

A Comparison of Operational Performance: Washington State Ferries to Ferry Operators Worldwide

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Michael Dean Bennion

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**A Comparison of Operational Performance:
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By

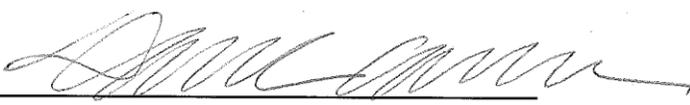
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16. ABSTRACT <p>This project compares eight measures of performance related to transit service quality (e.g. trip reliability, on-time departures) and cost-efficiency (e.g. farebox recovery, subsidy per passenger) between Washington State Ferries (WSF) and 23 ferry operators worldwide. The project will discuss how setting targets and/or benchmarks for performance can progress government accountability for public services provided. The purpose was to use operational characteristics such as asset and traffic data to demonstrate where WSF ranks amongst peers in the ferry industry and to provide a reproducible basis for future comparisons. Contact information and data was inputted into spreadsheets using e-mail questionnaires, phone interviews and extensive data mining. A profile will detail WSF and include a background of ferry transportation on the Puget Sound and the policy environment surrounding its current operations. Several peers in the industry, including British Columbia Ferries and the Alaska Marine Highway System, will be identified further with their respective policy and operational strategies discussed and 2009 performance analyzed. The project will find top ten annual rankings that include vessels and terminals operated and passengers and vehicles transported, and will analyze the results of the performance measures chosen.</p>			
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Executive Summary

Washington State Ferries (WSF), a division of the state's Department of Transportation, is a ferry system with the primary responsibilities of safely facilitating the movement of people, goods and services. The agency provides residents and coastal communities with access to commodities and to health, legal, government and social services. In 2009, WSF had 20 passenger-auto ferry vessels, 20 terminals in operation, and completed over 147,000 sailings along nine separate routes. The 22.4 million passengers and 9.9 million vehicles carried in the year made WSF the nation's most used ferry system and places the agency among the world's leaders in those two categories.

This report researches 23 total ferry systems around the world to compare with WSF. The analysis herein goes beyond simply comparing operational characteristics (e.g. assets, traffic statistics, financial data) and introduces the commonly used technique of benchmarking, whereby measures of performance among peers are recorded and analyzed against the performance of WSF. Once that is complete, policymakers and state officials can decide to import the practices, policies, and strategies of those systems to improve performance deemed shortcoming.

The report employed eight measures to ascertain transit service quality and cost efficiency. The outcome and general comparison (where data is available) of those measures are as follows:

- ✓ WSF completed 99.6% of its scheduled trips in 2009, exceeding the average of 98.1%.
- ✓ WSF's reported 92.9% of departures left within 10 minutes of schedule last year, just below the average of 94%.
- ✓ WSF averaged 5.02 passenger injuries per million transported in 2002 (last available data). In 2009, peer operators in British Columbia and Sydney, Australia, recorded 13.17 and 5.02 injuries per million, respectively.
- ✓ WSF's fleet has an average age of 36.3 years, well above the system average of 21.9 years of age.
- ✓ WSF averaged a cost per passenger of \$10.08, less than half the \$20.51 average of those with data on the statistic.
- ✓ WSF spent 50.9% of its operating expenses on labor costs, just above the 45.1% average.
- ✓ WSF covered 68.3% of its operating expenses through the fares it charges users. The average for the 14 publically-owned ferry operators included in the analysis during 2009 was 48.8%.
- ✓ WSF received an average of \$3.49 per passenger in taxpayer subsidies, significantly less than its peers in British Columbia (\$5.86), Alaska (\$300), North Carolina (\$15.62) and Sydney (\$4.52).

The report provides background on ferry services in the Puget Sound, including nearly six decades of operations under WSF. For both WSF and a select group of peers, the paper looks at the policy environment and operational characteristics that help explain each ferry system's results.

For an agency seemingly under fire for the costs of the services it provides, performance measures and benchmarking can be used to justify taxpayer funding and increase accountability. The matrix of data collected through this research can serve as a template for future efforts at updating data and creating further measures of performance that illustrate state and agency priorities.

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Photo: Washington State Ferries File

List of Acronyms Used

(AMHS)	Alaska Marine Highway System
(CO2)	Carbon Dioxide
(GHG)	Greenhouse Gases
(GMAP)	Government Management Accountability Performance
(GPRA)	Government Performance and Results Act
(IDO)	Istanbul Denis Otobusleri
(JTC)	Joint Transportation Committee
(LNG)	Liquefied Natural Gas
(MVET)	Motor Vehicle Excise Tax
(NCDOT)	North Carolina Department of Transportation
(NM)	Nautical Miles
(NO)	Nitric Oxide
(OPB)	Oregon Performance Benchmarks
(PSNC)	Puget Sound Navigation Company
(SSA)	Steamship Authority
(TPAB)	Transportation Performance Audit Board
(VMT)	Vehicle Miles Traveled
(WSF)	Washington State Ferries
(WSDOT)	Washington State Department of Transportation
(WTC)	Washington Transportation Committee



Photo: Washington State Ferries File

Chapter One: Introduction

For nearly six decades, Washington State Ferries (WSF), a division of the Washington State Department of Transportation (WSDOT), has been serving the residents of Western Washington's island and coastal communities. Of the hundreds of public and private ferry operators in the world, WSF ranks amongst the ferry industry's top 10 in several categories, including annual passengers and vehicles carried per year, and number of terminals and vessels in operation.¹

Like any publically-owned transportation agency, Washington State Ferries relies on the qualities of its service delivery as justification for the fares it charges users and for any government subsidies it may receive. This focus on the customer is clearly reflected in WSF's mission statement²:

"To provide safe, reliable, and efficient marine transportation for people and goods throughout the Puget Sound."

Individual agencies performance, such as on-time departures, operating expenses per passenger and scheduled trips completed can evaluate a ferry operator's service delivery. However, if an agency wishes to know how its performance measures up to how others in the industry are performing, comparisons must be drawn and analyzed among measurable attributes. WSF can use comparisons with industry peers to monitor their progress towards their identified vision statement³:

"To be the most efficient and affordable, customer focused ferry operator in the world."

The rapid increase in fuel costs and the sharp drop in tax revenues associated with the on-going economic downturn continue to pressure public agencies across the nation to reevaluate their budgets and service levels. Public transit agencies have been forced to cut service, lay off employees, raise fares, slow capital improvements and take many other actions to survive.⁴ Local and state governments are demanding increased accountability for the services each public agency provides.

¹ This data will be discussed and listed in later chapters.

² WSDOT. *WSF Progress Report*. (2003), p.7. <<http://www.wsdot.wa.gov/ferries/pdf/progressreport/introduction.pdf>>.

³ Ibid.

⁴ American Public Transportation Association. *Impacts of the Recession on Public Transportation Agencies*. (Mar. 2010). Web. <http://www.apta.com/resources/reportsandpublications/Documents/Impacts_of_Recession_March_2010.pdf>.

1.1 – Purpose: Research Concept and Question

Washington State Ferries seeks to identify specific measures of its performance in relation to that of its peers in the ferry industry. Doing so allows the agency to determine where it ranks in comparison to others in terms of cost efficiency⁵, service delivery, and productivity. Achieving this requires an extensive list of quantifiable data related to operations, hereafter referred to as ‘operational characteristics’, from ferry systems around the world. Examples of quantitative operational characteristics may include:

- ✓ Annual passenger/vehicle traffic
- ✓ Fleet size and capacity
- ✓ Farebox recovery rates
- ✓ Operating and capital budget size
- ✓ Terminals in operation
- ✓ Average fleet age

Analyzing peers can also present beneficial qualitative features or techniques such as another operator’s long-range funding plan and strategy handling increases in gasoline prices. Through research, data compilation and analysis, this paper intends to further define characteristics of peers and ferry industry leaders. More specifically, this paper seeks to address the following research question:

- ***How does WSF compare and contrast with other ferry system operators around the world?***

The variations between a ferry system’s customer base, the culture of the organization and society it operates in, geographical disparities, and local competitors in the ferry or transportation industry, are just a few characteristics that make comparisons between operators challenging. In some instances, it may be beneficial to compare some measures of performance to other modes of transportation.

How can the information be used?

The dialogues created or built upon with ferry operators worldwide and their representative(s) provides WSF with a rigorous and reproducible base for identifying best-in-class performance and can lead to periodic updates to the list of operational characteristics. It also offers WSF the opportunity to exchange information with other ferry system’s and learn from their unique operational strategies and organizational features.

Based on its performance, this analysis may identify areas where Washington State Ferries operates at, below or above that of its peers. For example, another ferry operator may transport a similar amount of

⁵ The term ‘efficiency’ is defined as providing the public user’s desired service with a minimum amount of resources, expense and waste.

passengers and vehicles at a cost per person or per vehicle that is lower than WSF. Likewise, WSF may have a higher on-time performance record than its chosen peer in the industry. This paper will attempt to explain any existing gaps in operational performance.

The analysis may prompt WSF to set benchmarks, or industry standards of performance, for chosen operational characteristics where it is not already performing at the benchmark.⁶ Through the process of benchmarking, an agency can continually monitor its performance and recalibrate its strategies accordingly. The term *benchmarking* is defined as a structured way of looking outside to identify, analyze, and adopt the best practices of the industry. Its context is based largely around total quality management, the idea of improving customer focus by seeing how peers satisfy their customers. If successful, it can bring in state-of-the-art practices and contribute to the rising competitive standards in the ferry and public transportation industry.

Finally, a public agency like Washington State Ferries can use an analysis of its performance compared to the industry to inform external funding sources, demonstrate its level of service, and justify any public subsidies it receives. WSF can present to state lawmakers, system managers, ferry users, and to the public a clearer depiction of its performance relative to its peers.

1.2 – Accountability through Performance Measures and Benchmarks

The desire from American citizens to hold public agencies accountable for their operations is not a concept new to government. One of the strongest attempts at the federal level to achieve full transparency and a results-oriented way of conducting affairs in government agencies was the Government Performance and Results Act (GPRA) of 1993. A key requirement of GPRA is that all federal agencies must prepare annual reports comparing actual performance to the targets set in the agency's annual performance plans.⁷ Regionally, the governments of Oregon and Washington have initiated programs aimed at measuring and improving the performance of their respective state agencies.

In 1989, then Governor of Oregon Neil Goldschmidt formed the Oregon Progress Board (OPB) and gave the commission's twelve members the responsibility of evaluating Oregon's overall progress toward statewide goals for economic, social and environmental well-being. These goals continue to be part of

⁶ Actual benchmarks would be set by the appropriate state officials. Benchmarks referred to herein are intended to prompt a discussion on ways to measure WSF's performance.

⁷ White House. *Government Performance Results Act of 1993*. Office of Management and Budget, (1993). Web. <http://www.whitehouse.gov/omb/mgmt-gpra_gplaw2m/>.

the state's strategic plan and as of April 2010, 91 benchmarks or measures were included in the state's biennial assessment report.⁸ Where a target is set and data available (67 in the 2009 report), a grade is given based on whether data is meeting or trending toward the target.⁹ For example the state's target of 80% of eighth graders achieving state reading standards found only 65% met that mark in 2008, leading to a 'NO' grade from the OPB commission.¹⁰

In February of 2005, Governor Christine Gregoire signed Executive Order 05-02, creating Washington State's Government Management Accountability and Performance program (GMAP).¹¹ Under the GMAP program, the governor sets her administration's priorities and personally conducts quarterly reviews where agency leaders present performance data, analyze problems, and develop specific action plans to address those problems.¹² The quarterly sessions are designed to be interactive and focus on action items such as discussing identified barriers and resources needed to accomplish goals.¹³

These examples of federal and state government efforts at comparing measures of performance internally and externally, and the process of benchmarking itself, are often used in the private sector as well. Private business and corporations aim to maximize profits and shareholder value. Their primary objective is to understand those practices that will provide a competitive advantage.¹⁴ For public entities, benchmarking allows agencies to share strategies on a regular basis with one another, igniting a chain reaction among organizations striving to do better.¹⁵ While their underlying motivation at providing the service is not profit oriented, depending on an agency's target, the process can affirm whether or not the agency is being appropriately funded, as well as to demonstrate how the agency is progressing towards its vision.

Example: AMHS Benchmarks

In collaboration with state and agency officials, the Alaska Marine Highway System (AMHS), another state-run ferry operator, set a number of targets and made benchmark comparisons as part of its 2004 key performance measures. As mentioned, the variations in ferry systems can make benchmarking

⁸Oregon Progress Board. *Highlights 2009 - Benchmark Report to the People of Oregon*. State of Oregon, (Feb. 2009). P. 5, Web. <http://www.oregon.gov/DAS/OPB/docs/2009Report/2009_Benchmark_Highlights.pdf>.

⁹The term 'target' is defined as a desired outcome, and for the OPB, that target is determined through the process of benchmarking.

¹⁰Ibid, p. 10.

¹¹Wa. Exec. Order 05-02, "Government Management, Accountability and Performance (GMAP)." (21 Feb. 2005). <http://www.governor.wa.gov/execorders/eo_05-02.pdf>.

¹²National Governors Association. *GMAP Washington: Government Accountability and Performance Program*. Office of Management Consulting & Training – 2006 Management Note. Web. <<http://www.nga.org/Files/pdf/06GMAPWASH.pdf>>.

¹³Ibid.

¹⁴Camp, Robert. "Business Process Benchmarking: Finding and Implementing Best Practices." Milwaukee, WI: ASQC, 1995. P. 14-15 Print.

¹⁵Keehley, P., Medlin, S., MacBride, S., & Longmire, L. "Benchmarking for Best Practices in the Public Sector." San Francisco, CA: Jossey-Bass Inc., 1997. P. 96. Print.

operational performance difficult and as AMHS demonstrates, comparisons to other modes of transportation may be necessary. Below are two of the 11 measures the agency targets and their benchmark comparisons that were released in the report.¹⁶

Measure: The percentage of scheduled trips where vessels departed on time.

AMHS Target & Progress: Goal is to exceed the nationwide on-time airline departure benchmark of 75.1%. On-time is within 15 minutes of scheduled departure. AMHS averaged 71%.

Benchmark Comparisons: The benchmark for airlines vary by airline and airport, but heightened security after September 11, 2001, delayed departures and caused AMHS to miss its target.

Measure: Revenue per rider mile divided by the operations costs per rider mile (including fuel costs).

AMHS Target & Progress: Revenue per rider equaled .64¢ by the cost of \$1.27, for a ratio of .51¢. No target was clearly stated.

Benchmark Comparisons: WSF reports a ratio of .60. BC Ferries reports a ratio of .81.

There are numerous elements similar across agencies that attempt to create benchmarks. The steps to follow in benchmarking differ among scholars and in practice. In the book *Benchmarking for Best Practices in the Public Sector*, an 11-step process captured the main themes.¹⁷ These include:

1. Determine the purpose and scope of the project
2. Understand your own process
3. Research potential benchmarking partners
4. Choose performance measures
5. Collect internal data on performance measurements
6. Collect data from partner organizations
7. Conduct a gap analysis
8. Import practices to close performance gaps
9. Monitor results
10. Recalibrate based on findings
11. Start the search anew

¹⁶ State of Alaska – Online Public Notice. “Performance Measurement Software – FY04 Key Performance Measures.” (2004), Web. <[http://notes4.state.ak.us/pn/pubnotic.nsf/0/d31592f84c4de48f89256c9500695d9d/\\$FILE/Attachment+7+Performance+Measures.pdf](http://notes4.state.ak.us/pn/pubnotic.nsf/0/d31592f84c4de48f89256c9500695d9d/$FILE/Attachment+7+Performance+Measures.pdf)>.

¹⁷ Ibid., citation 15.

This research attempts to complete the first seven steps and provide the foundation for the agency to accomplish steps 8 through 11.

1.3 – Organization of the Paper

The next chapter discusses the paper's research structure. Here I identify how the operational characteristics and performance measures were chosen, what they signify and how they will allow me to compare other ferry system's to WSF. Chapter Two then describes the four research methods I used to collect the necessary data, how each method was implemented and any initial findings.

In Chapter Three, I provide a brief background of this mode of transportation and general characteristics common among most ferry systems. Additionally, I include the origins of ferries locally and their influence on the Puget Sound region in Washington State.

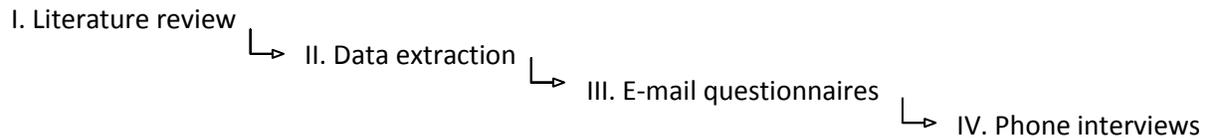
In Chapter Four, I profile the agency at the focus of the paper, Washington State Ferries. This will include a discussion of the agency's governance, assets and service delivery, and its funding structure. The chapter concludes with a description of the policy environment, describing relevant laws and policies that impact WSF operations.

Chapter Five looks in-depth at two ferry system's considered to be peers in the industry (and a few other operators in less detail) and their assets, route and financial data. In addition, I describe some relevant policy and operational strategies unique to each system. The intention of the chapter is to gain a deeper understanding of peers in the industry that can help explain the similarities and differences with WSF and between each other.

The final chapter makes the actual comparisons between ferry systems. The first section ranks the top 10 for selected operational characteristics amongst the ferry operators included in the analysis. The next section reveals the results of the performance measures for WSF, its peers and others for which data is available. I end the chapter by discussing some of the limitations of this analysis and reintroduce the concept of benchmarking and how this paper can contribute to that process.

Chapter Two: Research Structure

To answer the research question, the paper used four data collection instruments, conducted along a mostly sequential path as follows:



Prior to describing the methods, the chapter first focuses on the set of performance measures this paper will analyze, describing why each was chosen, what the data describes, and how the information can be of use to Washington State Ferries. The paper then describes each research method, their purpose, details how each were implemented and any initial findings.

2.1 – Operational Characteristics and Performance Measures

The relationship between operational characteristics and performance measures should be clarified. Operational characteristics are the quantifiable data related a ferry system, whether it is its assets, traffic volume, or figures related to a system’s budget. Performance measures are defined as the specific quantitative representation of a capacity, process, or outcome deemed relevant to the assessment of performance.¹⁸ It is the value of the characteristics that, usually in combination with another, can tell a story behind a ferry system’s operations.

Operational Characteristics

Together with WSF Operations Policy Advisor Melissa Johnson, we identified the characteristics that would both provide values to the performance measurements and facilitate a ranking based on general attributes (see Table 2.1 below). These are meant to be annual figures where applicable and are grouped into the following three categories:

¹⁸ Harry P. Hatry, Mark Fall, Thomas O. Singer, and E. Blaine Liner. *Monitoring the Outcomes of Economic Development Programs*. Washington, DC: The Urban Institute Press, 1990.

Table 2.1 - Operational Characteristics Broken into Three Categories

Assets	Routes / Traffic	Finances
Number of vessels	Number of routes	Operating revenue
Type of vessel (passenger or pass./vehicle)	Route length	Fare revenue
Vessel capacity (passenger and vehicle, if any)	Gallons of fuel consumed	Non-fare passenger revenue
Total fleet capacity (passenger and vehicle, if any)	Number of trips completed	Misc. revenue
Number of employees	Passengers transported -Difference over prev. yr	Operating expenditures
Number of terminals	Vehicles (if any) transported -Difference over prev. yr	Labor expenses
	On-time departures	Fuel expenses
	Trip reliability	Misc. expenses
		Capital expenditures

Performance Measures

Step four in the process of benchmarking referenced in the previous chapter is choosing performance measures. The goal is to use a set of operational characteristics guided by WSF’s strategic plan that would measure its output and encompass user, administration, and operational interests. In his book, *Performance Measurement: Getting Results*, the Urban Institute’s Harry Hatry identified three attributes of a useful performance measurement system:

1. A reasonable level of agreement exists on agency goals and strategies.
2. It is capable of documenting performance in a way that supports decision making.
3. The resulting information is clear, understandable, and meaningful.¹⁹

While this analysis is not intended to be a system, the performance measures were chosen to reflect and relate coherent goals and strategies of the agency. In addition, the results are intended to be of benefit to policymakers and agency staff. Where possible, performance measures are evaluated by comparing the data to desired outcomes, if any, set by WSF officials or state committees to other operators in the industry.

Together with WSF staff²⁰, a set of performance measures were determined useful for the analysis between ferry operators. These involve measures associated to transit service quality and cost efficiency as follows:

¹⁹ Hatry, Harry. *Performance Measurement: Getting Results*. 2nd ed. Washington, D.C.: The Urban Institute Press, 2006. P. 270. Print.

I. Transit Service Quality Performance Measures

TRIP RELIABILITY

(COMPLETED TRIPS DIVIDED BY SCHEDULED TRIPS)

Defined as the proportion of actual services provided relative to the number of scheduled services, this measure is beneficial for evaluating WSF because it is assumed to have a direct relationship with customer satisfaction. It can help to answer the question – how well is WSF service actually following published schedules? Weather and traffic congestion are two examples for reasons a ferry system may cancel a trip. While WSDOT does not set a trip reliability goal for WSF, the agency nonetheless records its performance and relating this to peers in the industry can help to assess whether WSF is in-line with others.

ON-TIME DEPARTURES

(PERCENTAGE LEAVING WITHIN 15 MINUTES)

The proportion of actual ferry services that depart within a reasonable time (differs between operators but is considered in this analysis as anything within 15 minutes) of its scheduled departure is referred to as ‘on-time’. WSDOT in its 2009 Gray Notebook sets a goal of 90% departures within ten minutes of schedule for WSF. Therefore, this measure can be of use in determining whether the agency is meeting its target and how others would perform under the same target.

