WASHINGTON STATE FERRIES

Fare Media Study

Draft Situation Assessment

OCTOBER 2011
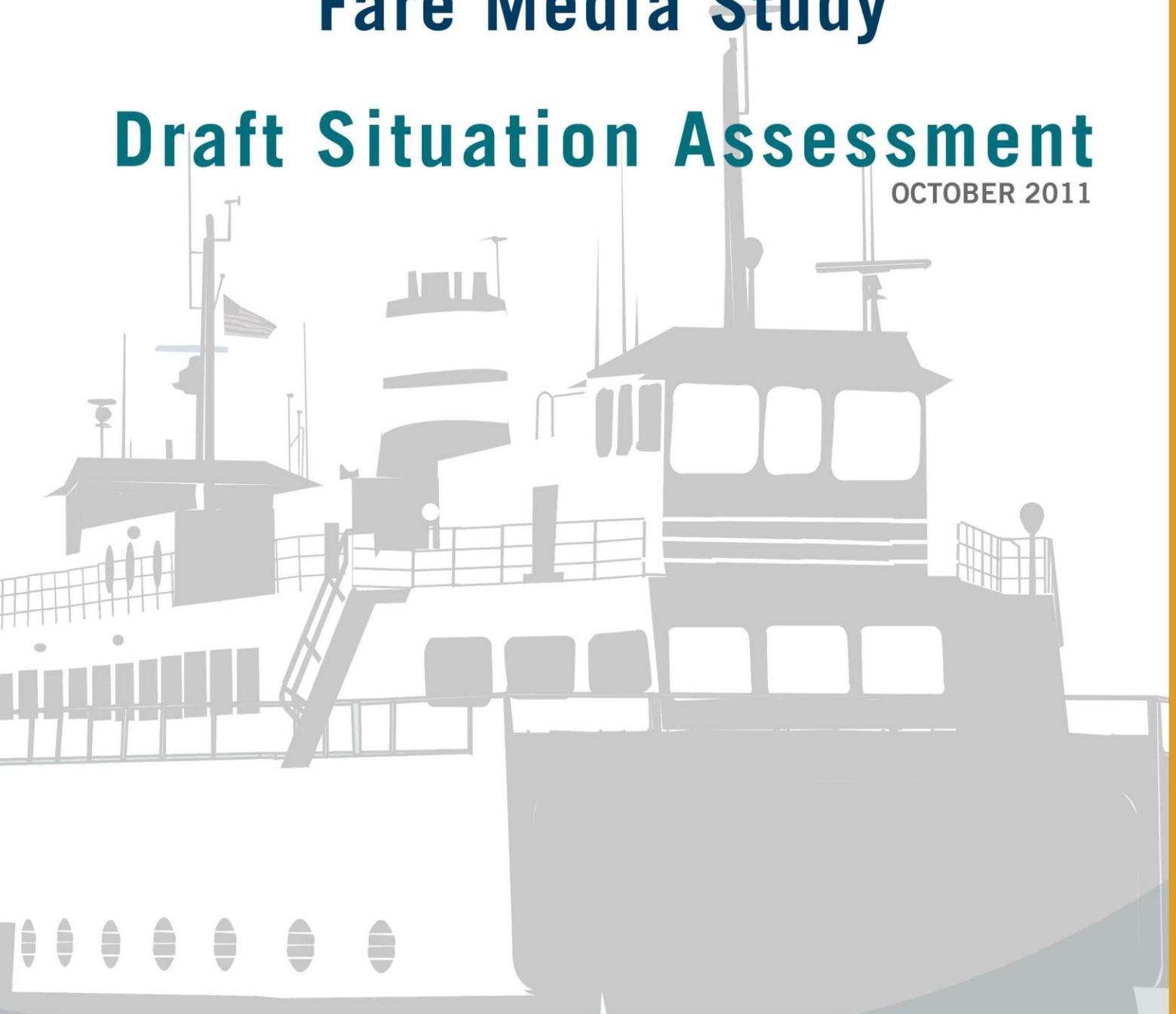
Fare Media ■ Fare Structure ■ Interoperability

EXECUTIVE SUMMARY

The 2011 legislature directed the Joint Transportation Committee (JTC) to conduct a study of the Washington State Ferry (WSF) fares that recommend the most appropriate fare media for use with the reservation system and the implementation of demand management pricing and interoperability with other payment methods.

A central focus of this study is the WSF customer. Fare media, interoperability, fare structure, and the introduction of new programs such as reservations and demand management pricing are intertwined and affect the customer experience, satisfaction, and ultimately WSF's ridership.

Customers and Ridership

The distinction between customers and ridership is critical when analyzing the fare system. *Customers* are the individuals who take at least one trip on WSF, while *ridership* measures the total number of trips taken by those customers. Customers make buying decisions for themselves and their households that may result in a single ride and/or in 500+ rides a year. Like most transit agencies, WSF tracks ridership - i.e. the total number of trips taken on the system, not the number of customers who take them. The consultants' analysis indicates that the number of WSF *customers* increased by approximately 15percent from 2000 to 2008. . In 2008 WSF served between 114,000 and 199,000 customers, with survey data showing that the number is likely on the high end of this range.

Ridership on the other hand has declined. From 2000 to 2008 when the number of *customers* increased by 15 percent, *ridership* dropped by 13 percent. Customers are traveling less frequently, with the analysis indicating a 20 percent reduction in trips per customer from 2000 to 2008.

The WSF Long-Range Plan 2030 included an analysis of factors that have contributed to WSF's declining ridership which include fare increases, service reductions, demographic changes, and expansion of the Tacoma Narrows Bridge. Our analysis of customer increase suggests that these factors are contributing to less frequent use of the system.

The fact that WSF's customer base has increased has important ramifications for this review of WSF fare system. Modifications to the fare system that affect ridership might be targeted at increasing the frequency with which current customers use the system. These may be different than modifications needed to increase the number of customers that use the system.

The second major factor to consider when reviewing the fare system is how highly segmented WSF customers are by travel shed, trip purpose, frequency of use, and whether they board the vessel in a vehicle or walk-on. These differences must also be taken into account when considering the fare system.

FARE STRUCTURE

The fare structure is based on legislative policy direction expressed in statute. Statutory policy direction changed significantly in 2008, but the basis of the fare structure was not changed.

The current fare structure is based on policies that were developed before 2008. Three (3) guiding principles – CUBE (charging all three variables of vehicle size - length, height and width equally), Tariff Route Equity, and Passenger/Vehicle Fare Relationship - are used to establish a base fare structure, to which additional discounts and surcharges are added and which are further modified by one-point or two-point fare collection.

The discounts and surcharges have been substantially modified over time, with most of the changes affecting customers who are frequent passengers. This is important because WSTC surveys show that a significant portion of frequent passengers have been riding the system for more than 10 years. The March 2011 Fare Strategies Survey showed that 38 percent of those using passenger or vehicle multi-ride cards have ridden the system for more than 10 years as had 39 percent of those using a passenger monthly pass and 31 percent of those using an ORCA card. Frequent passenger discounts have been reduced and the ability of customers to receive a refund on their unused rides has been discontinued. WSF also no longer provides a discount on a joint ferry/transit pass. These changes, along with underlying demographic factors, help account for the drop in frequent passengers and the reduction in trips per customer.

In 2008, with the passage of ESHB 2358, the Legislature enacted significant changes to the underlying policy guiding the fare structure. These changes provide very specific direction for the fare structure including recognizing that each travel shed is unique, use of WSTC's market survey information, public hearings and reviews with Ferry Advisory Committees, considering the impact on users and ferry communities, keeping fare schedules simple, considering demand management, and meeting the requirements of the biennial budget.

FARE MEDIA AND INTEROPERABILITY

WSF uses three forms of fare media: electronic fare system (EFS), which is also called *Wave2Go,* ORCA, and commercial accounts. The Washington State Department of Transportation has a tolling system, *Good To Go!* which operates on the Tacoma Narrows Bridge and the SR 167 HOT lanes, and will soon start service on SR 520.

EFS includes point of sale devices at each seller booth, kiosks and internet services for direct purchase of WSF fares, and links to the ferry system's accounting systems. The system provides single ride, multi-ride cards, monthly passes, and revalue cards for full fare passengers. System limitations and issues that may impact future interoperability include the complex fare computation process, difficulties in implementing fee changes, and software and supplier support complications.

- ORCA is the regional smart-card product used by seven (7) Puget Sound region agencies including WSF. WSF accepts ORCA for full fare passengers and monthly passes and will later this year include the ability for full fare drivers to purchase fares using their ORCA card. ORCA is not accepted for multi-ride cards.WSF also uses the ORCA program for employer purchases of monthly passes which are purchased as an al la carte product to the regional pass/PugetPass. Two features are part of the ORCA program that are not used by WSF: regional pass/PugetPass

which is a regional pass that allows access to the other six (6) transit systems;; and stored rides which is an option that Sound Transit has that allows multi-ride ticket books to be available on ORCA.WSF has elected not to make the multi-ride ticket books available on ORCA due to operational issues with customer processing and staff costs, particularly when an ORCA card has both a vehicle and passenger multi-ride product loaded.

Good To Go!, WSDOT's electronic toll program, enables tolls to be collected as vehicles pass through a facility at freeway speeds through the use of a transponder or license plate photo. It is not currently deployed at WSF terminals.

Interoperability considerations include:

- The expansion of the *Good to Go!* back office to accommodate tolling on the 520 bridge should be completed by 2013, the earliest practical date at which modifications to incorporate WSF needs would be started.
- The fare structure and U.S. Coast Guard requirements both which necessitate a visual count of passengers in vehicles.
- The fare structure requires the customer to provide information on passenger type and destination.
- Challenges to time of day pricing with EFS.
- The ability to delineate surcharges.
- The fact that *Good To Go!* is only deployed in King and Pierce Counties.
- Significant challenges to back end integration between ORCA and EFS, which means that WSF has two sets of data, two reporting infrastructures etc.

RESERVATIONS AND DEMAND MANAGEMENT

In response to legislative direction WSF's Long-Range Plan includes the development of a new vehicle reservation system and considers demand management pricing options.

WSF is currently designing the new reservation system which will ultimately be fully deployed on all routes except Mukilteo-Clinton, Point Defiance-Tahlequah, and Fauntleroy-Vashon-Southworth. The most critical technology link for the reservation system is with EFS. As of October 2011, the schedule for implementation has not been finalized. WSF has developed detailed system requirements for the reservation system. Because working with the EFS vendor, Gateway, is not possible in the short-term (Gateway has a 12 month waiting list), WSF has developed requirements for Phase 1 that do not require Gateway's assistance. Future phases, particularly as reservations are expanded into the Central Puget Sound routes and a potential loyalty program is developed, will require fuller integration with EFS. The schedule will be impacted by the vendor's availability.

The Long-Range Plan considers a variety of demand management pricing options, but they were presented as adaptive management strategies that WSF could use depending on its experience with the vehicle reservation system. Future options include differential vehicle and passenger pricing, July and August seasonal surcharge, time of day pricing, off peak discounts, vehicle frequent-user peak season charges, progressive pricing for larger vehicles, and variable pricing within a travel shed.

FARE REVENUE

Fare revenue provides 70 percent of the operating funds for WSF in FY 2010.

Vehicle and driver fares provide the largest source of fare revenue, accounting for 75 percent of all fare revenue. The largest share of this revenue is from standard vehicles and motorcycles (67 percent) with commercial and oversize vehicles accounting for 12 percent of all fare revenue.

Passenger revenue is 25 percent of WSF's fare revenue, which includes passengers who walk-on or are driven on to the vessel.

Single-trip full fare revenue is larger than revenue from multi-ride products, accounting for 68 percent of vehicle fare and 69 percent of passenger fares.

As is consistent with the reduction in the frequency of ridership, income from multi-ride products, despite fare increases and reductions in the discount rate, is substantially lower dropping from $12.9 million in FY 2006 to $10.9 million in FY 2010.

The effect of the shift from commute trips to infrequent user trips is that the average yield per trip has increased since a smaller percentage of ferry trips are taken using discounted fare media. The average revenue generated per passenger trip increased 11 percent from FY 2006 to FY 2010 when fares increased 9 percent and the average revenue generated per vehicle trip increased 13 percent as fares rose 8 percent. This indicates that the average revenue per passenger is increasing at a rate faster than the increase in fares.

Contents

FARE MEDIA STUDY

INTRODUCTION - SITUATION ASSESSMENT

The 2011 legislature directed the Joint Transportation Committee (JTC) to conduct a study of the Washington State Ferry (WSF) fares that recommends the most appropriate fare media for use with the reservation system and the implementation of demand management pricing and interoperability with other payment methods. The study is to include direct collaboration with members of the Washington State Transportation Commission (WSTC) (ESHB 1175, Section 204 (1)); (Chapter 367, 2011 Laws, PV).

A central focus of this study is the WSF customer. Fare media, interoperability, fare structure, and the introduction of new programs such as reservations and demand management pricing are intertwined and affect the customer experience, satisfaction, and ultimately WSF's ridership.

The following definitions are used throughout this study:

Interoperability: Degree to which system accepts fare media of other systems and vice versa.

Fare Media: The products that are accepted for payment.

Fare Structure: The structure and policies setting the fares and to whom they are charged.

This situation assessment includes overviews of:

- WSF system and its travel sheds
- Ridership and customers
- Fare structure
- Fare media and interoperability
- Reservation and demand management pricing programs that need to be accommodated by fare structure, fare media, and interoperability
- Fare revenue

SECTION I. APPROACH

The situation assessment is based on existing materials that have been developed by Washington State Ferries (WSF), the Washington State Transportation Commission (WSTC), and the Joint Transportation Committee (JTC).

Washington State Ferries documents that have been used in this report include:

- Washington State Ferries Origin and Destination Study - 2006
- Washington State Ferries Long-Range Plan – 2009
- Washington State Ferries Marketing Plan, Turning the Tide – 2009
- Washington State Ferries Marketing Plan, Turning the Tide – Technical Appendix – 2009
- Washington State Ferries Reservation System Pre-Design Report – 2010

RCW 47.60.286 directs the WSTC to, with the involvement of WSF, conduct surveys of ferry users to help inform level of service, operational, pricing, planning, and investment decisions. The survey, which is to include recreational, walk-on, vehicle, and freight customers, must be updated at least every two years and maintained to support the development and implementation of adaptive management of the ferry system. The first survey was conducted in 2008 and information from that survey informed the Ferries Marketing Plan and Reservation Pre-Design Report. This report references the 2008 survey, but also makes use of information available from WSTC's 2010 – 2011 surveys.

In 2010 WSTC created an online Ferry Rider's Opinion Group (F.R.O.G.) where ferry customers can respond to ferry issues through surveys and quick single question polls.

WSTC surveys reviewed for this report include:

- 2008 Ferry Customer Survey
- 2010 Ferry Customer Survey Summary Report and the following 2010 surveys
    - Summer Wave Survey
    - Winter Wave Survey
    - Freight Customer Survey
    - General Market Assessment Survey
    - Mode Shift Survey
    - Capital Funding Survey
    - Seven Quick Polls
- 2011 Fare Strategies Survey

The JTC has conducted a series of Ferry Financing Studies. Information from the following were useful for this assessment:

- Ferry Financing Study 2007
- Ferry Financing Study Phase II – Long-Range Finances Study 2009
- Ferry Financing Study Phase II – Review of Reservations Pre-Design Report 2010

SECTION II. WSF SYSTEM

WSF provides auto-passenger ferry service on 10 routes which are divided into seven (7) travel sheds. These travel sheds are distinct in the customers they serve, meaning that, in general, travelers in these sheds are not likely to choose other WSF routes as an alternative to their normal travel. For example, a traveler in the San Juans is unlikely to elect to travel on the Seattle-Bainbridge route as an alternative.

There are some travel sheds that have, to some extent, shared customers. These include the Bremerton route in Central Puget Sound and the Fauntleroy-Vashon-Southworth Triangle route; the Fauntleroy-Vashon-Southworth Triangle and Pt. Defiance – Tahlequah routes; and the Edmonds-Kingston route which can provide access to Port Townsend from the east Sound as can the Mukilteo-Clinton to Coupeville-Port Townsend routes.

