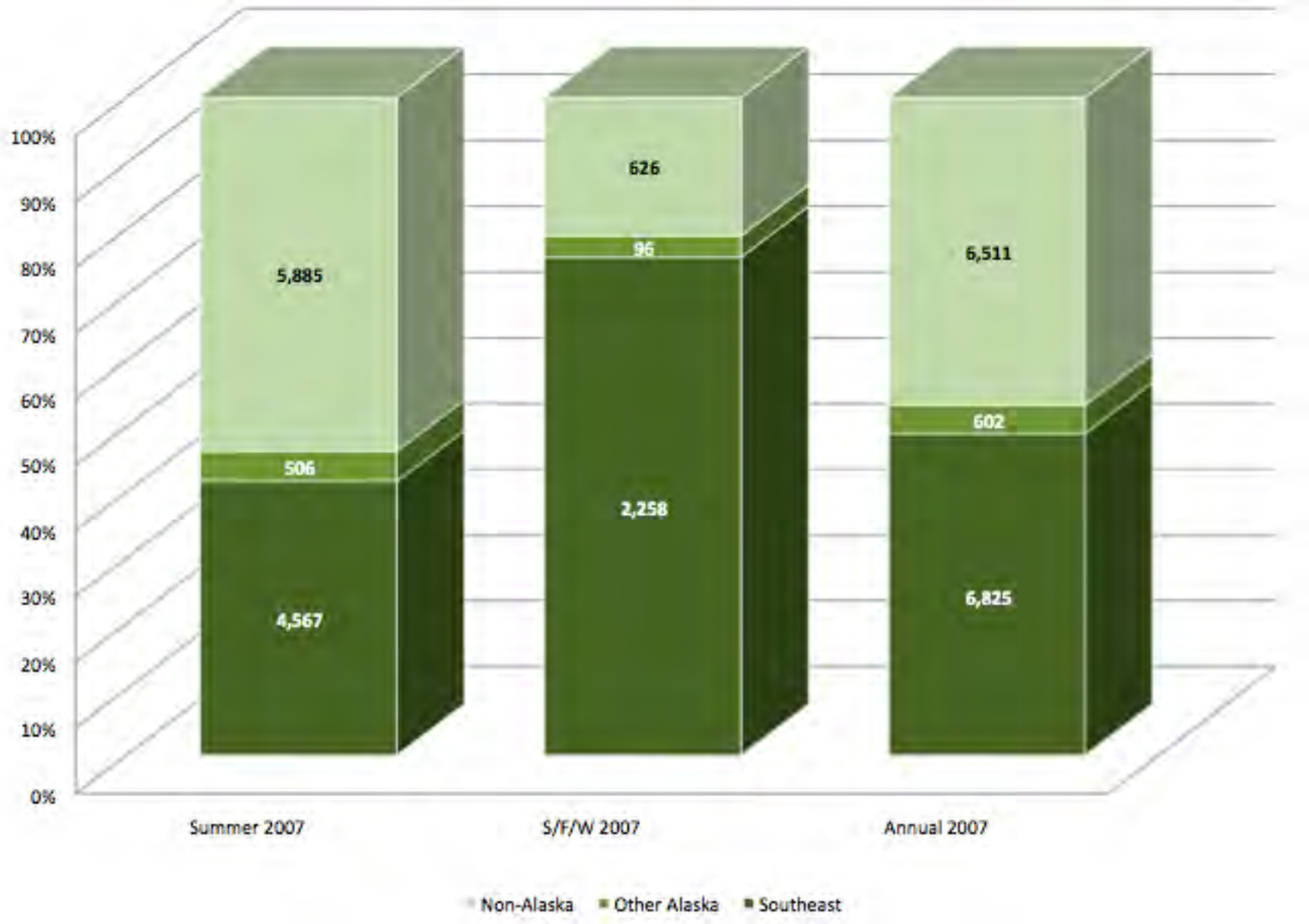


Figure 3.19
Percentage of Passenger Traffic by Season
Regional (Southeast) Residents, Other Alaska Residents and Non-Residents
Juneau – Whittier, calendar year 2007

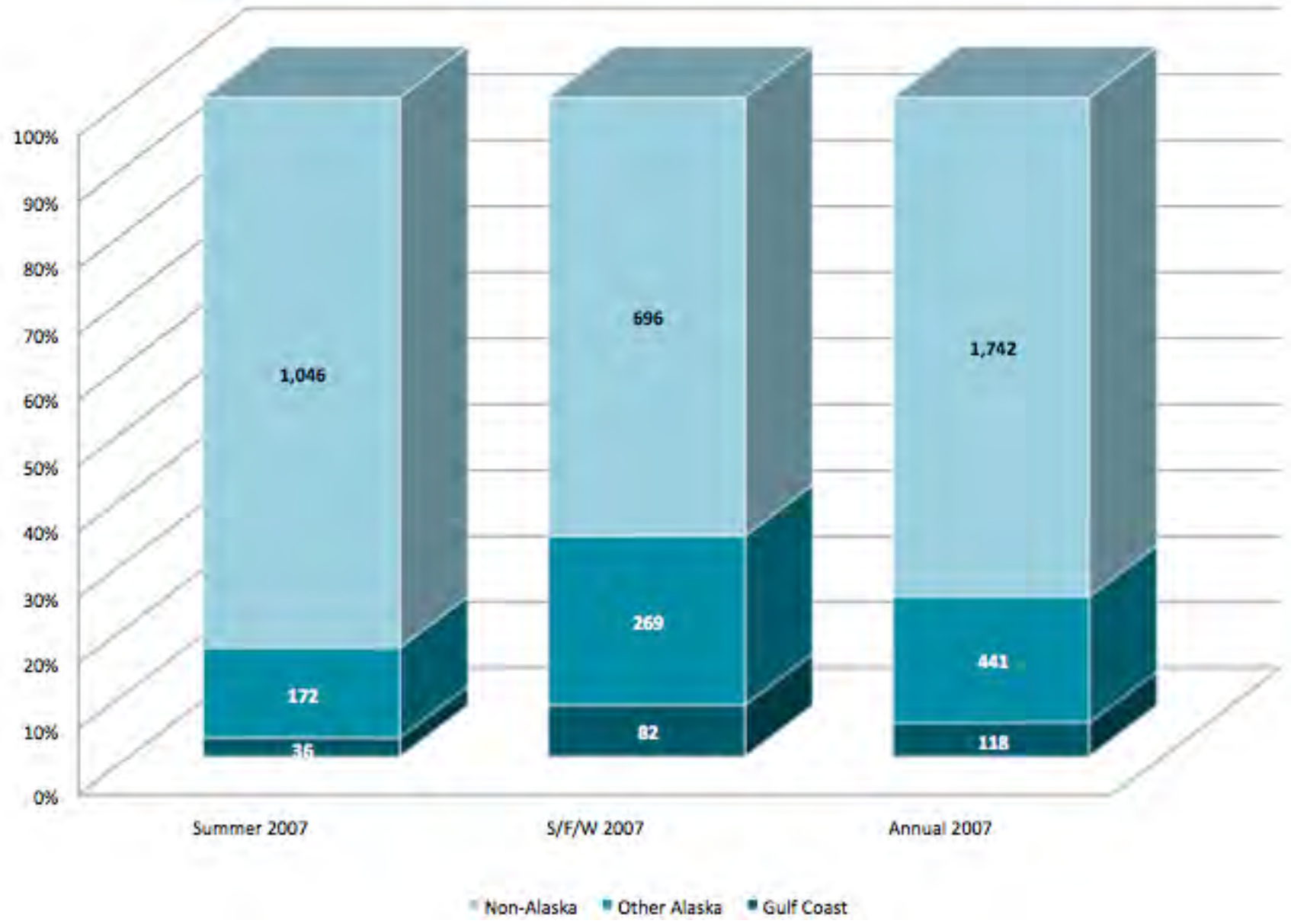


Figure 3.20
Percentage of Passenger Traffic by Season
Regional (Southwest) Residents, Other Alaska Residents and Non-Residents
Whittier – Valdez, calendar year 2007

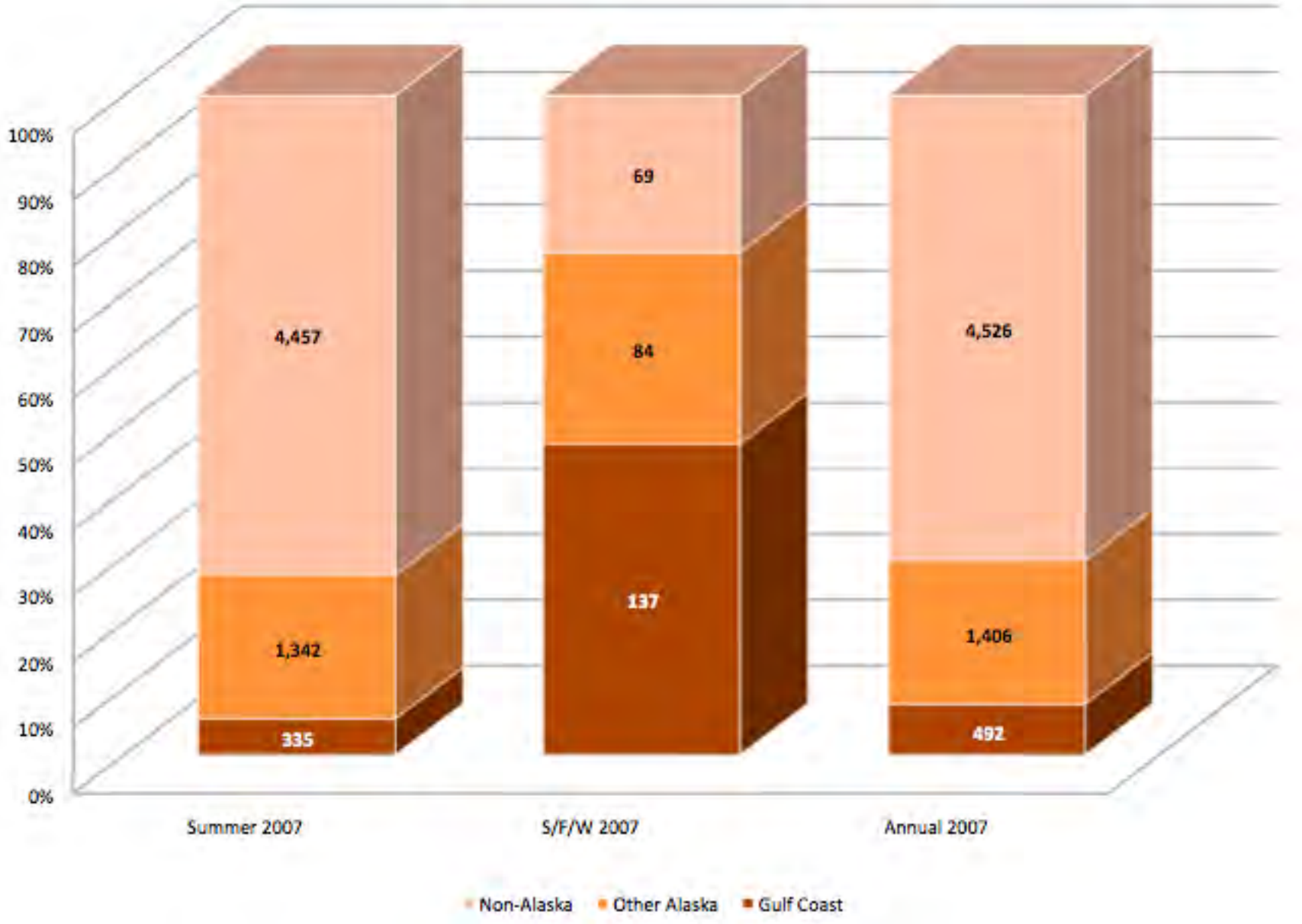
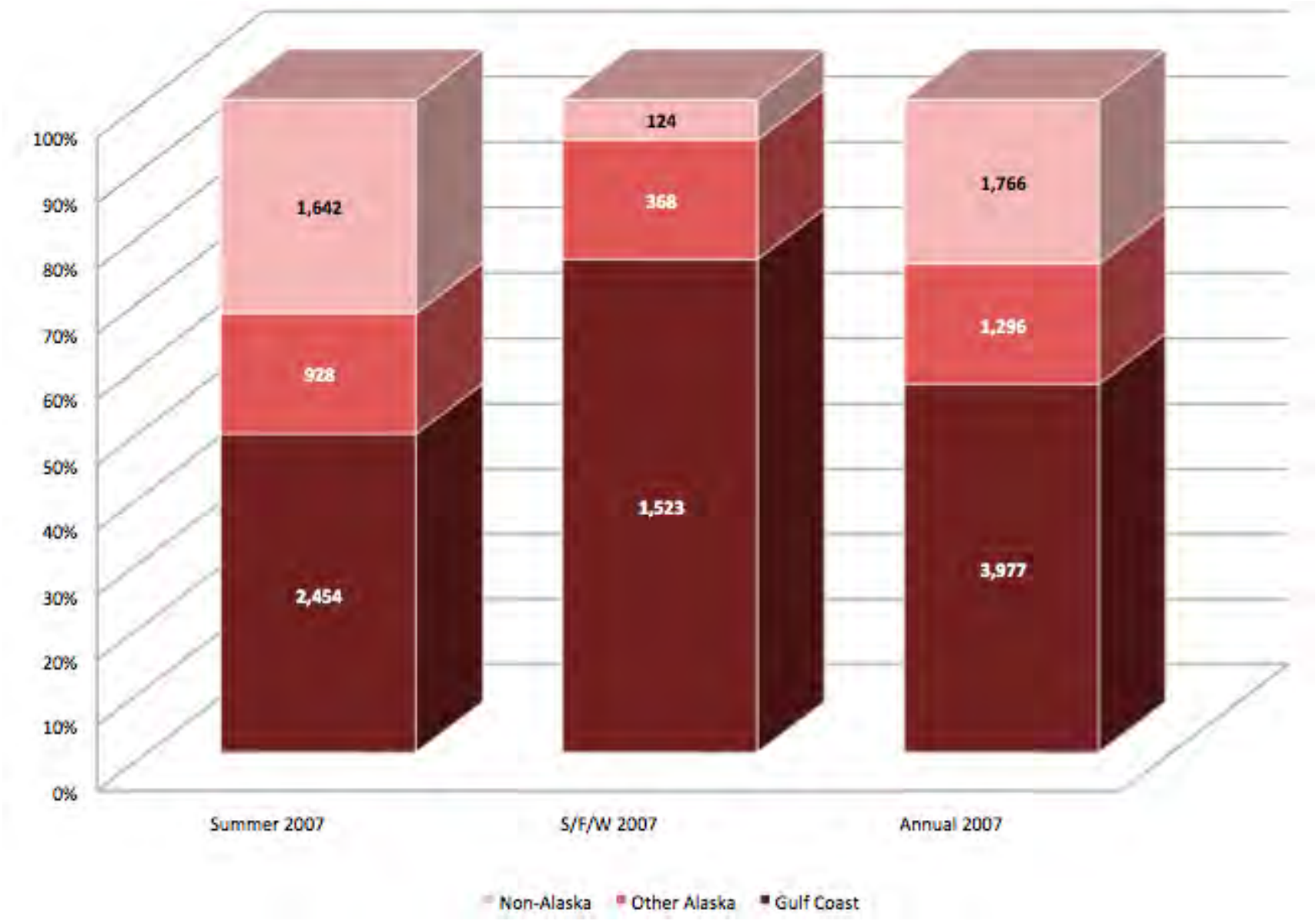


Figure 3.21
Percentage of Passenger Traffic by Season
Regional (Southwest) Residents, Other Alaska Residents and Non-Residents
Homer – Kodiak, calendar year 2007



3.14 AMHS OPERATING REVENUE AND EXPENDITURES

Table 3.17
AMHS Operating Revenue and Expenditures, FY 1995-FY 2007
(in $ millions)

Fiscal Year	Total Revenue	Total Expenditures	Revenue as Percent of Expenditures
2007	$48.4	$144.3	34%
2006	$51.0	$131.2	39%
2005	$45.6	$99.3	46%
2004	$43.6	$87.4	50%
2003	$41.5	$84.6	49%
2002	$32.2	$77.6	42%
2001	$37.6	$78.9	48%
2000	$38.3	$74.4	52%
1999	$38.8	$71.4	54%
1998	$37.1	$70.5	53%
1997	$38.6	$70.9	54%
1996	$38.5	$70.8	54%
1995	$41.5	$71.9	58%

Revenue Source: "Revenue Sources Book," State of Alaska Department of Revenue, Tax Division. Various years.
Expenditures Source: "Governor's Operating Budget" State of Alaska Office of Management and Budget (OMB). Various years.
Note on revenue: Revenue Sources Book actuals differ slightly from OMB actuals. Also, OMB refers to AMHS revenue as unrestricted. The Revenue Sources Book calls it restricted because it is required to be deposited in the AMHS sub-fund located in the General Fund.

Figure 3.22
AMHS Operating Revenue and Expenditures, FY 1995-FY 2007
(in $ millions)

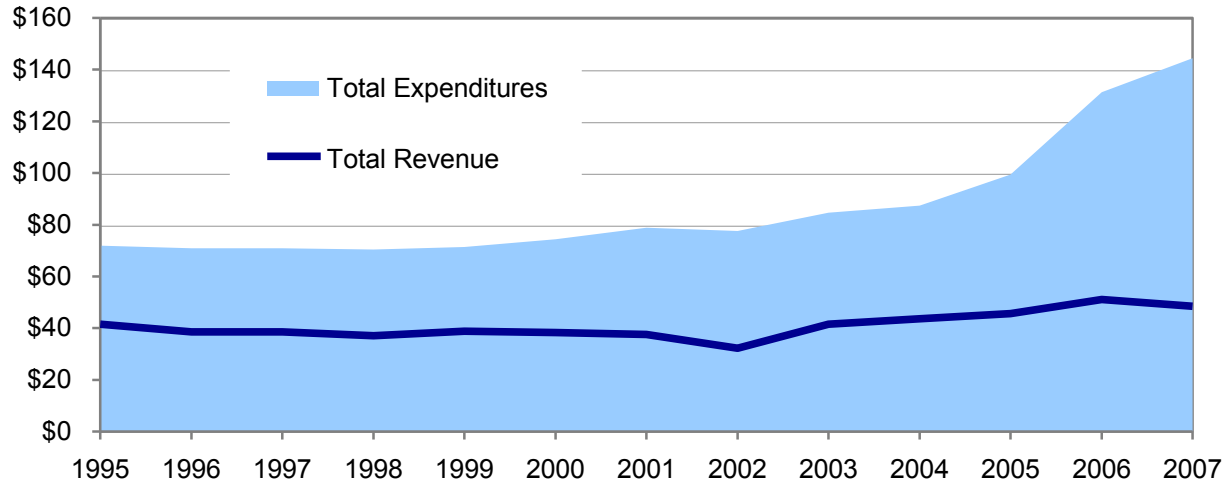


Table 3.18
AMHS Total Operating Expenditures, FY 1994-FY 2007
(in $ millions)

Fiscal Year	Reservations Marketing	Vessel Operations Management	Marine Shoreside Operations	Marine Vessel Operations	Marine Engineering	Overhaul	Other	Total Expenditures
2007	2.4	3.2	5.8	128.6	2.6	1.7	-	**144.3**
2006	2.4	2.0	5.2	118.2	1.9	1.6	-	**131.2**
2005	1.8	1.6	4.5	88.0	1.9	1.7	-	**99.3**
2004	1.8	1.6	4.2	76.1	2.1	1.5	-	**87.4**
2003	1.8	1.5	4.0	73.4	2.1	1.7	-	**84.6**
2002	1.9	1.3	3.9	66.9	1.9	1.7	-	**77.6**
2001	1.9	1.2	4.1	68.0	1.8	1.8	-	**78.9**
2000	1.8	1.0	3.9	64.3	1.6	1.7	-	**74.4**
1999	1.9	0.8	4.1	62.6	0.3	1.7	-	**71.4**
1998	2.2	0.9	3.8	58.5	0.6	1.6	3.0	**70.5**
1997	2.0	0.9	3.8	58.2	0.6	1.6	3.8	**70.9**
1996	2.3	1.4	3.7	57.8	0.6	1.8	3.2	**70.8**
1995	2.4	1.4	3.9	58.2	0.6	1.9	3.6	**71.9**
1994	2.4	1.3	3.8	57.0	0.6	1.7	3.6	**70.6**

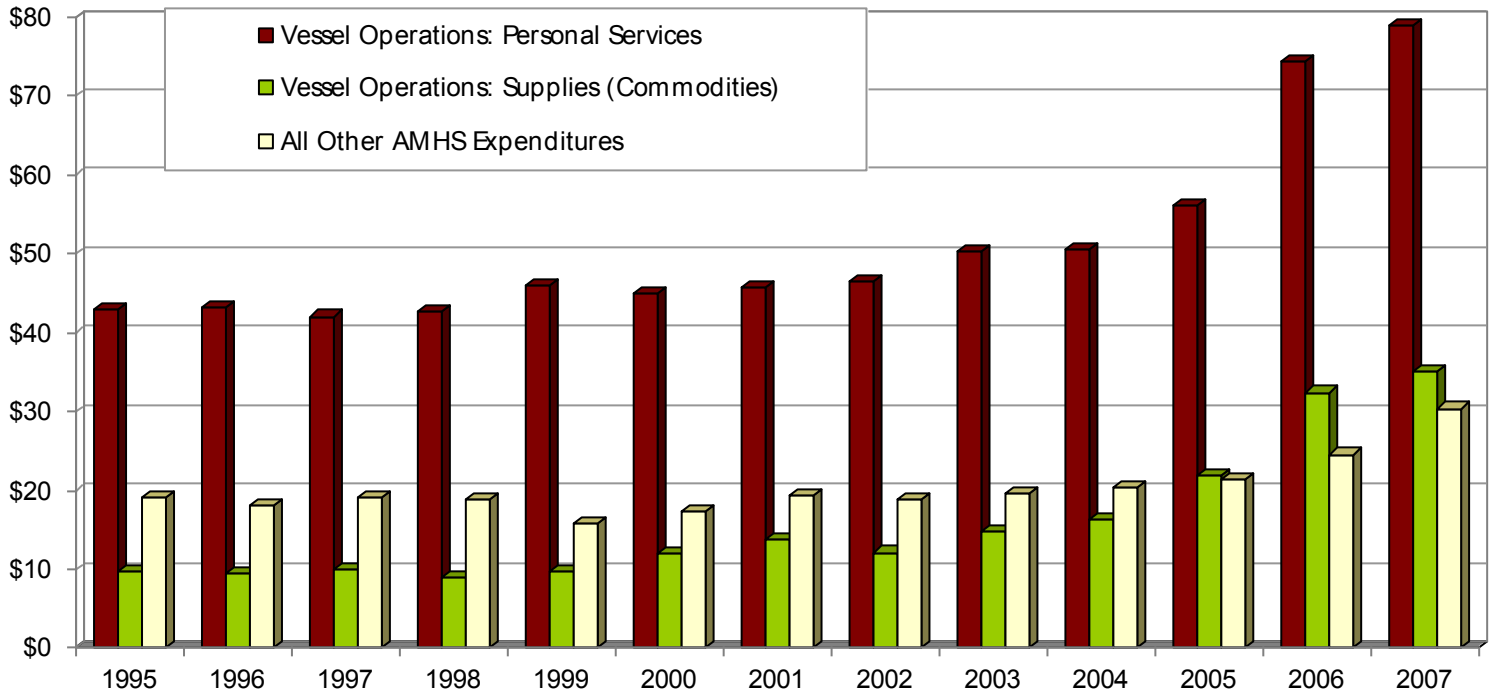
Source: "Governor's Operating Budget" State of Alaska Office of Management and Budget; various years.
Other includes: Capital Improvement Program, Marine Management Support Services, and AMHS Administration.
Note: Some categorization methodology changed during study period (example: Marine Engineering).

Table 3.19
Component Breakout: Marine Vessel Operations Expenditures, FY 1995-FY 2007
(in $ millions)

Fiscal Year	Personal Services	Supplies (Commodities)	Contractual Services	Travel	Capital Outlay (Equipment)	Land & Buildings	Total
2007	78.9	35.0	13.0	1.6	-	-	128.6
2006	74.2	32.4	9.7	1.8	-	-	118.2
2005	56.1	21.9	8.8	1.0	0.1		88.0
2004	50.5	16.4	8.6	0.7	-	-	76.1
2003	50.2	14.9	7.5	0.7	0.1	0.1	73.4
2002	46.5	12.1	7.7	0.5	-	-	66.9
2001	45.6	13.9	8.1	0.5	-	-	68.0
2000	45.0	12.1	6.8	0.4	0.1	-	64.3
1999	45.9	9.7	6.7	0.3	0.0	-	62.6
1998	42.5	9.1	6.4	0.4	0.1	-	58.5
1997	42.0	9.9	6.0	0.3	0.0	-	58.2
1996	43.2	9.5	4.9	0.2	0.0	-	57.8
1995	42.9	9.8	4.9	0.4	0.2	-	58.2

Source: "Governor's Operating Budget" State of Alaska Office of Management and Budget. Various years.

Figure 3.23
AMHS Expenditures: Marine Vessel Operations Personal Services, Marine Vessel Operations Supplies, and All Other AMHS Expenditures, FY 1995-FY 2007 (in $ millions)



Notes: "**All Other AMHS Expenditures**" (yellow columns) include reservations & marketing; vessel operations management; marine shoreside operations; marine engineering; and overhaul (see previous table). "**Vessel Operations Personal Services**" (red columns) are limited to the personnel costs of employees who work on board AMHS vessels. (Shoreside and other employee costs are included in "All Other AMHS Expenditures.") "**Vessel Operations: Supplies**" (green columns) is the category that captures marine fuel expenditures.

CHAPTER 4

FORMATION AND ROLE OF THE MARINE TRANSPORTATION ADVISORY BOARD

4.1 OVERVIEW, POWERS, AND DUTIES

The Marine Transportation Advisory Board (MTAB) was first assembled by administrative order under Governor Murkowski in 2003. The board was composed of regional, community, and industry stakeholders of the marine highway system and tasked with providing nonbinding recommendations to the commissioner of DOT&PF on public policy related to marine transportation functions. MTAB was reauthorized in 2007 by administrative order by Governor Palin.

In 2008, MTAB was established in state law under House Bill 294 as an 11-member board composed of representatives of a cross-section of Alaska communities. In a sponsor statement for HB 294, Rep. Peggy Wilson stated, [MTAB] "will provide the steadfast command and control for the AMHS, the continuity if you will, that is essential throughout any transition of a new governor or any changes in the hierarchy at DOT/PF."

Powers, duties and functions granted to MTAB by its establishing legislation are:

> (a) After the commissioner of transportation and public facilities has considered one or more candidates for the position of director or deputy commissioner of the Alaska marine highway system, the commissioner shall confer with the board regarding that candidate or those candidates before making an appointment to that position. The selection of those candidates shall be without regard to political affiliation.
>
> (b) The board may establish volunteer regional advisory committees. The purpose of the advisory committees is to provide recommendations to the board regarding concerns from the region of the members who constitute the advisory committee.
>
> (c) The board may issue reports and recommendations and shall, in cooperation with the Department of Transportation and Public Facilities, prepare and submit to the department and the governor for review a strategic plan that includes the mission, core values, objectives, initiatives, and performance goals of the Alaska marine highway system.
>
> (d) The board may receive information from the department as the board considers necessary to carry out its duties.

Additionally, HB 294 directs that "The Department of Transportation and Public Facilities, in consultation with the Alaska Marine Transportation Advisory Board, shall prepare a comprehensive

long-range plan for the development and improvement of the Alaska marine highway system and shall, in consultation with the Alaska Marine Transportation Advisory Board, revise and update the plan at least every five years."

The board consists of 11 members appointed by the governor and serving staggered, three-year terms. Each must be a resident of the state. The establishing legislation dictates the board composition, as described in the following excerpt:

- One member who has significant level of experience in the private sector or local government, specializing in financing or economic development or marketing, from each of the following districts:
    - Northern southeast Alaska, representing Haines, Juneau and Skagway;
    - Central southeast Alaska, representing Petersburg, Sitka and Wrangell;
    - Southeast Alaska, representing the cities of Angoon, Hoonah, Kake, Pelican, and Tenakee Springs;
    - The Prince William Sound and Kenai Peninsula areas, representing the cities of Cordova, Valdez, and Whittier, the City and Borough of Yakutat, and the communities of Chenega Bay and Tatitlek;
- Southwest Alaska, representing the cities of Akutan, Chignik, Cold Bay, False Pass, Homer, King Cove, Kodiak, Port Lions, Sand Point, Seldovia, and Unalaska, including Dutch Harbor;
- One retired marine captain or marine engineer who is not affiliated with the Alaska marine highway system;
- One representative, who may be retired, of a recognized union that represents employees of the Alaska marine highway system;
- One business owner who has experience interacting with the Alaska marine highway system;
- One travel agent or tourism specialist familiar with various Alaska marine highway reservation systems available to the public; and
- Two members of the public at large.

4.2 BOARD MEMBERSHIP

Alaskans currently appointed to the board are William T. Beck, John "JC" Conley, Mark Eliason, Gerry Hope, Capt. William Hopkins, Clay Koplin, Mike Korsmo, Shirley Marquardt, Cathie Roemmich, Maxine Thompson, and Robert Venables.

The following board appointee biographical information is taken from the Governor's office news announcement number 08-156.

Beck, of Anchorage, fills an at-large public seat and also fulfills a requirement that the board include a resident of an area not directly served by the AMHS. Since 1992, he has been owner and manager of an Anchorage travel agency now known as Alaska Travel Source, and has held certification from the International Association of Travel Agents. From 1980-91 he worked as a commercial diver for an Alaska underwater construction service, and before that spent three years as a junior and high school science teacher in Petersburg. Beck earned a bachelor's degree in biochemistry and education from the University of South Carolina in 1977.

Conley, of Ketchikan, fills a seat reserved for a business owner with experience interacting with the AMHS, and will also fulfill a requirement that one member reside in the Ketchikan Gateway Borough. Conley owns Service Auto Parts in Ketchikan. He has served three terms on the Ketchikan Gateway Borough Assembly, and served twice as chair of the Ketchikan Chamber of Commerce and the Southeast Conference. Conley chaired MTAB when it was originally authorized by administrative order in 2003.

Eliason, of Anchorage, fills a seat reserved for a travel agent or tourism specialist familiar with AMHS reservation systems. Since 1985, he has been president and owner of USTravel, a diversified travel management company. Eliason has served on several travel industry boards, including the Anchorage Convention & Visitors Bureau, which he served as vice chair, and the World Travel Partners Affiliate Advisory Board. He is also a member of the Alaska Travel Industry Association.

Hope, of Sitka, fills a seat representing central Southeast Alaska, including Petersburg, Sitka, and Wrangell. He has been the transportation manager for the Sitka Tribe of Alaska since 2007, and was an elected member of the Sitka Tribal Council from 1999-2007. Hope serves in the Sitka Chamber of Commerce board of directors, and is the current president of the Alaska Native Brotherhood.

Hopkins, of Ketchikan, fills a seat reserved for a representative of a union representing AMHS employees. He retired from the ferry system in 2007 after 30 years of service. Hopkins has served as a marine pilot in Southeast and Southwest Alaska and in Puget Sound on all state ferry vessels except the ferry *Wickersham* and the system's high-speed craft. He served eight years as permanent master of the motor vessel *Aurora* and another eight years as permanent master of the ferry *Kennicott*. Hopkins is the author of two books, including *Wrangell Narrows, Alaska*" a mile-by-mile guide for mariners navigating the Inside Passage. He was first appointed to MTAB in 2007.

Koplin, of Cordova, fills a seat representing the Prince William Sound and Kenai Peninsula areas. He has served as the manager of engineering and operations for the Cordova Electric Cooperative since 1988. Koplin worked with the Prince William Sound Economic Development Group and the Cordova Chamber of Commerce to develop a marketing strategy for the motor vessel *Aurora* and the fast vehicle ferry *Chenega*. He was first appointed to MTAB in 2007.

Korsmo, of Skagway, fills a seat designated for a retired marine captain or marine engineer who is not affiliated with the AMHS. He captains a 100-foot tugboat for Amak Towing, a subsidiary of Southeast Stevedoring. He has served as a Skagway City Council member since 2002, and is a

member of the Southeast Conference board of directors, chairing its transportation committee. Korsmo also serves on the Alaska Municipal League's public works and infrastructure committee. He was first appointed to MTAB in 2007.

Marquardt, of Unalaska, fills a seat representing Southwest Alaska, including the Aleutian Islands. She is the port operations manager for Samson Tug and Barge in Dutch Harbor. Marquardt was elected mayor of Unalaska in 2004, and served the previous 10 years on the Unalaska City Council. She has been a member of the American Seafoods Community Advisory Board since 1999. Marquardt also serves on the Alaska Municipal League's finance committee and the Southwest Alaska Municipal Conference's fisheries committee. She was first appointed to MTAB in 2007.

Roemmich, of Juneau, fills an at-large public seat. She has been executive director of the Juneau Chamber of Commerce since 2006. She was assistant port manager for Southeast Stevedoring in Sitka from 1985-96. Roemmich also spent four years as the service manager for Willie's Marine, Inc. Boat Sales and Service in Juneau. A lifelong Alaskan, she has served as chair of MTAB since 2007.

Thompson, of Angoon, fills a seat representing Angoon, Hoonah, Kake, Pelican, and Tenakee Springs in Southeast Alaska. She has been president of Angoon Oil Company for more than 20 years. Thompson served on the Angoon City Council from 1994-97, and served one term as mayor from 1997-99. A lifelong Alaskan, she was appointed to MTAB in 2007.

Venables, of Haines, fills a seat representing northern Southeast Alaska including Haines, Juneau, and Skagway. He is energy coordinator for the Southeast Conference. He worked for the Haines Borough as manager from 2004-08, and as economic development director 2000-04. He worked as Haines operations manager for a national wholesaling company from 1990-2001. Venables is active in the Haines and Alaska State chambers of commerce, is a former chair of the Southeast Conference, and has been a member of the Haines Borough Fire District #3 board since 1988. He served on MTAB from 2003-04, and was appointed again in 2007.

4.3 BOARD PARTICIPATION IN THE SYSTEMS ANALYSIS

Phase I of the systems analysis focused on establishing baseline data and identifying potential options to reconfigure AMHS resources and assets to improve operating efficiencies and promote the long-term health of the system. It includes an assessment of status quo financial and operational conditions, an examination of management and planning practices, and the first analysis of life-cycle/replacement-costs that has ever been done on the AMHS fleet.

The second phase of the project focuses on the development of a range of service alternatives based on data collected in Phase I. The project team will analyze the service options to determine the ongoing State subsidy necessary to sustain each option into the future. This phase includes a public involvement process that incorporates web content, direct mail, telephone surveys and public presentations to inform the public about the project and the challenges facing AMHS and to collect

public feedback. At the conclusion of Phase II, the project team will advance to DOT&PF a final list of service alternatives along with supporting data and proposed selection criteria.

The MTAB will receive a list of service alternatives for the AMHS from DOT&PF, along with selection criteria. Supporting documentation will outline levels of service, composition of assets, and long-term program needs for each option. The MTAB will independently evaluate all service options using the selection criteria developed in Phase II. It will solicit the public for comments and provide a comment period. The board will report its findings and its own recommendations to the commissioner and the public by November 30, 2009.

CHAPTER 5

REVIEW OF DOT&PF SHORT-TERM ALTERNATIVES FOR THE ALASKA MARINE HIGHWAY SYSTEM

5.1 BACKGROUND

In October 2007 the Alaska Marine Highway management team under a request from the Alaska Office of Management and Budget (OMB) to reduce operating cost of the System, prepared a Short-Term Operating Alternative Analysis. The entire Alternative Analysis is attached as a Appendix-B. The Alternative Analysis was predicated on the premise that AMHS service provided for Fiscal Year 2008 would be duplicated for Fiscal Year 2009 plus an additional $9.6 in FY 09 for ship Capital Improvement Projects (CIP).

Ten operating alternatives were examined. Alternatives 2-8 were progressive cuts in services relative to Alternative 1 which was the then current Full Service Model. Alternatives 9 and 10 were discrete and non-cumulative.

This Short-Term Alternative Analysis was conducted prior to the commencement of this Systems Analysis. Costs included in the Short-Term Alternative Analysis were current operating costs and current capital improvement costs and did not include full life-cycle costs (uniform annual equivalent of all capital costs plus all operating costs). It should be noted that the costs included in the Short-Term Alternative Analysis included costs assumptions for labor that were based on IBU contract rates that had expired on June 30, 2007 since new contract rates had not yet been negotiated.

For each of the Options, a tabulation of an FY09 Operating Budget, Ports of Call Summary, Fixed Cost Summary, and Operating Plan (Service Schedule) was prepared. In addition a short summary of the Pros and Cons of the Service Implications was tabulated (See Chapter 5 Appendix). These fulfilled the OMB request to examine alternatives to reduced the General Fund subsidy of the AMHS and demonstrate what the effective of such reductions would have on Ports-of-Call and service.

5.2 SUMMARY OF SHORT-TERM ALTERNATIVES

The following is a list of the Short-Term Alternatives including a summary of the service reductions for each:

Option 1 - Full Service Model with all boats running all the time

Option 2 – Draft budget presented to OMB

Option 3 – Introduction of Malaspina day-boat in Lynn Canal based in Haines

Option 4 – Reduction of Cross-Gulf Service (2 weeks on/2 weeks off Kennicott)

Option 5 – Elimination of Cross-Gulf Service (Lay up Kennicott)

Option 6 – Introduction of Prince Rupert Shuttle

Option 7 – Eliminates 1 Prince Rupert Vessel

Option 8 – Eliminates 1 Bellingham Vessel

Non-cumulative alternatives

Option 9 – Eliminates Bellingham Service

Option 10 – Eliminates Prince Rupert Service

Note that these Options are NOT TO BE CONSTRUED as the same options in this Systems Analysis as discussed in the Chapters 7 through 9 of this report.

The Operations Financing Components of the Short-Term Alternative Analysis are summarized in the first Table in the Appendix, entitled FY 09 Operating Scenario Analysis. The projected operating budgets for Option 1 through Option 4 are $153.0, $147.9, $145.6 and $138.0 million respectively. These four Options were considered by AMHS management as feasible within the existing political and economic conditions of the last Quarter of calendar year 2007 and the first half of calendar year 2008. The projected operating budgets for Option 5 through Option 8 are $130.9, $128.5, $123.5, and $120.2 million respectively. These four options were not considered for implementation. The projected operating budgets for Option 9 and Option 10 were $122.8 and $138.7 million respectively. These non-cumulative Options were also not considered for implementation.

5.3 OUTCOMES ANALYSIS OF SHORT-TERM ALTERNATIVES IMPLEMENTED FOR FY09 AND FY10

As noted above Option 4 was selected as the Short-Term Operating plan for FY09 with a projected budget of $138.0 million. The actual FY09 Operating Budget was $142.0 million. The variance of approximately $4.0 million was a function of higher fuel costs, higher travel costs, and higher shore-side costs than projected. The variance was within 3% of the projected budget. Thus the AMHS management and staff demonstrated the ability to control costs even in a period of significant economic uncertainty.

For FY10 (which shall end after the completion of this report) the estimated actual budget is $142.7 thus relative to the budget for Option 4 that was projected in October 2007, the variance is only $4.7

million. The expected actual expenditures include a 5% wage increase for FY10. The FY10 operating budget was positively impacted by lower fuel costs, lower service costs, and lower commodity costs.

The implementation of Option 4 of the Short-Term Alternatives has not only provided AMHS with the opportunity to demonstrate cost control within projections but has resulted in the maintenance of consistent vessel schedules. These consistent schedules have resulted in increased user satisfaction as demonstrated by decreased complaints to staff and management as well as to the Marine Transportation Advisory Board.

5.4 INCORPORATION OF LIFE-CYCLE COST ANALYSIS IN FUTURE ALTERNATIVES ANALYSIS

The Life-Cycle Cost Analysis model discussed in Chapters 7 and 8 shall provide AMHS managers with an additional engineering economic analysis tool to estimate the total cost of any short-term, intermediate-term, or long-term operating scenario that management would wish to consider in the future. This will enhance the ability of management to further control costs in the future just as it has demonstrated it could with the operational cost control of Option 4 during FY09 and FY10.

CHAPTER 6

LESSONS LEARNED FROM BRITISH COLUMBIA FERRIES

6.1 INTRODUCTION

Three major ferry companies operate in the Pacific Northwest and Alaska. Although distinguished by many differences, Washington State Ferries, British Columbia (BC) Ferries, and the AMHS share many operating challenges.

In recent years, BC Ferries has undergone significant change in its legislated mandate, organization, and business practices. Many of these changes resulted from shortcomings identified after a failed attempt to construct and implement service with three large, high-speed ferries.

Major corporate change is a bumpy road. BC Ferries has taken its bumps and bruises and is moving ahead, operating reliable service, replacing its fleet, and upgrading its terminals according to plan. Its financial house is in order, and the corporation has the capability of carrying on with capital renewal for the foreseeable future.

The changes within BC Ferries have been comprehensive and have taken several years to implement. The reasons for change, the analyses leading to the change, and the changes themselves hold several lessons that may assist AMHS to chart its future. This chapter explores those lessons.

6.2 EVOLUTION OF BC FERRIES 1958 – PRESENT

The British Columbia government formed BC Ferries in 1958 in reaction to a strike by employees of private carriers that crippled coastal ferry service.

BC Ferries commenced operation on June 15, 1960, with two ships. It is rumored that the provincial premier at the time, W.A.C. Bennett, looked out of his office window at a Black Ball ferry, in Victoria Harbour and told his adviser to "buy two ships like that one." Gulf Island Ferries and Black Ball Ferries were purchased in 1961 to initiate four decades of service expansion.

Eleven ships were constructed during the 60s. The route between Port Hardy and Prince Rupert was initiated in 1966. Fleet and service expansion continued in the 70s with the growth of BC's coastal economy.

In 1989, BC Ferries jumped in size after acquiring the responsibility for several short, island and inter-island routes. Fourteen small ferries accompanied this transaction with the Ministry of Highways.

The Duke Point terminal, south of Nanaimo on Vancouver Island, was opened in the mid-90s, as was the Discovery Coast Route between Port Hardy and Bella Coola. By the late 90s, BC Ferries operated service on 25 routes with a fleet of 36 ships, making it one of the world's largest ferry companies.

The company was launched under provincial legislation in 1958 as the BC Toll Authority Ferry System. It became a crown corporation in 1977, and this legislation remained in place until amendments were instituted in 2000 to provide sustainable funding. Major legislative change occurred again in 2003 to ensure sustainability and move the corporation further from government and closer to the private sector.

6.3 RECENT HISTORY AND CORPORATE TRANSFORMATION, 1999 – 2008

BC Ferries has undergone a remarkable transformation in governance, funding, and business practice during the past ten years. Many aspects of the business have changed significantly; however, the routes and schedules have remained very similar since the introduction of the Duke Point to Tsawwassen Route and the Discovery Coast Route in 1995 and 1996, respectively.

During the mid-90s the provincial government attempted to introduce a high-speed, aluminum shipbuilding industry in BC. A shipbuilding subsidiary was established within BC Ferries, and construction of three, 410-foot, 250-car, high-speed ferries—the "PacifiCats"—was launched.

The project ran into several difficulties, as the budget stretched from $270 million to $453 million. The "fast ferry fiasco," as it became known, resulted in the replacement of the board of directors and much of senior management and led to the rebuilding of the corporation.

During 1999 and 2000 the corporation was reorganized, dropping 20 percent of the non-union, non-operational employees. At the start of the rebuilding process, ongoing subsidy requirements were unclear. Detailed capital and operating budgets were developed to pave the way for government to introduce a sustainable financial structure in 2000.

Government administrations changed in 2001, leading to an independent review of BC Ferries, its history, its governance, and its strategic plan. The review concluded that the strategic plan was sound but had a low probability of being implemented under existing legislation authorizing BC Ferries. This review led to the approval of new legislation in 2003 that moved BC Ferries further from government and closer to the private sector. These changes created a regulated corporation that contracted with the provincial government for ferry services and received a mutually acceptable fee for this service, rather than a subsidy.

From 1999 until the present, BC Ferries' governance and organizational structure evolved to create a sustainable ferry service for coastal British Columbia. During these years, systems, procedures, and business practices have continued to improve. Today the corporation's major routes consistently operate at a profit, and minor routes, serving small ferry-dependent communities, operate within the terms and conditions of the contract with government.

6.4 A BASELINE COMPARISON OF AMHS AND BC FERRIES

The AMHS and BC Ferries share a common marine heritage and are widely viewed as essential, public services and extensions to, if not integral components of, their associated highway systems. However, the differences are significant. Whereas BC Ferries serves a large population that is largely concentrated in the lower mainland of British Columbia and southern Vancouver Island, the AMHS customer base is considerably smaller and more dispersed. The weather conditions in the AMHS operating area can be extreme. Although BC Ferries three "northern vessels" operate in similar conditions, the majority of BC Ferries' ships operate in the protected waters of Georgia Strait and the associated Gulf Islands.

6.4.1 TRAFFIC AND ROUTES

Traffic and routes of the AMHS and BC Ferry are compared in Table 6.1 and 6.2, respectively.

Table 6.1
Comparison of Traffic, AMHS and BC Ferries

	AMHS	BC Ferries
Vehicles	97,700	9,615,000
Passengers	308,800	21,665,000

Table 6.2
Comparison of Routes, AMHS and BC Ferries

	AMHS	BC Ferries
Ports/Terminals	32	47
Routes	12	25
Total Route Length	3500	755

It is noteworthy that only three of BC Ferries routes are greater than 90 nautical miles—these are the routes served by the "northern vessels"; the majority are less than 10 miles and enjoy service 10 to 14 times each day. In contrast, most AMHS routes are considerably longer; many ports are served sequentially; and service is far less frequent.

Despite the social and physical geographic differences between BC Ferries and AMHS, the legislative mandates and need for coastal transport of people, vehicles, and goods have strong similarities. The nature of the business and its cost drivers, systems and procedures, and regulations, as well as the expertise required to operate successfully. are likewise very similar.

Figure 6.1
Alaska Marine Highway System Routes

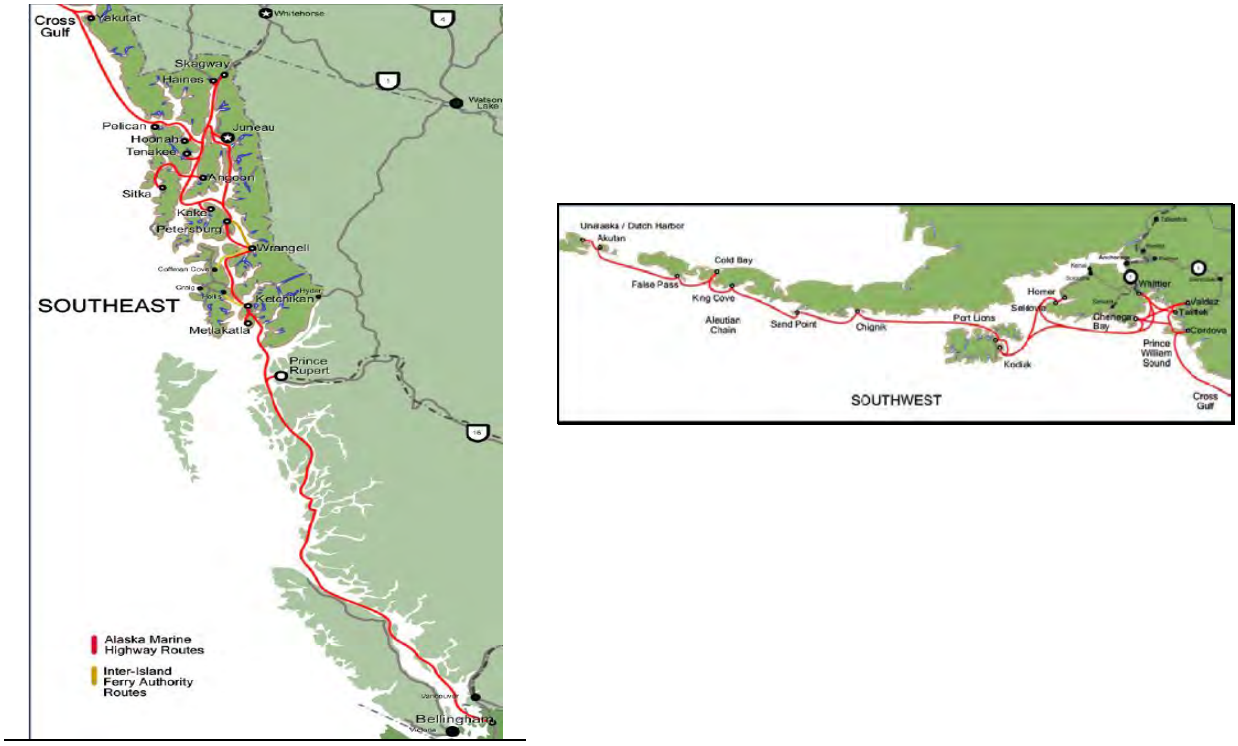


Figure 6.2
BC Ferries Routes

6.4.2 EMPLOYEE BASES AND FLEETS

The employee bases of the ferry systems, shown in Table 6.3, reflect the different service requirements.

Table 6.3
Comparison of Personnel, AMHS and BC Ferries

	AMHS	BC Ferries
Employees	852 (includes 80 non-permanent)	3400 Full-time employees
Represented by	Masters, Mates & Pilots Marine Engineers' Beneficial Association Inland Boatmen's Union	BC Ferry and Marine Workers' Union

Table 6.4 compares the fleets of AMHS and BC Ferries, and Figures 6.3 and 6.4 describe the vessels of AMHS and BC Ferries, respectively.

Table 6.4
Comparison of Fleet Mixes, AMHS and BC Ferries

	AMHS	BC Ferries
Major Ships 450-2050 passengers/258-470 vehicles	0	12
Intermediate/Small Ships 130-1130 passengers/16-192 vehicles	5	22
Overnight Ships 375-650 passengers/80-120 vehicles	6	3
Total Vessels	11	36
Average Age (2007)	26.2	32.6

Both AMHS and BC Ferries are challenged with an aging asset base, have had to deal with deferred maintenance accounts, and face considerable financial hurdles in replacing, let alone augmenting, their respective fleets. Crewing levels are notably higher for vessels that offer on-board accommodation or where the routes served require more than one crew watch.

Figure 6.3
AMHS Ships of the Fleet with their In-service Year

***Matanuska*, 1963**

***Malaspina*, 1963**

***Taku*, 1963**

***Columbia*, 1974**

***Kennicott*, 1998**

***Tustumena*, 1964**

***Aurora*, 1977**

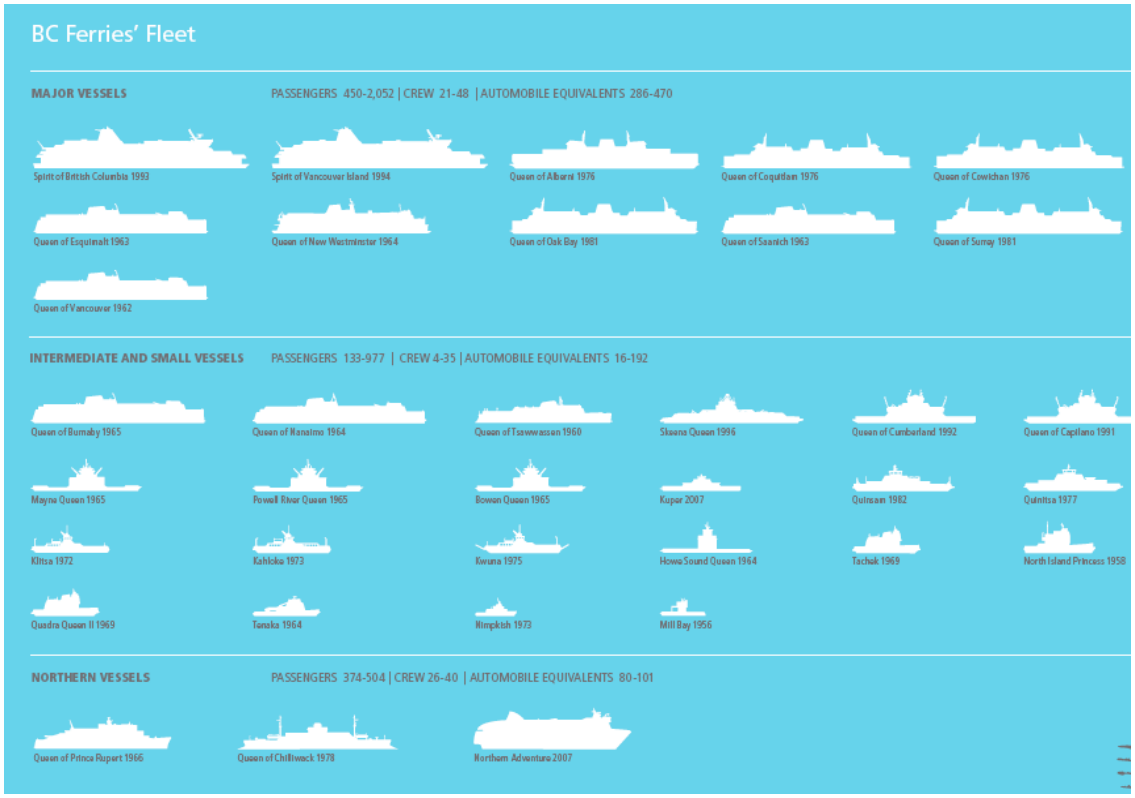
***LeConte*, 1974**

***Lituya*, 2004**

***Chenega*, 2005**

***Fairweather*, 2004**

Figure 6.4
BC Ferries Ships of the Fleet



6.4.3 REVENUES AND EXPENDITURES

An examination of the financial statements for AMHS and BC Ferries highlights the impact that different population bases, route structures, vessel requirements, and operating conditions have on the bottom line. As summarized in Table 6.5, AMHS generates approximately one-third of its total income from tariffs and fares; the tariff and related revenues for BC Ferries are ten-fold greater and account for 80 percent of total income. Cost recovery ratios for AMHS and BC Ferries were 0.34 and 0.87, respectively. In 2007, BC Ferries' net earnings of almost $48.8 million were to be reinvested in ship replacement.