SAFETY

(NUMBER OF ACCIDENTS PER 1,000 TRIPS, NUMBER OF INJURIES PER MILLION RIDERS)

WSDOT analyzes and reports statewide collision and fatality information, and uses this information to make data-driven decisions and deploy strategies to minimize occurrences. Especially after the recent 2003 Staten Island ferry accident where 11 people died in New York and the more recent May 2010 accident with the same operator where dozens were injured, this measure was chosen because of a strong recent history of safety within WSF operations. With an ever aging fleet of vessels and technology (dockside and on water), accidents and injuries were found to be particularly relevant. In addition, the perceived safety and security that users have for any public transportation system is impacted by the incidents reported.

AVERAGE FLEET AGE

(SUM OF YEARS SINCE EACH VESSEL WAS BUILT DIVIDED BY NUMBER OF VESSELS)

As a ferry vessel ages, the amount of times it will require dock maintenance increases. Over time, salt water corrodes the steel hull of a ferry vessel forcing continual repair, spare parts for outdated vessel models become more expensive, and the added fuel spent on the aged infrastructure lead ferry operators to establish vessel replacement plans. This was chosen and included as a transit service quality measure because the older a system’s fleet is, the increase in maintenance impacts trip reliability and pressures ferry operators to raise rates in order to cover higher expenses. The information may help uncover a causal relationship between age and other features, e.g. higher or lower operating costs, in comparison to others.

²⁰ Includes discussions with Melissa Johnson, WSF Operations Policy Advisor, and Ray Deardorf, WSF Planning Director.

II. Cost-Efficiency Performance Measures

COST PER PASSENGER TRANSPORTED

(OPERATING EXPENSES DIVIDED BY TOTAL PASSENGERS)

This measure incorporates price and affordability and attempts to answer the question: how does WSF ferry transportation line up with others on the basis of cost per passenger? Operating expenses are defined as the sum of all costs incurred in carrying out the ferry operator's day-to-day activities, including repair and maintenance of vessels and terminals, labor and benefits, and the cost of fuel. Taken on a passenger-by-passenger basis, this measure can help determine the relative cost of providing ferry service and can be of use for comparing averages amongst peers and to other modes of transportation. Apart from comparison purposes, this measure is also of use for legislators and agency officials for monitoring trends.

LABOR EXPENSES PROPORTION OF OPERATING EXPENSES

(LABOR EXPENSES DIVIDED BY OPERATING EXPENSES)

The cost to provide ferry service includes that to physically operate and maintain the vessels and terminals, in addition to paying staff. This measure was chosen in hopes of illustrating how staff levels and their related expenses impact an operator's total expenses and, ultimately, its bottom line. Some ferry systems have other business ventures or provide additional services aside from operating ferries and report their number of employees and costs as a whole. If there is a discrepancy in services provided between peers it will be noted, but the overall measure can show how WSF compares to others in terms of their proportion spent on labor.

FAREBOX RECOVERY

(FARE REVENUE DIVIDED BY OPERATING EXPENSES)

This proportion of operating expenses supported by fares was chosen because state legislators and agency officials have set the ratio of 80% in the short-term and over 90% in WSF's long-range plan. This measure is useful because it allows WSF the opportunity to see how other ferry system's cover their costs. Many operators depend on advertising, catering and concessions, charter services and other important revenue sources such as parking and reservation fees. For public agencies, shortfalls in the operating budget are commonly made up through government subsidies.

SUBSIDY PER PASSENGER TRANSPORTED (IF APPLICABLE)

(GOVERNMENT FUNDING DIVIDED BY TOTAL PASSENGERS)

In the current economic climate, state and local governments operating or subsidizing ferry systems are likely weighing the extent to which their cash-strapped departments can narrow contributions to operations. Where applicable, this measure calculates how much taxpayers contribute per passenger to the day-to-day operations for a ferry system. WSF must justify the funds it receives and including per passenger subsidies can be especially useful for comparing how much other public agencies contribute to their respective ferry operations.

In addition, there were a number of more specific policy-related questions related to the existence of public/private partnerships, strategies for dealing with increased fuel prices, fare trends, long-range funding plans, and ways the agency or organization requests and receives funds.

The next step in benchmarking is to collect the data from partner and/or peer organizations.

2.2 – Literature Review

The literature review consisted of print publications, ferry operator websites and their links to published reports, and other online documents. The review served three primary purposes. First, the analysis required that I learn more about the historical background of marine transportation and local ferries so as to put into context the services the agency provides (Chapter Three). Next, to become familiar with the agency, I needed to attain in-house documents and search for information related to issues such as its governance, policy environment and funding structure (Chapter Four). Finally, with limited resources available that comprehensively detail worldwide ferry system characteristics, I determined that the research had to cast a broad search of other systems whose features most closely aligned with WSF.

Initial Findings

There was a joint effort in June of 2008 between the University of Washington and WSDOT to compare other national and international ferry systems with Washington State Ferries.²¹ The unpublished and incomplete work was very helpful in serving as a template for this analysis.

The review also yielded a narrowed list of ferry system's among the hundreds of operators worldwide that this analysis uses to compare with WSF. The inclusion of ferry systems in countries regarded as 'third world' or 'developing' was considered, but it was determined that both the difficulty in establishing contact and the unequal records of service delivery to WSF were strong enough reasons to leave them out. However, based on features such as the size of the agency/organization in terms of its budget, number of vessels and terminals in operation, and number of passengers or vehicles transported, the analysis identified 26 ferry system's to analyze further as shown in Table 2.2 below.

²¹ UW Evans School MPA candidate Zach Howard, working as a graduate researcher with the UW Transportation Research Center and WSDOT Office of Research and Library Services Student Studies Program, began what he titled 'Ferry Systems Comparison Report: A Study of 19 Ferry Systems Throughout the World'. The roughly 12-page unedited draft focused primarily on fares, however the operational characteristics and systems he selected helped influence the selection WSF came to choose.

Table 2.2 - 14 European Operators Selected Among 26 Total Operators for Comparison

United States	Europe	Operators Elsewhere
Alaska Marine Highway Cape May-Lewes Golden Gate Ferries New York Waterway North Carolina Ferries Staten Island Ferries Steamship Authority	ANEK Lines Brittany Ferries Color Line Fjord1 Nordvestlandske AS Hellenic Seaways Irish Ferries Istanbul Deniz Otobusleri Jadrolinija Ancona P & O Ferries Scandlines Stena Lines AS Tallink Grupp Transtejo & Soflusa Waxholms Angfartygs AB	Bay Ferries BC Ferries Interislander Star Ferries Sydney Ferries

Each ferry operator has an online presence, a company or agency website that details their service route schedules and fares. Many give interested riders the opportunity to make reservations, detail special offers, provide traveling tips, and/or access to sign-up for newsletters and e-mail news bulletins. Some also provide current wait times and conditions, directions and maps, and provide links of use to travelers after riding a ferry. Whether on their webpage (e.g., annual and financial reports, business plans) or through general searches (e.g., Google and UW Libraries), I was able to obtain helpful information about many of the ferry system’s chosen and the industry in general.

2.3 - Data Extraction

Having narrowed the list to 26 ferry systems, the next step involved gathering publically-available data on the aforementioned characteristics. Most of this data came from various reports and links within each company or agency’s website. The purpose of attempting to acquire as much data as possible prior to personally contacting sources was two-fold. First, I wanted to increase the possibility of getting responses to the forthcoming questionnaire. The belief was that by demonstrating my knowledge of each individual system and the time expended personalizing the request for data, would prompt more willingness from the contact to update or correct the figures and provide additional data. Secondly, I did not want to depend entirely on the response of the contact at the organization for a response to the information request.

All of the ferry system’s had contact information on their websites that included e-mail addresses for general questions related to ferry service. In order to personalize my requests for data, I attempted to

identify the operations or managing director of the ferry system, and the finance director or comptroller so that I could contact them for questions related to their job function. These individuals were also determined to be the most appropriate proprietors of the data. Finally, a major part of the data extraction method consisted of gaining readily accessible figures from Washington State Ferries itself.

Initial Findings

For WSF, all information was acquired with the help of Operations Policy Advisor Melissa Johnson, Planning Director Ray Deardorf and their contacts at the agency. Finding figures for all the operational characteristics from the ferry industry as a whole was a struggle. There seemed to be no distinction between publically and privately-owned ferry systems in the information released online (that my research could find). About half of the initial 26 systems chosen for comparison had basic statistics regarding their assets and annual traffic accessible via the internet, albeit not uncommon for the data to be several years old. However, fewer operators had more specific information, especially regarding finances and policy-related questions.

With the exception of two ferry systems, an exhaustive online research found at least two and in some cases, up to five contacts per agency or organization. In total, I was able to identify 86 contacts that included their name, title, e-mail address and telephone number (included as Appendix A). With the acquired data and the applicable contacts, I set out to establish a dialogue with individual ferry system representatives, politely requesting they verify or update the data I was able to find and provide additional figures if possible.

2.4 – E-mail Questionnaires

My research determined that the most appropriate way to solicit information was via e-mail because of the magnitude of my request, the perceived reception of the contact, and to avoid duplicating requests for data. I created an e-mail protocol questionnaire (see Appendix B) introducing myself and the purpose of my correspondence, to each of the 86 contacts. The e-mail consisted of 12 questions designated for the operations representative and 7 questions for the finance representative. Sent from a designated WSF e-mail account, my e-mail personally addressed each contact by their first name, title, and agency or organization. The questionnaire first requested answers to one of the sets of questions (depending on the contact's area of expertise), and included the other set of questions at the bottom of the email. To ensure transparency in the process, I also indicated other members of the ferry system

that received an e-mail. Finally, to convey a commitment to openly exchanging information, I included the 2009 fiscal year data for WSF with each question.

The next phase of my strategy at collecting data was calling contacts willing to discuss more specific questions related to operations. In the email questionnaire, I asked when the best time to call would be and for verification of the telephone number I had for them through my research.

Initial Findings

Responses were varied. There were some organizations that cited privacy issues and would neither confirm the data I had found for them nor provide additional data. Others included limited statistics, but indicated a willingness to be contacted over the phone. The most common response (from five ferry systems) the first week after sending the questionnaire however, was complete disclosure. This and all information obtained will be discussed in more detail in Chapter Six.

2.5 – Phone Interviews

The last instrument included this research is phone interviews with ferry operator representatives. If the individual responding to the questionnaire indicated I could follow-up the first set of questions with a telephone interview, I was prepared to ask a series of policy and qualitative questions (see Appendix B). The other purpose of calling ferry system's representatives was an attempt to get a response to the original questionnaire.

This paper chose to focus most attention on collecting the data contained in the e-mail questionnaire, recognizing most of the data for the performance measures were addressed in those questions. Also a factor was the expected apprehension from ferry systems to speak about more detailed operational characteristics. The past efforts by a previous research student to open a spoken dialogue with agency or organization representatives were largely unsuccessful. I would attribute a majority of this sentiment in equal measure to privacy concerns and individual apathy to gather data or communicate. However, at a minimum, the peer ferry system's I would compare WSF performance to in more depth required that I attain answers to these questions and the other operational characteristics.

Chapter Three – Background

Residents of communities on or surrounded by bodies of water have, for hundreds of years, required the use of a vessel in which to traverse the water and arrive at their destination. Prior to the locomotive era, the transportation options were either by paddle or sailboat, both of which were exceptionally time-consuming. First Nations, for example, used canoes to transport people the approximately 60 miles from Olympia to Seattle, Washington, in two to three days.²² Technology and the Industrial Revolution would eventually usher in more efficient ways to get from point A to point B.

3.1 – Rise of the Ferry

Arguably the most important innovation in water transportation began around 1710 when Thomas Newcomen, a British businessman in the iron trade, invented the first steam engine.²³ Newcomen sought a way to pump water out of frequently flooded mines, and its success led others to explore new uses for the steam engine and to perfect the technology. A brief timeline of the pioneers and their important contribution to water-borne transportation follows.

- **Mid-Late 1700's:** James Watt, with financial support from fellow Englishman Matthew Boulton, partnered to create hundreds of steam engines that used 75% less fuel (coal, fuel oil) than Newcomen's by separating the condenser from the cylinder and piston.²⁴
- **Early 1800's:** Colonel John Stevens, an American inventor and engineer, reputedly founded the first commercially operated steam ferry in the world, the *Juliana*. The ferry quickly became a major conduit for commuters between New York City and Hoboken, New Jersey.²⁵
- **Early-Mid 1800's:** John Ericsson and Francis Pettit Smith helped institutionalize the use of screw propulsion, a concept traditionally attributed to Archimedes, which efficiently raised water and when rotating in opposite directions, moved a vessel forward faster than ever before.²⁶
- **Late 1800's:** Sir Charles Parsons, a British engineer, invented the steam turbine, a mechanical device that extracts thermal energy from pressurized steam and converts it into rotary motion.²⁷

²² Newell, Gordon. "Ships of the Inland Sea." Portland, OR: Binfort & Mort, 1951. P. 6-9. Print.

²³ Allen, John. "More about us – Thomas Newcomen." *The Newcomen Society*. Web. <<http://www.newcomen.com/thomas.htm>>.

²⁴ Encyclopedia Britannica. "Facts about James Watt: Newcomen engine." Web. Accessed on 2 Apr. 2010. <<http://www.britannica.com/facts/5/24556/James-Watt-as-discussed-in-energy-conversion-technology>>.

²⁵ Stevens Institute of Technology. "History." Web. Accessed on 2 Apr. 2010. <<http://www.stevens.edu/sit/about/steamboats.cfm>>.

²⁶ National Inventors Hall of Fame. "Inventor profile." *Invent Now* (2002). Web. <http://www.invent.org/hall_of_fame/54.html>.

²⁷ Parsons, Sir Charles. "The Steam Turbine." *Cambridge University Press: The Rede Lecture* (1911). Web. <<http://www.history.rochester.edu/steam/parsons/part1.html>>.

- **Late 1800's – Early 1900's:** Rudolf Diesel, a German inventor, patented the diesel engine which would go on to largely replace the steam piston and turbine engine in many applications. As a result, fuel efficiency, engine life, and energy conversion drastically improved operations and their use continues today.²⁸

The design and construction of vessels also evolved over time, moving from all wood in the early years of shipbuilding to iron and steel in the mid- and late-1800's.²⁹ Iron and steel materials were able to reduce vessel weight, improve durability and strength, and lower costs of construction and repair.³⁰ The dramatic increase in safety made ships more attractive to passengers, and caught the attention of shipbuilders, private operators and local jurisdictions near or around water. As vessels modernized, so did their size, capability and methods of use.

One of those uses is a ferry, defined as a ship or boat that carries passengers (and often vehicles) across a body of water. The analysis that follows, while interesting in their own right, will not incorporate cruise or freight-only operations. The topic of this paper is on the predominantly transportation-centric services of ferry systems.

While not universal worldwide, most ferry system's do share a number of key characteristics. First, ferries serve as an essential transportation link, in some cases the only link for isolated locations, connecting coastal communities to each other. Where bridges do not exist, the distance too far, or perhaps for cost savings, people have and will continue to benefit from ferry service. Next, they tend to operate under a regular schedule with published fares for fixed routes. Most ferry operators also share a collective commitment to safety, reliability, affordability and operational integrity. Finally, they facilitate the movement of not just people, but goods and services. Ferries act as the transportation that provides a base for economic development and community access to commodities and to health, legal, government and social services.

The variations between ferry systems are much more widespread. Some ferries transport only passengers, while others can also carry vehicles and cargo. The vessels themselves range in passenger and vehicle capacity, annual traffic and freight carried, and amenities and facilities onboard. Route specific differences include total distance traveled, frequency of service, and seasonal trends in service.

²⁸ Massachusetts Institute of Technology. "Inventor of the Week." *Lemelson-MIT Program* (Jan. 2004). Web. <<http://web.mit.edu/invent/iow/diesel.html>>.

²⁹ Author unknown. "Ships of Wood or Metal." *New York Times* (31 Jan. 1892). Web. <http://query.nytimes.com/mem/archive-free/pdf?_r=1&res=9F05E5D71738E233A25752C3A9679C94639ED7CF>.

³⁰ Ibid.

Finally, there are also variations in issues regarding policy, such as a system's governing structure and subsidies provided, trips completed on schedule, long-range funding plans, and the amount of operating revenue generated from fares.

These similarities and differences between ferry systems and the characteristics specific to Washington State Ferries will be discussed in further detail when the analysis looks at the characteristics in which to set benchmarks and measure performance.

3.2 – Ferries on the Sound

The Puget Sound was originally served by a large number of private operators often referred to as the 'Mosquito Fleet'. Steamboat ferries first arrived in the mid 1800's, but operated under irregular schedules and were an expensive form of transportation. In 1853, for example, the once-a-week trip from Olympia to Seattle cost \$10 per passenger on the steamer *Fairy* (or around \$255 in 2010 dollars).³¹

Until navigational technology came around, ferry captains were forced to embark on occasionally dangerous trips. In situations with low visibility, the most effective determinant of water location relative to land was accomplished by counting the time it took for the echo from a ferry's whistle to bounce back from the mainland.³² The initial ferry vessels had difficulty managing the periodically rough waters, becoming unseaworthy in some instances. Apart from occasional groundings and sinking's, other tragedies marred the early days of ferries on the Puget Sound. It was not uncommon for ferries to catch fire from boiler explosions and their all-wood construction or for there to be groundings during attempts to port or in rough weather.³³

The rise of the gold rush and the population that followed it in the late 1800's quickly brought in a large number of ferry operators, and Puget Sound became a main shipping point for supplies and gold seekers.³⁴ By 1890 there were regular daily services from Tacoma to Seattle. Early in the 1900's, as vessels advanced in structure and the first Puget Sound-built ferry, the *Tacoma*, made the dock-to-dock trip from Tacoma to Seattle in 77 minutes.³⁵

³¹ Winther, Oscar Osburn. *The Old Oregon Country: A History of Frontier Trade, Transportation and Travel*. Reprint edition. Omaha, NE: University of Nebraska Bison Book Printing, 1969. P. 167. Print.

³² Kline, M.S., and Beyless, G.A., *Ferryboats – A Legend on Puget Sound*. Seattle, WA: Bayless Books. P. 13. Print.

³³ Neal, Carolyn, and Thomas K. Janus. *Puget Sound Ferries - From Canoe to Catamaran*. 1st ed. Sun Valley, CA: American Historical Press, 2001. P. 28-31. Print.

³⁴ *Ibid.*, citation 22, p. 12-16.

³⁵ *Ibid.*, citation 22, p.174.

As rail and interurban transportation options expanded, especially with the advent of automobiles and an improved road and highway system, ferry passenger numbers began to rapidly decrease. Many ferries were converted to auto ferries, while others were abandoned or decommissioned and turned into tugboats.³⁶ By 1936, only one private operator remained – the Puget Sound Navigation Company (PSNC), running a fleet of ferries commonly referred to as the ‘Black Ball Line’.³⁷

The PSNC, as the sole operator on the Sound, started to receive public criticism in the 1940’s for being a monopoly and for its refusal to be regulated. To combat increasing union worker wages, the operator claimed it had to raise rates, a move legislators repeatedly rejected.³⁸ Residents and lawmakers demanded increased accountability as the company suffered operational shutdowns. When King County commissioners demanded a 40 percent rate reduction, the PSNC responded by declaring its intention to shut down the ferries the following month, but the two sides reached an agreement for a 10% reduction.³⁹

By late 1950, after ongoing negotiations, public decries and protracted legal battles, the PSNC went under and with public support, the State of Washington took control by purchasing all of the Black Ball Line’s equipment and facilities.⁴⁰ In May of 1951, the Washington Toll Bridge Authority issued bonds in the amount of \$6.8 million to pay Black Ball and to rehabilitate its vessels and docks.⁴¹ Daily operations would remain relatively unchanged after the June 1st transfer.

³⁶ Ibid., citation 22, p. 188.

³⁷ Ibid., citation 33, p. 81-85.

³⁸ Ibid., citation 33, p. 107.

³⁹ Ibid., citation 33, p. 120.

⁴⁰ Ibid., citation 33, p. 124.

⁴¹ Ibid.

Chapter Four: Washington State Ferries

Marine transportation on the Puget Sound has evolved from canoes to paddle boats to steamships. While some features of WSF haven't changed through recent years such as its well regarded record of safety, sailing reliability and environmental stewardship, there have been numerous events or issues over the last dozen years that have and will continue to shape the agency. Here I build a profile of the largest ferry system in the nation by describing its current governance structure and a few relevant legislative or policy initiatives that impact WSF operations. The following subchapters outline the agency's current assets, its service delivery, and ends with a description of the largest challenge facing WSF, its funding structure.

4.1 – Governance and Administration

When the newly created Toll Bridge Authority and State Highway Commission were formed in 1951 following the buyout of PSNC's fleet, the two agencies and the public believed that it was a temporary measure until the inevitable bridges linking the west and east sides of Puget Sound were built.⁴² However, the plan for bridges was rejected by the state's legislature in 1959, and the agencies continued to manage and operate ferry services for nearly two more decades.⁴³

Since 1977, Washington State Ferries (WSF) has been a division of the Washington State Department of Transportation (WSDOT). Beginning in July of 2005, at the request of the Transportation Performance Audit Board (TPAB), the state sought to align with government-sponsored performance oversight initiatives related to WSDOT.⁴⁴ At the recommendations of TPAB and after the April 2005 passage of Engrossed Senate Bill 5513, WSDOT became a cabinet agency reporting to the Governor.⁴⁵

As of March 2010, there were a total of 1,768 employees at Washington State Ferries, with over 92% belonging to one of 14 unions and 252 listed in Administrative roles.⁴⁶ At the top of the agency is the Assistant Secretary for the Ferries Division, who reports to the Secretary of the Washington State

⁴² Neal, Carolyn, and Thomas K. Janus. *Puget Sound Ferries - From Canoe to Catamaran*. 1st ed. Sun Valley, CA: American Historical Press, 2001. P. 129. Print.

⁴³ Website. "Washington State Ferries – History." *WSDOT*: Web. 28 March 2010.