Exhibit 1.
WSF Routes and Travel Sheds
FY 2010 Ridership
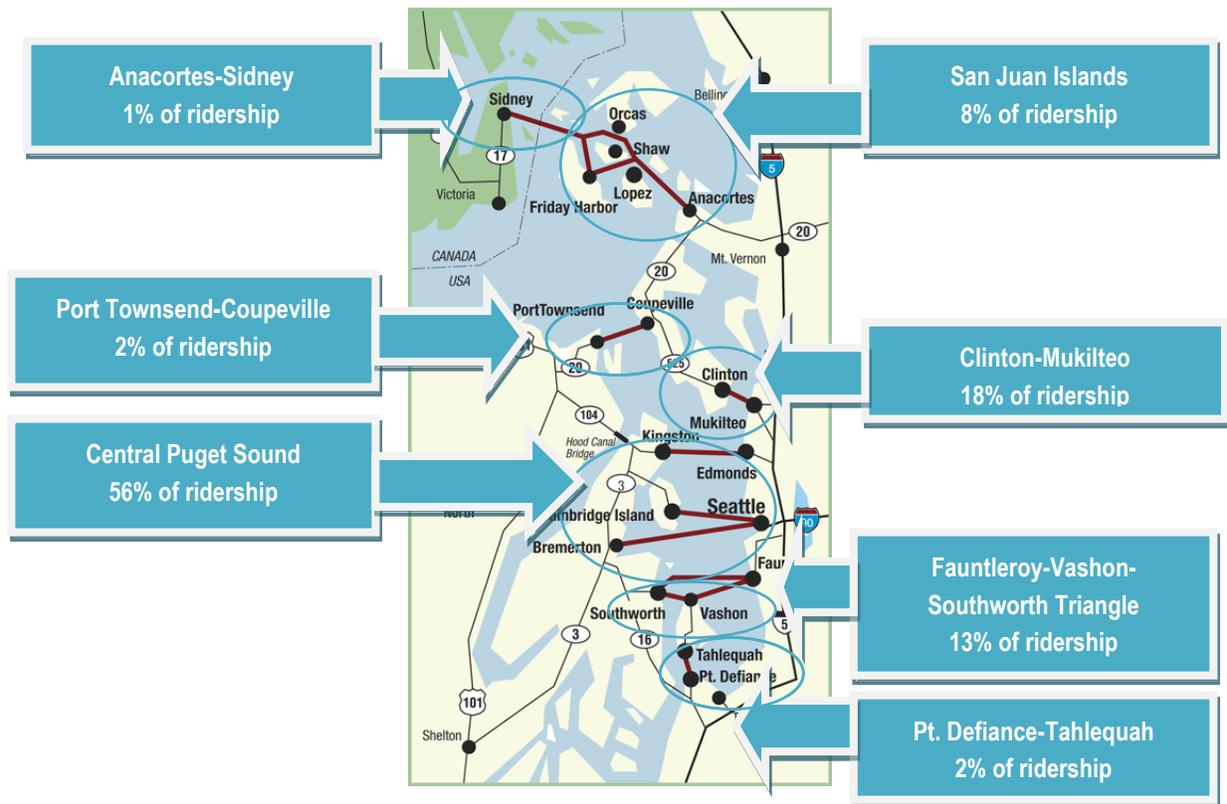
Understanding customer differences between these travel sheds is important when considering interoperability, fare media, and fare structure. As noted in the 2010 WSTC market survey: "Traveling for the purpose of commuting varies greatly depending on the route. This fact would require WSF programs and fares to be tailored to routes or sheds rather than system-wide." (p.18)

SECTION III. CUSTOMERS AND RIDERSHIP

The distinction between customers and ridership is critical when analyzing the fare system.

Customers are the individuals who take at least one trip on WSF, while *ridership* measures the total number of trips taken by those customers. Customers make buying decisions for themselves and their households that may result in a single ride and/or in 500+ rides a year.

Like most transit agencies, WSF tracks ridership - i.e. the total number of trips taken on the system, not the number of customers who take them. The consultants used data available from WSF and WSTC studies and surveys to estimate the numbers of customers in 2000 and 2008[1]. The results show that number of customers has increased by approximately 15 percent from 2000 to 2008. approximately 140,500 in 2000 to 154,000 in 2008. In 2008 WSF served between 114,000 and 199,000 customers, with survey data showing that the number is likely on the high end of this range.

Ridership has declined every year since it peaked in 1999. From 2000 to 2008 when the number of customers increased by 10 percent, ridership dropped by 13 percent. This indicates while there is solid growth in WSF's customer base, they are traveling less frequently. Our analysis shows that the average number of trips per customer has dropped by 20 percent from 2000 to 2008.

The WSF Long-Range Plan 2030 included an analysis of factors that have contributed to WSF's declining ridership which include fare increases, service reductions, demographic changes, and expansion of the Tacoma Narrows Bridge. Our analysis of customer increase suggests that these factors are contributing to less frequent use of the system

The fact that WSF's customer base has increased has important ramifications for this review of WSF fare system. Modifications to the fare system that affect ridership might be targeted at increasing the frequency with which current customers use the system. These may be different than modifications needed to increase the number of customers that use the system.

The second major factor to consider when reviewing the fare system is how highly segmented WSF customers are by travel shed, trip purpose, frequency of use, and whether they board the vessel in a vehicle or walk-on. These differences must also be taken into account when considering the fare system.

A. Customers

For the purposes of this study the consultants extrapolated customer data using similar frequency categories from the 1999 and 2006 origin and destination and 2008 WSTC surveys to estimate the number of WSF customers. Estimating the number of customers served by WSF is important because it helps inform the potential reaction to suggested modifications to the system.

---

[1] FY 2008 was used as the base because the WSTC 2008 survey and the 2006 Origin and Destination Study have the most information that can be correlated.

1. Customer Growth

The results show that while ridership has decreased, WSF customers have increased.

Exhibit 2.
Estimated WSF Customers FY 2000 and FY 2008
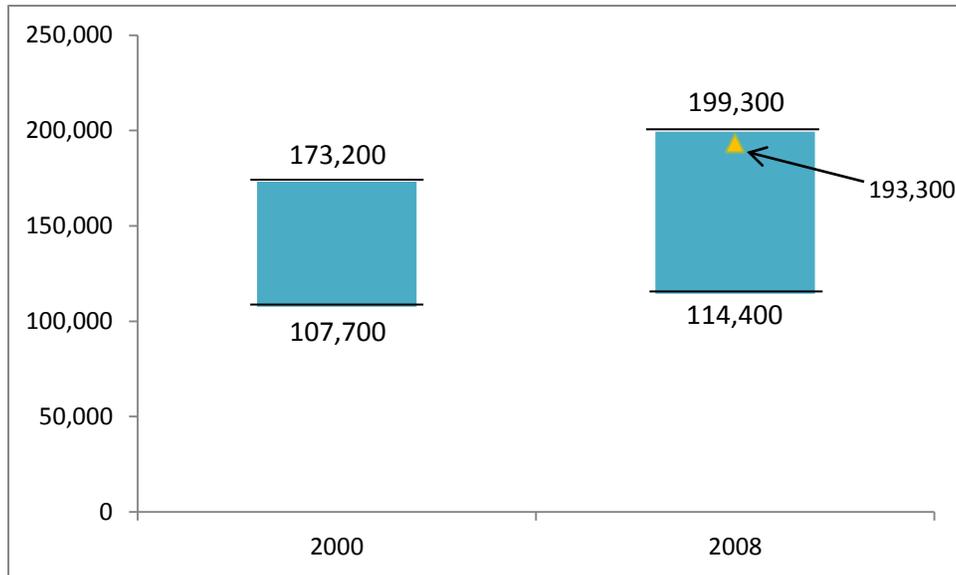
Source: BERK, 2011; WSTC 2008 Survey; 2000 OD Survey; WSF, 2011

- **Number of customers**. In 2000 WSF served between 108,000 and 173,000 customers. In 2008 WSF served between 114,000 and 199,000 customers, with survey data showing that the number is likely on the high end of this range. This represents an increase of 6-15% percent.
- **Trip Frequency**. Average trips per customer declined by 20 percent from 202 trips per customer to 162.5 per year.
- **Customer change varies by route**. While all routes lost ridership between 2000 and 2008, some did not lose customers. The Central Puget Sound travel shed includes two routes with fewer customers (Bremerton and Bainbridge) and one with more customers (Edmonds).

Routes with fewer customers	Seattle-Bremerton
	Seattle-Bainbridge
	Point Defiance-Tahlequah
Routes with same number of customers	Anacortes-Sidney
	Vashon-Southworth-Fauntleroy Triangle
Routes with more customers	Edmonds-Kingston
	Mukilteo-Clinton
	Port Townsend-Coupeville
	Anacortes-San Juans

2. Customer Characteristics

WSF customers are highly segmented by the travel shed/route they use, the purpose of their trip, the frequency of their travel, and how they board the vessel.

Purpose of Trip

The 2009 WSF Marketing Plan broke the customer base into four (4) broad categories or market segments including regular commuters, regular non-commuters, tourist/recreation riders, and business/commercial fleet customers. The exhibit below describes these customers.

Exhibit 3.
WSF Market Segments

	REGULAR COMMUTERS	REGULAR NON-COMMUTERS	TOURIST/RECREATION RIDERS	BUSINESS/COMMERCIAL FLEET
DESCRIPTION	Primarily use the system for transportation to and from work on a regular basis. • Comprise 30% of the WSF customer base • They tend to ride West to East in the morning and East to West in the evening • The most frequent users of the ferry system: 21 or more trips per month	Take occasional trips for errands, shopping, and social activities. • Comprise 35% of the WSF customer base • Reside in cities and counties that have the greatest access to the system but do not use it to commute • Take fewer than 5 trips per month	Infrequent users of the ferry system for recreational purposes. • Comprise 25% of the WSF customer base • Live in the Puget Sound region or out of state and use WSF for tourism and recreational purposes • Travel is westbound towards attractions such as the Olympic Peninsula or the San Juan Islands • Take fewer than 3 trips per month – mainly in the summer	Freight, delivery services and independent construction/trade businesses. • Comprise a small percentage of WSF customer base • Make frequent trips, often during off-peak times or in the counter-peak flow direction
AGE	Mid 30s to mid 60s	40s and older *(more riders over 65 than other segments)*	All Ages *(fairly distributed through all age ranges)*	N/A
INCOME	Middle to high income	Middle to upper-middle income	Middle to high income	N/A
ROUTES WITH HIGH % OF SEGMENT	• Fauntleroy/Southworth • Pt. Defiance/Tahlequah • Seattle/Bainbridge • Seattle/Bremerton	• Edmonds/Kingston • Mukilteo/Clinton • Port Townsend/Keystone	• Edmonds/Kingston • Mukilteo/Clinton • Port Townsend/Keystone • San Juan Islands	• Edmonds/Kingston • Mukilteo/Clinton • San Juan Islands • Vashon Island

Frequency of Travel

Customers vary by how frequently they travel. For both passenger ridership and vehicle ridership, frequent riders are a smaller percentage of total ridership in FY 2010 than was the case in FY 2000. As shown in the exhibit below, in FY 2010, non-frequent riders accounted for 61 percent of vehicle ridership, compared to 54 percent in FY 2000, and for 67 percent of passenger ridership compared to 55 percent in FY 2000.

The largest switch from frequent to infrequent fare media use was from FY 2007 to FY 2008. This was likely because WSF switched from frequent user coupon books to EFS multi-ride cards just before the start of FY 2008. Frequent user coupon books were easily severable and were often shared among family members or groups of travelers. After the switch to EFS multi-ride cards, travelers were less able to share their frequent use tickets so many travelers who could not use 10 trips in 90 days with their personal travel switched to single-trip fare media.

Exhibit 4.
Frequent and Infrequent Ridership
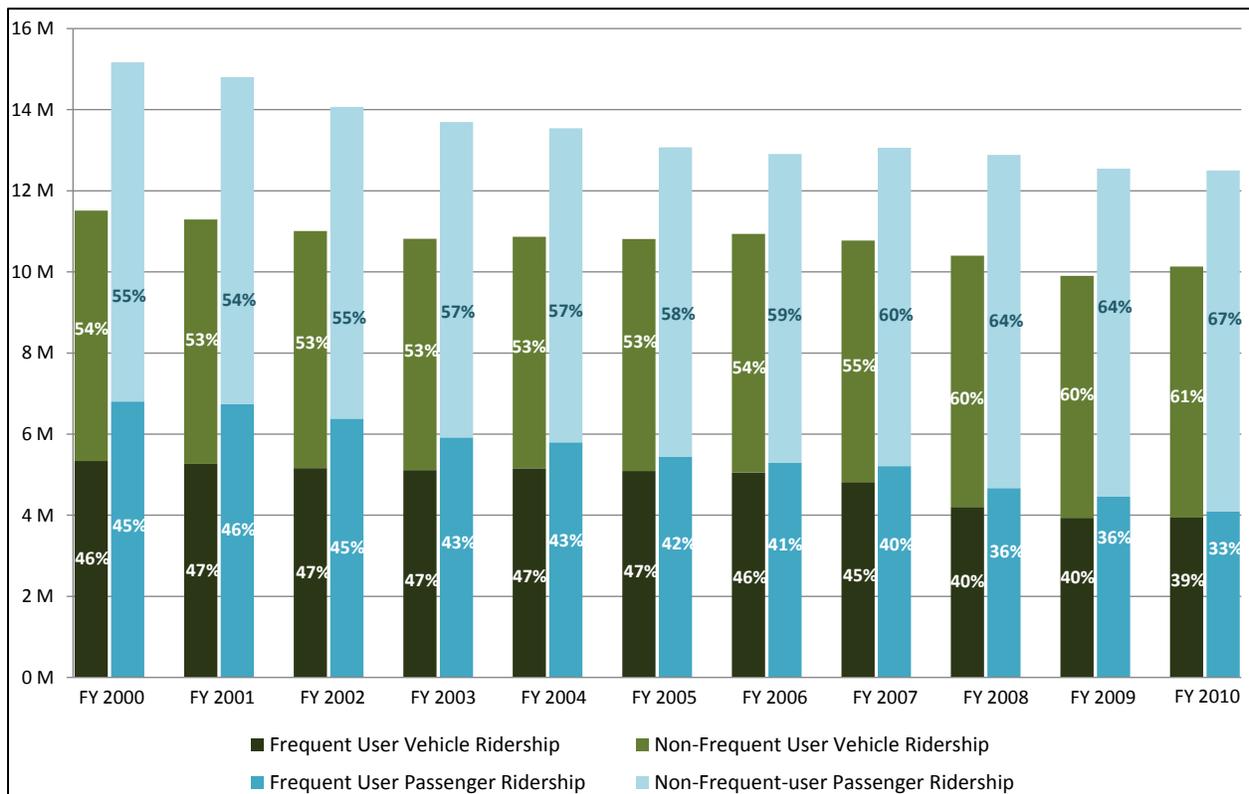
Ferry Access

Forty-five percent (45%) of all riders are vehicle drivers. Of the 55 percent who are passengers, the exhibit below shows that 50 percent walk on the ferry and 50 percent were passengers in vehicles in FY 2010.

Exhibit 5.
Split Between In-Vehicle and Walk-On Ferry Passengers (FY 2003-FY 2010)
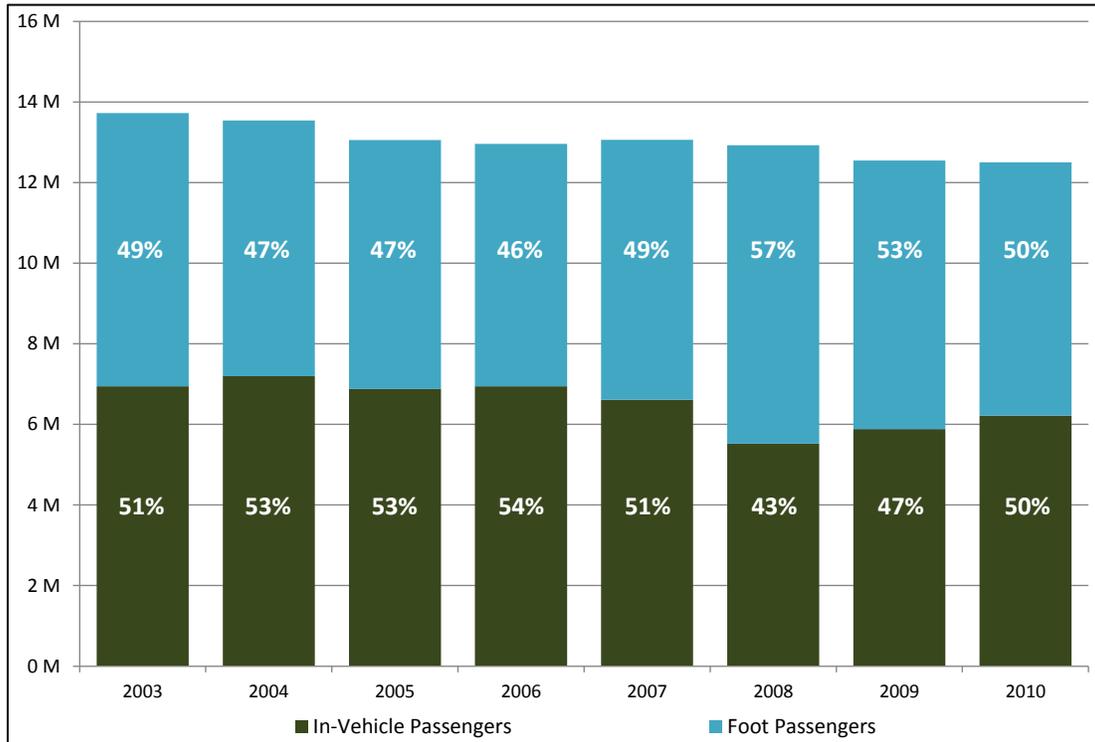
Seventy-two percent (72%) of all WSF riders access the vessel by vehicle as either a driver or vehicle passenger, which places great importance on fare structure, fare media, and interoperability that affect vehicles and their passengers.

B. Ridership

As shown in the exhibit below, WSF's ridership had periods of growth from 1970-1980, with a brief dip in 1979- through the early 1980s due to the national recession. Ridership peaked in 1999 at 26.8 million rides and has declined by 16 percent since then to 22.6 million.

