

## WASHINGTON STATE FERRIES OPERATIONAL STRATEGIES: SITUATION ASSESSMENT

During the 2007 legislative session, the Legislature passed Engrossed Substitute House Bill 2358 (ESHB 2358) - “the Ferry Bill” - and the associated biennial transportation budget ESHB 1094. Each of the pieces of legislation contains specific policy and operational directives to assess the efficiency and costs related to how Washington State Department of Transportation (WSDOT) /Washington State Ferries (WSF) provides service. The results of the studies conducted to address the legislation are intended to derive strategies for how WSDOT/WSF operates in the future.

The legislation identifies specific topics for study and requires new levels of cooperation and collaboration among the Legislature (through the Joint Transportation Committee (JTC) and the new JTC Ferry Policy Subcommittee), the Washington State Transportation Commission (WSTC), and WSDOT/WSF. These directives follow from the December 2006 JTC Ferry Financing Study (also referred to as Ferry Financing Phase 1 or the Cedar River Group Report) and are the next steps in the process of developing a policy framework to address the long-term sustainability of WSDOT/WSF.

The Legislation specifically spells out a list of tasks and a rough timeline that are designed to begin to address the questions raised in the Ferry Financing Study and to develop an information base that can support the ultimate question of how to address the long-term WSF funding requirements. Specifically ESHB 2358 and many of the Budget Provisos are designed to:

1. **Provide new, improved and “audited” information** – Ridership forecast reconciliation, life cycle cost model (LCCM), customer survey, cost allocation methodology, JTC Ferry Policy Working Group Studies, Pre-design study requirements
2. **Develop strategies to minimize costs or increase revenues** – Terminal design standards, operational strategies, pricing policy changes, Co-development study, evaluate 1-point toll collection, re-establish vehicle LOS

This situation assessment provides a foundation for the identification, analysis and adoption of **operational strategies** as required by ESHB 2358. This component of the work plan is the key element of a pivotal shift in how WSF plans for its service and investment needs. Historically, ferry investments were driven by changes in demand and the objective was to maintain a reasonable level of service. This approach suggested that WSF was a passive participant in the process and would simply adjust investments and services to keep pace with changes in demand. The new approach requires WSF to try to proactively manage the demand for ferry services through the use of operational and pricing strategies to maximize the use of existing assets and minimize the need for additional investments. The balance of this memo addresses the following key issues:

- Legislative direction

- Work that has already been done
- Preliminary identification of operational strategies
- Potential operational issues
- Key evaluative criteria for potential strategies
- Relationship to other work elements
- Next steps

### **Legislation Direction**

In the Ferry Bill, the Washington Legislature requested a significant review and possible development of new Washington State Ferries' operational strategies in order "to ensure that existing assets are fully utilized and to guide future investments" (Section 7). This examination is part of a larger directive, with the intent that:

- "Washington State Ferries be given the tools necessary to maximize the utilization of existing capacity and to make the most efficient use of existing assets and tax dollars...
- Department of Transportation adopts adaptive management practices in its operating and capital program so as to keep the costs of the Washington state ferries system as low as possible while continuously improving the quality and timeliness of service" (Section 1).

The intent and language of the Ferry Bill recognizes the tension between the continued growing demand and finite capacity and resources of the WSF system. Operational strategies can be seen as tools to manage this demand and make the most of existing capacity. According to the Ferry Bill, the following nine strategy areas must be reviewed:

- "The feasibility of using reservation systems;
- Methods of shifting vehicular traffic to other modes of transportation;
- Methods of improving on-dock operations to maximize efficiency and minimize operating and capital costs;
- A cost-benefit analysis of remote holding versus over-water holding;
- Methods of reorganizing holding areas and minimizing on-dock employee parking to maximize the dock size available for customer vehicles;
- Schedule modifications;
- Efficiencies in exit queuing and metering;
- Interoperability with other transportation services;
- Options for leveling vehicle peak demand; and
- Options for increasing off-peak ridership" (Section 7).

To guide the examination of these options, the legislation also provides parameters for evaluation, which include the need for each recommended strategy to:

- "Recognize that each travel shed is unique and might not have the same operational strategies;

- Use data from the current survey [to be conducted between Fall 2007 and Summer 2008]...
- Be consistent with vehicle level of service standards;
- Choose the most efficient balance of capital and operating investments by using a life-cycle cost analysis; and
- Use methods of collecting fares that maximize efficiency and achieve revenue management control” (Section 7).