<http://www.wsdot.wa.gov/ferries/your_wsf/index.cfm?fuseaction=our_history>.

⁴⁴ State of Washington JLARC. "Review of Accountability Mechanisms for Washington State Department of Transportation." Olympia: Washington (7 Aug. 2005). Web, p.3. <<http://www.leg.wa.gov/JLARC/AuditAndStudyReports/2005/Documents/05-15.pdf>>.

⁴⁵ Ibid.

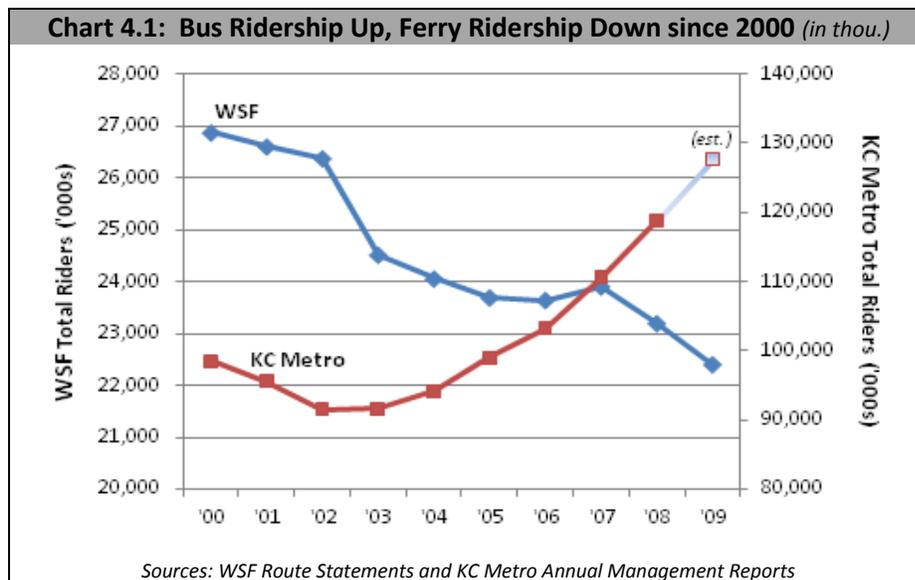
⁴⁶ Johnson, Melissa. 1 Apr. 2010.

Department of Transportation. An organizational chart, included as Appendix D, further illustrates the administrative structure of WSDOT and WSF.

The Governor is directly responsible for selecting the Secretary of WSDOT, for setting policy and management initiatives, operational goals and holding WSDOT accountable.⁴⁷ The State legislature passes laws related to service levels, setting the budget and appropriating taxpayer funds. As part of the state highway system, there are several state committees, such as the Washington Transportation Commission (WTC) that sets fare rates and along with local advisory committees, reviews WSF’s operational performance, regulates ferry vessels, and holds public forums. For example, during April of 2010, at the time of this paper’s writing, the WTC is conducting a thorough survey of ferry riders about their opinions on fares, schedules, congestion, pricing, transit connections and their general satisfaction with the agency’s service.⁴⁸

4.2 – Assets and Service Delivery

It wasn’t until 1974 that Washington State Ferries was designated a mass transportation system.⁴⁹ Over the years about one-third of total passengers have been commuters, rising to half of all riders during peak times.⁵⁰ Washington State Ferries is the number one tourist attraction in the state and the second



most used form of public transportation behind King County (KC) Metro. Beyond tourism and commuting purposes, commercial vehicles and local residents seeking recreation or leisure activities all rely on WSF services.

⁴⁷ Wa. St. Leg., SB5513. “Restructuring Certain Transportation Agencies.” (1 July 2005). <<http://apps.leg.wa.gov/documents/billdocs/2005-06/Pdf/Bills/Senate%20Passed%20Legislature/5513.PL.pdf>>.

⁴⁸ WTC. “Transportation Commission Launches Ferry Rider Survey.” Olympia: Washington (8 Apr. 2010). Web. <http://wstc.wa.gov/news/2010/10_0408_TranspComLaunchesFerryRiderSurvey.htm>.

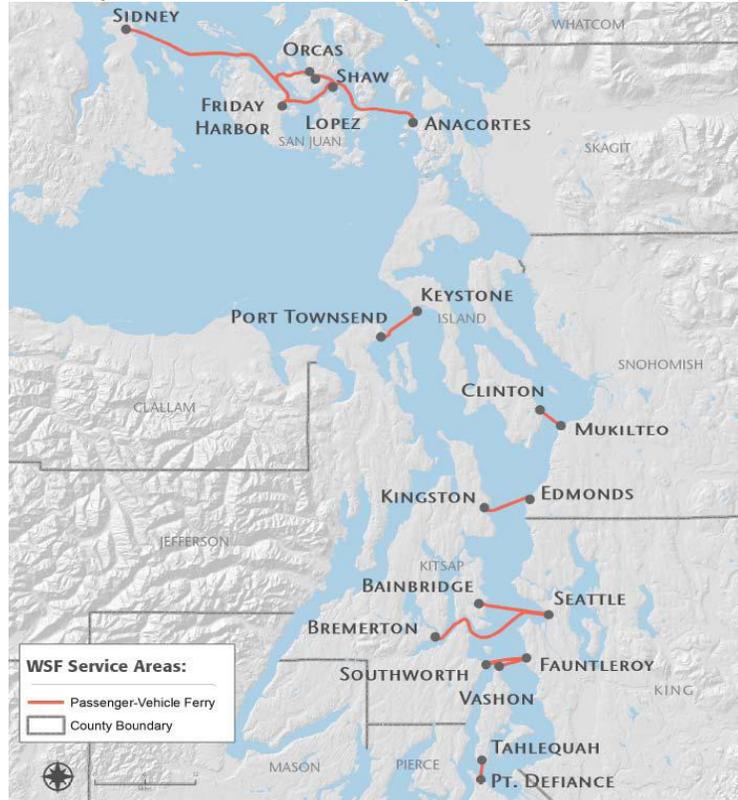
⁴⁹ Ibid., citation 43.

⁵⁰ WSDOT. *Washington State Department of Transportation Ferries Division Final Long-Range Plan*. Olympia: Washington. WSF (30 June 2009): Web, p.ES-7. <<http://www.wsdot.wa.gov/NR/rdonlyres/41834A0B-DABC-48FA-9700-DF0298AA65B4/58554/FinalLRPCompleteDocument1.pdf>>

As more and more Western Washington residents populate areas accessible by ferries, and as public transit supportive services continue to improve, demand is likely to increase. This is not always the case however. As depicted in Chart 4.1 above, the trend in ridership between KC Metro and WSF over the last decade has actually taken two different paths. For Metro, demand has grown significantly due to the economic downturn and skyrocketing gasoline prices forcing a growing customer base out of their cars and into public bus transportation.

Map 4.2 visually illustrates the routes and the terminals WSF operates from as of April 2010. In 2009, over 31,600 passengers per day, or 22.4 million riders were served by one of WSF's nine routes on the Puget Sound. This includes over 21,700 riders per day via vehicle, or 9.9 million for the year.

Map 4.2: WSF Provides Ferry Service on Nine Routes



According to the WSDOT Gray

Source: WSF Long-Range Plan (06/2009)

Notebook, during the second quarter of fiscal year 2010, WSF completed 99.6% of scheduled trips and

Table 4.3: Bainbridge Route Carries One-Third of Passengers Transported in 2009

Route	Passengers	Vehicles	Total Riders
Anacortes – San Juan Islands	868,000	817,000	1,685,000
Anacortes – Sidney, B.C.	84,000	44,000	128,000
Edmonds – Kingston	1,877,000	2,075,000	3,952,000
Fauntleroy – Vashon Island – Southworth	1,315,000	1,696,000	3,011,000
Port Townsend – Kingston	282,000	222,000	504,000
Mukilteo – Clinton	1,814,000	2,138,000	3,952,000
Point Defiance – Tahlequah	259,000	353,000	612,000
Seattle – Bainbridge	4,194,000	1,914,000	6,108,000
Seattle – Bremerton	1,796,000	653,000	2,449,000
TOTAL	12,489,000	9,912,000	22,401,000

Source: WSF Route Statement

92.9% departed on-time (considered to be within 10 minutes of scheduled departure). The total customer complaints in the same quarter were 2.4 per 100,000 passengers.⁵¹

In terms of walk-on passengers, the Seattle to Bainbridge route served the most traffic with nearly 4.2 million riders. Table 4.3 on the left

⁵¹ WSDOT. "The Gray Notebook." (19 Feb. 2010): Web. <<http://www.wsdot.wa.gov/NR/rdonlyres/6230A2A7-632A-4BC2-80F4-53DCFE6471D9/0/GrayNotebookDec09.pdf>>.

shows 2009 statistics on WSF's nine routes. For vehicle traffic, the Mukilteo to Clinton route was both the most heavily used, over 2 million vehicles.⁵²

As the map above shows, ferries load and unload passengers from 20 different terminals along nine total routes. WSF averages over 400 sailings daily, completing over 147,000 trips in 2009. The routes total 84 nautical miles (nm) of state highway among eight separate counties.⁵³ Several of the locations served depend entirely on ferry transportation to link them to the mainland. These include the mostly residential Vashon Island route and four different ports-of-call in the recreation and heavily trafficked tourist destinations of the San Juan Islands. Map 4.3 below visually illustrates the routes and the terminals operated by WSF.

As of April 2010, WSF operates 20 vessels with a total capacity of 30,881 passengers and 2,623 vehicles (Table 4.4 below lists each vessel and their respective age and capacities). For the first half of the 2009

fiscal year WSF operated a passenger-only vessel from Seattle to Vashon Island, but has since transferred operations to King County. In the summer of 2010, the newest edition to the agency's fleet, the vessel Chetzemoka, is expected to go into service on the Port Townsend – Keystone route.⁵⁵

In the next 20 years, eight of the WSF's current fleet of 20 passenger-auto ferries in operation will reach their maximum useful life and will need either rehabilitation to extend their use or be replaced.⁵⁶ As of January 2010, the average vessel age of the fleet was 36.3

Table 4.4: WSF Current Fleet Averages Over 36 Years in Age

<u>Vessel Name</u>	<u>Passenger Capacity</u>	<u>Vehicle Capacity</u>	<u>In Service Date</u>	<u>Vessel Age</u>
<i>Cathlamet</i>	1,200	124	1981	29
<i>Chelan</i>	1,200	124	1981	29
<i>Elwha</i>	1,076	144	1967	43
<i>Evergreen State</i>	983	87	1954	56
<i>Hiyu</i>	200	34	1967	43
<i>Hyak</i>	2,500	144	1967	43
<i>Issaquah</i>	1,200	124	1979	31
<i>Kaleetan</i>	2,500	144	1967	43
<i>Kitsap</i>	1,200	124	1980	30
<i>Kittitas</i>	1,200	124	1980	30
<i>Klahowya</i>	800	87	1958	52
<i>Puyallup</i>	2,500	202	1999	11
<i>Rhododendron</i>	546	60	1947	63
<i>Sealth</i>	1,076	90	1982	28
<i>Spokane</i>	2,000	188	1972	38
<i>Tacoma</i>	2,500	202	1997	13
<i>Tillikum</i>	1,200	87	1959	51
<i>Walla Walla</i>	2,000	188	1972	38
<i>Wenatchee</i>	2,500	202	1998	12
<i>Yakima</i>	2,500	144	1967	43
Totals/Avg:	30,881	2,623	36.3 years	

Source: WSF Fleet Guide

⁵² All figures are according to in-house document "WSF Route Statement Fiscal Year 2009."

⁵³ WSDOT. "WSDOT Ferries Division – Nation's Largest Ferry System." (2009). Web. <<http://www.wsdot.wa.gov/ferries/pdf/wsflargest.pdf>>.

⁵⁴ Russell, Doug. 9 Apr. 2010.

⁵⁵ Whalen, Nathan. "WSF's newest vessel, Chetzemoka, sails closer to Keystone." *Whidbey News-Times* (7 Apr. 2010). Web.

<<http://www.pnwlocalnews.com/whidbey/wnt/news/90009267.html>>.

⁵⁶ *Ibid.*, citation 50, p. 5.

years.⁵⁷ Add to this the natural deterioration of ferry terminals, and WSF is faced with substantial future costs to sustain their assets.

Gasoline prices and the economic downturn are not the only reasons for the decreased ridership. In November of 2007, four of the agency's steel electric class vessels (then 81 years old) were removed from service and have yet to be replaced. State officials decided the hulls of the aging ferry vessels were not safe and too expensive to continually repair. Their removal meant that there were less back-up vessels available, and the resulting reduction in services left some routes at overcapacity. For example, over the busy Memorial Day weekend in 2010, WSF will be participating in a marine rescue exercise with the U.S. Coast Guard and will use two of the San Juan Island vessels. While creative vessel scheduling aims to minimize the impact on holiday travelers, WSF issued a press release warning travelers to expect delays and allow extra time due to the vehicle capacity reduction.⁵⁸

4.3 – Funding Structure

Washington State Ferries has to compete with other state and federal agencies for an ever dwindling pool of government funding. Issues of financing have always been a concern for WSF, but have been exacerbated by the volatility in gasoline prices and the economic downturn, two causes primarily responsible for decreased ridership and fare revenue. The largest financial challenge to WSF operations has and continues to come from the repeal of a major revenue source over a decade ago.

When voters approved Initiative-695 and removed revenue generated from the Motor Vehicle Excise Tax (MVET) discussed in the next subchapter, it immediately created a \$52 million reduction in the ferry system's 1999-2001 operating budget and nearly eroded its capital budget by \$201 million.⁵⁹ The JTC made a series of recommendations in its 2001 report that included passing more of the operating costs for providing ferry service on to the users. They suggested increasing the *farebox recovery ratio*, the amount of revenue generated through fares as a proportion of its operating expenses, to 80% over the next six years.⁶⁰ Since 2000 the recovery ratio did reach a high of nearly 80% in 2004 but conditions outside the control of WSF, i.e. economic downturn and increase in wholesale fuel prices, has resulted in

⁵⁷ Calculations based on WSF Fleet Guide.

⁵⁸ Press Release. "34-car Hiyu to serve San Juans inter-island ferry route beginning May 24." WSF. 24 May 2010. Web. <http://www.wsdot.wa.gov/News/2010/05/Hiyu_052110.htm>.

⁵⁹ WSDOT. "2000 Supplemental Transportation Budget – Operating and Capital." (2000), p. 227. Web. <<http://leap.leg.wa.gov/leap/budget/lbns/2000partvi.pdf>>.

⁶⁰ WSDOT. Joint Transportation Committee. "Final Recommendations to the Governor and Legislature." (29 Nov. 2000), p. 10. Web. <<http://www.leg.wa.gov/JTC/Documents/BlueRibbonCommissionFinalReport.pdf>>.

a fiscal year 2009 ratio of less than 66%.⁶¹ Table 4.5 below shows the annual farebox recovery ratio for WSF, the average fare increases and revenue generated from 2000 to 2009.

Table 4.5: Large Fare Increases Improve Farebox Recovery Initially, But Ratio Largely Decrease Since 2004 As Ridership Declines and Expenses Mostly Increase				
<u>Year</u>	<u>% Fare Increase</u>	<u>Fare Revenue</u>	<u>Operating Expenses</u>	<u>Farebox Recovery</u>
2000	---	\$95,582,000	\$147,547,000	64.8%
2001	20.0%	\$96,200,000	\$165,561,000	58.1%
2002	12.5%	\$110,497,000	\$161,574,000	68.4%
2003	5.0%	\$119,825,000	\$166,007,000	72.2%
2004	5.0%	\$128,859,000	\$164,112,000	79.7%
2005	6.0%	\$135,044,000	\$178,617,000	76.4%
2006	6.0%	\$142,184,000	\$193,173,000	74.0%
2007	2.5%	\$149,758,000	\$214,992,000	70.2%
2008	---	\$152,600,000	\$235,811,000	65.0%
2009	2.5%	\$147,676,000	\$225,813,000	65.4%

Source: WSF Route Statements

During the last decade, users have seen total fare increases of anywhere from 37 to 122% depending on the route and time of the day and year.⁶² Despite this, a 2008 survey of 13,000 riders found rates to be relatively elastic, with ferry ridership estimated to decrease just 4% if a 10% rate increase were imposed in the future, further implying that non-discretionary trips were less price-sensitive than discretionary trips.⁶³ Even if rates were increased by their suggested revenue maximizing amount of 45% for non-essential travel and 70% for essential trips, not enough revenue can be generated over the coming years to fully fund WSF's operating costs.⁶⁴

The most heavily subsidized route, i.e. lowest farebox recovery ratio, in 2009 was the Port Townsend – Keystone route, with fares covering only 38.8% of its operating expenses. The highest farebox recovery in 2009 was the Edmonds – Kingston route with 94.3%, but in recent years past has charged riders more than the cost to operate the run, e.g. 120.9% farebox recovery in 2004.⁶⁵

The main obstacle holding down the farebox recovery is the explosion in the price of fuel. For example, in June of 2002 the retail price of diesel was \$1.29 per gallon, but by July of 2008 the price had increased 264% to \$4.70 per gallon.⁶⁶ As of April 2010, the price of diesel stood at just over \$3.00.⁶⁷ The high fuel

⁶¹ Ibid., citation 52.

⁶² Ibid., citation 50, p. ES-8.

⁶³ Ibid.

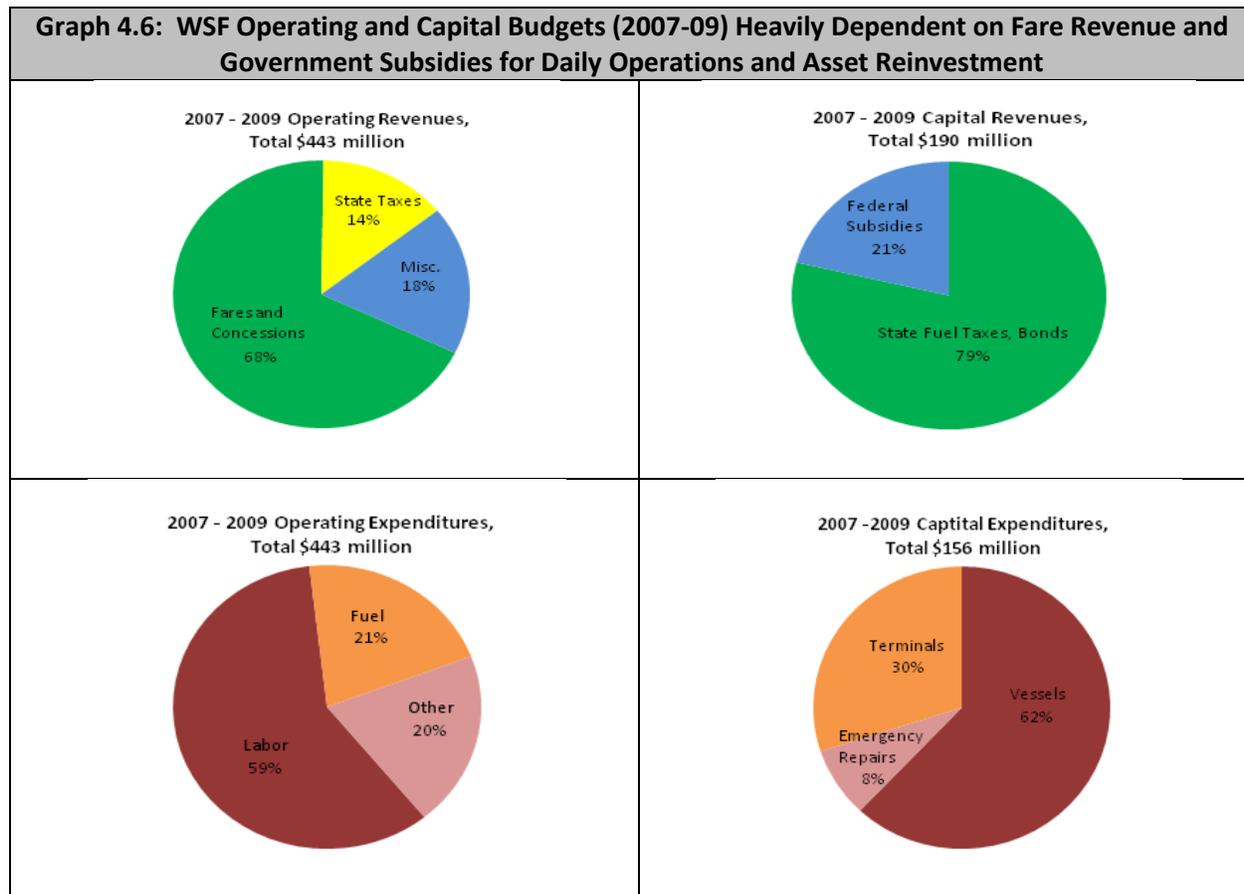
⁶⁴ Ibid., citation 50, p. 33.

⁶⁵ Ibid., citation 52.

⁶⁶ U.S. Energy Information Administration. "Diesel Fuel Components History." *Department of Energy* (2010). Web. <<http://tonto.eia.doe.gov/oog/info/gdu/dieselpump.html>>.

⁶⁷ U.S. Energy Information Administration. "Gasoline and Diesel Fuel Update." *Department of Energy* (2010). Web. <<http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp>>.

costs have negatively impacted WSF operations. Total fuel costs were just over \$10 million in 1999, but by 2009 the 17 million gallons of diesel expended cost WSF over \$42 million.⁶⁸ The proposed fuel surcharge now being considered by state lawmakers could be applied to fares and may increase farebox recovery to 82% to help cover the estimated two-year \$32 million deficit in the fuel budget.⁶⁹



Source: WSDOT Ferries Division (01/2010)

Graph 4.6 illustrates the recently completed 2007 – 2009 biennium budget for Washington State Ferries. All the revenue for the capital budget and 14% of the operating budget came from government subsidies. Labor and fuel made up the majority of WSF’s operating expenditures. Additionally, costs related to vessels and terminals accounted for over 90% of the agency’s capital expenditures.