With respect to these cost recovery ratios, it is important to note that three major routes operated by BC Ferries are highly profitable and receive no subsidy under the Coastal Ferry Services Contract. As such, the overall corporate cost recover ratio of 0.87 hides the fact that, much like AMHS, the majority of BC Ferries routes serve smaller, more isolated population centers and that such operations require substantial subsidization. Indeed, the entire provincial contract is dedicated to what are known as the "minor and other routes."

Table 6.5
AMHS-BC Ferries Revenue and Expenditures

		AMHS (millions US$) SFY 2007			BCFS (millions Cdn$) FY06/07
Revenues					
Ticket sales	$ 38.9		Tariff	$ 363.2	
Staterooms/Services	$ 5.7		Social Program	$ 16.0	
Pax Services Sales	$ 3.8		Catering and On Board	$ 71.0	
Concession/Unres	$ 0.03		Other Route Revenue	$ 23.5	
Restricted Revenues	$ 0.6		Other Indirect Revenue	$ 4.9	
Indirect Cost Recovery	$ 0.6				
Total SFY Revenues		**$ 49.6**			**$ 478.6**
SFY 2007 Subsidy		**$ 96.1**	Prov Contract	$ 92.4	
			Federal Subsidy	$ 25.3	**$ 117.7**
Total Income		**$ 145.7**			**$ 596.3**
Expenditures					
Vessel Ops Costs	$ 102.0		Operations	$ 309.1	
Leave Costs	$ 14.6				
Add'l Cost: All vessels	$ 11.0				
Support Services	$ 2.1				
Marine Engineering	$ 1.9		Maintenance	$ 84.9	
Overhaul	$ 1.6				
Operations Mgt	$ 4.1		Administration	$ 50.6	
Reservations & Mktg	$ 2.3		Cost of goods	$ 28.2	
Shore Operations	$ 5.7		Amortization	$ 55.6	
AHMS RSA	$ 0.4		Interest & Other Exp	$ 19.1	
Total Expenditures		**$ 145.7**			**$ 547.5**
Net Earnings		**$ -**			**$ 48.8**
Cost Recovery (excl subsidy)		**0.34**			**0.87**

6.5 LESSONS LEARNED

This section discusses the specific lessons learned at BC Ferries during the course of a multi-year change program. The information is presented in bullets that provide a combination of specific examples and general descriptions to convey the problems, previous environment, and solutions. The presentation is wide-ranging, as was the exercise at BC Ferries, and is intended to assist AMHS and DOT&PF management to identify similar situations that might be improved in similar ways.

6.5.1 FINANCIAL LESSONS

6.5.1.1 Operating Expenditures

- Expenditures are driven by routes, schedules, and work rules that, in turn, drive wages, benefits, and fuel expenditures. Vessel crew costs dominate wage and benefit expenditures and, because of regulatory requirements, are fixed. Other than reducing service, it is very difficult to achieve significant efficiencies in these areas. Over the longer term, labor and fuel efficiencies can be obtained when specifying and constructing new vessels.

- BC Ferries and public-sector operators have generally been unsuccessful in achieving contract concessions at the bargaining table. At best, they have been able to control cost increases to below the rate of inflation. United Kingdom and other ferry operators have achieved concessions on competitive, privatized routes where competitive pricing means the difference between success and bankruptcy.

- Prior to 1999, the BC government had been on a restraint program. BC Ferries often cut maintenance budgets as one component of meeting its budget target. This practice undermined proper maintenance planning and forced marine engineers to postpone non-regulatory procedures and employ cheap short-term solutions. A backlog of maintenance work resulted; poor maintenance planning practices emerged; and breakdowns degraded reliability.

- In 1999, BC Ferries management initiated an expenditure reduction program that lasted for several years. The first round of cost cutting saved $5 million annually and eliminated 20 percent of the corporation's non-union, non-operating positions. Over five years, the total cost savings had grown to $10 million annually; 2.5 percent of total expenditures, or 4 percent of the total wage and benefit budget. These net reductions come after added funding was given to priority areas, including vessel maintenance.

- The implementation of new computer systems and operating procedures streamlined work flows and reduced the labor requirement for several staff functions. Debt service costs and amortization of these capital investments were more than offset by the savings. The opportunity to make these advancements reflected a situation, found in many government-owned transportation companies, whereby capital had not been requested or provided to upgrade business technologies.

- During this time period, only modest effort was devoted to reducing fuel consumption. Given today's prices, fuel conservation deserves a systematic approach.

- BC Ferries' successful cost-cutting program controlled the rate of growth for expenditures and fares but did not move the corporation to a different financial paradigm.

- Prudent expenditure of public funds is an essential element of managing government departments and agencies. BC Ferries and AMHS devote more than 90 percent of their expenses directly to service delivery. The BC Ferries exercise proves that:

    - There is little room, in percentage terms, for cost reduction without tackling routes and schedules.
    - Deferring or reducing maintenance expenditures, as a tactic for achieving expenditure targets, results in higher down-the-road expenditures and/or additional service interruptions.
    - Integration of the following factors produces sizable benefit:
        - Rationalizing fixed expenditures,
        - Proper application of the union contract terms and conditions,
        - Effective investment in technology and systems,
        - Careful route planning and ship assignment,
        - Detailed planning of major maintenance and vessel refits.

6.5.1.2 Capital Expenditures

- The fast ferry fiasco took its toll on BC Ferries, and many important functions suffered from neglect. The capital planning program was one of the neglected functions. In 1999, despite the average fleet age of 29 and the ongoing calls for ship replacement, the plan was minimal, without supporting documentation. For existing vessels, surveys did not exist, as a basis for major refit and replacement planning.

- The project management environment also lacked rigor and discipline. Specifications and schedules were not tight; insufficient emphasis was placed on structured budgeting, control, and executive oversight; and the processes were poorly documented.

- Two years of planning and analysis were needed to rectify these conditions, and by 2001 BC Ferries had a comprehensive, 15-year, $2 billion capital plan that has been maintained and updated since that date. More importantly, the plan has served as the basis for sound capital investments in new ships and terminal upgrades.

- The ship replacement and terminal upgrade strategy was developed in conjunction with a detailed long-term service planning exercise. These two activities must go hand in hand.

- The initial analysis and involvement in AMHS service planning points to many similarities with the BC Ferries environment 8 to 10 years ago. It will be essential to work through the service issues, as they will confound detailed capital planning. Service and capital planning is an iterative process. In the case of BC Ferries, the first cut at the 15-year plan created a $700 million deficit over the time period. The plan was refined until it eliminated the deficit.

6.5.1.3 Revenue

Tariff:

- When BC Ferries commenced service between Vancouver and Victoria 47 years ago, the fares were simple, $5 per car and $2 per person. Over the years, the addition of routes and other factors led to a complex tariff. By 2003, there were more 500 individual fares for BC Ferries' 25 routes.

- At various times in this history, the corporation attempted to rationalize its tariff structure. Ferry-dependent communities were effective in identifying inequities in proposed structures. When route-by-route fares that produced similar recovery of costs were proposed, stakeholders poked holes in costing models or suggested an alternative result if a different vessel was applied to the route. The arguments were well articulated, logical, and pointed to an inconsistent philosophy and insufficient analysis to stand the test of stakeholders' and political scrutiny.

- Correcting this situation involved three vital steps:

    - Detailed, accurate route-by-route costing, signed-off by the corporation's auditors.
    - A philosophy of equitable fares for similar classes of route ([a] major routes with large ships operating on a commercial basis and [b] subsidized minor routes with mid to small ships, serving ferry-dependent communities with small populations). This approach spread overheads and debt service charges for new vessels across a broader expenditure base. Stakeholders realized that all vessels must be replaced, and that sooner or later all would benefit. They also understood that no individual community could absorb the debt service charges of a new ship without hardship.
    - Use of a distance-based fare structure, similar to taxis. This structure reflected the fixed costs inherent in terminals and overheads, as well as average costs for operating the class of ships used on either major or minor routes. Route distances were beyond dispute and route-by-route costs were accurate and available, as were average costs.

- Extensive consultation obtained stakeholder support because the research was sound and the approach was fair. However, the consultation process identified areas of weakness that were corrected.

- Another vital success factor was the implementation of a "bottom line" for the corporation. In 2001 BC Ferries was given long-term, dedicated motor fuel tax revenue ($0.04 per gallon) and was required to break even or produce a surplus from the combination of this tax source, dedicated federal funding, and its business revenue. A further change in legislation, in 2003, enshrined the commercial viability of BC Ferries.

- A legislated or regulated bottom line provides the impetus to keep fares and expenditures aligned or to adjust the service offering to reflect the government's financial capabilities.

- It is common for public transit agencies in North America to have legislated cost recovery requirements. Ferry agencies are relatively uncommon; therefore, a legislative norm does not exist.

- Initial analysis indicates that the tariff difficulties faced by BC Ferries are present in AMHS' current environment.

Other Revenue

- Food and Beverage: BC Ferries is among the top ten retailers of food and beverages in BC, with annual sales of $59 million in 2007. Prior to 2000, the accounting systems made it difficult to determine profit and losses for food services, either individually or collectively. A series of changes involving organization structure, systems, and branding partnerships improved profitability and quality. The corporation continues to improve in these areas with third-party contracts with concession managers and retailers in major terminals.

- Parking: BC Ferries' parking facilities had been manned by persons rehabilitating from injury, and parking rates were below market. Stories, some true, are told of attendants opening the lot gates at busy times to let patrons exit without paying. The rationale being that the long wait to pay, as would be expected when a large ferry unloads, was an inconvenience that detracted from customer satisfaction. Beginning in 2001, partnerships were arranged with companies specializing in parking lot management. This change has significantly improved BC Ferries' parking revenue (up from $1 million in 2002 to $2.8 million in 2007).

- Reservations: BC Ferries is one of the few transportation providers charging for reservations. This charge has been in place on major routes for approximately 15 years. The current fee is $17.50 for a car, roughly 33 percent of the ticket price and generates $12.4 million annually. The realization that customers perceive value in the certainty of a guaranteed place on a pre-selected sailing led to this service and charge.

- BC Ferries' major routes offer frequencies ranging from 6 to 16 sailings daily, depending on route and season. The scheduled ship capacity available for BC Ferries exceeds availability of AMHS capacity. The limited capacity make an AMHS reservation a necessity rather than a convenience.

- BC Ferries had revenue potential in all tariff and non-tariff activities. The potential was difficult to realize as a crown agency that was closely aligned to the provincial government and dependent on an annual grant from government. Users objected to most price increases, whether for hamburgers, parking, or onboard travel. A fixed subsidy and the legislative requirement to balance annual budgets improved both management and political discipline related to the planning and implementation of tariff changes and pricing for other goods and services.

- The combination of expenditure reduction and control, exercised by management and the Board of Directors, and well-reasoned price increases had a significant impact on the corporation's financial viability.

6.5.2 CORPORATE STRATEGY LESSONS

- The fast ferry fiasco created a "tipping point" for BC Ferries. It brought together the interests of government and stakeholders to produce predictable results for users and taxpayers alike.

- Strategy development required the integration of several actions. The content and sequence of these actions require resources, planning, commitment and leadership. The transformation of any

transportation provider, operating 365 days a year, offers an additional challenge to ensure that service quality and safety are not diminished over the course of the program.

- BC Ferries' corporate strategy was difficult to initiate. Much of the relevant information did not existent, was unreliable, or was expensive to retrieve. Several parallel initiatives were necessary. Many months were required to correct this situation and an even longer period to institutionalize the changes. The key factors in this turn around were:
  - Improved budget forecasts,
  - Integrated business systems,
  - Vessel surveys and reliable estimates to sustain the fleet,
  - Route-by-route costing,
  - A consistent tariff philosophy,
  - Long term traffic modeling, and
  - New business expertise and greater diligence.
- The lack of systems and meaningful information was wide spread. For the most part, managers and professionals were not developing and analyzing the information necessary to successfully plan a half-billion dollar corporation. Management was reactive, not proactive. In part, this was the result of the governance environment and the corporation's willingness to be reactive to government requests rather than initiate options for government to consider.
- The strategy development required extensive work with government decision makers and stakeholders to determine issues, needs and financial capabilities.
- A comprehensive examination and long range forecasting of the status quo enabled decision makers to determine the degree of change, if any that should be made to routes and schedules. Routes and schedules were generally ingrained in the way of life for ferry dependent communities and little change resulted to ferry services.
- Within a year of this decision, a new, administration was in power (2001). The new government carried out detailed evaluations of all government departments and agencies. Although significant change was made to the BC Ferries governance structure, the routes and schedules remained as before.
- Government's 2002 attempt to introduce fares on the Ministry of Transportation's fresh water ferry routes (in interior British Columbia) was also abandoned. These results are indicative of ferry service and tariff resilience and the formidable lobbying efforts of ferry dependent communities.

6.5.3 SERVICE PLANNING LESSONS

- The corporation had grown with a marine operating culture that undervalued the service planning function and expected to be told what to operate, rather than recommend what should be done.
- The lack of route-by-route financial data inhibited development of a service plan that balanced community needs, subsidies and tariffs. New routes and minor schedule changes were initiated with little knowledge of the financial implication.

- Plans were generally reactive in nature and thus focused on one geographic segment of the service area. Over time, stakeholder groups became knowledge-able of the inequities and used these as a basis to lobby the corporation for higher levels of service.

- To further complicate effective service planning, BC Ferries is a major employer in several communities. The employees often provide their personal views on the corporation, its vessels and cost structure. During service debates employees often appear on local committees lobbying for more service. In the few instances that route cancellations were contemplated, the vessel crews were among the most active counter-lobbyists.

- Although BC Ferries' route structure has changed little over the past decade, detailed analysis of the traffic data, costs and fares have enabled changes that reduce expenditures, increase tariff and non-tariff revenue and plan vessel replacements.

- Regular consultation and the provision of accurate information to ferry dependent communities continues to play an important role in planning and corporate relations.

6.5.4 SERVICE DELIVERY LESSONS

- BC Ferries has a strong tradition for high quality operations and has been an innovator in ferry operations over its history. As the corporation grew, operations and safety procedures were left in the hands of individual masters. Insufficient effort was devoted to corporate standards and processes. At the operational level, most processes differed by crew. This was evidenced in matters ranging from loading and unloading vehicles to the conduct of safety drills.

- A fatal accident in 1996 at the Nanaimo terminal resulted in the implementation of a Safety Management System under the International Safety Management (ISM) Code. This program took four years to design and implement. Maintaining its integrity is an ongoing but important challenge. However, even the best audit-based compliance system has its shortcomings and efforts are still required to examine and assure the competency of crews (both individually and collectively).

- A strong acceptance of the status quo was prevalent. For example, the first sailing from Victoria to Vancouver left each morning at 7:08, rather than 7:00. This went on for several years until, under considerable management pressure the start-up procedures were examined in detail. Sequence changes were made with the daily start-up steps that when combined saved eight minutes without incurring added cost.

- A similar problem existed when loading large ferries during times of heavy traffic. Sailings fell further and further behind schedule as the day progressed, causing even greater congestion in terminals and access roads. Again, there were tales (some undoubtedly true) of small decisions being taken that, over an operational day, created overtime for the entire crew. These situations persisted for years. Detailed examination of loading procedures led to changes that reduced the problem. However, ongoing management assessment is necessary to refine and improve such procedures ensure that they are properly carried out and avoid a return to 'the old ways'.

6.5.5 REGULATORY LESSONS

- Marine operations in Canada are governed by the Canada Shipping Act and regulated by Transport Canada (TC). The Act itself has only recently been thoroughly revised but, for much of BC Ferries' history, it was not well understood. More significantly, it was subject to considerable interpretation, did not contemplate or adapt to new technologies (e.g., Marine Evacuation Systems), and provided TC Inspectors with extraordinary powers to enforce individual opinions. Such orders could be challenged only through lengthy appeals to an Ottawa-based Board. These factors had three principal outcomes –

    - Rules were applied in hindsight rather than used to achieve an optimum solution. Although opinions could be sought and received from TC head office regulators, such opinions were non-binding and could be overruled by regional inspectors. In some instances, action on the regulators orders or opinions was not acted upon in a timely manner.
    - Maintenance periods often experienced unplanned, unbudgeted requirements at or near the end of the work period when Inspectors assessed the work and overall ship condition.
    - Not surprisingly, adversarial relationships with regulators developed from time to time.

- Ultimately, it has taken a concerted and ongoing effort by TC and BC Ferries executives to work through these issues. Consistent, effective management of the relationship with regulators and similar authorities is critical to adhering to the principles of a Safety Management System and is essential to maintaining control over related expenditures.

6.5.6 GOVERNANCE LESSONS

- BC Ferries was a crown corporation for most of its history, from 1977 until 2003. As a "Crown," the provincial cabinet appointed the Board of Directors. The corporation relied on an annual grant from government to cover operating losses. Capital expenditures required advance approval by the provincial Treasury Board (a cabinet committee). Tariff increases and the implementation of new routes or cancellation of existing routes required government approval.

- During the history of BC Ferries, direct government intervention was common. From its earliest days, the BC government used BC Ferries in efforts to sustain BC's shipbuilding industry and expand tourism. Involvement also occurred at the micro level.

- In 2001, government altered the governing legislation to allocate $0.01 from each liter of motor fuel ($0.04 per U.S. gallon) sold in the province to BC Ferries. This allocation generated $75 million annually at the time. BC Ferries was mandated to operate its services and renew its assets with the gas tax revenue, a dedicated federal government subsidy, and its business revenue. These sources of revenue were believed to create a sustainable financing model.

- In 2003, a different government administration altered the legislation governing BC Ferries to further distance the corporation from the government. BC Ferries was transformed from a reactive government crown corporation to a regulated quasi-private ferry operator. In place of cabinet and Treasury Board participation in the oversight of BC Ferries, an independent regulator was created to review tariff increases, and the government negotiated a fee for service contract with the corporation for the provision

of ferry services. The changes enabled BC Ferries to borrow in private markets and removed its debt from the province's books. BC Ferries was mandated to operate on a commercial basis.

- In FY 2001, the first year of BC Ferries' sustainable funding program, public subsidies totaled $94.4 million ($72 million from the Province of British Columbia and $22.4 million from the Government of Canada). Retained earnings for the year were $9.8 million. The subsidies for the 2006/07 fiscal year totaled $117.7 million ($92.4 million from the service contract with the Province of British Columbia and $25.3 million from the Government of Canada). Retained earnings for the year were $48.8 million.

Table 6.6
BC Ferries, Subsidies and Retained Earnings of BC Ferries
(in millions)

	2000-01	2006-07
British Columbia	$72.0	$92.4
Canada	$22.4	$25.3
Total	**$94.4**	**$117.7**
Retained Earnings	$9.8	$48.8

- During the above time period, fares have increased above the rate of inflation, with fuel surcharges added on top of these increases.

- To date, BC Ferries' governance changes have been effective in sustaining the corporation, enabling fleet renewal, and coping with unanticipated issues, such as the dramatic increase in the price of fuel.

6.6 CONCLUSIONS

6.6.1 GOVERNANCE

Changes to BC Ferries' legislated mandate were a key factor in achieving a sustainable operating environment. The model in BC is unique. It more closely resembles a regulated private carrier than a government department or agency.

Governance models are designed to achieve desired, longer-term results and address fundamental problems. Therefore, the process and analysis leading to a governance change are very important. Governance models from other jurisdictions are used for guidance and ideas, rather than a blueprint of what to do.

6.6.2 ROUTES AND SCHEDULES

Two BC government administrations carried out detailed evaluations of ferry routes and schedules between 1999 and 2003. Both situations anticipated material savings due to service reductions. Only minor schedule changes resulted. The achievement of material savings was not straightforward, as some had thought.

The most significant savings occurred on profitable, major routes and involved the management of extra sailings to cope with unexpected traffic demands. Improved financial and historical traffic information was used to manage resources more efficiently.

Service levels to ferry-dependent communities have now been enshrined in a service contract between the government and BC Ferries. The initial five-year contract is renegotiated every four years. On a year-to-year basis, routes and schedules have become more, rather than less, predictable.

6.6.3 TARIFFS

In the above noted reviews, large tariff increases were contemplated on several routes to address high per vehicle and percentage subsidies. In the end, significant increases did not occur.

Since the new legislation in 2003, tariffs have been increased annually. These changes must not exceed price caps, for major and minor routes, set every four years by the new BC Ferry Commissioner.

The tariff follows a distance-based philosophy that takes into consideration operating and capital requirements within similar route groups. The philosophy is consistently applied.

Fare increases since 2003 have been higher than those made previously. Fuel surcharges have also been added on top of the increases. Although ferry fares are very much a topic of conversation in coastal cities, tariff revenue has balanced the BC Ferries' financial model and the corporation is self-sustaining. Service level and fare changes that negatively impact port communities are very resistant to change.

6.6.4 CORPORATE MANAGEMENT

A comprehensive approach to management at BC Ferries produced benefits in all sectors. The sum of these benefits was a significant factor in the reduction of expenditures and the improvement of safety and service quality. Key management actions involved the following:

- Systems and Procedures: It is vital to have corporate systems and procedures that produce desired results on a consistent basis. At BC Ferries all basic systems were upgraded or replaced, resulting in greater consistency and quality information on a timely basis. These results, in turn, provided the data for performance measurement and the ability to analyze and resolve a variety of problems.

- Corporate Strategic Plan (service, tariff, capital, and financial forecasts): An integrated strategy provides the ability to create a sustainable model for different subsidy levels. An integrated corporate strategy was a key success factor for BC Ferries.

- Organization Structure, Business Expertise and Management Diligence, Performance Measurement, and Customer Focus: Good organizations structure themselves to deliver their mandate. When the mandate is unclear, the organization structure is often unclear. Resources of marginal value are retained in case they become of value and other needed resources are not available. Reactive environments allow little time for thorough analysis, and management does the best it can with the resources at hand.

- Project Management: The implementation of corporate systems, procedures, strategies, and a complex capital program requires project management skills. BC Ferries had lost this expertise and developed an undisciplined approach that took significant effort to correct.

- Customer Focus: Government transportation monopolies tend to focus internally. Management spends more time competing for government subsidies than for customer revenue. Customer relations tend to be treated as a frontline function and not a corporatewide responsibility. This focus was true at BC Ferries. Although a great deal of work has been done in this regard, much work remains to be done. The customer focus topic is an important concern in its own right and not central to this brief on lessons learned.

BC Ferries' recent history has several useful lessons for AMHS. Most of all, it illustrates the importance of the basics. First, decision-makers must resolve what services they wish to provide and how much of the total cost government can afford to subsidize. This process is iterative, and requires a long-term commitment to the course chosen. Second, the management of the corporation must have the expertise, mandate, and tools to effectively implement the service plan and sustain the department. This multi-functional responsibility and reasonable strength of corporate management must be developed and maintained in all functional areas.

6.7 PERFORMANCE MEASURES

6.7.1 INTRODUCTION TO PERFORMANCE

Performance measurement is a universal business practice used by successful companies, in both the public and private sector. These measures provide senior managers and shareholders the ability to assess performance using facts that condense data into indices and ratios that are comparable over time. Leading corporations use indices, not only to identify their strengths, weaknesses, and market position, but also to guide decisions governing the expansion or contraction of their business.

Without facts, AMHS decision-makers work with opinion to guide complex activities, occurring over a large geographic area. This situation is not desirable for any manager or shareholder.

Performance measurement fulfills three primary roles (described below). These roles assist in defining those measures best suited to the AMHS.

1. Reporting to Boards, Shareholders, or Both (DOT&PF and the State Legislature are deemed to be the shareholders): Measures for which comparison to the previous year's record and, in some instances, to other similar companies provide governing bodies with trends and verify the achievement of objectives.

2. Performance Management: Measures that assist managers in identifying the corporation's strengths and weaknesses. "Drilling" into these measures identifies factors that require change.

3. Target and Objective Setting: Measures that consist of annual targets for key performance typically set by chief executive officers and boards. These targets become the basis for evaluating annual performance of individual departments and the management team as a whole.

The above uses of performance measures translate to two categories that assist in defining measures of greatest importance to the AMHS:

- Measures generally under the control of corporation.

- Measures relating to shareholder concerns and objectives.

6.7.2 EXISTING AMHS MEASURES

The appropriateness of measures currently used to guide AMHS decision-making is discussed below.

1. Customer Satisfaction: The data gathering methodology for this important measure may require adjustment. Surveys should be conducted throughout the year to obtain a representative mix of market groups and satisfaction based on different weather conditions and service frequencies. Survey work should focus on those topics that users have indicated are most important to them.

2. On-time Departures: If schedules are well structured and loading and unloading procedures are consistent, a tighter standard than 30 minutes that is now reported for on-time departure could be considered.

3. Frequency of Port Calls: This non-standard measure assesses the growth or decline in the amount of service. A simpler, more comparable measure is total scheduled route miles. Neither measure is recommended.

4. Onboard Sales: This measure reflects a specific short-term objective and would normally be a subcomponent of cost recovery. It is not recommended for future use.

5. Passenger Capacity Utilization: This useful measure is incorporated in the suggested performance measures in the following section.

6.7.3 SUGGESTED AMHS PERFORMANCE MEASURES

The performance measures that follow are designed for both the AMHS senior management and the DOT&PF Commissioner and his deputies. The measures also serve as the basis for reporting to the Governor and the public on the status and progress being made by AMHS.

Each index or ratio has a specific purpose and the combination of these measures provides insight into all primary elements of the business. Four business elements, or parameters, are addressed by the performance measures:

- Efficiency – cost to supply the service.
- Effectiveness – market response to the service.
- Service quality – considerations of delivery important to customers plus customer opinion.
- Safety – the welfare of passengers, employees, and major assets.

The performance measures, which are presented below with the applicable business elements, are designed to be used in concert with one another.

Financial accounts and individual data bases require structure that enables users to drill down into subcomponents of each measure.

Managers have many avenues to improve performance. For example, the efficiency measure, "expenditure per service hour," is influenced by procedures and a wide variety of management actions. The measure, when compared over time, indicates the relative success of management's combined initiatives.

Other detailed measures would also be employed at the service sector and route subcomponent level. In these situations, the objective is to explain specific trends in the corporate (systemwide) measures or design future services to improve efficiency and/or effectiveness, rather than measure and report progress.

The performance measures that follow are designed for use by the AMHS senior management, DOT&PF Commissioner, Governor, and State Legislature to assess progress in a rational, comprehensive manner. Indices and ratios are used to facilitate comparisons over time. Most indices are two dimensional (e.g., expenditure per service hour), because such indices are easily calculated and more readily comprehended by managers, senior officials, and the public. These measures, with the exception of the Annual Route Report, are intended for quarterly reporting; whereby, the current quarter is compared to the previous quarter and the same quarter from the previous year.

It is recommended that the following base data be reported:

- Total expenditure
- Total revenue
- Total riders
- Total vehicles
- Total service miles operated

Table 6.7
System Efficiency

Performance Measure	Measurement
Expenditure per Service Mile	Total expenditures divided by total miles operated in revenue service

Expenditure per service mile is a basic and important efficiency measure that illustrates the combined effect of management action to control expenditure. The exclusion of passengers (i.e., expenditure per passenger mile) focuses the measure on the cost of supplying service. Government-owned transportation providers are generally not profit motivated and frequently serve isolated settlements that attract few passengers. Although, AMHS recommends and influences the service schedule, it may be instructed to provide services that generate few passengers and little revenue. Other measures identified below address traffic and combine it with expenditures.

Financial accounts should be structured so that the measure can be assessed on fixed and variable expenditures. Fixed cost must also be allocated, using general accounting procedures, on a route or sector basis to enable effective analysis.

Table 6.8
System Effectiveness

Performance Measure	Measurement
Passengers per Service Mile	Total service miles operated divided by total passengers carried
Vehicles per Service Mile	Total vehicles carried divided by total service miles
Revenue per Service Mile	Total service miles divided by total revenue
Cost Recovery	Total expenditure divided by total revenue
Expenditure per Passenger Mile	Total expenditures divided by total miles traveled by all passengers
Vehicle Capacity Utilization	A current measure, described above

Effectiveness, for this exercise, measures the market response to the service, in terms of the passengers and vehicles carried and the revenue generated. A distance base is used for the first three effectiveness measures to make them comparable over time. Distance is also important because expenditure varies directly with distance and distance can be accurately measured.

The "cost recovery'' measure equates revenue and expenditure and indicates the financial balance between users and taxpayers.

"Expenditure per passenger mile" has been added. It is a more complex, three part, measure that provides a basis for comparison with other transportation modes under DOT jurisdiction.

A global measure of "capacity utilization" is important because the department must make choices about the deployment of ships having different capacities and expenditures. Vehicle capacity is generally in shorter supply than passenger capacity; therefore, it is the used in the recommended capacity measure.

Table 6.9
System Service Quality

Performance Measure	Measurement
Reliability	Same as current measure "on-time departures" described above
Service Delivery	Total miles of service operated divided by total miles of service scheduled
Customer Satisfaction	A current measure. described above

Service quality measures can be considered under effectiveness. They have been separated because the measures either contain a subjective element, as is the case with customer satisfaction, or are not directly influenced by the volume of traffic, as is the case with "reliability" and "service delivery."

"Reliability," assessed as on-time departures, is an important measure of service quality affected by scheduling and by ship and crew performance. Departures are commonly used in both public transport systems and airlines and are recommended because they are used as an existing performance measure and arrival times are not currently published by AMHS. The feedback about on-time arrivals and customer satisfaction is valuable. When

AMHS becomes accomplished in the use of the current quality measure, it may wish to include a measure for on-time arrivals.

"Service delivery" (i.e., missed trips) measures the proportion of the trips promised to the public in comparison to those that are provided to the public. Missed service, as opposed to late service, has an even greater impact on customers and warrants separate analysis.

Table 6.10
System Safety

Performance Measure	Measurement
Vessel Contacts Causing Damage	An absolute number or a figure per 100,000 miles of operation
Passenger Safety	Number of passenger injuries per 100,000 miles operated
Employee Safety	Number of lost time injuries per 100,000 miles operated

These basic safety measures require refinement to relate to other required reports to the Coast Guard, insurance carrier, and others. The distance measure should be increased to a minimum of 100,000 miles. This figure may be adjusted based on actual information. (It is preferable to have indices that produce whole numbers and avoid having more than one decimal place.) "Passenger safety" is more accurate if the measure accounts for the relative number of persons that travel from year to year. A two-dimensional index has been selected as it is easier to comprehend. The concept of passenger miles is confusing to many; however, if it is a term with which the department is comfortable, the index can be changed. If this is not the case, it is best to leave it as is.

It is assumed that AMHS has information pertaining to these three system safety measures; however, the data may be logged in several places. As with all performance data, the information must move quickly and, if at all possible, electronically from the source to the person or department responsible for preparing the performance report.

6.7.3.2 Annual Route Report: Route by Route Presentation of Expenditures, Revenues, Passengers, and Vehicles

Based on the feedback provided during the initial discussion of these indicators, a more detailed route (sector) report outline is being prepared for circulation. This report will offer information useful to decision-makers and communities served by AMHS. Because of seasonal variations, the report should be an annual document.

6.7.4 Conclusions

Government agencies are mandated to report performance to aid oversight by elected officials and provide public transparency. The role of performance measurements as a management tool is equally important. Well-structured measures focus management on facts that define organizational success and identify factors driving performance improvement or degradation.

The measures presented above will provide important information to the State Legislature, offer stakeholders and members of the public insight into AMHS, and give AMHS managers a potent tool to guide their work.

6.7.5 General Comments

Some specific suggestions are addressed above. Several suggestions reflect the desire to have a better basis on which to plan the AMHS. The measures presented are designed to report the result of management's combined actions to achieve objectives and further the department's mission. These initiatives should be measured at the corporate or system-wide level, and the measures are designed for this purpose. Sub-indices can and should be used to explain trends and prepare detailed plans.

During the course of each year, management will focus on several objectives, set by the senior decision-makers. Usually, these objectives seek to improve efficiency, effectiveness, customer service, and safety. However, this the chosen direction in a particular time frame may not encompass similar objectives. For example, a decision to expand service to small isolated communities, for broader social and economic reasons, may reduce effectiveness (passengers and revenue per unit of service). Similarly, one objective may dominate. For the ongoing systems analysis of the AMHS, , efficiency dominates and much of the work will focus on expenditure reduction, both in absolute terms and per unit of service.

Performance measures are retrospective. They look back to determine what has been accomplished. In so doing, it is essential that AMHS assessment of its operations and planning include all major elements of performance for its business. Comprehensive inclusion of business elements requires consideration of efficiency, effectiveness, service quality, and safety. The number of measures should be limited to the minimum number necessary to address this range of performance elements. The measures should be simple, accurate, and reported at regular intervals.

CHAPTER 7

SERVICE OPTIONS ANALYSIS FOR INTERMEDIATE AND LONG-TERM PLANS AND INTRODUCTION TO LIFE-CYCLE COST ANALYSIS

NOTE TO READER

This chapter presents the work done in Phase 1 (Chapters 1 – 7) and includes discussion of the Southeast Alaska Transportation Plan (SATP), the Juneau Access Highway, and Southeast Shuttle Ferries (SESF) considered necessary under that Plan.

The feedback received on the Phase 1 report assisted with the refinement of several modeling assumptions and elimination of work related to the Juneau Access Highway proposal. However, editorial changes were not made to the Phase 1 report and this Chapter retains those references. Chapter 8 of this Report presents the findings of Phase 2. In any instances where the reader finds differences between Chapter 7/Phase 1 and Chapter 8/Phase 2, the latter provides the most accurate result.

7.1 INTRODUCTION

The analysis of service options presented in this chapter was prepared by the Van Horne Institute, in collaboration with McDowell Group and HDR. This work represents another step in the development of a long-range strategic plan for AMHS. The analysis will be used to elicit feedback from decision-makers and provide vital information for public discussion. This feedback and the outcome of the public process will be used, in subsequent steps, to refine existing options and/or to create alternative options and a sustainable future for AMHS.

The service option analysis simulates three primary options for ten years:

1. Status Quo: the 2008/09 service program
2. Service Reduction: a service program with 10, rather than 11, vessels
3. Service Expansion: a service program similar to that operated in 2006-07

A variation of the Status Quo option is used to assess the effect of replacing the *Malaspina*, the first AMHS ship due for retirement, with a Southeast Shuttle Ferry in FY 2014-15. All options offer services familiar to decision-makers and to AMHS users and generate subsidies that bridge the affordability gap.

There is a fourth option: Multiple Alaska Class Ferries in Lynn Canal, plus Juneau Access Highway. This option, identified in the 2004 Southeast Alaska Transportation Plan (SATP), models changes to the AMHS 2008-09 operating plan, including the Juneau Access Highway when it is in place. The option reflects the AMHS plan to replace two mainline ferries (*Malaspina* and *Taku*) with three identical day boats. One boat would operate between Prince Rupert and Ketchikan, and two boats would operate in Lynn Canal in the summer months.

Operation of the day boats would result in a cessation of mainline service in Lynn Canal. This option assumes that the Juneau Access Highway will be in operation to Slate Cove within the initial ten-year planning period and to Katzehin two years later. This option includes the Juneau Access Highway but is not dependent on it. With the shuttles operating out of either Slate Cove or Katzehin, there would be an increase in frequency of trips (increase in number of port calls) and total vehicle capacity.

A fifth option to be included in Phase II will examine the Multiple Day Boat Shuttle alternative in the absence of the Juneau Access Highway, with the shuttle operating from Auke Bay. The consequence of Option 5 would be a greater distance of operation, resulting in a reduction in trip frequency, fewer port calls, and lower total capacity relative to Option 4. Option 5 assumes that mainline service from Bellingham to Lynn Canal would not change.

The assumptions in this model differ slightly from those in the Final Environment Impact Statement (FEIS) for the Juneau Access Highway. The FEIS notes that the AMHS operation associated with the various options are projections and are not binding requirements on the AMHS. The FEIS describes three vessels operating during the summer months between Katzehin, Skagway, and Haines and two in winter with no Haines-Skagway route. The FEIS projected two shuttles operating 10-11 hours per day in winter, rather than the 16 hours in this draft analysis. However the AMHS operations described in Option 4 are minimum AMHS operations once the highway reaches Katzehin and uses the same two day boats that will initially operate out of Auke Bay.

Option 4 simulates only ferry system costs for 30 years, with the highway opening in the 11th year, FY 2018-19. The option will not address the capital or operating expenditures associated with the road or the transportation benefits, other than those directly related to AMHS.

The service options respond to the users' desire to have continuity of service and/or improved service and to the State's need to manage subsidies. Six principles have been used to select the three primary service options. These are:

1. Ability to operate for 10 years
2. Ability to service existing ports
3. Ability to implement with the existing AMHS fleet
4. Offering a range of service quality and subsidy, both lower and higher than the 2008-09 Service Plan
5. Providing high-quality revenue and expenditure data for financial modeling
6. Practical and doable

The service options analysis draws on analysis, history, and knowledge of the AMHS services. It finds that the issues facing Alaska's ferry service have been experienced by other public transportation service providers. Although long-term solutions to these issues exist, they require patience and dedication to design and implement. The methodology of this report offers a step-by-step process to develop viable long-term marine transportation solutions.

7.1.1 Historical Perspective

The history of AMHS provides lessons for the long-range planning of AMHS.

The reasons for initiating government controlled ferry service in Alaska, the timing of these actions, and the current sustainability issues are similar to those experienced by Washington State Ferries and BC Ferries, the other two major West Coast ferry operators.

AMHS has its roots in the 1950s when private ferry operators were faltering and government sought means of continuing service. The marine highway service began in 1963 as a result of voter-approved bonds that financed the construction of three ships (*Malaspin*a, *Taku* and *Matanuska*). Service in the first year was limited to Southeast Alaska. The ports included Skagway, Haines, Juneau, Sitka, Petersburg, Wrangell, Ketchikan, and Prince Rupert.

The southern terminus of the original ferry route was in Prince Rupert. Canadian ferries already provided connecting service between Prince Rupert and Seattle. However, deterioration of Canadian service led to an extension of the ferry system to Seattle in 1967.

In 1966, a second bond package of $15.5 million was put before the voters to construct two more ferries. By 1968, Seattle, Vancouver, Anchorage, Port Lions, Tatitlek, and Whittier were added as ports of call.

Additional bonds and Federal-Aid Highway funds financed four more vessels and several new terminals between 1969 and 1977. New ships included the *M/V Bartlett* in 1969, the *M/V LeConte* in 1974, the *M/V Columbia* in 1974, and the *M/V Aurora* in 1977. The *Tustumena*, *Malaspina,* and *Matanuska* were lengthened in 1969, 1972, and 1978, respectively.

New ships and increased capacity meant new ports of call. The communities of Kake, Hoonah, Metlakatla, Hollis, Pelican, Angoon, Tenakee, Sand Point, King Cove, False Island, Thorne Bay, and San Juan were added in the 1970s. The ferries visited places off the set schedule, such as Yakutat, Glacier Bay, San Francisco, and Port Ashton.

By 1980, nine AMHS ships served 30 communities. Traffic had also increased from the marine highway's early days, transporting 325,000 passengers and 77,000 vehicles in 1980.

Following the acquisition of the *Aurora* in 1977, no additions were made to the fleet for the next 20 years. Few changes were made to the list of communities visited by Alaska State ferries during this period. Chignik, Unalaska (Dutch Harbor), Cold Bay, and Hyder were added as stops in the 1980s. Seattle service was replaced with service to Bellingham in 1989, thus shortening the sailing time by ten hours.

After years of expansion, AMHS traffic peaked in 1992 with 420,000 passengers and 113,000 vehicles. By 2007 traffic declined to 322,000 passengers, a loss of 23 percent, and vehicles were down by 7.5 percent, to 105,000.

The other major West Coast ferry systems have gone through similar expansion programs only to face the budgetary impacts resulting from rising labor costs, aging vessels and terminals, rapidly escalating fuel costs, and strong customer resistance to fare increases. Like AMHS, other agencies have looked to fast ferries and other remedies. The results of these initiatives have ranged from limited success at best, to outright failure at worst.

In Alaska, other planning studies have examined ferry service alternatives to maintain or improve service and contain expenditures. Most notable among these is the 2004 SATP that planned new roads to create shorter ferry routes, allowing the use of less costly 'day boats. This phased, long-range approach requires significant investment in road infrastructure. The service option analysis examines the 2004 concept in relation to the Juneau Access Highway, the highest road construction priority of the SATP.

7.1.2 LESSONS LEARNED

Over the past 30 years, the history of land- and marine-based public transport industries in North America highlights two important lessons:

1. Solutions are easy to devise and difficult to implement because they require an acceptable balance between service quality, user fares, and taxpayer subsidy.
2. Sustainability requires a clear understanding of the desired results and the will to achieve them.

For the most part, public transportation services that expand to meet demand over the long term with subsidized fares generate higher taxation. Decisions to implement significant fare increases and/or service reductions create hardships and generate strong political opposition. Transit agencies throughout the United States have faced the problems of aging infrastructure, rising fuel and labor costs, low fares, and significant mobility needs. Major ferry systems have been even more susceptible to these issues due to the long life span of ships and terminals, the level of regulation, and the isolation of many ports and customers.

Washington State Ferries and BC Ferries have been challenged by similar service and financial issues and have implemented a variety of programs to control subsidy and maintain acceptable service. These initiatives, like Alaska's fast ferries, have met with limited success.

In 2002, the British Columbia Provincial Government legislated changes to create a sustainable ferry system after "coming to grips" with the long-range subsidy requirements of its existing service. Debate and study of fares, routes, service levels, and bridges resulted in a decision to maintain service, freeze subsidy, and use fares to absorb deficit increases. Prior to this decision, it was necessary for the government to write off approximately $1 billion of ferry debt. The changes in BC were implemented through conscientious efforts by two successive administrations, over four years, to balance user and taxpayer interests.

Future strategies begin with a sound understanding of the present. Before delving far into the future, planners and decision-makers require a thorough knowledge of their current service program: its strengths, its weaknesses, and the ability to sustain that which currently exists. This is not to say that everything should remain the same; however, the time and the investment necessary to carry out a major change to a ferry system and the difficulty of rebounding from an error should be respected and recognized.

7.2 OBJECTIVES OF THE SERVICE OPTIONS ANALYSIS

This service options analysis is designed to achieve three specific objectives:

1. Define and evaluate a range of service plans to determine their impact on ferry users and on State subsidy.
2. Support public discussion about the future of AMHS service with information relevant to individual users and taxpayers alike.
3. Provide analysis that assists decision-makers in striking a sustainable balance among service, fares, and subsidy.

7.3 METHODOLOGY

The following methodology was used for the analysis:

- Service Option Development: The Van Horne Institute developed service options consistent with the six principles set out below. A limited range of options was analyzed over a ten year period to focus discussion on service priorities, the impact of subsidy reductions, and the implications of continuing business as it is today. The six selection principles are as follows:
    - Ability to operate for 10 years
    - Ability to service existing ports
    - Ability to implement with the existing AMHS fleet
    - Offering a range of service qualities and subsidies, both lower and higher than the 2008-09 Service Plan
    - Providing high-quality revenue and expenditure data for financial modeling
    - Practical and doable
- Option Refinement: The service options were refined in collaboration with the McDowell Group and AMHS staff to ensure that increases or decreases in service are business-like and responsive to the needs of individual coastal communities
- Value Analysis: A working group of key representatives of the participating consulting firms and University of Alaska determined the financial modeling assumptions and reviewed the service options for compliance with the six selection principles, errors, and omissions.
- Financial Modeling: The purpose of the life cycle analysis (LCA) conducted by HDR (described later in this chapter) was to analyze the current condition of the system and develop benchmarks for planning and informed decision making. This LCA examines both operating and capital costs. HDR has identified all current costs related to AMHS vessel construction, overhaul, operations, and maintenance, conducting research to determine the proper values of each input and to determine exactly how the inputs could be quantified and incorporated into the life-cycle cost analysis. Moreover, a risk analysis that assigns a risk range around each input and employs Monte Carlo simulation techniques to account for uncertainty in both the input values and model parameters has been developed. In the analysis work to come, the options described in this chapter will be incorporated into the HDR LCA model. Thereafter, the assumptions and financial inputs will be validated, and the 10-year and 30-year financial pictures will be developed. The financial information reporting this chapter is preliminary and does not contain the results of the LCA nor refinements to expenditures and revenue associated with the analysis phase.
- For analysis, refer to Phase II, Chapter 8.
- For conclusions, refer to Phase II, Chapter 8.

7.4 ASSUMPTIONS

The analysis of each option is based on the assumptions set out below.

7.4.1 SERVICE DELIVERY

Roads: The 2004 SATP identifies several road projects with the potential of improving either the cost of providing ferry service or service quality. The highest road priority is the Juneau Access Highway, linking Juneau with a ferry terminal at Katzehin, close to Haines and Skagway. The 2004 SATP had a long-term planning horizon; therefore, the top priority was selected to assess the impact of the road on ferry operations as Option 4 in the service options analysis.

Financial modeling assumes that the road will open in 2019. Although the road can be completed sooner, given funding approval, the ten-year horizon was deemed a reasonable assumption. When the road is in operation, the impact of the road on the ferry system is modeled for another 20 years.

Ship Replacement: During the 10- and 30-year periods modeled in the service options analysis, the AMHS will, of necessity, replace a number of ships. For the purposes of this analysis, it is assumed that:

- The Southeast Shuttle Ferry (SESF) currently under consideration by the AMHS will largely be capable of replacing the *Malaspina* on the routes this vessel currently serves.
- Two additional, identical SESFs would be required to provide shuttle ferry services if the Juneau Access Highway project is implemented.
- With the addition of the above-noted SESFs and the reassignment of the remaining mainline vessels, the *Taku* can be retired.
- Subsequent ship replacements are on a one-for-one basis, whereby new ship capabilities and capacities will be largely the same as those of the vessels being replaced.
- The sequence of ship replacement is an outcome of the LCA by HDR.

7.4.2 FINANCIAL

Treatment of Federal Funds: Federal funds have been used for a variety of capital and major maintenance expenditures by AMHS. Note: a decision must be taken on the treatment of Federal funds for modeling purposes.

Capital Costs for Ferries: The options presented in this service options analysis include estimates of current-year operating costs where ships are replaced. However, the analysis does not yet address the capital costs for new ferries. These will be considered and included in the LCA work to be done in Phase II.

Capital Costs for Terminals: This analysis also does not consider the capital cost of new (or modified) terminals associated with road projects, although terminal improvements and/or construction will be needed to support vessels overnight. Although such costs are not of direct financial concern to the AMHS, they are clearly of concern to the DOT&PF and government in consideration of any business case and of the ongoing highway maintenance requirements. Nevertheless, any reduction in demand for AMHS services resulting from construction of the Juneau Access Highway will be reflected in the model and discussed in the analysis. As such, this service options analysis will support the broader discussion concerning roads and/or ferries.

Capital and Operating Costs for Roads: Similarly, neither the capital nor operating costs for roads have been reflected in the analysis.

7.4.3 MODELING

The Life Cycle Cost Model includes a significant number of assumptions relating to fares, other revenues, and such cost factors and influencers as fuel price, anticipated labor costs, inflation/Consumer Price Index, ship retirement dates, replacement costs, and engine repowering costs. Of these, the most volatile factor – and one that cannot be controlled or managed by the AMHS – is, of course, the price of fuel. The model sensitivity to these factors will be examined as part of the LCA.

7.5 DESCRIPTION OF THE SERVICE OPTIONS

As depicted below, the AMHS provides year-round scheduled ferry service throughout Southwest and Southeast Alaska, the latter extending south to Prince Rupert and Bellingham.

Figure 7.1
Southwest Vessel Routes

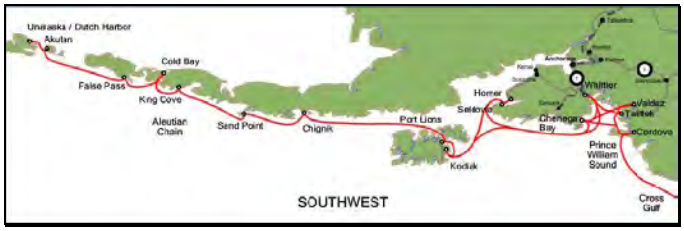


Figure 7.2
Southeast Vessel Routes

7.5.1 OPTION 1 – STATUS QUO

The Status Quo option is based on the service delivery plan and budget approved by the Alaska State Legislature for FY 2009. Although annual operating plans will vary from year to year as vessels are rotated through Capital Improvement Programs (CIPs), overhaul, and lay-up, the level of service set out in the FY 2009 Operating Plan represents the starting point for the analysis and the basis for comparing other scenarios.

The ten-year modeling for this option considers two fundamental changes:

- Option 1a utilizes the existing vessels throughout the ten-year time frame.
- Option 1b recognizes that the AMHS has embarked on a project to replace the *Malaspina* in 2014 with the SESF. Although there is a capital cost impact (budget $80 million), this multi-mission vessel is expected to operate with a smaller crew (10 in Lynn Canal, 18 elsewhere), and will carry 60 Alaska-standard vehicles and 500 passengers. Relevant to this analysis, it is anticipated to have lower annual operating costs. To the extent possible, the SESF will operate on the same routes as served by the *Malaspina*. Adjustments will be necessary to the operating profiles of other vessels to maintain the previous route structure and service frequency.

7.5.1.1 Southwest/Cross-Gulf Service

The Southwest system serves Prince William Sound, Kodiak Island, the Alaska Peninsula, and the Aleutian Islands to Unalaska/Dutch Harbor. The Southeast, Southcentral, and Southwestern regions are connected by regular sailings across the Gulf of Alaska, referred to as cross-Gulf, which include a stop at Yakutat.

In the Status Quo option, Prince William Sound receives a minimum of daily, year-round service with regular service provided between Kodiak, Port Lions, Seldovia, and Homer. Additional summer and supplemental service is provided by the ship assigned to the cross-Gulf route. Between April and October, service is provided once per month out the Aleutian Chain to Unalaska/Dutch Harbor, stopping at Chignik, Sand Point, King Cove, False Pass, Akutan, and Cold Bay. Service out the Aleutian Chain is suspended during the winter months, during which time *Kennicott* continues to provide cross-Gulf service. Limited year-round service is provided to Tatitlek and Chenega Bay.