The Central Puget Sound fares are used in the exhibit below because those fares under the Tariff Route Equity policy provide the basis for all other fares. These fares are also the fares that are paid by the majority of WSF customers.

Exhibit 6.
Historic Systemwide Ridership and Inflation-adjusted Central Sound Vehicle Fares
(FY 1970 – FY 2010)
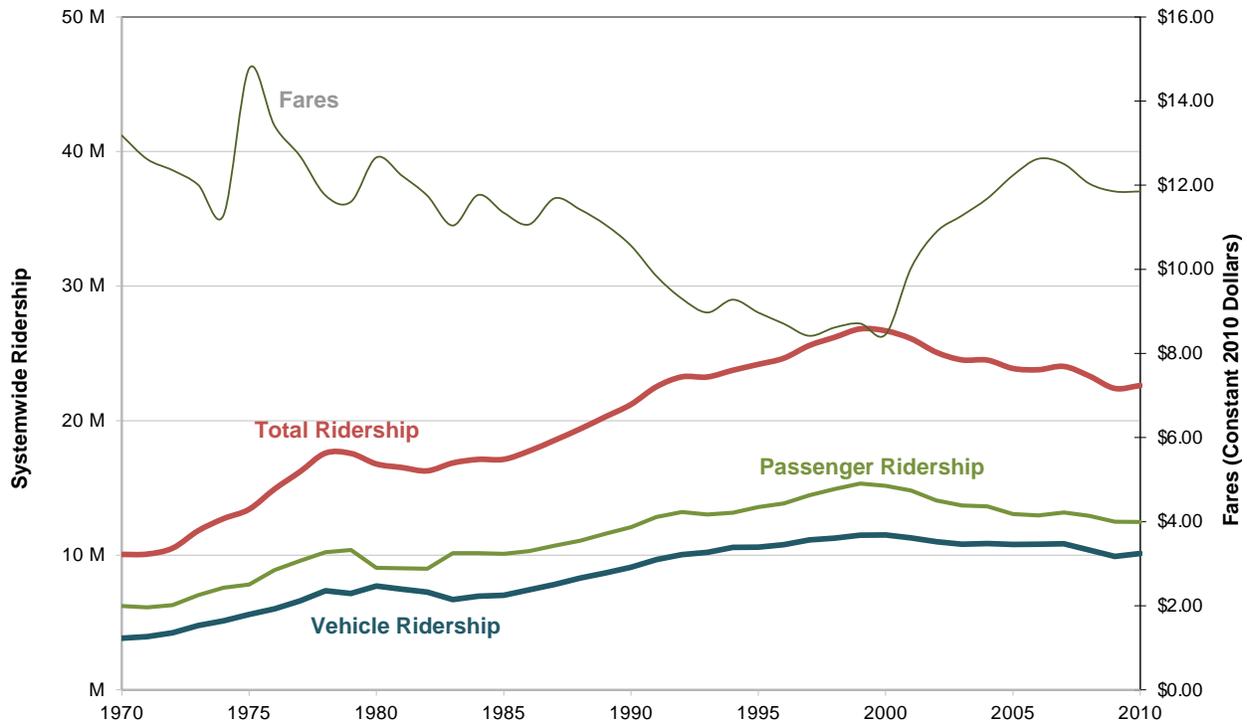
1. Ridership Growth 1970-1999

Factors that contributed to ridership growth include:

- **Population growth in the West Sound.** Clallam, Island, Jefferson, Kitsap, Mason, and San Juan counties provide the bulk of WSF customers, especially frequent riders. From the 1970s through the 1990s, population was increasing more quickly in the West Sound than in the East Sound, and employment levels in the West Sound were not keeping up with population growth.
- **Fares were declining on an inflation-adjusted basis.** From 1970 through 1999, WSF fares trended downward on an inflation-adjusted basis. This made taking WSF a more financially attractive option over time because the fares became less expensive on an inflation-adjusted basis.
- **Increased capacity/service expansion.** From the late 1980s up through 1999, WSF steadily expanded both its service hours and its vessel capacity.

2. Declining Ridership 1999 - Present

WSF's overall ridership declined during this period and the composition of the ridership also changed, with vehicle/driver ridership dropping 12 percent and passenger ridership19 percent.

Exhibit 7.
WSF Vehicle & Passenger Ridership FY 1999- FY 2010
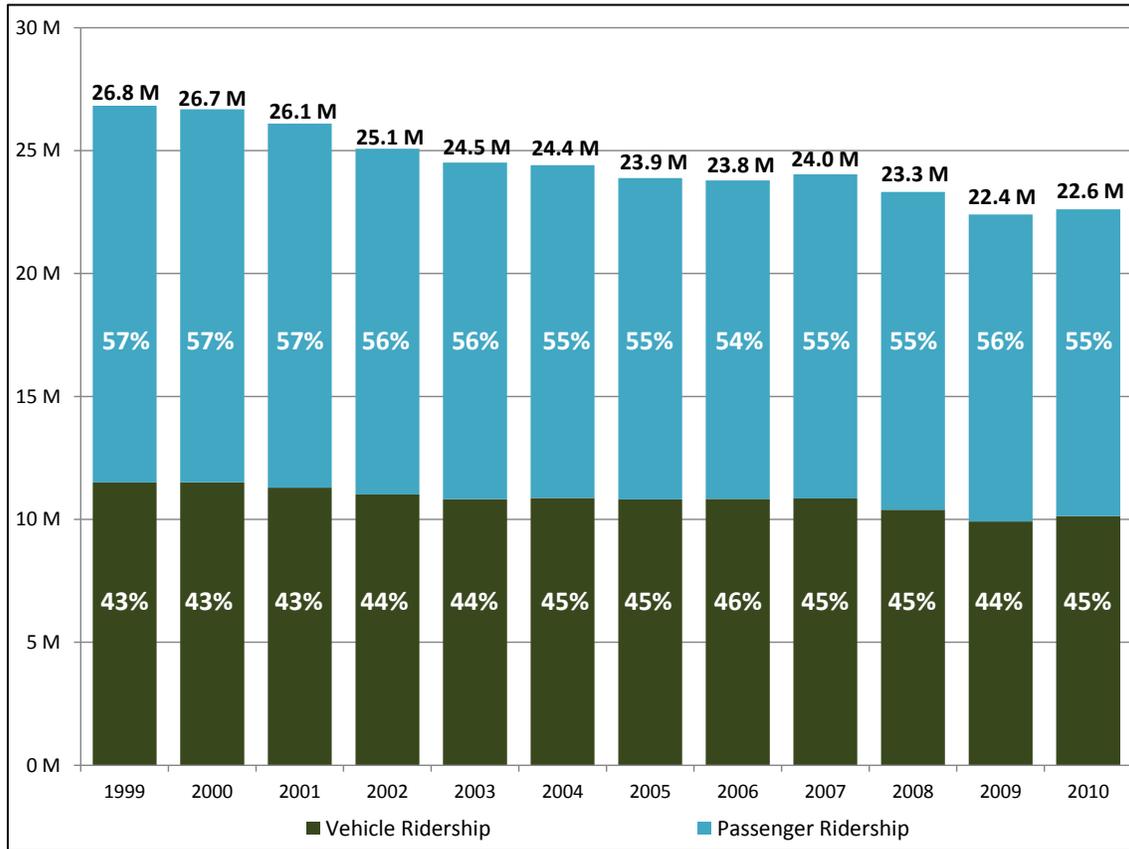
This reduction in ridership is attributable to a number of factors, which include WSF pricing and service changes, the opening of the Tacoma Narrows Bridge, and underlying demographic changes.

- **WSF Fare Increases.** Fares increased with the loss of motor vehicle excise tax (MVET) revenue in 2000.Prior to 2001, fares were only increased four times in the previous 15 years: 3.0% in 1987, 6.0% in 1994, 2.3% in 1998, and 4.4% in 1999.

-

Fiscal Year	General Annual Increase
2001	20%
2002	12.5%
2003	5.0%
2004	5.0%
2005	6.0%
2006	6.0%
2007	2.5%
2008	No change
2010	2.5%
2011 (Jan 1)	2.5%

- **WSF Service Changes.** WSF implemented significant service reductions including: reduced winter service hours on most routes; elimination of its passenger-only ferry service on the Bremerton route in 2004 and the transfer of POF service from Vashon to Seattle to King County in 2009; and, with the retirement of the Steel Electric vessels, one-boat summer service rather than two-boat summer service was provided on the Port Townsend-Coupeville route from 2007 until 2011 when two-boat summer service was restored.

- **Tacoma Narrows Bridge.** The new Tacoma Narrows Bridge, which opened in 2007 and now has eastbound tolls of $2.75 for *Good To Go!* accountholders and $4.00 for cash and credit customers, competes primarily with the Fauntleroy-Southworth and Seattle-Bremerton ferry routes for customers. There is no toll charged westbound.

- **West Sound Demographics.**
  - **Population Growth.** Since 1998 the East Sound has experienced higher population growth than the West Sound, with West Sound counties that provide the bulk of WSF riders experiencing slower growth than the state average. Over 200,000 riders would have been added to the system in 2008, approximately a 1 percent increase, had the West Sound population continued to grow at the previous historical rate.[2]
  - **Income.** West Sound counties household incomes are lower than in the East Sound counties and have grown at a slower rate.
  - **Age.** West Sound counties have an older population than the East Sound which affects employment and the pool of potential commuters.
  - **Employment Patterns.** West Sound employment opportunities have grown faster than the East Sound's since 2000, which means that more people can work on the west side rather than commute. This trend is very pronounced in Kitsap County where over 3,000 more workers are living and working.
  - **Employment Level.** The recession has resulted in lower employment levels throughout WSF's service area. Downtown Seattle – a major destination for ferry commuters – has been especially affected by the recession with a net loss in employment between 2000 and 2008 of 21,000 jobs.
  - **Telecommuting.** The increase in telecommuting has reduced the number of commuters. In the 2006 WSF Travel Survey about 20 percent of riders reported telecommuting at least one day per week. In the 2008 WSTC Customer Survey, 6 percent of riders reported telecommuting as a reason why they are using the ferry system less. customer surveys.

3. Ridership by Travel Shed

As shown in the below, ridership loss has occurred in all travel sheds but at a somewhat disproportionate rate, with some routes contributing a greater percentage of the ridership loss than their 2010 share of the ridership. These routes include:

---

[2] WSF Marketing Plan, 2009-2015 Market Research Technical Appendix, p. 25-26.

	% Total Ridership (2010)	% Ridership Loss from 2000 to 2010
Central Puget Sound	56%	61%
Seattle-Bremerton	*11%*	*16%*
Seattle-Bainbridge Island	*26%*	*32%*
Edmonds-Kingston	*18%*	*13%*
Fauntleroy-Southworth-Vashon	13%	17%
Point Defiance-Tahlequah	3%	5%
Port Townsend – Coupeville	2%	7% (one boat service)

Two travel sheds have less of a ridership loss than their percentage of total ridership.

	% Total Ridership (2010)	% Ridership Loss from 2000 to 2010
Clinton-Mukilteo	18%	7%
Anacortes-San Juans	8%	2%

Anacortes-Sidney has 1 percent of the ridership and 1 percent of the ridership loss.

Exhibit 8.
Contribution Ridership Loss by Travel Shed
(FY 2000 compared to FY 2010)
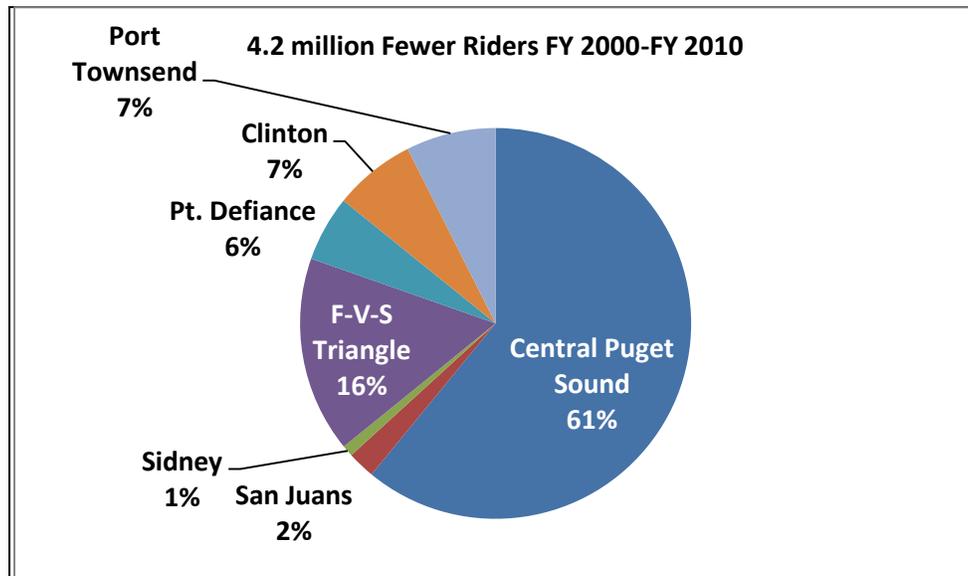
As shown in the exhibit below, the composition of ridership is different between WSF's travel sheds. The percent of vehicle & driver riders ranges from 62 percent in the Central Puget Sound to 42 percent in Pt. Defiance-Tahlequah.

Exhibit 9.
Ridership by Travel Shed
(FY 2000 compared to FY 2010)
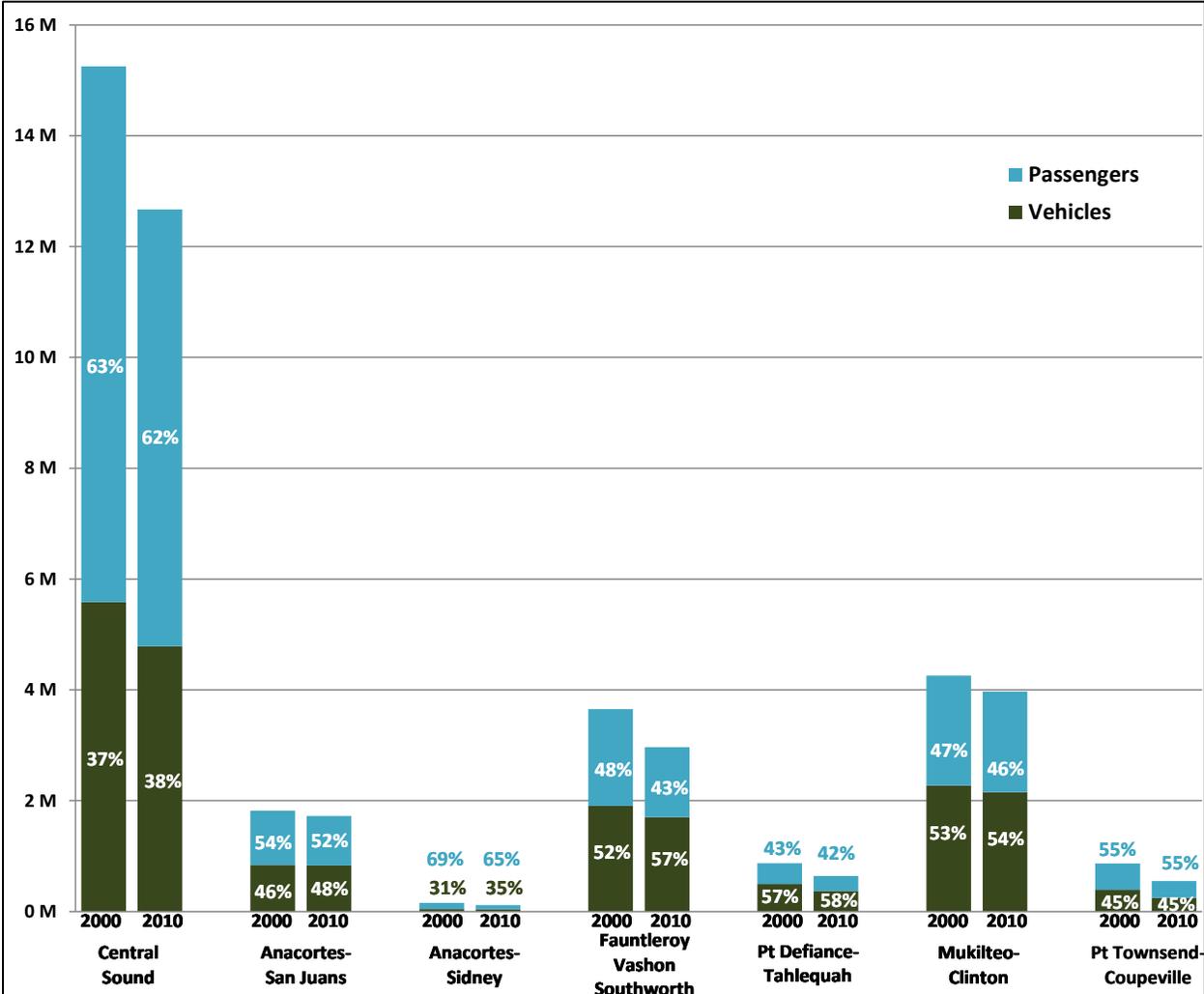
SECTION IV. FARE STRUCTURE

The fare structure is based on legislative policy direction expressed in statute. Statutory policy direction changed significantly in 2008, but the basis of the fare structure was not changed.