Over the next few decades, assuming 2.5% yearly fare increases and 1-2% yearly increases in ridership, WSF indicates in its current 2009 long-range plan that costs of operation will total \$5.1 billion and

⁶⁸ Ibid., citation 46.

⁶⁹ WSDOT and WTC. “Fuel Cost Mitigation Plan – A Joint Report on Ferry Fuel Cost Savings Strategies and Fuel Surcharge Business Plan.” (14 Jan. 2010). Web. <<http://wstc.wa.gov/FerryFuelSurchargePresentation.pdf>>

projects an overall operational deficit of \$189 million by 2030.⁷⁰ On the capital budget side, WSF sees cost totaling \$4.9 billion, including \$3.4 billion for vessel improvement or replacement, and a total capital budget shortfall of \$1.8 billion.⁷¹

Government Subsidies

There are several important revenue streams on the state and federal level. First, the Ferry Boat Discretionary (FBD) Program, created as part of a larger federal transportation bill in 1991, authorizes annual funding for ferry boat and terminal construction. For the fiscal year 2009, over \$67 million was authorized, of which \$62 million was awarded.⁷² A required provision allots \$20 million of the funding be set-aside for three marine highway systems, shared as follows to the States of: Alaska (\$10 million), New Jersey (\$5 million), and Washington (\$5 million). Of the remaining \$42 million awarded in 2009, Washington was set to receive an additional \$9.2 million.⁷³

The Recovery Act of 2009 allocated an additional \$60 million in one-time funding to the FBD for construction of ferry boats and terminal facilities.⁷⁴ Washington State Ferries initially secured only \$750,000 of this, but the U.S. Department of Transportation acknowledged the oversight and with assistance from U.S. Senator Patty Murray, total funding was increased to \$8.35 million.⁷⁵ In March of 2010, an additional \$3.2 million of Recovery Act funding was released to Washington State for vessel preservation activities including renovation, replacement and upgrading of vessels.⁷⁶

In recent years, the State has moved to fill budget shortfalls. In 2003, State Legislature passed the 10-year, \$4.2 billion 'Nickel Package', which provided \$298 million in funding for one new vessel and ferry terminal improvements.⁷⁷ The revenue is generated primarily from a \$.05 increase to the gas tax and other license fees.⁷⁸ In 2005, the Transportation Partnership Program was passed which increased gas

⁷⁰ Ibid., citation 50, p. ES-6.

⁷¹ Ibid.

⁷² U.S. Dept. of Transportation. "Program Information." Federal Highway Administration. Washington D.C., (Mar. 2010). Web. <<http://www.fhwa.dot.gov/discretionary/fbdinfo.cfm>>.

⁷³ U.S. Dept. of Transportation. "FY 2009 Ferry Boat Discretionary (FBD) Awards." Federal Highway Administration. Washington D.C., (16 Apr. 2010). Web. <<http://www.fhwa.dot.gov/discretionary/fbawrd09.cfm>>.

⁷⁴ Ibid.

⁷⁵ News Release. "Murray Muscles Ferry Money." *Website: U.S. Senator Patty Murray*, (15 July 2009). Web. <<http://murray.senate.gov/news.cfm?id=315840>>.

⁷⁶ News Release. "Murray Applauds Ferry Funding for Washington State." *Website: U.S. Senator Patty Murray*, (5 Mar. 2010). Web. <<http://murray.senate.gov/news.cfm?id=322862>>.

⁷⁷ Puget Sound Regional Transportation Commission. "Regional Transportation Commission – Final Report." Olympia: Washington (31 Dec. 2006). Web, p.105. <<http://www.globaltelematics.com/pitf/psrtc-report.pdf>>.

⁷⁸ Ibid., p. 101.

taxes further, by \$.095 per gallon.⁷⁹ Over the next 16 years, \$184.5 of the \$7.14 billion package has been identified for the ferry system.⁸⁰

4.4 – Policy Environment

Highways and Taxes

In 1944, Washington State adopted the 18th amendment to the state constitution, creating a state highway trust fund made up of vehicle license fees and excise taxes on motor vehicle fuel. The amendment to Article 2, Section 40, declared that all revenue collected could only be used for ‘highway purposes’.⁸¹ Revenue generated from taxes and fees are then distributed to counties, cities and state accounts. The state receives about half of the total revenues collected and uses these funds to support WSDOT highway programs as well as WSF.⁸²

The state recognizes ferry routes over the Puget Sound to be a continuation of the highway system and thus eligible for funding. However, the law stipulates that funds from the taxes and fees cannot be used for passenger-only ferry service. This may have an effect on how the agency measures its performance and any emphasis it places on accommodating and transporting as many vehicles as possible. It may also be more directly linked to state’s decision in recent years to transfer ownership of the Seattle to Bremerton and Vashon Island passenger-only routes to the local level (discussed below).

Built-in-Washington Requirement

In 1993, the state legislature passed a provision that requires all ferry vessels be constructed within the boundaries of the state of Washington.⁸³ Shipbuilders in other states and around the world offer competitive bids, but lawmakers saw the requirement as a strong way of reinvesting taxpayer dollars into the local community, providing jobs and wages to residents of the state. However, there are two negative impacts.

First, restricting competitive bids may mean the state is paying more than it should for the same product. A cost-benefit analysis can determine whether the funds reinvested in capital projects yield a

⁷⁹ Washington State House Democrats. “The Transportation Partnership Act of 2005 – Saving Lives, Moving People, Delivering Goods.” Olympia: Washington, (25 Apr. 2005). Web, p. 4. <http://housedemocrats.wa.gov/issues/transportation/2005_transpo_summary_final.pdf>.

⁸⁰ Ibid.

⁸¹ Wa. St., Const., art. 2, § 40 (amended in 1943 by House Joint Resolution No.4, p. 938; approved November 1944).

⁸² Website. “Fuel Taxes.” WSDOT: Web. 01 Apr 2010. <<http://www.wsdot.wa.gov/Finance/fueltaxes.htm>>.

⁸³ Wa. St. Leg., RCW, t. 47, c. 60, § 772. (1993). <<http://apps.leg.wa.gov/RCW/default.aspx?cite=47.60.772>>.

positive return, but from the perspective of the agency the provision means more of the scarce public funding must be used than might otherwise be required. For example, in February 2008 legislation, the Governor authorized the construction of up to three new car ferries.⁸⁴ However, only Todd Pacific Shipyards presented a bid for the first ferry slated for delivery in the summer of 2010 – \$65.5 million, \$16 million above state engineer estimates.⁸⁵ The same company bid \$124.5 million for two additional ferries, above the \$109.5 million estimated by the state, and was only awarded the contract when the bid was reduced to \$114 million.⁸⁶ Secondly, the bill removes access to federal funding for cost overruns due to federal rules prohibiting funds for projects that restrict competition. State lawmakers are currently considering whether to remove the provision.⁸⁷

Loss of Revenue Source

Voters approved I-695 in 1999, removing the MVET that was responsible for funding 20% of WSF's operating budget and 82% of its overall capital budget.⁸⁸ On January 1, 2000, the 2.2% MVET was replaced with a \$30 license tab fee and any future tax or fee increase had to be approved for by Washington voters.⁸⁹ The growing funding gap over the last decade, most noticeable in its capital program, has delayed and/or eliminated WSF projects related to vessel and terminal preservation, maintenance or replacement.

End of Passenger-only Service

In 2003, the Washington State Legislature authorized local and regional jurisdictions to create local ferry districts to provide passenger-only services.⁹⁰ Under the recommendation of the Joint Transportation Committee (JTC), in 2005 the Legislature voted to end state funding for such services.⁹¹ Two years later, state legislature directed WSDOT's Ferries Division to sell the *Chinook* and *Snohomish* vessels and deposit the proceeds into a passenger ferry account to incentivize local jurisdictions to assume

⁸⁴ Wa. St. Leg., SB 6794. (2008). <<http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/Senate%20Passed%20Legislature/6794-S.PL.pdf>>.

⁸⁵ Gilmore, Susan. "Todd Shipyards is sole bidder, likely to build new ferries." *Seattle Times* (9 Oct. 2009), Web. <http://seattletimes.nwsourc.com/html/localnews/2010026816_webferry08m.html>.

⁸⁶ Ibid.

⁸⁷ Freidrich, Ed. "Ferry Construction Bill Gets Hearing in Olympia." *Kitsap Sun* 3 Feb 2009, Print.

⁸⁸ WSDOT. WSF Two-Year Operations Report 1999/2001. Heffron Transportation, Inc. and Parsons Brinckerhoff (2002).

⁸⁹ Yukubousky, Rich. "Initiative 695 - Local Government Impacts." *Municipal Research & Services Center* (2009): Web. 01 Apr. 2010. <<http://www.mrsc.org/subjects/finance/695/i695mrnews.aspx>>.

⁹⁰ Wa. St. Leg., RCW, t. 36, c. 57A, § 200. (2003). <<http://apps.leg.wa.gov/RCW/default.aspx?cite=36.57A.200>>.

⁹¹ Wa. St. Leg., SB6091. "Making 2005-2007 Transportation Appropriations." (5 May 2005). <<http://apps.leg.wa.gov/documents/billdocs/2005-06/Pdf/Bills/Senate%20Passed%20Legislature/6091-S.PL.pdf>>.

responsibility.⁹² The proceeds from the sale went towards helping fund a county-run passenger-only ferry service. As of July 2009, King County Ferry District has assumed full operation of the Seattle to Vashon passenger-only ferry.

Climate Change Initiatives

In January of 2005, Governor Christine Gregoire issued an executive order establishing sustainability and efficiency goals for state agencies.⁹³ By 2007, state legislators enacted a law with a more specific target of fuel reduction, requiring diesel vehicles in the state fleet to consume 20% biodiesel by 2009.⁹⁴ However, the June 2009 deadline was amended for Washington State Ferries so that further testing could be conducted, and replaced with a minimum 5% biodiesel requirement so long as the price is no more than 5% that of diesel.⁹⁵ Governor Gregoire issued another executive order in May of 2009 that directed state agencies to further develop strategies and to work together in ways that will reduce carbon emissions from transportation fuels.⁹⁶

The Governor signed HB-2815 in March 2008, a sweeping climate change bill focused on a statewide effort to reduce greenhouse gas emissions (GHG) and vehicle miles traveled (VMT) in the state. Two of the more ambitious long-range targets in the bill include achieving a 50% reduction in GHG emissions below their 1990 levels and a 50% reduction in annual per capita VMT by the year 2050.⁹⁷ Being a vital form of public transportation, WSF can play an essential role in meeting the long-range targets of the bill by continuing to provide accessible and efficient service to commuters and other ferry users. However, to reduce the amount of pollution WSF vessels emit, e.g. 17 million gallons of diesel in 2009, requires significant capital investment in new technology. The challenge for WSF, as previously mentioned, is trying to fill the anticipated operating and capital budget deficits while complying with on-going legislation mandating fuel standards and emission reductions in its own operations.

On-line Reservation System

⁹² Website. "WSDOT Ferries Division sells two passenger-only ferries." *WSDOT*: Jan. 21, 2009.

<http://www.wsdot.wa.gov/News/2009/01/POF_012109.htm>

⁹³ Wa. Exec. Order 05-01, "Establishing Sustainability and Efficiency Goals for State Operations" (5 Jan. 2005).

<http://www.governor.wa.gov/execorders/eoarchive/eo_05-01.pdf>

⁹⁴ Wa. St. Leg., HB1303. "Encouraging the Use of Cleaner Energy." (7 July 2007). <<http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/Session%20Law%202007/1303-S2.SL.pdf>>

⁹⁵ Wa. St. Leg., SB 5352, § 716. "Making 2009-11 Transportation Appropriations." (13 May 2009).

<<http://apps.leg.wa.gov/documents/billdocs/2009-10/Pdf/Bills/Senate%20Passed%20Legislature/5352-S.PL.pdf>>

⁹⁶ Wa. Exec. Order 09-05, "Washington's Leadership on Climate Change." (21 May 2009). <http://www.governor.wa.gov/execorders/eo_09-05.pdf>

⁹⁷ Wa. St. Leg., HB2815-2S, "Providing a framework for reducing greenhouse gas emissions in the Washington economy." (12 June 2008).

<<http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/House%20Passed%20Legislature/2815-S2.PL.pdf>>

Washington State Ferries views vehicle capacity during peak periods to be the agency's greatest constraint and the origin of pressure for additional services and larger facilities.⁹⁸ Traffic control costs, air pollution from idling vehicles and high wait times for users on the more popular routes are all related to vehicle capacity. One of the most important operational strategies that the agency identified to alleviate these concerns is through expanding its online reservation system. In early 2010, the agency released a report detailing its recommended \$26 million proposal that would make early reservations available by 2011 for one route and three more by 2015.⁹⁹ The agency estimates the costs to expand terminals and holding areas will cost \$290 million in coming years and views the reservation system as a viable alternative to many of those costs.¹⁰⁰

⁹⁸ Ibid., citation 50, p. ES-3.

⁹⁹ Gilmore, Susan. "Washington State Ferries may add reservations systems." *Seattle Times* (18 Dec. 2009), Web. <http://seattletimes.nwsourc.com/html/localnews/2010545531_ferryreservation19m.html>.

¹⁰⁰ Ibid.

Chapter Five – Peers in the Industry

The next phase in this analysis was choosing ferry operators that are most similar to WSF in operational characteristics and to conduct an in-depth analysis based on the outcome of their service and the performance measures chosen. Together with WSF officials, consideration was given to systems based on the following characteristics:

- I. Governance – A key feature of WSF is that it operates within the boundaries and under the guidance of state legislators. As a government agency, it is important to compare systems that are impacted by political bodies.
- II. Location – The Puget Sound and the islands within are subject to unique weather and seasonal demand. In addition to identifying a ferry system that traverses in like conditions, the culture of Western Washington residents can be replicated by choosing a system nearby.
- III. Size – WSF is the nation’s largest ferry system in terms of passenger and vehicles transported. At least one of the peers should be of similar size.
- IV. Purpose – WSF serves a mixed user base of tourists, commuters and commercial traffic. Therefore, operators that focus on one or another are given less focus than those that serve multiple purpose users. Similarly, emphasis was placed on operators whose vessels are capable of carrying vehicles.
- V. Relationship – A number of ferry operators are frequently compared with WSF in legislature and in agency meetings. To better understand and provide more clarity on the differences in performance, these operators were given added consideration.

Finally, the ferry system had to either have publically available data or a contact willing to provide the operational data needed. Two ferry systems, the Alaska Marine Highway System and British Columbia (BC) Ferry Services, were chosen for an in-depth comparison. This chapter describes the governing structure, assets, and traffic and route characteristics of those systems and notable operational features and strategies. Additionally, several other ferry operators are discussed in more general terms at the end of the chapter. Chapter Six will compare actual performance of WSF to these systems using the measurements discussed in Chapter Two.

5.1 – Alaska Marine Highway System

Ferry transportation in Alaska began in 1949 when a private operator and its one passenger-vehicle vessel made a weekly, roughly 100 nautical mile, trip from Juneau to Skagway. High costs of operation forced the Territory of Alaska to acquire the vessel and its operations in 1951 and replaced the vessel six years later. When Alaska became a state in 1959, its voters approved bonds totaling \$18 million dollars and by 1963, under the newly structured Alaska Marine Highway Systems (AMHS), new vessels arrived, terminals opened, routes increased and communities became more accessible. Today it operates under the division of that state’s Department of Transportation & Public Facilities.

AMHS operates from 32 terminals of which 13 are staffed by AMHS with the remainder under private contracts or unstaffed.¹⁰¹ Maps 5.1 and 5.2 depict AMHS port-of-calls. In 1989, AMHS moved its only

Map 5.1 – AMHS Southwest Routes Serve the Aleutian Chain



Source: AMHS Traffic Volume Report – 2009

Washington State terminal from Seattle to Bellingham. From Bellingham to the tip of the Aleutian Islands, AMHS sails over 3,000 nautical miles of coastline. This compares with WSF’s approximately 85 nautical miles covered in its routes combined.

The agency’s 11 passenger-vehicle vessels, are on average 29.2 years of age, and have an overall fleet capacity of 3,890 passengers and 653 vehicles.¹⁰² Six of the vessels are equipped with staterooms (463 cumulative). The fleet’s largest vessel can carry up to 600 passengers and 134 vehicles. For comparison, the largest ferry in WSF’s fleet has a vessel capacity of 2,500 passengers and 202 autos.

There were a total of 137 separate routes traveled in 2009, a majority (56%) of which ran ten times or fewer in total over the year.¹⁰³ Over the course of 2009, AMHS completed 4,123 trips, transporting almost 318,000 passengers and over 108,000 vehicles. The most expensive single route as of May 2010,

¹⁰¹ Interview with Chuck VanKirk, 5 May 2010.

¹⁰² Alaska Marine Highway Fund. *Annual Financial Report – 2009*. State of Alaska Department of Transportation and Public Facilities. P.6, Web. <http://www.dot.state.ak.us/amhs/documents/reports/afr_09.pdf>.

¹⁰³ Alaska Marine Highway System. *Annual Traffic Volume Report - 2009*. State of Alaska Department of Transportation and Public Facilities. P.32-35, Web. <<http://www.dot.state.ak.us/amhs/documents/reports/atvr2009.pdf>>.

from Prince Rupert in British Columbia to Whittier in Alaska, charges \$372 for a one-way adult fare and \$843 for a vehicle up to 15 feet. In addition, a four-berth cabin for the nearly three day route costs \$557. For WSF, the most expensive route is from Sidney to Anacortes and has one-way fares of \$16.40 per adult and \$44.05 per vehicle.¹⁰⁴

During the fiscal year ending June 30, 2009, the agency reported \$46.2 million in total operating revenue¹⁰⁵ and \$141.6 million in operating expenses. AMHS covers its operating deficits each year, \$95.4 million in 2009, through a general fund transfer. Money is appropriated to the Alaska Marine Highway Fund by the legislature in an amount that is consistent from year to year and is the amount necessary to provide stable services to the public. In addition, like WSF, AMHS also receives \$10 million per year in allotted FBD funds for capital projects and was awarded nearly \$1 million more in 2009 via the Recovery Act.¹⁰⁶

In addition to being a public transportation agency, there are other similarities between AMHS and WSF. Like Vashon and the San Juan Islands, there are some areas entirely isolated from their state's mainland. Islands and coastal area communities along the Aleutian Chain and Prince William Sound are, to varying extents, dependent on marine transportation for commerce and a basic standard of living. Just as WSF serves as a major tourist attraction, the scenic and diverse landscape along its routes may have contributed to 62% of AMHS riders surveyed in 2005 identifying themselves 'vacation/pleasure' travelers or 'sightseeing while visiting'.¹⁰⁷

Notable Policy Features and Operational Strategies

Promotional campaign. AMHS credits the reversal of a decade long slump in ridership to a marketing campaign that began in 2005 and continues today. The agency used print ads, digital marketing

Map 5.2 – AMHS Southeast Routes Sail From Bellingham to Yakutat



Source: AMHS Traffic Volume Report – 2009

¹⁰⁴ According to WSF 'Passenger and Vehicle Fares' brochure (effective 10/2009).

¹⁰⁵ Includes unrestricted revenue. Excludes \$1.705 million in 'restricted revenue' and 'indirect cost recovery'.

¹⁰⁶ Ibid., citation 73.

¹⁰⁷ Alaska Marine Highway System. *FY10 Marketing Plan*. State of Alaska Department of Transportation and Public Facilities. P. 7, Web. <http://www.dot.state.ak.us/amhs/documents/reports/10_mktg_plan.pdf>.

techniques and launched a new website (ferryalaska.com). The tactics are also aimed at gaining positive exposure for AMHS, expanding awareness of the ferry system and building communication ties to users via a monthly e-newsletter. Efforts are budgeted to cost \$500,000 in fiscal year 2010.¹⁰⁸

Search and rescue role. The U.S. Coast Guard presented a *Partner in Search and Rescue* award to AMHS in April 2010, citing the AMHS's countless occasions helping locate overdue vessels and rescuing mariners in distress.¹⁰⁹

Class Ferry Project. Like Washington State Ferries, AMHS is faced with the need to replace an aging fleet. According to its website, four of the eleven vessels in service were built in 1963-64, and in response the state government initiated a three phase design project. To be complete in 2010, the process involved an extensive public outreach through meetings, surveys and information distribution.¹¹⁰

5.2 – British Columbia (BC) Ferry Services Inc.

Travelers on the AMHS route from Prince Rupert to Bellingham pass through the Strait of Georgia in British Columbia, a body of water 150 miles long and up to 35 miles wide separating Vancouver Island from the Canadian mainland. Since 1960, residents in the communities around the Strait up north to the Queen Charlotte Islands have relied on BC Ferries to provide marine transportation services. Headquartered in Victoria, British Columbia, about 100 miles northwest of Seattle, BC Ferries operates 36 vessels along 25 routes (main routes are shown in Map 5.3 below) and from 47 terminals.¹¹¹

The Canadian provincial government retained ownership and operational control of BC Ferries from its inception in 1960 as a department under the Ministry of Transportation and Highways, and then as a Crown corporation from 1977 to 2003. As a Crown corporation, BC Ferries was a wholly-owned government organization with an eleven member board of directors appointed by and at the service of the provincial government.¹¹² A new Canadian political party came into power in 2001 and promised reforms to government agencies. In December 2001, a nonpartisan study of BC Ferries cited mounting

¹⁰⁸ Ibid.

¹⁰⁹ Author N/A. "Marine Highway receives Coast Guard search, rescue award." *Juneau Empire* (27 Apr. 2010). Web. <http://www.juneauempire.com/stories/042710/reg_626078764.shtml>.

¹¹⁰ Website. Alaska Marine Highway System. Accessed 13 May 2010. <http://www.dot.state.ak.us/amhs/alaska_class/introduction.shtml>.