7.5.1.2 Southeast Service

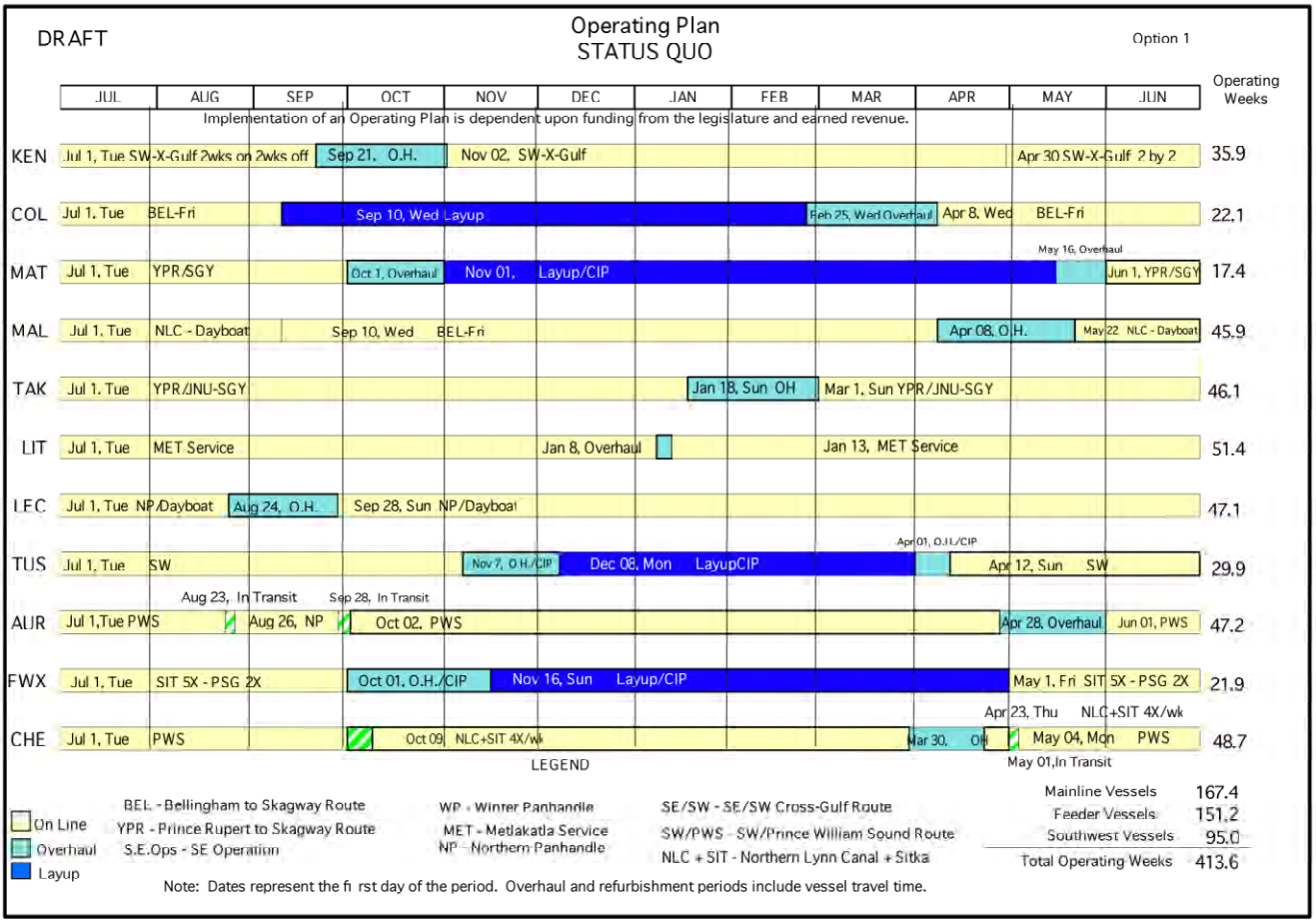
The Southeast system is composed of mainline routes (which typically take more than one day for the ship to complete the route) and shorter, day boat routes (for which the vessels return to their departure or home ports on the same day). In the Status Quo option, the five largest AMHS ships are assigned to the Southeast mainline service. This service principally connects Prince Rupert or Bellingham and Skagway, though the vessels stop en route at Ketchikan, Wrangell, Petersburg, Sitka, Juneau, and Haines, and less frequently at Hoonah and Kake.

In the Status Quo option, weekly service is provided year-round between Bellingham and Skagway. Weekly service is also provided between Prince Rupert and Skagway, except for one winter month when the associated

mainline vessel is in overhaul. Frequent service is provided on the North Lynn Canal route. Day boats are assigned to inter-connect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route at their larger stops. Sitka is served year-round by mainline vessels and fast ferries. Yakutat is provided with at least one northbound and southbound stop each month. Near-daily service is provided year-round between Metlakatla and Ketchikan.

This operating plan is presented graphically in Figure 7.3.

Figure 7.3
Status Quo Operating Plan



A summary of the level of service can be expressed in terms of the total number of operating weeks that ships are engaged in delivery of their respective services. For the Status Quo option, the totals are as follows:

Table 7.1
Status Quo Operating Weeks

	Operating Weeks
Mainline vessels	167.4
Feeder vessels	151.2
Southwest vessels	95.0
Total	**413.6**

7.5.1.3 Port Departures

There will be year-to-year variations as specific ships are taken out of service for overhaul, maintenance, and work funded by CIPs. However, the Status Quo option provides for the average port call frequency summarized in the following table.

Table 7.2
Status Quo Average Port Call Frequency

Southeast	Port Departures		Southwest/ Cross-Gulf	Port Departures
Angoon	105		Akutan	10
Bellingham	51		Chenega Bay	40
Haines	594		Chignik	10
Hoonah	227		Cold Bay	10
Juneau	1060		Cordova	343
Kake	172		False Pass	10
Ketchikan	912		Homer	279
Metlakatla	513		King Cove	10
Pelican	18		Kodiak	185
Petersburg	394		Port Lions	101
Prince Rupert	151		Sandpoint	10
Sitka	288		Seldovia	118
Skagway	316		Tatitlek	54
Tenakee	103		Unalaska	5
Wrangell	355		Valdez	329
Yakutat	36		Whittier	425
TOTAL	**5299**			**1939**

7.5.1.4 Cost, Revenue, and Financial Summary (FY2008-09)

The Status Quo option is anticipated to incur the costs, generate the revenues, and require State support in the amounts noted in the following table.

Table 7.3
Status Quo Expenses and Revenues

	Malaspina **(10 years)**	***Malaspina*** **Replaced by SESF***
Costs and Expenses	**(000s)**	**(000s)**
Marine Vessel Operations	$ 137,394.5	$ 137,420.3
Shoreside Costs	18,244.5	18,244.5
Allocated Costs	2,274.2	2,274.2
Total AMHS Costs	**$ 157,913.2**	**$ 157,939.0**
Generated Revenues	**$ 52,256.9**	**$ 51,750.0**
Surplus(Shortfall) from Operations	**(106,656.3)**	**(106,189.0)**

* The shuttle ferry is less expensive to operate than the *Malaspina*; however, the new shuttle ferry cannot provide the winter Bellingham service formerly provided by the *Malaspina*. Therefore, it becomes necessary to keep the *Columbia* in year-round Bellingham service, resulting in no decrease in system operating expenses.

7.5.2 OPTION 2 – SERVICE REDUCTION

To achieve a material reduction in State subsidy, it is necessary to eliminate one or more ships and associated crews from the AMHS fleet. The Service Reduction option models the retirement and sale of the *Malaspina* at the outset of FY 2009-10. Various ship assignments are altered to spread the impact of this service reduction across the Southeast sector. It is anticipated that the personnel reduction would be absorbed largely through attrition and overtime reduction.

Retirement of the *Kennicott* would result in a larger expenditure reduction. Although it is a relatively new vessel, the limitations of the *Kennicott* noted below cause it to receive cursory consideration. The *Kennicott* is one of AMHS' largest vessels, requires a large crew complement, is fuel intensive to operate, does not easily lend itself to replacement ship duties on certain of the Alaska routes where tidal and vessel size issues constrain her utility, and has a low payload of just 88 Alaska-standard vehicles. However, *Kennicott* is designed for open-ocean operations, is only one of two vessels certified for cross-Gulf service, and is used as the back-up vessel on most every mainline route. Removal of the *Kennicott* would essentially curtail all cross-Gulf service.

Therefore, the primary Option 2 considers retirement of *Malaspina* without replacement by the SESF, thus reducing subsidy and degrading service quality and coastal mobility.

7.5.2.1 Southwest/Cross-Gulf Service

The Southwest system serves Prince William Sound, Kodiak Island, the Alaska Peninsula, and the Aleutian Islands to Unalaska/Dutch Harbor.

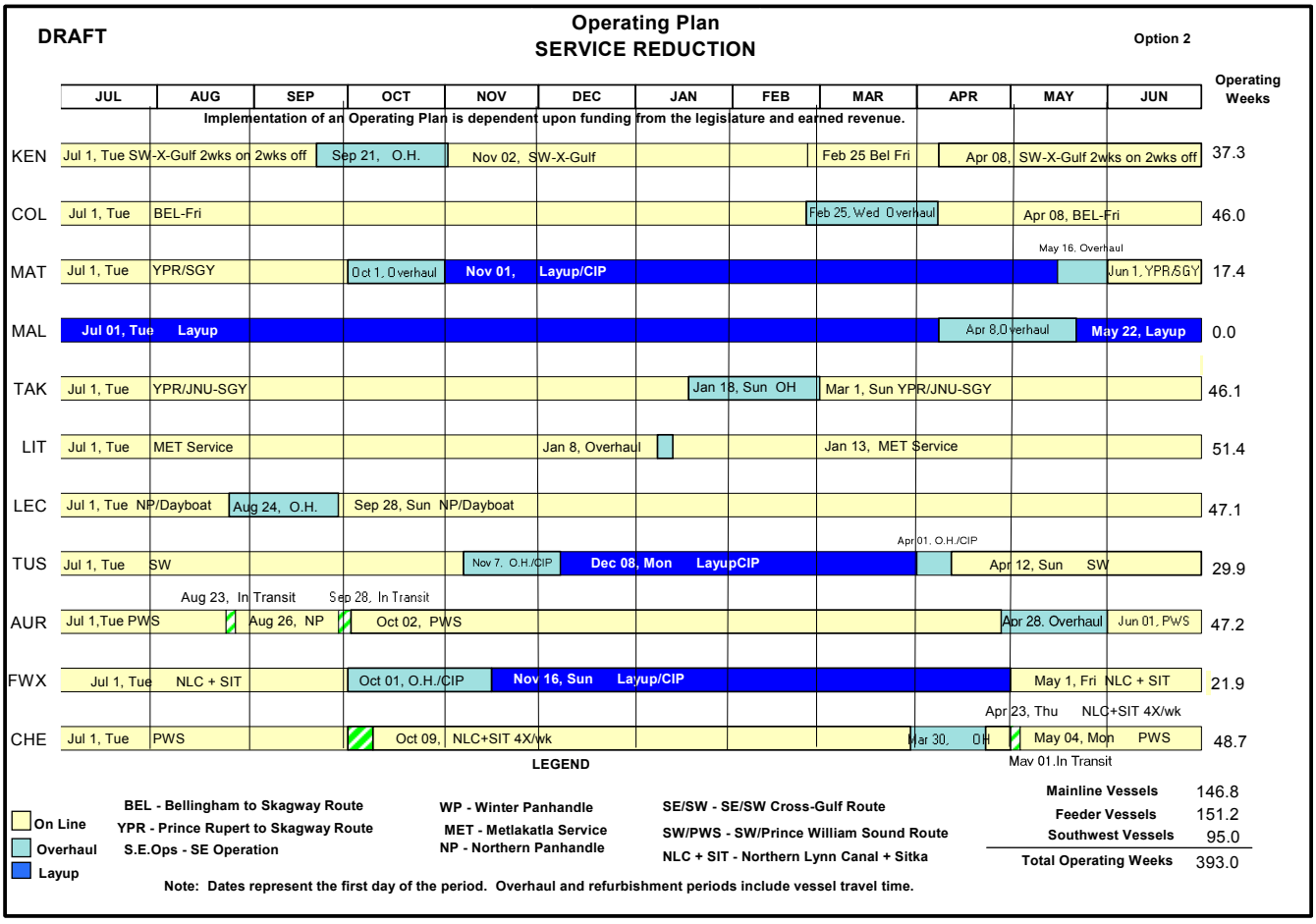
Service under the Service Reduction option is largely unchanged from the Status Quo option. Service levels to the Southwest remain unchanged. Cross-Gulf services are reduced by approximately 8 percent when Kennicott is assigned (in March) to the Bellingham route. Yakutat would see a 15 percent reduction (from 36 to 30 stops).

7.5.2.2 Southeast Service

The Southeast system is composed of mainline routes and shorter day boa" routes. With the retirement of a mainliner and no replacement, the remaining ships normally deployed in the Southeast are reassigned to "cover the gaps," Service to/from Petersburg, Sitka, and Skagway is reduced by 10-14 percent. The most significant impact is felt at Haines where port calls are reduced from 594 to 413 (a 30 percent reduction). Day boat services to interconnect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route remain unaffected.

The operating plan for the Service Reduction Option is presented in Figure 7.4.

Figure 7.4
Service Reduction Operating Plan



A summary of the level of service can be expressed in terms of the total number of operating weeks that ships are engaged in delivery of their respective services. For the Service Reduction option, the totals are as follows:

Table 7.4
Service Reduction Operating Weeks

Operating Weeks	Retire *Malaspina*	Retire *Kennicott*
Mainline vessels	143.8	158.5*
Feeder vessels	151.2	151.2
Southwest vessels	95.0	92.3
Total	**390.0**	**402.0**

(*estimate)

7.5.2.3 Port Departures

There will be year-to-year variations as specific ships are taken out of service for overhaul, maintenance, and work funded in CIPs. However, the Service Reduction option provides for the average port call frequency summarized in the following table.

Table 7.5
Service Reduction Average Port Call Frequency

Southeast	Port Departures		Southwest/ Cross-Gulf	Port Departures
Angoon	109		Akutan	10
Bellingham	51		Chenega Bay	34
Haines	413		Chignik	10
Hoonah	234		Cold Bay	10
Juneau	993		Cordova	343
Kake	161		False Pass	10
Ketchikan	906		Homer	258
Metlakatla	513		King Cove	10
Pelican	19		Kodiak	170
Petersburg	357		Port Lions	101
Prince Rupert	149		Sandpoint	10
Sitka	253		Seldovia	109
Skagway	271		Tatitlek	54
Tenakee	103		Unalaska	5
Wrangell	353		Valdez	329
Yakutat	30		Whittier	419
TOTAL	**4915**			**1882**

7.5.2.4 Cost, Revenue, and Financial Summary (FY 2008-09)

The Service Reduction option is anticipated to incur the costs, generate the revenues, and require State support in the amounts noted in the following table:

Table 7.6
Service Reduction Expenses and Revenues

	Retire *Malaspina*	Retire *Kennicott*
Costs and Expenses	**(000s)**	**(000s)**
Marine Vessel Operations	$ 131,338.0	$ 128,413.2
Shoreside Costs	18,244.5	18,244.5
Allocated Costs	2,274.2	2,274.2
Total AMHS Costs	**$ 151,856.7**	**$ 148,931.9**
Generated Revenues	**$ 49,904.4**	**$ 50,326.5**
Surplus(Shortfall) from Operations	**(101,952.3)**	**(98,605.4)**

7.5.3 OPTION 3 – SERVICE EXPANSION

The Service Expansion option is essentially the service plan delivered in FY 2006, contemplates all vessels running at a full service level, and is as close to "full service" as is reasonably possible with the existing fleet.

7.5.3.1 Southwest/Cross-Gulf Service

The Southwest system serves Prince William Sound, Kodiak Island, the Alaska Peninsula, and the Aleutian Islands to Unalaska/Dutch Harbor.

Regular service is provided between Kodiak, Port Lions, Seldovia, and Homer. Between April and October, service is provided out the Aleutian Chain twice per month to Unalaska/Dutch Harbor, stopping at Chignik, Sand Point, King Cove, False Pass, Akutan, and Cold Bay. Overall service to the Aleutian Chain is more than doubled from that in the Status Quo option. Regular service in Prince William Sound to Valdez, Cordova, and Whittier is unchanged. Service to Tatitlek and Chenega Bay is increased by 25-30 percent. Regular cross-Gulf sailings include a 28 percent increase in stops at Yakutat.

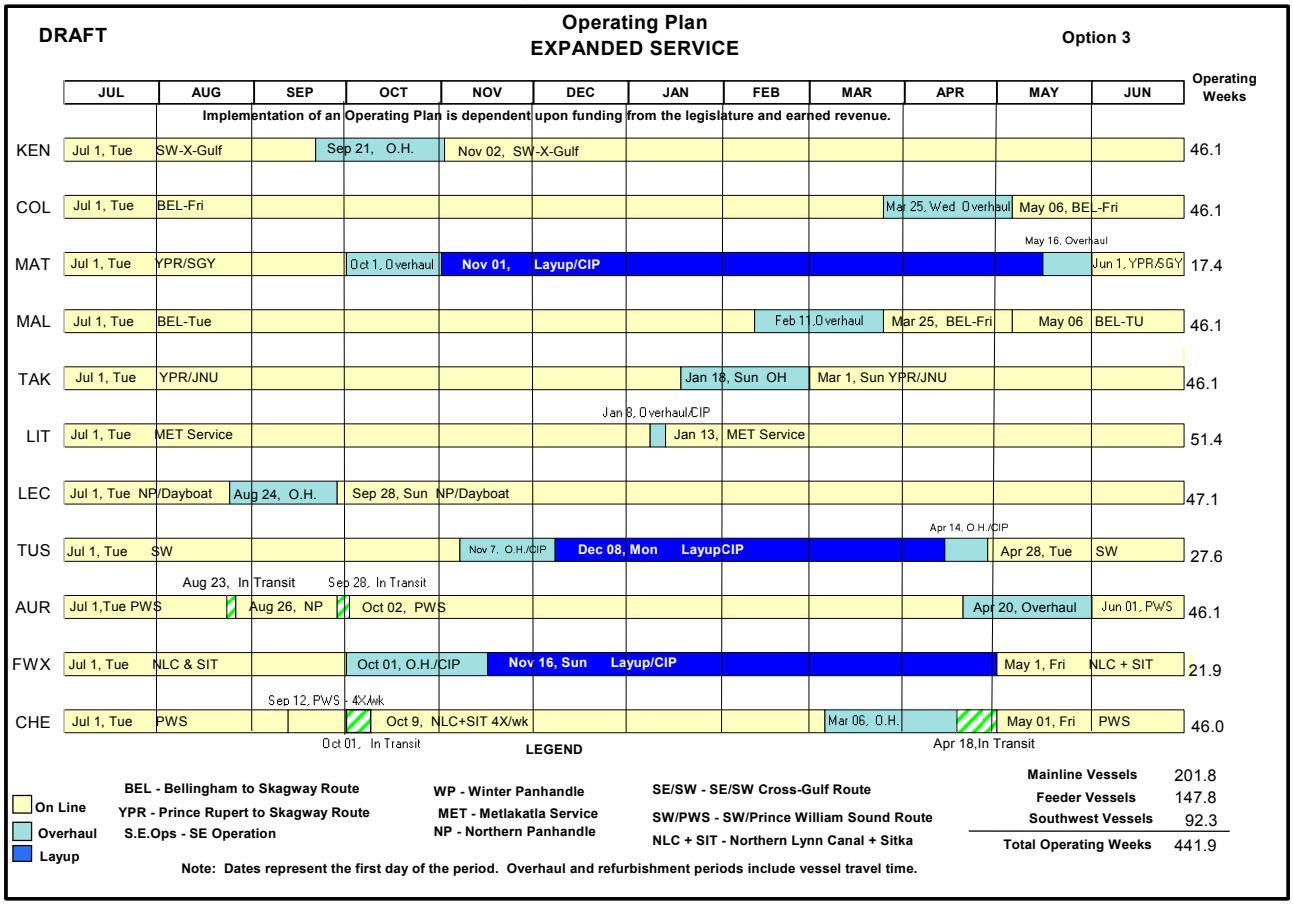
7.5.3.2 Southeast Service

The Southeast system is composed of mainline routes and shorter "day boat" routes.

In the Service Expansion option, the five largest vessels assigned to the Southeast mainline service provide a near doubling of service (compared to service in the Status Quo option) from Bellingham, with consequential increases in port calls in Ketchikan, Wrangell, Petersburg, Hoonah, and Juneau. Frequent service is provided on the North Lynn Canal route, as is round-trip service between Juneau, Haines, and Skagway. Day boats continue to be deployed to interconnect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route at their larger stops. The tempo is unchanged from that for the Status Quo option.

The operating plan for this Service Expansion option is presented graphically on the following page.

Figure 7.5
Service Expansion Operating Plan



A summary of the level of service can be expressed in terms of the total number of operating weeks that ships are engaged in delivery of their respective services. For the Service Expansion option, the totals are as follows:

Table 7.7
Service Expansion Operating Weeks

	Operating Weeks
Mainline vessels	201.8
Feeder vessels	147.8
Southwest vessels	92.3
Total	**441.9**

7.5.3.3 Port Departures

There will be year-to-year variations as specific ships are taken out of service for overhaul, maintenance, and work funded by CIPs. However, the Service Expansion option provides for the average port call frequency summarized in the following table.

Table 7.8
Service Expansion Average Port Call Frequency

Southeast	Port Departures		Southwest/ Cross-Gulf	Port Departures
Angoon	104		Akutan	24
Bellingham	93		Chenega Bay	50
Haines	565		Chignik	24
Hoonah	294		Cold Bay	24
Juneau	1104		Cordova	330
Kake	137		False Pass	13
Ketchikan	996		Homer	199
Metlakatla	514		King Cove	24
Pelican	19		Kodiak	175
Petersburg	439		Port Lions	81
Prince Rupert	151		Sandpoint	24
Sitka	264		Seldovia	81
Skagway	331		Tatitlek	72
Tenakee	103		Unalaska	12
Wrangell	438		Valdez	313
Yakutat	46		Whittier	428
TOTAL	**5598**			**1874**

7.5.3.4 Cost, Revenue, and Financial Summary (FY2008/09)

The Service Expansion option is anticipated to incur the costs, generate the revenues, and require Status support in the amounts noted in the following table.

Table 7.9
Service Expansion Expenses and Revenues

Costs and Expenses	(000s)
Marine Vessel Operations	$ 150,176.0
Shoreside Costs	18,244.5
Allocated Costs	2,274.2
Total AMHS Costs	**$ 170,694.7**
Generated Revenues	**$ 57,511.5**
Surplus(Shortfall) from Operations	**(113,183.2)**

7.5.4 OPTION 4 – MULTIPLE DAY BOAT SHUTTLE

The Multiple Day Boat Shuttle option responds to the concept, as set out in the 2004 SATP, for new roads that shorten ferry routes and allow for the use of smaller, less costly day boats. The highest road priority is the Juneau Access Highway, a two-lane highway on the east side of the Lynn Canal that connects Juneau to a new ferry terminal at Katzehin.

In response to this new access option, shuttle ferry service under Option 4 is modified to include new day boat service between the new ferry terminal at Katzehin, and each of Haines and Skagway, distances of 5 and 18 miles, respectively. One to two shuttle ferries operate this service seven days a week, 16 hours a day. *Malaspina* and *Taku* are retired; the other mainline vessels are redeployed to satisfy the remaining service requirements.

Avalanche interruptions on the Juneau Access Highway are anticipated to be intermittent for individual storm events, averaging 34 days per winter, with an average closure of two days, and a maximum closure of eight days (the latter in the event that the road is blocked and/or action is required to trigger an avalanche and then clear the resulting blockage). When the road is closed, the ferry service would be extended south to Slate Cove.

On-beam wind and sea conditions on this cross-canal segment strongly suggest the need for a large, closed vessel. Moreover, the requirement to run south to Slate Cove (in avalanche/winter conditions) requires a closed vessel. Consequently, AMHS envisions using the SESF that would transport 60 Alaska-standard vehicles and 500 passengers, and that could be redeployed from Katzehin and the northern Lynn Canal to the Prince Rupert-Ketchikan run or elsewhere in the AMHS system.

The associated costs for AMHS (capital costs for new or modified terminals and replacement ferries) are not yet accounted for in this analysis but will be accounted for in the Phase II LCA.

7.5.4.1 Southwest/Cross-Gulf Service

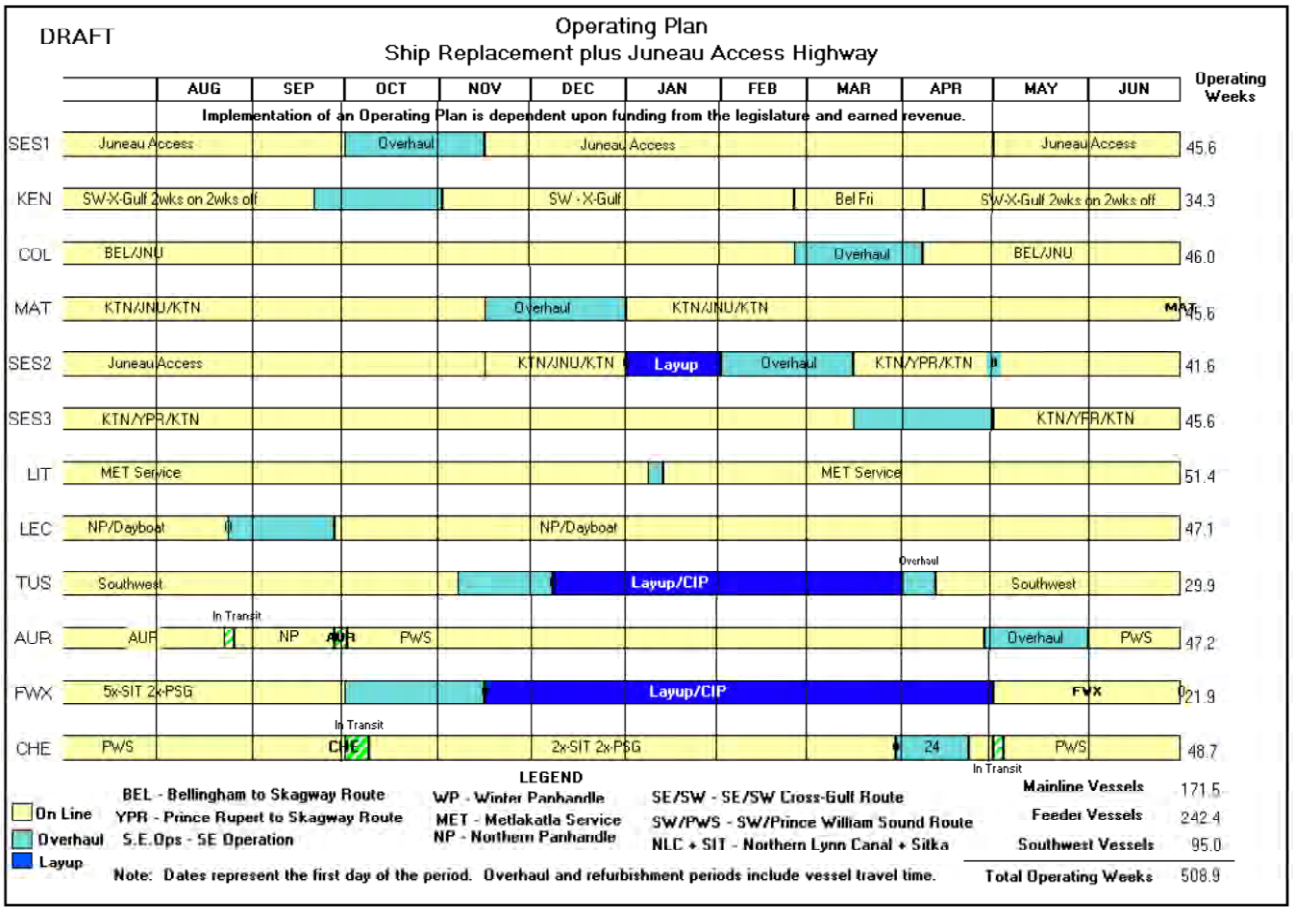
AMHS services in the Southwest and cross-Gulf will remain largely unchanged from that for the Status Quo option. Between April and October, service is provided out the Aleutian Islands once per month to Unalaska/Dutch Harbor, stopping at Chignik, Sand Point, King Cove, False Pass, Akutan, and Cold Bay. This Aleutian Chain service is suspended during the winter months, during which time *Kennicott* continues to provide cross-Gulf service. Prince William Sound receives a minimum of daily, year-round service with regular service provided between Kodiak, Port Lions, Seldovia, and Homer.

7.5.4.2 Southeast Service

The most significant changes take place in the Southeast. In the time frame of the Multiple Day Boat Shuttle option – beyond 2019 – Malaspina has been retired and is replaced by an SESF. The Juneau Access Highway is opened and shuttle services between Katzehin and each of Skagway and Haines are provided by two additional SESFs. A third SESF is deployed on the Prince Rupert to Ketchikan run; *Taku* is retired. Bellingham services turn around at Juneau and are maintained at one round-trip per week year-round. The remaining mainline vessels (notably *LeConte*, *Columbia*, and *Matanuska*) are redeployed to best satisfy demand in the remainder of the system. Turning around in Juneau allows for more in-port time at major ports, and allows deployment of *LeConte* to the Northern Panhandle Route. There would be a significant increase of service to the North Lynn Canal and year-round fast vehicle ferry service to Sitka and Petersburg.

With the effective addition of one ship to the AMHS fleet, there is a significant increase in the number of operating weeks. The operating plan for the Multiple Day Boat Shuttle option is presented in Figure 7.6.

Figure 7.6
Multiple Day Boat Shuttle Operating Plan



The total number of operating weeks under this option is presented below:

Table 7.10
Multiple Day Boat Shuttle Operating Weeks

	Operating Weeks
Mainline vessels	171.5
Feeder vessels	242.4
Southwest vessels	95.0
Total	**508.9**

7.5.4.3 Port Departures

There will be year-to-year variations as specific ships are taken out of service for overhaul, maintenance, and work funded by CIPs. However, the Multiple Day Boat Shuttle option provides for the average port call frequency summarized in the following table.

Table 7.11
Multiple Day Boat Shuttle Average Port Call Frequency

Southeast	Port Departures		Southwest/ Cross-Gulf	Port Departures
Angoon	109		Akutan	10
Bellingham	51		Chenega Bay	34
Haines*	1,675		Chignik	10
Hoonah	294		Cold Bay	10
Juneau*	993		Cordova	343
Kake	161		False Pass	10
Katzehin **	3,350		Homer	258
Ketchikan	906		King Cove	10
Metlakatla	513		Kodiak	170
Pelican	19		Port Lions	101
Petersburg	435		Sandpoint	10
Prince Rupert	149		Seldovia	109
Sitka	387		Tatitlek	54
Skagway*	1,675		Unalaska	5
Tenakee	103		Valdez	329
Wrangell	353		Whittier	419
Yakutat	30			
TOTAL	**11,203**			**1,882**

** New Terminal
* Now served by SESF

7.5.4.4 Cost, Revenue, and Financial Summary (FY2008/09)

The Multiple Day Boat Shuttle option is anticipated to incur the costs, generate the revenues, and require Status support in the amounts noted in the following table.

Table 7.12
Multiple Day Boat Expenses and Revenues

Costs and Expenses	**(000s)**
Marine Vessel Operations	$ 149,479.2
Shoreside Costs	18,244.5
Allocated Costs	2,274.2
Total AMHS Costs	**$ 169,997.9**
Generated Revenues	**$ 58,750.0**
Surplus(Shortfall) from Operations	**(111,247.9)**

7.5.5 OPTIONS SUMMARY

The following table summarizes the operating plans for each of the four options described above in terms of the numbers of port calls and operating weeks.

Table 7.13
Summary of Operating Plans

	Status Quo	**Service Reduction**	**Service Expansion**	**Multiple Day Boat Shuttle**
Ports of Call (# by Region)				
Southeast	5,299	4,915	5,598	11,203
Southwest/Cross-Gulf	1,939	1,882	1,874	1,882
Total	7,238	6,797	7,472	13,085
Operating Weeks				
Mainline	167.4	143.8	175.3	171.5
Feeder	151.2	151.2	171.7	242.9
Southwest	95.0	95.0	95.0	95.0
Total	**413.6**	**390.0**	**442.0**	**508.9**

The following table summarizes the financial impact for each of the four options described above.

Table 7.14
Summary of Option Financial Impacts

	Status Quo*		Service Reduction		Service Expansion	Multiple Day Boat Shuttle**
	Existing Fleet Composition	*Malaspina* replaced with Shuttle Ferry	Retire *Malaspina*	Retire *Kennicott*		
Costs &Expenses	**(000s)**	**(000s)**	**(000s)**	**(000s)**	**(000s)**	**(000s)**
Marine Vessel Operations	$ 137,394.5	$ 137,420.3	$ 131,338.0	$ 128,413.2	$ 150,176.0	$ 149,479.2
Shoreside Costs	18,244.5	18,244.5	18,244.5	18,244.5	18,244.5	18,244.5
Allocated Costs	2,274.2	2,274.2	2,274.2	2,274.2	2,274.2	2,274.2
Total AMHS Costs	**$ 157,913.2**	**$ 157,939.0**	**$ 151,856.7**	**$ 148,931.9**	**$ 170,694.7**	**$ 169,997.9**
Generated Revenues	**$ 52,256.9**	**$ 51,750.0**	**$ 49,904.4**	**$ 50,326.5**	**$ 57,511.5**	**$ 58,750.0**
Surplus(Shortfall) from Operations	**(106,656.3)**	**(106,189.0)**	**(101,952.3)**	**(98,605.4)**	**(113,183.2)**	**(111,247.9)**

* The shuttle ferry is less expensive to operate than the *Malaspina*; however, the new shuttle ferry cannot provide the winter Bellingham service formerly provided by the *Malaspina*. Therefore, it becomes necessary to keep the *Columbia* in year-round service to Bellingham, resulting in no decrease in system operating expenses.

** Option 4 results in a reduction of operating expenses within the northern Lynn Canal service area and an increase in available vessel-service-weeks throughout the system. This option assumes that vessels will be fully utilized, not laid-up or retired, thus resulting in an overall increase in operating costs. Phase II of this analysis will evaluate permutations of option 4 including further vessel retirements and adjustments to the level of service.

7.6 ANALYSIS OF THE SERVICE OPTIONS

Service options analysis is in Phase II, Chapter 8.

7.7 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations are in Phase II, Chapter 8.

7.8 LIFE-CYCLE ANALYSIS EXAMPLE AND DISCUSSION

In Phase I HDR produced a first cut at an LCA) for the current AMHS inventory of ferry vessels. The purpose of the LCA was to analyze the current condition of the system and develop a benchmark to help plan for a more efficient, dependable, and sustainable ferry transportation system as an integral part of the State of Alaska transportation network. The net present value and uniform annual equivalent costs (AEC) were calculated utilizing a cost of capital of 7 percent. The interest rate is the rate mandated by the federal Office of Management and Budget. Because AMHS vessel acquisitions and major capital overhauls have in part relied in federal funding, this interest rate is deemed appropriate.

The use of federal funds to pay for vessel construction and overhaul has tended to focus the discussion and attention on vessel maintenance and other direct operating costs. It is possible that this focus results in the retention and operation of vessels that should be retired and cost-effectively replaced with new vessels. This LCA examined both operating and capital costs with the intention of providing a baseline to help determine what future action needs to be taken to optimize the system (see Table 7.15). Accordingly the LCA will form the basis of the business case model that will be used to value each alternative in Phase II.

HDR has identified all costs related to AMHS vessel construction, overhaul, operations, and maintenance. Research was conducted to determine the proper values of each input and to determine exactly how they will be quantified and incorporated into the Phase II LCA. Each element was developed or converted into monetary terms for the purpose of estimating the financial impacts for the LCA. In addition, the LCA will be performed as a risk analysis assigning a risk range around each input variable.

The research team developed an economic simulation model based on a 64-year spreadsheet. Risk analysis and Monte Carlo simulation techniques are used to account for uncertainty in both the input values and model parameters. All projections are expressed as probability distributions (range of possible outcomes and probability of each outcome). The probability distributions reflect the combined uncertainty of all input variables and model parameters, and the combined likelihood of all expected changes identified in the course of the study. Risk analysis allows the research team to assess the probability of any particular outcome, defined for instance as a break-even point or desired state subsidy level.

To complement the LCA, the forward-looking LCA results will be compared to actual historical data taken from AMHS archives. Various hard copies of past AMHS data were uncovered and converted to MS Excel for further analysis. The historical revenue and operating expenses will be combined with forward-looking information in Phase II.

Although further analysis of the potential future service options will permit further refinement of the baseline LCA estimates, it remains clear that the status quo is resulting in large deficit gaps between revenue and expenses today and the deficit gap will grow during the next 20 years.

Figure 7.7 illustrates the annual equivalent cost of the existing AMHS fleet (annual cost of capital recovery of the first cost of the vessel, plus annual equivalent of major overhaul costs, plus annual operating costs).

Figure 7.8 is the net present value and profitability of each AMHS vessel. The profitability index is the difference in the present value of revenues, less the present value of expenses, divided by the net present value of the capital cost of the vessel.

Figure 7.9 is a graphic of the annual equivalent cost per passenger and passenger mile for each vessel in the fleet. Figure 7.10 charts the baseline annual equivalent cost per vessel mile.

The profitability index is an indication of the potential for the recovery of the capital cost of a piece of equipment from the revenues that the equipment generates. Because revenues are less than expenses for all AMHS vessels, the profitability indexes are all negative. The larger the negative number the less the less profitable the vessel is

relative to its first cost. These data are necessary in the analysis of which vessels should be retained in service and which vessels should be retired.

Example of Profitability Index Calculation for the *Kennicott* (data from Table 7.15)

PI = (PV Revenue – PV Expenses)/PV Capital Cost (Note units in $ millions)

PI = ($79.3 – $324.2)/$66.2

PI = - 3.7

Note: PI = profitability index; PV = present value.

Table 7.15
Summary of Life-Cycle Analysis for AMHS
Baseline Scenario
Figures for rows 1 through 9 are in millions of dollars; figures for rows 10 through 15 are in dollars

Summary of Life-Cycle Cost Analysis for AMHS — Baseline Scenario — All Figures in ($M) except "per"

	Total	Average	Aurora	Chenega	Columbia	Fairweather	Kennicott	LeConte	Lituya	Malspina	Matanuska	Taku	Tustumena
PV T. Cost of Ownership:	$ 2,922.3	$ 265.7	$ 232.6	$ 238.1	$ 509.4	$ 217.8	$ 390.4	$ 171.7	$ 35.8	$ 452.7	$ 36.8	$ 357.5	$ 279.5
Less PV of Capital:	$ 976.9	$ 88.8	$ 72.3	$ 67.5	$ 130.9	$ 49.2	$ 66.2	$ 61.2	$ 21.9	$ 173.9	$ 141.9	$ 111.6	$ 80.3
Less PV of Expenses:	$ 2,327.3	$ 211.6	$ 160.2	$ 170.6	$ 378.5	$ 168.6	$ 324.2	$ 110.4	$ 14.0	$ 278.8	$ 276.7	$ 245.9	$ 199.3
PV of Revenues:	$ 1,089.6	$ 99.1	$ 37.7	$ 33.9	$ 228.5	$ 43.8	$ 79.3	$ 11.5	$ 6.8	$ 119.5	$ 418.6	$ 69.5	$ 40.6
Net Present Value:	($2,511.8)	($228.3)	($194.8)	($204.3)	($281.0)	($174.0)	($311.1)	($160.2)	($29.1)	($333.2)	($297.2)	($288.0)	($238.9)
Profitability Index:		(1.3)	(1.7)	(2.0)	(1.1)	(2.5)	(3.7)	(1.6)	(0.3)	(0.9)	(1.1)	(1.6)	(2.0)
Op Exp as a % of Rev:		214%	425%	504%	166%	385%	409%	964%	206%	233%	228%	354%	491%
Annual Subsidy Required:	$220.6												
Annual Equivalent Cost:	$ 290.1	$ 26.4	$ 20.4	$ 20.9	$ 44.7	$ 19.1	$ 34.3	$ 15.1	$ 3.1	$ 39.7	$ 36.8	$ 31.4	$ 24.5
AEC per PAX:		$ 887	$ 962	$ 613	$ 1,332	$ 371	$ 2,349	$ 641	$ 135	$ 1,198	$ 941	$ 947	$ 1,235
AEC per PAX-Mile:			$ 12	$ 7	$ 3	$ 4	$ 8	$ 9	$ 8	$ 3	$ 5	$ 6	$ 9
AEC per Vehicle:			$ 2,905	$ 1,725	$ 3,636	$ 1,568	$ 4,950	$ 2,539	$ 386	$ 3,312	$ 3,044	$ 2,913	$ 3,218
AEC per Vehicle-Mile:			$ 37	$ 18	$ 7	$ 18	$ 16	$ 37	$ 24	$ 7	$ 15	$ 17	$ 17
AEC per Vessel-Mile:			$ 437	$ 420	$ 670	$ 372	$ 540	$ 393	$ 260	$ 509	$ 512	$ 384	$ 440
AE Surplus per Ves-Mile:			($366)	($360)	($370)	($297)	($430)	($366)	($211)	($374)	($364)	($309)	($376)

Figure 7.7
Annual Equivalent Cost of AMHS Vessels in $ million

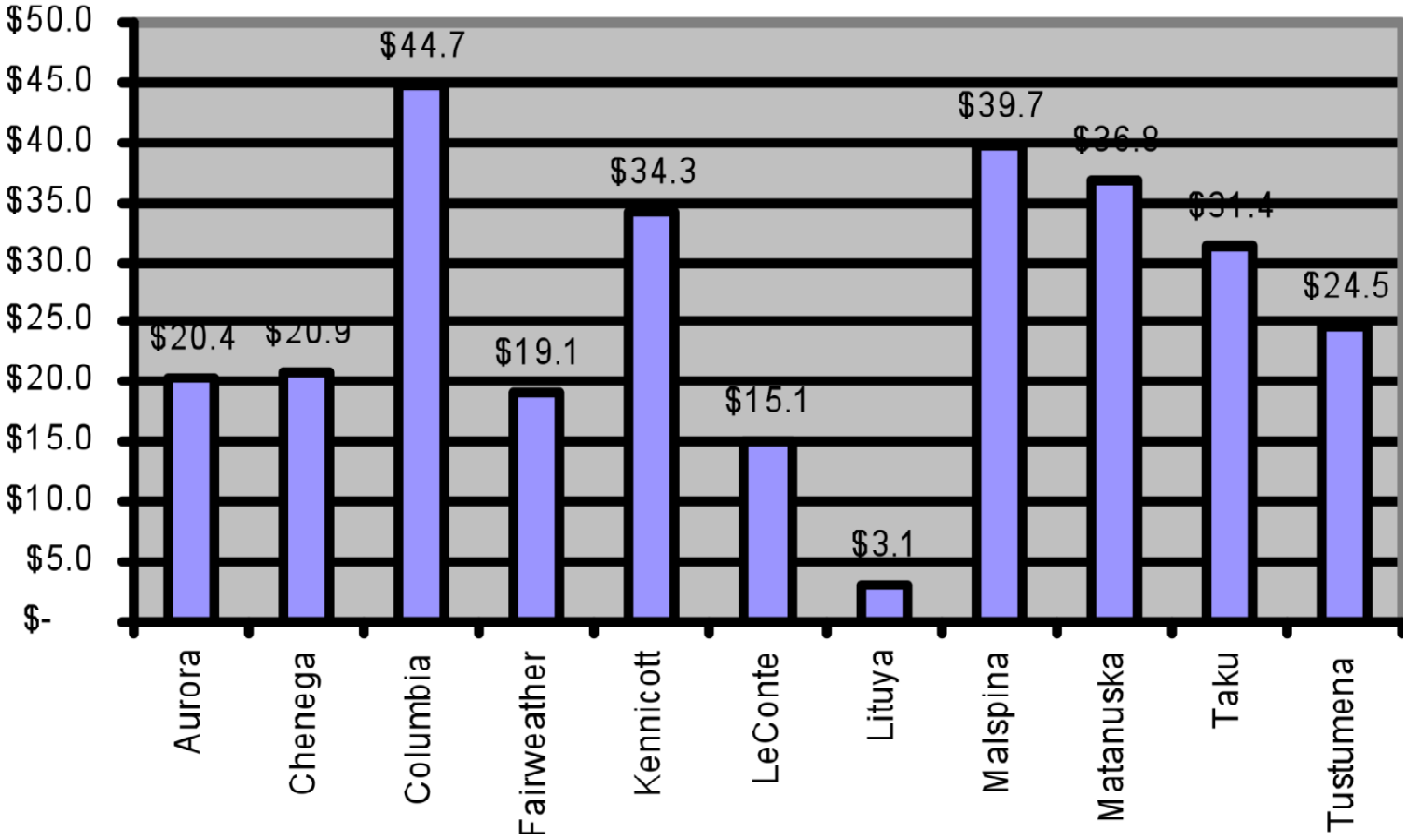
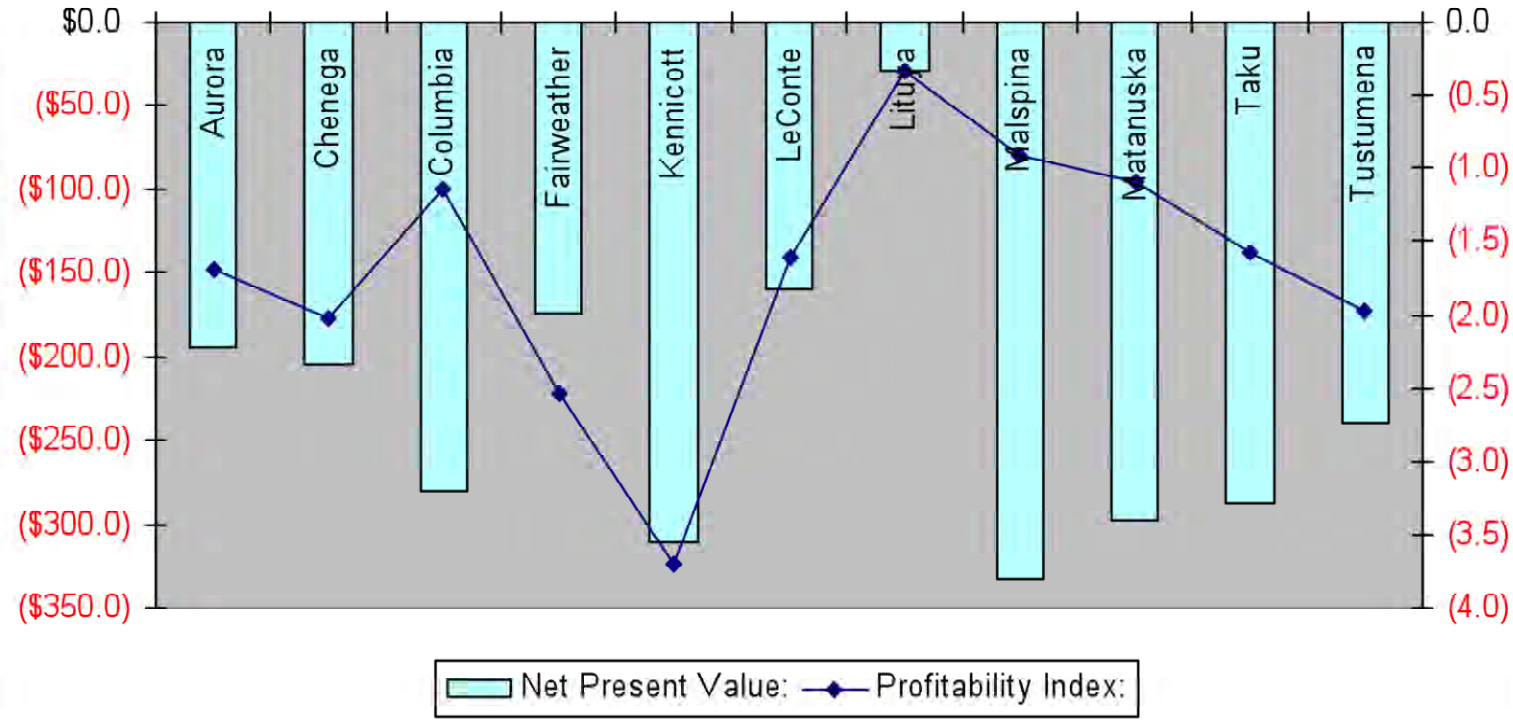


Figure 7.8
Net Present Value and Profitability Index of AMHS Vessels



Note: The profitability index is the difference in the present value of revenues less the present value of expenses divided by the net present value of the capital cost of the vessel. The Profitability Index is an indication of the potential for the recovery of the capital cost of a piece of equipment from the revenues that the equipment generates. Since revenues are less than expenses for all AMHS vessels, the Profitability Indexes are all negative. The larger the negative number the less the less profitable to vessel is relative to its first cost. These data are necessary in the analysis of which vessels should be retained in service and which vessel should be retired.

Figure 7.9
Annual Equivalent Cost per Passenger and Passenger Mile

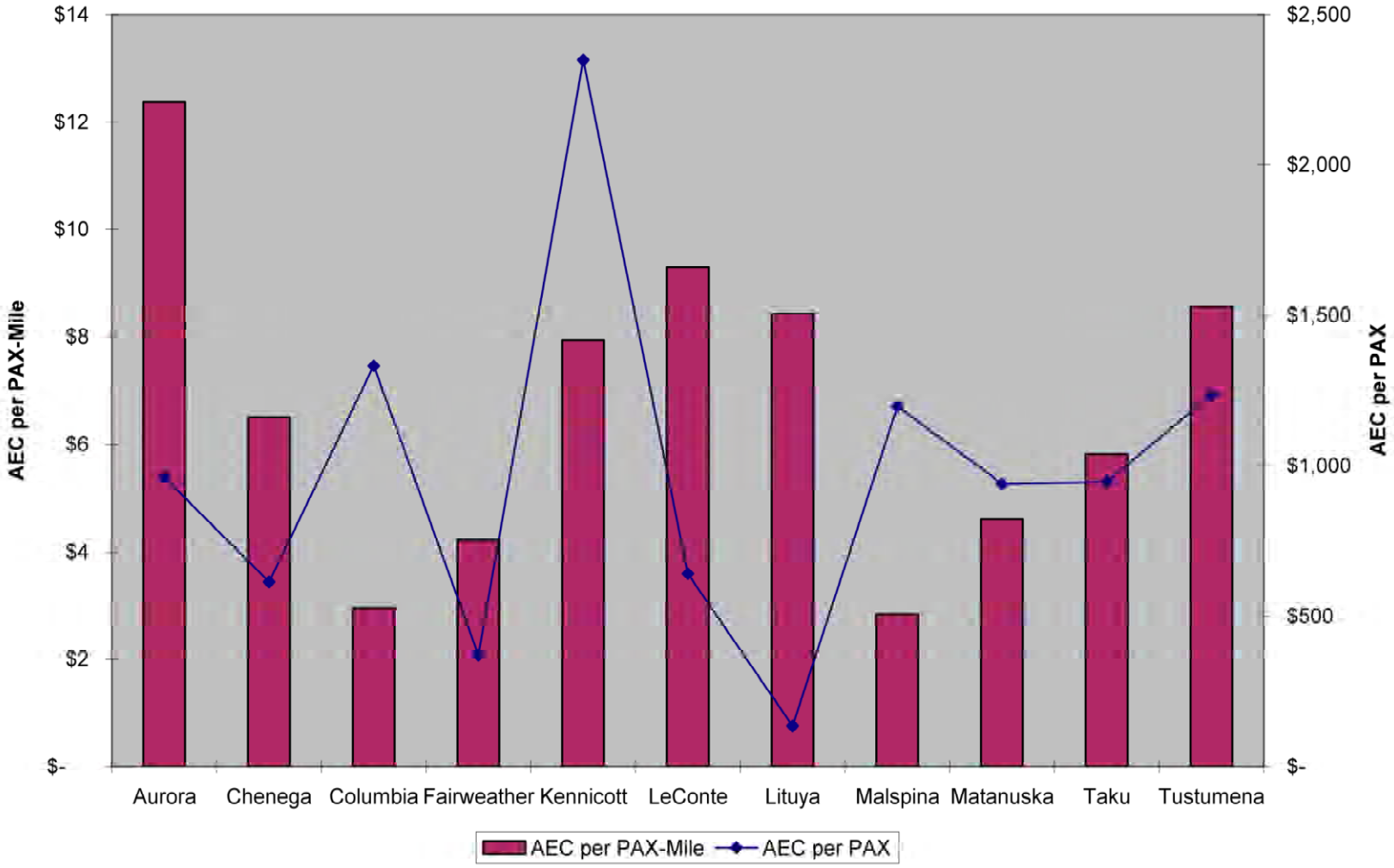
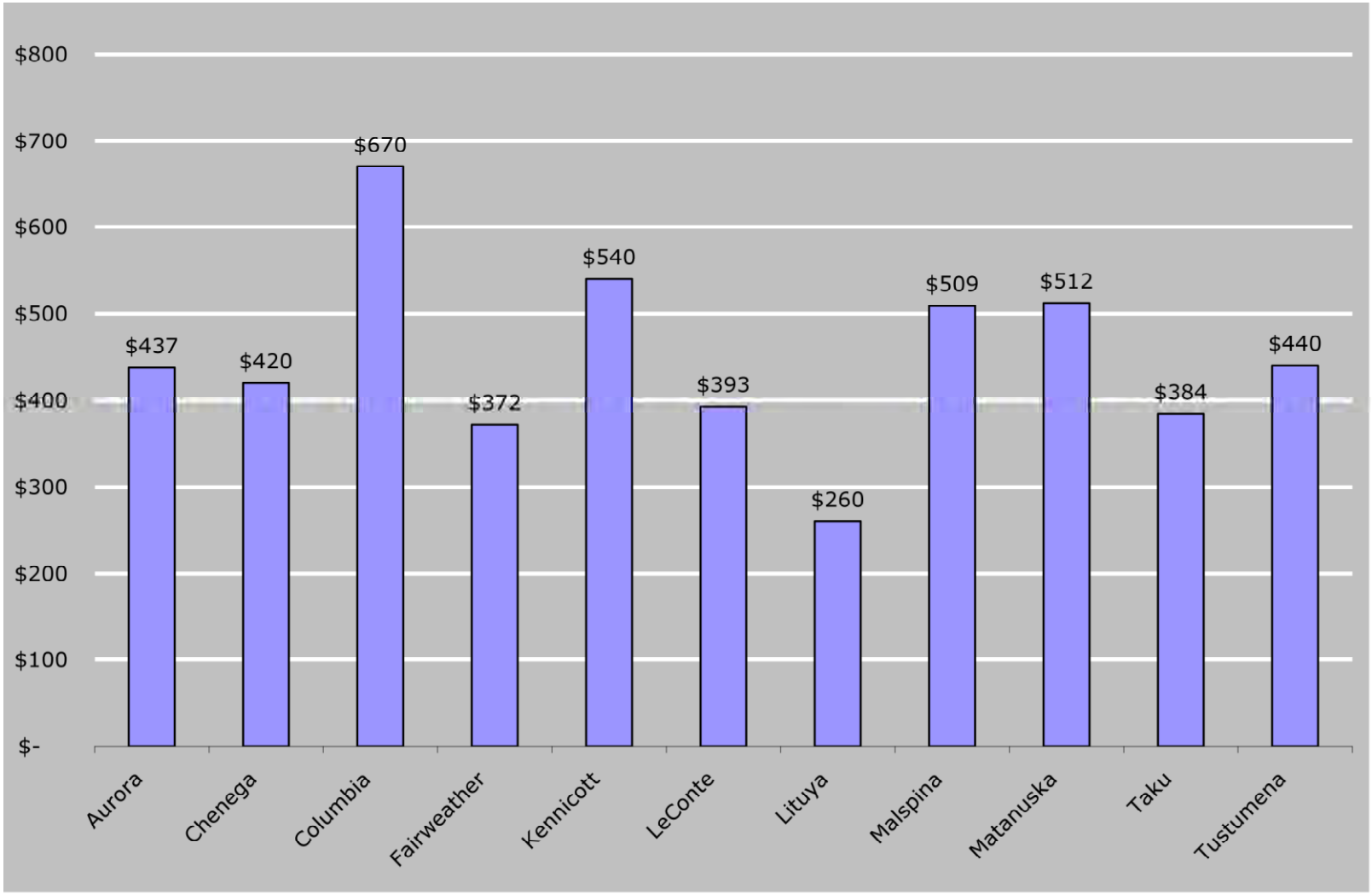


Figure 7.10
Baseline Annual Equivalent Cost per Vessel Mile in 2008 dollars



CHAPTER 8

PHASE II SYSTEM ANALYSIS COMPONENTS

8.1 REVIEW AND FURTHER DEVELOPMENT OF ALTERNATIVE SCENARIOS FOR INTERMEDIATE AND LONG-TERM PLANS

The previous chapters of the AMHS System Analysis presented a comprehensive report comprised of the following major elements:

- Review of the Mission Statements, Goals and Performance Measures, 1960 to 2008
- History of AMHS and descriptive scenario of the current System
- Economic benefits of the Alaska Marine Highway System
- Formation and role of the Marine Transportation Advisory Board
- Review of Alaska DOT&PF short term Alaska Marine Highway Alternatives
- Lessons learned from British Columbia Ferry Services Incorporated

Development of alternative scenarios for intermediate and long term plans and introduction to life-cycle cost analysis

This chapter assesses the financial and socio-economic impacts of six (6) service options. The options include the status quo, service expansion and service reduction. As well, the analysis investigates the effect of ship replacement and the impact on ferry service of adding Alaska Class ferries to the existing fleet and increasing service, primarily in the Southeast.