The current fare structure is based on policies that were developed before 2008. Three (3) guiding principles - CUBE (charging all three variables of vehicle size - length, height and width equally), Tariff Route Equity, and Passenger/Vehicle Fare Relationship - are used to establish a base fare structure, to which additional discounts and surcharges are added and which are further modified by one-point or two-point fare collection.

The discounts and surcharges have been substantially modified over time, which is particularly important because WSF surveys show that 73 percent of WSF riders have used the system for 10 years or more.

Most of the changes have affected customers who are frequent passengers. Their discounts have been reduced and the ability of customers to receive a refund on their unused rides has been discontinued. WSF also no longer provides a discount on a joint ferry/transit pass. These changes, along with underlying demographic factors, help account for the drop in frequent passengers and the reduction in trips per customer.

In 2008, with the passage of ESHB 2358, the Legislature enacted significant changes to the underlying policy guiding the fare structure. These changes provide very specific direction for the fare structure including recognizing that each travel shed is unique, use of WSTC's market survey information, public hearings and reviews with Ferry Advisory Committees, considering the impact on users and ferry communities, keeping fare schedules simple, considering demand management, and meeting the requirements of the biennial budget.

A. Legislative Direction

The current fare structure reflects principles adopted by WSF and the WSTC following legislative direction established prior to 2008.While the legislative direction changed in 2008, the principles used to develop fares; CUBE, Tariff Route Equity, and Passenger/Vehicle Fare Relationship were not simultaneously updated or changed. (Chapter 512, 2007 Laws).

The changes provide very specific direction on what WSF must consider in developing fare and pricing policy proposals. These include the recognition that each travel shed is unique, use of market survey data in addition to public hearings and review with Ferry Advisory Committees, considering the impact on users and ferry communities, keeping fare schedules as simple as possible, and directions to consider demand management pricing to level peak demand and increase off-peak ferry use.

Prior legislative direction included items that WSF could consider in reviewing tariffs for the purpose of establishing a more fair and equitable tariff for passengers, vehicles and commodities. These considerations included, among others, the time and distance of runs, reasonable rates, increasing walk-on and vehicular passenger use, and the efficient distribution of traffic between cross-sound routes.

Current legislative direction on fares requires that the fares generate the amount of revenue required by the biennial budget. Prior legislative direction provided that in establishing fares WSF could consider the subsidy available to the system and maintenance and operation costs.

Exhibit 10.
Legislative Direction on Fares

Prior Legislative Direction on Fares – Now Repealed	Current Legislative Direction on Fares
RCW 46.60.326. Review tariffs for the purpose of establishing a more fair and equitable tariff for passengers, vehicles and commodities, subject to RCW 47.60.326. *RCW 47.60.326 (now repealed)* Fare review may include: a. Subsidy available to the ferry system for maintenance and operation. b. Time and distance of runs. c. Maintenance and operation costs for runs adjusted for use of outmoded or less efficient equipment. d. Efficient distribution of traffic between cross-sound routes. e. Reasonable rates for commuters & other frequent users in ferry dependent communities. f. Increasing walk-on and vehicular passenger use. g. Promote non-peak use. h. Other revenues from advertisements, parking, contracts, leases, etc. i. The pre-purchase of multiple fares. j. Other factors prudent ferry system managers would consider. RCW 47.60.30 *(now repealed)* The review required by RCW 47.60.326 shall occur every three years & must include: a. time of travel b. distance of travel c. operating costs d. maintenance and repair expenses e. effect on debt service requirements f. allocation of vessels to particular runs g. the scheduling of particular runs h. the adequacy and arrangements of docks and dock facilities i. or factors as decided by the department	RCW 47.60.290. WSF is responsible for conducting an annual review of fares. Beginning in 2008, the department shall develop fare and pricing policy proposals that must: a. Recognize that each travel shed is unique, and might not have the same farebox recovery rate and the same pricing policies; b. Use data from the current survey conducted under Section 4 of this act (i.e. by the WSTC) c. Be developed with input from affected ferry users by public hearing and by review with the affected ferry advisory committees, in addition to the data gathered from the survey conducted in section 4 of this act; d. Generate the amount of revenue required by the biennial transportation budget; e. Consider the impacts on users, capacity, and local communities; and, f. Keep fare schedules as simple as possible. While developing fare and pricing policy proposals, the department must consider the following: a. Options for using pricing to level vehicle peak demand; and b. Options for using pricing to increase off-peak ridership.

B. Fare Structure Responsibility

The legislature has given responsibility for preparing fare proposals to WSF, which operates as the marine division of the Washington State Department of Transportation, and for adopting fares to the WSTC. With the adoption of ESHB 2358, the fare making cycle was modified so that new fares must be adopted by the WSTC by September 1st of each year to come into effect October 1st of each year. (Previously fares were adopted in June and came into effect July 1st of each year.) This allows WSF and WSTC to meet the new legislative requirement that fares generate the amount of revenue required by the biennial budget.

The key steps in the process are:

- **Annual Fare Review**. WSF conducts annual fare reviews and develops fare proposals that conform to the policy direction in RCW 47.60.290.
- **Ferry Advisory Committee on Tariffs (FACT).** The FACT was created in 2010 by the WSTC to, in cooperation with WSF, provide advice, input, and recommendations on WSF's annual fare proposal. The committee structure was developed jointly by WSTC and WSF. FACT includes members of the Ferry Advisory Committee Executive Council, with members added if needed to provide expertise in a particular area, and ex-officio members from WSTC and WSDOT. Among other duties, FACT is to consult with local elected officials in ferry-served communities.
- **WSTC.** The WSF proposal is presented to the Commission, along with recommendations from FACT, by July 1st of each year. The WSTC may modify the proposal, and then incorporates the proposal as revised into a rulemaking filing. The WSTC, with support from WSF, conducts public hearings and adopts a final rule change by Sept. 1st for fares that go into effect on Oct. 1st.

C. Current Fare Structure

While the legislative direction changed in 2008, the principles used to develop fares were not simultaneously updated or changed. The fare structure reflects earlier legislative direction to establish a fair and equitable tariff for passengers, vehicles and commodities, which is in line with how public utility rates are typically set.

As shown in the exhibit below, the fare structure evolved around three guiding principles used to establish a base fare structure, to which additional discounts and surcharges are added, and which are further modified by one-point or two-point fare collection. When charged as a one-point fare, the customer has no option but to pay for a round trip even if they are not planning a return trip.

Exhibit 11. FARE STRUCTURE PRINCIPLES

THREE GUIDING PRINCIPLES FOR BASE FARE STRUCTURE		
CUBE	**TARIFF ROUTE EQUITY**	**RELATIONSHIP PASSENGER/VEHICLE FARES**
Vehicle Rates	Vehicle Rates Passenger Rates	Vehicle Rates Passenger Rates
Fares based on space occupied height, width & length	Price relationship between routes based on service time/ travel sheds	Vehicles cost 3.4 times more than passengers (now at 3.5)

DISCOUNTS AND SURCHARGES APPLIED TO BASE FARE STRUCTURE	
DISCOUNTS (% decrease)	**SURCHARGES (% of flat fee increase)**
Senior (65+), Disabled, Medicare Card • **Passenger Rates – 50%** • **Vehicle Rates – 12% Peak, 15% Non-Peak**	**Peak Season – Vehicles – May 1 to Sept. 1** • **25% (35% in San Juans)**
Youth (6-18) • **Passenger Rates – 20%** • **Under 6 - Free**	**Bicycles All Year (+ passenger fare)** • **$1.00 ($2.00 Anacortes-San Juans non-peak/ $4.00 peak and $4.00/$6.00 Anacortes-Sidney) on full fare passengers**

Frequent Vehicle
• **Multi-ride card**
   • **20% - non-peak (25% San Juans)**
   • **45% - peak (50% San Juans) peak**
• **Van Pools – Free vehicle, pay passenger fee**
	Fuel Surcharge – periodic – passengers & vehicles
	• **Maximum 10% (depends on fuel price increase)**

Frequent Passenger
• **Multi-ride card**
   • **20% - all year (25% San Juans)**
• **Monthly pass**
   • **20%+ (if use max 31 times, 58%)**
• **Ferry-transit multimodal pass**
   • **20%+ (if use max 31 times, 58%)**
	Vessel Replacement Fund – passengers & vehicles
	• **$0.25 per ride**

San Juans Inter-Island Passengers • **Free**	
Director's Promotional Authority • **50% buses & recreational vehicles Sidney** • **10% frequent commercial**	

FARE COLLECTION	
ONE POINT (COLLECT ROUND-TRIP FARE)	**TWO-POINT (COLLECT ONE-WAY FARE)**
Passengers (9 routes/sub-routes)	**Passengers (2 routes/sub-routes)**

Seattle –Bainbridge **Mukilteo-Clinton**
Seattle – Bremerton **Pt. Defiance-Tahlequah**
Fauntleroy-Vashon **Anacortes to San Juans**
      San Juan Islands to Sidney
      Southworth – Vashon
	Port Townsend-Coupeville
	Anacortes-Sidney

Vehicles (5 routes/sub-routes) **Fauntleroy-Vashon** **Anacortes – San Juans** **Point Defiance-Tahlequah** **San Juans Inter-Island**	**Vehicles (6 routes/sub-routes** **Seattle-Bainbridge** **Mukilteo-Clinton** **Seattle-Bremerton** **Port Townsend-Coupeville** **Edmonds-Kingston** **Anacortes-Sidney** **Vashon-Southworth**

1. Base Fare Principles

- **The "CUBE" policy.** The CUBE structure was introduced in 1992. Under the CUBE policy, all measures of vehicle size – height, length, and width – are valued equally so users are charged equally for the space they occupy. Height is valued as much as length and width because vessels could be double-decked if they did not have to be designed to accommodate overheight vehicles. Therefore, a vehicle under 30' long but over 7'6" tall is charged twice as much as the equivalent 7'6" vehicle would be. All vehicles 30' and over are assumed to be overheight or are required to be accommodated in the center lanes and are thus charged as overheight vehicles. Length increments are charged for every ten (10) feet in length until 80 feet at which point the charge is the 70' to under 80' rate plus an additional per foot charge.

- **Tariff Route Equity (TRE).** TRE, a time-based fare structure, was introduced in June 2001. The intent of TRE was to add a component to the fare structure where price relationships between routes would be proportional to the amount of service time being used by the customer. Under TRE, Central Sound route fares (Edmonds-Kingston, Seattle-Bainbridge, and Seattle-Bremerton) are set via the general fare increase and then all other routes are priced proportionally to the Central Sound fare – the TRE factor. The Central Sound routes and the routes serving Vashon Island were standardized relative to each other so that pricing did not shift traffic between routes where substitutions are possible. For example, someone with a choice between driving on at Bainbridge or Edmonds to get to the eastside does not have a price incentive either way.

- **Passenger/Vehicle Fare Relationship**. The current relationship between fares dates to the mid-1970s, when the WSTC set the passenger to vehicle relationship to a uniform 3.4 to 1 ratio. Since that time, the ratio has changed slightly to 3.5 to 1 ratio as a result of equalizing passenger fares on the San Juan Island routes, eliminating the interisland passenger fares and raising the Anacortes-San Juan Islands passenger fares to offset revenue losses, and a rounding policy that rounded all vehicle fares to the next $0.25 and all passenger fares to the next $0.10 for a number of years in the late 1990's and early 2000's. With the capital surcharge implemented in 2011, which applies a $0.25 surcharge to both passenger and vehicle trips, the ratio experienced by the customer ranges from 3.2 – 3.4 to 1.

2. Discounts

- **Senior/Disabled Discounts**. As a federal transportation grant recipient, WSF must comply with a number of federal guidelines, including tariff-related policies. The Federal Transit Administration rules state that "fares charged elderly persons, persons with disabilities, or an individual presenting a Medicare card during off-peak hours will not be more than half of the peak hour fare." To meet this requirement WSF senior/disabled fares have been rounded down to the nearest $0.05 WSF also applies the discount policy uniformly across the system, including during peak periods.

- **Youth Discounts**.WSF offers a youth fare which is based on a 20 percent discount over the base passenger fare. The youth discount used to be the same as the senior/disabled discount, but only applied to children aged 5-11, with children under 5 travelling free of charge. As part of aligning its policies with other ORCA program partners, WSF expanded the youth category to

match the transit definition of 6-18 and reduced the discount to reflect the much larger number of passengers that would be eligible.

- **Frequent User Discounts (Multi-ride Products)**
  - **Vehicle & Driver.** Customers can purchase a multi-ride card that contains 10 roundtrips at a 20 percent discount from the base season regular fare and the peak surcharge does not apply. The multi-ride card must be used within 90 days. In the San Juans the discount is 25 percent and the card is good for 5 round-trips and the card must be used within 90 days.
  - **Passengers**. Passengers can purchase a multi-ride card that contains 10 roundtrips at a 20 percent discount and must be used within 90 days. In the San Juans the multi-ride discount is 35 percent, the card contains 10 roundtrips and it must be used within 90 days. Customers can also purchase a non-transferable monthly pass that can be used for 31 passenger roundtrips during a month.
  - **Ferry/Transit Pass Product**. A combination ferry-transit pass can be made available for a particular route when determined by Washington state ferries and a local public transit agency to be a viable fare instrument. The WSF portion of this fare is set at the same discount level (16 days of travel at 20 percent discount) as the passenger monthly pass. Prior to 2002, WSF offered a 10 percent higher discount on the monthly pass when sold as a combination product. Now essentially the customer gets no additional discount by purchasing a ferry/transit pass rather than a separate ferry monthly pass and separate transit ferry monthly pass.
  - **Van Pools**. Van pools are free, with occupants required to each pay the passenger fare with a minimum requirement of five (5) passengers, including the driver. Any registered van pool is eligible for the discount, including official transit agency van pools. This program has been in place since at least the early 1980's, though at one point the threshold was greater than 5 people including the driver.
- **Director's Authority**. RCW 47.60.315 gives the chief executive officer of the ferry system the authority to use promotional, discounted, and special event fares to the general public and commercial enterprises for the purpose of maximizing capacity use and the revenues collected by the ferry system. The Director has used this authority to implement two (2) discount programs:
  - **RV Promotional Discount**. Fare on the Sidney B.C. Route. RVs and tour buses receive a 50 percent discount on the applicable oversize vehicle fare. This was done to make the route more competitive for recreational travelers.
  - **Commercial Frequent User**. Commercial customers can qualify for a 10 percent discount by making 12 one-way trips a week.
  - **Free Interisland Passenger Travel**. In the San Juan Islands passengers travel free on the interisland boat. When this policy was implemented, fares were increased on the Anacortes-Island routes beyond what TRE would have allowed to make it revenue neutral. Interisland passenger travel is no longer tracked so it is not possible to say whether the actual experience has been revenue neutral.

3. Surcharges

- **Peak Surcharge Levels**. Except on San Juan Islands routes, a peak period surcharge of 25 percent applies to full vehicle fares from the months of May through mid-October. On San Juan Island routes surcharges are 35 percent on full vehicle fares. The peak surcharge does not apply to vehicles using multi-ride cards.

- **Bicycles.** The bicycle surcharge is $1.00 on full fare single purchase passenger fares, except in the Anacortes-San Juans routes where it is $2.00 in the non-peak and $4.00 in the peak season and Anacortes-Sidney route where it is $4.00 in the non-peak and $6.00 in the peak season. Effective Oct. 1, 2011, multi-ride, monthly pass and ORCA cardholders are exempt from the surcharge.

- **Fuel surcharge.** Effective Oct. 1, 2011, WSF is authorized to implement a fuel surcharge with 30-days notice when fuel costs exceed the budgeted amount. WSF may only implement a fuel surcharge in 2.5% increments, up to a maximum surcharge of 10 percent.

- **Vessel Replacement.** Effective Oct. 1, 2011, WSF will implement at legislative direction a $0.25 per ticket vessel replacement surcharge.

4. Changes in Discounts and Surcharges

The value of discounts and surcharges has been substantially modified over time, which is particularly important because WSTC surveys show that a significant portion of multi-ride product users have been riding the system for more than 10 years. The March 2011 Fare Strategic Survey showed that 38 percent of those using multi-ride products have written the system for more than 10 years, 39 percent of those using a monthly pass, and 31 percent of those using an ORCA card.

The changes in the value of the discounts and surcharges are shown in the exhibit below.

- **Youth Discount.** The youth discount has changed from 50 percent in 1999 for ages 5 to 11 to 20% for ages 6 to 18.

- **Frequent Passengers**. These discounts have been reduced to match the discount given to vehicles and the ability of customers to receive a refund on their unused rides has been discontinued.

- **Multi-Ride.** The discount has been reduced from 40 percent to 20% and the unused portion is not refundable.

- **Monthly**. The discount has been reduced from 40% to 20% and the card is no longer transferrable.

- **Passenger Ferry/Transit Discount.** Customers who purchased a joint ferry/transit pass were able to get an additional 10 percent discount on the ferry portion of the pass. Since 2002 there has been no discount on by purchasing a joint pass – it costs the same to buy the passes together as it does to purchase them separately.