¹¹¹ British Columbia Ferry Services Inc. & BC Ferry Authority. *2008/09 Annual Reports*. Web. <http://www.bcferry.com/files/AboutBCF/AR/Annual_Report_08-09.pdf>.

¹¹² Stewart, Gayle Lorraine. "Repositioning BC Ferries: From Crown Corporation to Administrative Hybrid." *University of British Columbia* (1976), P. 10. Web. <https://circle.ubc.ca/bitstream/handle/2429/2646/ubc_2008_spring_stewart_gayle_lorraine.pdf?sequence=1>.

capital projects and a lack of political will to finance them in its recommendation that the government amend legislation and enable an independent board of directors.¹¹³ The Chair of BC Ferries, David Emerson, summed up the situation at the time:

"Capital investments were approved within the short-term rotation of government fiscal priorities rather than adhering to a long-term business model that is required for a service of this magnitude. In addition, each decision was directly influenced by the politics of the day."¹¹⁴

The agency was officially remodeled in April of 2003 when the Coastal Ferry Act was enacted and subsequent Coastal Ferry Services Contract established. There are three notable impacts of the Act and the contract that followed, it:

- 1) Established the BC Ferry Authority, holder of the single-issued voting share of the newly structured commercial company BC Ferry Services Inc., and whose main responsibility is appointing the board of directors. The Province retains ownership of the terminals and holds all of the company's 75,477 issues of preferred stock.¹¹⁵
- 2) Classified ferry routes into groups and defined service fees the Province would incur to make routes financially viable (per-sailing service fees for 22 of 25 such routes totaled \$84.7 million¹¹⁶ in 2009) and ensure the continuance of the discounts provided to eligible user segments (\$15.6 million in 2009).¹¹⁷
- 3) Created the BC Ferry Commission as a regulatory body with such responsibilities as enforcing fare price caps on designated routes, ensuring service levels are maintained and monitoring the terms of the service contract with the Province of British Columbia. For example, the Commission set the annual cap or maximum amount BC Ferries can raise rates each year between 2008-12 at 7.3% for major routes and 4% for non-major routes. Actual fares from 2008-2009 increased an average of 7.25% and 3.74% respectively.¹¹⁸

¹¹³ Wright, Fred. "Review of BC Ferry Corporation and Alternative Uses for the Fast Ferries." (Dec. 2001), Web. <http://www.th.gov.bc.ca/publications/reports_and_studies/BCferriesWrightReport/wrightreport.PDF>.

¹¹⁴ BC Ferry Commission. "2003: Status Change." Web, accessed May 16, 2010. <http://www.bcferrycommission.com/2003__status_change.html>.

¹¹⁵ Ibid., citation 111, p. 68.

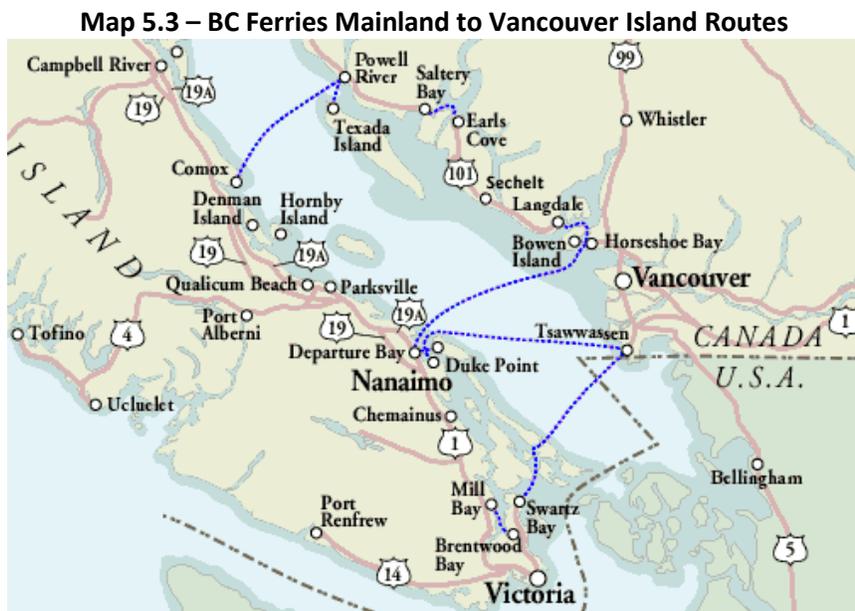
¹¹⁶ Based on an exchange rate as of March 31, 2009 of 1 USD = 1.24230 CAD (Canadian Dollars).

¹¹⁷ Ibid., citation 111.

¹¹⁸ Ibid.

The Board of Directors and management of BC Ferries have implemented long-term performance measures to gauge the progress of its operations. In its 09/10 Business Plan, eight measures are identified, and include a customer service rating, cost per passenger, earnings per full-time employee, safety, service reliability and asset reinvestment. For 2009, the company met five of the eight targets it set for itself, but ran over its cost and fell short of its earnings targets.¹¹⁹

BC Ferries' 36 passenger-auto vessels have an average age of 28.5 years but this is decreasing with each year as the company is currently undergoing an aggressive 30-month, seven vessel replacement program. While the fleet passenger capacity total of 26,179 persons is four thousand less than WSF, BC Ferries can transport over twice the number of vehicles



Source: BC Ferries Website 2010

(5,475 capacity) because its vessels are designed to accommodate more (e.g. BC Ferries has ten ships that can each carry 270 vehicles or more, whereas WSF's largest vessel has a 202 vehicle capacity).

During the fiscal year ending March 30, 2009, BC Ferries completed 169,185 trips, transporting 20.7 million passengers and 8.1 million vehicles. The roughly five percent decreases in both volumes are slightly higher than WSF's 3.9 and 4.6% year over year passenger and vehicle reductions. The company reported a 99.8% trip reliability rate and 88.5% on-time departure performance.

For the year ending 2009, BC Ferry Services Inc. reported operating revenues of \$548.8 million on \$502.5 million operating expenses for a total annual gain of \$46.3 million. Passenger and vehicle fares made up \$345.4 million, or 63%, of overall revenue receipts. Public funding from the provincial and Canadian government totaled \$121.4 million and catering and onboard services contributed over \$82 million in revenue.

¹¹⁹ BC Ferry Services Inc. *Business Plan Fiscal Year Ending March 31, 2010*. Accessed 14 May 2010. Web. <http://www.bcferreries.com/files/PDFs/BCFerries_BusinessPlan_Fiscal2010.pdf>.

Notable Policy Features and Operational Strategies¹²⁰

Partnerships and Business Ventures. The company has taken several actions in recent years to reach out and promote its services. This includes partnerships with sports clubs, the Royal Museum, the Canadian Parks Department and Chevron. Additionally, in 2007 the company established Pacific Marine Ventures, a wholly-owned subsidiary to pursue strategic business opportunities related to commercial traffic, tourism, and terminal management.

BC Ferries Experience Card. In March 2008, BC Ferries introduced an electronic swipe card that can be loaded with money and used to pay for ferry travel on participating routes. Two years later, a majority of routes allow riders access to savings on passenger/vehicle fares by registering their card and applying funds.

Fuel Surcharge. To offset fuel prices, when BC Ferry Services and government officials met to reassess the terms of their contract in 2008, the policy tying increases in fares caused by fuel prices to inflation changed. In August of 2008, fuel surcharges (almost 18% on one route) were imposed on most routes. Three months later, the surcharges were cut in half and by mid-December the rates were eliminated entirely. In less than five months time, the surcharges managed to raise \$39.4 million and because of the recent decreases in fuel prices, riders on some rates are receiving 5% fuel rebates off fare prices.¹²¹

Administration restructuring. In January 2009 restructuring of administrative staff led to 77 eliminations in order to align the company's expenses with their revenues (the move is expected to save \$11.3 million in 2010).¹²²

Operations and Security Centre. In May 2009, BC Ferries opened a new \$7.2 million facility in Victoria, B.C. to enable increased coordination of responses to service disruptions and provide clear and concise documentation of occurrences.

BC Vacations Centre. In May of 2010, the company opened an office space across from the Vancouver B.C. Convention Center and launched a website of the same name. Tourists can walk-in, interactively

¹²⁰ Unless otherwise indicated, the following information was obtained through the home website available at: <<http://www.bcferries.com/>>.

¹²¹ Ibid., citation 119.

¹²² Ibid.

navigate the routes and schedules, and representatives are there to provide information and book vacation packages such as golfing or stays at a bed-and-breakfast.¹²³

5.3 – Others in the Ferry Industry

North Carolina Ferries

The State of North Carolina began subsidizing private ferries in 1934 and in 1947, the state's Department of Transportation launched its first route of the North Carolina Ferry Division. Since that time, NC Ferries has become the nation's second largest public ferry system in terms of fleet size. In 2009, the agency reported that its 22 passenger-vehicle vessels carried 2.2 million passengers and over 900,000 vehicles. The seven routes traverse five bodies of water on North Carolina's eastside and depart from 13 terminals. The agency reported \$36.4 million in expenses on just \$2.3 million in revenue, with the remainder of the operating revenue coming from state funding.¹²⁴ The bulk of the funding comes for the state's motor fuel tax, capped at 29.9 cents per gallon as of May 2010.

A few notable operational features and strategies include:

- ✓ **Asset reassessment.** In its 2008/09 Annual Report, the NCDOT indicated it is launching a study to modernize its aging fleet. The agency says it will set new ferry boat capabilities, determine the best fleet size and establish optimal fares and schedules.
- ✓ **Reorganized governing structure.** In 2009, the state's governor signed an executive order that moved authority to approve transportation projects from the State Board of Transportation to the Secretary of Transportation. The Board now sets policy and monitors performance.

Steamship Authority

Referred to as the 'Lifeline to the Islands', the Steamship Authority (SSA) is a public agency created by the Massachusetts legislature for adequate transportation of goods and people between the mainland ports of Hyannis and Woods Hole and the islands of Martha's Vineyard and Nantucket. The authority operates five terminals and nine vessels, of which one is passenger-only. During 2009, the Authority completed 21,445 trips with a trip reliability rate of 97.2%. The agency reported \$79.8 million in operating revenue, \$70.4 million of which came from the 2.7 million passengers and 456,478 vehicles

¹²³ News Release. "BC Ferries Opens New Vacations Centre in Downtown Vancouver." (11 May 2010), Web. <<http://www.bcferrries.com/bcferrries/faces/attachments?id=174204>>.

¹²⁴ Interview with Beth Govoni, 3 May 2010.

transported.¹²⁵ Finally, the agency's 675 employees cost the company \$41.3 million in total labor expenses, which represents over 55% (\$74.8 million) of all operating expenses.¹²⁶

A few notable operational features and strategies include:

- ✓ **Private ferry contracts.** In addition to running its own operations, SSA is responsible for regulating various other commercial aspects of ferry services to and from the islands. For example, to accommodate transportation demands to residents and travelers between New Bedford and Martha's Vineyard, Steamship Authority's five-member board voted in 2003 to license the services of a private operator to provide ferry services to the community.
- ✓ **Mobility Compact.** SSA joined the state's Mobility Compact in December of 2008 after Governor's Patrick's Executive Order became law. The Compact brings the heads of the state's transportation agencies together in their attempts to coordinate efforts, collaborate on issues like economic development, energy conservation, and stronger regional transit. The results of their work are presented to the public bi-annually.¹²⁷

Sydney Ferries¹²⁸

The Australian provincial government owns and operates 28 passenger only ferries, along 8 routes, reaching 23 total miles around metropolitan Sydney, Australia. In 2009 the agency completed 177,861 trips, or 99.5% of those scheduled, departing from 38 terminals and serving 14.3 million passengers. Sydney Ferries reported \$105 million¹²⁹ in operating revenue, with just over \$39 million coming from fares and nearly \$65 million from government subsidies. Finally, Sydney Ferries reported approximately \$117 million in annual expenses, \$55 million of which was spent on labor.

A few notable operational features and strategies include:

- ✓ **Union agreement.** In May 2009, the workforce found common ground and voted in favor of a new bargaining agreement whereby employees collectively agreed to one set of working conditions, overtime rates were made flat, and crew based flexible rosters and a new Customer Assistant Officer classification was introduced. The agency believes it will deliver millions of dollars in efficiency and less red tape.

¹²⁵ The company also reported transporting 133,175 trucks.

¹²⁶ Response to e-mail questionnaire from Wayne Lamson at SSA, 30 April 2010.

¹²⁷ Executive Order 488, Massachusetts Mobility Compact. "Massachusetts Mobility Compact Annual Report", October 2008. Web. <http://www.eot.state.ma.us/downloads/mobility/MC_Annual102308.pdf>.

¹²⁸ All data and information for Sydney Ferries are derived from the ferry operators Annual Report. Accessed 21 May 2010, Web. <<http://www.sydneyferries.info/uploads/AnnualReport200809.pdf>>.

¹²⁹ Based on an exchange rate as of June 30, 2009 of 1 USD = 1.243 AUD (Australian Dollars)

- ✓ **Payroll tax funding.** Over \$3 million dollars of operating revenue came from a 4% provincial payroll tax.
- ✓ **Investments.** Significant capital expenditures in recent years include installing navigational aid (radar imaging and night vision equipment), asset management software and implementing other IT and business systems. Sydney Ferries claims their financial costs are improving vessel reliability and enabling them to better report performance and analyze finances.

Fjord 1

The largest regional transport provider in Norway is ferry operator Fjord1, subsidiary of Fjord1 Nordvestlandske, a government-owned public transportation agency involved in bus, rail and freight operations. Fjord1 ferries depart from 86 terminals, run along 55 separate routes, and in 2009 the agency reported that its fleet of 80 vessels carried 28.9 million passengers and almost 9 million vehicles.¹³⁰

One notable operational feature and strategy include:

- ✓ **Environmental focus.** Following the success of the world's first ferry to run on liquefied natural gas (LNG) in 2000, Fjord1 has continued to investment in the technology, adding three new LNG ferries in 2010 alone, and by 2011 the ferry operator is expected to have 11 such ferries in operation. Among other advantages, the cleaner fuel is estimated to reduce NO emissions by 90% and CO2 emissions by 20% compared to conventional diesel ferries.¹³¹

¹³⁰ Response to e-mail questionnaire from Hallgeir Kleppe of Fjord1, 30 April 2010.

¹³¹ Press Release. "Fjord1 with new LNG Ferries." *Corporate Social Responsibility Newswire* (23 Nov. 2009). Web. <[http://www.cswire.com/press/press_release/28234-Fjord1-with-new-LNG-ferries->](http://www.cswire.com/press/press_release/28234-Fjord1-with-new-LNG-ferries-).

Chapter Six – Findings & Analysis

Upon completion of the research methods, this analysis was able to gather basic figures on the operational characteristics (Table 2.1) for 23 ferry systems (not including WSF).¹³² Divided into asset, route and financial data, Appendix E contains the results of the data collection instruments. The three-page *Ferry Comparison Matrix* was created as a tool for WSF to use in the future. The contact information (see Appendix A) and sources for the data accumulated over the internet are included in separate Excel spreadsheets and provided to the agency as a means of periodically updating the matrix.

6.1 – Comparison of Key Operational Characteristics

This subchapter ranks the ferry system’s included in this analysis for six operational characteristics that were deemed most applicable by WSF agency officials. The top 10 rankings are divided up based on asset (terminals and vessels), route (total served and annual trips), and traffic volume (passengers and vehicles transported). Where possible, the analysis will attempt to explain each ranking.

Asset Operational Characteristics

Based on the number of terminals a ferry system operates from, Washington State Ferries ranks 9th among all 24 systems reporting (see Table 6.1 below). The top three, all with over 80 terminals, are ferry operators serving a myriad of islands in their respective areas. One concern with this ranking is that the definition of a terminal and how each is reported is not universal. As mentioned earlier, AMHS reported 32 terminals, however only 13 are staffed. Norwegian operator Fjord1 reported having 86 terminals, and given its massive network of routes these figures seem reasonable. However, Stockholm-based Waxholms Angfartygs, with a similar

Table 6.1: WSF Operates From Second Most Terminals In U.S. (n=24)

Rank	Ferry System	# of Terminals
1	Fjord1	86
2	Istanbul Deniz Otobusleri	85
3	Jadrolinija	83
4	BC Ferries	47
5	Anek Lines	40
6	Sydney Ferries	38
7	Hellenic Seaways	36
8	Alaska Marine Highway	32
9	Washington State Ferries	20
10	Waxholms Angfartygs	17
...	<i>Other US operators</i>	...
11	North Carolina Ferries	13
18	Steamship Authority	5
21	Golden Gate Ferries	3
22(t)	Staten Island Ferries	2
22(t)	Cape May Lewes	2

¹³² Data was unavailable through the internet and correspondence never returned from Bay Ferries, NY Waterway and P & O Ferries. This limitation and others will be discussed below and later in the chapter.

amount of routes, lists 17 terminals on their website all based on the mainland despite the fact that their 24 ferries arrive and depart from over 100 locations in the Swedish archipelagoes. Future endeavors at updating figures may want to distinguish terminals that are unstaffed or contracted out and those which may be nothing more than a wooden pier leading to the mainland.

Table 6.2: WSF Eleventh in World For Fleet Size (n=24)

<u>Rank</u>	<u>Ferry System</u>	<u># of Vessels</u>
1	Istanbul Deniz Otobusleri	106
2	Fjord1	80
3	Jadrolinija	56
4	Transtejo & Soflusa	38
5	BC Ferries	36
6	Hellenic Seaways	34
7	Stena Lines	34
8	Sydney Ferries	28
9	Waxholms Angfartygs	24
10	North Carolina Ferries	22
...	<i>Other US operators</i>	...
11	Washington State Ferries	20
15	Alaska Marine Highway	11
17	Steamship Authority	9
20	Staten Island Ferries	8
21	Golden Gate Ferries	7
22	Cape May-Lewes	5

The largest U.S. operator included in this analysis in terms of fleet size is North Carolina Ferries and their 22 ships (see Table 6.2 to the right). Not surprisingly, six of the top 10 terminals are also in the fleet size top 10.

There seems to be no relationship between the years that an operator has been in service (listed in Appendix E) and fleet size. Rather, it seems logically based on two attributes: the demands of users and the relative capacity of the vessels to meet that demand, and the financial ability for the ferry system to purchase additional vessels. For example, Turkish operator Istanbul Deniz Otobusleri (IDO) serves the greater Istanbul area,

a metropolitan city of almost 13 million and 7.5 million tourists in 2009¹³³, reported having 106 vessels with a total capacity of almost 91,000 that are able to traverse the popular mile-wide Bosphorus and destinations in the Sea of Marmara.

Route Operational Characteristics

Amongst all 24 operators in the analysis, WSF and its 9 routes rank 8th in the U.S. behind AMHS and its 137 routes. Like terminals, there is some discretion for ferry operators that reported their routes served (see Table 6.3). Routes in this analysis are defined as a trip from one point to another. Where possible, I attempted to correct these discrepancies through independent verification. For example, Cape May-Lewes provides service crossing the Delaware Bay between New Jersey and Delaware. The representative reported two routes, apparently counting the return trip as a separate route. In addition,

¹³³ Author Unknown. "Istanbul hosts 7.5 mln tourists last year." *Today's Zaman* (07 Jan. 2010), Web. <<http://www.todayszaman.com/tz-web/news-197728-istanbul-hosts-75-mln-tourists-last-year.html>>.

routes with multiple stops are considered one route, e.g. WSF's Seattle-Vashon Island-Southworth is one route, not two separate routes.

<i>Rank</i>	<i>Ferry System</i>	<i>Routes</i>
1	Alaska Marine Highway	137
2	Waxholms Angfartys	57
3	Fjord1	55
4	Istanbul Deniz Otobusleri	33
5	BC Ferries	25
6	Stena Lines	18
7	Anek Lines	12
8	Washington State Ferries	9
9	Scandlines	8
9(t)	Sydney Ferries	8
...	<i>Other US operators</i>	...
11(t)	North Carolina Ferries	7
19(t)	Golden Gate Ferries	3
19(t)	Steamship Authority	3
22(t)	Cape May-Lewes	1
22(t)	Staten Island Ferries	1

<i>Rank</i>	<i>Ferry System</i>	<i># of Trips</i>
1	Fjord1	985,500
2	Istanbul Deniz Otobusleri	359,756
3	Sydney Ferries	177,861
4	Transtejo & Soflusa	171,666
5	BC Ferries	169,185
6	Washington State Ferries	147,833
7	Scandlines	140,000
8	Stena Lines	76,568
9	North Carolina Ferries	73,141
10	Staten Island Ferries	33,000
...	<i>Other US operators</i>	...
11	Steamship Authority	21,445
12	Golden Gate Ferries	17,812
15	Cape May-Lewes	5,054
18	Alaska Marine Highway	4,123

The analysis was able to gather the annual trips completed for 18 ferry systems, including WSF. As Table 6.4 shows above, WSF and the over 147,000 trips in 2009 leads the nation in this category. Interestingly, taking the annual trips and dividing the number of vessels in the fleet, WSF ranks behind only Fjord1 in terms of average trips per vessel (7,392 to 12,319), whereas AMHS and its 4,123 total trips in 2009 averaged just 375 trips per vessel.

This figure is also heavily dependent on demand and distance. For a system that serves a heavy amount of daily commuters, such as Staten Island Ferries, its relatively short and only route is 4.5 nautical miles, but its fleet of 8 vessels completed 33,000 trips and ranks amongst the leaders in passengers carried.