Five of the six service options were selected using the following principles:

(1) Ability to operate for a minimum of 10 years,

(2) Ability to service all existing ports,

(3) Ability to implement with the existing AMHS fleet,

(4) Offer a range of service quality and subsidy, both lower and higher than the 2008/09 Service Plan,

(5) High quality revenue and expenditure data for financial modeling, and

(6) Practical and doable.

The remaining option, Option 4 below, was drawn from the 2004 Southeast Alaska Transportation Plan.

(1) Status Quo: The 2008/09 service program. Two variations of the Status Quo option are simulated:

a. Status quo service with a significant capital investment in Malaspina

b. Status quo service that sees Malaspina replaced by an Alaska-class shuttle ferry in 2014

(2) Service Expansion: A service program similar to that operated in 2006/07,

(3) Service Reduction: A service program with 10 rather than 11 vessels. Two retirement scenarios are simulated:

a. Retirement (without replacement) of Malaspina, and

b. Retirement (without replacement) of Kennicott.

(4) Multiple Alaska-Class Ferries: This option considers the acquisition of three Alaska-Class shuttle ferries, one to replace the Malaspina and two to provide increased service in the North Lynn Canal. There is no associated road or terminal construction.

Each of the six service options are supported by a comprehensive life cycle cost analysis of operating costs, capital expenditures and revenues, and a discussion of the socio-economic impacts.

8.2 AMHS BUSINESS PARADIGM

AMHS has become a highly subsidized business. State and Federal subsidies cover approximately 70% of annual expenditures. Fares are low, in economic terms, to encourage travel and the external social and economic benefits derived from the movement of people and goods. In the current business model, AMHS vessels can travel at full capacity and not generate sufficient revenues to break even.

Public transportation agencies such as AMHS generally arrive in this financial position after several years of tariff increases, averaging less than the Consumer Price Index (CPI), while incurring labor cost increases that exceed CPI. Service expansion without equivalent market response and the lack of fuel surcharges to cope with rapid escalations in the price of oil further contribute to subsidy growth.

Tables 8.1 and 8.2 illustrate the financial circumstances at AMHS. In the 10-year period between 1995 and 2004, business revenue increased by 5.9%, yet AMHS operating expenditures rose by 25.9% and the Total System Subsidy virtually doubled (from $53.9 to $107.2 million). If the costs associated with ship and engine replacement are excluded (but all other capital investments considered), AMHS' total costs rose by 68% (from $90.2 to $151.9 million) and the total State subsidy more than doubled (from $48.0 to $107.2 million). At the base level of marine operations, the vessel operating subsidy increased by 83.5% from $18.2 to $33.4 million. In terms of AMHS operations (excluding all capital expenditures), cost recovery decreased from 59% to 50%.

Table 8.1
AMHS Cost and Revenue Growth 1995-2004

AMHS Costs and Revenues (millions)	1995	2004	Change
Total AMHS (including all capital)	$ 96.1	$ 151.9	58.1%
Total Unrestricted Revenues	$ 42.2	$ 44.7	5.9%
Total System Subsidy	$ 53.9	$ 107.2	98.9%
Total AMHS (excl ship, engine repl)	$ 90.2	$ 151.9	68.4%
Total Unrestricted Revenues	$ 42.2	$ 44.7	5.9%
Total AMHS Subsidy (excl ship, engine repl)	$ 48.0	$ 107.2	123.3%
AMHS Operating Expenses	$ 71.1	$ 89.5	25.9%
Total Unrestricted Revenues	$ 42.2	$ 44.7	5.9%
AMHS Operating Subsidy	$ 28.9	$ 44.8	55.0%
Marine Vessel Operations	$ 60.4	$ 78.1	29.3%
Total Unrestricted Revenues	$ 42.2	$ 44.7	5.9%
Vessel Operating Subsidy	$ 18.2	$ 33.4	83.5%

Table 8.2
AMHS Cost and Revenue Growth 2004-2007

AMHS Costs and Revenues (millions)	2004	2007	Change
Total AMHS (including all capital)	$ 151.9	$ 188.9	24.4%
Total Unrestricted Revenues	$ 44.7	$ 48.4	8.3%
Total System Subsidy	$ 107.2	$ 140.5	31.1%
Total AMHS (excl ship, engine repl)	$ 151.9	$ 188.9	24.4%
Total Unrestricted Revenues	$ 44.7	$ 48.4	8.3%
Total AMHS Subsidy (excl ship, engine repl)	$ 107.2	$ 140.5	31.1%
AMHS Operating Expenses	$ 89.5	$ 143.7	60.6%
Total Unrestricted Revenues	$ 44.7	$ 48.4	8.3%
AMHS Operating Subsidy	$ 44.8	$ 95.3	112.7%
Marine Vessel Operations	$ 78.1	$ 127.2	62.9%
Total Unrestricted Revenues	$ 44.7	$ 48.4	8.3%
Vessel Operating Subsidy	$ 33.4	$ 78.8	135.9%

The State subsidy faces ongoing pressure for ship replacements, major overhauls, wage increases and volatile fuel prices. On the revenue side of the equation, relatively low percentage fare increases, particularly on longer routes, produce a significant lift in ticket prices. Ferry users consistently apply pressure to avoid significant tariff increases.

Subsidized fares are an integral part of the AMHS route structure and service frequency. The analysis illustrates that tariff changes that will generate revenue large enough to recover 50% of expenditures will deter a significant volume of travel.

The trends indicate that current economic and political pressures are likely to increase AMHS expenditures at a greater rate than their revenue. This situation places upward leverage on the State subsidy and focuses the management of the annual State contribution to AMHS on long term financial planning and cost control.

8. 3 LIFE CYCLE COST MODEL

The Life Cycle Cost Model ("the Model") is comprehensive analytical tool developed by HDR and is used in a wide variety of businesses to compare the long term or life cycle cost of alternative actions. The Model utilizes a full range of cost, ridership and revenue inputs, and incorporates assumptions regarding the variability of oil prices, ridership, and inflation. Outputs include Present Value and Annual Equivalent Costs for each option.

As noted previously in the report, the use of Federal funds to pay for a portion of vessel construction and overhaul costs focuses the local attention towards the direct operating costs funded by the State. The life cycle cost analysis considers both operating and capital expenditures and treats all public funds equally to determine actions most likely to optimize the system.

The Model utilizes assumptions regarding key cost and revenue variables. Based on the study team's experience, published federal forecasts, AMHS historical financial data and discussions with senior AMHS staff, the key cost and revenue variables and the range presented in Table 8.3 were adopted for this analysis.

8.3.1 Oil Prices

The price of oil (and its direct effect on the price of marine diesel fuel) is the most volatile of the inputs and the most difficult to forecast. The Model assumptions regarding oil prices are drawn from the Department of Energy (DOE) forecasts, whereby a low of $32.50 per barrel, a high of $150.00 and a median of $82.00 yield an expected mean value of $85.50 per barrel (bbl). It is also assumed that fuel prices will grow with a low of 0% and a high of double CPI plus 1%.

Table 8.3
Values Used for Key Probability Distributions

VARIABLE	MEDIAN	LOW	HIGH	Expected Value
Underlying Price of Oil	$82.00	$32.50	$150.00	$85.50
Ridership Growth Factor	0.0%	-2.5%	2.5%	0.0%
General CPI Inflation 2010-2011	1.5%	0.8%	2.3%	1.5%
General CPI Inflation 2012+	1.9%	1.0%	2.9%	1.9%
Wage Inflation 2012+	2.9%	0.9%	4.9%	2.9%
Fuel Price Inflation 2012+	2.9%	0.0%	5.8%	2.9%
Capital Cost Inflation 2012+	2.9%	1.9%	4.9%	3.1%
Shoreside Costs (status quo)	$16.13	$14.51	$17.74	$16.13

Fuel represented 20% of AMHS authorized spending in FY09 and was budgeted at $41 million but, with the recession and dramatic decline in oil prices, actual expenditures totaled only $28 million. In FY08 and 07, the actual to budgeted costs were reversed as these years experienced a period of rapid oil price escalation. Monthly prices have fluctuated by $10/bbl. On an annual basis, $10/bbl equals expenditures or a savings in the order of $2.4 million.

8.3.2 Labor

Employee salaries, wages and benefits comprised 47% of the FY 09 budget ($74.0 million). Given the compounding nature of labor adjustments, the cost of labor has a significant impact on the AMHS' cost structure. In recent years, wages have increased by 7%, 6%, 6%, and 3% respectively. Pay increases of 0, 5% and 4% have been negotiated for the three years commencing July 2009. Compounded, this represents a 36.5% increase in labor costs over seven years with the result that, in 2009, a 1% increase in wages and benefits equals $740,000 annually. Unlike the price of oil that fluctuates up and down, labor expenses continue a steady upward climb, with each year's increase being added to the previous year.

Large ferry operations such as AMHS have labor requirements that are largely dictated by the number, size and class of ships in operation. Some cost reductions are possible by crewing to ship certification levels and only exceeding such levels where a business case demonstrates that there is an appropriate return on investment. However, significant labor cost reductions come from reducing service to the extent that complete crews become redundant. A marginal labor cost reduction is not as readily achieved as in the manufacturing sector.

The Model assumes a wage inflation range where the Low = CPI, the Median and Expected Mean = CPI+1%, and the high = CPI+2%.

8.3.3 Revenue and Ridership

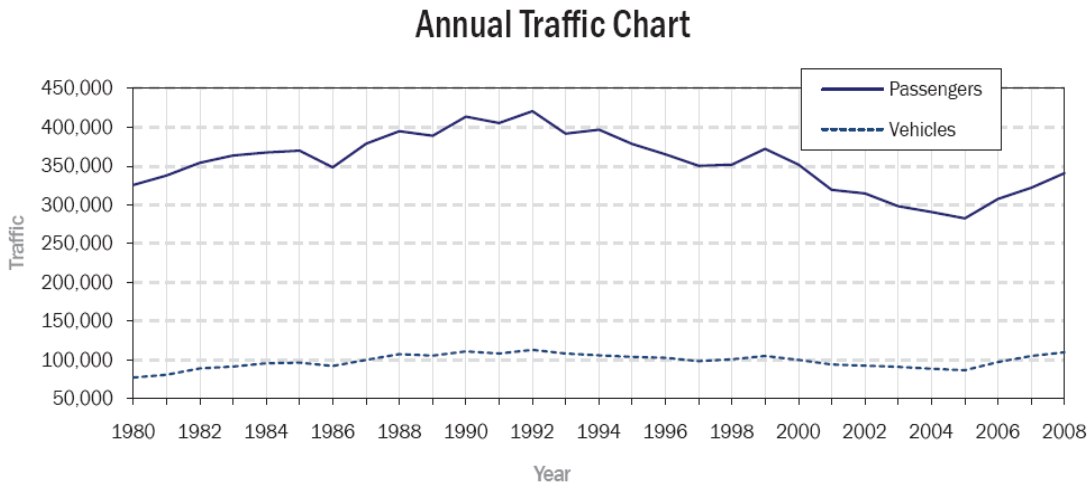
Ticket and other business revenue equaled 33% of total operating expenses in FY09. AMHS revenue is captured on a ship-by-ship, rather than route-by-route. To adjust for this, the Model considers the average annual operation for each AMHS vessel, and then derives revenues based on the operational profile assigned to each ship. In Option 5 where new routes are postulated, specific tariff models have been developed. Together, these provide a realistic baseline for anticipated revenues.

Another factor complicating ridership forecasting is the practice of counting passengers on each leg of the route. Therefore, a passenger traveling three legs on a single journey is counted three times and represents three passengers, rather than one.

Fares are estimated to increase at CPI and can be changed only by conscientious State decision. Their range is zero-based; that is, the tariff is not subject to fluctuation due to uncontrollable external influences such as automatic fuel surcharges.

Figure 8.1 (from the AMHS Annual Traffic Volume Report – 2008) illustrates a consistent ridership decline from peak levels in the early 1990s until 2006. In 2006, the introduction of Fairweather and Chenega, in combination with changes to the operating profile and marketing initiatives, reversed this ridership trend. The majority of this recent growth has occurred on the lower-revenue Prince William Sound and Metlakatla runs.

Figure 8.1
Annual Traffic (Annual Traffic Volume Report – 2008)



The notable turnaround in recent years has not been accompanied by equivalent growth in revenue. In fact, total AMHS revenues have fallen every year from that turnaround point: $51.8 million (2006), $49.5 million (2007), $48.2 million (2008), $47.0 million (2009-est).

This dichotomy – increasing ridership and falling revenues – presents a challenge in projecting revenue growth. It is possible that the recent growth will be sustained but, without changes in tariff levels, revenue can be anticipated to continue to decline. Given these conditions, a ridership growth of zero with a range of +/- 2.5% is considered appropriate to this analysis.

8.3.4 Capital Cost Inflation

The capital markets have been subjected to extraordinary pressures in late 2008 and 2009. The analysis assumes that global economies will recover and, in the 20-year time frame established for the options under study, that the actual cost of capital will return to "recent normal" levels. Although capital expenditures represent significant one-time investments, the assets purchased by these expenditures have long life cycles (nominally 20-30 years for engines and 25-60 years for ships). Therefore, capital cost inflation has a relatively minor impact on annual expenditures. The actual cost of capital purchases such as new engines has been increasing each year at a rate higher than CPI; thus, the Model assumes a Low = CPI, a Median = CPI + 1% and a High = median + 2%.

8.3.5 Highway and Terminal Costs

Capital and operations and maintenance (O&M) Costs for roads are outside the scope of this study and have not been factored into any option.

8.3.6 Model Inputs

The Model makes use of AMHS historical cost and revenue data for the past ten years, together with estimates of notable financial demands:

- All direct, indirect, shore side, and allocated costs
- All revenues
- Cost estimates for new ship construction, major overhauls, component improvement programs, and engine repowering
- All state and federal funds received in the form of subsidies and capital contributions for such activities as major overhauls, component improvements, and engine repowering.

8.3.7 Model Outputs

Appendix B presents a summary of the model outputs for each of the six options simulated in this analysis. Model outputs include:

- Present Value of Total AMHS system costs –
    - Capital
    - Vessel Operating Expenses
    - Indirect Costs
    - Shoreside Costs
    - Administration Costs
- Present Value of Revenues –
    - Net Present Value (PV Revenue – PV Costs)
    - Profitability Index (PV of Future Cash Flows/PV of Capital)
- Annual Equivalent Revenue (average annual revenues over the study period expressed in current year dollars)
- Annual Financial Assistance (i.e., the total state subsidy). These are key indications of the level of government assistance required to operate and sustain the Marine Highway System. Detailed distributions are provided for the following three key subsidy considerations –
    - AMHS as a Total System including all capital costs
    - AMHS operating costs
    - Vessel operations only
- Revenue as a percentage of costs – a key performance measure for
    - AMHS as a Total System including all capital costs
    - AMHS operating costs
    - Vessel operations only
- Annual equivalent cost per passenger – a key performance measure that provides a customer-specific value of the AMHS.

8.4 COMMUNITY IMPACTS OF ANALYTICAL SCENARIOS

The scenarios modeled for this project –– Status Quo, Service Reduction, Service Enhancement, and Multiple Alaska-Class Ferries (introduction of new vessels) –– were chosen to represent clearly distinct analytical alternatives rather than detailed service options. Were any of the scenarios actually implemented, AMHS would also need to address a complex set of route, schedule and logistical decisions that would determine, to a large extent, the specific socio-economic impacts on riders and communities. Further, these six scenarios by no means exhaust the service alternatives available to AMHS as it works to maximize benefits and minimize costs. The scenarios serve as benchmarks because AMHS service must follow one of three courses; stay as it is today, expand service or contract service.

The life-cycle-cost model developed for this project is designed to help managers assess a wide range of factors systematically. The study team anticipates that the model will be used to analyze many other alternatives in addition to these six as AMHS makes decisions about vessels and services in the future. Because the range of potential impacts is so broad, this section of the report discusses them only generally and with respect to only the most directly affected communities in each case. When decision-makers have assessed the implications of the cost analysis to date, the analytical tools developed here may be used to examine additional scenarios, including specific vessel assignments, schedules and fares. At that point community impacts may be projected in more detail.

Some new data will be needed when and if a full assessment of community impacts is undertaken. For example, data on the amount and nature of the freight carried by AMHS and its closest competitors is incomplete, and for many communities, simply lacking. Although passenger and vehicle data, including the number of freight vans, is collected and reported regularly by AMHS, there is no ongoing tracking of the type, quantity and destination of the contents of AMHS freight shipments. In the past, the impacts of ferry service on local and out-of-state shippers typically has been estimated based mainly on limited or anecdotal information obtained by independent consultants from private firms.

8.5 OPTION 1A - STATUS QUO

The Status Quo Option 1A is based on the service delivery plan and budget approved by the Alaska State Legislature for FY09. This service plan resulted from extensive stakeholder consultation, senior AMHS staff analysis, and debate in the State legislature. It has accommodated the significant financial pressure from fuel price escalations and recent wage increases. The plan incorporates service changes that control costs while retaining revenues. For example, the Bellingham service has reduced expenditures, met the overall customer demand, and retained the total revenue for this route. The FY09 service program has successfully contained subsidy growth.

Although annual operating plans will vary from year to year as vessels are rotated through Capital Improvement Programs, overhaul and lay-up, the level of service set out in the FY09 Operating Plan represents the starting point for the analysis and the basis for comparing other scenarios.

In this analysis, the Status Quo option is simulated for 20 years, during which time no vessels are replaced. The Columbia and Aurora are re-powered and life-extension and re-powering investments are made to Malaspina to permit her continued operation. Prince William Sound receives a minimum of daily, year-round service with regular service provided between Kodiak, Port Lions, Seldovia and Homer. The ship assigned to the cross-Gulf route provides additional summer and supplemental service. Between April and October, service is provided twice monthly out the Aleutian chain to Unalaska/Dutch Harbor, stopping at Chignik, Sand Point, King Cove, False Pass, Akutan and Cold Bay. Limited year-round service is provided to Tatitlek and Chenega Bay. In the Southeast, weekly service is provided year-round between Bellingham and Skagway. Weekly service is also provided between Prince Rupert and Skagway except for one winter month when the associated mainline vessel is in overhaul. Frequent service is provided on the North Lynn Canal route. Day boats are assigned to inter-connect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route at their larger stops. For the most part, Sitka is served year-round by mainline vessels and fast ferries. Yakutat is provided with one north- and south-bound stop each month. Near-daily service is provided year-round between Metlakatla and Ketchikan.

In summary and over any 3-year cycle in the Status Quo option, AMHS vessels are deployed in such a manner as to provide the levels of service shown in Table 8.4:

Table 8.4
Option 1A – Operating Weeks

Sector and Operating Weeks	Status Quo (1A)
Mainline Vessels	168
Feeder Vessels	151
Southwest Vessels	95
Total	414

Table 8.5 presents the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements. These present values represent the total expenditure (or total revenue) for the ten-year period, expressed in today's dollars.

Table 8.5
Option 1A – Present Value and Annual Equivalent Values

	Option 1A: Status Quo (millions)
Present Value of Total AMHS System Costs	**$ 2,411.2**
PV of Capital:	$ 571.2
PV of Major Overhaul Costs (Terminals):	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,582.1
PV of Shoreside Costs:	$ 200.4
PV of Admin Costs:	$ 28.0
PV of AMHS Operating Costs	$ 1,810.5
Present Value of Revenues	**$ 595.7**
PV of Subsidy (Net Present Value =PV Revenue – PV Costs):	**($ 1,815.4)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$ 59.5**
Annual Equivalent Cost (Total System Costs):	$ 240.8
Annual Equivalent Cost (AMHS Operating Costs):	$ 180.8
Annual Equivalent Cost (Marine Vessel Operations Costs):	$ 158.0
Revenue as a % of Costs (Total System Costs):	24.7 %
Revenue as a % of Costs (AMHS Operating Costs):	32.9 %
Revenue as a % of Costs (Marine Vessel Operations Costs):	37.6 %
Annual Financial Assistance Required (Total System Costs)	$ 206.7
Annual Financial Assistance Required (AMHS Operating Costs)	$ 121.3
Annual Financial Assistance Required (Marine Vessel Operating Costs)	$ 98.5

Of the model outputs presented above, four key indicators will be used to establish comparisons between this status quo option and those that follow. These are as follows:

a. <u>PV of Subsidy</u> ($ 1,815.4M)
This is the Net Present Value of the total cost of ownership of the AMHS and is equal to the PV of the Total AMHS Costs less the PV of all Revenues

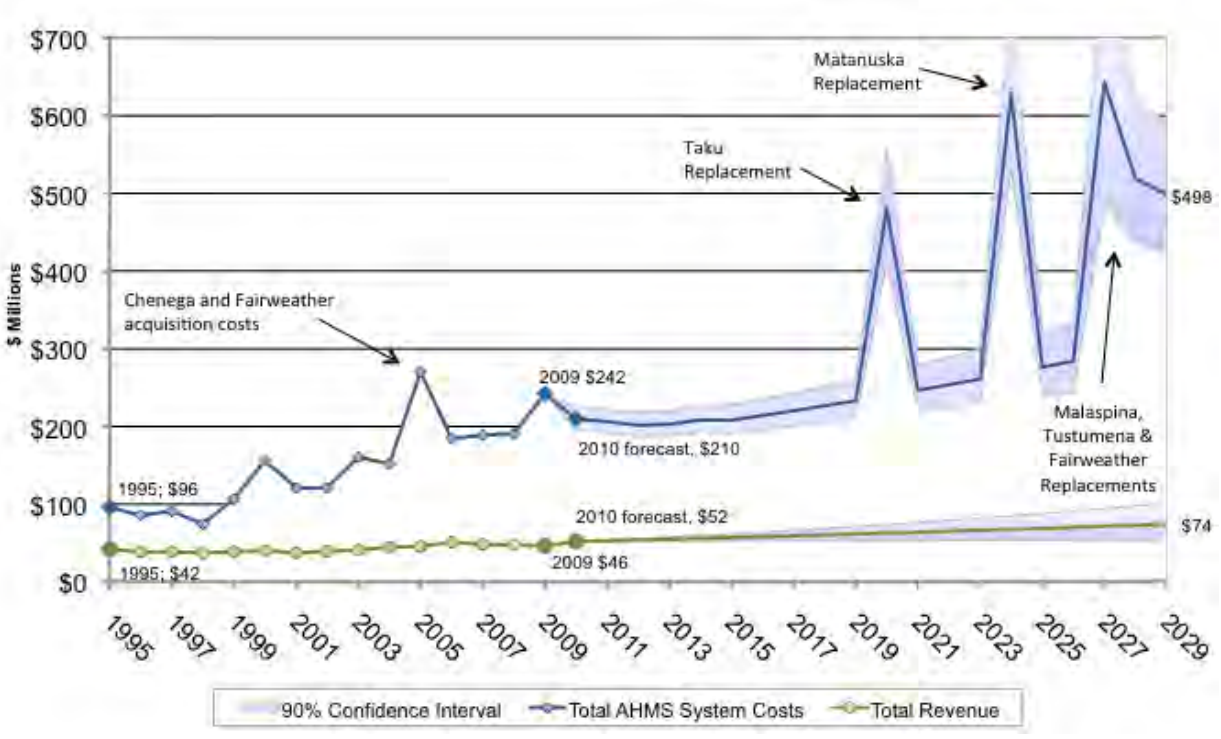
b. <u>Revenue as a % of the Total System Cost</u> 24.7%

c. <u>Annual financial assistance required for the total system</u> $ 206.7M
This figure is the average annual subsidy required to support all aspects of the AMHS as a system. It considers all revenues, and all operating and capital costs, regardless of funding source (i.e., it includes all funding received from Federal sources).

d. <u>Annual financial assistance required to sustain operations</u> $ 98.5M
This figure is the average annual subsidy required simply to support AMHS' Marine Vessel Operations. It excludes all capital expenditures (regardless of funding source) and all direct and indirect overheads.

Figure 8.2 highlights the overall AMHS 'Status Quo' financial forecast. This "total system" graph considers all capital, operating and maintenance costs.

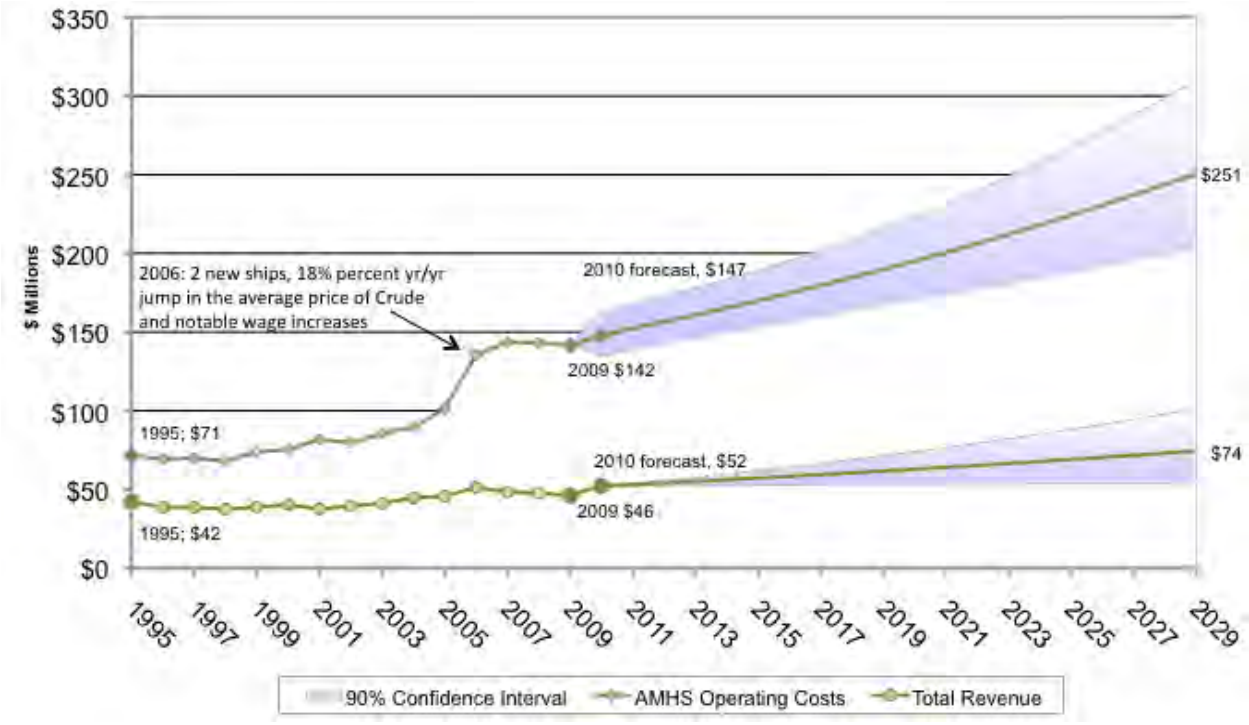
Figure 8.2
Option 1A: AMHS Historic and Project Total Revenue vs. Total System Cost



The capital investment in the FVFs accounts for the spike in 2003-04 while the growth in required investment beginning in 2010 is attributed mainly to the repowering of Columbia, Aurora and, in this option, Malaspina. Replacement of Taku (2020), Matanuska (2024), and Malaspina and Tustumena (2027) create a significant demand for capital. The bands of uncertainty in the forward-looking 20-year period reflect the combined impact of all of the model variables.

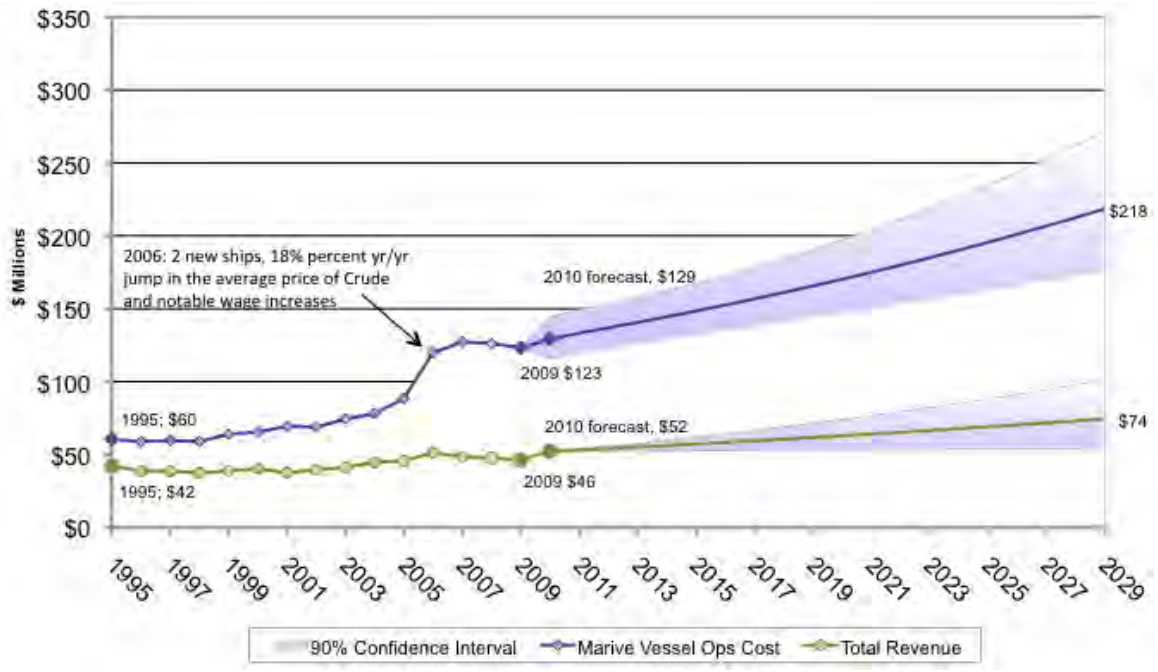
Figure 8.3 excludes capital expenditures and presents the AMHS revenues and operating costs. These are the annual costs and revenues associated with the annual operating plan. The extent to which the expense-revenue gap is anticipated to widen over the study period is evident – the total State annual investment (to sustain AMHS operations) is projected to rise from approximately $95 million in 2010 to $177 million in 2029.

Figure 8.3
Option 1A: AMHS Historic and Projected Total Revenue vs. Total Operating Costs



All capital, direct and indirect overhead costs are excluded from consideration in the following graph, Figure 8.4, which therefore presents only Marine Vessel Operations costs and operating expenses related to overhauls. The rise in labor costs from 2004 through 2007 (associated with the introduction of the FVFs and the higher-than-CPI wage increases) and the impact of fuel price changes accounts for the significant lift in operating expenses. The analysis projects an ever-widening of the cost-revenue gap until, in 2029, an operating subsidy of $144.1 million will be needed simply to bridge the gap between the cost of vessel operations ($218.5 million) and projected revenues ($74.4 million).

Figure 8.4
Option 1A: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Excluding major capital expenditures, regardless of funding source, Table 8.6 presents the best, the worst and the expected cases of AMHS operating costs, revenues and State subsidy in 2019 and again in 2029, the end of the period of this analysis.

Table 8.6
Option 1A –Potential Ranges of AMHS Operating Subsidy – 2019 and 2029

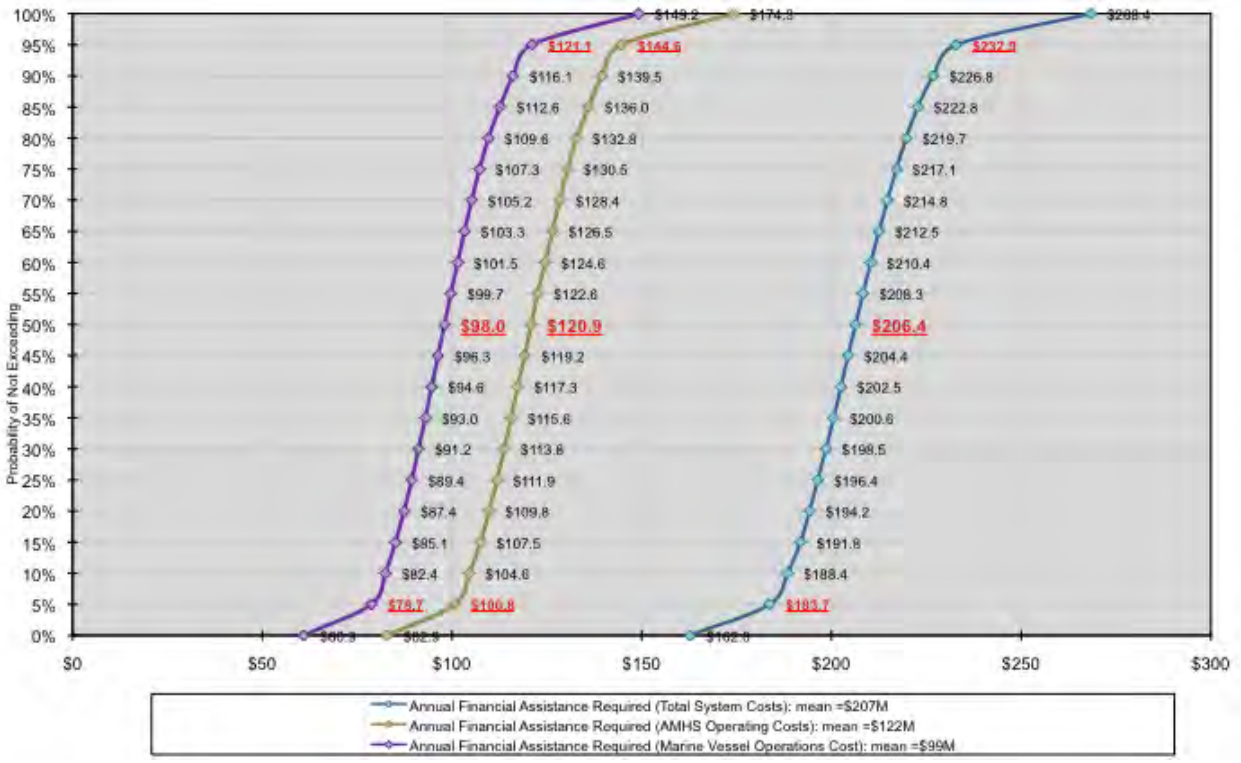
		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 71.3	$ 61.7	$ 53.2
Operating Costs (millions)				
Low	$ 167.3	$ 96.0	$ 105.6	$ 114.1
Median	$ 189.7	$ 118.4	$ 128.0	$ 136.5
High	$ 216.0	$ 144.7	$ 154.3	$ 162.8

		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 101.4	$ 74.4	$ 54.3
Operating Costs (millions)				
Low	$ 203.3	$ 101.9	$ 128.9	$ 149.0
Median	$ 250.6	$ 149.2	$ 176.2	$ 196.3
High	$ 310.1	$ 208.7	$ 235.7	$ 255.8

In the very best case, the AMHS operating subsidy is projected to rise from $96.0 million (2019) to $101.9 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could be as high as $255.8 million. The median projections are that maintenance of the Status Quo would require an AMHS operating subsidy of $128.0 million in 2019 rising to $176.2 million in 2029.

Finally, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 8.5.

Figure 8.5
Option 1A: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $206.4 million
- AMHS Operations – $120.9 million
- Marine Vessel Operations – $98.0 million

8.5.1 Option 1A Community Impacts

The Status Quo scenario represents service approved for implementation in FY 2009. This service is not identical to – and for some communities is slightly less than – service levels in recent years. In general, however, the Status Quo scenario would not generate significant economic or socioeconomic changes from the current status of the communities served by AMHS.

8.5.2 Option 1A Summary

When assessing service options, it is important to look closely at the current service model, particularly in the Alaska environment where many of the port communities are in a relatively steady state. The Status Quo provides a basis on which to judge the other options.

The Status Quo is also a legitimate option in its own right. This service design was achieved after due process involving the consideration of other options and extensive experience serving the current port communities. It provides a balance between service quality and subsidy, as compared to the previous service plan. Stakeholders and decision makers understand the level of mobility, benefits and disbenefits of the service design and the financial modeling provides the information to assess whether this service is affordable in the mid-to-long term (10 years).

8.6 Option 1B - Status Quo with Malaspina Replacement

This option utilizes the 2008/09 service program until 2014, at which time Malaspina is retired, decommissioned and replaced by an Alaska-Class ferry. As in the 'Status Quo" option the Columbia and the Aurora are repowered early in the period under analysis.

From a service delivery perspective, this option is the same as the 'Status Quo' Service Plan described in Option 1A until 2014 when the Alaska-Class Ferry and the remaining AMHS vessels are deployed to provide the levels of service shown in Table 8.7:

Table 8.7
Option 1B – Operating Weeks (2014-2029)

Sector and Operating Weeks	Status Quo (1A)	Option 1B
Mainline Vessels	168	160
Feeder Vessels	151	170
Southwest Vessels	95	95
Total	414	425

Table 8.8 presents the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements. These PVs represent the total expenditure (or total revenue) for the twenty-year period, expressed in today's dollars. Notably, the PV of the Total AMHS as a system is approximately $50 million higher than that in Option 1A, partly as a result of the capital investment made in the new ship (the PV of capital is $19 million higher) and partly due to the increased operating costs associated with the higher tempo operations (PV of Marine Vessel Operations Costs is $31.6 million greater).

Table 8.8
Option 1B – Present Value and Annual Equivalent Values

		Option 1B: Status Quo (Replace Malaspina) (millions)
Present Value of Total AMHS System Costs	**$**	**2,461.5**
PV of Capital:	$	590.0
PV of Major Overhaul Costs (Terminals):	$	29.4
PV of Marine Vessel Operations Costs:	$	1,613.7
PV of Shoreside Costs:	$	200.4
PV of Admin Costs:	$	28.0
PV of AMHS Operating Costs	$	1,842.1
Present Value of Revenues	**$**	**593.2**
PV of Subsidy (Net Present Value =PV Revenue - PV Costs):	**($**	**1,868.3)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$**	**59.2**
Annual Equivalent Cost (Total System Costs):	$	245.8
Annual Equivalent Cost (AMHS Operating Costs):	$	184.0
Annual Equivalent Cost (Marine Vessel Operations Costs):	$	161.2
Revenue as a % of Costs (Total System Costs):		24.7 %
Revenue as a % of Costs (AMHS Operating Costs):		32.2 %
Revenue as a % of Costs (Marine Vessel Operations Costs):		36.8 %
Annual Financial Assistance Required (Total System Costs)	$	207.2
Annual Financial Assistance Required (AMHS Operations Costs)	$	124.7
Annual Financial Assistance Required (Marine Vessel Ops Costs)	$	101.9

Changes in the four key model outputs (from the baseline Option 1A) follow:

a.	PV of Subsidy (PV Total Costs less PV Revenues) The PV of the subsidy increases by $52.9 million over option 1A. This increase is attributed to the capital expenditure associated with the Malaspina replacement and the increased service weeks required of the remaining mainliner vessels offset by an anticipated increase in revenue, particularly from the feeder routes. Although additional revenue may accrue from increased mainliner service, it is evident that the direct replacement of Malaspina does not improve the AMHS' financial position. However, it is also clear that a notable investment must be made to either replace or extend the life of this ship – the decision is based on the need to maintain reliability and the social and economic benefits of the service rather than cost containment.	($ 1,868.3 M)
b.	Revenue as a % of the Total System Cost The model suggests a 0.6% reduction in this metric over Option 1A. This option has a slightly higher PV of AMHS Operating Expenses ($1,842 million versus $1,810 million) plus a marginal decline in the PV of revenues ($593 million versus $596 million).	24.7%
c.	Annual financial assistance required for the total system It might be argued that the $0.5 M average annual increase in the state's annual contribution to the AMHS can and should be attributed wholly to the capital investment made in the new ship. However, the next model output suggests otherwise.	$ 207.2 M
d.	Annual financial assistance required to sustain operations The increased operating schedule, concentrated on the feeder routes, actually yields a slight decrease ($253K) in annual equivalent revenue while the cost of operations continues to rise. As a result, the average annual subsidy needed to sustain operations increases by $3.4 M.	$ 101.9 M

Figure 8.6 includes the additional capital cost of replacing Malaspina with an Alaska-Class ferry in 2014. The acquisition cost for this vessel together with the increased operating tempo of Columbia and Kennicott (as these ships take up the ex-Malaspina roles that cannot be met by the Alaska-Class ferry) result in a slightly higher demand for financial support over the Status Quo – $1.9 million in 2019 and $2.8 million in 2029. On a Total System Cost basis, there is very little difference between this option and the Status Quo.

Figure 8.6
Option 1B: AMHS Historic and Projected Total Revenue vs. Total System Cost

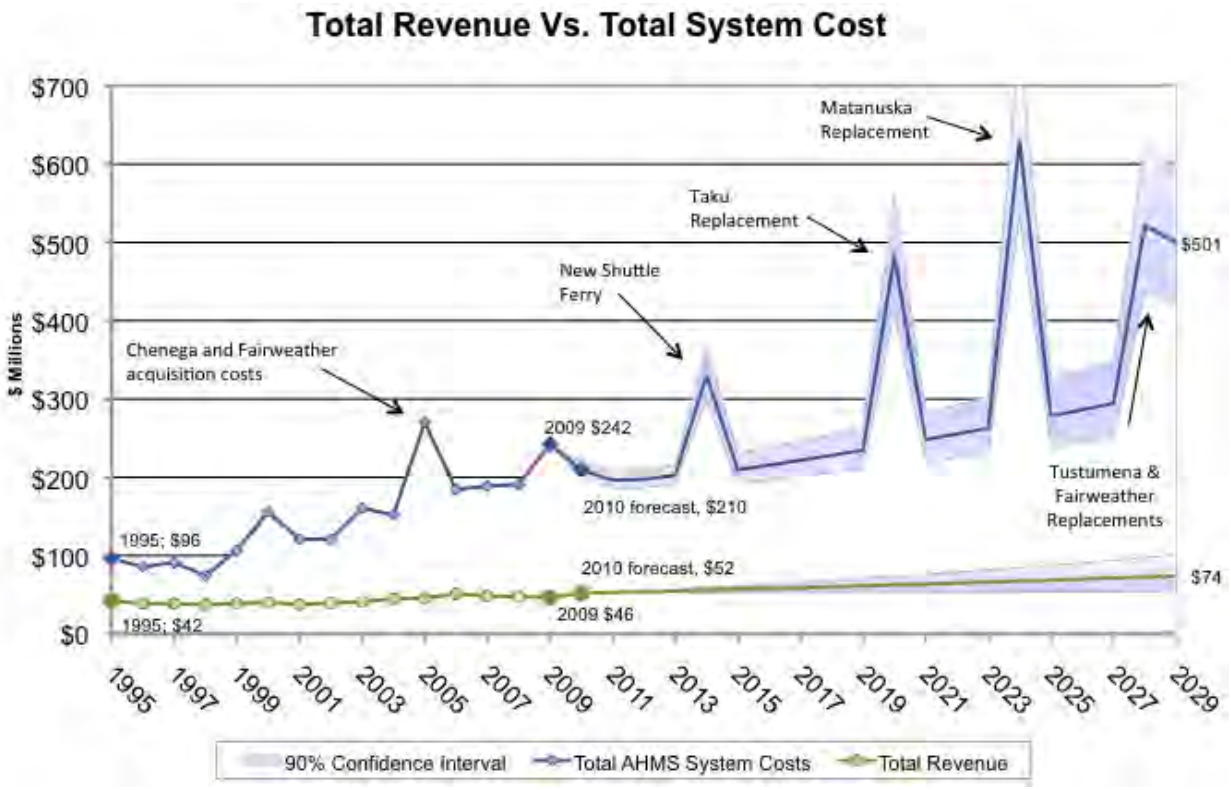
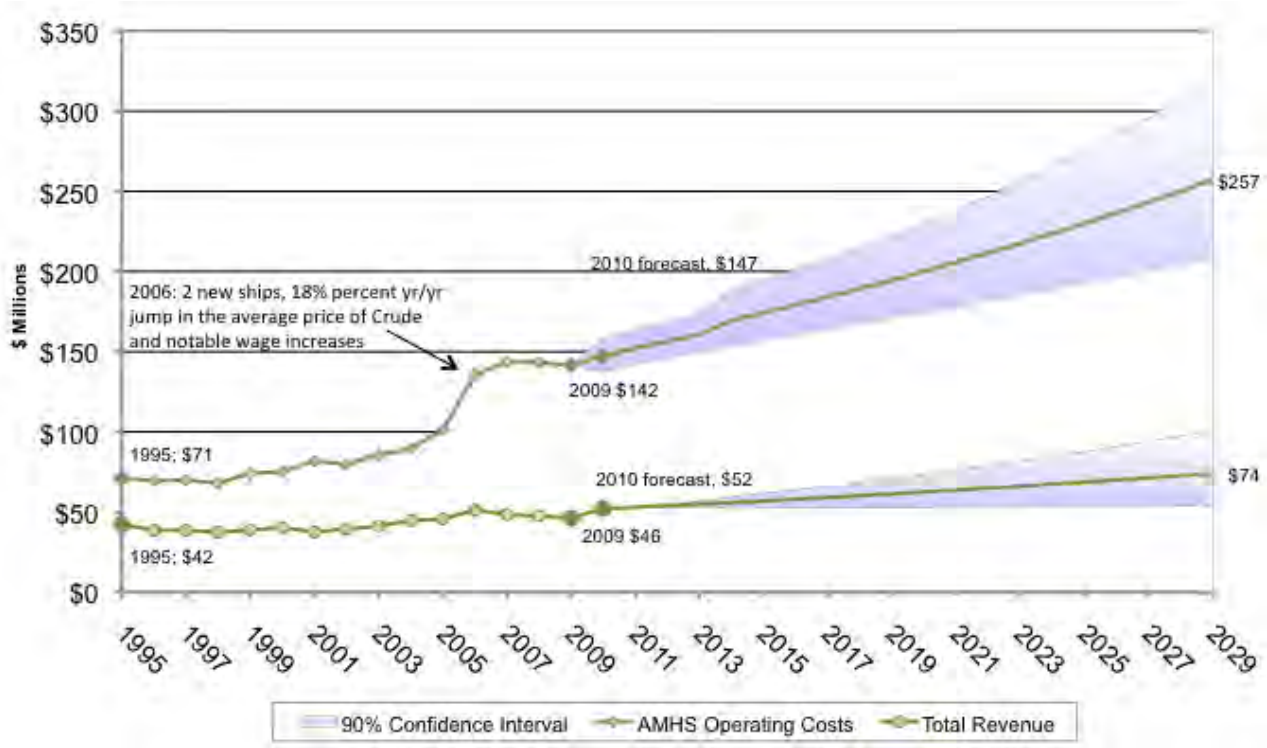


Figure 8.7 excludes capital expenditures and presents the AMHS revenues and operating costs. These are the annual costs and revenues associated with the annual operating plan. The step increase in the expense line commencing in 2014 results from the increased operational activity that must be taken up by Columbia and Kennicott even as Malaspina is replaced by an Alaska-Class ferry with its lower operating costs. The extent to which the expense-revenue gap is anticipated to widen over the study period is evident – the total State annual investment (to sustain AMHS operations) is projected to rise from approximately $95.1 million in 2010 to $133.2 million in 2019 and $183.2 million in 2029.

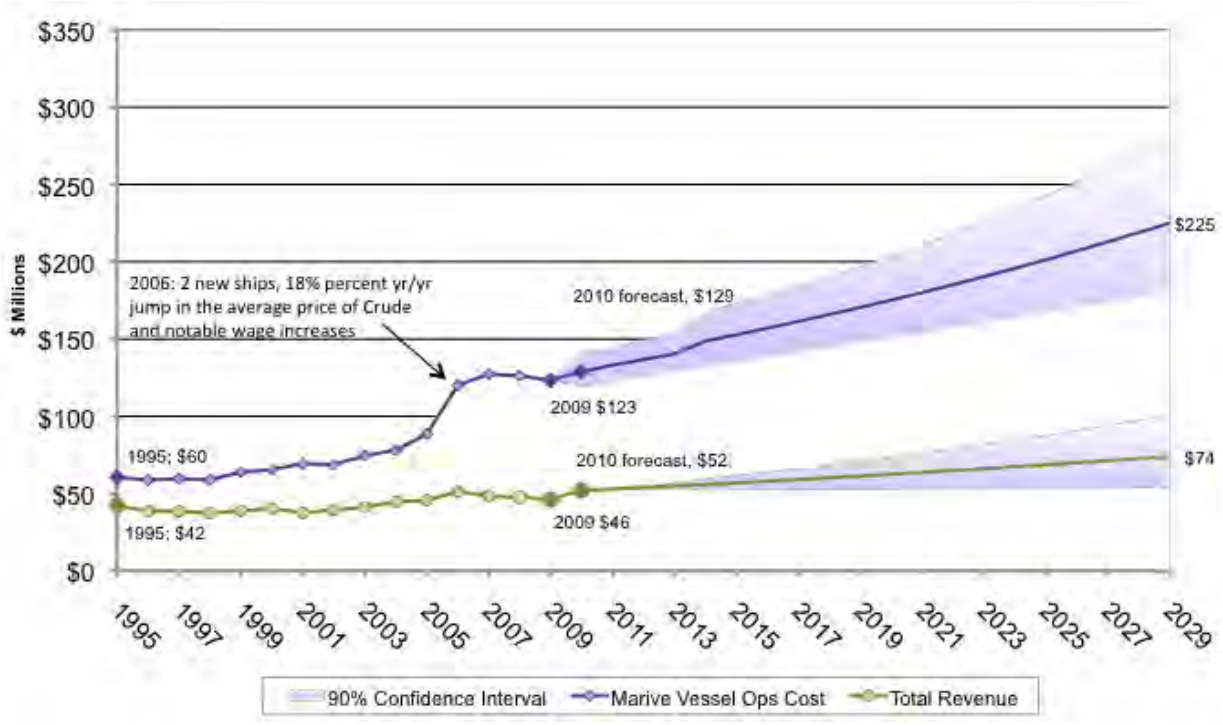
Figure 8.7
Option 1B: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



All capital, direct and indirect overhead costs are excluded from consideration in the following graph, Figure 8.8, which therefore presents only Marine Vessel Operations costs and operating expenses related to overhauls. The rise in labor costs from 2004 through 2007 (associated with the introduction of the FVFs and the higher-than-CPI wage increases) and the impact of fuel price changes accounts for the significant lift in operating expenses. The increased operating tempo required of Columbia and Kennicott, without similar revenue growth, is responsible for the step increase in operating costs in 2014.