### **Existing Work on Operational Strategies**

Some study and work has already been done in regard to operational strategy areas. *The Washington State Ferries Financing Study* (December 2006) and the *Washington State Ferries Draft Long-Range Strategic Plan 2006-2030* (April 2006) are two documents that heavily influenced the formulation and direction of ESHB 2358. Washington State Ferries’ internal draft documents—such as the *Final Draft White Paper: Operational Strategies for Reducing the Impact of Ferry Terminal Traffic in the Col-man Dock Area* (May 2006), the *San Juan Ferries Reservation Program Feasibility Study* (June 1991), and *Edmonds Ferry Terminal Operations Analysis* (February 1996)—have evaluated some of the operational impacts associated with strategies for particular terminals.

Washington State Ferries may not have a stated demand management policy to date, but congestion conditions are already an ad hoc demand management tool. Lengthy wait times can and have resulted in a shift in modes—from vehicles to walk-ons, motorcycles, and vanpools—as well as shifts in time. It is important to be aware that ferry users already adapt their behavior to the existing incentives and disincentives of the system in place. The examination and recommendation of operational strategies is a way to approach demand management and incentive structures more consciously, effectively, and efficiently.

### **Preliminary List of Operational Strategies**

The strategies that follow are an initial list of ways that WSF can manage demand and increase operational efficiency. Variations of each strategy and existing models in operation are added where relevant. These and other strategies should be viewed as a menu of options that could be combined in various ways to create a coherent package that reflects the needs of terminals, routes, travel sheds and the system as a whole.

- **Congestion pricing** is a policy that charges a user fee in order to reflect the true marginal cost of using a scarce resource—here, space on a ferry and terminal docks. Congestion pricing comes with many names—such as peak-load, value, time-of-day or discriminatory pricing—but the most important differences relate to the implementation of the fee structure. Implementation forms include:
  - Uniform tolls during a set time period based on typical congestion patterns at the location;
  - Variable tolls across locations based on real-time monitoring of congestion conditions.

Congestion pricing is currently being used in London, Hong Kong, and Singapore and in development and roll out in other European countries to manage traffic in downtown areas. In the US, voluntary systems of congestion pricing (in the form of High Occupancy Toll lanes) exist in four areas, which will be described in greater detail below.

The *WSF Final Draft White Paper: Operational Strategies for Reducing the Impact of Ferry Terminal Traffic in the Colman Dock Area* identified congestion pricing—or “peak pricing” as it was called in the paper—as one of the “most promising strategies” for reducing the impact on WSF traffic around the Colman Dock. In the paper, a \$5 peak pricing surcharge, applied 100 days a year during a uniform peak period was modeled.

In contrast WSF customers, for the better part of the past 30-40 years, who traveled the most frequently, enjoyed the best per trip price through the use of frequent-user coupon books. As such, a high percentage of regular commuters traveling during the most congested periods are in fact paying the lowest possible price for their trip.

Congestion pricing would be most applicable to vehicle users since capacity for autos is the existing and foreseeable constraint on the system.

Consistent with ESHB 2358’s direction that operational strategies may vary by route, congestion pricing could take different forms on WSF’s routes.

On one or more routes, congestion pricing could include lowering non-peak fares in order to: 1) shift demand from peak periods and 2) increase overall ridership. Information on elasticity and likely responses will be gathered by route to help inform this analysis.

The definition of peak will also vary by terminal and route, with a decision to be made whether congestion pricing is applied only to the most heavily used sailing of the day or to all sailings within the defined peak period.

- **A reservation system** is “a means of controlling traffic demand to fit available service capacity,” according to the 1991 WSDOT *San Juan Ferries Reservations Program Feasibility Study*. This would be an extension of the WSF reservation system already provided for international travel routes (Anacortes-Sidney). Passengers could reserve space on a vessel via phone, internet, or terminal stations and counters. Features of the reservation system that would require further study include:
  - Percentage of reserved space allotted per vessel;
  - Existence of a reservation fee, and its amount;
  - Reservation cancellation policy;
  - Reservation unit (vehicle, passengers, bikes, etc)
  - Treatment of distinct ferry users (commuters, island residents, tourists, etc).

Other ferry systems comparable to WSF with reservation systems in place for some routes include British Columbia Ferries and Woods Hole, Martha’s Vineyard, and Nantucket Steamship Authority.

Based on its previous studies of Colman Dock and the San Juan Island travel shed, WSF did not pursue a reservation system as an isolated strategy at those particular facilities

because of concerns regarding the costs and benefits of implementation and citizens' fear (especially island residents) of reduced customer service. Yet, this previous analysis did not extend to a system-wide, integrated approach.