Traffic Volume Operational Characteristics

A majority of the ferry systems reported experiencing declines in their annual passengers transported over the previous year (annual increases and decreases are included in Appendix E). WSF is no exception, having experienced nearly a 4% drop in ridership over its 2008 level, yet the agency remains the leader in the U.S. in the category and 4th out of all the systems analyzed with 22.4 million passengers

carried in 2009. Of the twenty systems where data is available on year-over-year passenger volumes, Estonian operator AS Tallink Grupp had the largest increase in ridership, attributing its investments in new vessels and modern sales system as the explanation for a nearly 15% increase in its passenger volume from 7.1 to 8.1 million passengers in 2009 (see Table 6.5 on the above right). It appears 2009 was a particularly difficult year for national operators in terms of passenger volume. North Carolina Ferries has the onerous distinction as having the sharpest decline in ridership of all systems analyzed. The ferry operator reports that ridership in 2009 was down over 9% from 2008 to 2.2 million. One reason for this may be that of all riders on its seven routes, anywhere from 23% to 85% are tourists or recreationists and thus are negatively impacted by a poor economy.¹³⁴ Given that NC Ferries offers free fares on four of its seven routes and \$1 per person on the remaining, maintaining services requires increased taxpayer support.

Table 6.5: WSF's 22.4 Million Passengers Served Rank First In North America (n=24)

<u>Rank</u>	<u>Ferry System</u>	<u>Passengers</u>
1	Istanbul Denis Otobusleri	100,575,370
2	Transtejo & Soflusa	28,445,987
3	Star Ferries	23,000,000
4	Washington State Ferries	22,400,000
5	BC Ferries	20,727,493
6	Staten Island Ferries	20,118,000
7	Fjord1	18,900,000
8	Stena Lines	15,280,000
9	Sydney Ferries	14,310,000
10	Scandlines	12,000,000
...	<i>Other US operators</i>	...
17	Steamship Authority	2,693,178
19	North Carolina Ferries	2,184,433
20	Golden Gate Ferries	1,949,035
23	Cape May-Lewes	842,499
24	Alaska Marine Highway	317,891

Table 6.6: WSF Carries More Vehicles Than Any Other Ferry Operator (n=18)

<u>Rank</u>	<u>Ferry System</u>	<u>Vehicles</u>
1	Washington State Ferries	9,911,000
2	Fjord1	8,972,000
3	BC Ferries	8,130,356
4	Istanbul Denis Otobusleri	6,954,718
5	Scandlines	3,400,000
6	Stena Lines	2,866,800
7	Jadrolinija	2,445,994
8	AS Tallink	1,115,043
9	Brittany Ferries	1,055,000
10	North Carolina Ferries	943,504
...	<i>Other US operators</i>	...
15	Steamship Authority	589,653
17	Cape May-Lewes	295,240
18	Alaska Marine Highway	108,541

This analysis attempted to distinguish between cruise operators and public transportation providers, but understands that there is some overlap between the two. For example, Irish Ferries reported having a vessel capable of carrying 1,582 vehicles, which seems to indicate a different purpose than that of WSF's largest vessel capable of carrying 202 vehicles. In fact, with the exception of Portugal's Transtejo & Soflusa, all European operators had higher maximum vessel capacities for vehicles than WSF (2,623 total). Further analysis can determine whether this is related to something other than user demand, but on

¹³⁴ Tsai, Jeff. "Benchmarking And Optimization Of The North Carolina Ferry Services." *Institute for Transportation Research and Education North Carolina State University* (17 Mar. 2010), Web. <http://www.ncleg.net/documents/sites/committees/JLTOC/2010-03-17/Presentations/2010%203%2017%20JLTO_Ferry_ITRE.pdf>.

the surface, international comparisons with WSF is complicated by the sheer size of the vessel.

Regardless, WSF is the worldwide leading ferry system in the analysis in terms of annual vehicles transported - carrying 9.9 million in 2009 (see Table 6.6). As with annual passengers, when looking at average vehicles carried per vessel in the fleet, Washington State Ferries doubles the nearest operator. BC Ferries carried an average of 226,000 vehicles per vessel compared to a WSF average of 496,000.

In all, there were 19 ferry operators included in the *Ferry Comparison Matrix* that have passenger-vehicle ferries. However, since the September 11th terrorist attacks and for security reasons, Staten Island Ferries continues to not be permitted to transport vehicles on its four such vessels.

6.2 – Comparison of Performance Measures

Recall from Chapter Two subsection 2.1 that the performance measures chosen were divided into the following two categories:

Transit Service Quality

- ✓ Trip reliability
- ✓ On-time departures
- ✓ Safety
- ✓ Average fleet age

Cost-Efficiency

- ✓ Cost per passenger transported
- ✓ Labor expenses proportion of operating expenses
- ✓ Farebox Recovery
- ✓ Subsidies per passenger transported

Where possible, the following analysis will evaluate WSF against these measures of performance and make comparisons to the systems included in the ferry comparison matrix (Appendix E) and other modes of public transportation, but will attempt to focus particularly on the peers listed in Chapter Five. Each measure includes a brief gap analysis that discusses the difference between WSF actual performance and how it would like to perform as determined by peer performance in the industry. A summary of the results to the performance measures can be found with Appendix F.

Trip Reliability

Result: Washington State Ferries reported a 2009 trip reliability rate of 99.6%.

- **BC Ferries** sets a target for itself of 99.4% to 99.59% and for its fiscal year 2009, the agency exceeded its goal, reporting a **99.67%** reliability rate.
- **NC Ferries** sets a 97% target for trip reliability, and for 2009 reported a **97.6%** rate.
- **Steamship Authority** listed a 2009 reliability rate of **97.2%**, with no target identified.

- **Sydney Ferries** reported a **99.5%** rate during 2009, precisely hitting the target set out for itself according to its 2008/09 Annual Report.

GAP ANALYSIS: No data was available for other modes of public transportation. Of the 13 ferry operators who reported figures for this measure, the average trip reliability rate was 98.1%. While WSF slightly underperformed BC Ferries' performance, its 99.6% reliability rate is above the average of the system's reporting. Among the four other U.S. systems with available data, WSF is second only to Golden Gate Ferries' 99.9% rate in the nation. The difference can be related to service maintenance on aging vessels and inclement weather.

On-time Departures

Result: Washington State Ferries reported a 2009 on-time departure rate of 92.9%.

- **AMHS** reported a **92%** on-time departure (within 30 minutes of scheduled departure) during 2009, beating the target of 75.1% it set based on the airline industry's performance for the measure.¹³⁵
- **BC Ferries** reported a system-wide on-time departure in fiscal 2009 of **88.5%** for trips departing within 10 minutes of schedule. The company/agency does not set a target for itself, but the performance is the highest recorded for the operator.
- **Steamship Authority** had the strongest on-time performance of the five U.S. operators that reported their performance in this analysis - **99.5%** of schedule trips departed on-time.
- **Sydney Ferries** sets a target of **99.5%** for on-time departures (considered within 5 minutes of schedule), but for fiscal year 2009 the public agency missed its target, reporting a 98.1% on-time rate.
- **KC Metro** reported in its 2008 Annual Management Report an on-time departure rate (within five minutes after or one minute before schedule) of **76%**, an increase of over 1% from the previous year, but still shy of the transit agency's 80% target.¹³⁶
- **Amtrak Cascades** provides rail service in the Pacific Northwest corridor from Vancouver, BC to Eugene, Oregon. During 2009, the state supported agency averaged a **72%** on-time performance.¹³⁷

GAP ANALYSIS: WSF outperformed the 90% target set by WSDOT. It's 92.9% on-time departures were well above that of BC Ferries and exceeded AMHS performance as well. Of the 12 ferry operators

¹³⁵ According to the 2008 Bureau of Transportation Statistics, the national average for airlines was 81.1% on-time within 15 minutes of scheduled departure.

¹³⁶ King County. "2008 Annual Management Report." *King County Metro Research and Management Information* (2008), Web. <<http://metro.kingcounty.gov/am/reports/2008/2008-QMRyearend.pdf>>.

¹³⁷ WSDOT. "Amtrak Cascades 2009 Performance Report." (2009), Web. <<http://wadot.wa.gov/NR/rdonlyres/13F68D8F-B6F3-4B44-96D0-05766C2E99B1/0/AmtrakPerformanceFolioReporting2009WEB.pdf>>.

reporting statistics for this measure, the average system saw just over 94% of scheduled trips depart on-time. The difference can be related to roadway congestion loading vehicles onto the vessels, marine congestion dockside, vessel maintenance, and inclement weather. Other factors impacting trip reliability and on-time performance (e.g. unionized workforce, the existence of an on-line reservation system, advanced navigational technology) could be analyzed in future studies.

Safety

WSF Result: Figures on passenger injuries and vessel accidents/incidents were difficult to obtain from WSF because agency officials could not publically reveal what they consider to be sensitive information. This revelation occurred as the research paper had already determined the importance of including this measure. However, In 2002 WSF did report 100 passenger injuries on-board vessels and an additional 33 at the terminals – all minor in nature.¹³⁸ Based on that years passenger statistics, **WSF had a ratio of 5.02 injuries per million transported.** There were also four vessel accidents (i.e. hard landings) during 2002, with varying damage inflicted.¹³⁹ To obtain an accurate figure for accidents/incidents per 1,000 trips, WSF would need to disclose more details on their safety record.

- **BC Ferries** set a target of 13.32 passenger injuries per million persons transported and beat that by reporting a ratio of **13.17 injuries per million** in 2009. In 2006, operator error was found the cause of a BC ferry that ran aground and sank, taking the lives of two passengers.
- **Sydney Ferries** reported 12 total injuries, below its target of 16, which translates to **1.2 passenger injuries per million** transported. The operator also reported 71 vessel accidents (10 collisions and groundings and 61 incidents that includes sailing too close to other vessels) translating into **2.5 accidents per 1,000 trips.**
- **The Steamship Authority** had only two relatively recent news stories of safety issues: a serious injury to an employee at a vessel maintenance facility and a June 2007 report of vessels colliding, with no injuries reported.

GAP ANALYSIS: Washington State Ferries appears to have something to be particularly proud of in regards to its safety record. Human error (e.g. collisions with other boats, steering mistakes), daily operations (e.g. vehicle and pedestrian ramp mishaps) and infrastructure (e.g. vessel age and navigational technology) are common causes of passenger injuries and accidents associated with ferry operations. Nationally, the unfortunate tragedy in 2003 and 2010 accident with Staten Island Ferries underscores the importance of safety as a goal an operator strives to succeed in providing. The lack of

¹³⁸ WSDOT. "WTP Strategic Issues." Accessed 22 May 2010, Web. <<http://www.wsdot.wa.gov/planning/wtp/documents/Safety.htm>>.

¹³⁹ WSDOT. "WTP-Safety-Washington State Ferries." Accessed 22 May 2010, Web. <<http://www.wsdot.wa.gov/planning/wtp/datalibrary/Safety/WSF.htm>>.

media reports on accidents may highlight the exceptional performance of WSF. The research method did not ask for safety data from other systems and a separate analysis on safety records within the ferry industry may identify WSF as a leader among operators.

Average Fleet Age

Result: Washington State Ferries and its 20 vessels have an average vessel age of 36.3 years.

- **AMHS** and its 11 vessels have an average fleet age of **29.2 years**.
- **BC Ferries** and its 36 vessels have an average fleet age of **20.6 years**.
- **NC Ferries** and its 22 vessels have an average fleet age of **19 years**.
- **Steamship Authority** and its 9 vessels have an average fleet age of **25.1 years**.
- **Sydney Ferries** and its 28 vessels have an average fleet age of **19 years**.
- **Fjord1** and its 80 vessels have an average fleet age of **28.3 years**.

GAP ANALYSIS: With the exception of Hong Kong's Star Ferries, Washington State Ferries has the oldest fleet of vessels in this analysis. The research was able to gather data on this measure for 19 ferry system's worldwide, and collectively these operators have an average fleet age of 21.9 years. The result of this measure and the impact of an aging fleet on WSF operations have been discussed above. The difference in value and performance is the result of a lack of political will to reinvest and dwindling capital revenue sources.

Cost per Passenger Transported

Result: Washington State Ferries reported an average cost of \$10.08 per passenger transported.

- **AMHS** reported operating expenses of \$141.6 million in 2009 for an average **cost of \$445.31 per passenger transported**.
- **BC Ferries** reported expenses of \$502.5 million in 2009 for a **cost per passenger of \$24.24**.
- **NC Ferries** reported operating expenses of \$36.4 million in 2009 which translates to a **cost of \$16.66 per passenger transported**.
- **Steamship Authority** reported expenses of \$74.8 million in 2009 for a **cost per passenger of \$27.76**.
- **Sydney Ferries** reported 2008 expenses of \$116.7 million, a **cost per passenger of \$8.15**.
- **Fjord 1** reported expenses of \$466 million in 2009 for a **cost of \$24.66 per passenger**.
- **KC Metro** reported operating revenues in 2008 as \$109.3 million and operating expenses of \$432.6 million. Total passengers transported 127.9 million passengers. Revenue per passenger is therefore .85 cents, with a **cost per passenger of \$3.38**.¹⁴⁰

¹⁴⁰ Ibid., citation 136.

- **Amtrak Cascades**, the Washington State supported rail provider, reported operating revenues in 2009 as \$16.9 million versus \$31.2 million in expenses. Total passengers transported by state funded trains were 524,000. This translates to \$32.30 in average operating revenue per passenger and a **cost of \$59.60 per passenger**.¹⁴¹

GAP ANALYSIS: There are several factors that skew this figure including whether the operator transports vehicles, the distance of the routes traveled, and other services provided that add to expenses and inflate the average cost. A look at WSF peers demonstrates these variations as AMHS and its over 3,000 nautical miles in routes cost nearly 45 times more per passenger than that of WSF. Meanwhile, Sydney Ferries had a lower cost per passenger transported, but it is a passenger-only ferry operator with a quarter the total route length. Among the five national ferry operators (excludes AMHS) in this analysis, Staten Island has the lowest cost at \$5.38 per passenger and the five system national average cost was \$17.43 per passenger.

For an industry average I included operators that served routes accessible within a day's trip. A total of 13 ferry system's had an average cost of \$20.51. International examples include, Swedish operator Waxholm Angfartygs at \$10.27 per passenger, Portuguese operator Transtejo & Soflusa with its \$2.32 average, and Istanbul based IDO at \$2.29 per passenger.¹⁴² Operators where costs to operate are low, distance is shorter and volumes high, per passenger costs were substantially lower. For example, Star Ferries in Hong Kong averaged just .42 cents per passenger in 2008. Such an outlier is considered offset in the average calculation because the figure includes rates from more high-wage and moderate distance transporters, e.g. New Zealand's InterIslander's over \$107 operating cost per passenger.

Labor Expenses Proportion of Operating Expenses

Result: Washington State Ferries reported 50.9% of its expenses in 2009 went towards labor.

- **NC Ferries** reported approximately **69%** of its expenses were associated with labor.
- **Steamship Authority** reported **55.2%** of its expenses were associated with labor.
- **Sydney Ferries** reported **47%** of its expenses were associated with labor.
- **Fjord1** reported approximately **45.1%** of its expenses were associated with labor.

GAP ANALYSIS: The ferry comparison matrix includes 14 of the 23 operator's labor expenses. It is assumed that the reported figures incorporate all labor expenses (e.g. wages, benefits, pensions). The average proportion of labor expenses to total operating expenses for these ferry system's in their

¹⁴¹ Ibid., citation 137.

¹⁴² These figures are based on exchange rates at the time of the last day for which the operator's data is calculated. For example, Portuguese operator Transtejo & Soflusa's fiscal year ends on December 31st and an exchange rate based on the value of the Euro on that date was used.

respective year reporting was 45.1%. WSF seems to be spending a comparable amount on labor to other ferry operators. Other national operators for which data is available include Cape May-Lewes (71%) and Golden Gate Ferries (61.4%).

Farebox Recovery

Result: Washington State Ferries reported a 2009 farebox recovery ratio of 68.3%.

- **AMHS** reported a 2009 farebox recovery of **26.4%**.
- **BC Ferries** reported a 2009 farebox recovery of **68.7%**.
- **NC Ferries** reported a farebox recovery of just **5.8%** in 2009 due to its free or discounted fare rates on all routes served.
- **Steamship Authority** reported a **94.1%** farebox recovery in 2009.
- **Sydney Ferries** reported a **33.5%** farebox during 2009.
- **Fjord1** reported a 2009 farebox recovery rate of **67%**.
- **KC Metro** reported a 2008 a farebox recovery rate of **24.6%**.¹⁴³
- **Amtrak Cascades** reported a **54%** farebox recovery in 2009.¹⁴⁴

GAP ANALYSIS: WSF is not meeting the target of 80% set by WSDOT. Compared to its peers, WSF seems to be in-line with others, posting nearly identical farebox ratio's with both Sydney Ferries and BC Ferries. All publically-owned ferry operators in this analysis, 14 not including WSF, rely on other revenue sources to make up operating expenses not covered from fare revenues. The average ratio among those systems is found to be 48.8%. Staten Island Ferries and its free fares, not surprisingly, had the lowest ratio in the analysis. Private operators generally exceeded their operating expenses through fares and other activities that includes parking, onboard services, charter services and reservation fees.

The cause for the difference in ratio's are based on the policy of the operator, the ability and willingness to raise fare prices, the rate at which operating expenses are growing compared to fares, and likewise, the decrease or increase in annual ridership.

Subsidies per Passenger Transported

Result: Washington State Ferries received \$78.1 million in operating revenue from government funding, for a \$3.49 average subsidy per passenger transported.

- **AMHS** received \$95.4 million in 2009, an **average subsidy of \$300 per passenger.**
- **BC Ferries** received \$121.4 million in 2009, an **average subsidy of \$5.86 per passenger.**

¹⁴³ Ibid., citation 136.

¹⁴⁴ Ibid., citation 137.

- **NC Ferries** received \$34.2 million in 2009, an *average subsidy of \$15.62 per passenger*.
- **Steamship Authority** reported making up its \$9.5 operating deficit through other revenue generating services, and *no government subsidies for operations*.
- **Sydney Ferries** received \$64.7 million in 2009, an *average \$4.52 subsidy per passenger*.
- **Fjord1** received \$160.5 million in 2009, an *average subsidy of \$8.49 per passenger*.

GAP ANALYSIS: WSF has one of the lowest subsidy per passenger contributions towards its operating revenues of the publically-owned operators for which data is available. With the exception of Steamship Authority and Interislander (New Zealand), all other publically-owned operators depended to some extent on government subsidies. For WSF, 34.6% of its operating expenses were derived from government funds. That compares to an over two-thirds ratio for AMHS and nearly a quarter for BC Ferries in 2009. The other national public ferry operators have subsidies equal to \$5.38 per passenger (Staten Island Ferries), \$7.98 (Cape May-Lewes) and \$5.61 (Golden Gate Ferries).

Other local modes of public transportation are also heavily subsidized by taxpayers. For example, WSDOT has provided Amtrak Cascades with \$331 million in taxpayer subsidies since 1994, including \$14.3 million in 2009, or \$27.30 per passenger in government subsidies.¹⁴⁵ In 2008, King County Metro received almost two-thirds of its operating expenses through the county sales tax alone, or \$334.1 million, for a tax subsidy of \$2.63 per passenger.¹⁴⁶

Further analysis could yield specific subsidy figures for all operators, but this analysis had some difficulty discerning the revenues being reported. For example, Waxholm Angfartygs of Sweden reported operating revenue of \$310 million, of which \$112 million came from fares.¹⁴⁷ It may be that the remaining funds came from government subsidies, but without clarification of the source, that assumption was not made in this analysis.

6.3 – Limitations of the Analysis

There are several significant limitations worth noting. These include:

- **A small sample size of ferry systems.** Of the hundreds of ferry systems in the world, the analysis tried to include the largest and most modern operators. The selection could be expanded to include a more comprehensive list, but that is beyond the scope of this research paper.

¹⁴⁵ Ibid., citation 137.

¹⁴⁶ Ibid., citation 136.

¹⁴⁷ Figures are in Swedish Kronor.

- **Difficulty obtaining full data.** Receiving a response to the request for data was difficult for reasons already mentioned. However, there is a publication from Swedish company ShipPax that apparently contains statistics for ferry operators worldwide. It is possible that if WSF were able or willing to purchase that information, the amount of time and energy expended trying to accumulate it could be lessened in the future.
- **Data with more specific units of measurement.** Unfortunately, there were several pieces of information that could have gone further to explain the performance of WSF and its relation to state public transportation goals. One example would be comparing cost or subsidy per passenger mile instead of a per passenger average. This would help explain discrepancies in values based on the distance traveled. In addition, a figure that represents the amount of VMT reduced could show how WSF contributes to the goals set by Governor Gregoire.
- **More customer focused measures.** None of the measures really captured how satisfied customers are with the services that WSF provides. Measures of trip reliability and on-time departure undoubtedly impact customer satisfaction, but there would need to be a universal way of measuring this in order to make accurate comparisons to peers.

6.4 - Conclusion

A world class institution is a leading provider of a service and/or an entity of great importance. Under this definition, WSF is both. On any given day, the agency makes 400 daily trips along the marine highway, connecting communities to each other and acting as an invaluable facilitator of commerce activities. According to this analysis, it can rightfully claim to be the world's leader in ferry operations for vehicles transported. The agency can make a strong argument for its cost-efficiency service, and despite the extraordinary age of its fleet, WSF also has a strong defense for the qualities of its transit service.

The research question asked how Washington State Ferries compares and contrasts to other ferry systems around the world. To maximize the use of the data gathered and the effort to acquire the needed information, this research paper chose to analyze the agency against not just basic operational characteristics but also against specific measures of performance. The performance measures are part of the process of benchmarking, identifying best in class, their practices, and then determining how WSF compares to those peers in the ferry industry. The other part of the process involves incorporating the strategies, policies and/or practices of the peers that the agency hopes to emulate, and continually monitoring and reassessing the results.

The State of Washington and WSDOT have set few targets for WSF operations known to the public (only on-time departures and farebox recovery). In its vision statement, WSF identifies the goal of being the most 'customer focused ferry operator in the world'. If agency officials and policymakers consider 'customer focus' to be transporting vehicles, then WSF can rightfully claim success. However, if the focus is on maximizing passengers carried, to comply with the state's climate change initiatives for instance, officials would want to determine ways in which to emphasize walk-on passengers. Improving transit supportive services, encouraging ride share programs and decreasing walk-on fares while increasing vehicle fares are just a few techniques the agency may choose to employ. Carrying the most vehicles in the world could be a characteristic the agency can tout, but without clear targets made or benchmarks set it remains unclear as to what WSF is aiming for.