The analysis projects a slight widening of the cost-revenue gap over the Status Quo Option 1A. In 2019, an operating subsidy of $109.1 million will be needed simply to bridge the gap between the cost of Marine Vessel Operations ($170.4 million) and projected revenues ($61.3 million). In 2029, this gap is projected to increase to $151.0 million, approximately $6.9 million high than that of the Status Quo.

Figure 8.8
Option 1B: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Excluding major capital expenditures, regardless of funding source, Table 8.9 presents the best, the worst and the expected cases of AMHS costs, revenues and State subsidy in 2019 and again in 2029, the end of the period of this analysis.

Table 8.9
Option 1B – Potential Ranges of Operating Subsidy – 2019 and 2029

		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 71.0	$ 61.3	$ 52.9
Operating Costs (millions)				
Low	**$ 171.1**	$ 100.1	$ 109.8	$ 118.2
Median	**$ 194.5**	$ 123.5	$ 133.2	$ 141.6
High	**$ 222.1**	$ 151.1	$ 160.8	$ 169.2

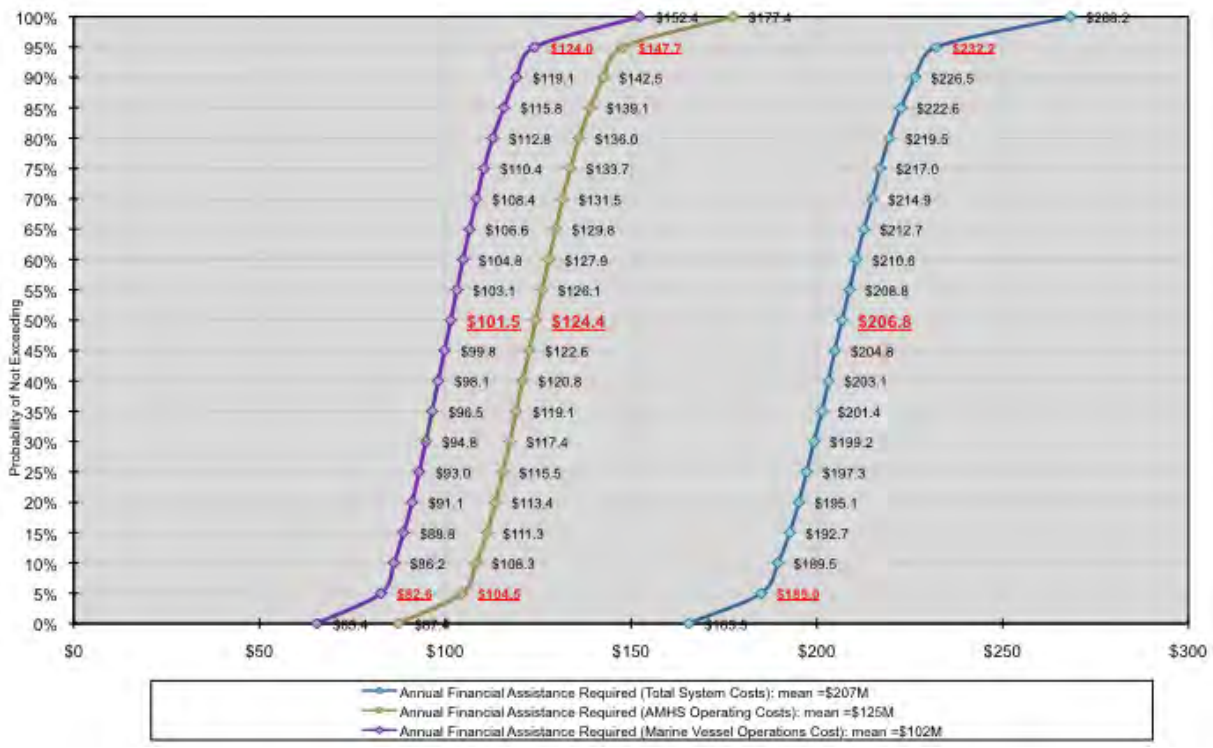
		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 100.7	$ 74.0	$ 54.0
Operating Costs (millions)				
Low	**$ 208.1**	$ 107.4	$ 134.1	$ 154.1
Median	**$ 257.2**	$ 156.5	$ 183.2	$ 203.2
High	**$ 310.1**	$ 209.4	$ 236.1	$ 256.1

In the very best case, the AMHS operating subsidy is projected to rise from $100.1 million (2019) to $107.4 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could be as high as $256.1million. The median projections are that maintenance of the Status Quo would require an

AMHS operating subsidy of $133.2 million in 2019 rising to $183.2 million in 2029. These latter values are, respectively, $5.2 million and $7.1 million higher that those of Option 1A, Status Quo.

Finally, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 9.

Figure 8.9
Option 1B: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $206.8 million ($0.4 million higher than the Status Quo)
- AMHS Operations – $124.4 million (3.5 million higher than the Status Quo)
- Marine Vessel Operations – $101.5 million (3.5 million higher than the Status Quo).

8.6.1 Option 1B Summary

In summary, Option 1B replaces Malaspina with a new Alaska-Class ferry in 2014 and operates a service similar to the Status Quo, given the vessel mix. The capital cost of the Alaska-Class ferry ($120 million) has a $50 million impact on the PV of the total AMHS system costs. However, the $31.6 million increase in the PV of Marine Vessel Operations costs results from the increased use of Columbia and Kennicott. Their higher labor and fuel costs exceed the quantum of the labor savings that are anticipated with the new ferry. Replacement of Malaspina by an

Alaska-Class ferry must be based on the need for reliable service and the continuation of a service program at or above current levels, rather than on cost savings.

8.7 SERVICE REDUCTION OPTIONS

The AMHS business paradigm relies on annual subsidies approximating 70% of total expenditures. Therefore, lowering expenditures, rather than increasing revenue, is the primary tool to reduce the State subsidy. To make a material reduction in subsidy, it is necessary to reduce the number of ships and the number of crews. Option 2A retires and disposes of Malaspina while Option 2B retires Kennicott. The remaining ships in the AMHS fleet are redeployed to balance the impact of the service reduction as equally as possible, given the operating characteristics of the remaining vessels. It is anticipated that the personnel reduction will be absorbed through attrition and overtime reduction. To this end, the financial model phases in personnel reductions over three to four years.

Retirement of Malaspina in Option 2A and the retirement of Kennicott in Option 2B are modeled from the outset of FY2009/10.

8.7.1 OPTION 2A – SERVICE REDUCTION – RETIRE MALASPINA

Malaspina is among the oldest ships in the fleet, is due for engine repowering and other life-extension improvements. In this option the remaining AMHS vessels would be deployed to provide the levels of service shown in Table 8.10:

Table 8.10
Option 2A – Operating Weeks

Sector and Operating Weeks	Status Quo (1A)	Option 2A
Mainline Vessels	168	142
Feeder Vessels	151	151
Southwest Vessels	95	95
Total	414	388

The option reduces service by 26 operating weeks or 6% from Option 1A, Status Quo. The reduction would occur entirely in the Southeast. The remaining ships normally deployed in this sector would be reassigned to balance the impact among the communities. Service to/from Petersburg, Sitka and Skagway would be reduced by 10-14%. The most significant impact would be felt at Haines where port calls would be reduced by 30%, from 594 to 413. Day boat services to interconnect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route would remain unaffected.

Table 8.11 presents the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements.

Table 8.11
Option 2A – Present Value and Annual Equivalent Values

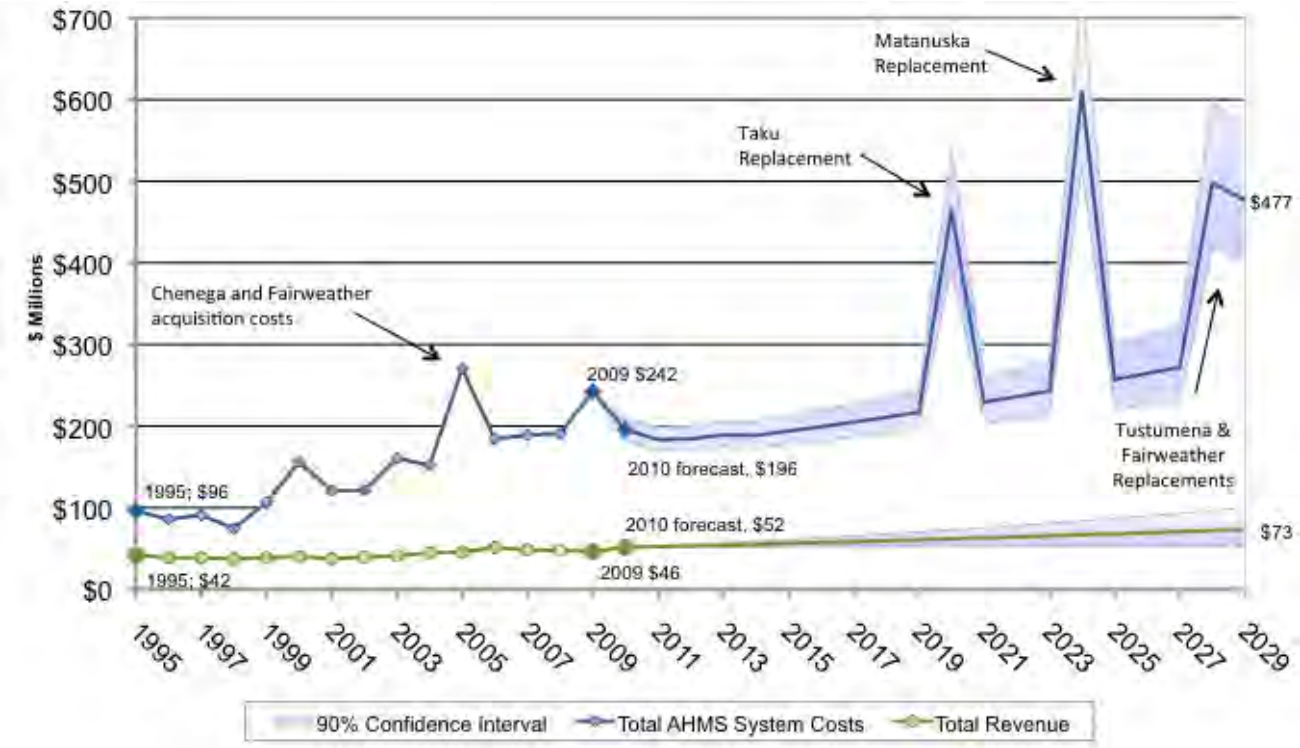
	Option 2A: Service Reduction (No Malaspina) (millions)
Present Value of Total AMHS System Costs	**$ 2,224.5**
PV of Capital:	$ 501.7
PV of Major Overhaul Costs (Terminals):	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,482.4
PV of Shoreside Costs:	$ 182.9
PV of Admin Costs:	$ 28.0
PV of AMHS Operating Costs	$ 1,693.3
Present Value of Revenues	**$ 587.0**
PV of Subsidy (Net Present Value = PV Revenue – PV Costs):	**($ 1,637.5)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$ 58.6**
Annual Equivalent Cost (Total System Costs):	**$ 222.2**
Annual Equivalent Cost (AMHS Operating Costs):	**$ 169.1**
Annual Equivalent Cost (Marine Vessel Operations Costs):	**$ 148.1**
Revenue as a % of Costs (Total System Costs):	**26.4 %**
Revenue as a % of Costs (AMHS Operating Costs):	**34.7 %**
Revenue as a % of Costs (Marine Vessel Operations Costs):	**39.6 %**
Annual Financial Assistance Required (Total System Costs)	**$ 182.2**
Annual Financial Assistance Required (AMHS Operating Costs)	**$ 110.5**
Annual Financial Assistance Required (Marine Vessel Ops Costs)	**$ 89.4**

Changes in the four key model outputs (from the baseline Option 1A) follow:

a.	PV of Subsidy (Net Present Value) The PV of the subsidy is $177.9 million lower than in the Status Quo. Vessel operating, indirect and shore side costs are all reduced, despite the fuller utilization of the remaining mainliners. The improvement in NPV (or PV of the subsidy) is achieved even as the PV of revenue decreases by $8.8 million from Option 1A, given the substantial ($117.2 million) reduction in the PV of AMHS operating costs.	($ 1,637.5 M)
b.	Revenue as a % of total AMHS System costs This 1.7% improvement (over the Status Quo value of 24.7%) reflects a slight loss in revenue, as service is decreased, offset by a much more significant reduction in operating costs.	26.4%
c.	Annual financial assistance required for the total system The average annual subsidy for all capital and operating requirements is reduced by $24.5 million from the Status Quo described in Option 1A. Capital costs are not incurred for either the replacement or the life-extension of the Malaspina, direct and indirect operating costs are reduced and the existing market and revenues are substantially retained.	$ 182.2 M
d.	Annual financial assistance required to sustain operations It is recognized that the total system subsidy includes flow-through Federal funding. However, for the reasons noted in (c) above, the average annual subsidy required to support Marine Vessel operations is reduced from the status quo by approximately $9.1 million.	$ 89.4 M

The graph in Figure 8.10 highlights the total financial environment in the Service Reduction Option 2A. Again, this total system graph considers all capital, operating and maintenance costs, regardless of the funding source.

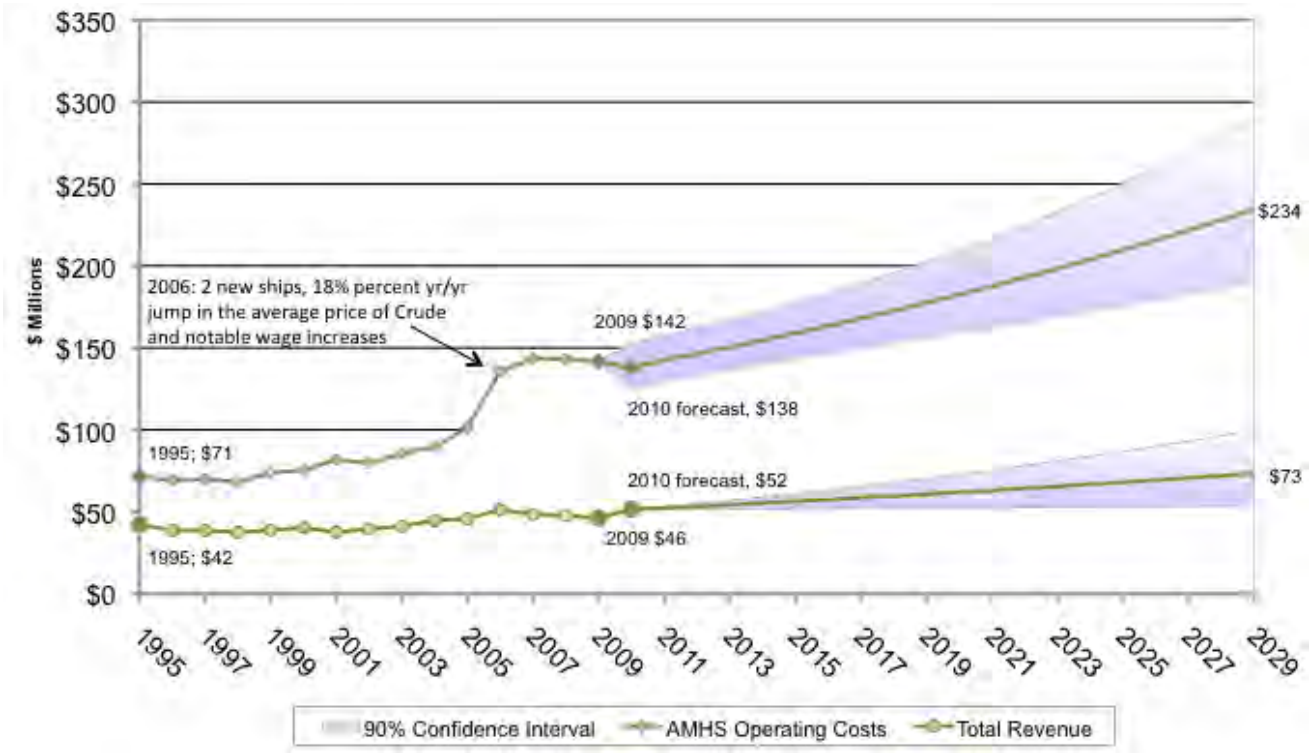
Figure 8.10
Option 2A: AMHS Historic and Projected Total Revenue vs. Total Systems Cost



The capital investment in the FVFs accounts for the spike in 2003-04 while the slight growth in required investment beginning in 2010 is attributed to the repowering of Columbia and Aurora. Given that Malaspina would be retired immediately and without replacement, the third major spike (the capital investment in the previous option for an Alaska-Class ferry in 2014) is avoided.

Figure 8.11 excludes capital expenditures and presents the AMHS revenues and operating costs. Although operating cost growth continues to outpace that of revenue, there is an immediate-to-near term reduction in the overall subsidy. The reduction results from the elimination of all of Malaspina's operating costs – savings that are realized over 1-3 years. The total State annual investment (to sustain AMHS operations) is projected to rise from approximately $86 million in 2010 to $116.6 million in 2019 and $161.1 million in 2029.

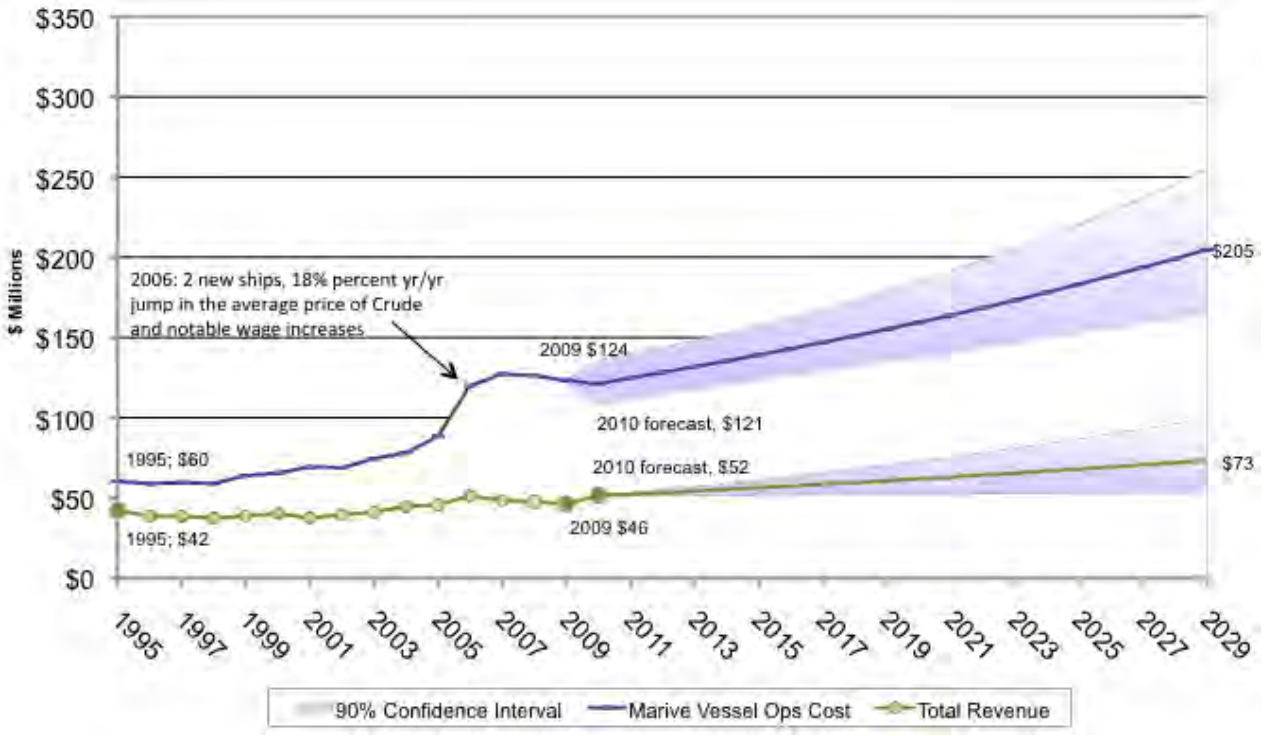
Figure 8.11
Option 2A: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



All capital, direct and indirect overhead costs are excluded from consideration in the following graph, Figure 8.12, which therefore presents only Marine Vessel Operations costs and operating expenses related to overhauls. This representation again depicts the rise in labor costs from 2004 through 2007 (associated with the introduction of the FVFs and the higher-than-CPI wage increases) and the impact of fuel price changes, all of which combine to produce the significant lift in operating expenses. However, the forward-looking portion depicts the expected reduction in the cost-revenue gap and, therefore, the required financial support.

In 2019, an operating subsidy of $94.3 million would be needed simply to bridge the gap between the cost of Marine Vessel Operations ($155.1 million) and projected revenues ($60.8 million). In 2029, this gap is projected to increase to $131.4 million, approximately $12.7 million lower than that of the Status Quo.

Figure 8.12
Option 2A: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Excluding major capital expenditures, regardless of funding source, Table 8.12 presents the best, the worst and the expected cases of AMHS costs, revenues and State subsidy in 2019 and again in 2029, the end of the period of this analysis.

Table 8.12
Option 2A – Potential Ranges of Operating Subsidy – 2019 and 2029

		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 70.3	$ 60.8	$ 52.4
Operating Costs (millions)				
Low	**$ 156.1**	$ 85.8	$ 95.3	$ 103.7
Median	**$ 177.4**	$ 107.1	$ 116.6	$ 125.0
High	**$ 202.1**	$ 131.8	$ 141.3	$ 149.7

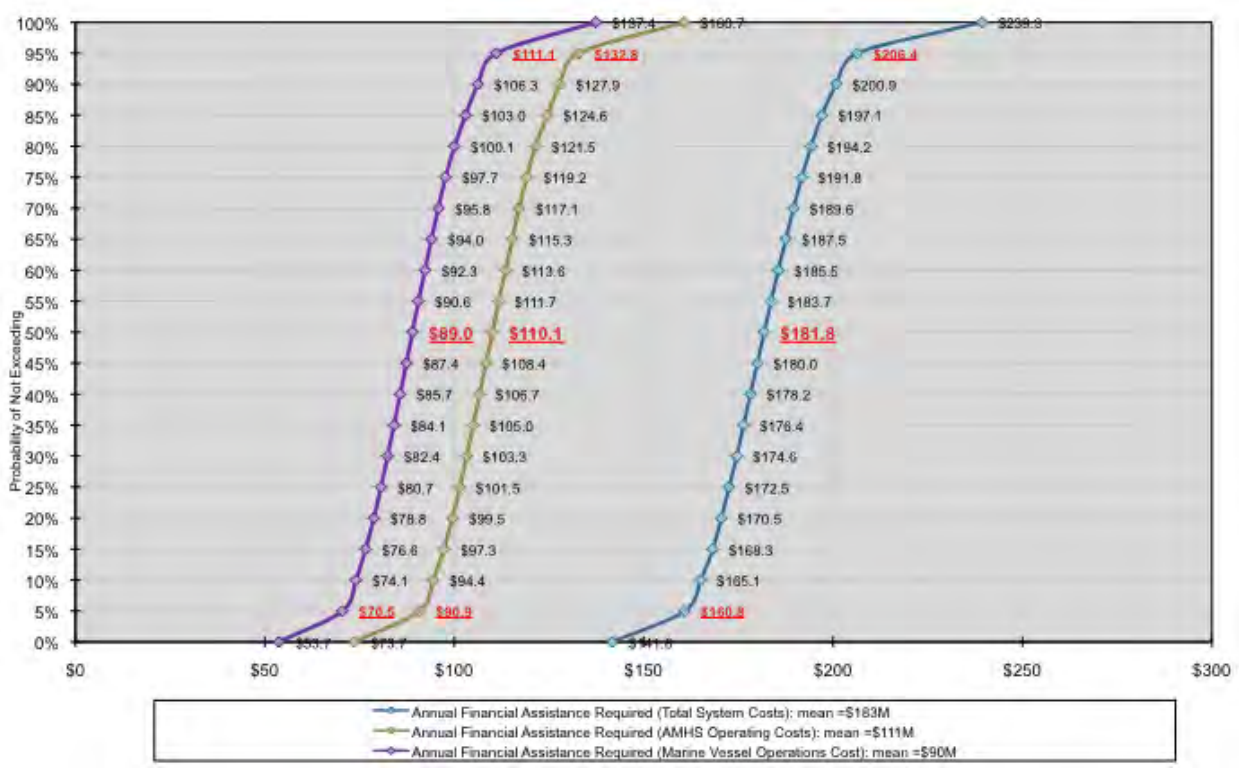
		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 99.8	$ 73.3	$ 53.6
Operating Costs (millions)				
Low	**$ 189.9**	$ 90.1	$ 116.6	$ 136.3
Median	**$ 234.4**	$ 134.6	$ 161.1	$ 180.8
High	**$ 290.4**	$ 190.6	$ 217.1	$ 236.8

In the very best case, the AMHS operating subsidy is projected to rise from $85.8 million (2019) to $90.1 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could be as high as $236.8 million. The median projections are that this Service Reduction Option (retire Malaspina) would

require an AMHS operating subsidy of $116.6 million in 2019 rising to $161.1 million in 2029. These latter values are, respectively, $11.4 million and $15.1 million lower that those of Option 1A, Status Quo.

Finally, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 8.13.

Figure 8.13
Option 2A: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $181.8 million ($24.6 million lower than the Status Quo)
- AMHS Operations – $110.1 million (10.8 million lower than the Status Quo)
- Marine Vessel Operations – $89.0 million (9.0 million lower than the Status Quo).

8.7.2 Option 2A Community Impacts

Under the assumptions currently used for this analysis, retirement of Malaspina would generate the most significant community impacts in Haines, where service would decline by approximately 30% (from 594 port calls to 413). Other communities would also see service reductions, including Petersburg, Sitka and Skagway, where service would be reduced by 10-14%. Cross-Gulf service would be reduced by 8% overall and, with respect to stops in Yakutat, by 17% (from 36 to 30 port calls).

Haines and Skagway are northern termini of AMHS's Inside Passage service, providing connections between Southeast Alaska and the Alaska/Canada highway system. Both communities receive barge service and have small airports with scheduled service by small planes. The other communities mentioned, Petersburg, Sitka and Yakutat, all have jet service at least once per day, as well as scheduled and charter air services and scheduled barge service. (Barge service to Yakutat is seasonal only.) None of the three latter communities has surface connections to continental road networks.

Ferry travel by residents of Haines and Skagway is mainly to Juneau for shopping, business, medical care, school and cultural events, access to a regional airport, and other household needs. The majority of passengers embarking and disembarking in both communities are leisure travelers, however. Leisure travelers may be Alaska residents or non-residents arriving by road from other Alaska regions (via Canada) or they may be visitors coming from Bellingham, Prince Rupert or other Southeast Alaska communities. In either case, the amount of leisure travel, especially through Haines, is sensitive to the amount of service. This is in part because of vessel capacity, but also because the schedule of voyages largely determines how much time visitors spend in the community. When ferry schedules are not amenable, travelers moving from or to the Lower 48 and British Columbia have the option of driving the ALCAN Highway. Vacationers moving between Southeast Alaska and the northern parts of the state can take advantage of regular jet service.

A large reduction in ferry service would have a significant impact on Haines. While Skagway benefits from a large number of cruise ship visitors, Haines, with a population of 2,300 is more dependent on visitor spending associated with ferry passengers. In 2008, 34,214 passengers and 12,567 vehicles disembarked in Haines. Similar numbers of passengers and vehicles boarded ferries in Haines in 2008. Though Haines ferry traffic has been trending up over the last several years, total passenger volume is still well below peak years in the 1990s when annual passenger disembarkations were as high as 45,000.

Though not possible to quantify within the scope of this study, a 30% reduction in AMHS service would result in reduced visitor spending in Haines, with associated employment and income effects. Impacts of the reduction could be mitigated to a degree with scheduling modifications (for example, by ensuring service during special events). Nevertheless, some reduction in overall passenger and vehicle traffic to Haines would be expected under Scenario 2 with retirement of Malaspina.

Travel from Haines to Juneau for shopping, business, and other purposes would also be somewhat constrained by reduced ferry service. Whether the constraint would lie mainly in fewer convenient travel opportunities, or whether it would also mean inadequate space to accommodate passenger, vehicle and freight demand, depends on the capacity of the vessel(s) used to provide the residual service.

Past research has shown that, in addition to the leisure travelers described above, Haines non-resident passengers include people relocating to or from Southcentral and/or Interior Alaska, especially military personnel, regional residents traveling to Haines and the Yukon for weekend getaways, and regional residents traveling to Haines for special events (notably, the Alcan 200 International Snow Machine Race, the Great Alaska Craftbeer and Homebrew Festival, the Kluane to Chilkat Bike Relay, and the Southeast Alaska State Fair and Bald Eagle Music Festival, among others.) The Haines Tourism Management Plan (2002) ranks as a highest priority aggressively pursuing frequent, convenient ferry service in Lynn Canal.

Finally, it may be noted that changes in ferry service affect the many Alaska businesses that depend on the AMHS for shipments of freight, equipment, parts, etc. These impacts are impossible to predict with specificity, however.

8.7.3 Option 2A Summary

This service reduction option – retirement of Malaspina without replacement – offers improved financial performance over the Status Quo. The savings realized when this major vessel is removed from service more than offset the increased operating costs incurred when the remaining mainliners are operated at a higher tempo.

If the community impact is deemed acceptable or, indeed, if the service level reductions to Haines, Petersburg, Sitka, Skagway, and Yakutat, can be offset by other transportation providers, this Reduction Option provides a means to reduce the ongoing level of State subsidy.

8.7.4 Option 2B – Service Reduction – Retire Kennicott

Kennicott is relatively new and is one of AMHS' largest vessels. It requires a large crew complement, has high fuel consumption, does not easily lend itself to replacement ship duties on routes where tidal and vessel size constrain her utility, and has a proportionately low payload of Alaska-standard vehicles. However, Kennicott is designed for open-ocean operations and is one of two vessels certified for cross-Gulf service. It also serves as the back-up vessel on mainline routes. Disposal of Kennicott largely curtails Cross-Gulf service.

Under this option, the remaining AMHS vessels are deployed to provide the levels of service shown in Table 8.13:

Table 8.13
Option 2B – Operating Weeks

Sector and Operating Weeks	Status Quo (1A)	Option 2B
Mainline Vessels	168	132
Feeder Vessels	151	151
Southwest Vessels	95	95
Total	414	378

Table 8.14 presents the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements.

Table 8.14
Option 2B – Present Value and Annual Equivalent Values

	Option 2A: Service Reduction (No Kennicott) (millions)
Present Value of Total AMHS System Costs	**$ 2,166.2**
PV of Capital:	$ 525.1
PV of Major Overhaul Costs (Terminals):	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,400.0
PV of Shoreside Costs:	$ 183.6
PV of Admin Costs:	$ 28.0
PV of AMHS Operating Costs	$ 1,611.7
Present Value of Revenues	**$ 558.8**
PV of Subsidy (Net Present Value = PV Revenue – PV Costs):	**($ 1,607.4)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$ 55.8**
Annual Equivalent Cost (Total System Costs):	**$ 216.4**
Annual Equivalent Cost (AMHS Operating Costs):	**$ 161.0**
Annual Equivalent Cost (Marine Vessel Operations Costs):	**$ 139.8**
Revenue as a % of Costs (Total System Costs):	**25.8 %**
Revenue as a % of Costs (AMHS Operating Costs):	**34.7 %**
Revenue as a % of Costs (Marine Vessel Operations Costs):	**39.9 %**
Annual Financial Assistance Required (Total System Costs)	**$ 186.0**
Annual Financial Assistance Required (AMHS Operating Costs)	**$ 105.2**
Annual Financial Assistance Required (Marine Vessel Ops Costs)	**$ 84.0**

Changes in the four key model outputs (from the Status Quo Option 1A and the preceding Service Reduction Option 2A) follow:

a.	PV of Subsidy (Net Present Value) When compared to the Status Quo, this Option offers a $208.0 million improvement in AMHS overall financial position for the period to 2029. As with Option 2A, the elimination of AMHS' highest operating cost asset, together with the associated reductions in service, indirect and shore side costs results in a total PV cost improvement of $245.0million offset by a $36.9 million reduction in the PV of revenues. The latter impact is attributable to the elimination of the Cross-Gulf service. This result again underscores the financial benefit of eliminating expensive assets and more fully utilizing the remaining assets. It is also important to note that the PV of capital ($525 million) is $23.4 million higher than in Option 2A. This is due to the need to replace Malaspina in the 18th year of this analysis.	($1,607.4M)
b.	Revenue as a % of total AMHS costs This result is a 0.9% improvement from the Status Quo (at 24.7%) but a 0.6% reduction from Option 2A (Malaspina retirement). The significant improvement in the PV of total system costs is offset by the lost of Cross-Gulf revenue.	25.8%
c.	Annual financial assistance required for the total system The average annual State subsidy for capital and operating activities is reduced by $20.7 million from the Status Quo Option 1A. While there is some loss of revenue, these reductions accrue almost completely from reduced operations. Option 2B is $3.8 million higher than that of Option 2A due to the need to replace Malaspina in year 18. The impact on operating subsidy from Kennicott's disposal is seen in the average annual subsidy required for either the AMHS or Marine Vessel Operations.	$ 186.0 M
d.	Annual financial assistance required to sustain operations It is recognized that the total system subsidy includes flow-through Federal funding. However, the average annual subsidy required to support Marine Vessel operations is reduced from the Status Quo option by $14.5 million and by $5.4 million from that of Option 2A.	$ 84.0 M

Figure 8.14 depicts the growth of all costs (capital, operating, maintenance) and revenues (tariff and all subsidies) in a "total system" environment. The capital investment in the FVFs accounts for the spike in 2004-05 while a modest investment in 2010-11 is attributed to the repowering of Columbia, Aurora and Malaspina. Given this life-extension investment in Malaspina, the capital investment for an Alaska-Class ferry in 2014 is again avoided. In the median-to-optimistic conditions, the total cost-revenue gap stays fairly constant at roughly $130.0 million until 2020 when Taku is due to be replaced.

Figure 8.14
Option 2B: AMHS Historic and Projected Total Revenue vs. Total System Cost

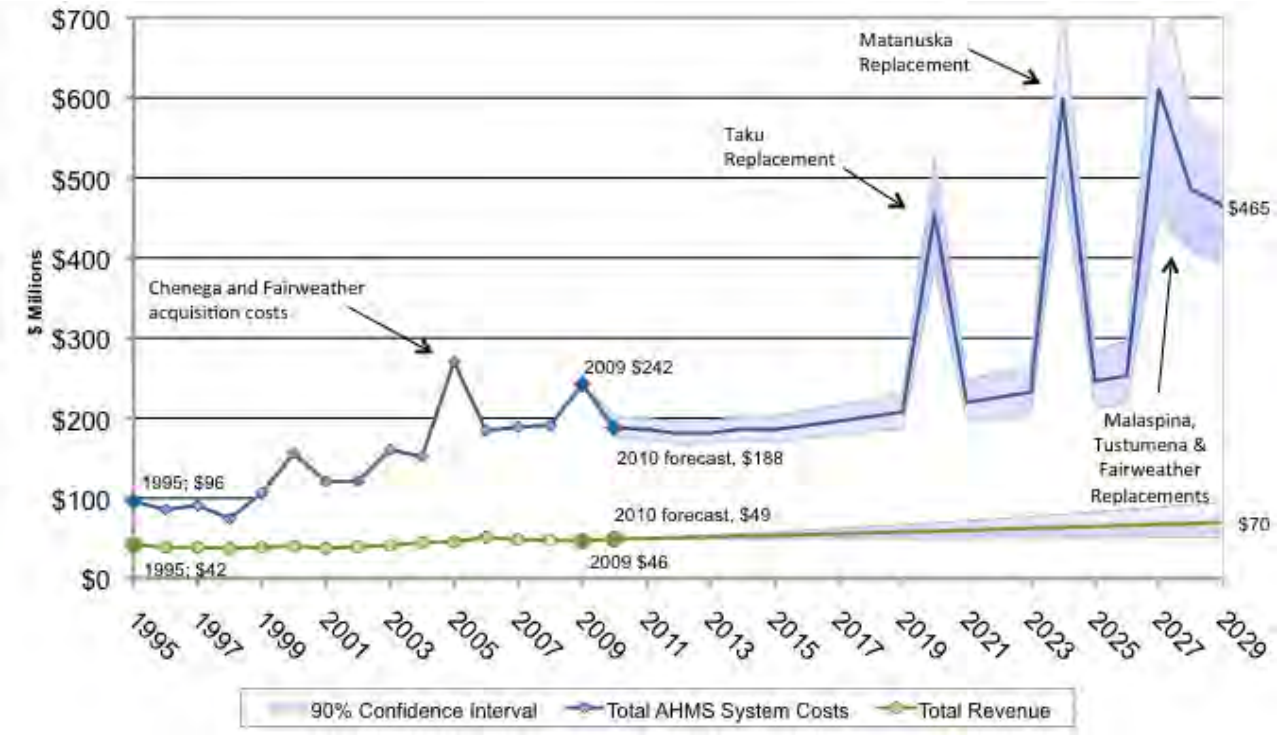
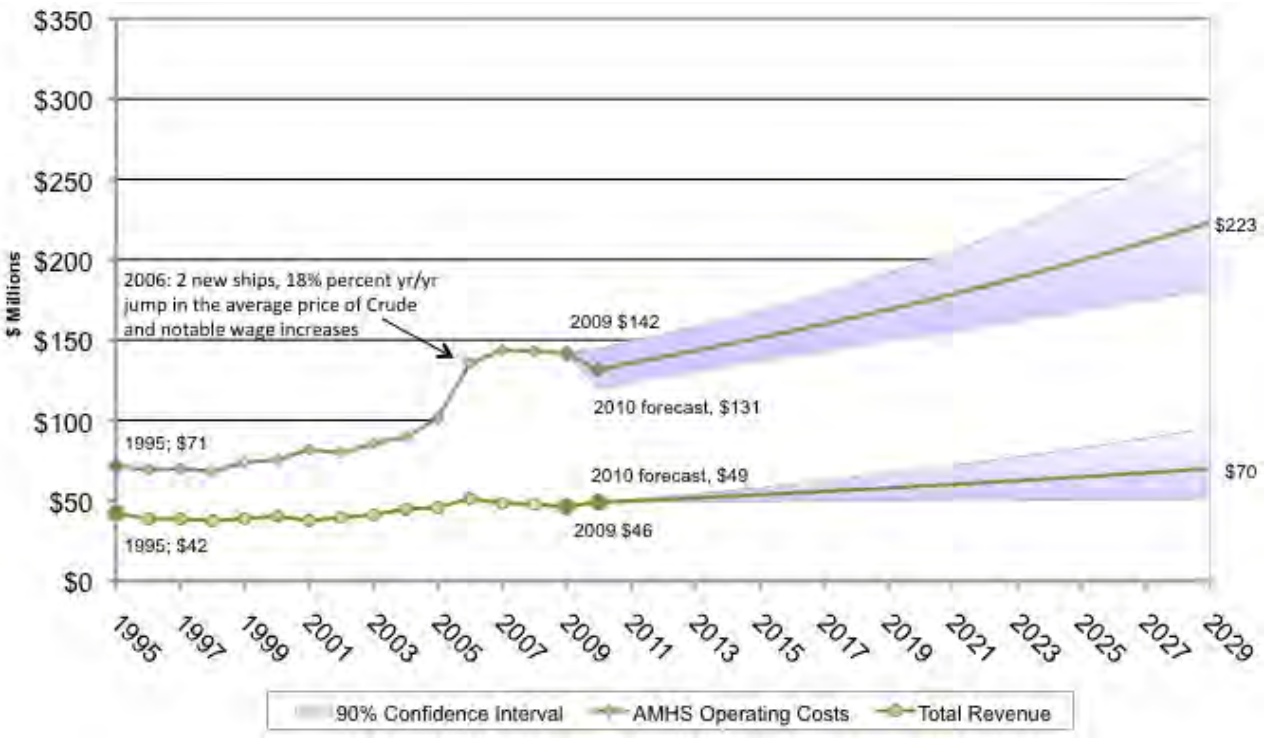


Figure 8.15 excludes capital expenditures and presents the AMHS revenues and operating costs. Although operating cost growth continues to outpace that of revenue, there is an immediate-to-near term reduction in the overall subsidy. The reduction results from the elimination of all of Kennicott's operating costs – savings that are realized over 2-4 years. Total system costs remain largely flat for 10 years, in only a modest increase in overall State commitment. The annual investment (to sustain AMHS operations) is projected to rise from approximately $82.3 million in 2010 to $111.0 million in 2019 and $153.0 million in 2029.

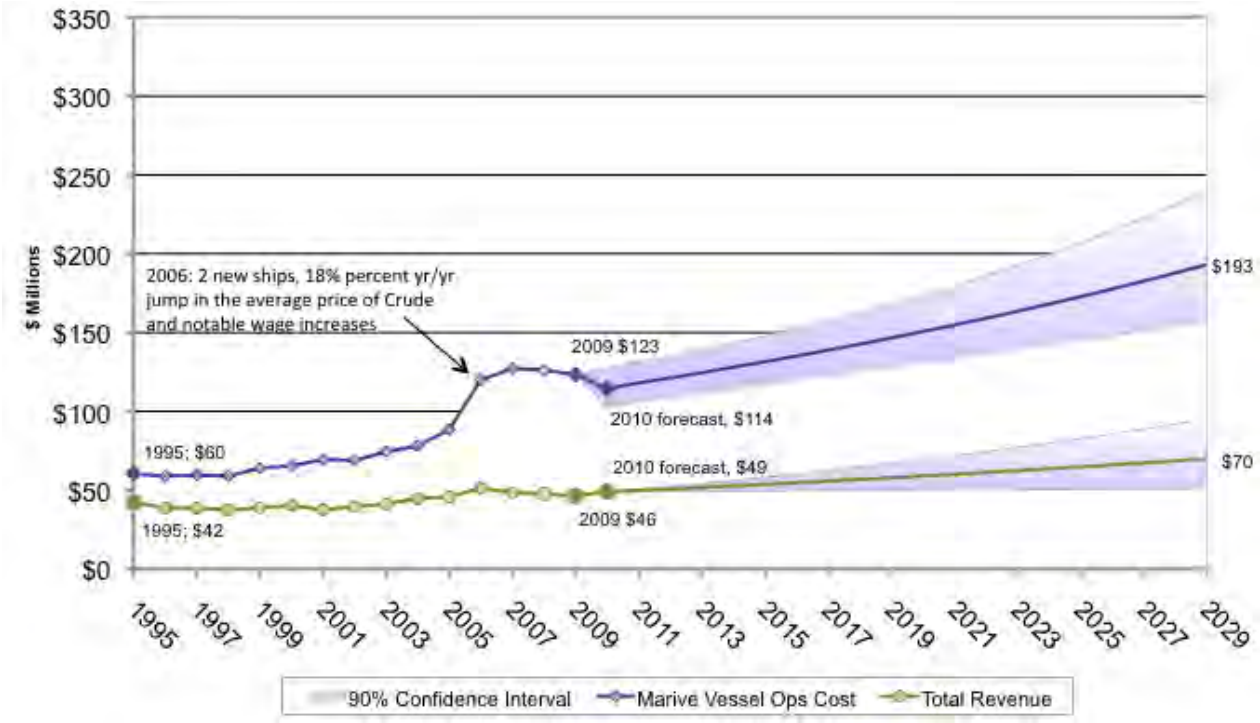
Figure 8.15
Option 2B: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



All capital, direct and indirect overhead costs are excluded from consideration in the following graph, Figure 8.16, which therefore presents only Marine Vessel Operations costs and operating expenses related to overhauls. As with previous options, this representation depicts the rise in labor costs from 2004 through 2007 (associated with the introduction of the FVFs and the higher-than-CPI wage increases) and the impact of fuel price changes. Together, these account for the significant lift in operating expenses.

However, the forward-looking portion captures the financial impact of disposing of Kennicott. It depicts an even greater reduction in cost-revenue gap and subsidy support. As depicted in Figure 8.16, an operating subsidy of $88.6 million would be needed in 2019 to bridge the gap between the cost of Marine Vessel Operations ($146.5 million) and projected revenues ($57.9 million). In 2029, this gap is projected to increase to $123.3 million, approximately $20.8 million lower than that of the Status Quo.

Figure 8.16
Option 2B: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Excluding all capital expenditures regardless of funding source, Table 8.15 presents the best, worst and expected cases for AMHS operating costs, revenues and the requisite operating subsidy in 2019 and 2029 (at the end of the modeled period).

Table 8.15
Option 2B – Potential Range of Operating Subsidy – 2019 and 2029

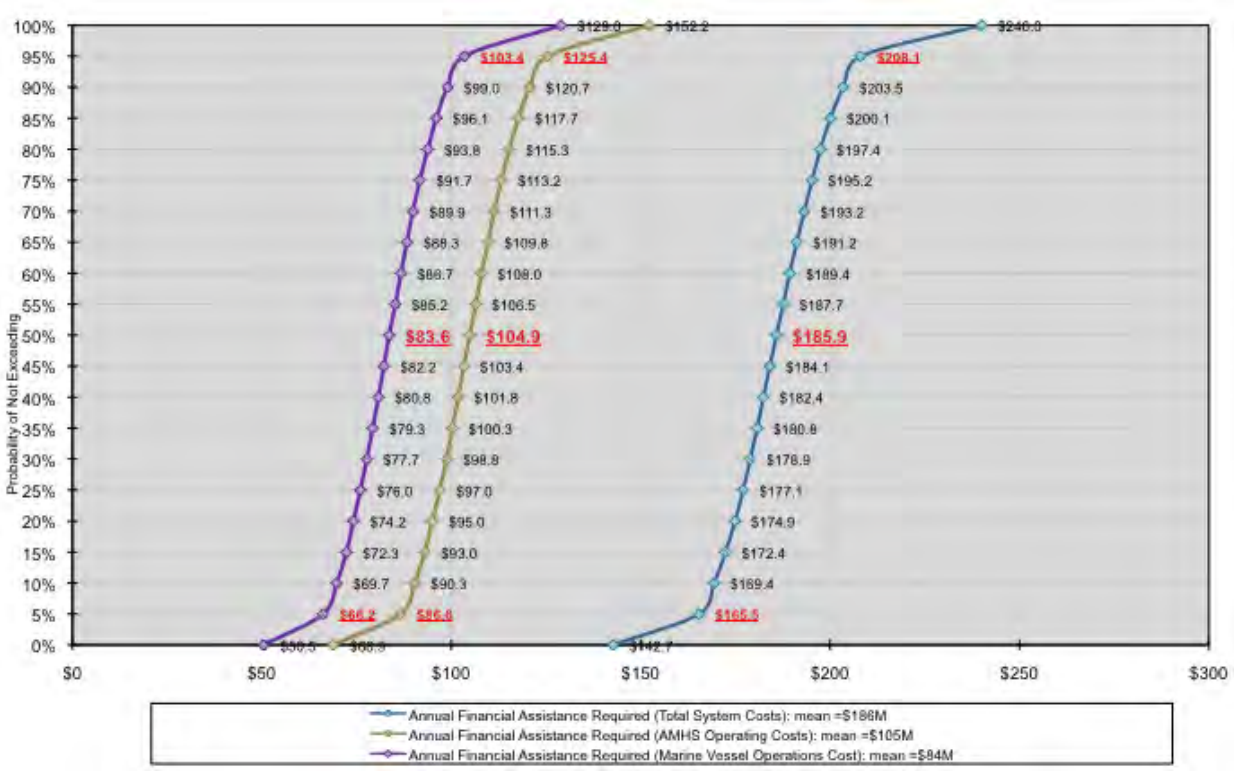
		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 67.0	$ 57.9	$ 49.9
Operating Costs (millions)				
Low	**$ 149.4**	$ 82.4	$ 91.5	$ 99.5
Median	**$ 168.9**	$ 101.9	$ 111.0	$ 119.0
High	**$ 191.5**	$ 124.5	$ 133.6	$ 141.6

		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 95.2	$ 69.9	$ 51.0
Operating Costs (millions)				
Low	**$ 181.5**	$ 86.3	$ 111.6	$ 130.5
Median	**$ 222.9**	$ 127.7	$ 153.0	$ 171.9
High	**$ 275.3**	$ 180.1	$ 205.4	$ 224.3

In the best case, the AMHS operating subsidy is projected to rise from $82.4 million (2019) to $86.3 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could rise to $224.3 million. The median projections are that this Service Reduction Option 2B (retire Kennicott) would require an AMHS operating subsidy of $111.0 million in 2019 rising to $153.0 million in 2029. These latter values are, respectively, $17.0 million and $23.2 million lower that those of Option 1A, Status Quo, and offer a further reduction of $5.6 million and $8.1 million, respectively, over those of Option 2A.

Finally, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 8.17.

Figure 8.17
Option 2B: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $185.9 million ($20.5 million lower than the Status Quo)
- AMHS Operations – $104.9 million (16.0 million lower than the Status Quo)
- Marine Vessel Operations – $83.6 million (14.4 million lower than the Status Quo).

This Service Reduction option is the most attractive from a purely financial perspective. Although the capital costs of extending Malaspina are incurred, the very significant operating and support costs associated with Kennicott are eliminated. Moreover, the $20.5 million reduction in the average annual state subsidy is significant.

8.7.5 Option 2B Community Impacts

The financial benefits are not realized without the loss of Cross-Gulf mobility. Retirement of Kennicott would make Cross-Gulf service impossible, except by re-deploying Tustumena, the only other open-ocean vessel in the AMHS fleet. Ending Cross-Gulf service would mean no ferry stops in Yakutat and no ferry connection between the Southeast and Southcentral/Southwest segments of the Marine Highway. In 2008, Kennicott carried 18,730 passengers on 238 trips throughout the system. This included 11 trips westbound (Juneau to Whittier) across the Gulf of Alaska carrying 1,300 passengers and 10 trips eastbound carrying 1,100 passengers.

Cross-gulf passengers have been primarily leisure travelers. Approximately 53% of 2007 passengers were non-residents of Alaska (see Table 8.16, below). Those who are Alaska residents often travel with visiting friends and relatives. Other passengers include relocating military personnel and others moving household goods from Southeast to Southcentral Alaska and vice versa. Anecdotal information suggests that the cross-gulf route is not significantly used by businesses, with the exception of two or three small tour operations.

For travelers without vehicles, cross-gulf ferry service is not competitive with air travel when both time and cost are factored in. However, moving a vehicle between Juneau and the Kenai Peninsula by cross-gulf ferry costs roughly half what it would cost to drive and takes about the same travel time. One-way airfare between Juneau and Anchorage ranges from approximately $170 to $300. The fare for a walk-on passenger from Juneau to Whittier is approximately $220 for the roughly 40-hour trip, including a stop in Yakutat. Adding a standard automobile costs an additional $500. Roomettes and cabins are available at additional cost.

Cross-Gulf traffic was substantially higher in 2007 than in 2008, with total bi-directional traffic of about 5,500 passengers. The Cross-Gulf route serves a mix of resident and non-resident travelers, as illustrated in Table 8.16. Analysis of AMHS reservations data shows that, in 2007, over half (53%) of Kennicott's Cross-gulf passengers were non-Alaska residents. Anchorage residents were the second largest group at just under 19% of total Cross-Gulf passenger traffic.

Ending Cross-Gulf service would have a relatively small impact on the northern terminus of that service, the town of Whittier. The 2,400 passengers and 1,220 vehicles that traveled to and from Whittier on cross-gulf ferries in 2008 represent just 6% and 8% respectively of the total AMHS traffic through Whittier in that year.

Though Yakutat residents represent a small portion of total Cross-Gulf traffic, the effects of Kennicott retirement would be the most significant in this community. The number of AMHS port calls in Yakutat has varied widely in recent years, ranging from 10 departures in 1999 and 2000 to a peak of 52 departures in 2007 (year-round service). The 30 departures estimated under retirement of the Malaspina, above, would actually be an increase from 2008 when service was offered only 8 months of the year for a total of 21 departures. Traffic in 2008 included 162 disembarking passengers and 70 disembarking vehicles. In 2007, a total of 276 passengers disembarked in Yakutat along with 202 vehicles.

Eliminating service to Yakutat altogether would certainly affect the community, in particular because Yakutat has struggled somewhat economically in recent years. Population has declined 13% since 2000 to 592 in 2008. Though ferry service to and from Yakutat has varied over time, it is still perceived as an important component of the community's transportation infrastructure.