Since there are no constraints on passenger walk-on service, reservation policies would be applicable only to auto traffic and may vary both by route and by type of vehicle (i.e. passenger auto, freight trucks, recreational vehicles).

Integration with congestion pricing may mean that the time of day when reservations are available and the costs of those reservations may vary to reflect congestion pricing decisions. It could be less expensive to make a reservation during non peak periods and very expensive to make a reservation during a peak period.

- **High-occupancy toll (HOT) lanes** are a hybrid system that combines voluntary congestion pricing and reservations. This strategy would require a creation of high-occupancy vehicle (HOV) lanes—such as those on freeways—at ferry terminals that would give priority to vehicles willing to pay a toll for assured passage on the next ferry. The lanes could also give priority to high-occupancy vehicles, such as its freeway counterpart does, or other sub-groups of vehicles deemed appropriate.

While new to the ferry system, WSDOT is currently planning a HOT pilot project on nine miles of SR 167, scheduled to open in the spring of 2008. Tolls will be collected electronically via a “Good to Go!” transponder mounted on a vehicle’s windshield. Interstate HOT lanes are already operational in Orange County, California; San Diego, California; Denver, Colorado; and Minneapolis, Minnesota. Tolls in San Diego, Denver, and Minneapolis adjust to real-time congestion in the HOT lanes, while Orange County tolls are based on a predetermined schedule.

- **Mode shift** strategies encourage ferry passengers to use other modes (walk-on, bicycle, motorcycle, vanpool, and transit). Ways to implement mode shift strategies include:
  - Pricing vehicles at a higher rate than other modes;
  - Increasing transit connections and services at and near terminals.

Vehicle pricing and transit connections were identified respectively as “a potentially high-benefit” and “most promising” strategies in the *WSF White Paper*.

- **Ticketing operations** are methods—such as eTicketing, tandem ticketing, and fare structure simplification—to improve efficiencies at the terminal docks prior to departure. The *WSF White Paper* mentions that WSF has recently completed the roll out of a new electronic fare collection system (EFS), which would allow passengers to purchase future tickets—but not specific trips—online and via kiosks and some tollbooths. Tandem ticketing arranges ticket booths in succession so that two sets of vehicles can be processed simultaneously
- **Increasing holding facilities** for waiting vehicles in order to reduce congestion on neighboring streets is closely related to current dock size. Further study of each terminal and dock should be conducted to evaluate the two options of creating remote holding and increasing on-dock capacity. Both options require an assessment of how much extra

capacity is desirable, given peak and off-peak loading times. Remote holding considerations include:

- Management of vehicle traffic to and from remote holding locations;
- Time associated with transferring vehicles.

On-dock expansion options include:

- Reduction of employee parking;
- Physical expansion.

Both on-dock and remote holding could require significant capital investments. In addition, any such measures discussed in operational strategies should be aligned with the work of the “Terminal Design Standard Team.”

- **Entry and exit queuing and metering** techniques aim to reduce congestion in neighboring streets and affect the percentage of time under a green light condition. Ways of implementing this strategy include the following:
  - Entry metering with the option of vehicle transfer to a holding location (on-dock or remote);
  - Exit metering by reducing the boat offloading rate;
  - Exit metering by transferring vehicles to a holding location (on-dock or remote).

The *WSF White Paper* identified on-dock exit queuing as a “worthwhile strategy” to pursue at Colman Dock.

- **Scheduling and other operational constraints/issues** should be reviewed from the perspective of ensuring that ferry service is delivered in a cost efficient, cost effective and responsive manner. This is a very broad mandate to look at how WSF is providing its services and if there are approaches that would either maintain current service levels at a lower cost or improve service levels on a cost efficient basis. Examples could include the following:
  - The relationship between schedules, operating costs and vessel utilization and whether there are opportunities to improve utilization by adjusting schedules.
  - Labor agreement work rules which have a cost impact or reduce service flexibility options.
  - How the current route configurations align with demand and ridership and if there might be alternative terminal pairs that offer a better overall balance of costs and services from either the customer or the ferry system’s perspective.
  - Peak service scheduling. Labor agreements require that all vessel staff receive a minimum 8 hour shift except on auto-passenger ferries which has heavily influenced WSF’s scheduling. An analysis of peak scheduling should be included to assess the costs and benefits of meeting peak demand by

increasing service during these periods despite the costs associated with current labor agreements.

- How can existing vessels be deployed or re-deployed to ensure cost efficient and responsive service.