At the time of this paper's writing, WSF is experiencing heavy public criticism for its perceived exorbitant spending on labor related expenses. Through benchmarking, the accountability gap that may exist between WSF operations and Washington State residents would narrow. While by no means comprehensive, the systems that were included were able to capture service level and cost-efficiency measures of performance from a wide selection of ferry operators. This analysis began the process and will ideally jumpstart discussion among agency and state officials to set benchmarks for ferry service operations based on that of its peers and which align to the policies and priorities of the state.

Glossary of Terms Used

Benchmark: An industry standard of performance.

Benchmarking: A structured way of looking outside to identify, analyze and adopt the best practices in the industry.

Cost-efficiency: Providing the public user's desired service with a minimum amount of resources, expense and waste.

Farebox recovery ratio: The proportion of operating expenses supported by fare revenue.

Ferry: A ship or boat that carries passengers (and often vehicles) across a body of water.

Gap analysis: Tool that helps a company or agency compare its actual performance with its potential or desired performance.

Mosquito Fleet: Term referring to the large number of private ferry operators serving the Puget Sound between the mid 1800's to the early 1900's.

Nautical mile: A unit of length used in sea navigation (1 nautical mile is equal to 1.15 miles).

On-time departure: The proportion of actual ferry service that depart within a predetermined amount of time of schedule (e.g. WSF considers this to be within 10 minutes).

Operating expense: The costs incurred in carrying out the ferry operator's day-to-day activities, including repair and maintenance of vessels and terminals, labor and benefits, and the cost of fuel.

Operating revenue: The money received from ferry operations, including fares, concessions, charter services, parking, gift shops and reservation fees.

Operational characteristics: Quantifiable data that can describe a ferry system's assets, route and financial attributes.

Passenger-mile: Unit of measurement equal to the distance (in miles) that a passenger traverses.

Performance measure: Specific quantitative representation of a capacity, process, or outcome deemed relevant to the assessment of a ferry system's performance.

Target: A desired service level or finance related outcome set by a ferry operator.

Trip reliability: The proportion of actual departures relative to the number scheduled.



Photos: Melissa Johnson, Washington State Ferries File

Appendix A: Contact Data for Initial List of 26 Ferry Systems

Ferry System Operator	Contact	Title	Email	Telephone
1 Alaska Marine Highway	Chuck Van Kirk	Operations Manager	chuck.vankirk@alaska.gov	907.228.7252
1 Alaska Marine Highway	Mike Wilson	Ship Services Manager / Port Steward	mike.wilson@alaska.gov	907.465.8813
1 Alaska Marine Highway	David Jancauskas	Senior Port Captain	david.jancauskas@alaska.gov	907.228.7255
1 Alaska Marine Highway	John Falvey	Division Director	john.falvey@alaska.gov	907.228.7250
1 Alaska Marine Highway	Catherine Belfry	Program Budget Analyst	catherine.belfry@alaska.gov	907.228.7266
2 ANEK Lines	Stavros Agelioakis	Operations Manager	account@anek.gr	+30 28210.24177
2 ANEK Lines	Spyridon Protopapadakis	Second VP	info@anek.gr	+30 28210.24177
2 ANEK Lines	Stylianios I. Stamos	CFO	cfo@anek.gr	+30 28210.24000
2 ANEK Lines	Ioannis Vardinoyiannis	Managing Director	mgd@anek.gr	+30 28210.24177
3 Bay Ferries	Danny Bartlett	VP, Finance and Administration	dbartlett@nfl-bay.com	+1 902.626.2545
3 Bay Ferries	Don Cormier	VP, Operations and Safety Management	dcormier@nfl-bay.com	+1 902.626.2543
3 Bay Ferries	Nancy Cousins	Terminal Manager	ncousins@nfl-bay.com	+1 506.649.7705
4 BC Ferries	Mike Corrigan	Exec VP and Chief Operating Officer	mike.corrigan@bcferries.com	+1 250.978.1360
4 BC Ferries	Rob Clarke	Exec VP and Chief Financial Officer	rob.clarke@bcferries.com	+1 250.381.1401
4 BC Ferries	Jason Bowman	Regional Director, Terminal Operations	jason.bowman@bcferries.com	+1 250.978.1186
4 BC Ferries	Patrick Morris	Operational Planning Manager	patrick.morris@bcferries.com	+1.250.978.1293
4 BC Ferries	Navin Sami	Pacific Marine Ventures	navin.sami@bcferries.com	
5 Brittany Ferries	Martine Jourden	Group Managing Director		+33 02 9829.2703
5 Brittany Ferries	Christopher Mathieu	Group Corporate Controller	christopher.mathieu@brittany-ferries.fr	+33 02 9829.2728
5 Brittany Ferries	Francois Potier	Development Manager	francois.potier@brittany-ferries.fr	+33 02 9829.2868
5 Brittany Ferries	Stephen Tuckwell	Communications Director	stephen.tuckwell@brittanyferries.com	+44 (0) 239.240.2985
5 Brittany Ferries	Christopher Jones	Communications Executive	christopher.jones@brittanyferries.com	+44 (0) 871.244.0415
5 Brittany Ferries				+44 (0) 239.240.2965
6 Cape May-Lewes	Heath Gehrke	Director of Operations	heath.gehrke@drba.net	609.889.7220
6 Cape May-Lewes	Fred Coldren	Business Manager	fred.coldren@drba.net	609.889.7257
6 Cape May-Lewes	Jim Walls	Chief Operations Officer	jim.walls@drba.net	302.571.6394
6 Cape May-Lewes	Victor Ferzetti	Director of Finances	victor.ferzetti@drba.net	
7 Color Line	Helge Mathison	VP, Communication and Public Affairs	helge.otto.mathisen@colorline.no	+47 2311.8060
7 Color Line	Robin Stenersen	Information Manager	robin.stenersen@colorline.no	Gen#: +47 2294.4440
7 Color Line	Lars Setsaa	Strategy Analyst	lars.setsaa@colorline.no	+47 9529.0219
8 Fjord1 (Nordvestlandske AS)	Ingrid Feroyvik	Communications Director	ingrid.feroyvik@fjord1.no	+47 5775.7102
8 Fjord1 (Fylkesbaatane)	Iris Hogelid Vik	Controller / Economist	iris.hogelid.vik@fjord1.no	+47 5775.7201
8 Fjord1 (Fylkesbaatane)	Hallgeir Kleppe	Staff Director	hallgeir.kleppe@fjord1.no	+47 5775.7240
8 Fjord1 (MRF)	Anker Grovdal	Administrative Director	anker.grovdal@fjord1.no	+47 7121.9573
8 Fjord1 (MRF)	Kjersti Sivertsen	Controller / Economist	kjersti.sivertsen@fjord1.no	+47 7121.9589
9 Golden Gate Ferries	Celia Kupersmith	District General Manager	ckupersmith@goldengate.org	415.923.2203
9 Golden Gate Ferries	James Swindler	Deputy General Manager Ferry Division	jswindler@goldengate.org	415.925.5570
9 Golden Gate Ferries	Joseph Wire	District CFO	jwire@goldengate.org	415.923.2289
9 Golden Gate Ferries	Ron Downing	Acting Planning Director	rdowning@goldengate.org	415.257.4583
10 Hellenic Seaways	A. Agapitos	Chief Operating Officer	m.chryssini@hellenicseaways.gr	30 210 41 99 100
10 Hellenic Seaways	G. Vasilokostantakis	Chief Financial Officer	info@hellenicseaways.gr	31 210 41 99 100
10 Hellenic Seaways	A. Papadakis	Chief Administrative Officer	a.papadakis@hellenicseaways.gr	32 210 41 99 100
11 Interislander	Thomas Davis	General Manager	tdavis@interislander.co.nz	+64 4 498.2084
11 Interislander	Nik Zangouropoulos	Consultant	nik.zangouropoulos@interislander.co.nz	+64 4 498.5290
11 Interislander	Tony Eagle	AP / AR	teagle@interislander.co.nz	+64 4 498.8659
12 Irish Ferries	Garry O'Dea	Group Finance Director	garry.odea@irishferries.com	+353 1607.5620
12 Irish Ferries	John Reilly	Operations Director	john.reilly@irishferries.com	+353 1607.5631
12 Irish Ferries	Tony Kelly	Marketing Director	tony.kelly@irishferries.com	+353 818 300 400
12 Irish Ferries	Tim Corcoran	Company Secretary	corcorant@icg.ie	+353 1607 5611
13 Istanbul Deniz Otobusleri	Dr. Ahmet Paksoy	General Manager	apaksoy@ido.com.tr	+90 212.455.6970
13 Istanbul Deniz Otobusleri	Ufuk Tugcu	Vice General Manager	utugcu@ido.com.tr	+90 212.517.9294
13 Istanbul Deniz Otobusleri	Mustafa Mutlu	Vice General Manager	mmutlu@ido.com.tr	+90 212.455.6900
13 Istanbul Deniz Otobusleri	Fuat Gedik	Vice General Manager	fgedik@ido.com.tr	+90 212.455.69 56-57

Appendix A: Contact Data for Initial List of 26 Ferry Systems (cont.)

Ferry System Operator	Contact	Title	Email	Telephone
14 Jadrolinija d.d.		General Information	passdept_e@jadrolinija.hr	+385 51 666.111
14 Jadrolinija d.d.	Igor Butorac	Managing Board	igor.butorac@jadrolinija.hr	
14 Jadrolinija d.d.	Blanka Celhar	Financial Director	blanka.celhar@jadrolinija.hr	
15 New York Waterway	Arthur Imperatore	President	imperatoresr@nywaterway.com	
15 New York Waterway	Alan Warren	Director of Ferry Operations	alanw@nywaterway.com	201.914.1514
15 New York Waterway	Gary Davis	Senior Marketing Manager	garyd@nywaterway.com	1.800.533.3779
15 New York Waterway		General Information	customerservice@nywaterway.com	201.420.4422
16 North Carolina Ferries	Jesse Vinson	Business Officer II	jvinson@ncdot.gov	252.726.6446
16 North Carolina Ferries	Charlie Piner	Assistant Director Operations	cpiner@ncdot.gov	252.726.6446
16 North Carolina Ferries	Lillian (Beth) Govoni	Administrative Officer I	lgovoni@ncdot.gov	252.726.6446
17 P & O Ferries	Karl Howarth	Chief Financial Officer	karl.howarth@poferries.com	
17 P & O Ferries	John Garner	Fleet Director	john.garner@poferries.com	+44 13048.63216
17 P & O Ferries	Mike Langley	Fleet Manager, Tech. and Procurement	mike.langley@poferries.com	+44 13048.63217
17 P & O Ferries	Chris Laming	Communications Director	communications@poferries.com	+44 13048.63859
17 P & O Ferries	Sue MacKenzie	Ports Director	sue.mackenzie@poferries.com	
18 Scandlines Danmark A/S	Claus Nikolajsen	Operations Manager	claus.nikolajsen@scandlines.com	+45 3529.0210
18 Scandlines Danmark A/S	John Steen-Mikkelsen	Chief Operating Officer	john.s.mikkelsen@scandlines.com	+45 3529.0240
18 Scandlines GmbH	Michael Speckenbach	Corporate Communications Director	michael.speckenbach@scandlines.com	+49 43715.05390
18 Scandlines GmbH	Tage Reinert	Chief Financial Officer	tage.reinert@scandlines.com	
19 Star Ferries	Myra Mok	Administration Secretary	sf@starferry.com.hk	+852 2367.7065
19 Star Ferries	Mickey Leung	Director and General Manager	mleung@starferry.com.hk	
19 Star Ferries	Johnny Leung	Assistant General Manager		
20 Staten Island Ferries	Trinity Abbott	Chief of Staff, Ferries Division	tabbott@dot.nyc.gov	718.876.2357
20 Staten Island Ferries	Joseph Jarrin	Chief Financial Officer	jjarrin@dot.nyc.gov	212.676.0562
20 Staten Island Ferries	James deSimone	Chief Operating Officer	jdesimone@dot.nyc.gov	718.876.2657
20 Staten Island Ferries	Janette Sadik-Kahn	Commissioner	jsadikkhan@dot.nyc.gov	
21 Steamship Authority	Robert Davis	Treasurer / Comptroller	rdavis@steamshipauthority.com	508.548.5011 x205
21 Steamship Authority	Wayne Lamson	General Manager	wlamson@steamshipauthority.com	508.548.3788
21 Steamship Authority	Mary T.H. Claffey	Director of Information Tech.	mclaffey@steamshipauthority.com	508.548.5011 x456
22 Stena Lines	Anders Claesson	Program Manager / Budget Analyst	anders.claesson@stenaline.com	+46 3185.8532
22 Stena Lines	Gunnar Blomdahl	Managing Director	gunnar.blomdahl@stenaline.com	+46 70485.8532
22 Stena Lines	Mattias Kjellberg	Port & Nautical Operations Manager	mattias.kjellberg@stenaline.com	+46 3185.8532
22 Stena Lines	Joakim Kenndal	Communications Director	joakim.kenndal@stenaline.com	+46 3185.8180
22 Stena Lines				+46 70485.8555
23 Sydney Ferries	Terry O'Brien	Acting CFO	terry.obrien@sydneyferries.nsw.gov.au	+61 2 9246.8366
23 Sydney Ferries	Scott Maclean	Communications Manager	Scott.Maclean@sydneyferries.nsw.gov.au	+61 2 9246.8377
23 Sydney Ferries	Denis Mole	General Manager Operations	denis.mole@sydneyferries.nsw.gov.au	+61 2 9207.3126
24 AS Tallink Grupp	Mr. Janek Stalmeister	Chief Financial Officer	janek.stalmeister@tallink.ee	+372 6409.800
24 AS Tallink Silja	Janis Pavuls	Communications Director (Tallink Silja)	janis.pavuls@tallinksilja.com	+46 8666.3429
24 AS Tallink Silja	Kadri Land	Managing Director (Tallink Silja)	kadri.land@tallinksilja.com	+46 8666.3414
24 AS Tallink Grupp	Harri Hanschmidt	Advisor to Management	harri.hanschmidt@tallink.ee	+372 640 8981
24 AS Tallink Silja	Hans Markström	Area Manager	hans.markstrom@tallinksilja.com	+46 8666.3400
25 Transtejo & Soflusa		General Information	geral@transtejo.pt	+351 210.422.400
25 Transtejo & Soflusa	Dr. Maria Carvalho	Fiscal Counsel President	mcarvalho@transtejo.pt	+351 210.422.400
25 Transtejo & Soflusa	Dr. Pedro Rolo	Director of Finance	prolo@transtejo.pt	+351 210.422.400
25 Transtejo & Soflusa	Joao Pintassilgo	Administrative Counsel President	jpintassilgo@transtejo.pt	+351 251.422.4256
26 Waxholms Angfartygs AB	Ewa Stenberg	Managing Director	ewa.stenberg@Waxholmsbolaget.sll.se	+46 8614.6450
26 Waxholms Angfartygs AB	Indrek Pöldma	Technical Advisor	indrek.poldma@Waxholmsbolaget.sll.se	+46 8614.6437

Appendix B: E-mail Questionnaire to Ferry System Operators

Dear [name],

Working with Washington State Ferries (WSF) located in Seattle Washington, USA, and as part of my studies for a Master's degree in Public Administration, I am researching ferry systems worldwide. The intention is to develop a set of ferry industry performance standards for WSF. The information from you will be presented to WSF and to the University of Washington's Evans School of Public Affairs.

I would like to introduce myself over the telephone and discuss my research. The data needed ranges from general statistics regarding [ferry system]'s fleet, traffic and finances, to more complex policy issues. My goal is to gather basic information through e-mail and then contact you with additional questions via telephone or electronically.

- What is the best day and time to call you?
- The phone number I have for you is [telephone]. Is that correct?
- Is there someone else you recommend I contact regarding this?

As the [title], I am requesting responses to **12** basic operation related questions (see below). I have also sent a separate list of short questions related to [ferry system]'s finances to [person, title] and included those questions at the end of this email. Please feel free to provide that information if you have it.

I researched [ferry system] and was able to find some of the information through the Internet. **Please verify the accuracy of these figures, provide additional figures were necessary and e-mail reply as soon as possible.**

Terminals and Vessels:	[ferry system]'s data	WSF data from 2009
1. How many ferry terminals does [ferry system] operate?		20
2. Total number of vessels in [ferry system]'s fleet?		20
2a. Of those, how many are passenger & vehicle (car) vessels?		20
3. On average, how long have your vessels been in operation?		36.3 years
4. What is [ferry system]'s total fleet passenger capacity ?		30,881
5. What is [ferry system]'s total fleet vehicle/car capacity ?		2,623
Traffic:		
6. How many total number of routes does [ferry system] operate?		9
7. How many total nautical miles were traveled ?		85.5
8. What are the total annual trips (sailings)?		167,355
9. What were the total annual passengers?		22,400,000
9a. How has that changed from last year?		-3.9%
10. What were the total annual vehicles?		9,911,000
10a. How has the changed from last year?		-4.6%
11. What percentage of departures were made on-time?		93% (<10 min.)
12. What percentage of scheduled trips were completed?		99.2%

Upon request I will send a summary of my findings. The information from you is intended to improve WSF performance standards. If you have any concerns regarding how the information is used, please contact Rhonda Brooks, Research Manager at Washington State Department of Transportation.

Thank you so much for your time and your assistance!

Michael Bennion

Graduate Consultant
 E-mail: benniom@consultant.wsdot.wa.gov
 Phone: (+1) 206.470.0594
 Fax: (+1) 206.264.3555

Rhonda Brooks, Research Manager
 E-mail: brookrh@wsdot.wa.gov
 Phone: (+1) 360.705.9545

Additional questions:

Revenue:	[ferry system]'s data	WSF data from 2009 (USD)
1. What were the total operating revenues (excluding EBITDA)?		\$147,676,000
2. Of that total, how much came from fares?		\$144,030,000
3. Of that total, how much came from non-fare revenue?		\$3,646,000
3a. What does non-fare revenue include?		Concessions, Parking, other
Expenditures:		
4. What were the total operating expenses?		\$225,813,000
5. Of that total, how much came from labor (salary, benefits)?		\$115,005,000
5a. Total number of employees?		1,768
5b. Of those, how many are in Administrative positions?		252
6. How much of the total operating expenses came from fuel?		\$41,932,000
6a. How many gallons/liters were used?		17m gal (approx.)
7. What were the total capital expenditures?		\$93,393,000

Appendix C: Phone Interview Follow-Up to E-mail Questionnaire

Contact Name: _____

Contact Organization: _____

Thank you so much for your time. Let me briefly explain the purpose of my call. I am a graduate student from the University of Washington here in Seattle. As part of my Master's degree requirement, I am working with Washington State Ferries towards developing a set of benchmark performance measurements. Along with my e-mail request for data on your organization, I have a few specific policy-related questions I was hoping you could answer for me.

Question 1: Apart from on-time departure and trip reliability, are there other ways your organization measures its operational performance?

(for example, WSF looks at operational costs per passenger, vehicle miles reduced, customer satisfaction)

Question 2: Describe your organization's long-range operating and capital budget funding plan. What type of strategies does your organization use in dealing with any gaps? How does it go about requesting additional funds?

(for example, WSF must request funds from the state legislature for both its operating and capital budget, and is advised to raise its revenue from fares to 80% of operating expenses)

Question 3: What strategies does your organization use to deal with the volatility in fuel prices?

(for example, BC Ferries in Canada used a fuel surcharge and WSF is considering doing the same)

Question 4: Describe the trends in fare prices over the last five to ten years.

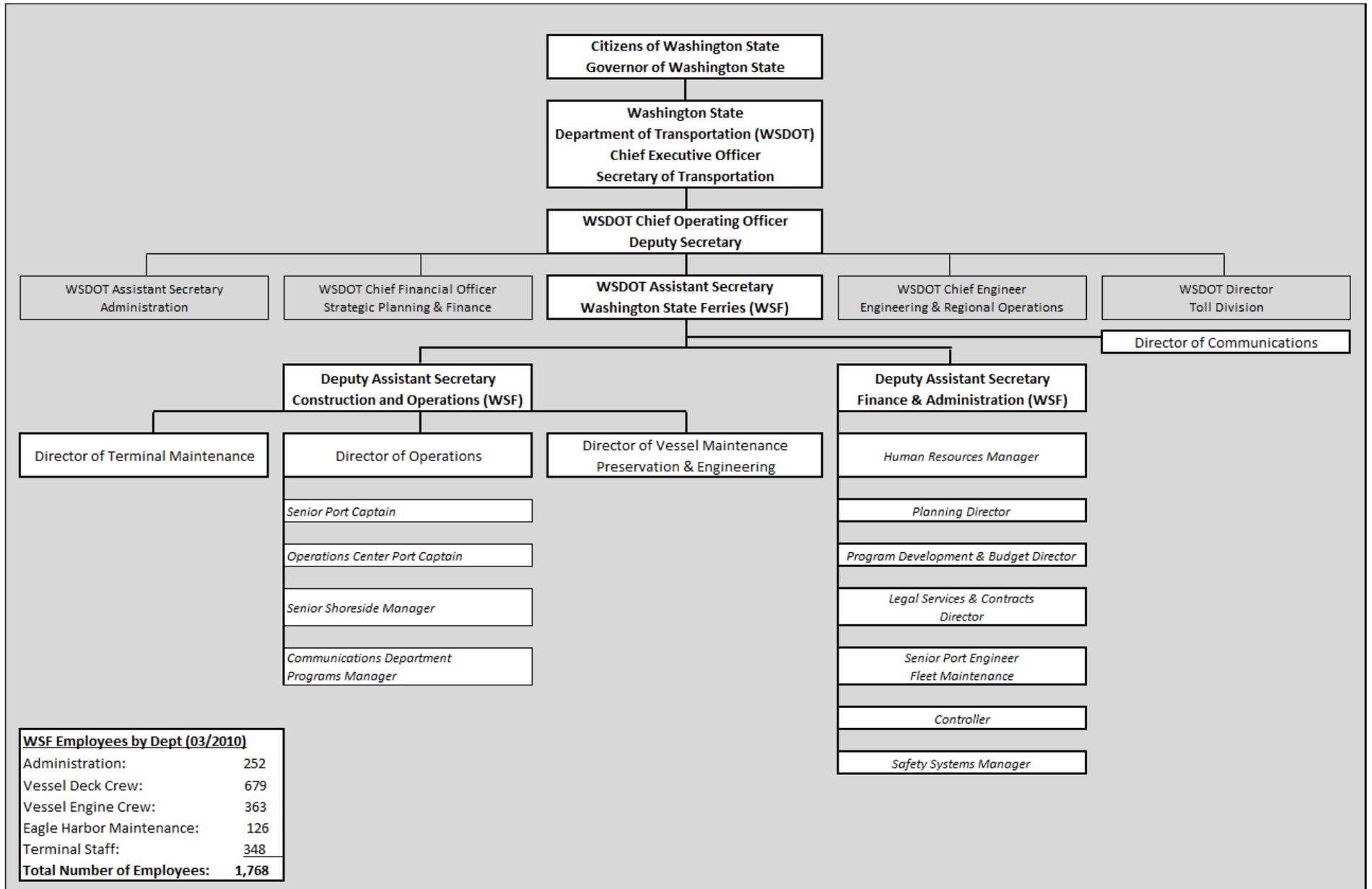
(for example, Fares have increased between 2.5% and 20% each year since 2001)

Question 5: Are there any public / private partnerships?