Table 8.16
AMHS Cross Gulf Traffic by Passenger Place of Residence, 2007

Place of Residence	2007 Passenger Traffic	% of Total
Outside	2,948	53.3%
Anchorage	1,024	18.5%
Kodiak	217	3.9%
Juneau	175	3.2%
Fairbanks	101	1.8%
Homer	80	1.5%
Ketchikan	80	1.5%
Eagle River	79	1.4%
Wasilla	72	1.3%
Yakutat	67	1.2%
Soldotna	59	1.1%
Palmer	52	0.9%
Cordova	51	0.9%
Sitka	40	0.7%
Valdez	34	0.6%
Kenai	32	0.6%
Seward	29	0.5%
Eielson AFB	28	0.5%
Wrangell	25	0.5%
Chugiak	23	0.4%
Fort Wainwright	23	0.4%
All Others	289	5.2%
Total	5,528	100%

Source: AMHS reservations database

Yakutat has daily northbound and southbound jet service, and regular barge service (monthly in the winter and more frequently during the summer). The community's economy is based on commercial fishing and seafood processing, tourism, and government. The precise role of ferry transport in supporting these industries is not known. In general, where jet service is available, it plays a more important role in both seafood and tourism than ferries.

8.7.6 Option 2B Summary

Kennicott has the lowest profitability and highest annual equivalent cost in the AMHS fleet. This service reduction option – retirement of Kennicott without replacement – offers significantly improved financial performance over the Status Quo with an average annual subsidy reduction of $20.5 million through to 2029.

The community impact is considered to be relatively small for most Alaskans and visitors to the State; however, it is significant for the residents of Yakutat. Although beyond the scope of this study, it may be possible to ameliorate these impacts with some alternate transportation investment and still offer the substantial reduction in the ongoing level of public support.

8.8 OPTION 3 – SERVICE EXPANSION

The Service Expansion Option analyzes the impact of maximizing the number of service weeks and port calls from the existing fleet, an option very similar to the service plan delivered in FY06.

Regular service is provided between Kodiak, Port Lions, Seldovia and Homer. Between April and October, service is provided to the Aleutian chain twice per month to Unalaska/Dutch Harbor, stopping at Chignik, Sand Point, King Cove, False Pass, Akutan and Cold Bay. Overall service to the Chain is more than doubled from the Status Quo. Regular service in Prince William Sound to Valdez, Cordova and Whittier is unchanged. Service to Tatitlek and Chenega Bay is increased by 25-30%. Regular cross-Gulf sailings include a 28% increase in stops at Yakutat.

In the Southeast, the five largest vessels assigned to the mainline service provide a near doubling of service (over the Status Quo) from Bellingham, with consequential increases in port calls in Ketchikan, Wrangell, Petersburg, Hoonah, and Juneau. Frequent service is provided on the North Lynn Canal route, as is round-trip service between Juneau, Haines and Skagway. Day boats continue to be deployed to interconnect smaller Southeast Alaska communities (Angoon, Hoonah, Kake, Metlakatla, Pelican, Tenakee) and to provide connections to the mainline route at their larger stops.

As summarized in Table 8.17, service levels are significantly greater than in any of the Status Quo or Service Reduction options, with the increased service concentrated in the Southeast:

Table 8.17
Option 3 – Operating Weeks

Sector and Operating Weeks	Status Quo (1A)	Option 3
Mainline Vessels	168	200
Feeder Vessels	151	148
Southwest Vessels	95	92
Total	414	440

Table 8.18 provides the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements.

Table 8.18
Option 3 – Present Value and Annual Equivalent Values

	Option 3: Service Expansion (millions)
Present Value of Total AMHS System Costs	**$ 2,537.3**
PV of Capital:	$ 571.2
PV of Major Overhaul Costs (Terminals):	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,706.6
PV of Shoreside Costs:	$ 202.0
PV of Admin Costs:	$ 28.0
PV of AMHS Operating Costs	$ 1,936.7
Present Value of Revenues	**$ 655.7**
PV of Subsidy (Net Present Value = PV Revenue – PV Costs):	**($ 1,881.6)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$ 65.5**
Annual Equivalent Cost (Total System Costs):	**$ 253.4**
Annual Equivalent Cost (AMHS Operating Costs):	**$ 193.4**
Annual Equivalent Cost (Marine Vessel Operations Costs):	**$ 170.5**
Revenue as a % of Costs (Total System Costs):	**25.8 %**
Revenue as a % of Costs (AMHS Operating Costs):	**33.8 %**
Revenue as a % of Costs (Marine Vessel Operations Costs):	**38.4 %**
Annual Financial Assistance Required (Total System Costs)	**$ 213.4**
Annual Financial Assistance Required (AMHS Operating Costs)	**$ 127.9**
Annual Financial Assistance Required (Marine Vessel Ops Costs)	**$ 105.0**

Changes in the four key model outputs from the Status Quo Option 1A follow:

a.	<u>PV of Subsidy (Net Present Value of the Total System)</u> The NPV is $66.2 million worse than in the Status Quo. The PV of total AMHS costs is $126.1 million higher, with virtually the entire increase borne in vessel operating expenses (to be expected when all ships are running to maximum availability) and in the absence of any new or different capital investment decisions. The PV of revenues is anticipated to increase by $60.0 million – this improvement is not sufficient to offset the increase in vessel operating expense. These results are consistent with actual revenues in FY06 and suggest very clearly that there is not a great pent-up or latent demand waiting to be exploited by a significantly greater service offering.	($ 1,881.6 M)
b.	<u>Revenue as a % of total AMHS costs</u> This result is a 1.1% improvement and – by comparison – is not an unreasonable outcome for this metric. As will be noted in the following two observations, however, a high ongoing investment is needed to maintain this performance.	25.8 %
c.	<u>Annual financial assistance required for the total system</u> The average annual subsidy for all capital and operating activities is projected to be $6.6 million higher than the Status Quo and is the highest of all options examined thus far. As will be seen in the next output metric, this increase is almost completely associated with the increased operational tempo.	$ 213.4 M
d.	<u>Annual financial assistance required to sustain operations</u> The average annual subsidy needed only to support Marine Vessel Operations is $6.4 million higher than in the Status Quo. As noted in the examination of the system NPV in (a) above, the investment to maximize the service offering does not realize a similar revenue gain.	$ 113.6 M

The graph in Figure 8.19 depicts the growth of all costs (capital, operating, maintenance) and revenues (tariff and all subsidies) in a "total system" environment. This provides a clear appreciation of the impact created from a service increase without an associated increase in revenue. In the 2010-2012 time frame, Columbia and Aurora are re-powered and Malaspina is life-extended. This coincides with the significant increase in the service offering. Given that these four factors are all operations-specific, the cumulative impact in an expanded service scenario is reflected in an even wider band of uncertainty in the "out-years". Indeed, in 2019 the total subsidy required rises to $178.4 million, this is the highest of any of the options analyzed thus far in this Report.

Figure 8.18
Option 3: AMHS Historic and Projected Total Revenue vs. Total System Cost

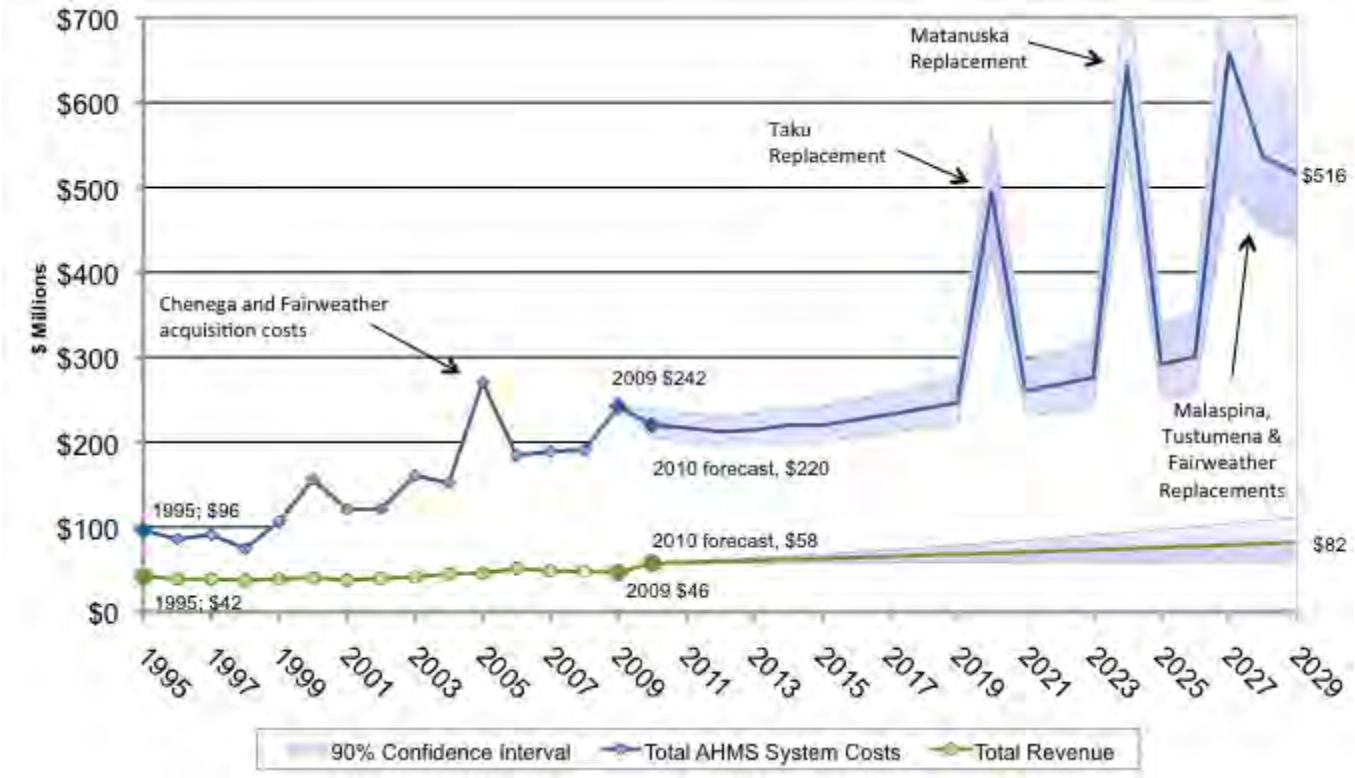
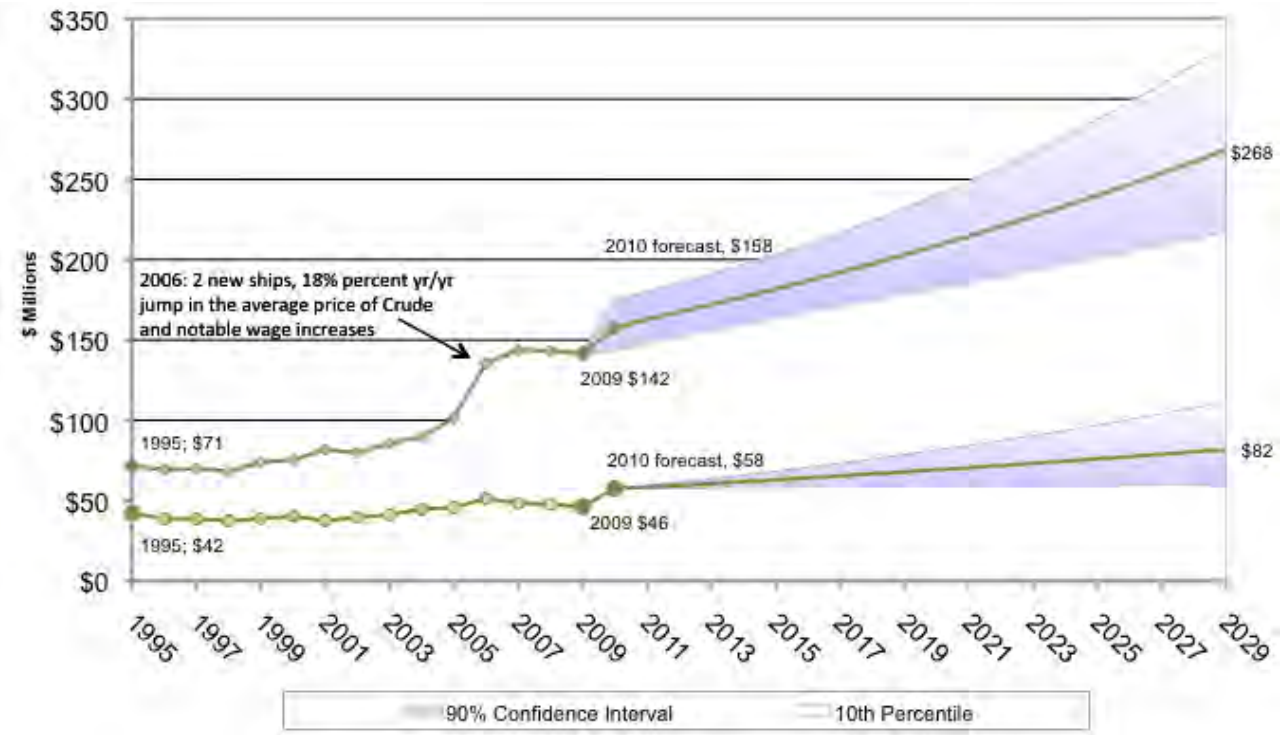


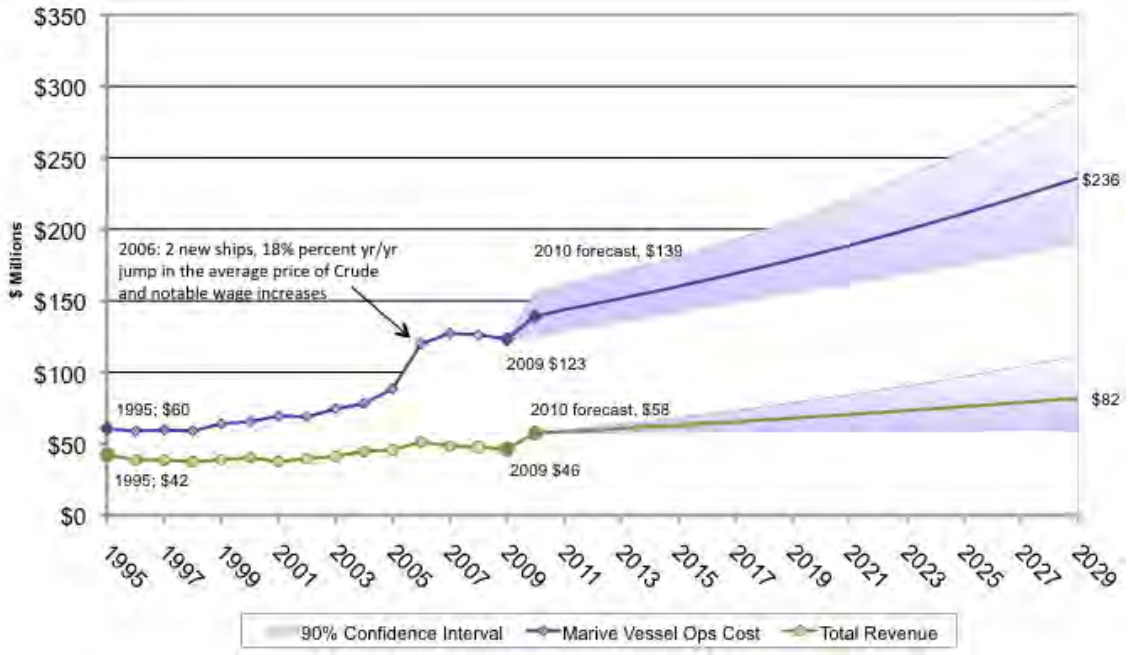
Figure 8.19 excludes capital expenditures and presents the AMHS revenues and operating costs. This figure illustrates the notable widening of the cost-revenue gap over this period driven by the more intense operating tempo. The annual investment (to sustain AMHS operations) would be projected to rise from approximately $100.2 million in 2010 to $135.0 million in 2019 and $186.3 million in 2029.

Figure 8.19
Option 3: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



The final graph in this section, Figure 8.20, further underscores the financial implications of this option. All capital, direct and indirect overhead costs are excluded; thus, only Marine Vessel Operating costs and operating expenses related to overhauls are included. The forward-looking portion (from 2010) captures the financial impact of the much-increased operating tempo, the slight increase in revenues and the widening of the expense-revenue gap. Subsidy support for vessel operations increases at a significant rate year-over-year such that an operating subsidy of $100.1 million would be needed in 2019 to bridge the gap between the cost of Marine Vessel Operations ($178.6 million) and projected revenues ($78.5 million). In 2029, this gap is projected to increase to $153.9 million, approximately $9.8 million greater than that of the Status Quo.

Figure 8.20
Option 3: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Excluding all capital expenditures regardless of funding source, Table 8.19 presents the best, worst and expected cases for vessel operating costs, revenues and the requisite operating subsidy in 2019 and 2019 (at the end of the modeled period for this analysis).

Table 8.19
Option 3 – Potential Range of Operating Subsidy

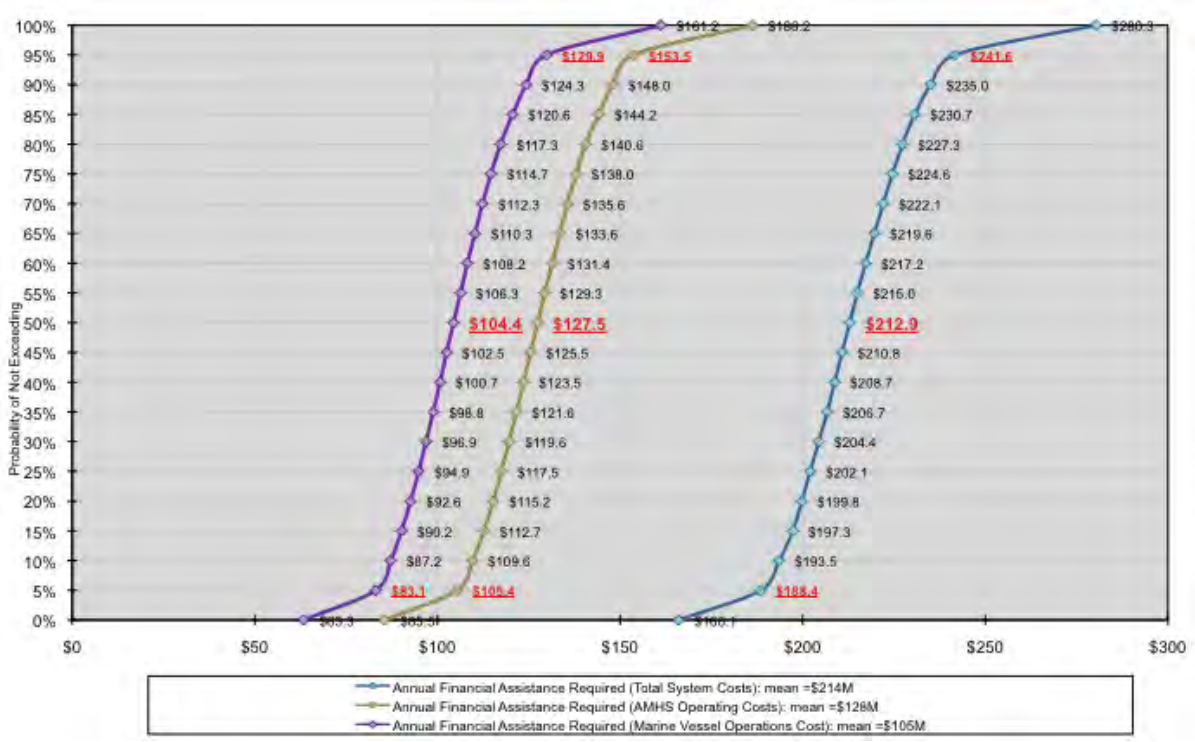
		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 78.6	$ 67.9	$ 58.5
Operating Costs (millions)				
Low	$ 178.5	$ 99.9	$ 110.6	$ 120.0
Median	$ 202.9	$ 124.3	$ 135.0	$ 144.4
High	$ 231.8	$ 153.2	$ 163.9	$ 173.3

		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 111.6	$ 81.9	$ 59.8
Operating Costs (millions)				
Low	$ 217.1	$ 105.5	$ 135.2	$ 157.3
Median	$ 268.2	$ 156.6	$ 186.3	$ 208.4
High	$ 333.0	$ 221.4	$ 251.1	$ 273.2

In the very best case, the AMHS operating subsidy is projected to rise from $99.9 million (2019) to $111.6 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could be as high as $273.2 million. The median projections are that this Service Expansion Option would require an AMHS operating subsidy of $135.0 million in 2019 rising to $186.3 million in 2029. These latter values are, respectively, $7.0 million and $10.1 million greater that those of Option 1A, Status Quo.

Lastly, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 8.21.

Figure 8.21
Option 3: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $212.9 million ($6,5 million higher than the Status Quo)
- AMHS Operations – $127.5 million (6.6 million higher than the Status Quo)
- Marine Vessel Operations – $104.4 million (6.4 million higher than the Status Quo).

8.8.1 Option 3 Community Impacts

The Service Expansion scenario assumes essentially the same service as was provided in FY06. Overall, service to the Aleutian Chain would more than double, compared with the Status Quo scenario. Other elements of the Service Expansion scenario include:

- 28% increase in Yakutat stops
- PWS service unchanged
- Tatitlek and Chenega Bay service up 25-30%
- Doubling in service from Bellingham

The Service Expansion scenario would result in some increase in passenger and vehicle traffic to many communities served by the AMHS. Historically, in smaller or more isolated communities, passenger loads have tended to increase or decrease by less than the increment of the service changes. For example in Yakutat, the

drop in port calls from 52 in 2007 to 21 in 2008 (60% drop) was accompanied by a decline in disembarking passengers from 276 to 162 (40% drop). Similarly, when fast-ferry service between Juneau and Sitka was increased by 65% from 2007 to 2008, total passengers increased by 46%.

With respect to Bellingham service, it is difficult to project the long-term effect on traffic of increased service. Traffic into and out of Bellingham consists mainly of tourists to Alaska, and demand for tourism reflects economic conditions more than transportation scheduling. For example, between 2007 and 2008, the number of summer sailings from Bellingham decreased from 44 to 28, while winter sailings increased from 28 to 30. This net service decrease of 19% was accompanied by an 11% decrease in passengers embarking from Bellingham and a 16% decrease in vehicles. At the same time, however, there was a 6% increase in passengers and a 13% increase in vehicles embarking from Prince Rupert, the alternative AMHS port for traveling from the continental U.S. and Canada to Alaska. This suggests that, within reasonable limits, the visitor market will adapt to AMHS schedules without much altering overall demand. Similarly, it is reasonable to think that simply adding additional Bellingham sailings will not appreciably change the demand for Alaska vacations.

8.8.2 OPTION 3 SUMMARY

This Service Expansion option is forecast to increase the required State subsidy an average of $6.6 million annually while offering limited additional socio-economic benefit.

8.9 OPTION 4 – MULTIPLE ALASKA-CLASS FERRIES

This option analyzes a variant of the Service Expansion option whereby Malaspina is replaced by an Alaska-Class ferry in 2014, as in Option 1B. In addition, however, this Option would see two additional Alaska-Class ferries introduced into service in 2016 and 2017 and put into service in the Southeast, largely in the North Lynn Canal between Auke Bay, Haines and Skagway, and between Prince Rupert and Ketchikan. In addition to Malaspina, Taku would be retired (2018); the other mainline vessels would be redeployed to satisfy the remaining service requirements. As a result, the AMHS fleet would increase from 11 (Status Quo) to 13 ships. No new routes are envisaged; hence, the existing fare structure is used to develop revenue projections. No roads are constructed; however, an investment is made at the Haines terminal to support stern loading of an Alaska-Class ferry.

This Multiple Alaska-Class Ferry Option models the impact of changes to the AMHS service.

As illustrated in Table 8.20, this option offers 71 more weeks of service than the Status Quo. This added service is concentrated mainly in the North Lynn Canal, offering expanded service between Auke Bay, Haines and Skagway.

Table 8.20
Option 4 – Operating Weeks

Sector and Operating Weeks	Status Quo (1A)	Option 4
Mainline Vessels	168	160
Feeder Vessels	151	230
Southwest Vessels	95	95
Total	414	485

Table 8.21 presents the Present Values and Annual Equivalent data for each of the cost, revenues and financial assistance (total subsidy) elements.

Table 8.21
Option 4 – Present Value and Annual Equivalent Values

	Option 4: Multiple Day Boat Shuttles (millions)
Present Value of Total AMHS System Costs	**$ 2,623.6**
PV of Capital:	$ 678.3
PV of Major Overhaul Costs (Terminals):	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,687.4
PV of Shoreside Costs:	$ 200.4
PV of Admin Costs:	$ 28.0
PV of AMHS Operating Costs	$ 1,915.9
Present Value of Revenues	**$ 634.7**
PV of Subsidy (Net Present Value = PV Revenue – PV Costs):	**($ 1,988.9)**
Annual Equivalent Revenues (Average annual revenues over study period expressed in today's dollars):	**$ 63.4**
Annual Equivalent Cost (Total System Costs):	**$ 262.0**
Annual Equivalent Cost (AMHS Operating Costs):	**$ 191.4**
Annual Equivalent Cost (Marine Vessel Operations Costs):	**$ 168.5**
Revenue as a % of Costs (Total System Costs):	**24.2 %**
Revenue as a % of Costs (AMHS Operating Costs):	**33.1 %**
Revenue as a % of Costs (Marine Vessel Operations Costs):	**37.6 %**
Annual Financial Assistance Required (Total System Costs)	**$ 213.3**
Annual Financial Assistance Required (AMHS Operating Costs)	**$ 128.0**
Annual Financial Assistance Required (Marine Vessel Ops Costs)	**$ 105.1**

The four key model outputs and changes from the Status Quo Option 1A follow:

a.	PV of Subsidy (Net Present Value) The NPV is $173.5 million more negative than in the Status Quo. Although the PV of revenues are projected to increase by $39.0 million greater, the PV of total AMHS costs would be $212.4 million higher, with roughly half of this increase attributed to vessel operating expenses. This is to be expected with the net addition of one ship, the increased operational costs and the expanded service. The remainder of the increase is associated with the capital investment in the new ships. This metric clearly indicates that the revenue growth over the period would not be sufficient to offset the increased capital costs. This observation is discussed further in the other model outputs.	($ 1,988.9 M)
b.	Revenue as a % of total AMHS costs This figure 0.5% below that of the Status Quo and is at the low end of the six options examined thus far. The projected operating costs for the shuttle ferries in this service configuration are proportionately higher than the revenues that they generate	24.2 %
c.	Annual financial assistance required for the total system This figure represents the average annual subsidy needed to sustain all capital and operating expenses and is expressed in current (2009) dollars and is anticipated to be $6.5 million higher that in the Status Quo option. Although this difference may not seem high, the following metric demonstrates that this annual increase over the Status Quo is associated entirely with the increased operational tempo.	$ 213.3M
d.	Annual financial assistance required to sustain operations The average annual subsidy needed only to support Marine Vessel Operations is $6.6 million higher than in the Status Quo and is virtually the same as that of Option 3 – Service Expansion. As noted in the examination of the system NPV in (a) above, the investment to maximize the service offering does not realize a similar revenue gain.	$ 105.1 M

Figure 8.22 graphically depicts the growth of all costs (capital, operating, maintenance) and revenues (tariff and all subsidies) in a total system environment. This figure provides some appreciation of the overall impact of the projected and substantial capital program (primarily ship replacement) and the ongoing shortfall in revenue growth.

The "spikes" in Figure 8.22 reflect the investment of $330-360 million in three Alaska-Class ferries in 2014 through 2017, as well as the planned, follow-on replacements for Matanuska, Chenega, Fairweather and Tustumena, and LeConte.

Figure 8.22
Option 4: AMHS Historic and Projected Total Revenue vs. Total System Cost

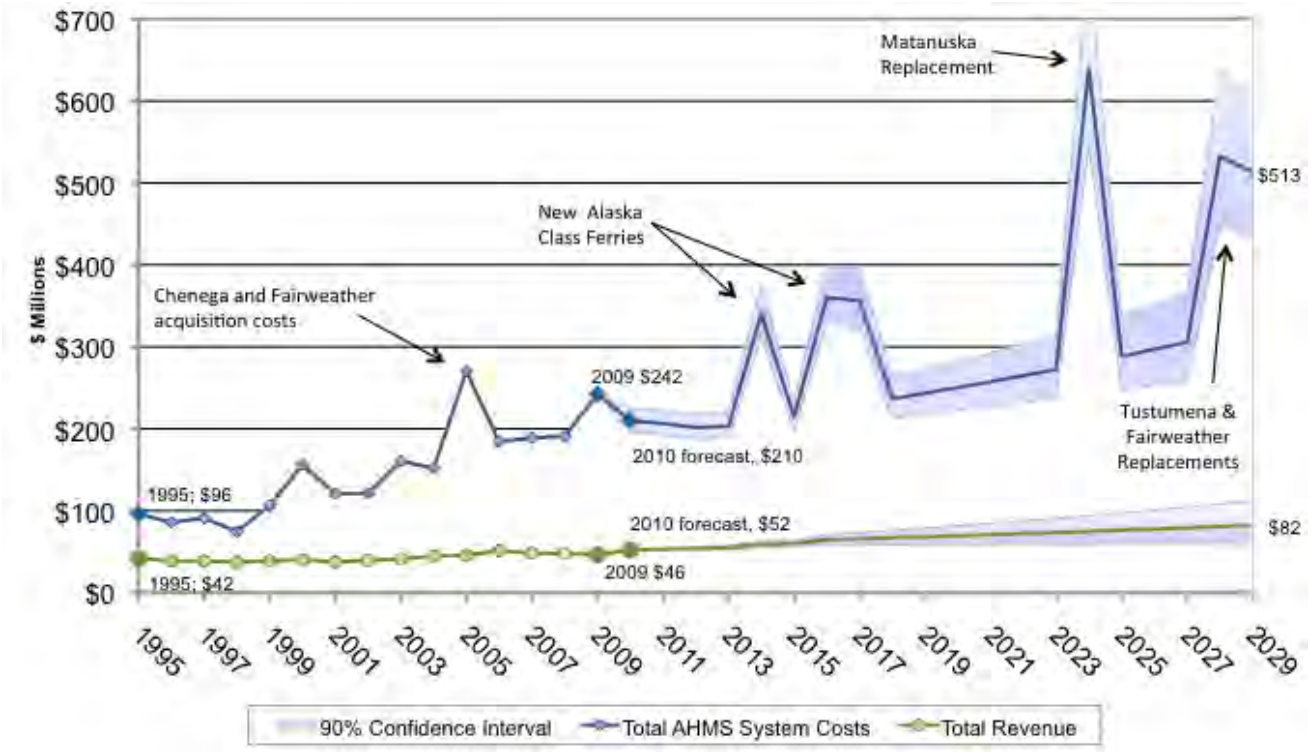
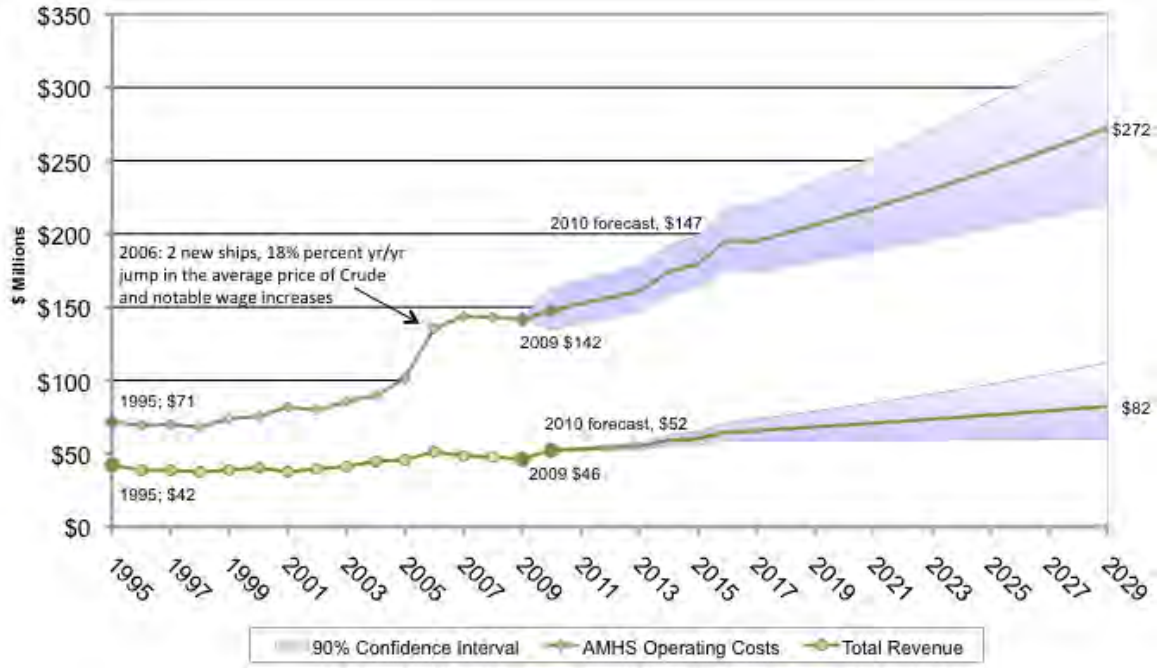


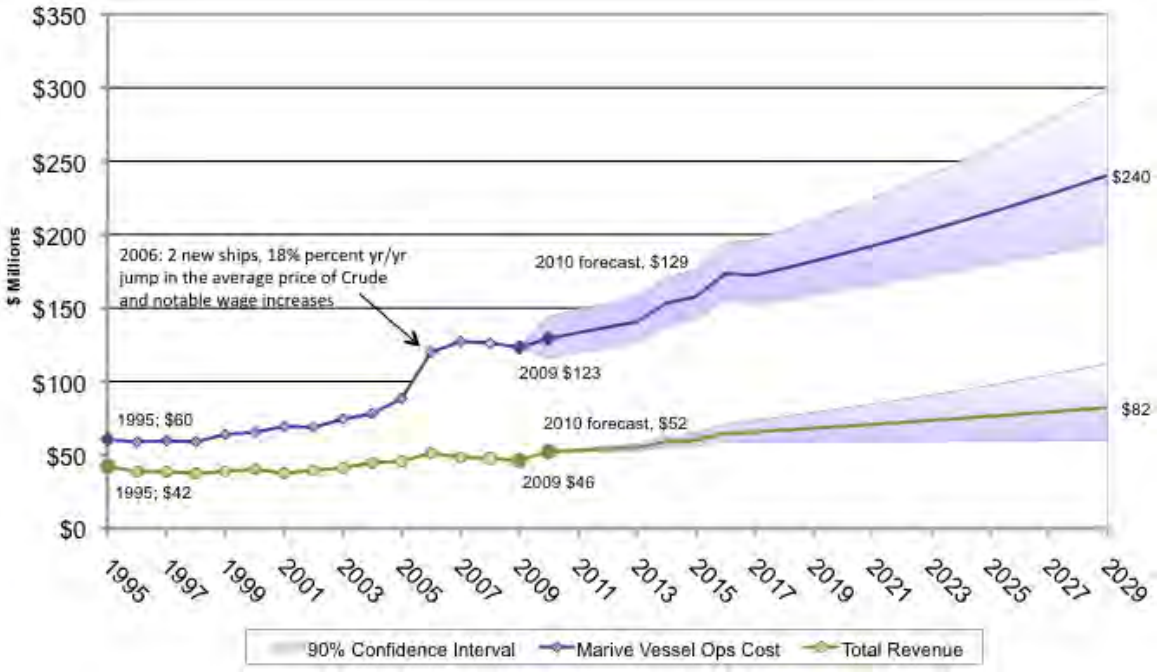
Figure 8.23 excludes capital expenditures and presents the AMHS revenues and operating costs. The step increase in the expense line between 2015 and 2017 and the subsequent "widening" of the cost-revenue gap reflect the increased operational costs for the Alaska-Class ferries operating in Lynn Canal, expenditures that are not offset by a proportional increase in revenues. The annual investment (to sustain AMHS operations) would be projected to rise from approximately $95.2 million in 2010 to $137.9 million in 2019 and $190.2 million in 2029.

Figure 8.23
Option 4: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



The graph in Figure 8.24 further underscores the financial implications of this option. All capital, direct and indirect overhead costs are excluded; thus, only Marine Vessel Operating costs and operating expenses related to overhauls are included. The forward-looking portion (particularly from 2016) captures the financial impact of the expanded fleet, the increased operating costs and service delivery plan, the slight increase in revenues and the widening of the expense-revenue gap. Subsidy support for vessel operations increases at a significant rate year-over-year such that an annual operating subsidy of $113.7 million would be needed in 2019 to bridge the gap between the cost of Marine Vessel Operations ($181.9 million) and projected revenues ($68.2 million). In 2029, this gap is projected to increase to $158.0 million, approximately $13.9 million greater than that of the Status Quo.

Figure 8.24
Option 4: AMHS Historic and Projected Total Revenue vs. Marine Vessel Operations Cost



Given the volatility of many of the input variables, (notably oil prices, labor costs, general and capital cost inflation, and fuel price inflation) Table 8.22 presents the best, worst and expected cases for AMHS operating costs, revenues and the requisite operating subsidy in 2019 and 2029 (at the end of the modeled period for this analysis).

Table 8.22
Option 4 – Potential Range of Operating Subsidy– 2019 and 2029

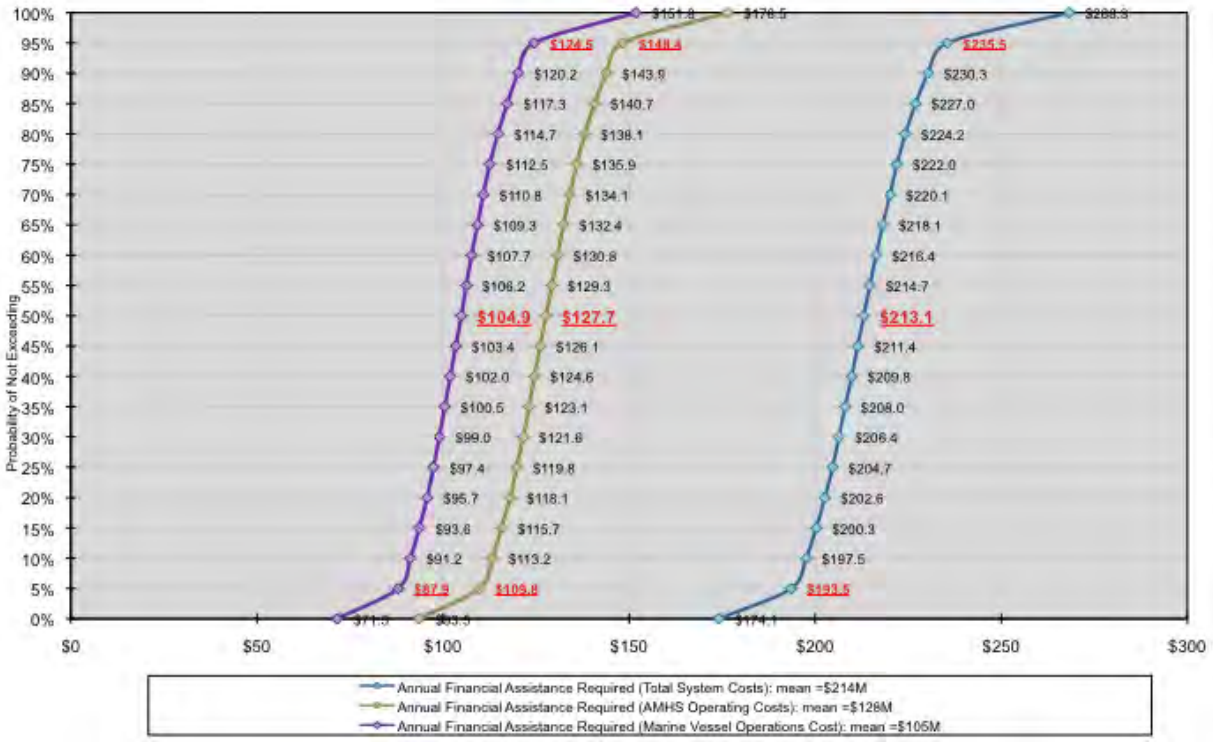
		Operating Revenues (millions) 2019		
		High	Median	Low
		$ 78.9	$ 68.2	$ 58.8
Operating Costs (millions)				
Low	$ 181.2	$ 102.3	$ 113.0	$ 122.4
Median	$ 206.1	$ 127.2	$ 137.9	$ 147.3
High	$ 235.2	$ 156.3	$ 167.0	$ 176.4

		Operating Revenues (millions) 2029		
		High	Median	Low
		$ 112.1	$ 82.3	$ 60.0
Operating Costs (millions)				
Low	$ 220.3	$ 108.2	$ 138.0	$ 160.3
Median	$ 272.5	$ 160.4	$ 190.2	$ 212.5
High	$ 337.6	$ 225.5	$ 255.3	$ 277.6

In the very best case, the AMHS operating subsidy is projected to rise from $102.3 million (2019) to $108.2 million (2029). In the worst case (where all expenses are high and all revenues are low), the 2029 subsidy could be as high as $277.6 million. The median projections are that this Multiple Alaska-Class Ferry Option would require an AMHS operating subsidy of $137.9 million in 2019 rising to $190.2 million in 2029. These latter values are, respectively, $9.9 million and $14.0 million greater that those of Option 1A, Status Quo.

Lastly, taking into account the range of all variables, the Model provides probability distributions of average annual financial assistance required to 2029 for the Total AMHS, for AMHS operations, and for Marine Vessel Operations. These are illustrated in Figure 8.25.

Figure 8.25
Option 4: AMHS Annual Financial Assistance Required ($M) Probability Distribution



The median values are as follows:

- Total AMHS – $213.1 million ($6.7 million higher than the Status Quo)
- AMHS Operations – $127.7 million (6.8 million higher than the Status Quo)
- Marine Vessel Operations – $104.9 million (6.9 million higher than the Status Quo).

8.9.1 Option 4 Community Impact

This scenario includes replacement of two mainline vessels with three Alaska-Class ferries to provide service between Prince Rupert and Ketchikan and within Lynn Canal.

Community impacts associated with the new ships clearly depend on how they are deployed. As defined in this Option, the Alaska-Class ferries will serve the Prince Rupert/Ketchikan route and will provide more frequent

service between Juneau, Haines and Skagway. The increased PV of revenues (over that of the Status Quo) reflects increased customer response to this expanded service offering.

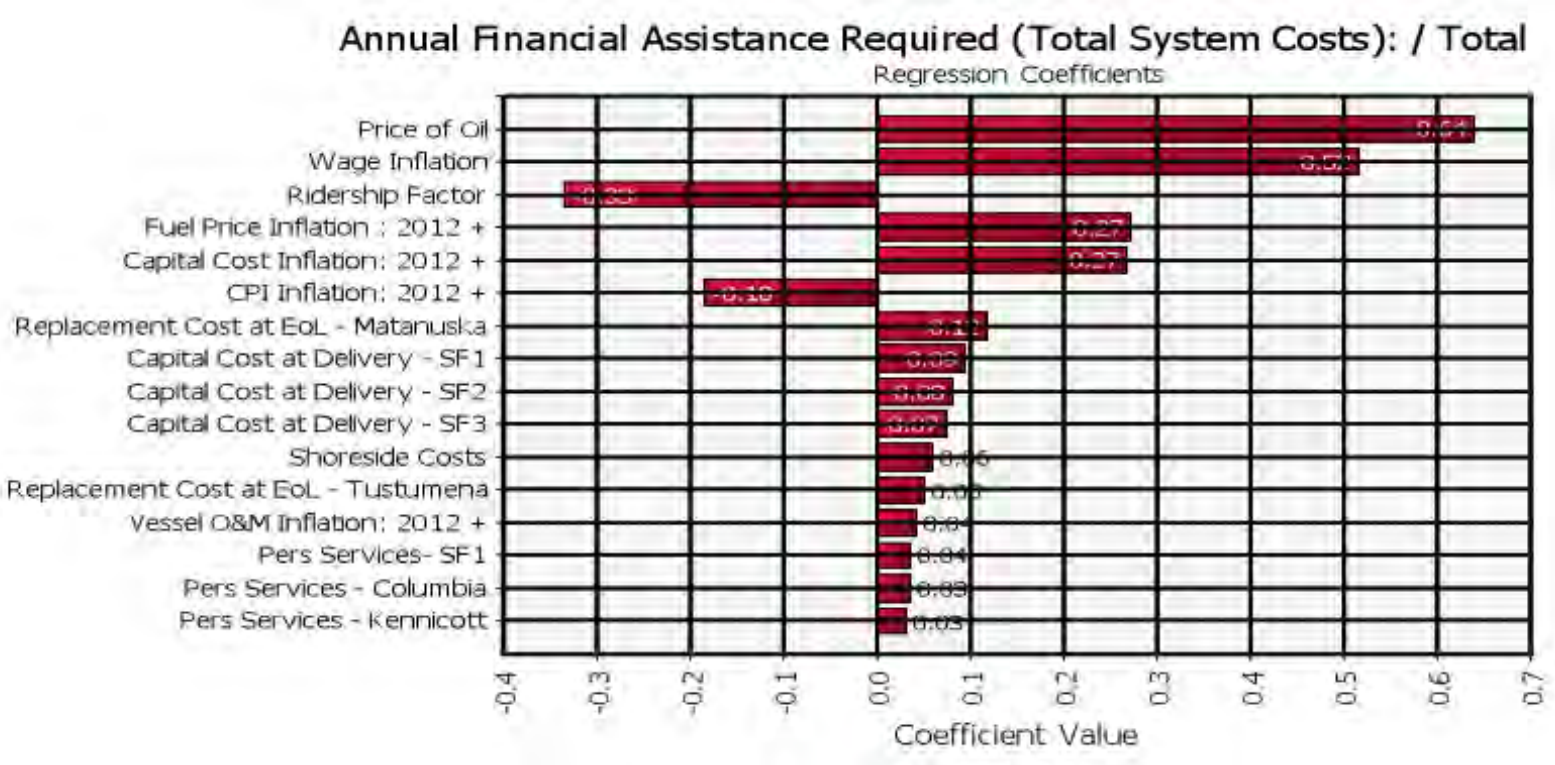
8.9.2 OPTION 4 SUMMARY

This Multiple Alaska-Class Ferries Option replaces two aging vessels in the AMHS fleet (Malaspina and Taku) and offers a substantially greater level of service, particularly in the North Lynn Canal between Juneau, Haines and Skagway. The latter offering is anticipated to be well-received by AMHS' customers; however, it will come at a substantially increased cost and will demand an average annual AMHS operating subsidy approximately $6.7 million greater than in the Status Quo option.

8.10 SENSITIVITY ANALYSIS

As noted in an early section of this Report, the Life Cycle Cost Model utilizes historical cost and revenue data, estimates of construction and similar investment decisions and a number of assumptions regarding key cost and revenue variables. In arriving at the range of PVs, Annual Equivalent Costs and Revenue, and projections of the Annual Financial Assistance required, the Model executes an extensive Monte Carlo simulation that considers the varying impacts of each of the assumptions. For each option, a "Tornado Diagram" as depicted in Figure 8.26 provides a visual and numerical appreciation of the relative impact of the respective variables.

Figure 8.26
Sample Tornado Diagram



Of all the variables and inputs used in the Life Cycle Analysis, three dominate the range of uncertainty around the projected results: oil prices, wage inflation and ridership growth. These are consistent from option to option and are discussed in decreasing order of impact.

Oil Prices. As noted in the assumptions section, fuel price is the most volatile of the inputs and is the most difficult to forecast. Fuel represented 20% of AMHS authorized spending in FY09 and was budgeted at $41.6 million; actual expenditure totaled $28.3 million. In FY08 and 07 the actual to budgeted costs were reversed during a period of rapid oil price escalation. Given this volatility, fuel price increases of CPI plus or minus 1% at the median with a range of between 0% and 5% were assumed for this analysis. The extent to which this assumption dominates the Model results is evident in the relative magnitude of its associated regression coefficient.

Wage inflation. Labor constitutes the single largest AMHS cost component and, for vessel operations only, accounted for $74.0 million of budgeted expense in FY09 and 47% of authorized spending. Labor costs are less volatile than those related to fuel costs (which are variable and do offer some respite from time to time) and are manageable to the extent that they are negotiated. However, wages rarely decline, they have recently grown faster than CPI and each negotiated wage increase has a compounding effect on earlier adjustments. In subsidized public transportation systems like AMHS, tariff increases do not generally fully offset wage increases. At current levels, a 2.0% wage increase results in a $1.5 million annual expenditure increase and would require a 3.0% increase in revenues to maintain the subsidy level.

Ridership growth. As noted earlier, AMHS ridership was in near-constant decline from peak levels in the early 1990s until 2006 when the introduction of Fairweather and Chenega, substantial changes to the operating profile and specific marketing activities resulted in ongoing increases in AMHS ridership. However, that turnaround has not been accompanied by equivalent growth in revenue. Given this dichotomy of increasing ridership and falling revenues, a ridership growth of zero with a range of +/- 2.5% is still considered appropriate to this analysis.

Taken together, the foregoing assumptions have the greatest impact on the cost estimate confidence intervals depicted in Figures 8.2 through 8.25. It is important to note that, in the worst-case condition, the combined impact of the projected variation is not significant when compared to the widening gap between AMHS expenses and revenues.

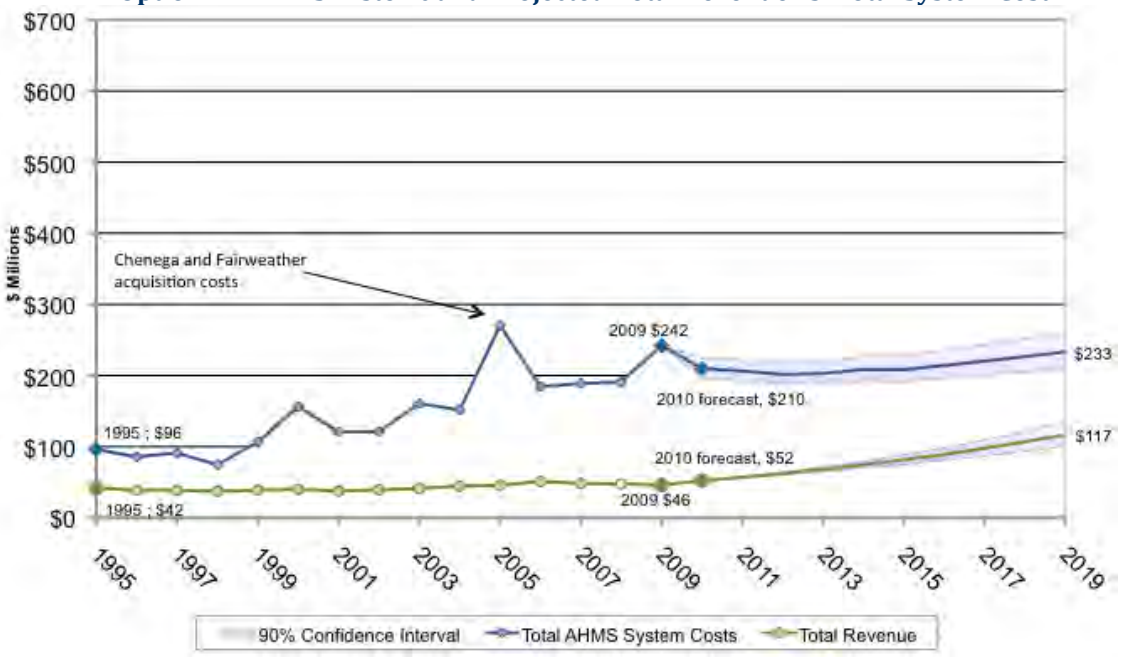
Thus far, the analysis has focused on increasing or decreasing expenditures based on the amount of service. The following assesses tariff increase.

8.10.1 Impact of Increasing Tariff

As noted earlier in this report, the State subsidy faces ongoing pressure due to ship replacement needs, major overhaul requirements, wage increases and volatile fuel prices. On the revenue side of the equation, the State faces strong pressure from users to maintain low fares. This pressure is particularly strong on longer routes where relatively small percent changes result in a material total price increase. Thus, the pressure for expenditures to increase is generally greater than that for revenue. The declining expenditure recovery places greater upward leverage on subsidy and increases the importance of long term expenditure planning and cost control. It appears AMHS cannot price its way out of its current subsidy level or business paradigm.

In order to test this assertion and the sensitivity of the model to tariff increases, the Status Quo model was adjusted with a series of regular, across-the-board tariff increases based on CPI multiples. At present, CPI is approximately 1.0%. Annual tariff increases of 2x and 5x CPI had little impact – without considering any other factors, these are insufficient to offset just the annual growth in labor costs. For the purposes of this discussion, tariffs were increased by 10% per year in real terms (that is, 10% above inflation). Figures 8.27 and 8.28 present the impact of such adjustments on the Status Quo option.