- **Vehicle Peak Surcharge.** The vehicle surcharge was increased to 25 percent during the summer from 20 percent in 2002.

- **Commercial Frequent User Discount**. The discount has been changed from 20 percent to 10 percent.

- **San Juan Islands.** The San Juans Island routes had and then eliminated early week and passenger peak fares. A commercial reservation fee began in 2003.

Effective October 1, 2011, a new capital surcharge of $0.25 has been added to all tickets and WSF has received authority to implement a fuel surcharge program.

Exhibit 12.
Fare Discount and Surcharge Changes (1998-2010)

Year	Youth Discount % & Age	Passenger Multi-Ride Discount %	Passenger Monthly Pass Price & Policy	Passenger Ferry/Transit Discount %	Vehicle Peak Surcharge	Vehicle Multi-Ride Policy	Commercial Frequent User Discount %	San Juan Islands
1998		40% to 35%	40% to 35%		20% to 25%			
1999	50% to 30% Upper age to 18 from 11	35% to 30%	35% to 30%	50% to 40% (10% larger than monthly/multi-ride				
2001		No refund if unused						
2002		30% to 25%	30% to 25% Priced at 16 trips rather than 21 to improve breakeven point for commuters	40% to 25% (no > discount than other passes)			20% to 15%	15% discount *early week* 20% *passenger peak season surcharge. Vehicle peak season surcharge increased to 35% from 25%*
2003	30% to 20%	25% to 20%	25% to 20%	25% to 20%			15% to 10%	*Early week discount* from 15% to 10% *Vehicle multi ride discount* from 20% to 25% *Passenger multi ride discount* from 25% to 30% *Commercial reservation* fee
2005	Change to 6-18 from 5-18							
2006			Limit 31 round trips/month					
2010								End *early week discount* End *passenger peak surcharge*

5. Fare Collection: One-Point Toll Collection

WSF collects fares in only one direction on many routes in the system. One-point toll collection has been an efficient way to minimize transaction time for customers and to reduce WSF staffing and capital costs by not building and staffing additional toll booths at many terminals.

One-point toll collection is based on the assumption that passengers departing from a terminal where passenger tolls are not collected will be returning to their point of origin via a westbound ferry, subsequently paying the fare at the westbound terminal. The premise is the same for vehicles, though one-point toll collection for vehicles exists only on island routes that do not have a drive-around option. The exhibit below summarizes toll collection policies by route.

Exhibit 13.
Fare Collection Policy by Route

Route	Passengers	Vehicles
Vashon Island routes	1-point toll collection (collected going to Vashon)	1-point toll collection (collected going to Vashon)
Central Sound	1-point toll collection (collected Westbound)	Collected each way
Port Townsend-Coupeville	Collected each way	Collected each way
Mukilteo-Clinton	1-point toll collection (collected Westbound)	Collected each way
San Juan Islands	1-point toll collection (collected going to Islands)	1-point toll collection (collected going to Islands)
International service	Collected each way	Collected each way

Effects of One-point Toll Collection

There are operational and traffic imbalance effects from one-point toll collection.

- **Savings.** WSF estimates saves annual terminal operating costs through its one-point collection system by staffing fewer westside terminals. An estimate of the savings would have to be developed if the one-point toll collection is modified. Older estimates of $2.5 million in annual savings were developed before the implementation of EFS.

- **Traffic Imbalance**. With fares collected only one way, a significant number of riders on the Fauntleroy-Southworth route and on the Bremerton route make a roundtrip that includes an eastbound ferry ride and a westbound drive over the Tacoma Narrows Bridge, which allows them to avoid both the TNB toll westbound and pay only for the vehicle and driver on the eastbound trip. WSTC's 2011 Fare Strategies Survey found that 44 percent of Fauntleroy-Southworth and 28 percent of Seattle Bremerton respondents had used an alternative to the westbound route, with 29 percent of those on the Fauntleroy-Southworth route indicating that they had done it for 10 or more trips in the first four months of 2011 as had 13 percent of those on the Seattle-Bremerton route.

It is difficult to measure the precise imbalance, as information on eastbound passengers is not collected on affected routes. Using vehicle traffic as a proxy, the exhibit below shows the imbalance in eastbound and westbound vehicle traffic in 2009. This analysis looks at the five routes with one-point toll collection and a drive around option in May 2009. The imbalance is highest on the Seattle-Bremerton and Fauntleroy-Southworth routes, where the drive-around option is the most competitive.

Exhibit 14.
Summary of 2009 Eastbound/Westbound Traffic Imbalance

Route	May 2009 Westbound	Eastbound	Difference
Seattle-Bainbridge	66,467	70,169	-5%
Seattle-Bremerton	24,384	28,925	-16%
Edmonds-Kingston	56,894	57,913	-2%
Mukilteo-Clinton	87,551	91,024	-4%
Fauntleroy-Southworth	16,723	22,150	-25%
Total Imbalance on Affected Routes	**252,019**	**270,181**	**-7%**

- **Revenue.** The revenue impact of this traffic imbalance is difficult to project primarily because it is not clear how many customers would simply not go on the ferry at all if passenger fees were collected both ways.

SECTION V. FARE MEDIA AND INTEROPERABILITY

WSF uses three forms of fare media: electronic fare system (EFS) which is also called *Wave2Go,* ORCA, and commercial accounts. The Washington State Department of Transportation has a tolling system, *Good To Go!* which operates on the Tacoma Narrows Bridge and SR 167 Hot Lanes and will soon start service on SR 520.

EFS includes point of sale devices at each seller booth, kiosks and internet services for direct purchase of WSF fares, and links to the ferry system's accounting systems. The system provides single ride, multi-ride cards, monthly passes, and revalue cards for full fare passengers. System limitations and issues that may impact future interoperability include the complex fare computation process, difficulties in implementing fee changes, and software and supplier support complications.

ORCA is the regional smart-card product used by seven (7) Puget Sound region public transportation agencies including WSF. WSF accepts ORCA for full fare passengers and monthly passes, and will later this year include the ability for full fare drivers and passengers to purchase fares using their ORCA card at the vehicle booths. ORCA is not accepted for multi-ride cards. WSF also uses the ORCA program for employer purchases of monthly passes which are purchased as an al la carte product to the regional pass/PugetPass. Two features are part of the ORCA program that are not used by WSF: regional pass/PugetPass which is a regional pass that allows access to the other six (6) transit systems;; and stored rides which is an option that Sound Transit has that allows multi-ride ticket books to be available on ORCA. WSF has elected not to make its multi-ride ticket books available on ORCA because of throughput issues when a customer might elect to have both a vehicle and a passenger multi-ride product on their ORCA card. Processing of vehicles would be slowed on those routes which use hand held devices for any part of the vehicle processing (such as at Fauntleroy or with van polls and bikes on Central Puget Sound routes). In addition it might require a higher rated staff to operate the hand held devices if fare determination became part of their job responsibilities.

Good To Go!, WSDOT's electronic toll program, enables tolls to be collected as vehicles pass through a facility at freeway speeds through the use of a transponder or license plate photo. It is not currently deployed at WSF terminals.

Interoperability considerations include the timing of *Good To Go!* back office, the fact that WSF current fare structures and US Coast Guard requirements necessitate a visual count of passengers in vehicles and requires passenger type and destination, challenges to time of day pricing with EFS, the ability to delineate surcharges, and the fact that *Good To Go!* is only deployed in King and Pierce counties, although there are no doubt many Kitsap county residents who use the system. There are also significant challenges to back end integration between ORCA and EFS which means that WSF has two sets of data, two reporting infrastructures etc.

A. WSF Electronic Fare System (EFS)/Wave2Go

The Washington State Ferries Electronic Fare System (EFS) was deployed in 2005 as a replacement for a previous point of sale system that had been operational since the early 1990's. Among other benefits, the new system addressed a long-standing audit finding regarding separation of duties by more clearly separating fare media sales and collection functions. This was done in part by implementing new options for customers to purchase fares over the web and at unattended kiosks, whereas previously both the sales and collection functions were virtually all handled at staffed seller booths.

The system was procured through on open bid/RFP process, with Gateway Ticketing systems being the successful system supplier. WSF's goal at the time was to procure a system that was as much "off-the-shelf" as possible, tailoring it to meet WSF's ticketing needs. The Gateway system had been successfully deployed for various ticketing applications (primarily theaters and amusement parks) and included as a key function the ability to both "sell" and "redeem" tickets, thus separating the sales and collection functions.

Key elements of the system include:

- **Point of sale devices.** Point of sale devices (POS) are in each seller booth to sell and redeem fares. These are "fat client" devices where the application runs on local workstation/server architecture. The ability to run locally is an important consideration for WSF as there are often communications network interruptions, particularly in the Islands.

- **Kiosks**. Self-service kiosks where customers can purchase WSF fares.

- **Internet.** Internet services where customers can purchase WSF fares and print tickets at home or at work.

- **Link to State Accounting Systems**. An interface through Microsoft BizTalk to WSF's Great Plains (now Microsoft Dynamics GP) accounting system and software. Great Plains in turn interfaces with the State accounting systems such as TRAINS. Revenue is reported in TRAINS by type of ticket sale (i.e. vehicle full fare). The distribution of revenue by route is accomplished through an interface with the WSF traffic system.

The new system, branded "Wave2Go" offers the following products:

- **Single ride.** Single ride vehicle and driver, full fare passenger, and discounted youth and senior fare passenger.

- **Multi-ride.** Multi-ride cards for car and driver or passenger.

- **ReValue Cards.** ReValue cards are available for full fare car and driver, full fare passenger, and youth and senior passengers. The cards automatically "top up" when they run out (a credit card on file is charged).

- **Monthly passes.** Monthly passenger passes.

The following table describes these fare products in more detail.

Exhibit 15.
Ticket Products

Media	Description	Purchase	Use
Single-Trip Ticket	• Available for passenger and vehicle fares. • Good for one ferry trip, either one-way or round-trip depending on toll collection method.	• Purchase online or at tollbooth/kiosk. • Pay with cash, credit card, or ORCA ePurse (passenger fares only*). • Youth, senior, and disabled tickets are not available for purchase online or at kiosk.	• Redeemed at tollbooth at time of travel • Valid for 90 days from date of purchase • Can be used on routes of equal or lesser value. • Customers can use on routes of greater value by paying the difference with cash or credit card.
Multiride Card &ReValue Cards	• Available for passenger and vehicle fares. • Provide discount for frequent travelers. • Stored-ride media good for 10 round-trips in 90 days (5 for vehicles in San Juan Islands).	• Purchase online or at tollbooth/kiosk. • Pay with cash or credit card. • Customers have option to have their multiride card automatically re-valued via credit card.	• One trip subtracted each time it is redeemed at tollbooth. • Trips can be used on routes of equal or lesser value. Refunds not given. • Cannot be used on routes of greater value. • Valid for 90 days from date of purchase.
Monthly Pass	• Available for passengers only. • Provides discount for frequent travelers. • Provides 31 round-trips per month (EFS version) or unlimited trips (ORCA version). • 31-trip limit on EFS version is due to customer ability to photocopy barcode.	• Can be purchased online or at tollbooth/kiosk or at retail locations. • Can be loaded onto an ORCA card. • Pay with cash or credit card. • Customers have option to have their EFS monthly pass automatically re-valued via credit card.	• Valid for calendar month. • For EFS version, one trip is subtracted each time it is used. • For ORCA version, pass is checked for validity each time it is redeemed. • Pass can be used on routes of equal or lesser value. Refunds are not given. • Cannot be used on routes of greater value.

While in general the system is functioning as intended, the off-the-shelf software and systems have a number of limitations and issues that may impact future interoperability:

- **Fare Computation**. For WSF, the fare computation process is complex and involves many steps including selection of a route (22 options), account classification (7 options), fare type (72 options), ticket type (9 options), validity period (27 options), passenger type (15 options), and year valid (10 options), resulting in hundreds or thousands of possible combinations.

- **Implementing Fare Changes**. Fare computation is driven by a series of data files in the system rather than algorithms and simple tables. As a result, implementing a fare change is a complex process. With each fare change, a new data file has to be created and tested, and copied over the old data files in order for the changes to go into effect. This makes it very difficult to support dynamic pricing structures (e.g. time of day pricing) as there is a time-consuming process that needs to be followed to switch the files.

- **Off the Shelf Software**. Off-the-shelf software, while offering cost benefits over a fully custom software package, has inherent limitations that have impacted the ability of the system to fully accommodate WSF's business practices and business practice goals. An example is that the system does not support certain end of day declaration and revenue management functions that WSF would like to implement, and revising the software to accommodate these functions would be costly and impractical.

- **Supplier Support.** The primary market for the system supplier is theater and amusement park ticketing operations. While they have some transportation-related implementations, they do not have a large base of transportation projects to support continuous change and improvement to the software With recent reservations system project needs, WSF has been told by the supplier that there is a minimum 12 month waiting list for any customized projects or software changes. **Software Code.** There is old code in the software and the system architecture does not support easy integration with other systems. The biggest issue is that the software is vendor-specific. While it may be possible to find expertise, it would be a significant effort for new programmers to learn the old code to a level needed to reliably modify it. This means the vendor, over time, will become less and less willing to try to implement major changes. It also means that vendor costs are likely to be high and scheduling their work will be a difficulty.

- **Software Design.** Due to the software design the system cannot easily accommodate supplemental prices such as the recent implementation of the $0.25 surcharge.

These items are not by themselves fatal flaws with respect to the way EFS operates and is used today, but are things that may impact future directions, integration efforts, costs, and schedule. As discussed in more detail in the section on reservations, WSF has elected to build its own reservation software rather than buy an off-shelf product because of the difficulty of integrating off the shelf packages with EFS and vendor support is being scheduled approximately one (1) year in advance.

B. One Regional Card for All (ORCA)

ORCA (One Regional Card for All) is the regional smart-card based public transportation fare payment system that allows customers to use "one card" to ride public transportation services in King, Pierce, Kitsap and Snohomish counties. Possession of a valid ORCA card and fare products allows customers to ride buses, rail and ferries, subject to the transportation privileges provided by the product loaded on the card.

ORCA is governed through a seven-agency interlocal agreement. King County METRO and Sound Transit jointly manage and administer the program. The other five agencies are WSF, Community Transit, Pierce Transit, Everett Transit, and Kitsap Transit.

The ORCA card was publicly launched in April 2009 and is currently fully operational with over 800,000 cards in circulation (as of March, 2011).

On Washington State Ferries, ORCA is currently or will soon be accepted for:

- **Full Fare Passenger Fares/Stored Value.** Passengers can pay the full fare by using their ORCA card, a discounted senior or youth fare. Sometimes referred to as "e-purse", this is the equivalent of electronic cash stored on the card. This is a convenient option for semi-frequent or casual riders that do not use public transportation enough to justify the cost of a pass, yet still want the convenience of using public transportation with an ORCA card. Fares are paid by deducting the face (full fare) value of the ride from stored value when a customer boards a public transportation service.

- **Monthly passes.** Monthly WSF passenger passes may be loaded on the ORCA card.

- **Drivers.** Within the year, drivers will be able to use their ORCA card to pay the full fare due at the toll booth, including passengers they wish to pay for, using the stored value feature. The ORCA card can currently be used to pay for passengers only at the toll booth.

- **Employer Program**. This feature of ORCA allows businesses to purchase monthly or annual PugetPass products for their employees which the business can subsidize from 50 to 100 percent. In addition, they are able to load any retail products (i.e. WSF monthly passes) on their employees' ORCA cards at the same retail price.WSF also uses the ORCA program for employer purchases of monthly passes which are purchased as an al la carte product to the regional pass/PugetPass

There are two features of ORCA used by the other agencies that are not accepted by WSF. These include:

- **Regional Pass/PugetPass**. A regional monthly pass lets customers travel on all transit services in the region for a specified period of time. Passes are valid on Community Transit, Everett Transit, King County Metro Transit, Kitsap Transit, Pierce Transit and Sound Transit.

- **Stored rides.** Only currently in use by Sound Transit, the electronic equivalent of a 10-ride ticket book is available on the ORCA card. WSF multi-ride passenger or vehicle products cannot be purchased through ORCA due to operational issues when an ORCA card has both a vehicle and passenger multi-ride product loaded.

Customers can choose various combinations of products such as multiple passes or stored value plus a pass. The system is designed to check through the available products on a customer's card and choose the one best suited for the trip.

A key difference between the ORCA system and other types of pre-paid toll/fare systems (including *Good To Go!*) is that ORCA is "card based" rather than "account based". This means that the payment information is stored on the card itself, rather than in an account record held at the back office. When a customer purchases a pass product or pre-pays funds into an e-purse, the funds and/or product are loaded and stored on a chip in the card the next time that the card is presented to a reader. The reader

device stores the fare tables, and it is the interaction between the two that computes and deducts the appropriate fare.

ORCA is accepted at WSF turnstiles, at passenger booths, and at certain terminals where WSF ticket takers use handheld readers to electronically read ORCA cards (ORCA is not accepted at Sidney).

Customers who wish to establish an ORCA account for their cards (e.g. to check their balance, manage transactions, add value over the Internet, etc.) do so within ORCA; there is no tie to EFS. Similarly customers wishing to reload their ORCA card must do it through the ORCA system and ORCA devices – cards cannot be reloaded at seller booths or other WSF facilities.