(for example, WSF, a public agency, partnered with a private company to build a new terminal several years ago at a lower cost)

In the next two or three years, Washington State Ferries may wish to contact you to get an update on your organization's data. Would that be okay? I really appreciate you taking the time to speak with me. Thank you again.

Appendix D: WSDOT and WSF Organizational Chart



Appendix E: Ferry Comparison Matrix of Asset, Route and Financial Operational Characteristics

	SYSTEM INFO					TERMINAL AND VESSEL CHARACTERISTICS								
	Area(s) Served	Year Service Began	Governance Structure	Data for FY Ending*	Employees	Terminals	Number of Vessels	Passenger-only Vessels	Passenger & Vehicle Vessels	Vessel Capacity Range		Fleet Capacity		Average Age of Fleet
										Passengers	Vehicles	Passengers	Vehicles	
WASHINGTON STATE FERRIES	Washington, USA	1951	Publically-owned	2009	1,768	20	20	0	20	200 - 2,500	34 - 202	30,881	2,623	36.3 years
US OPERATORS	* indicates response to data questions from ferry operator													
1 Alaska Marine Highway	Alaska	1963	Publically-owned	2009*	935	32 13 staffed	11	0	11	149 - 600	18 - 134	3,890	653	29.2 years
2 Cape May-Lewes	New Jersey and Delaware	1964	Publically-owned	2009*	450	2	5	0	5	1000 each (approx.)	100 each (approx.)	3,884	485	29 years
3 Golden Gate Ferries	San Francisco Bay	1970	Publically-owned	2009*	79	3	7	7	0	390 - 715	n/a	3,890	n/a	21 years
4 North Carolina Ferries	North Carolina	1947	Publically-owned	2009*	503	13	22	0	22	149 - 300	22 - 50	5,092	787	19 years
5 Staten Island Ferries	New York City	1905	Publically-owned	2009		2	8	4	4	1,280 - 6,000	0 - 42	30,600	166	21.3 years
6 Steamship Authority	Massachusetts	1962	Publically-owned	2009*	675	5	9	1	8	149 - 1,200		5,448	399	25.1 years
EUROPEAN OPERATORS														
7 ANEK Lines	Greece, Italy	1967	Privately owned,	2009*	1,362	40	16	1	15	1,500 - 2,500	450 - 1,100	25,000	6,500	25 years
8 Brittany Ferries	France, Ireland, Spain, UK	1972	Privately owned	2009	2,900	9	8	0	8	718 - 2,400	185 - 830	12,644	4,098	10 years
9 Color Line	Denmark, Germany, Norway, Sweden	1990	Privately owned	2005	3,827 (inc. p/t)	7	10	0	10	1,109 - 2,750	195 - 750	16,815	4,747	24.7 years
10 Fjord1 Nordvestlandske	Norway	2001	Publically-owned	2009*	2,185	86	80	12	68	84 - 589	0 - 212	18,384	4,546	28.3 years
11 Hellenic Seaways	Greece	2005	Privately owned	2007		36	34	14	20	12 - 1,915	0 - 640	22,448	3,695	16.8 years
12 Irish Ferries	France, Ireland, UK	1992	Privately owned,	2009*	792	6	4	0	4	800 - 2,200	200 - 1,582	6,333	2,832	13 years
13 Istanbul Deniz Otobusleri	Turkey	1987	Publically-owned	2009*	3,225 (2,058 outsourced)	85	106	79	27	350 - 2,100	0 - 225	90,724	3,027	19 years
14 Jadrolinija	Croatia	1947	Publically-owned	2008		83	56					27,540	3,600	
15 Scandlines	Scandinavia (Denmark, Germany, Latvia, Sweden)	1993	Privately owned	2009*	2,000	11	16	2	14	111 - 1,250	0 - 450	11,607	3,898	
16 Stena Lines	Scandinavia, Holland, Ireland, UK	1962	Privately owned	2008	5,778	4	34	0	34	65 - 2,274		19,790		
17 AS Tallink Grupp	Scandinavia (inc. Finland), Estonia, Latvia	1990	Privately owned,	2009*	6,853	13	19	0	19	200 - 2800	450 - 650	33,082	25,684 lm	15 years
18 Transtejo & Soflusa	Lisbon, Portugal	1975	Publically-owned	2008		9	38	36	2	146 - 1000	0-30	18,068	40	19.4 years
19 Waxholms Angfartygs	Stockholm, Sweden	1880	Publically-owned	2008		17	24	24	0	180 - 350	n/a	6,822	n/a	
OPERATORS ELSEWHERE														
20 BC Ferries	British Columbia, Canada	1960	Public/Private	2009	3,480	47	36	0	36	125 - 2,100	16 - 410	26,719	5,475	20.6 years
21 Interislander	New Zealand	1962	Publically-owned	2010*	600	2	3	0	3	360 - 1,650	124 - 600	2,548	854	13 years
22 Star Ferries	Hong Kong, China	1888	Privately-owned	2008*		4	8	8	0	288 - 762	n/a	4,395	n/a	48 years
23 Sydney Ferries	Sydney, Australia	1861	Publically-owned	2009	668	38	28	28	0	150-1100	n/a	12,265	n/a	19 years

Appendix E: Ferry Comparison Matrix (cont.)

	ROUTE DATA				TRAFFIC DATA				PERFORMANCE	
	Total Route Length	TOTAL Routes	Annual Trips (Sailings)	Fuel Consumed (US Gal.)	Annual Passengers	inc/dec over prior year	Annual Vehicles	inc/dec over prior year	On-time Departures	Trip Reliability
WASHINGTON STATE FERRIES	84 nm	9	147,833	16,844,618 gallons	22,400,000	-3.9% ('08)	9,911,000	-4.6% ('08)	92.9% (<10 minutes)	99.6%
US OPERATORS										
1 Alaska Marine Highway	3041 nm (est.)	137 (56% <10/yr)	4,123		317,891	-6.6% ('08)	108,541	-1.2% ('08)	92.0%	
2 Cape May-Lewes	14.77 nm	1	5,054	970,907 gallons	842,449	-8.6% ('08)	295,240	-7.2% ('08)	97.5%	98.5%
3 Golden Gate Ferries	16.75 nm	3	17,812	1,614,539 gallons	1,949,035	-1.6% ('08)	n/a	n/a	94.0%	99.9%
4 North Carolina Ferries	66.5 nm	7	73,141		2,184,433	-9.2% ('08)	943,504	-8.7% ('08)		97.6%
5 Staten Island Ferries	4.5 nm	1	33,000		20,118,000	-1.8% ('08)	0 - No cars post 9/11	n/a	91.1%	
6 Steamship Authority	46 nm; 172,136 (yr)	3	21,445	2.8 million gallons	2,693,178	+0% ('08)	456,478 cars 133,175 trucks	+1.0% ('08)	99.5% (<10 min.)	97.2%
EUROPEAN OPERATORS										
7 ANEK Lines		12	5,100	61,062,707 gallons	2,500,000	+7.2% ('08)	677,000	+8.2% ('08)	95% approx	99% approx.
8 Brittany Ferries		7			2,571,000	-3.6% ('07)	823,000 cars 232,000	+2.9% ('07)		
9 Color Line		6			4,433,072	+5.3% ('04)	809,188	-1.7% ('04)		
10 Fjord1 Nordvestlandske		55	985,500	18.5 m dsl, 17.2 m LNG	18,900,000	+2% ('08)	8,972,000	+2% ('08)	99.9% (est.)	99.9% (est.)
11 Hellenic Seaways		20	28,398		5,714,145	-3.9% ('06)	625,433	-2.8% ('06)		
12 Irish Ferries	336,512 nm (yr)	4	4,236	20,029,230 gallons	1,430,000	-2.7% ('08)	376,000	-2% ('08)		95.0%
13 Istanbul Deniz Otobusleri	2,172,384 nm (yr)	33	359,756		100,575,370		6,954,718		99.8%	100.0%
14 Jadrolinija		7			9,572,933		2,445,994			
15 Scandlines		8	140,000		12,000,000	-7.4% ('08)	2.7 m cars 700k trucks	-3.7% ('08)		
16 Stena Lines		18	76,568		15,280,000		2,866,800			96.0%
17 AS Tallink Grupp	1,435,538 nm (year)	7	9,476	92,542,595 gallons	8,124,561	+14.9% ('08)	863,017 cars 252,026 trucks	+11.2% ('08)	n/a	n/a
18 Transtejo & Soflusa		6	171,666	3,704,799 gallons	28,445,987	+1.3% ('07)	negligible	negligible		
19 Waxholms Angfartygs		57			3,798,000	+1% ('07)	n/a	n/a	84%	
OPERATORS ELSEWHERE										
20 BC Ferries		25	169,185		20,727,493	-4.9% ('08)	8,130,356	-5.2% ('08)	88.5% (<10 minutes)	99.7%
21 Interislander	50.2 nm	1	4,588	10,087,146 gallons	855,000	-2% ('08)	227,000	+1.9% ('08)	89% (<15 minutes)	94.0%
22 Star Ferries	136,884 nm (yr)	2			23,000,000		n/a	n/a		99.0%
23 Sydney Ferries	20 nm	8	177,861		14,310,000	+2.5% ('08)	n/a	n/a	98.1% (<5 minutes)	99.5%

Appendix E: Ferry Comparison Matrix (cont.)

	ETC.			OPERATING REVENUE						OPERATING EXPENDITURES				OTHER
	Data for FY Ending*	Currency	Exchange Rate	Annual Operating Revenue	Fare Revenue	Non-Fare Passenger Revenue	Description	Misc. Revenue (e.g. Public Funding)	Farebox Recovery	Annual Operating Expenditures	Labor Expenses	Fuel (Petrol) Expenses	Other Operating Expenses	Capital Expenditures
WASHINGTON STATE FERRIES	2009	US Dollars	US Dollars	147,676,000	144,030,000	3,646,000	Parking, concessions	78,137,000	63.8%	225,813,000	115,005,000	41,932,000	68,876,000	93,392,697
US OPERATORS	* indicates response to data questions from ferry operator													
1 Alaska Marine Highway	2009*	USD	USD	46,200,000	37,378,000	8,822,000	Stateroom & service sales	95,361,000	26.4%	141,561,000		11,500,000 (est.)		
2 Cape May-Lewes	2009*	USD	USD	14,280,659	14,060,198	220,461	Games, golf, res fees, bus fares	6,725,134	68.0%	21,005,793	14,933,754	1,733,983	4,338,056	2,300,000
3 Golden Gate Ferries	2009*	USD	USD	13,236,328	10,066,831	561,570		10,941,997	41.6%	24,178,325	14,849,842	4,187,341	5,141,142	9,334,800
4 North Carolina Ferries	2009*	USD	USD	2,272,000	2,100,000	166,000	Ship stores	34,118,000	5.8%	36,390,000	25,000,000	5,000,000	6,390,000	
5 Staten Island Ferries	2009	USD	USD	108,234,840	negligible				0.0%	108,234,840				
6 Steamship Authority	2009*	USD	USD	79,780,000	70,317,000	9,463,000	Pkg, concess., penalties		94.1%	74,764,000	41,307,000	5,511,000	27,946,000	12,445,000
EUROPEAN OPERATORS														
7 ANEK Lines	2009*	EURO	EURO	274,572,000	240,525,072	34,023,000	Rest., bars, stores		106.9%	225,050,000	57,403,458	81,487,845	86,158,697	38,486,966
8 Brittany Ferries	2009	EURO	EURO	332,000,000					98% (all rev)	337,600,000				
9 Color Line	2005	EURO	EURO	586,000,000					125% (all rev)	468,000,000	163,000,000			
10 Fjord1 Nordvestlandske	2009*	NOK	1 USD = 5.9 NOK	495,000,000	312,000,000	22,500,000		160,500,000	67.0%	466,000,000	210,200,000	63,000,000	192,800,000	58,500,000
11 Hellenic Seaways	2007	EURO	EURO	182,300,000	161,200,000	21,100,000			99.3%	162,300,000				
12 Irish Ferries	2009*	EURO	EURO	149,000,000	141,600,000	7,400,000	Vessel charter, other		108.2%	130,900,000	32,700,000	20,900,000	77,300,000	3,600,000
13 Istanbul Deniz Otobusleri	2009*	YTL	1 USD = 1.513 YTL	253,679,581	188,719,764	64,959,817	Sea bus and ferry rev.		82.0%	230,233,571	80,171,880	48,373,646	101,688,045	53,525,276
14 Jadrolinija	2008	HRK	HRK	696,800,000					107.4% (all rev)	648,700,000	161,700,000			
15 Scandlines	2008*	EURO	EURO	505,000,000					146% (all rev)	346,000,000	115,130,000			
16 Stena Lines	2008	SEK	SEK	10,309,000,000					138% (all rev)	7,483,000,000				
17 AS Tallink Grupp	2009*	EURO	EURO	791,900,000	590,644,000	201,219,000			73.8%	800,200,000	101,021,000	90,576,000	608,603,000	
18 Transtejo & Soflusa	2008	EURO	1 USD = .71 EURO	38,739,958	20,398,872				30.9%	66,043,693		12,327,421		
19 Waxholms Angfartygs AB	2008	SEK	1 USD = 7.767 SEK	39,914,506	14,434,888				37.0%	39,013,210				
OPERATORS ELSEWHERE														
20 BC Ferries	2009	USD	1 USD = 1.242 CAD	548,849,000	345,425,500	82,029,500	Catering, onboard serv.	121,394,000	68.7%	502,481,000				
21 Interislander	2010*	NZD	1 USD = 1.407 NZD	106,018,617	50,166,986	55,851,631	Onboard serv, commercial vehicles,		54.8%	91,593,832	33,255,169	19,043,559	39,295,104	3,908,193
22 Star Ferries	2008*	HKD	1 USD = 7.756 HKD	9,145,337	5,368,338	3,776,998			54.5%	9,852,742	5,782,904		4,069,838	
23 Sydney Ferries	2009	AUS Dollars	1 USD = 1.243 AUD	104,987,250	39,136,512	1,125,496		64,725,243	33.5%	116,684,680	54,862,073	(and other fleet)		29,100,000

Appendix F: Summary Results to Performance Measures (All Data 2009 Unless Noted)

Transit Service Quality Measures	Cost-Efficiency Measures
<p style="text-align: center;">Trip Reliability <i>(actual trips completed / scheduled trips)</i></p> <p>WSF: 99.6%</p> <p>Peers: BC Ferries (99.67%), NC Ferries (97.6%), Steamship Authority (97.2%), Sydney Ferries (99.5%)</p> <p>System average (n=13): 98.1%</p> <p>Other modes: unavailable</p> <p>Discussion: A total of 13 systems reported figures of reliability. Golden Gate Ferries reported the highest rate at 99.9% in the nation, while IDO in Turkey was the international leader, reporting 100% reliability.</p> <p>Bottom Line: WSF outperforms the average and is in-line with that of its peers included in this analysis.</p>	<p style="text-align: center;">Cost per Passenger <i>(operating expenses / number of passengers transported)</i></p> <p>WSF: \$10.08</p> <p>Peers: AMHS (\$445.31), BC Ferries (\$24.24), NC Ferries (\$16.66), Steamship Authority (\$27.76), Sydney Ferries (\$8.15), Fjord1 (\$24.66)</p> <p>System average (n=13): \$20.51</p> <p>Other modes: KC Metro (\$3.38 in '08), Amtrak Cascades (\$59.60)</p> <p>Discussion: Nationally, only Staten Island Ferries (\$5.38) had a lower average. The industry average included system's with routes accessible within a day in order to identify system's similar in ferry services provided to WSF.</p> <p>Bottom Line: WSF has a lower average cost per passenger than most system's included in the analysis.</p>
<p style="text-align: center;">On-time Departures <i>(Trips departing within 'x' minutes / scheduled trips)</i></p> <p>WSF: 92.9%</p> <p>Peers: AMHS (92%), BC Ferries (88.5%), Steamship Authority (99.5%), Sydney Ferries (99.5%)</p> <p>System average (n=12): 94%</p> <p>Other modes: KC Metro (76% in '08), Amtrak Cascades (72%)</p> <p>Discussion: Reporting was limited and 'on-time' was discretionary (from within 5 minutes to 30 minutes of departure). Inclement weather, vessel maintenance and marine/dock congestion negatively impact performance.</p> <p>Bottom Line: WSF on-time performance in 2009 exceeded its target of 90%, performing similar to peers but below the average found in the analysis.</p>	<p style="text-align: center;">Labor Expenses Proportion of Operating Expenses <i>(labor expenses / operating expenses)</i></p> <p>WSF: 50.9%</p> <p>Peers: NC Ferries (69%), Steamship Authority (55.2%), Sydney Ferries (47%), Fjord1 (45.1%)</p> <p>System average (n=14): 45.1%</p> <p>Other Modes: unavailable</p> <p>Discussion: Industry average may be skewed downward by high expenses - some system's report expenses not related specifically to ferry operators. Elsewhere in the U.S. - Cape May-Lewes (71%) and Golden Gate Ferries (61.4%).</p> <p>Bottom Line: WSF contributes a labor expense ratio similar to the industry standard, and the lowest of U.S. operators reporting.</p>
<p style="text-align: center;">Safety <i>(incidents per 1,000 trips, injuries per million passengers)</i></p> <p>WSF: 5.02 injuries per million passengers (2002), unknown vessel incidents per 1,000 trips</p> <p>Peers: BC Ferries (13.17 injuries per million passengers), Sydney Ferries (1.2 injuries per million, 2.5 incidents per 1,000 trips)</p> <p>System average: not applicable</p> <p>Other modes: unavailable</p> <p>Discussion: Due to privacy concerns, WSF was unable to provide updated statistics on the two safety performance measures. Data was limited from other ferry operators.</p> <p>Bottom Line: WSF has had few publically reported safety problems. Further analysis and disclosure is needed for comparison purposes.</p>	<p style="text-align: center;">Farebox Recovery <i>(fare revenues / operating expenses)</i></p> <p>WSF: 68.3%</p> <p>Peers: AMHS (26.4%), BC Ferries (68.7%), NC Ferries (5.8%), Steamship Authority (94.1%), Fjord1 (67%)</p> <p>System average (n=14): 48.8%</p> <p>Other modes: KC Metro (24.6% in '08), Amtrak Cascades (54%)</p> <p>Discussion: Farebox ratio's are most relevant for public agencies because like WSF, they operate within a policy environment with differing positions on user contributions to operations.</p> <p>Bottom Line: WSF is not meeting its 80% target, yet performs similar to BC Ferries and exceeds publically-owned ferry systems in this analysis.</p>
<p style="text-align: center;">Average Fleet Age <i>(sum of years since each vessel was built / total vessels)</i></p> <p>WSF: 36.3 years</p> <p>Peers: AMHS (29.2 years), BC Ferries (20.6), NC Ferries (19), Steamship Authority (25.1), Sydney Ferries (19), and Fjord 1 (28.3 years)</p> <p>System average (n=19): 21.9 years</p> <p>Other modes: unavailable</p> <p>Discussion: System average is skewed lower because of new systems and ships designed to traverse longer distances with higher capacities. Regardless, many systems are actively engaged in vessel replacement plans.</p> <p>Bottom Line: WSF's fleet is substantially older than its peers and second only to Hong Kong's Star Ferries in terms of fleet age among operators with available data.</p>	<p style="text-align: center;">Subsidy Per Passenger <i>(government subsidies / total passengers)</i></p> <p>WSF: \$3.49</p> <p>Peers: AMHS (\$300), BC Ferries (\$5.86), NC Ferries (\$15.62), Steamship Authority (\$0), Sydney (\$4.52), Fjord1 (\$8.49)</p> <p>System average: unavailable</p> <p>Other modes: KC Metro (\$2.63 in '08), Amtrak Cascades (\$27.29)</p> <p>Discussion: Public subsidies for ferry operators offset any shortfall in budgets, exclusively the operating budget in this analysis. Few others provided figures but did include Cape May-Lewes (\$7.98) and Golden Gate Ferries (\$5.61).</p> <p>Bottom Line: WSF receives a per passenger subsidy well below that of its peers and just below that of King County Metro locally.</p>