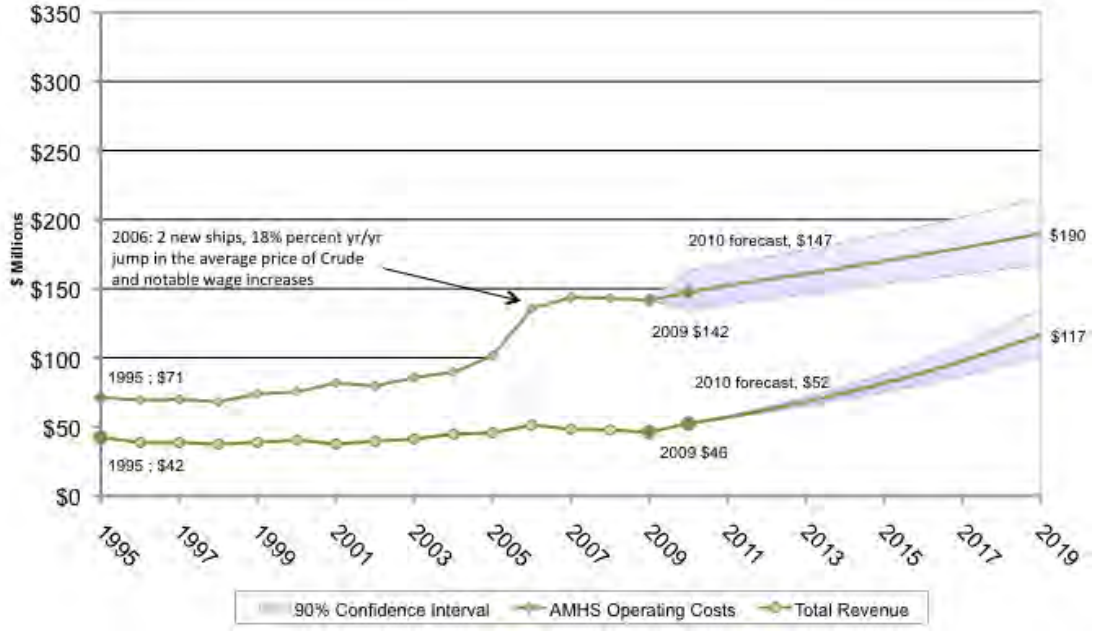
Figure 8.27
Option 1A: AMHS Historic and Projected Total Revenue vs. Total System Cost



This is a dramatic increase – after ten years, fare rates including inflation would be approximately 150% higher than current values; for example, a $100 fare today would increase to the $250 range. Annual revenues rise from $52.2 million to $116.8 million, even as price elasticity, discussed in the next section, causes ridership to decrease by 22%. Revenue as a percentage of Total System costs rises from 25% to just over 50%. The total subsidy for AMHS, in 2019, is reduced from the Status Quo value of $157.6 million to $116.4 million.

However, as significant as these increases are, Figure 8.27 illustrates that 2019 revenues would still not offset the cost of AMHS Operations. Revenue as a percentage of total AMHS operating costs rises from the Status Quo value of 35% to 62% but remains well short of the breakeven point. Subsidization of the Status Quo Option, in 2019, would be reduced from $95.3 million to $72.9 million (expenses of $189.7 million less revenues of $116.8 million). The average annual financial assistance required (at this base operational level) is reduced from $95.3 million to $72.9 million.

Figure 8.28
Option 1A: AMHS Historic and Projected Total Revenue vs. AMHS Operating Costs



These results demonstrate the extent to which AMHS operates in an expenditure-control rather than a revenue-driven business paradigm.

It would be very difficult to estimate how passengers might respond to the six scenarios at different tariff levels. The price elasticity of demand for AMHS services has never been measured in any quantitatively rigorous way. Such a study would be highly complex due to AMHS's many different routes and market segments. Additional challenges are imposed by the fact that ferry schedules and service levels vary from season to season and year to year, and by unplanned service interruptions. Finally, a thorough analysis of the price/demand relationship for AMHS would need to account for cross-elasticity, that is, changes in traffic demand resulting from changes in the prices of competing types of transportation, particularly cruise travel and air travel, as well as income elasticity, changes in demand resulting from economic factors that affect people's ability and willingness to spend.[16]

Elasticity of demand is usually expressed as the percentage change in demand that occurs in response to a percentage change in price. Note that the percentage change in demand does not typically remain constant for all changes in price. While a 10% price increase might result in a 5% decline in purchases, a 30% increase might result in 20% decline in purchases. Similarly, the percentage change in demand can vary depending on the dollar price in question. While many purchasers may ignore a 10% increase in a $10 price (to $11), they may be more sensitive to a 10% increase in a $300 price (to $330).

[16] The cost of competing transportation modes is a complex variable in itself, in part because none is strictly comparable to AMHS in the service it provides. Air travel is faster, but cannot accommodate vehicles or large amounts of freight or baggage. Neither does air travel provide the pleasurable experience of an Inside Passage ferry cruise. Finally, air travel is more weather dependent and less safe than ferry travel. Other modes –– cruise ships, barges, and highways (where available) –– have their own sets of similarities and dissimilarities compared with ferries.

Although inconclusive, past studies suggest that AMHS has relatively inelastic demand with respect to modest price increases. That is, within the range of fare increases that have been imposed in the past (typically 10% or less in a given year), the volume of AMHS traffic does not appear to be especially sensitive to price for most routes.

Previous customer survey research has suggested that one reason for inelastic demand is that most AMHS users perceive a high value for the service they receive, relative to the cost of that service. McDowell Group's September 2000 Alaska Marine Highway System Marketing and Pricing Study offers the following:

> Research in this study reveals that most customers consider AMHS a very good bargain for the money, especially when it comes to passage fares. The market, particularly the dominant summer visitor market, appears willing to pay more. This is confirmed repeatedly by customers who rate their AMHS experience as an excellent buy for the money, especially passage fares. The lucrative summer visitor market is especially appreciative of the value for the money.

The Marketing and Pricing Study also concluded that an increase in tariffs would result in an overall increase in system revenue, without significantly affecting traffic:

> Passage tariff increases are recommended at 30%, cabins, 20%, and vehicles, 5% above current tariffs. Research results indicate these specific increases will be accepted by most of the summer market. Further, pricing sensitivity modeling shows this will result in little loss of customers and at least a 10% increase in overall summer revenue…A somewhat less aggressive increase in 2001 – 20% passage, 20% cabins and 5% vehicles – would still result in an estimated overall system revenue gain of nearly 10%, again with little or no loss in passengers.

This is consistent with work done in 1992 by Erickson & Associates in the Long-Range AMHS Business Planning Analysis. Regarding the effect of price increases on traffic, the study states:

> Our statistical analysis of historical revenue and loads demonstrates that increases in effective fares have caused AMHS passenger and vehicle loads to decline by less than the percentage increases in the fares.

That study concluded that for Southeast passengers, a 10% fare increase would result in a 5.6% decrease in traffic, with a net 3.9% increase in revenue. The study also concluded that a 10% increase in fares for Southwest passengers would result in a 3.4% decline in demand, with a net increase in revenue of 6.3%. In other words, Southwest passenger traffic is estimated to be less elastic than Southeast passenger traffic.

A number of fare increases were implemented in the years following the McDowell Group study. For the current life cycle cost model, McDowell Group examined fare/traffic relationships for 13 representative AMHS routes between 1998 and 2008. During that period, cumulative increases in adult passenger fares ranged from 14% for the Cross-Gulf Juneau/Whittier run to 92% for the Juneau/Skagway run. When examined on a per-trip basis to account for variations in the amount of service provided from year to year, the percentage change in annual passenger counts for the 13 routes varied widely, from a 74% decline to a 101% increase over the ten-year period. Table 8.23 shows the net change in fares and in per-trip traffic from 1998 to 2008 for the selected port pairs.

Table 8.23
AMHS Traffic and Fare Changes, 1998 to 2008, by Port Pair

	Total Cumulative Adult Fare	Total Cumulative Vehicle Fare	Change in Annual No. of Passengers per Trip	Change in Annual No. of Vehicles per Trip
Bellingham/Haines	47%	40%	-9%	1%
Bellingham/Juneau	44%	38%	9%	45%
Prince Rupert/Ketchikan	42%	29%	-43%	-40%
Prince Rupert/Skagway	38%	29%	-74%	-59%
Juneau/Skagway	92%	76%	-40%	-30%
Juneau/Angoon	54%	50%	101%	113%
Juneau/Haines	85%	87%	-12%	-11%
Juneau/Sitka	73%	48%	55%	63%
Juneau/Whittier	14%	19%	-6%	45%
Ketchikan/Juneau	45%	40%	30%	27%
Ketchikan/Metlakatla	85%	87%	-12%	-11%
Valdez/Whittier	53%	45%	-32%	-21%
Homer/Kodiak	54%	42%	58%	64%

The table demonstrates some of the challenges of calculating overall elasticity factors for a system as large and complex as AMHS. First, from an economic perspective, there is no such thing as negative elasticity. Increases in price are assumed never to result in increases in demand. Clearly, then, in the case of some AMHS routes, factors other than price have affected traffic. Relatively large increases in ridership for Juneau/Angoon, Juneau/Sitka, Ketchikan/Metlakatla, and Homer/Kodiak likely are due in part to pent-up demand responding to additional service. That demand was not unmet due to lack of vessel capacity, for the most part, but rather due to the number and timing of opportunities to travel.

Finally, it may be noted that passenger traffic for AMHS as a whole declined from 1999 to 2005 and has increased each year since, again for reasons only partially associated with pricing.

For purposes of this analysis, the study team draws the following conclusions as they relate to price elasticity:

- Past studies and analysis of representative routes over the past 10 years suggest that demand is relatively inelastic for price changes of less than 10%. Among other things, this means that fare decreases would not generate sufficient new traffic to result in a net increase in revenue for most routes.
- Even though many travelers prefer ferries to air travel, practically speaking, the cost of air travel imposes an upper bound on ferry prices for most routes.

- Analysis of fare increases and traffic on selected routes between 1998 and 2008 suggests that, for planning purposes, price increases of 3% to 4% per year are possible without negatively affecting traffic, assuming fares do not exceed those of alternative modes.

8.11 SUMMARY AND CONCLUSIONS

The Alaska Marine Highway System faces a very challenging operating environment with equally challenging financial circumstances. Ship replacement needs, volatile fuel prices, wage increases, static markets, declining revenues and the difficulty of imposing significant tariff increases for ferry dependant communities result in a growing State subsidy.

This analysis is an important step in developing a long-range strategic plan for AMHS. The description of the six options defines the socio-economic and financial impacts for a range of ferry services, including expansion, contraction, and replacement and addition of ships. These options cover the spectrum of ferry services; each is sufficiently distinct that decision-makers and stakeholders will better understand the ramifications of the option(s) that best suit their particular needs. The analysis of each option is supported by a comprehensive life cycle cost analysis of capital and operating costs, revenues and socio-economic impacts. The results enable informed debate to refine service and capital expenditure decisions and generate the desired long-term benefits from the AMHS, at an affordable price.

AMHS is a highly subsidized business. State and Federal subsidies cover approximately 70% of annual expenditures. Fares are low, in economic terms, to encourage travel and generate the external social and economic benefits derived from the movement of people and goods. The analysis has shown that annual tariff increases of 10% for each of the next 10 years would increase the recovery of expenditures from business revenues from 30% to 43%, failing to bring AMHS to a point where revenues offset the costs associated with marine vessel operations and ship overhauls. It is equally important to note that such increases deter a significant volume of travel (a 22% decline in ridership is projected), thus working against the broader socio-economic objectives. This result clearly demonstrates the extent to which AMHS operates in an expenditure-control and not a revenue-driven business paradigm. It is equally evident that AMHS cannot "price its way" out of the current financial model.

In the current business model, all AMHS vessels could travel at full capacity on every voyage and still require a subsidy. In this paradigm, expenditure control is the lever to control subsidy.

On this basis, this analysis examined a total of six, 20-year options that, while considering some reasonable growth in ridership and revenues, were generally focused on expenditures. These included an option that considered procurement of two additional Alaska-Class ferries for use between the northern Lynn Canal ports of Skagway, Haines and the Juneau terminal at Auke Bay.

The FY09 service delivery plan was used as the Status Quo for this investigation. Over the 20-year period of this analysis, this plan is projected to require an average annual subsidy of $98.5 million to support Marine Vessel Operations and overhauls. If one also considers the various overheads, administration and shore side costs, the average annual subsidy required to support the AMHS is projected to be $121.3 million. From a total system

perspective that considers all expenditures and all capital investments, regardless of funding source, the average annual subsidy is projected to be $206.7 million.

From this baseline, the analysis examined current plans to replace Malaspina with an Alaska-Class shuttle ferry. Over the 20-year period of this analysis, this option is projected to require an average annual subsidy of $101.9 million to support Marine Vessel Operations and overhauls, and an average annual subsidy of $124.7 million for the AMHS as a whole. From a Total System perspective, the average annual subsidy is projected to be $207.2 million. These values are slightly higher than for the Status Quo. Similarly, both the net present value and profitability index are very slightly worse. As such, the analysis does not provide conclusive support for this replacement decision but recognizes that Malaspina's retirement and the introduction of an Alaska-Class ferry in her place may be required in order to continue to provide reliable service at or above current levels.

Both of the Service Reduction options (retirement without replacement of either Malaspina or Kennicott) have been shown to have a material, positive impact on the level of State subsidy. From the perspective of the Total AMHS system, the analysis projects reductions in the average annual financial assistance of $24.5 million or $20.7 million for Options 2A and 2B, respectively. The average annual financial assistance required to support all of AMHS' operations is projected to be $10.8 million lower if Malaspina is retired and $16.1 million if Kennicott is retired. These results confirm the assertion that, if the goal is to make a material reduction in subsidy in the AMHS service- and subsidy-driven business paradigm, it is necessary to reduce the number of ships, reduce the number of crews, and eliminate the associated direct and indirect overhead costs. Such decisions, however, must be made within the socio-economic context of the service delivery objectives and with regard to alternate transportation modes available to the affected communities.

The Multiple Alaska Class Ferry option includes replacement of two mainline vessels with three day-boat ferries to replace Malaspina, and to provide service between Prince Rupert and Ketchikan and within Lynn Canal. The current Auke Bay facility serves as the southern terminus of this Lynn Canal "triangle" route.

The capital and operating costs associated with these ships are substantially greater than the revenues they produce. Although more focused work is required to assess the potential growth in ridership, the modeling range applied to ridership is sufficient to accommodate both zero growth and some increase associated with the shorter route and lower fare. However, the currently forecast loss of revenue from the lower fares is projected to be larger than any increase in ridership, resulting in a lower net yield.

The following three figures assist the comparative analysis of the Status Quo, Service Reduction, Service Expansion and Multiple Alaska-Class Ferry options.

The first of these, Figure 8.29, is a Present Value (PV) comparison of:

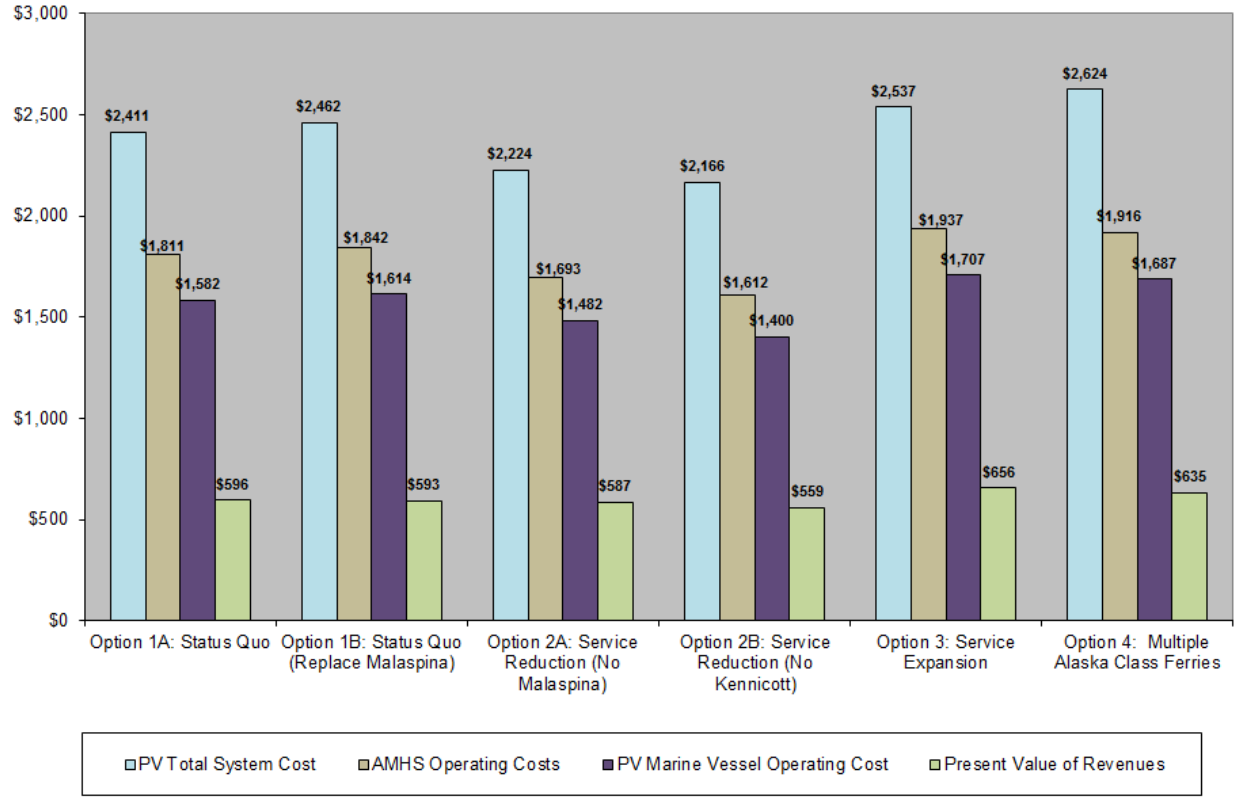
a) Total System costs (including all capital, regardless of funding source);

b) AMHS operating costs, as defined by current budgeting processes;

c) Marine Vessel Operations and overhaul costs; and

d) Total revenues.

Figure 8.29
AMHS Options Present Value (PV) of Revenue and Costs ($M)



On an overall basis and using Option 1A Status Quo as the baseline, the following conclusions can be drawn:

a) AMHS' financial performance is only slightly worse in Option 1B (where Malaspina is replaced by an Alaska-Class shuttle ferry). Once again, this decision is likely to be driven by technical and maintenance support issues and the need for reliable service and the continuation of a service program at or above current levels;

b) Either of the two Service Reduction options would result in noteworthy improvement in financial performance, although the socio-economic cost of Option 2B (Kennicott retirement) may be unpalatable;

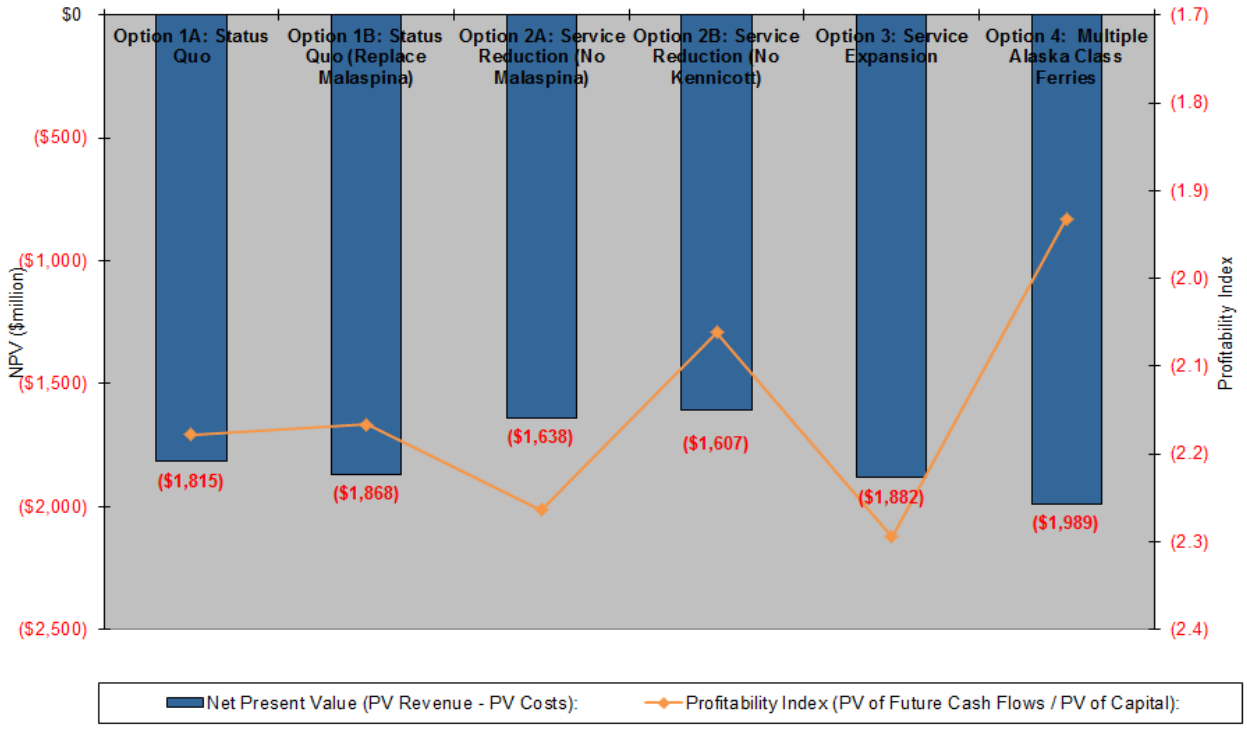
c) From a purely financial perspective, Option 3 Service Expansion is an undesirable performer. Although users may welcome increased levels of service, this scenario does not result in a sufficient increase in operating revenues to justify the increased operating costs; and

d) The Multiple Alaska-Class Ferry option demands a greater operating subsidy than all options except for the "full" Service Expansion Option 3. The revenues generated by the expanded Lynn Canal service fall well short of the level expected to accrue from the proposed capital expense. In this option, revenue yield actually decreases while Marine Vessel Operating costs remain unchanged. It may be possible to reduce these costs through changes to the current labor contract; however, examination of the potential savings is beyond the scope of this analysis.

These observations are even more apparent in the following 20-year comparison of Net Present Values and Profitability Indices for each of the options. The negative NPVs in Figure 8.34 are expressions of the PV of the required State subsidy. Since AMHS' costs are significantly greater than revenues, the NPV is negative in all options. Hence, the "deeper" the NPV bar, the greater the required subsidy.

The Profitability Index (PI) is the ratio of the PV of future cash flows to the PV of capital. In the private sector, this index is normally positive – revenues exceed expenditures and the ratio of this difference to capital expenditures yields a measure of profitability. In the subsidized AMHS environment, expenditures substantially exceed revenues. This yields a "negative index" whereby increasing the capital investment (that is, the denominator) results in a "less negative" or apparently better result. Profitability Index is really only relevant when comparing profitable projects. Because of the AMHS' losses, it is a misleading indicator but, to remain consistent with the Phase I report, the indicators are presented in Figure 8.30 and discussed in the ensuing paragraphs.

Figure 8.30
NPV and Profitability Index



Using the Status Quo Profitability Index (PI) of -2.18 as the basis for comparison, the following observations are made on the remaining options:

a. Option 1B. The PI of –2.17 is statistically identical to that of the Status Quo and is to be expected. The PV of Revenues is essentially unchanged, while the PV of Marine Vessel Operational Costs (numerator) and the PV of Capital (denominator - replacement of Malaspina) increase in a proportional manner.

b. Option 2A. The PI of –2.21 suggests a very slight reduction in profitability. Again, this is to be expected with the disposal of one ship, the significant reduction in PV Marine Vessel Operations and PV Shoreside costs (numerator factors), and the very large reduction in the PV of Capital (denominator) as AMHS would avoid the capital cost associated with Malaspina's life extension or replacement

c. Option 2B. The PI of –2.01 suggests that retiring Kennicott without replacement would be "less unprofitable" than the Status Quo. But it is important to examine the changes in the index components. The PV of Revenue (numerator) is $37 million lower, reflecting the loss of Cross-Gulf revenue. The PV of all expenses (numerator) is approximately $200 million lower while the PV of Capital (denominator) is some $45 million less, but is roughly equal to the reduction in revenues. In short, the major reduction in expenses dominates the index, lowering its absolute value, even while other key indices – Annual Equivalent Costs, Revenue as a % of Costs, Annual Financial Assistance Required – all suggest that this Option is the best performer financially.

d. Option 3. The PI of –2.29 is equally interesting, suggesting that this option is the more "unprofitable" than the Status Quo. The PV of Capital (denominator) is unchanged from the Status Quo. The PV of all expenses is $126 million higher while the PV of Revenue increases by $60 million. This 2:1 ratio reflects the incremental improvement in financial performance; however, such improvement requires an increase in the average annual subsidy of $6.6 million.

e. Option 4. The PI of –1.93 for Option 4 appears the least "unprofitable" of the six options. It reflects the significant, $107 million increase in the PV of Capital (denominator) associated with the acquisition of two Alaska-Class ferries. At the same time, the PV of expenses (numerator) increases by $105 million while generating an improvement of just $30 million in the PV of Revenue. In this case where there is a substantial capital investment, the losses are spread over a larger base; this makes the index look "less unprofitable" as a percentage of total investment.

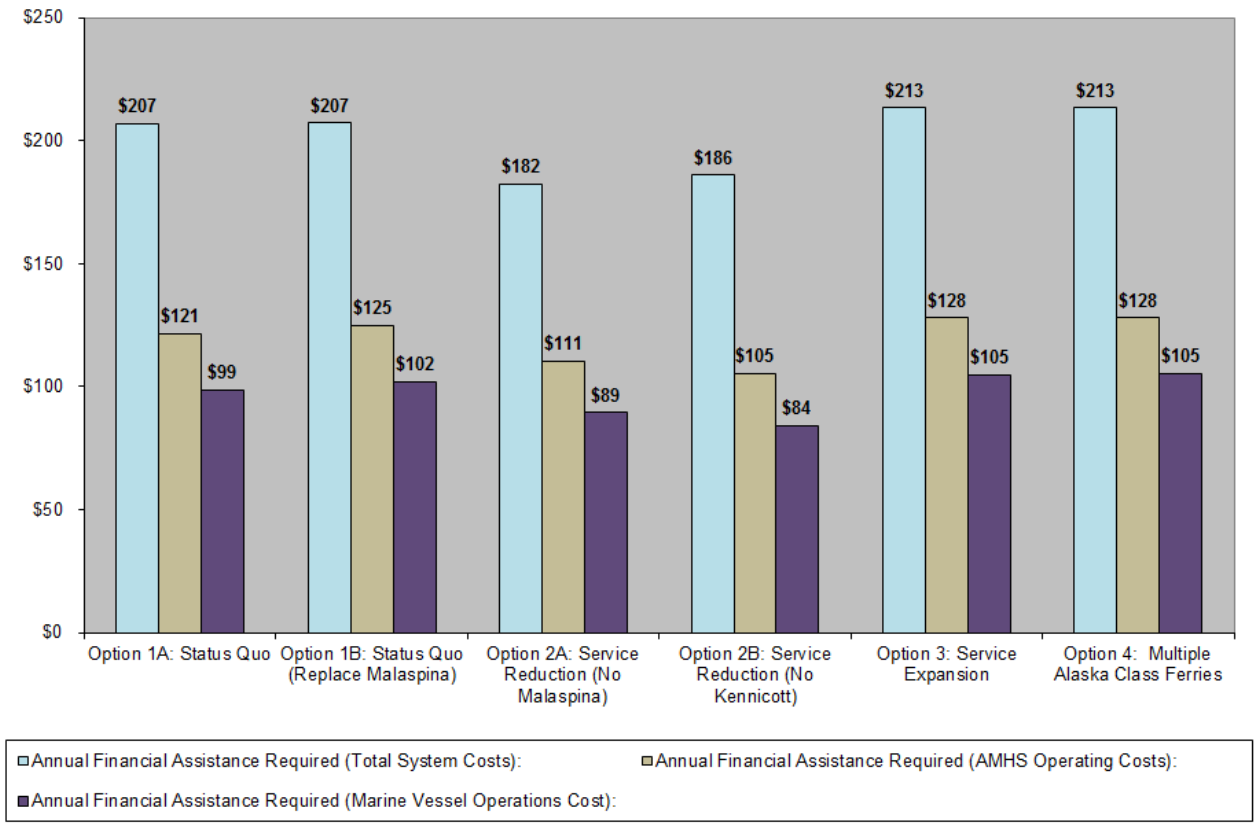
As noted above, this indicator is not appropriate in unprofitable enterprises but has been included for consistency with Phase I. It should not be used in the decision-making process and emphasizes the importance of considering a number of performance measures in the decision-making process.

The planned Malaspina replacement in 2014 is not projected to have a beneficial impact on profitability; indeed, this NPV analysis suggests that it is better from a financial perspective to invest in a life extension for this vessel.

Material deficit reduction requires service reduction to the extent that a ship is retired and sold. The analysis indicates the strategic nature of the decision respecting which ship to retire, as this has a significant impact on the financial outcome and the community impacts. The financial results of Kennicott's retirement are much better than that of Malaspina; however, disposing of Kennicott is done at the cost of the Cross-Gulf service.

Figure 8.31 below provides a direct comparison of the average annual financial assistance (i.e., the average annual subsidy) required to support the AMHS over the next twenty years. The "Total System Costs" include flow-through Federal and other funds that are normally associated with the capital program. As noted earlier, the average annual financial assistance (subsidy) required from Option 2B is higher than that of Option 2A largely because of the need to replace Malaspina in the 18th year of the 20-year analysis. The State subsidy required to support AMHS Operations and Marine Vessel Operations is more immediately relevant to decision-makers.

Figure 8.31
Average Annual Financial Assistance Required over the next 20 years ($M)



Comparisons of these confirm that a significant reduction in service and a reduction in the number of vessels are necessary to achieve a material subsidy reduction. By contrast, it also confirms that the expansion of the AMHS fleet to incorporate three Alaska-Class ferries (while retiring two mainliners Malaspina and Taku) would require an increase in the average annual subsidy of approximately $7 million.

In summary, the Multiple Alaska Class Ferry option does not compare favorably, in financial terms, with any of the options examined in this analysis. Expanding the fleet and using two Alaska-Class ferries to meet the marine service needs in the North Lynn Canal requires the highest annual AMHS subsidy. Other ship deployment options and, potentially, different personnel contract terms and conditions would require careful study in conjunction with the other components of this plan in order to find means of reducing capital and operating expenditures while offering reasonable year round mobility.

Five primary conclusions are drawn from the options analysis:

1. The 12 year period FY1995-2007, described under "AMHS Business Paradigm', experienced a 96% growth in total expenses, a 15% growth in revenue that resulted in a 230% increase in State subsidy. Service changes implemented in FY2008 significantly moderated this trend. However, the historic growth in the gap between expenditures and revenue will continue under all options that offer the current level (Status Quo Option) or a greater amount of service. Continuation of the Status Quo option will result in a State subsidy increase from $157.5 million in FY2010 to $172.5 million in 2019, and an average annual subsidy of $206.7 million through to 2029.

2. A material reduction in subsidy necessitates service reductions to the point where a ship can be retired and sold. Over the twenty year period of this analysis and when compared to the Status Quo, disposing Malaspina reduces the AMHS average annual subsidy by $10.8 million while disposing Kennicott creates a $16.2 million reduction. Due to the different operating characteristics of the AMHS fleet, the community impact varies with each specific ship disposal and requires more detailed consideration in any ongoing evaluation of ship disposal options.

3. Tariff sensitivity analysis, on the Status Quo option, concludes that regular, significant fare hikes are required to increase the system's cost recovery. Rate increases of three times CPI were not sufficient to absorb anticipated wage increases, let alone other cost escalation. A tariff model was examined whereby fares were increased by CPI+10% annually for ten years. This scenario caused an increase from 25% to 50% in the ratio of revenue to Total AMHS System expenditure. Price elasticity work previously conducted forecasts a 22% traffic decline due to these increases. For AMHS to transition to a business model that recovers the majority of expenditures from user revenue requires a significant adjustment to both service and price. Given this paradigm, it is important to improve the sophistication of cost control and performance reporting techniques and systems; as well as, undertaking comprehensive, longer-term analysis for all service and tariff proposals.

4. In the AMHS business paradigm, where subsidies approximate 70% of total expenses, cost control, performance management and comprehensive long-term service and tariff planning are of the utmost importance. AMHS should consider ongoing investment and training in systems and techniques that will improve cost control and monitor the performance of the ferry service. Future service and tariff proposals should be subject to a comprehensive, long-term analysis.

5. Options 1B and, 4 illustrate that ship replacement of one or more existing vessels with Alaska-Class ships will increase the subsidy requirement, particularly in Option 4 where the fleet size increases. In subsidized businesses, the replacement or addition of major assets is more costly than refurbishment. Strong ship replacement justification occurs when capacity requirements change or new regulations render a vessel obsolete. Intuitively, new ships are more reliable than old refurbished vessels; however, supporting availability and cost data is difficult to obtain.

When replacing vessels, AMHS must pay careful attention to the longer-term service requirements and the expenditure and the subsidy implications of the investment to ensure that the desired service levels are affordable.

6. Service expansion will not generate revenue sufficient to recover the added expenditure. The socio-economic impacts of more general expansions such as Option 3 are relatively minor. Service expansion must be strategic, focused on specific markets, and designed to achieve specific purposes.

CHAPTER 9

PHASE III AMHS PORT COMMUNITY SURVEY

9.1 INTRODUCTION

This research explores public knowledge of, and attitudes toward, some of the broad issues of ferry service and cost that are highlighted in the life-cycle financial modeling of the Alaska Marine Highway Systems Analysis, Phase 2. It is important to remember that ferry service needs and preferences can vary substantially from community to community, even for ports of roughly the same size and in the same geographic area. This research is qualitative in nature and is not designed to provide a basis for allocating service or setting specific rates.

9.2 MAJOR THEMES

Respondents from all ferry ports rated ferry service of very high importance to their communities. Although some respondents commented that fares are high, many are willing to pay more rather than face reduced service. Those in smaller communities rate ferry service importance the highest. At the same time, respondents from the smallest communities with the least service are more likely to say they have about the right amount of ferry service than those from larger communities, many of which have much more service.

Additional ferry service is of especially high value to a component of port residents that ranges from less than 10 percent to more than 30 percent, depending on where they live. Those respondents (20 percent overall) said that more service with significantly higher fares would be preferable to either existing service and fares or to less service and lower fares. In smaller Southeast ports this proportion was one in four, and in Southwest ports it was one in three.

When forced to choose a single strategy to address continuing increases in ferry operating costs, only 15 percent of respondents said reducing service should be the strategy. Approximately one-third picked increasing fares. Nearly 40 percent indicated neither reduced service nor higher fares was acceptable, and half of those (20 percent overall) said subsidies should increase.

Respondents are split with respect to the current level of General Fund support for the AMHS. Slightly less than one-half (45 percent) said it is about right. Approximately one-third said it is too little, and eight percent said it is too much. Residents of Southwest communities and larger Southeast communities are more likely than others to say the General Fund subsidy is too little.

The ability to travel with a personal vehicle was rated highest in importance among five ferry attributes in forced trade-off comparisons. This is consistent with the view, expressed by many in open-ended comments, that the ferry system's primary purpose is to substitute for highways where none exist.

- Among the other four attributes, "maintaining ferry prices at current levels" and "more frequent service" were the most highly rated. Southcentral port communities were most interested in maintaining current prices, and Southwest ports especially wanted more service.

- "More convenient arrival and departure times" and "reduced travel times" are both seen as less important than the other three attributes by respondents from all regions.

Asked what one thing they would do to improve the ferry system, respondents most often answered "more service" or "better schedules." The next most popular answer was "nothing, the system is good as it is," followed by "lower fares."

Differences of opinion, open-ended comments, and "don't know" answers from this survey suggest that residents of AMHS ports need more information about the system's operating and financial conditions, especially if they are to help shape policies to address the challenges faced by system managers. The life-cycle financial model developed during this study can provide key pieces of that information.

9.3 SURVEY PURPOSE

The purpose of the survey is to learn more about how residents of communities with ferry service feel about the service they get and the cost of that service. This report is intended to help frame and inform ongoing public discussion of the Alaska Marine Highway Systems Analysis, Phase 2 and, more generally, the overall mission and priorities of the AMHS. The information will be used in future efforts to help the public understand the implications of the life-cycle cost modeling and will assist managers and decision makers in their ongoing efforts to address the balance of cost, fares and service.

9.4 SURVEY METHODOLOGY

The survey was fielded using a combination of telephone and online data gathering. The following were key steps in the fielding process:

- A sample target of 600 completed surveys was allocated across 30 AMHS port communities.

- Telephone surveyors called randomly selected phone numbers in each port community.

- Those agreeing to do the survey were provided a password and a website address by email. They were asked to log onto the survey site and follow instructions. People who were willing to do the survey, but who were either not equipped or not comfortable responding on line were offered the opportunity to answer the survey questions over the phone.

- The final number of completed surveys was 590, representing four regions of the ferry system:

    - Southwest – 64 responses
    - Southcentral – 108 responses
    - Smaller Southeast ports – 229 responses
    - Larger Southeast ports – 189 responses

Approximately 50 percent of those contacted declined to participate. Approximately 50 percent of those who said they would participate actually completed the survey, 116 over the telephone and 474 on the internet survey site. This is an overall response rate of 25 percent. [Please see section 9.5, Respondent Demographics, for a profile of the survey sample.] Surveyors were able to obtain responses from at least one person in all but one AMHS port (Tatitlek).

In the tables presented in this report, the number of respondents answering a question is noted by "n = #".

9.5 RESPONDENT DEMOGRAPHICS

Table 9-1 shows the location of surveyed households. A total of 29 AMHS port communities were represented in the survey.

Table 9.1
Location of Survey Households

n=590	Total
Smaller Southeast	39%
Haines	8
Hoonah	7
Petersburg	5
Metlakatla	5
Skagway	5
Angoon	2
Kake	2
Wrangell	2
Yakutat	2
Pelican	1
Tenakee	1
Larger Southeast	32%
Juneau	16
Ketchikan	9
Sitka	7
Southcentral	18%
Cordova	6
Kodiak	5
Homer	3
Valdez	3
Chenega Bay	1
Seldovia	1
Whittier	1
Southwest	11%
Unalaska	2
Sand Point	2
Port Lions	2
King Cove	2
Chignik	1

Cold Bay	1
Akutan	1
False Pass	1

Survey respondents reported an average age of 54, ranging from 48 years old in Southwest to 57 years old in larger Southeast communities (Table 9.2).

Table 9.2
Survey Respondent Age

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
Under 30	4%	6%	10%	2%	3%
30 – 40	11	22	16	8	8
41 – 50	21	28	19	24	17
51 – 60	30	28	31	31	29
61+	33	16	24	34	43
Average age*	**54.4**	**48.0**	**50.4**	**55.7**	**57.4**

* The average age of all Alaskans who are over 18 is 44.

The most common income range reported by respondents was $50,000 to $100,000 (Table 9.3). When responses were assigned mid-points and averaged, the average was highest among Southwest residents at $87,000 and lowest among residents of smaller Southeast communities at $61,000.

Table 9.3
Respondent Income Range
Which category best describes your total combined household income before taxes for 2009?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
Less than $10,000	2%	2%	-%	3%	2%
$10,001 to $20,000	6	5	6	10	2
$20,001 to $30,000	7	2	3	11	6
$30,001 to $50,000	18	22	19	22	12
$50,001 to $100,000	36	27	40	34	40
$100,001 to $150,000	16	28	17	11	16
Over $150,000	6	9	8	3	8
Don't know	1	-	-	2	2
Refuse	7	6	7	4	11
Average household income*	**$74,000**	**$86,800**	**$80,300**	**$60,900**	**$82,800**

* Averages computed using the midpoint of the ranges given in the table.

Slightly more than half of respondents were female. Women typically are more likely than men to participate in telephone surveys.

Table 9.4
Respondent Gender

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=-189
Female	55%	50%	63%	50%	58%
Male	45	50	37	50	42

9.6 SURVEY RESULTS

The telephone/internet survey of 590 households in communities serviced by the Alaska Marine Highway was conducted in February of 2010. A total of 29 communities were represented in the survey. Results are presented below for the total sample as well as by region: Southwest, Southcentral, Larger Southeast (Juneau, Ketchikan, Sitka), and Smaller Southeast (other Southeast communities serviced by AMHS).

It is important to remember when interpreting survey results that the Alaska Marine Highway System consists of at least five different types of service.

1. Long-haul service using mainliner vessels between Alaska and Prince Rupert or Bellingham (COLUMBIA, MALASPINA, MATANANUSKA, TAKU, KENNICOTT), and across the Gulf of Alaska (KENNICOTT)
2. Long-haul service along the Aleutian Chain using ocean-going (SOLAS) ferries (TUSTUMENA and KENNICOTT)
3. Short-haul service in Southcentral using a combination of vessels
4. Short haul service in Southeast using circuit ships (LECONTE Class, TAKU)
5. Dayboat service to Metlakatla, in Lynn Canal, between Juneau and Sitka, and in portions of Prince William Sound using displacement (LITUYA) and high-speed (FAIRWEATHER and CHENEGA) shuttles

These five sub-systems serve very different community and passenger needs.

9.6.1 Current Ferry Usage

Number of Trips

Respondents reported an average of ten one-way ferry trips among members of their households in the previous year (Table 9.5). The average was lowest among households in larger Southeast communities (5.1 trips) and highest among households in smaller Southeast communities (15.2 trips).

Among residents of communities with jet service, the average number of trips reported was 6.3 trips, less than half the number reported by residents of communities without jet service (13.7 trips).

Table 9.5
Average Trips
How many one-way trips did you or others in your household take on the Alaska ferry system in the last 12 months? (Please count each round trip as two)

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
0 – 4 Trips	45%	69%	53%	21%	61%
5 – 10	23	11	20	26	24
11 – 20	18	5	18	29	8
21 – 50	10	8	5	20	2
51+	1	3	1	2	-
Don't know	3	5	4	2	5
Average number of trips	**9.8**	**7.4**	**7.8**	**15.2**	**5.1**

Among those who reported taking at least one trip on the ferry in the past year — three quarters of all respondents — the average number of ferry trips that included a personal vehicle was 8.0 (Table 9.6). The number of vehicle trips ranged from 3.9 among residents of larger Southeast communities to 10.3 trips among residents of smaller Southeast communities.

Table 9.6
Average Trips with a Vehicle
How many of those trips included traveling with a personal vehicle?
(Base: those who took a trip on the Alaska ferry in the last 12 months)

Base=456	Total n=456	Southwest n=37	Southcentral n=79	Smaller Southeast n=205	Larger Southeast n=135
0 – 4 Trips	59%	68%	54%	47%	77%
5 – 10	19	8	19	24	16
11 – 20	13	5	19	18	5
21 – 50	7	16	6	9	2
51+	1	3	1	2	-
Don't know	<1	3	-	-	1
Average number of trips	**8.0**	**9.0**	**8.4**	**10.3**	**3.9**

Preference for Ferry or Air Travel

A majority of residents in three of the four regions said they prefer ferry travel to air-taxi travel.

- Overall, seven out of ten survey respondents said they prefer travel by ferry over scheduled air taxi, while two of ten prefer air. Ten percent said neither or declined to answer.
- Residents of smaller Southeast communities expressed the strongest preference for ferries at 84 percent, followed by larger Southeast community residents at 70 percent, Southcentral residents at 61 percent, and Southwest residents at 47 percent.

In Southwest, it should be noted that communities receive substantially less ferry service, on average, than most ports in the other three regions. Further, the distance that must be traveled between ferry ports and the nearest larger communities is much longer for most Southwest residents.

Do you usually prefer to travel by ferry or scheduled air taxi?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeas n=229	Larger Southeast n=189
Ferry	71%	47%	61%	84%	70%
Air taxi	19	47	20	11	18
Neither	6	3	10	3	8
Don't know/Refused	4	3	8	2	4

Respondents who prefer ferry travel gave four main reasons:

- Enjoyable, leisurely, social travel
- Safer, less weather dependent, more reliable service
- Lower cost
- Ability to take a vehicle or large amounts of baggage/supplies

Typically, respondents referenced more than one of the above. Together, these four factors represent the package of advantages most people perceive in ferry travel.

Respondents who prefer air taxi service nearly all said the reason was a combination of faster travel and more convenient schedules. A few said that air taxi service is less expensive when the cost of longer stays and less convenient travel is added to the cost of ferry fares.

9.6.2 Attitudes toward Current Ferry Service

When asked how they felt about the amount of ferry service to their communities, nearly half of respondents said they receive less than what their community needs, while the same amount said they receive about the right amount. Only 2 percent said they receive more than what is needed.

Responses varied widely by region. Southcentral residents were much more likely to say that their communities receive less than what is needed, at 69 percent. Southwest residents were much more likely to say they receive about the right amount (77 percent). Southeast residents were split, but residents of smaller communities were slightly more likely to say they receive the right amount of service.

Table 9.7
Amount of Service
Would you say the amount of ferry service your community receives year-round is…?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
More than the community needs	2%	0%	1%	1%	3%
Less than the community needs	48	23	69	43	51
About the right amount	48	77	25	55	43
Don't know/Refused	2	-	6	1	3

9.6.3 Importance of Ferry Service

Nine out of ten survey respondents characterized ferry service as "very important" to their communities. Nine percent said it is "important." Only 1 percent said it is "slightly important," and zero respondents said it is "not important."

While importance was rated highly among all regions, it was particularly so among residents of smaller Southeast communities (97 percent "very important").

Table 9.8
Affordability of Service
How important would you say that having affordable ferry service is for your community?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
Very important	91%	92%	88%	97%	85%
Important	9	8	12	3	14
Slightly important	1	-	-	<1	1
Not important	-	-	-	-	-
Don't know/Refused	-	-	-	-	-

9.6.4 Preferences for Frequency versus Fare Increases

Respondents were asked to select among three situations describing ferry frequency and fares. The choices are intentionally broad and are not intended to reflect realistic policy options. Instead they are designed to obtain a sense of the relative importance of fares versus frequency of service. The question was posed in two forms, 1) with respect to what is best for the community and 2) with respect to what is best for the individual household.

- The most frequent choice with respect to communities was "the same frequency of ferry service you have now with the same fares," selected by 71 percent of respondents. One out of five respondents selected "more

frequent service but with significantly higher fares." Just 8 percent selected "less frequent service but with significantly lower fares."

- While a majority of residents in all regions said keeping frequency and fares as they are would be best for the community, there were slight differences by area. The highest proportion choosing the status quo was in Southcentral, with 86 percent saying to keep frequency and fares the same. One third of Southwest respondents and one quarter of Smaller Southeast respondents said that more frequent service with significantly higher fares would be preferable to either of the other choices.

- Household income level, alone, had no bearing on the responses to this question. The percentages choosing each alternative were virtually identical for households earning less than $50,000 per year and those earning more than $50,000 per year.

- The largest proportion choosing less service/lower fares under these three scenarios was just 15 percent in Larger Southeast, the communities with the most frequent and reliable air and barge service.

These responses suggest, though not conclusively, that the main influence on people's desire for, and willingness to pay for, more ferry service is primarily a function of the availability of alternative modes rather than price. That, in turn, suggests that ferry travel tends to be viewed as non-discretionary, i.e., as a necessity (Table 9.9).

Table 9.9
Best Service for Community
Which of the three situations below would be best, overall, for future ferry service to your community?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
The same frequency of ferry service you have now with the same fares	71%	64%	86%	69%	68%
More frequent service but with significantly higher fares	21	34	7	26	17
Less frequent service but with significantly lower fares	8	2	6	6	15

Respondents were again asked to select among three scenarios of frequency and fares, this time choosing what would be best for members of their households. More than half preferred to keep frequency and fares as they are; one-quarter preferred more ferry service with higher fares; and 16 percent selected less ferry service with lower fares.

Respondents, then, may feel slightly more price sensitive with respect to their individual households than with respect to the community as a whole (Table 9.10). Nevertheless, the responses indicate a strong reluctance to accept less service, even if it means saving money.[17] Differences by region were similar to the previous question.

[17] As noted earlier, the definition of "enough service" varies widely from community to community (and rider to rider). These research results are broad indicators and are not a measure of service needs for individual ports or routes.

Table 9.10
Best Service for Household
Which of the three situations below would be best, overall, for the members of your household?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
The same amount of ferry service you have now with the same fares	59%	50%	77%	58%	55%
25% more ferry service with 25% higher fares	25	45	6	31	20
25% less ferry service with 25% lower fares	16	5	17	11	25

9.6.5 PRIORITY TRADE-OFFS

This question asked about the relative importance, to respondents' communities, of five attributes of, or priorities for, ferry service:

- Ability to take a personal vehicle on the ferry
- Maintaining ferry prices at current levels
- More frequent service (more arrivals and departures) in your community
- More convenient ferry arrival and departure times
- Faster ferries to reduce travel times

To help respondents make these comparisons, the attributes were presented three at a time in several different combinations. For each set of three, respondents were asked to identify the most and least important. This type of question, known as a "MaxDiff" analysis, provides information about both the order of respondents' priorities and the relative degree of importance they attach to each of the choices.

High scores in the table below indicate high priority, lower scores indicate lower priority ***relative to the other choices provided***. The size of the difference between one score and the next is an indicator of the size of the difference in priority for the respondents. It is important to remember that the scores only refer to the choices in the question. There may be other priorities or considerations that respondents would rate as highly or more highly, if they were asked.

Tale 9.11
Most Important and Least Important for Community
Which of the following is most important and which is least important to residents of your community?

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
Ability to take a personal vehicle on the ferry	29.4	33.6	31.9	29.0	27.0
Maintaining ferry prices at current levels	25.5	26.4	31.0	23.5	24.3
More frequent service (more arrivals and departures) in your community	22.0	30.1	16.7	23.3	20.7
More convenient ferry arrival and departure times	12.0	5.7	9.7	14.3	12.7
Faster ferries to reduce travel times	11.2	4.3	10.6	9.9	15.3

- The ability to take a personal vehicle was rated highest in all four regions and especially in Southwest and Southcentral. This is consistent with the view, expressed in many survey comments, that residents of ferry port communities rely on the AMHS to provide the same basic services as a paved road system. The ability to take a vehicle to the destination port or beyond is seen as an important benefit of ferry travel.
- "Maintaining ferry prices at current levels" and "more frequent service" are the other highest rated attributes. These results suggest that Southcentral is the region that is most sensitive to price increases.
- Not surprisingly, given the historical service levels in Southwest, more frequent service was rated significantly higher by those residents than by respondents from the other three regions.
- "More convenient arrival and departure times" and "reduced travel times" are both seen as less important than the other three attributes by respondents from all regions. Convenient arrival and departure got the highest ratings in Southeast. This is consistent with open-ended comments, below, in which many Southeast respondents suggested schedules that facilitate short, round-trip visits to hub communities
- "Faster ferries to reduce travel time" is most important to respondents from larger Southeast communities. This reflects, at least in part, the role of fast vehicle ferries between Juneau and Sitka and in Lynn Canal.

9.6.6 Ideas to Improve the Ferry System

Asked what one thing they would do to improve the ferry system, respondents most often answered "more service" or "better schedules." The next most popular answer was "nothing, the system is good as it is," followed by "lower fares."

- More service was especially key for residents of Southwest Alaska and the smaller communities of Southeast, but was also identified by some respondents from Cordova and Valdez.

- Better schedules were primarily an issue for Southeast residents, especially those in smaller communities, but also for those from Southcentral. The predominant comment was to adjust schedules so that round trips to hub communities, and connections to other transportation modes in hub communities, could be accomplished in a reasonable period of time (one or two days) and without expensive hotel stays.

- Lower fares were primarily an issue for Southeast residents and for some in the Prince William Sound area. No one from Southwest and just one person from Kodiak picked lower fares as their one suggestion.

Table 9.12
Ideas to Improve the Ferry Improve System
Themes from Open-Ended Suggestions
about How to Improve the Alaska Marine Highway System

Topic	# Suggestions	Main Communities
More service, more seasonal service	161	Southwest, smaller Southeast, some Prince William Sound
Better, more convenient schedules	110	Southeast, especially smaller, and Southcentral
Nothing – the system is good as is	68	
Lower fares	47	Mainly Southeast, some Prince William Sound
Faster ships	26	Southeast
New ships	15	Southeast, some Southwest
Better sleeping arrangements, especially in public spaces	8	Southeast
More vehicle space	6	Cold Bay, Yakutat, Wrangell
Other	137	Various
Don't know	12	Various

Among the "Other" suggestions were better food, better accommodations for elders and people with disabilities, improving the terminal experience, and many ideas for changes to specific service schedules or routes. High speed or "faster" ferries were the subject of approximately twenty comments, and are viewed from two perspectives. Roughly half the comments applauded faster service. The other half described the current fast vehicle ferries as unreliable and expensive.

A list of all the suggestions has been conveyed to AMHS management for their consideration.

Regional Priorities

Southwest – By far the most common suggestion for improving the ferry system in Southwest Alaska was more service. This includes more capacity for vehicles, more service in the summer, and extending the spring and fall shoulder seasons.

Southcentral – Suggestions from Southcentral residents covered a variety of topics. Most often mentioned was more service, especially for Cordova, Homer, Kodiak and Valdez. Residents of Kodiak were also most likely to say

they are satisfied with the current system. Better schedules were especially an issue for Cordova, Seldovia and Valdez.

Smaller Southeast Ports – Respondents from smaller Southeast ports were most likely to suggest better schedules or more service, both of which got approximately the same number of mentions.