As of mid-2011, ORCA use accounted for approximately 270,000 passenger transactions across all its member agencies a day with about 3,000 (1%) of these being on WSF.

Exhibit 16.
Daily ORCA Transactions (percent) by Service – Quarter 1, 2011
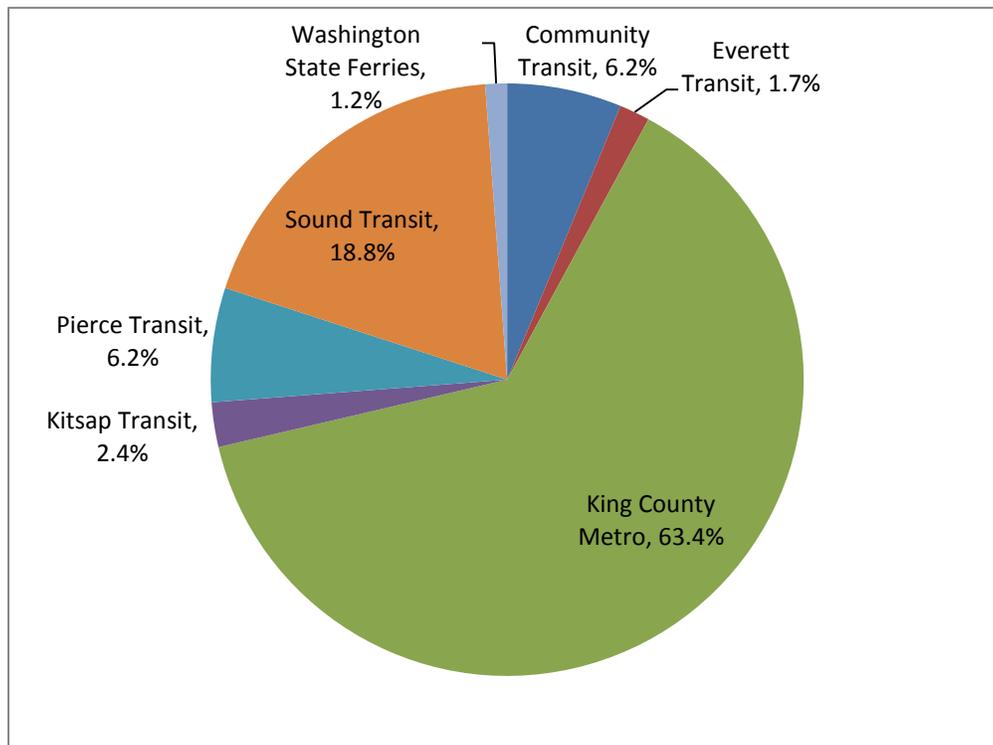
C. *Good To Go!*

Good To Go! is the Washington Department of Transportation's (WSDOT) electronic toll collection program. *Good To Go!* enables tolls to be collected as vehicles pass through a facility at freeway speeds, without stopping or slowing down. Vehicles are identified through the use of an in-vehicle transponder or a photo of their license plate. This information is then linked to either a pre-paid account from which the toll is debited, or in the case of a license plate with no account, vehicle registration information through the Department of Licensing. The vehicle registration information is then used to mail the owner a toll bill or infraction notice.

The *Good To Go!* transponders, lane systems and back office components were procured by WSDOT under multiple vendor contracts. Implementation is overseen by the WSDOT Toll Division.

Good To Go! has been operational on the second span of the Tacoma Narrows Bridge since the span opened in July 2007, and is also used to collect tolls on the SR 167 HOT Lanes. In 2009, plans to toll the existing SR 520 bridge to help fund its replacement necessitated the procurement of a new back office to support the significantly larger volume of transactions and accounts needed to support SR 520 tolling. The new back office has been in development and testing through 2010 and 2011, with tolling anticipated to begin at the end of 2011.

A typical toll lane is equipped with the following equipment:

- **Transponder Reader**: The reader communicates with the in-vehicle transponder using Radio Frequency Identification (RFID) protocols to "read" the transponder identification number.
- **Vehicle Detection:** Vehicle detection systems are used to differentiate between vehicles passing through the tolling point and provide traffic counts. The traffic count data is used for traffic/revenue reconciliation.
- **Automatic Vehicle Classification (AVC):** The AVC uses pavement sensors and/or infrared to detect a vehicle's class by length. Height detection is also possible with infrared. Vehicle tolls frequently vary by class.
- **License Plate Readers (LPR):** The license plate readers are cameras positioned to capture the license plates of passing vehicles under varying ambient conditions. The images are used as a backup method to identify the vehicle's owner if a transponder is not read, not valid, or not present. Optical Character Recognition (OCR) is used to automatically extract the license plate characters from the image without requiring human review for most images. OCR may be done at the lane, at the back office, or both.
- **Lane Controller:** The lane controller assembles all of the above-collected information into a unique transaction with date/time stamp and uploads the transactions to the back office. The lane controller also regularly receives transponder status files from the back office so that the lanes "know" whether a transponder is valid or not. If communications to the back office are lost, the lane controller can continue to accumulate and store transaction data until communications are resumed. Additionally, the lane controller can be used to monitor the lane equipment, detect failures, and open or close a lane for toll collection.

The *Good To Go!* back office includes both the customer service and accounting system as well as a sizable customer service operation with three in-person storefronts (in Bellevue, Seattle and Gig Harbor), a web site offering self-service account maintenance, interactive voice response telephone line, and nearly 200 customer service representatives.

D. System Components

The following exhibit presents a summary of the components comprising each of the fare payment systems described above, broken down by the fare media, front end equipment and back office system. While the systems have these three basic structural elements in common, the table illustrates the differences of each, and hints at the potential challenges of interoperability.

Exhibit 17.
Comparison of ORCA, *Good To Go!* and EFS System Components

|	ORCA	*Good To Go!*	EFS
Fare Media	• Plastic ISO 14443 smart card similar in size to a credit card. • Internal chip stores fare product, passenger class and e-purse value data. • "Contactless" close proximity communications -does not have to come into direct contact with a reader to be read.	• In-vehicle transponder coded with a unique identification number and linked to a prepaid account. • Uses Dedicated Short Range Communications (DSRC) protocol to communicate with transponder reader. • License plate image captured and used for identification if no transponder is present.	• Bar-coded tickets purchased at a kiosk, fare booth or online.
Front End	• Standalone and handheld readers • Readers store tariff data and compute fare due based on information from card.	• Over-the-road readers. Other reader technology such as handheld or booth equipment are available that can read *Good To Go!* transponders, but these have not been deployed. • Vehicle detection, classification and license plate reader systems installed as needed • Lane controller assembles transaction	• Point of Sale terminals at fare booths calculate and collect fares • Self-serve ticket kiosks and website • Turnstiles at passenger gates open when valid fare presented
Back Office	• Financial clearinghouse • Financial settlement (sales and use) for partner agencies • Customer account information and use records • Card inventory management • Reporting	• Customer service and accrual-based accounting system • Toll transaction posting • Account maintenance • License plate image review • Post-billing of customers who do not have a valid toll account. • Adjudication process support for enforcing delinquent tolls. • Reporting	• Accumulates sales and use transactions from terminals • Reporting • Interfaces with separate financial system

E. Interoperability Considerations

While a detailed discussion of interoperability considerations for *Good To Go!* and ORCA is beyond the scope of this White Paper, several known conditions are worth noting at this time as they will have an influence on the tasks conducted later in this study.

- *Good To Go!* **Back Office Timing.** As noted above, the new *Good To Go!* back office is currently in development and nearing full deployment. With the focus on completing the contracted system, it is unlikely that the vendor could consider integration with new systems until 2013, which is the earliest date that WSF integration would be needed. The cost and level of effort associated with such integration is unknown at this point in the study.

- **WSF Visual Count Requirements.** The current ferry fare structure and U.S. Coast Guard rules require visual verification of the vehicle size and passenger count, which would not allow "free-flow" toll collection at ferry terminals. Vehicles would still need to stop at a toll booth to pay the fare, which is somewhat contrary to the current messaging around *Good To Go!* offering "nonstop" tolling.

- **WSF Passenger Type and Destination.** These are needed to value a ticket. While on ORCA the passenger type is routinely stored on the card, the amounts and types of information that can be stored on a transponder are limited.

- **Communities outside of King and Pierce Counties.** These communities, with the exception of Kitsap County residents that use the Tacoma Narrows Bridge, have not been introduced to *Good To Go!.!* A dedicated communications and outreach program would be needed to educate customers about how to sign up for and use *Good To Go!* For the ferry communities that do not have any existing or planned toll facilities, a *Good To Go!* account could have limited value and therefore these communities may not see much benefit from interoperability.

- **EFS Accounting**. EFS recognizes revenue when a ticket is sold, not when it is used. This may present a challenge for time of day pricing. *Good To Go!* also has quite complex revenue recognition and accounting business rules.

- **Surcharges**. The ORCA accounting functions do not accommodate the delineation of any surcharges on top of the base fare. When a walk-on customer pays with ORCA, the transaction only records a single dollar value equating to the total cost of fare and surcharge; WSF must make manual adjustments to this data to separate the fare from the surcharge. Vehicle fare payments are recorded correctly as in that case EFS separately records the fare and surcharge.

F. Systems Interoperability

From a systems perspective, interoperability is provided through an interface between ORCA card equipment supplied by the ORCA system provider (Vix Technology/ERG Transit Systems), and the WSF Electronic Fare System (EFS) as illustrated in the diagram below.

Exhibit 18.
ORCA and EFS Interoperability

Card Reader

ORCA Use transaction

Turnstile open request

Gate Adaptation Kit (GAK)

Data Acquisition Computer

Regional Clearinghouse

Turnstile

Payment request
Confirmation

Configuration Data
• Fare Tables
• Card reloads
• Blocked cards

Point of Sale
FERRIES

EFS sale transaction
EFS use transaction

EFS payment data

EFS Back Office
FERRIES

Financial data

Great Plains Software
FERRIES

Accounting data

TRAINS
FERRIES

Manually Reconciled

ORCA and EFS function as two distinct systems with their own infrastructure, communications paths, and operations as illustrated in the top and bottom halves of the diagram. The ORCA "half" of the system functions as follows:

- Turnstiles and seller booths are equipped with an ORCA card reader that communicates with ORCA cards for the purpose of accepting ORCA for fare payment (it is not possible to add passes or value to ORCA cards through EFS). To accomplish this there is a special interface device called a "Gate Adaptation Kit (GAK)" that acts as the point of interface between the ORCA system and EFS components. There is no integration between ORCA and the EFS self-serve kiosks used to sell tickets, although WSF could elect to have ORCA kiosks at the terminals.

- The GAK and card reader store all pertinent ORCA fare tables, customer value reload information, blocked card information, etc. and handle the validation/fare deduction process with the ORCA card.

- ORCA "use transaction data" – i.e. the ORCA validation/fare deduction data – is passed between the GAK and an ORCA data acquisition computer (DAC) that essentially consolidates the day's

ORCA transactions from various WSF terminals, creates a batch file, and sends it to the regional ORCA clearinghouse.

- The DAC also stores the most current version of the fare tables, customer reload information, blocked cards, software updates, etc. and transfers it down to the GAK/card readers on a daily basis.

- The regional ORCA clearinghouse processes the ORCA use transaction data, determines revenue apportionment to WSF based on that data, and generates daily, weekly, and monthly reports for use by WSF in its reconciliation process. Reconciliation is manual as there is no "back end interface" between ORCA and EFS.

Where there is a turnstile, the GAK, upon validating an ORCA card, sends a signal to the turnstile to unlock the mechanism and let the customer through. This is a one-way interface with no feedback back to the ORCA system to let it know that the turnstile operated correctly and the customer passed through.

When an unlock signal is received, the gate generates two (2) EFS transactions simultaneously:

1. A "sale" transaction, equivalent to selling a single ride adult ticket.

2. A "use" or redemption transaction, equivalent to redeeming or canceling that ticket.

This process mirrors the individual ticket sale process that occurs when a customer purchases a single ride Wave2Go ticket, and allows turnstile data to match the structure and format of other single ticket sale/use data within EFS for reporting and financial management purposes.

At a point of sale terminal the process is somewhat different in that the ORCA card is simply considered a payment mechanism (not a fare instrument), equivalent to the use of cash or a credit card. Operation is as follows:

- The seller computes the applicable fare (e.g. vehicle/driver + passengers) using the EFS point of sale terminal just like he or she would do for a cash fare.

- The point of sale terminal sends a signal to the GAK telling it how much fare to deduct from the ORCA card (stored value). The ORCA GAK/card reader complete the transaction with the ORCA card and transmit payment confirmation to EFS.

- For walk-on customers using a pass, the pass validity is checked and registered as valid payment.

- The sale is recorded in EFS the same way as it would be with other payment mechanisms.

In all cases once ORCA-related data is recorded in EFS, it is processed in the same manner as other EFS Wave2Go data.

G. Key Issues – Customer Perspective ORCA AND EFS

From the customer perspective, WSF-transit interoperability is simply the ability for the customer to use one physical card (an ORCA card) for both WSF and transit travel. There are currently no shared or joint fare products (though the WSF tariff does permit this and previously such products were available in the form of "ship to shore" passes), and no discounts are provided for transfers between WSF and connecting transit services. Customers wishing to use both WSF and transit need to either:

1. Use stored value and pay full fare on both services; or

2. Purchase two products such as a WSF pass and a transit pass and have them loaded onto their ORCA card.

At the walk-on passenger level, either stored value or a WSF pass can be accepted for travel. At the vehicle level, only stored value will be accepted. There are no frequency of use discounts provided for ORCA customers using stored value, though technically the system incorporates the ability to calculate these.

With respect to reloading ORCA cards, customers must do this either over the Internet or phone, or at a transit agency customer service office or ticket vending machine. No reload provisions are available at WSF.

H. Key Issues – Systems Perspective ORCA AND EFS

At the front end (i.e. the devices that the customer interfaces with), the integration approach is reasonably effective as it allows both ORCA and EFS to operate as independent systems with only the level of interface necessary to accept the ORCA card for travel. There are however some limitations and issues:

- There is no feedback mechanism from the turnstile to the GAK to signal that the turnstile unlocked and the customer successfully passed through.

- Parallel sets of fare tables need to be maintained in both ORCA and EFS, with implementation and testing coordinated between the two systems with any fare change.

The main issues relate to the non-integration of systems at the back end. ORCA and EFS have independent transaction processing, reporting, and financial management systems and there is effectively no integration between the two. This means that WSF has two sets of data, two reporting infrastructures, and a number of manual processes in place to reconcile information which requires approximately one (1) FTE on an ongoing basis. There are significant technical challenges to back-end integration as both systems are vendor-specific and not designed to directly handle transactions and data from the other.

I. Commercial Accounts

WSF provides a commercial account program for freight customers that is separate from EFS and ORCA. WSF currently offers its commercial customers the opportunity to sign up for a commercial business account, which allows companies to have all their trucks pay for WSF passage by charging back to a single account. Individual employees carry a charge card that is processed at the time of travel, and includes the company's name and account number. The commercial account system tracks each business's travel and bills the firm at the end of the month for all ferry usage. WSF currently has about 1,400 active commercial accounts, generating about $9 million in annual revenue from customers traveling on commercial accounts. In order to join the commercial account program, a business must pass a credit screen and pay a $50 annual administration fee.

Commercial account customers can also have a commercial reservations account for travel to and from the San Juan Islands.

SECTION VI. RESERVATIONS AND DEMAND MANAGEMENT PRICING

In response to legislative direction WSF's Long-Range Plan includes two customer programs that any modifications to interoperability, fare media and fare structure must accommodate. These include reservations, including the current vehicle reservation systems and the proposed system; and demand management pricing.

WSF is in the process of designing and implementing the reservation system which will be fully deployed on all routes except Mukilteo-Clinton, Point Defiance-Tahlequah, and Fauntleroy-Vashon-Southworth.

Demand management pricing has been considered but is intended to be implemented following the reservation system. A different approach may be needed for those parts of the system that will not be included in the vehicle reservation system.

A. Vehicle Reservations

1. Existing Reservation Programs

WSF has two reservation programs in place.

- **Port Townsend-Coupeville & Sidney.** Vehicle reservations can be made on the Anacortes-Sidney and Port Townsend-Coupeville routes.
- **Commercial Account Reservations San Juans.[3]** Commercial account customers can also have a commercial reservations account for travel to and from the San Juan Islands. This service is offered to give commercial users the ability to plan their delivery schedules with certainty, given the relatively infrequent daily sailings to and from the Islands. Commercial account holders are charged a seasonal fee to be part of the reservation program - $200 for the summer season and $100 for each other season. Requests are submitted at the beginning of each schedule season for reservations for the whole season. Slots are allocated on a first-come, first-served basis.

2. New Vehicle Reservation System

System Overview and Objectives

The 2009 WSF Long-Range Plan proposed and the legislature has provided funding for a vehicle reservation system as the primary strategy to manage demand, spread peak vehicle traffic, improve asset utilization, reduce wait times, and minimize the need for costly terminal and vessel expansion projects.

The new system will be implemented first on the routes that currently take reservations – Port-Townsend-Coupeville, Anacortes-Sidney, and San Juan Island commercial program. After that vehicle reservations will become available on the Anacortes-San Juans routes and to commercial account

---

3 On the Port Townsend-Coupeville route, commercial customers can make reservations using the standard reservation system available to all customers.

holders on all routes, followed by the three (3) Central Puget Sound routes – Seattle-Bainbridge, Seattle-Bremerton, and Edmonds-Kingston.

Vehicle reservations are not planned for the Fauntleroy-Vashon-Southworth Triangle route or Mukilteo-Clinton or Point Defiance-Tahlequah due to terminal configuration issues.

Key Elements of the Reservation System

There are four major elements of WSF's planned reservation system: (1) A communication system, (2) business rules, (3) terminal and vehicle processing, and (4) information technology and back office systems.

Regional ferry information systems and improved communications. Improved communications will be deployed system-wide and include improvement and further development of the following: highway/ferry advisory radio, local signs, email and texts to customers regarding their specific reservations, and improvements to traveler information on the WSF website. These information systems will need to interface with the fare media system.

Business rules. The business rules define how the reservation system will work, including how reservations will be made, when they will be made, how much of the boat is available for reservations and what the change and cancelation policies will be. The key business rules that affect the fare system are currently under development. Some of the policies being considered include:

- **Share of Vessel Available for Reservations.** WSF currently makes 70 percent of the vessel available for reservations on the Port Townsend – Coupeville route. With the new reservation system, WSF may change this allocation. The system likely roll out with 70 percent or less of the boat available for reservations in order to minimize potential risks and issues around delayed and cancelled sailings. WSF will monitor system performance and demand management objectives, adjusting the share of the vessel available for reservations if needed. The share of the vessel available for reservations can be adjusted by sailing – i.e. peak and off-peak sailings could have different shares available for reservations.

- **Pre-Payment of Deposit**. Regular reservations will require pre-payment of a deposit, which will be credited towards the final fare at the tollbooth. The deposit will be set somewhere between 25 percent and 100 percent of the vehicle and driver fare – likely close to but less than 100 percent. There will be no extra fee for reservations. Customers who participate in WSF's premier account program (name to be determined) will not have to pay a deposit up front. As it is currently envisioned, WSF will store their credit card information and get agreement from the customer that if they don't show up for their reservation (and haven't changed or canceled the reservation), they will be charged the deposit. This allows the customer to use fare products like multi-ride cards to pay for their travel without requiring WSF to refund deposits.

- **Changes and Cancellations.** There will be flexibility to change or cancel reservations at no charge within a given timeframe. If the customer changes or cancels a reservation outside of that timeframe (i.e. too close to the reserved sailing time), a change or cancellation fee might apply.

Link to EFS. The most critical technology link for reservations is with the ticketing system. Since reservations will offer a way to provide a guaranteed trip, it is best to think of a reservation as pre-selling the space of the boat. The customer will not purchase a ticket until he or she arrives at the tollbooth. At that point, the reservation system must link to EFS to communicate if a customer has paid

a deposit, how much has been paid, and the remaining balance owed for the required ticket(s).The ticketing system integration will address these key requirements:

-

- In the first phase, the reservation system will be independent from the ticket system.At the time of vehicle processing, information available to toll booth operators needs to include reservation confirmations plus any amount pre-paid so the ticket seller can verify that the appropriate fare has been paid and complete the transaction.

- Ticket seller must have the ability to add to any prepaid amounts to account for the final transaction costs reflecting the actual vehicle size used for the trip and the number of passengers.

-

Project Status

WSF and WSDOT Office of Information Technology (OIT) are working together to build the new reservation system. Market research showed that it is not possible to buy an "off-the-shelf" reservation system without also purchasing a new ticketing system. WSF has invested in making Wave2Go work for customers, so rather than buy a new ticketing and reservation system, WSF will be developing a reservation system independently that will work with Wave2Go.

WSF has completed the design process, and is currently building prototypes of the different features and system components. As of October 2011, the schedule still has not been finalized, but WSF is hoping to have basic system capabilities (i.e. the ability for customers to pay deposits, make, change, and cancel reservations online, and the ability for ticket sellers to redeem reservations at the tollbooth) rolled out to customers at Port Townsend – Coupeville and Anacortes – Sidney by May 2012. Additional features like premier accounts and website capabilities for commercial customers may come at a later date.

WSF has developed detailed system requirements for all three phases of the reservations project and is in the process of prioritizing those requirements. Because working with Gateway to modify EFS is not an option in the short term (Gateway has a 12 month waiting list), WSF has developed requirements for Phase 1 that do not require Gateway's assistance. In Phases 2 and 3, as WSF expands to more routes with heavy commuter traffic, and considers a Loyalty Program that can track frequency of travel by customer, fuller integration with EFS will be necessary. The schedule for these improvements may be impacted by Gateway's availability..

B. Demand Management Pricing

The legislature requires WSF to consider options for using pricing to level vehicle peak demand; and/or to increase off-peak ridership. The 2009 WSF Long-Range Plan evaluates potential pricing strategies in terms of demand management effectiveness and potential revenue impacts.

1. Demand Management Pricing Experience

WSF has not commonly used demand management pricing in its fare structure. The few examples of its use of demand management pricing are:

- **Day-of-week Pricing in the San Juan Islands.** From 2001 to 2010, customers purchasing a single vehicle or passenger ticket in the San Juan Islands paid a smaller fare if they traveled Sunday-Tuesday than if they travel Wednesday through Saturday This structure was intended to move

customers to less frequently travelled days, but it was not effective in meeting that goal The structure also caused customer dissatisfaction and confusion, which created a time burden for WSF staff due to customer service phone calls. There were also problems with the terminal-specific kiosk programming, which became exceeding complex with all the different fares. In order to simplify fares and alleviate these concerns, this structure was dissolved in 2010. **Peak Season Surcharge.** The one part of WSF's current fare structure that has a demand management element is the peak season surcharge on single-ticket vehicle fares, which is 25 percent on most routes and 35 percent in the San Juan Islands. This surcharge increases revenue by charging a larger fare to discretionary travelers from May through September, encourages mode shift to walk-on from vehicles during the peak season, and allows WSF to maintain lower fares during the non-peak season which encourages ridership when there is capacity.

2. Demand Management Pricing Considered in the Long-Range Plan

The following strategies were presented in the Long-Range Plan as adaptive management strategies WSF could use, depending on actual experience with the vehicle reservation system.

- **Differential Vehicle and Passenger Pricing.** Differential vehicle and passenger pricing refers to how specific fare categories could be increased to achieve the annual fare increase required to meet transportation budget revenue requirements. Increasing passenger fares at a slower rate than vehicle fares in the near term, allows the differential between the two fare categories to grow more rapidly, creating a stronger pricing incentive for mode shift. WSTC survey results showed that this could be an effective strategy, and it is currently included in the Revised Draft Long-Range Plan.

- **July and August Additional Seasonal Surcharge.** Actual ridership trends show a seasonal peak that is not evenly spread between May and October. July and August represent the "peak of peak" with much higher proportions of cash-paying recreational users. As vehicle capacity constraints are significantly worse during these months, WSF should consider adding a third level to its seasonal pricing structure that allows for a higher surcharge during July and August which would encourage more walk-on use of the ferries during this time. In 2009, the Commission considered implementing a July/August surcharge, but public input indicated an additional surcharge would be a burden to residents during this poor economy.

- **Congestion Pricing (Time of Day Pricing).** The pricing strategy with the greatest potential to shift travel behavior is congestion pricing. If reservations alone are not sufficient to shift demand then it may be necessary to evaluate a reservations plus a variable congestion pricing approach.

- **Congestion Pricing (Off Peak Discounts).** Off-peak discounts are a pricing incentive designed to encourage existing vehicle travelers to use lower demand sailings (thereby reducing pressure during peak periods) and to attract new riders to the system. While preliminary analysis shows that this strategy would have negative revenue impacts and only minor demand management benefits, it could be used in conjunction with tools such as surcharges to maximize demand management benefits while maintaining revenue neutrality. It could also be used as part of a larger commercial customer pricing program that seeks to accommodate large commercial vehicles on sailings with excess capacity.

- **Vehicle frequent-user peak season charges**. The summer season surcharge does not currently apply to multi-ride fares. If frequent-users were charged the peak season surcharge it would decrease demand during the peak season.

- **Progressive pricing for larger vehicles.** The concept underlying the small vehicle discount would also apply to the possibility of charging proportionally more for larger vehicles as well, in order to accommodate more total vehicles (especially during peak periods).

- **Variable pricing among routes within a travel shed**. A fare structure could be developed to encourage the use of underutilized routes where customers have a choice (i.e. Bremerton versus Bainbridge).

SECTION VII. FARE REVENUE

Fare revenue provided 70 percent of operations funds for WSF in FY 2010.

Vehicle and driver fares provide the largest source of fare revenue, accounting for 75 percent of all fare revenue. The largest share of this revenue is from standard vehicles and motorcycles (67 percent) with commercial and oversize vehicles accounting for 12 percent of all fare revenue.

Passenger revenue is 25 percent of WSF's fare revenue, which includes passengers who walk-on or are driven on to the vessel.

Single-trip revenue is larger than multi-ride revenue, accounting for 68 percent of vehicle fare and 69 percent of passenger fares.

As is consistent with the reduction in the frequency of ridership, income from multi-ride products, despite fare increases and reductions in the discount rate, is substantially lower dropping from $12.9 million in FY 2006 to $10.9 million in FY 2010.

The effect of the shift from commute trips to infrequent user trips is that the average yield per trip has increased since a smaller percentage of ferry trips are taken using discounted fare media. The average revenue generated per passenger trip increased 11 percent from FY 2006 to FY 2010 when fares increased 9 percent and the average revenue generated per vehicle trip increased 13 percent as fares rose 8 percent. This indicates that the average revenue per passenger is increasing at a rate faster than the increase in fares.

A. Farebox Recovery and Fare Levels

Since the mid-1970's, WSF operating costs have been funded by a mix of fare revenues and state tax sources, including the Motor Vehicle Excise Tax (MVET). In 1999, voters approved Initiative 695, which replaced the value-based Motor Vehicle Excise Tax (MVET) with a $30 flat fee, resulting in the loss of approximately 20 percent of WSF's operating revenues and 80 percent of the systems capital revenue

The farebox recovery rate is the proportion of fare revenues to WSF operating expenses. Operating expenses include the cost of management support, vessel operations, and terminal operations. The portion of operating expenses not covered by fares are funded by state tax sources. During the MVET years, farebox recovery dropped to approximately 60 percent, meaning that state taxes funded 40 percent of WSF's operations. This level corresponds to the lowest levels of fare revenue support over WSF's history.

Exhibit 19.
Farebox Recovery Rates over WSF History
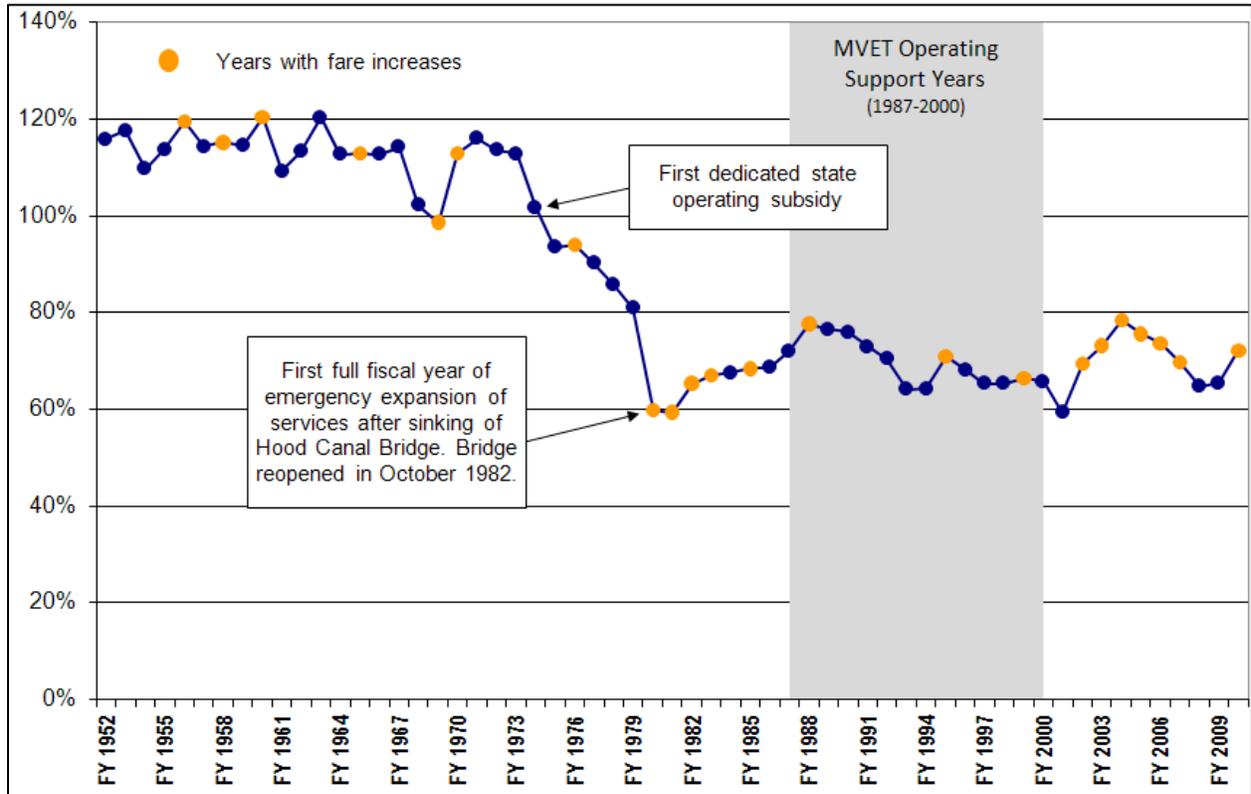
The exhibit below shows historical fares for the central sound routes from 1951-2010, adjusted for inflation and shown in constant 2010 dollars. This graph shows how fares dropped during the heavy state support period of the MVET years, and have only been increased in recent years to bring them back in line with historical fare levels.

Exhibit 20.
Historic Central Sound Fares (Adjusted for Inflation)
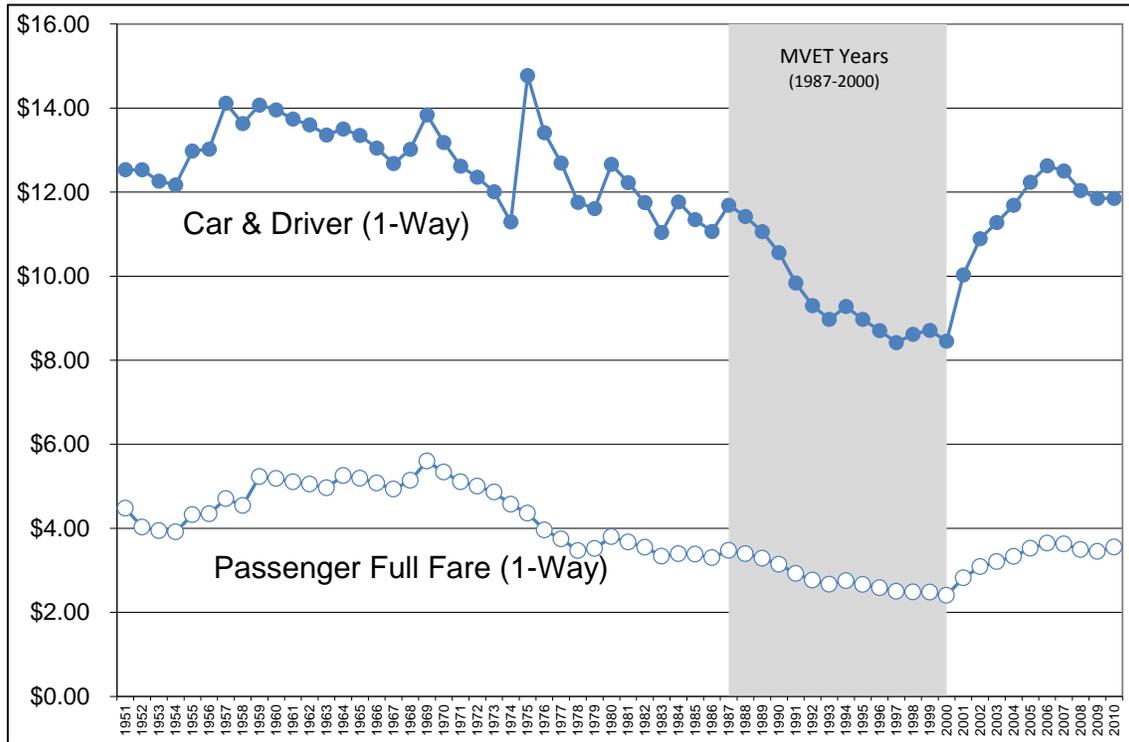
1. Systemwide Revenue and Expenditures

Fare revenue has increased from $92 million in FY 1999 to $147 million in FY 2010. Although ridership has decreased, fare increases have steadily increased total revenues. However, the exhibit below also shows that expenditures increased more quickly than revenues in recent years.