Larger Southeast Ports – Respondents from Juneau, Sitka, and Ketchikan focused equally on better schedules, lower fares and more service. They mentioned faster and newer ships.

9.6.7 State Support for the Ferry System

- Respondents were provided basic information about ferry system costs and sources of funds. They were then asked if the portion of ferry costs covered by the General Fund was too much, too little, or about right. Approximately 45 percent of respondents said it is about right, and 35 percent said "too little." Only 6 percent felt the amount of General Fund support was "too much."
- Responses varied little by region, although Southcentral residents were less likely to say the General Fund amount was "too little," and Southwest residents were more likely.
- Fourteen percent said they don't know.

Table 9.13
Perception of State Support
Right now, it costs about $150 million a year to run the ferry system. The State General Fund pays for about two-thirds or $100 million, and ticket sales pay for about one-third or $50 million. Do you think the amount that the State General Fund pays is…

	Total n=590	Southwest n=64	Southcentral n=108	Smaller Southeast n=229	Larger Southeast n=189
Too much	6%	2%	8%	6%	6%
Too little	35	44	22	33	41
About right	45	45	49	48	40
Don't know/Refused	14	9	20	14	13

9.6.8 Options for the Future

Although real AMHS management strategies employ a combination of tactics to address the balance of cost and service, this question forced respondents to choose just one. The purpose was to learn what respondents think are the most viable choices, and, especially, the extent to which service reduction is seen as a viable option.

- Only 15 percent of respondents chose reducing service as the primary way to address increasing costs.
- Respondents were more than twice as likely to support increasing fares (36 percent) as reducing service.
- More than one-third chose neither less service nor higher fares and suggested other options. More than half of those (20 percent of respondents overall) said to increase subsidies.

- Southwest residents and residents of smaller Southeast communities were more likely to support increasing fares, and less likely to support reducing service, when compared to residents of Southcentral and larger Southeast communities.

- Ten percent had no suggestion.

Table 9.14
Options for the Future
Analysis has shown that even if all AMHS ferries were full all the time, the fares would not be enough to cover the cost of the system. If costs continue to increase in the future, do you think AMHS should:

	Total	Southwest	Southcentral	Smaller Southeast	Larger Southeast
Increase fares	36%	48%	32%	41%	28%
Reduce service	15	6	25	9	20
Do something else	38	36	30	40	43
Increase subsidy	20	14	16	20	24
Reduce costs	9	11	4	10	9
Build revenue	2	-	-	3	3
Charge nonresidents more	2	3	3	2	2
Increase fares and reduce service	1	-	1	<1	2
Other	4	8	6	3	4
Don't know/Refused	10	9	13	10	10

APPENDIX A

AMHS ANNOTATED BIBLIOGRAPHY

The Alaska Department of Transportation and Public Facilities (DOT&PF) has asked a diverse study team to review various aspects of the Alaska Marine Highway System (AMHS) in order to identify system financial and operation challenges, examine management and planning practices, and recommend methods and tools to ensure safe, reliable ferry service in keeping with the mission and objectives of the AMHS. Headed by the University of Alaska Fairbanks, the project team includes the McDowell Group, Information Insights, HDR Alaska, Inc., and the Van Horne Institute.

The McDowell Group was tasked with compiling an annotated bibliography of documents and research related to the AMHS, covering a range of perspectives from system design and history to economic impacts and vessel design. Documents covered in the bibliography are from periods throughout the history of the AMHS, though most attention was given to publications from the last ten years. The purpose of this annotated bibliography is to provide the project team with a fairly comprehensive overview of available relevant documents. The bibliography is a working compilation of sources related to AMHS and may be expanded as the project progresses.

ALASKA MARINE HIGHWAY SYSTEM-SPECIFIC DOCUMENTS

GENERAL DOCUMENTS

2006. **Northern Panhandle Marine Service Alternatives Traffic Forecast and Benefit/Cost Analysis**. McDowell Group.

This report is part of the North Panhandle Transportation Study and addresses passenger and vehicle traffic, and benefits and costs associated with a range of marine service alternatives for the North Panhandle service area. The analysis considers capital costs, annual operations and maintenance costs, revenues, and user benefits for five service alternatives. The report is available from the McDowell Group.

2006. **Sitka Access Service Alternatives Traffic Forecast and Benefit/Cost Analysis**. McDowell Group.

This analysis considers capital costs, annual operations and maintenance costs, traffic, revenues, and user benefits for five service alternatives for surface access to Sitka. Traffic forecasts developed for this study considered several sources of information, including results of a Sitka household survey, historical AMHS traffic data, and case study data. This report is available from the McDowell Group.

2004. **Northern Panhandle Community Survey**. McDowell Group.

This 19-page report presents findings from a 2004 survey of households in the Northern Panhandle, as part of the Sitka Access Environmental Impact Study (EIS) and North Panhandle Transportation Study. Findings include respondents' opinions towards access priorities, ferry issues, ferry versus flying, and travel to Juneau, Sitka, and Petersburg. The document is available from the McDowell Group.

2004. **Alaska Marine Highway Visitor Profiles**. McDowell Group.

This report presents visitor information from two surveys: a custom onboard survey of ferry passengers and sections of the summer 2003 Alaska Travelers Survey, a proprietary visitor industry database. Visitor information presented in the report includes various trip satisfaction ratings and visitor profiles of a sampling of visitors who used the marine highway to enter or exit Alaska, or travel between communities. The report also provides specific marketing recommendations. It is available from the McDowell Group.

2004. **Any Tonnage, Any Ocean: Conversations with a Resolute Alaskan**. Jacquelin Benson Pels.

Any Tonnage, Any Ocean is a biographical narrative about Captain Walter Jackinsky, Jr. of Ninilchik, a 34-year veteran of the AMHS. The 307-page book intertwines historical writings from the Jackinsky family, local/Native history, and a history of the marine highway system. The title of the book refers to Captain Jackinsky's master mariner's license - "Any tonnage, any ocean." The book is available at the Alaska State Historical Library, as well as some bookstores.

2002. **Marine Highway Transportation Improvement Study,Parts I and II**. McDowell Group.

This study, prepared for Southeast Conference, assessed the potential benefits of commissioning a comprehensive, independent study of the future of the AMHS. The McDowell Group provided an analysis of the current situation, identifying limitations and sources of revenue problems. The report also includes evaluations of potential management models and examples of both in-state and Outside management models. Finally, the study team provided a recommended request for proposals (part II of the report) to conduct a full-scale system improvement study. The report is available from the McDowell Group.

2001. **Alaska Travelers Survey Custom Report: Alaska Marine Highway System Summer 2001 Survey**. McDowell Group.

This report describes findings from a 2001 summer survey of ferry passengers. The survey was conducted as part of the Alaska Travelers Survey (ATS), a proprietary statewide research tool developed by the McDowell Group to provide critical marketing planning information, to help AMHS enhance its market presence and make greater use of unfilled inventory. Data analysis and marketing implications focus are several key topics of survey findings. They include ferry experience, trip planning, travel patterns, past and future Alaska travel, and demographics information. The report is available from the McDowell Group.

2001. **Lynn Canal and Northern Panhandle Ferry Operations and Service Study**. McDowell Group.

This year-long study for the DOT&PF assessed demand for passenger, vehicle, and freight movement between 11 communities. The study team developed recommendations for the best balance of cost and service, including specific routes, schedules, and vessels. McDowell Group prepared benefit/cost and net present value analysis and Elliott Bay Design Group of Seattle performed vessel operations analysis based on standardized operating periods to help identify the most cost-effective alternative. A series of 22 community meetings ensured broad input to the process. The report is available from the McDowell Group.

2000. **Alaska Marine Highway System Marketing and Pricing Study**. McDowell Group.

The AMHS Marketing and Pricing Study is a three-volume report which makes recommendations for how AMHS can enhance revenue and decrease subsidy through improved marketing and pricing practices. The first volume of the report is a summary of key findings and recommendations (functioning as an executive summary of the one-year study); the second volume discusses customer research findings and relevant recommendations (based on numerous onboard and telephone surveys, and focus group research); and the third volume provides supplementary recommendations and supporting information for the marketing and pricing strategies discussed in the first volume.

The report also includes four supplementary items: an interim report for internal AMHS management use that provides a market assessment and summary of research findings, a short-term marketing and pricing action plan, a document with strategic information and business modeling tools, and a report on the focus group research. All portions of the report are available from the McDowell Group.

1994. **Alaska Marine Highway System Ferry System Alternatives in the Prince of Wales Island Service Area (Volume I) and Prince William Sound (Volume II**). McDowell Group and Art Anderson & Associates.

This study provides an overview of possible service alternatives in the Prince of Wales Island and Prince William Sound service areas. Economic and public satisfaction issues are examined, as well as alternatives for the next 20 years, considering predictable changes in the needs of the communities. The report offers technical, economic, and public service data used to identify optimal service levels. The appendices contain data on vessel, terminal and scheduled information, and results of detailed market assessments. The report is available from the McDowell Group.

1993. **Building an All American Ship: The Alaska Model**. Alaska Marine Highway System.

This descriptive document outlines the project model for building a vessel for the AMHS—an American-built ocean-going passenger and vehicle ferry that will serve Alaska and America. It highlights elements of the "model," such as a clear mission statement, an innovative procurement process, early involvement of the shipyard, and use of American technology and products. Challenges faced by AMHS, Alaska, and America's shipbuilding industry are discussed briefly, accompanied by photographs. Details of vessel design, proposed service routes, the project design and construction schedule, and budget and financing information are also included in the report. It is available from the State of Alaska Library and the State Historical Library.

1978. **Alaska Marine Highway System: Reports to Interim Committee on Transportation.** Ron E. Whitcraft.

In 1978, Legislative Assistant to the Interim Committee on Transportation, Ron Whitcraft, produced a series of five reports discussing various AMHS issues. Each report includes a brief analysis of the respective topic, following by interview transcripts. The five topics are: (1) the Proposed Bellingham Terminal, (2) Fleet Morel, (3) the Haines Tank Farm, (4) Management Operations, and (5) the Juneau Warehouse. All reports are available at the Alaska State Library.

1977. **Erosion of a Highway**. Fred A. Ross.

Written by former naval engineer with roughly 15 years of experience working with AMHS, this 72-page report describes and analyzes funding, scheduling, planning, fares, and staffing within the system prior to 1997. Detailed topics include tensions between shoreside management and vessel staff, system operating costs and revenue, traffic volume, and vessel schedules and maintenance. Five specific recommendations for system improvement are included at the end of the document. The report is available from the Alaska State Historical Library.

1973. **Southeast-Southcentral Connection: Alaska Marine Highway**. Department of Public Works, Division of Marine Transportation.

This 29-page report analyzes potential ferry service across the Gulf of Alaska between Southeast and Southcentral Alaska using the *M/V Wickersham*. It includes a review of prior studies, data on then-existing vessels, economic data on communities affected by potential cross-Gulf service, and projections of future traffic demands. Details on possible schedules, revenue and expense estimates, and cost comparisons between vessel types, ports and schedules are also presented in the report. This document, as well as a preliminary report published one month prior, are available at the Alaska State Historical Library.

1971. **Thoughts, Answers, Management, Suggestions: A Personalized Look at the Alaska Marine Highway**. William F. McVaugh.

This report discusses suggested improvements for the 1971 dilapidated marine highway fleet and sub-par service, scheduling, and routes. Main topics covered in the report include AMHS organization purpose and philosophy, adopting a business-like approach to AMHS management, scheduling, routing, food, public relations, employee relations, and crewmember suggestions. This document is available from the Alaska State Historical Library.

1964. **Economic Justification for Extending the Alaska Marine Highway System to Bellingham, Washington**. Alaska Ferry-Bellingham Terminal Committee.

In this report, the Alaska Ferry/Bellingham Terminal Committee examines the cost of operating Alaska ferries between Prince Rupert, BC and Bellingham, WA. Topics discussed include cost defrayal, link time estimates, regioanl frieght cost reductions, passenger and tourist traffic revenue, and the impact on development of Alaskan industry. The report provides actual figures for cost comparisons. It is available at the Alaska State Historical Library.

HISTORY

1994. **Highway on the Sea: Pictorial History of the Alaska Marine Highway System**. Stan Cohen.

This 48-page soft cover book offers a history of the AMHS through photographs, ship diagrams, maps, and brief descriptions of each ship. It also provides a short history of the Inside Passage, as well as information about the Seattle and Bellingham terminals, trip schedules, and ports of call. The book is available at the Alaska State Historical Library.

1992. **Ferries in the North: The Alaska Marine Highway, 1948-1989**. Clinton H. Betz. In *The Sea Chest*, December 1992.

A historical recount of the Alaska Marine Highway System starting in 1948 with the first ferry service offered in Southeast Alaska by a private enterprise and ending in 1989 when the southern terminus of the system was moved from Seattle to Bellingham. The 20-page chronological article includes detailed information on and photographs of all nine ships in the system's 1989 fleet and well as information on

ports of call. It was published in *The Sea Chest*, the journal of the Puget Sound Maritime Historical Society. The article is available at the Alaska State Library.

1977. **History of the Alaska Marine Highway**. William R. Hudson.

This AMHS history review provides an overview of the system's purpose, the organization and operations, vessels, tariffs, fiscal year 1976 statistics, federal aid to highways, capitol improvement projects, historical revenue and expenditure, a management and efficiency review by the current govenor, and a six-year transportation plan. The report is available from the Alaska State Historical Library.

1970. **Review of Business and Economic Conditions: The Alaska Marine Highway System**. George Rogers. In *Review of Business and Economic Conditions*, October 1070, Vol. VII, No. 5. Institute for Social and Economic Research.

In this 16-page article, analyst George Rogers examines the early years of the AMHS, discussing current and potential fleets and service, the impact of the Jones Act, and operational finances. The article also looks at the economics and politics of public transportation, as well as projected construction and improvements. It is available in a collection of ISER periodicals entitled *Review of Business and Economic Conditions* at the Alaska State Historical Library.

1963. **The Alaska Marine Highway**. Art Downs. In *British Columbia Digest*, May-June 1963, Vol.19, No. 3.

Written for British Columbia Digest, an outdoors magazine, this brief article describes the AMHS and its vessels during the first year of AMHS service. Detailed accounts of vessel layout, seating, catering, and cabins are given, along with discussion of the serviced routes. The author describes why the ferry system was created and what some of the expected benefits to British Columbia would be. The *British Columbia Digest* is available from the Alaska State Historical Library.

PLANNING

2008. **Alaska Statewide Long-Range Transportation Policy Plan (Let's Get Moving 2030).** Alaska Department of Transportation and Public Facilities.

Let's Get Moving 2030 establishes a state transportation vision and policy framework to guide statewide transportation planning and development through the year 2030. The plan is designed to help analyze the costs associated with the state's transportation infrastructure. It creates a tool to measure improvements of management practices and determines whether additional funds are necessary to maintain existing facilities. The plan also sets system development priorities and the best use of limited project funding, including recommended strategies for addressing the gap between documented needs and available funding. The main document and appendices is available from the DOT&PF website, www.dot.alaska.gov/2030.

2005. **Alaska's Marine Highway: Segment Corridor Plans**. Jensen Yorba Lott, Inc.

In 2005, Jensen Yorba Lott, Inc. developed segment corridor plans for three regions served by AMHS: The Inside Passage, Prince William Sound and the Kenai Peninsula, and Kodiak and the Aleutian Islands. Each plan is designed to provide a detailed action plan for guiding and shaping the region's marine highway system to meet the needs of the its communities. The regional plans should be viewed within the context of the overarching system plan, Alaska's Marine Highway Corridor Partnership Plan, but used for region-specific goals such as grant applications, marketing priorities, and facility improvements. Each consists of three major sections: overview of regional communities and marine highway service, review of the major issues facing that segment of the marine highway, and an action program based on the first two sections. The reports are between 60 and 80 pages each and generally include a number of photographs and maps. The 2005 AMHS segment corridor plans are available from the Alaska State Library.

2004, 1991, 1986. **Alaska Marine Highway System Master Plans.** Alaska Marine Highway System.

The AMHS system plans provide direction for the long-term development and operation of the system. The plans document the history, development, and current status of AMHS, including its shore facilities, vessel condition and configuration, services provided, routes and traffic patters, scheduling and reservation systems, financial management, organization structure, and planning processes. Major issues facing AMHS and potential alternatives are also examined. AMHS system master plans are available from the Alaska State Library, and the 2004 AMHS System Master Plan is available from the AMHS website, www.dot.state.ak.us/amhs/index.html.

2004, 1999. **Southeast Alaska Transportation Plan.** Alaska Department of Transportation and Public Facilities.

The 2004 Southeast Alaska Transportation Plan (SATP) is a 124-page document providing short- and long-term recommendations for a more cohesive transportation system in Southeast Alaska. It includes three fundamental highway elements that better link the region at large to the continental highway system: the preferred alternative for the Juneau Access project is a road up the east side of Lynn Canal connecting Juneau to Skagway, including a short shuttle ferry crossing to Haines; construction of new highways to establish a through connection from Ketchikan (and Wrangell and Petersburg) to the Cassiar Highway in Canada; and a highway from Sitka across Baranof Island that would improve the level of ferry service to Sitka and reduce cost to the traveler and the state. The plan is available from the DOT&PF website: www.dot.state.ak.us.

2002. **Alaska Marine Highway Corridor Partnership Plan: Celebrating the 40th Anniversary of the Nation's Most Scenic Byway.** Jensen Yorba Lott, Inc.

Prepared for DOT&PF as part of the department's submission package to designate the Alaska Marine Highway as a National Scenic Byway, under the Federal Highway Administration. The plan outlines goals and objectives intended to enhance the experience of passengers on Alaska's marine highway and meet the goals of the National Scenic Byway Program, with hopes of increasing visitation and economic development in communities along the ferry routes. The document includes a byway organization plan, intrinsic quality assessment and management, transportation, tourism marketing, interpretation, implementation, and maps of three main areas (Southeast, Prince William Sound, and the Aleutian Islands Chain). It is available from the Alaska State Historical Library.

2002. **Southwest Alaska Transportation Plan.** Parsons Brinckerhoff, in association with HDR Alaska, Northern Economics, The Glousten Associates, Christopher Beck & Associates, and Ojden Beeman & Associates.

The Southwest Alaska Transportation Plan provides the framework for a sustainable transportation system that will improve the ability of residents to move between communities in Southwest Alaska and lessen transportation barriers to economic growth in the region. The 78-page plan establishes priorities for key projects to bring real benefits to both region and state, while also illustrating a vision that extends beyond what is economically feasible within the constraints of a 20-year transportation plan.

The plan's recommendations contain eight key components: Corridor Delineation, Selected Community Linkages, Intermodal Development, Improved Marine Highway Service, Aviation System Improvements, Port and Harbor Improvements, a Marked Winter Trail System, and Validation of Previous Approved and Ongoing "Baseline" Projects. The plan is available from the DOT&PF website, www.dot.state.ak.us.

2001. **Prince William Sound Area Transportation Plan.** Parsons Brinckerhoff, in association with HDR Alaska, Northern Economics, The Glousten Associates, Christopher Beck & Associates, and Ojden Beeman & Associates.

The Prince William Sound (PWS) Transportation Plan focuses on linking communities within the region to each other, to the rest of the state and to outside the state, with specific attention given to marine transportation. The 49-page plan suggests prefered improvements to AMHS, namely the purchase of two new high-speed ferries (one immediately and the second several years later), which would be deployed to serve Cordova, Whittier, and Valdez with much greater frequency, capacity, and convenience than provided by the current service. The document is available from the DOT&PF website, www.dot.state.ak.us.

Southwest Alaska Transportation Master Plan and Prince William Sound/Copper River Transportation Master Plan. The Glosten Associates.

The Glosten Associates provided recommendations on vessel type, performance, acquisition and operating costs for use in a broader examination of long-range (i.e., 20-year perspective) transportation policy for the Southwest Alaska Transportation Master Plan and the Prince William Sound/Cooper River Transportation Master Plan. A number of vessel-based transportation improvements were developed, and a recommendation affecting both regions was made to provide improved service to the PWS region via the high-speed ferries and releive the *M/V Tustumena* of is PWS duties, enabling the vessel to serve the Kodiak Island and Alaska Peninsula area. Both plans are available from Glosten Associates (job number 97077).

1993. **Long-Range AMHS Business Planning Analysis**. Erickson & Associates.

The Long-Range AMHS Business Planning Analysis identifies the factors most likely to affect the future financial performance of the AMHS. The 1993 study examined three scenarios: keeping the the current fleet, replacing one of the ships with a new ship, and adding a new ship to the current fleet. The study and determined that all three were likely to result in decreased general fund support. Historical trends in Southeast Alaska's population, income, tourism, AMHS operating performance, and other system aspects, such as fares, capacity, transportation competition, and labor costs, are also discussed in the document. The report is available at the Alaska State Library.

1961. **Use of the Chilkat Ferry Service**. Alaska Highway Planning Division, Planning Section.

This brief report describes the Chilkat ferry service between Juneau, Haines, and Skagway during the 1960 season. The report presents results from an on-board survey of passenger and vehicle information, including trip purpose, willingness to pay higher fares, and willingness to increase ferry system use if service were increased. No concluding statements were made. The document is available from the Alaska State Library.

1959. **Proposed Ferry Service for Southeastern Alaska**. Felix J. Toner.

This pre-AMHS report makes recommendations for a ferry system that would best suit the needs of Southeastern Alaska as well as the state as a whole over a period of years. It reviews prior studies and proposals for a ferry system and discusses three different system proposals: a fast, thru-run ferry service, a multiple run service, and a service that combines these service options. The fast, through-run service is concluded to be the best service for the region, and details on routes, speed, and capacity of vessels are provided. Various options for development and operation of a ferry system, financing methods, and cost estimates are also provided in the report. The document is available from the Alaska State Library.

FINANCIAL

Annual (1959 to Present). **Alaska Marine Highway System Annual Financial Reports**. Alaska Marine Highway System.

Annual financial reports for the AMHS are submitted in accordance with Alaska statute at the end of the fiscal period (June 30). These reports provide a statement of revenues, expenditures, and changes in fund balance; a statement of actual and estimated revenues from operation; operating revenues and expenditures by vessel; andgeneral information on the AMHS fleet and ports of call. The Alaska State Library has annual financial reports dating back to 1959.

2004. **Alaska Marine Highway System Lynn Canal Corridor: Revenues and Expenditures 2001-2002 and Projected Capital Costs 2001-2038 (Draft).** Alaska Department of Transportation and Public Facilities.

This analysis examines the costs and revenues of AMHS transportation between three main points in Lynn Canal: Juneau, Haines, and Skagway. It also offers capital improvement program projections attributable to Lynn Canal service. The report is available from the DOT&PF.

TRAFFIC

Annual (1959 to Present). **Alaska Marine Highway System Annual Traffic Volume Reports**. Alaska Marine Highway System.

These reports summarize passenger and vehicle traffic on the AMHS throughout a calendar year. They provide traffic data by region, community, route, and vessel for passengers and vehicles, as well as historical traffic data and stateroom usage. These reports also give a brief overview of the marine highway system. The Alaska State Library has a copy of each annual traffic report dating back to 1959, but recent reports (2004 to 2006) are available on the AMHS website, www.dot.state.ak.us/amhs/index.html.

1994. **Alaska Marine Highway System Traffic Forecast**. McDowell Group.

As a part of McDowell Group's assessment of service alternatives for the Prince of Wales Island and Prince William Sound Service areas, household surveys and executive interviews were conducted in the two AMHS service areas. Survey methodology included random selection of 250 households in each service area. Blanket mailings were sent to every residential postal customer in the study areas. A market analysis included identification of the components of the current AMHS market, development of forecasts for each market component, and application of growth rates to baseline AMHS traffic to forecast specific numbers of passengers and vehicles. The report is available from the McDowell Group.

1992. **Traffic Patterns: Ketchikan, Hollis, and Metlakatla, and Prince William Sound**. Alaska Marine Highway System.

The purpose of this 1992 two-part series is to provide regional traffic details for use in evaluation of service alternatives for the area. One report examines the Ketchikan/Hollis/ Metlakatla area and the second report focuses on Prince William Sound. The documents were compiled as a starting point in developing a comprehensive service plan and present information on regional population growth, service, peak travel periods, passenger and vehicle capacity, detailed population projections, and regional service-link passenger and vehicle frequency distributions. These documents are roughly 30 to 40 pages and are available at the Alaska State Library.

1986. **Alaska Marine Highway System Traffic Forecast Model**. O. Scott Goldsmith, Steve Colt, and Kent Miller. Institute for Social and Economic Research.

ISER provides a description and analysis of its traffic forecasting model for the AMHS in this 1986 paper. There is a base case forecast for the system overall as well as numerous additional forecasts, based on other assumptions about growth of the economy and tourism. The report can be requested from ISER.

1972. **Alaska Marine Highway System Study, Phase I: Traffic and Usage**. Robert Crommelin and Associates.

This 1972 report estimates projections of AMHS passenger and vehicle usage from 1970 to 1995 if the system were to be expanded from its 1972 size and coverage. It does not discuss engineering feasibility, routing and scheduling, and physical development requirements for an expansion. A description of the system (fleet, ports served, and various looks at usage) and user characteristics is provided, along with a base-year traffic model, analysis, and estimates for future system usage. Six appendices follow the body of the report and include analytical techniques, port travel growth factors, socioeconomic characteristics of port service areas, and a sample questionnaire. Phase I is on file in the Alaska State Historical Library. Phase II was not published.

VESSEL TYPE/DESIGN

2002. **Fleet Condition Survey Update.** Glosten Associates, Inc.

This Glosten Associates document presents a 2002 update to the firm's 1991 Fleetwide Condition Survey Report. The objectives met in the update include current descriptions of all AMHS vessels and their conditions, identification of and potential programming for future capital improvement projects through 2010, and development of a database to assist AMHS in planning capital improvement projects. The report update and the original 1991 report are available from Glosten Associates.

1999. **Vessel Suitability Study (VSS).** The Glosten Associates.

This project addressed regional and community ferry services prescribed by the Southeast Alaska Transportation Plan to serve 14 ports in Southeast Alaska, and to interface with three other local ferry systems. The analysis included development of 82 alternative route systems, as well as vessel operating profiles, acquisition and operating cost estimates, and feasibility-level designs for hundreds of candidate vessels, both of conventional and high-speed type, and of varying capacities, speeds, and capabilities. Modeling included seasonal scheduling of vessel assets to better match demand. This study included development of a comprehensive wind and wave climatology (based on location and season) for the Southeast Alaska operating region. The report is available from Glosten Associates (job number 99095).

1998-1999. **Juneau Access Marine Alternatives Update.** Glosten Associates.

Glosten examined marine transportation alternatives (conventional monohull ferries, high-speed catamarans, and high-speed monohulls) to a proposed new East Lynn Canal Highway. A total of 728 marine alternatives were developed and sorted to identify the top 15 solutions at each level of traffic volume. Northern Economics, Inc., subconsultant to Glosten, developed a demand elasticity model for these marine alternatives, evaluating the effect on traffic demand of service convenience and tariffs. Estimates were made for tariffs and traffic volumes that would recover 60 percent of the operating costs. The demand elasticity model is a particularly unique aspect of this study, and the elasticity model was coupled with the final optimization cycles leading to identification of the port-pair, routes, vessel type, and service profile that was optimal according to each of the various objective functions. The report is available from Glosten Associates (job number 98091).

1990-1991. **AMHS Fleet Condition & Asbestos Surveys.** Glosten Associates.

The main focus of this project was a thorough assessment of the condition of all AMHS ferries at the time of the survey, except for the *M/V Columbia* (accomplished by a different contractor). Survey efforts included structure, mechanical, electrical, piping, HVAC and other systems, crew and passenger habitability spaces, and a particular effort (accomplished by a subcontractor) to identify the locations, extent, type, and condition of the remaining asbestos on each vessel. These survey reports were developed for use in recommending major scheduled maintenance and refurbishment activity extending out approximately ten years.

From a long-term policy point-of-view, Volume 10 of the AMHS Fleet Condition & Asbestos Survey is of particular interest because it developed a long-term discounted cash flow economic model for the entire AMHS fleet and attempted to answer the question of when each vessel should be retired. This Volume 10 report is the original source of the recommendation, now often treated as doctrine, that the AMHS ferries should be retired from service by age 64 years.

The survey was updated in 2000-2001 and in 2005-2006. The most recent update identified local, state, federal, and international regulations, with particular attentioned paid to SOLAS 2010 (retroactive fire safety amendments affecting the fleet). All documents are available from Glosten Associates (job numbers 9019, 99082, 05109, respectively).

1990. **Welcome to the Fleet**. Alaska Marine Highway System.

A 35-page orientation booklet targeted at new AMHS employees. The document provides detailed information of various aspects of employment with AMHS, such as "What we expect from you," "You're part of the union too," "Safety through the years," and "What if a passenger complains." A brief history of the fleet is provided, along with numerous tips for new workers to help them do their jobs well. The booklet is available from the Alaska State Library.

1985. **High-Speed Ferry Demonstration Trial Service Report**. Alaska Marine Highway System.

This report provides a history and description of the 80-day high-speed ferry trial service operated by the Boeing Corporation in Southeast Alaska in 1984. Description details include traffic volume, revenues, operating costs, and vessel performance, as well as some limited conclusions about the feasibility of a high-speed service and the sustainability of using Boeing Jetfoil to provide such service. This 49-page document is available from the Alaska State Library.

ECONOMIC ANALYSIS

2004. **Discussion Paper: AMHS Office Relocation to Ketchikan**. Pacific Marine Technical Services.

This brief discussion papers analyzes the feasibility and cost of moving AMHS management and engineering personnel from the Juneau Central Office to a new office space in Ketchikan. The author examines the pros and cons of such a move and argues why it is economically advantageous now (2004) compared to a 1997 study which found it disadvantageous. Details about office space and operational costs in Ketchikan are provided, and key issues related to operating out of Juneau and operating out of Ketchikan are described. The paper is available from the Alaska State Library.

2003. **Economic Analysis for a Ferry Terminal at South Mitkof Island**. McDowell Group.

CH2M Hill contracted with McDowell Group to provide socioeconomic analysis for a National Environmental Policy Act (NEPA) scoping study and subsequent Environmental Assessment (EA) for a proposed ferry terminal at the southern end of Mitkof Island in Southeast Alaska. McDowell Group analyzed operating benefits and costs for the terminal with respect to routes specified in the Southeast Alaska Transportation Plan. The analysis included factors such as vessel operating costs, bus service, road maintenance, and effects on AMHS revenues. The report is available electronically from the McDowell Group.

2001. **Petersburg Alaska Marine Highway System Transportation Impact Study**. McDowell Group.

Conducted for the City of Petersburg and the DOT&PF, the study analyzed the potential social and economic effects on the City of Petersburg as a result of changes in ferry service proposed under the Southeast Alaska Transportation Plan. McDowell Group worked on this study in cooperation with Sheinberg Associates, Transportation Engineering Northwest, and R&M Engineering. The document is available from the McDowell Group.

2001. **Alaska Marine Highway System Route Analysis.** Elliott Bay Design Group.

Working as a subcontractor to the McDowell Group, Elliott Bay Design Group (EBDG) built route models for servicing Lynn Canal and the smaller communities around Juneau. Models were based on EBDG software that conducted an analysis of AMHS vessel operational costs, capital costs, revenue potential, and return on investment. The analysis showed how changing the routes from a circuit-based system, in which the ferry visits every community in turn, to a hub and spoke system, in which the ferry visits different communities on different days, could provide significant cost savings. The document is available from Elliott Bay Design Group.

1997. **Impact Analysis: Relocation of the DOT&PF Alaska Marine Highway System Administrative Offices to Ketchikan**. Information Insights.

Information Insights provided analysis of the economic impact and a summary of the issues concerning the 1997 proposed movement of AMHS administrative offices from Juneau to Ketchikan. The 28-page report presents three analytical approaches: (1) a stakeholder analysis identifies the non-economic impacts on the parties affected by such a move; (2) the operational impacts of a move; and (3) the economic impacts of a move on the communities of Juneau and Ketchikan. This document can be found at the Alaska State Library.

1995. **The Economic Benefits of the Alaska Marine Highway System**. McDowell Group.

This study measures the economic benefits of the AMHS. It provides analysis of Alaska's financial return on investment in the AMHS, including indirect or "multiplier" effects, and of the statewide and regional economic benefits of the AMHS, including employment, spending in support of AMHS operations, and instate capital expenditures. The report also includes a detailed discussion of the role of the AMHS in Alaska's visitor industry. The document is available in paper format only from the McDowell Group.

LEGISLATIVE TASK FORCE DOCUMENTS

1997. **Report of the Sentate Task Force on the Alaska Marine Highway System**. Senate Task Force on the Alaska Marine Highway System.

Prepared for the Senate Transportation Committee of the 20th Alaska State Legislature, this report identifies several key management policies and decisions that the the Senate Task Force deems representative of the type of policies that bring the current management of the AMHS into question. The task force held public meetings in Ketchikan, Seward, and Sitka, and accepted written testimony following the meetings. Based on public opinion and the research of the task force, this report recommends that the State Legislature consider moving AMHS management from the DOT&PF to a semi-autonomous Marine Highway Authority. This document is available from the Alaska State Library.

1992. **Governor Hickel's Task Force on the Alaska Marine Highway System: Report to the Goveror**. Alaska Marine Highway Task Force.

A brief 5-page review of the AMHS by Governor Hickel's AMHS task force, this document supports the creation of an AMHS authority to guide the system. A key focus is how an authority might be implemented to improve efficiency and consistent management practices at the AMHS. The report's findings and recommendations are based on review of the 1992 operations of the AMHS, the 1991 master plan, the long-term financial plan, consideration of a capital improvement program, and numerous discussions of an authority. Additionally, the task force considered public testimony on the creation of an authority. The report ultimately advocates that a marine highway authority be created. The document is available at the Alaska State Library.

1984. **Report and Recommendations of the Alaska Marine Highway Task Force.** Alaska Marine Highway Taskforce.

This study thoroughly examines the activity and management of the AMHS in the early 1980s, identifies problems within the system, and recommends strategies for improved service and operating efficiencies. The 11-member task force researched and reviewed five major topics: administration, passenger service, vehicle service, marketing, and operations. Additionally, the task force held public meetings in 24 communities throughout Alaska and a teleconference for input from another 11 communities, interviewed AMHS personnel, observed passenger and vehicle loading and unloading, examined labor union contracts, and met with officials from a British Columbia ferry organization. A proposed definition of AMHS goals is provided in the report summary: The AMHS is a public utility charged with the task of providing transportation between points where there is public need that cannot be fulfilled by the use of highways or by private enterprise on a sound economic basis. The system must have the flexibility to operate in the best interest of the traveling public and citizens of Alaska. Research data is included in six appendices following the report. The document is available from the Alaska State Library.

1978. **Committee on Transportation Report**. Alaska State Legislature Committee on Transportation.

This document provides a detailed overview of the status of the *M/V LeConte*, the *M/V Malaspina*, the *M/V Columbia*, and the *M/V Matanuska*, as well as information about the terminal and reservation facilities based in Seattle. When available, interview transcripts are included. The document is available at the Alaska State Library.

LEGISLATIVE RESEARCH REPORTS

Legislative research reports are commissioned by State legislators on various topics. Below is a list of AMHS-related legislative research reports. The full documents can be requested from Alaska Legislative Research Services (www.legis.state.ak.us).

2001. **A Summary of the Legislative and Fiscal History of the Alaska Marine Highway System**.

The report summarizes the the legislative history of the AMHS from 1995 to 2001 and provides an analysis of the system's expenditures from inception to 2001. It also examines the transactions related to the Marine Highway Stabilization Fund and the Vessel Replacement Fund. Other information includes on capital and operational expenditures related to AMHS operation.

1997. **Passenger Fares and Volume on the Alaska Marine Highway, 1983-1997, and Alaska Airline Airfares, 1991-1997.**

This report compares changes in airline and AMHS ticket prices over previous years and reviews AMHS traffic volume statistics for the entire ferry system and selected ports.

1995. **Legislative History of the Alaska Marine Highway Including Privatization Efforts.**

This report serves as a legislative history of AMHS and examines past studies focusing on privatization of the system. The question of how enabling AMHS legislation defines "essential service" with regard to system service is also addressed in this report.

1987. **Options for the Alaska Marine Highway to Operate Similarly to Cruise Ships.**

This paper discusses potential options for AMHS to operate more similarly to cruise ships on the mainline route from Seattle to Skagway via Prince Rupert.

LEGISLATIVE AUDITS

Legislative audits of particular AMHS projects have been ordered in various years. Listed below are AMHS-realted audits to date. Audits dating back to 1990 are available online at the Alaska Division of Legislative Audit website (www.legaudit.state.ak.us).

2005. Review of DOT&PF adherance to state and federal procurement laws and regulations in awarding contracts for AMHS vessel maintenance and repair. Additionally, the report addresses governmental subsidies received by the in-state shipyards used by AMHS.

2000. Evaluation of the AMHS fund's unrestricted revenue activity for the period ending June 30, 2000.

1997. Assessment of the methodology used to estimate the interport differential for determining contract awards for overhaul, repair, and maintenance of the AMHS vessels. The review also included an analysis of the actual cost of transporting the *M/V Matanuska* out of state for contracted work.

1996. Review of AMHS procedures for developing ferry schedules to small Southeast Alaska communities, and evaluation of the AMHS reservations system, ferry passengers' impressions of on-board services, and issues related to food waste and bar closures.

1990. Evaluation of various aspects of the state-constructed shipyard located in Ketchikan, Alaska.

STATE LEGISLATURE HOUSE BILLS AND RESOLUTIONS

Many bills and resolutions associated with the AMHS are proposed to the Alaska Legislature every session. Listed below are bills and resolutions proposed during the current 2007-2008 Legislature, as well as the two preceding legislatures, 2005-2006 and 2003-2004. Bills dating as far back as 1993 are available on the Alaska State Legislature website (www.legis.state.ak.us), and earlier bills are available by request at the Legislative Information Office.

2007-2008

- HB 80: An Act directing preparation of a feasibility study report relating to expanding the AMHS to Yukon and Kuskokwim River locations.
- HB 294: An Act establishing the Alaska Marine Highway Authority, transferring to it from the DOT&PF the responsibility for the operation, management, planning, construction, and maintenance of facilities of the AMHS, making conforming amendments; and providing for an effective date.
- HB 298: An Act relating to long-range plans for the AMHS and providing for an effective date.

2005-2006

- HR 12: Requesting that the DOT&PF terminate the State of Washington's involvement in the AMHS.
- HCR 38: Urging the DOT&PF to use the AMHS fast ferries efficiently by deploying the fast ferries in northern Lynn Canal and Prince William Sound beginning in the summer of 2006, and to provide data regularly to the affected communities to enable the communities to evaluate the service effectively.
- HB 432: An Act expanding the AMHS to Yukon River locations and relating to the duty of the DOT&PF to construct, purchase, or lease ferry terminal facilities.

2003-2004

- HB 426: An Act relating to the levy and collection of an assessment on certain tourism-related and recreation-related sales, leases, and rentals, to tourism marketing contracts, and to vehicle rental taxes; relating to AMHS passenger fares; and providing for an effective date.

GENERAL MARINE TRANSPORTATION DOCUMENTS (NOT AMHS-SPECIFIC)

2004-2005. **Southern Gateway Shuttle Design Study Report.** The Glosten Associates.

This report examines many vessel concept designs and service profiles meeting the projected traffic demand for a shuttle ferry operating between Ketchikan and Prince Rupert. Both conventional and high-speed ferry types were studied. The study effort included a significant effort to characterize the operating wind and wave environment for the ferry and to include realistic assessments of weather operability in the analysis. The recommended solution was a conventional displacement monohull ferry operating at speeds in excess of 20 knots. Alternatively, a high-speed catamaran that could perform nearly as well was also identified. The document is available from Glosten Associates (job number 04087).

2002. **Fast Vehicle Ferries for the Alaska Marine Highway System**. Smith, G.; R. . Van Slyke; and K. Harford. Glosten Associates, Inc.

This document examines AMHS plans to improve ferry service in Southeast Alaska and Prince William Sound with high-speed roll-on/roll-off (ro-ro) ferries, or fast vehicle ferries. Why speed is important to economic improvements in Alaska transportation is discussed; some critical features of the fast vehicle ferry design are outlined; and insight into the decision-making process to date is provided. The report is available from The Glosten Associates.

2002. **Analysis of AMHS Fast Vehicle Ferry Wake Wash Predictions, Phase 1 & 2**. Stumbo Associates.

Phase 1 of this analysis compares expected wash characteristics of the AMHS fast vehicle ferry against measured vessels and past studies. Phase 2 compares the AMHS fast vehicle ferry's expected wash characteristics to existing AMHS vessels and cruise ships. The documents are available at the Alaska State Historical Library.

1997. **Project Evaluation Criteria**. Alaska Department of Transportation and Public Facilities.

This 26-page document consists of a series of matrices, evaluating AMHS, remote roads and trails, rural and urban streets and roads, Trails and Recreational Access for Alaska (TRAAK), transit, aviation, and harbors. Standards are listed in the first column of each table, and scores ranging from 5 to -5 are listed in the subsequent columns. Detailed comments are given in the individual cells. The document is available at the Alaska State Historical Library.

1991. **Alaska Marine Highway System: Cook Inlet Marine Transportation System**. Textron Marine Systems.

This report discusses the feasibility of developing a deep-water port at Point MacKenzie and operating an air cushion ferry across the Knik Arm. It highlights the economic benefit of such a crossing, as well as

technical specifications and drawings of a proposed air cushion ferry. The report is on file at the Alaska State Historical Library.

1981. **Jetfoil Trial Service Proposal for Southeastern Alaska Routes**. Boeing Marine Systems.

In 1981, Boeing Marine Systems made a proposal to test-run Jetfoil marine transportation in Southeast Alaska. The proposal gives an overview of Boeing Jetfoil technology; a description of potential routes in Southeast Alaska, Price William Sound/Kodiak, and Cook Inlet/Kodiak with estimated travel times; and a detailed trial service proposal for points in Southeast Alaska, including routes, travel times, and financial data. The document is available from the Alaska State Library.

1981. **Yukon River Ferry Economic Analysis**. Louis Berger and Associates, Inc.

This two-volume report presents the findings of an economic feasibility study of Yukon River ferry service. This study serves as an update to the 1973 study on the same topic. Volume I of the report describes the study area (broken into lower- and upper Yukon); provides economic perspectives on population, fishing, agriculture, forestry, tourism, mineral potential, and land status; and looks at past, current (1981), and future traffic in the region. Volume I discusses 10 types of marine vessels considered for alternative service in both sections of the Yukon River, as well as navigational and facility requirements, environmental considerations, and economic and financial analysis of the various alternatives. Volume II of the report includes 13 appendices, including fisheries perspectives, impacts on forestry and agriculture, a tourism overview, dredging threshold analysis, tug and barge costs, ferry schedules and facilities, public involvement information, air traffic forecasts, land use policy, and economic and financial tables. Both volumes of the Yukon River Ferry Economic Analysis and a separate executive summary can be found at the Alaska State Library.

1980. **Aleutian and Southwest Alaska Coastal Ferry Study.** DMJM Forssen and Tetra Tech, Inc.

This 93-page transportation study of Southwest Alaska addresses on the Alaska Peninsula, Kodiak, the Pribilof Islands, the Aleutian Islands west to Atka, and portions of Bristol Bay and Cook Inlet. The key focus of the study was determination of potential requirements and applications for a coastal ferry system. The report describes existing conditions in the proposed service area; identifies the need for improved transportation; presents and compares potential alternatives to meet this need, including system considerations, vessels, and port facilities; and makes recommendations for the most suitable alternative and candidate communities for improved transportation service. Policy issues and political decisions relating to expanded ferry service are also included in this report, which is available at the Alaska State Historical Library.

1967. **Study to Determine the Optimum Sized Ferry Boat for Service on Cook Inlet and Prince William Sound for the State of Alaska**. Philip F. Spaulding and Associates.

This 26-page study proposes construction of two symmetric vehicle and passenger vessels, optimally sized to serve Cook Inlet (shuttling between Homer and Seldovia) and Prince William Sound (between Cordova, Valdez, and Whittier). Vessel specifications are given, as well as estimates of traffic demand, construction and operating costs, and revenues. The report is available from the Alaska State Historical Library.

1967. **Recommendations on a Proposed Ferry Connection between Southeastern Alaska and Puget Sound Points**. Wolf Management Services.

This report is a preliminary evaluation of the State of Washington's application to the U.S. Department of Economic Administration for funding a feasibility study of ferry service between Alaska and Puget Sound points. It is not an evaluation of the proposed service itself. The report presents views on the subject from transportation specialists and development planners in the Northwest, including the International Rail and Highway Commission, the Alaska Highway Study, a plan proposed by the U.S. Forest Service, and a number of Canadian plans. A proposed freight service between the two states, a proposed passenger service, and alternatives and recommendations (including a recommendation for further study) are also discussed in the report. The 37-page report includes a number of fairly primitive maps and is available from the Alaska State Library.

1965. **A Technical Study of Investment Opportunities in Southeastern Alaska with an Evaluation of the Economic Impact of the "Marine Highway" System**. Wolf Management Services.

A 1965 technical review of Southeast Alaska, this report explores opportunities for capital and industry attraction in light of the increased accessibility of the region due to the AMHS. Appendix A specifically discusses the economic impacts of the system on local industries and market aspects, including tourism, other business, investment, employment, and freight. Limitations, accomplishments, and failures of the AMHS are also outlined in this section. This 244-page document is available from the Alaska State Historical Library.

APPENDIX B

DOT INTERNAL SHORT TERM OPERATING ALTERNATIVE ANALYSIS

Alaska Marine Highway System®

Fiscal Year 2009

Short Term Operating Alternative Analysis

October 2007

Alaska Marine Highway

APPENDIX C

SUMMARY OF MODEL OUTPUTS

Table C-1
Summary of 20 Year Life-Cycle Cost Analysis for AMHS
(All Figures in ($M) except "per")

	Option 1A: Status Quo	Option 1B: Status Quo (Replace Malaspina)	Option 2A: Service Reduction (No Malaspina)	Option 2B: Service Reduction (No Kennicott)	Option 3: Service Expansion	Option 4: Multiple Alaska Class Ferries
Present Value of Total AMHS System Costs:	$ 2,411.2	$ 2,461.5	$ 2,224.5	$ 2,166.2	$ 2,537.3	$ 2,623.6
PV of Capital:	$ 571.2	$ 590.0	$ 501.7	$ 525.1	$ 571.2	$ 678.3
PV of Major Overhauls (Terminals) Costs:	$ 29.4	$ 29.4	$ 29.4	$ 29.4	$ 29.4	$ 29.4
PV of Marine Vessel Operations Costs:	$ 1,582.1	$ 1,613.7	$ 1,482.4	$ 1,400.0	$ 1,706.6	$ 1,687.4
PV of Shoreside Costs:	$ 200.4	$ 200.4	$ 182.9	$ 183.6	$ 202.0	$ 200.4
PV of Admin Costs:	$ 28.0	$ 28.0	$ 28.0	$ 28.0	$ 28.0	$ 28.0
PV of AMHS Operating Costs:	$ 1,810.5	$ 1,842.1	$ 1,693.3	$ 1,611.7	$ 1,936.7	$ 1,915.9
Present Value of Revenues:	$ 595.7	$ 593.2	$ 587.0	$ 558.8	$ 655.7	$ 634.7
Net Present Value (PV Revenue - PV Costs):	($1,815.4)	($1,868.3)	($1,637.5)	($1,607.4)	($1,881.6)	($1,988.9)
Profitability Index (PV of Future Cash Flows / PV of Capital):	(2.18)	(2.17)	(2.26)	(2.06)	(2.29)	(1.93)
Annual Equivalent Revenues (The total revenue over the 20 years is equivalent to 20 annual amounts of this size):	$ 59.5	$ 59.2	$ 58.6	$ 55.8	$ 65.5	$ 63.4
Annual Equivalent Cost (Total System Costs):	$ 240.8	$ 245.8	$ 222.2	$ 216.4	$ 253.4	$ 262.0
Annual Equivalent Cost (AMHS Operating Costs):	$ 180.8	$ 184.0	$ 169.1	$ 161.0	$ 193.4	$ 191.4
Annual Equivalent Cost (Marine Vessel Operations Cost):	$ 158.0	$ 161.2	$ 148.1	$ 139.8	$ 170.5	$ 168.5
Revenue as a % of Costs (Total System Costs):	25%	24%	26%	26%	26%	24%
Revenue as a % of Costs (AMHS Operating Costs):	33%	32%	35%	35%	34%	33%
Revenue as a % of Costs (Marine Vessel Operations Cost):	38%	37%	40%	40%	38%	38%
Annual Financial Assistance Required (Total System Costs):	$ 206.7	$ 207.2	$ 182.2	$ 186.0	$ 213.4	$ 213.3
Annual Financial Assistance Required (AMHS Operating Costs):	$ 121.3	$ 124.7	$ 110.5	$ 105.2	$ 127.9	$ 128.0
Annual Financial Assistance Required (Marine Vessel Operations Cost):	$ 98.5	$ 101.9	$ 89.4	$ 84.0	$ 105.0	$ 105.1

All Figures are equivalent to average 2009 dollars
PV = Present Value

APPENDIX D

ON-LINE SURVEY INSTRUMENT

1. What community do you live in?

01o Akutan
02o Angoon
03o Chenega Bay
04o Chignik
05o Cold Bay
06o Cordova
07o False Pass
08o Haines
09o Homer
10o Hoonah
11o Juneau
12o Kake
13o Ketchikan
14o King Cove
15o Kodiak
16o Metlakatla
17o Pelican
18o Petersburg
19o Port Lions
20o Sand Point
21o Seldovia
22o Sitka
23o Skagway
24o Tatitlek
25o Tenakee
26o Unalaska)
27o Valdez
28o Whittier
29o Wrangell
30o Yakutat
31o Other _____
32o Refused

2. How many times per week would you say an Alaska ferry departs from your community going in any direction? *[This question is only for communities with at least one departure per week. Only those who enter an appropriate community in Q1 will see this question. Others will skip to Q3]*

	# of Departures	
During the summer season	_____	02❒ DK/Ref
During the fall/winter/spring season	_____	02❒ DK/Ref

3. Would you say the amount of ferry service your community receives year-round is…

01❒ More than the community needs
02❒ Less than the community needs
03❒ About the right amount
04❒ DK/Ref

4. How important would you say that having affordable ferry service is for your community? Would you say it's….

01❒ Very important 02❒ Important 03❒ Slightly important 04❒ Not important 05❒ DK/Ref

5. Which of the three situations below would be best, overall, for future ferry service to your community?

a. The same frequency of ferry service you have now with the same fares?
b. More frequent service but with significantly higher fares?
c. Less frequent service but with significantly lower fares?

6. In your opinion, which of the following is <u>most important</u> and which is <u>least important</u> to the residents of your community?

a. Faster ferries to reduce travel times
b. More frequent service (more departures and arrivals) in your community
c. More convenient ferry arrival and departure times
d. Maintaining ferry prices at current levels

Ability to take a personal vehicle on the ferry

[INSTRUCTION] The next set of questions asks about ferry travel by you and other members of your household. A household member is someone who lives with you at least 9 months of the year.

7. How many one-way trips did you or others in your household take on the Alaska ferry system in the last 12 months? Please count each round trip as two.

#of trips_____ 02❒ DK/Ref

8. How many of those ___[ANS TO Q7]___ trips included traveling with a personal vehicle? Please count each round trip as two.

#of trips_____ 02❒ DK/Ref

9. Do you usually prefer to travel by ferry or scheduled air taxi?

01❒ Ferry 02❒ Air taxi 03❒ Neither 04❒ DK/Ref

9(a) Why _____

10. Which of the three situations below would be best, overall, for the members of your household?

a. The same amount of ferry service you have now with the same fares
b. 25% less ferry service with 25% lower fares
c. 25% more ferry service with 25% higher fares

[INSTRUCTION] The next set of questions asks about funding for the ferry system.]

11. Right now, it costs about $150 million a year to run the ferry system. The State General Fund pays for about two-thirds or $100 million, and ticket sales pay for about one-third or $50 million. Do you think the amount that the State General Fund pays is….

01❒ Too much 02❒ Too little 03❒ About right 04❒ DK/Ref

12. Analysis has shown that even if all AMHS ferries were full all the time, the fares would not be enough to cover the cost of the system. If costs continue to increase in the future, do you think AMHS should:

01❒ Increase fares 02❒ Reduce service 03❒ Do something else (Specify: _____)

04❒ DK/Ref

13. If you could change one thing about the ferry service in your community, what would it be?

[INSTRUCTION] The last few questions are for demographic purposes.

14. In what year were you born? _____

15. Which category best describes your total combined household income before taxes for 2009?

01❒ Less than $10,000 04❒ $30,001 to $50,000 07❒ Over $150,000

02❒ $10,001 to $20,000
03❒ $20,001 to $30,000
05❒ $50,001 to $100,000
06❒ $100,001 to $150,000
08❒ Don't know
09❒ Refuse

16. What is your gender? 01❒ Male 02❒ Female