Exhibit 21.
Historic Fare Revenue, Expenditures, and Farebox Recovery (FY 1999 – FY 2010)
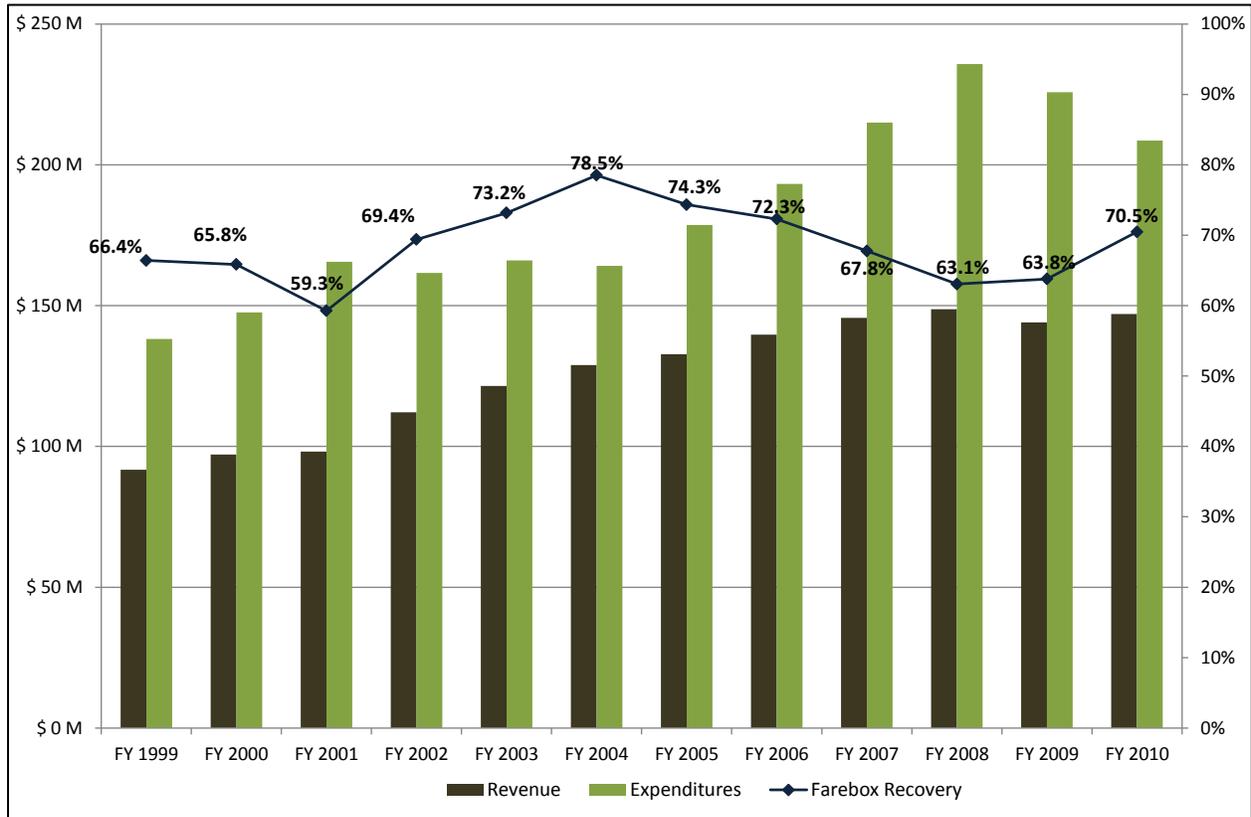
### Vehicle & Driver Fares Largest Source of Fare Revenue

The most important source of fare revenue is vehicle and driver fares which account for 75 percent of all fare revenue. Standard vehicles and motorcycles account for 67 percent, commercial accounts and oversize vehicles, 9 percent.[4]

Passenger revenue is 25 percent of WSF's fare revenue, which includes passengers who walk-on or are driven on to the vessel. The proportion of revenue coming from different modes of travel has remained fairly stable over the last decade. As shown in earlier exhibits, 50 percent of passengers drive on the vessel so it is reasonable to assume that in total nearly 87percent of WSF fare revenue is associated with vehicles.

Even as passenger and vehicle ridership has declined, fare revenue has increased due to fare increases, from approximately $110.5 million in FY 2002 to $147.0 million in FY 2010.

---

[4]With WSF's current revenue tracking system, it is difficult to parse out commercial vehicles from standard traffic. What is tracked is vehicles that pay as part of WSF's commercial account program. It is likely there are additional commercial vehicles traveling who do not use WSF frequently enough to warrant enrollment in the account program. Revenue from these vehicles likely falls into the other oversize vehicle category.

Exhibit 22.
**Revenue by Customer Type (FY 2002 – FY 2010)**
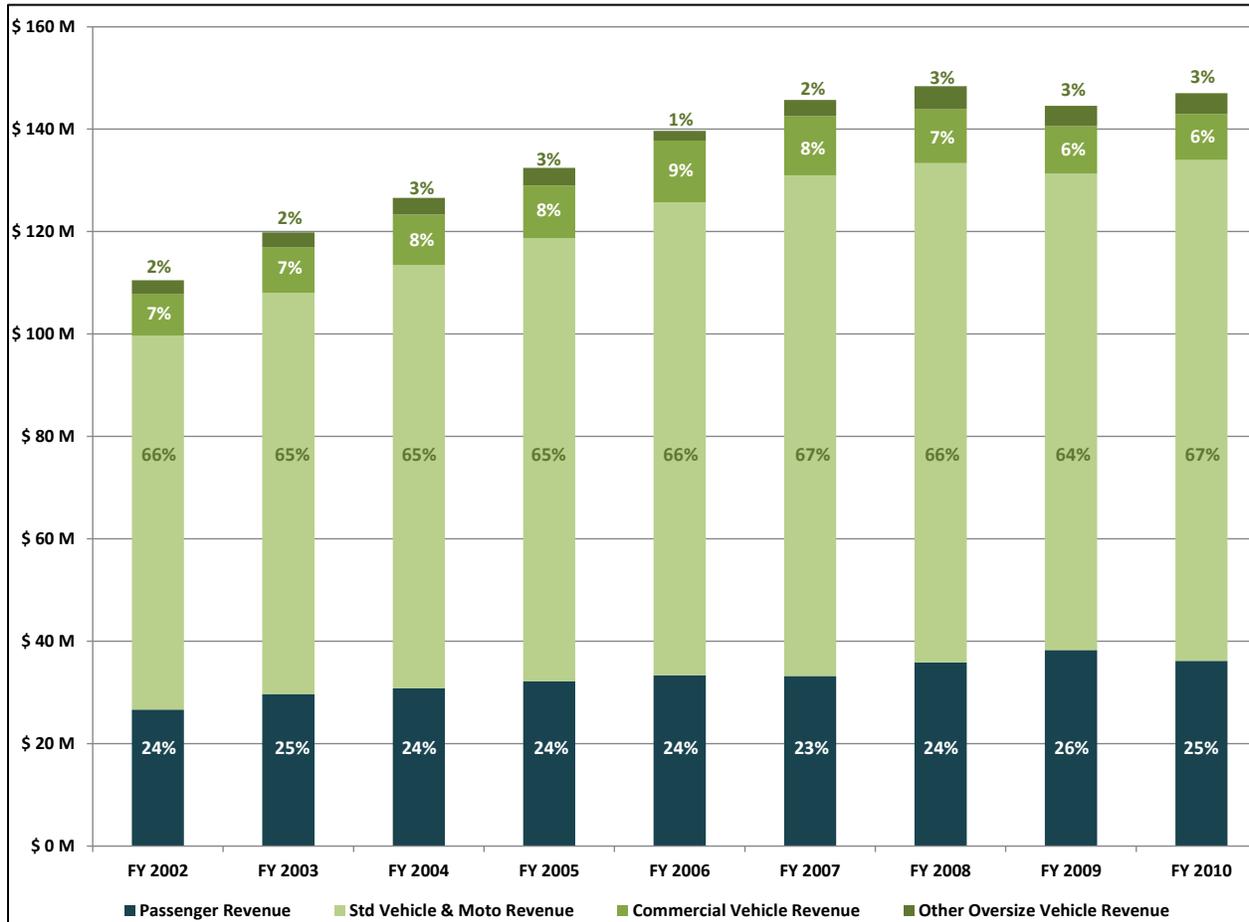
Single-trip Revenue is Larger than Multi-Ride Revenue.

As shown in the exhibit below single-trip fares account for 68 percent of fare vehicle and passenger fare revenue (excluding commercial accounts) and for 69 percent of passenger fares. Passengers traveling on multi-ride fare media account for 12 percent of the passenger fares and those traveling on monthly passes for 19 percent.

Even with fare increases, revenue from frequent user products has declined over this time period from $12.9 million in FY 2006 to $10.9 million in FY 2010 for passengers and from $35.6 million to $32.2 million for vehicles.

- **Monthly Pass**. Passenger monthly pass revenue has increased slightly over this time, from $6.1 million in FY 2006 to $6.7 million in FY 2010. However, this has not been a steady increase – pass revenue has varied between $4.2 million and $9.8 million during this time.

- **Passenger multi-ride.** Revenue has decreased steadily from $6.8 million to about $4.3 million since FY 2006.

- **Vehicle multi-ride**. Revenue grew to $36.8 million in 2007, and since has declined to about $32.2 million.

Exhibit 23.
**Revenue from Frequent User and Single-Trip Tickets (FY 2006 – FY 2010)**
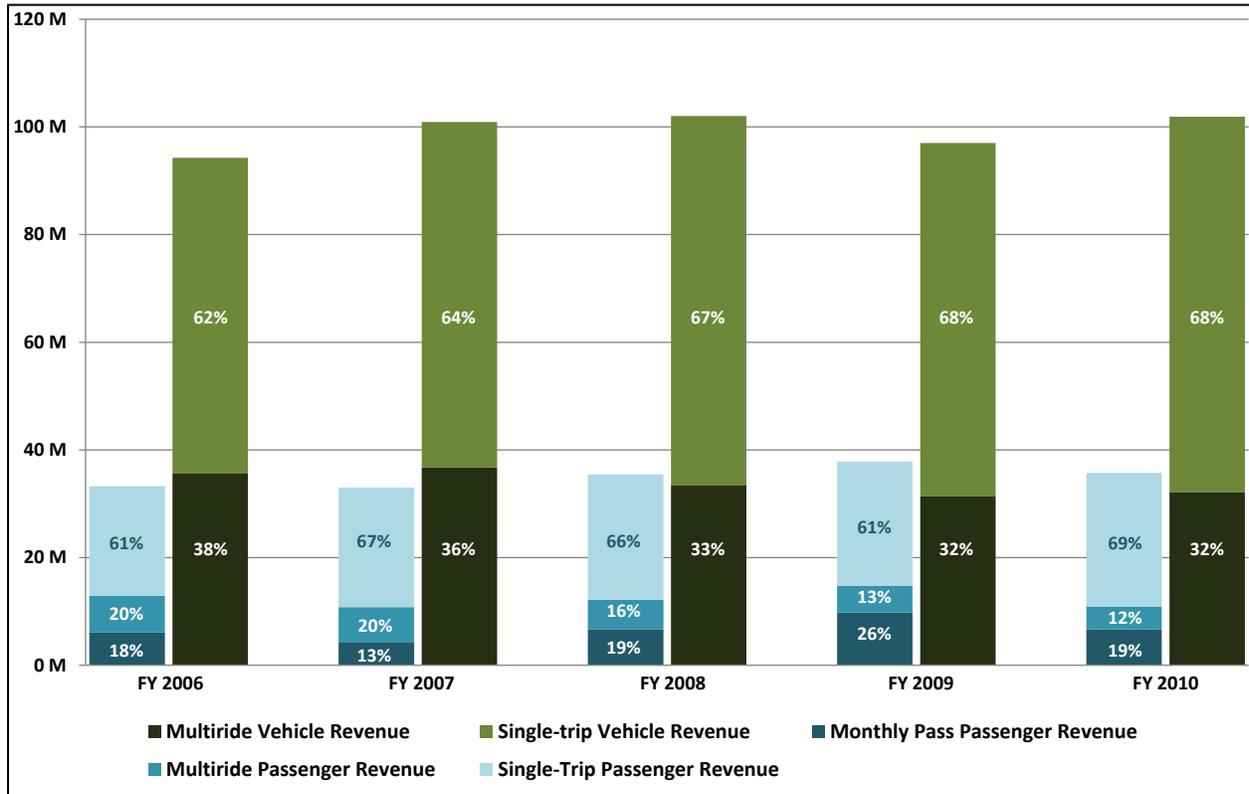
Single-trip travel for both passengers and vehicles has become a higher percentage of revenue since 2006. This mirrors the ridership trend of decreasing frequency of use.

Revenue per Trip (Yield).

An effect of the shift from commute trips to infrequent user trips is that the average yield per trip has increased, since a smaller percentage of ferry trips are taken using discounted fare media such as a multi-ride card or monthly pass. The exhibit below shows how the average system-wide yield for passenger, vehicle, and all ridership has changed over the last five years.

Exhibit 24.
Average Systemwide Yield per Trip (FY 2006 – FY 2010)

From FY 2006 to FY 2010, average yields increased:
- 11% for passengers
- 13% for vehicles
- 11% system-wide

Over the same period, central sound fares increased:
- 9% for passengers
- 8% for vehicles

Legend: ■ Avg Yield (Passenger) ◆ Avg Yield (Vehicle) ● Avg Yield (All Riders)
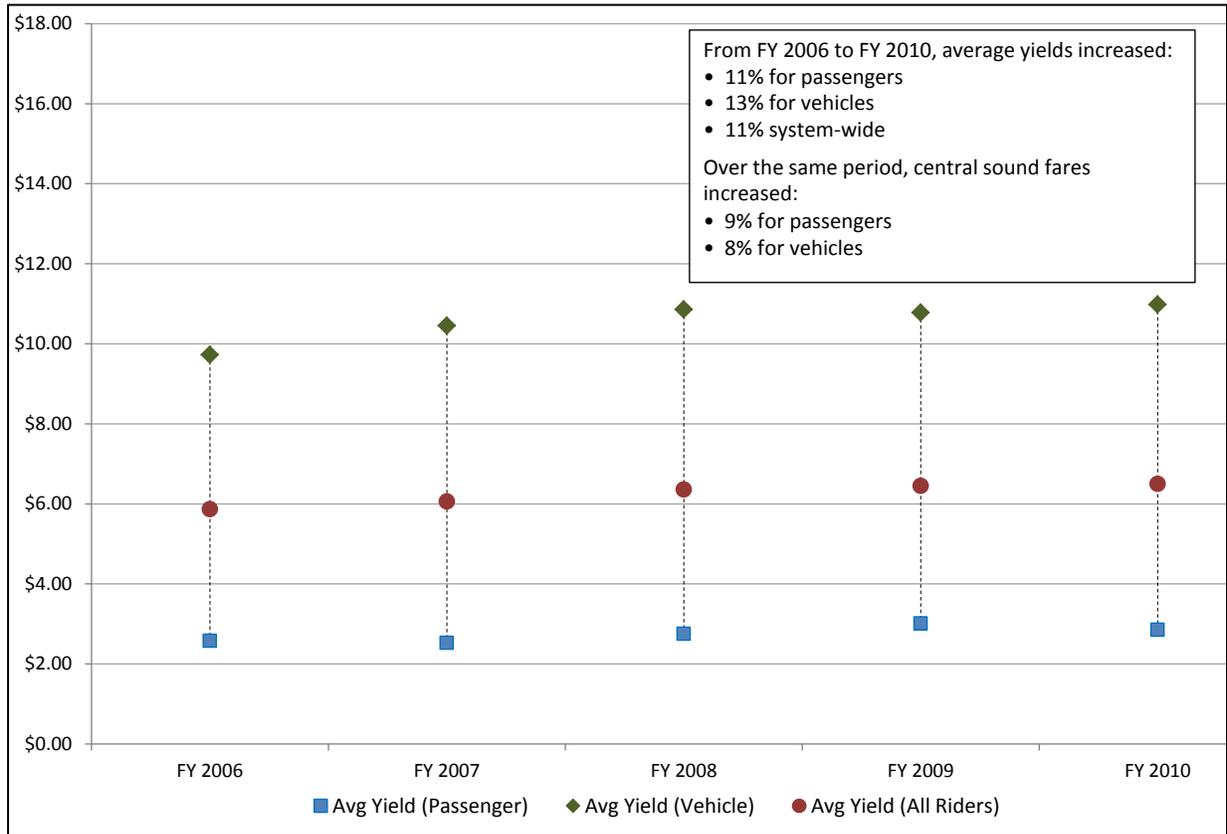
- Although fares have increased over the same time period, the average yield is still increasing relative to the fare level due to the increasing ratio of full fare payments:

  o Passenger Yield: average yield per passenger trip has increased 11 percent over the time period, while the average passenger fare, using the Central Sound route as an example, has increased approximately 9 percent over the same period.

  o Vehicle Yield: average yield per vehicle trip has increased 13 percent over the time period, while the average vehicle fare, using the Central Sound route as an example, has increased approximately 8 percent over the same period.