### **Potential Operational Issues**

The strategies listed above require varying degrees of operational changes. Potential implications of implementing the strategies that warrant further study include:

- **Change in WSF staff size:** Extra terminal staff will be needed for the implementation of reservation systems, HOT lanes, entry and exit queuing, and additional holding facilities in order to take reservations or direct vehicle traffic and segregation. eTicketing, on the other hand, may reduce tollbooth staffing. The costs associated with changes in staff size must be considered in further analysis of these options.
- **Schedule modifications** may result because of increasing demand during off-peak times and changes in the loading and unloading of vehicles.
- **Increase in terminal capacity and facilities:** Vehicle segregation and holding require increased space on-dock or off-dock. Increased transit connectivity may require additional terminal facilities such as ramps, waiting spaces, etc. Congestion pricing, HOT lanes, and reservations may also require additional terminal tolling booths, and the possible reinstatement of two-point tolls for all routes. There are significant capital investments and operating costs that come with these additions. ESHB 2358 requires WSF to find the most efficient balance between operating and capital expenses in assessing these alternatives for each terminal.
- **Increase in technology systems:** Variable congestion pricing and HOT lanes, and reservations require an expansion of technology capacity. Existing technology—such as the system in place for international reservations—as well as developing technology in WSF and WSDOT—such as EFS and “Good to Go!” HOT lane transponder—should be leveraged and integrated wherever possible.
- **Development of new protocol and procedures:** With any significant change in operations, WSF staff must be informed and trained. The time involved doing so could vary considerably depending on the strategy being introduced.

### **Key Evaluative Criteria for Potential Operational Strategies**

In determining recommendations, operational strategies should be evaluated by their impact on four dimensions implicit in ESHB 2358: 1) demand 2) customer service 3) revenue generation and 4) impact on users, capacity and communities. While these criteria are mentioned in the Ferry Bill no explicit prioritization is stated. In later stages of analysis, prioritization and the balancing of these considerations should be clear or further guidance may be warranted.

In order to evaluate how potential strategies could change WSF policy and operations, it is useful to first highlight relevant concepts of the previous policy framework which have been modified by ESHB 2358.

- The farebox recovery rate target had been initially set to 80% in the Joint Task Force on Ferries report to the Legislature in 2001. The target was never codified in statute. ESHB 2358 states that pricing will recognize that each travel shed is unique, and might not have the same farebox recovery rate and the same pricing policies. (Section 5)
- The peak seasonal surcharge applies a uniform fee to all non-commuting vehicles.
- The policies established by the Tariff Policy Committee of the Washington State Transportation Committees regarding tariff route equity were not codified and have been overridden by the requirements of ESHB 2358.

This evaluation will be conducted in parallel to this process under the pricing strategies work element which will involve the Washington State Transportation Commission, as they have the regulatory authority to set fares for ferries. Below are some initial questions to guide data collection and analysis as well as begin to frame how individual strategies might be evaluated.

**Demand Impacts.** Managing ferry demand—and vehicle ferry demand in particular—is an integral part of the Legislature’s directive. Questions include:

- What is the estimated demand elasticity for vehicles, walk-ons, bicycles, motorcycles, and vanpools?
- What is the estimated cross-elasticity for walk-ons, bicycles, motorcycles, vanpools, and transit if vehicle fees are increased?
  - Do terminals have the added facility capacity to handle the shift in demand from autos to other modes?
- How does demand elasticity differ for rider sub-groups (commuters, tourists, island residents, etc)?
- How does demand elasticity differ by travel routes?
- How does one measure the effectiveness of demand response?

**Customer Service.** “Improving the quality and timeliness of service” is a stated goal in the Ferry Bill. Therefore, it is important that each operational strategy be evaluated according to its effects and perceived effects on the service toward different customer groups by route. For example, a reservation system may be seen by regular users as an improvement in customer service since they can plan their trips without waits, but as a hindrance to users who do not know that reservations are available. Questions by route include:

- How do users define “customer service improvements” (more efficient loading/unloading, more amenities on the ferries and in the terminals, etc)?
- How would the public respond to the new strategy and its perceived effect on service?
- Does the strategy affect different user groups in different ways? If so, how? Do certain user groups have special needs that should be addressed?

- How do customers value their time and how does that affect their likely response to operational changes.

**Revenue Impacts.** The passage of I-695 and its elimination of the Motor Vehicle Excise Tax (MVET) in 1999 decreased funding for WSF operations. The Ferry Bill emphasizes the need to keep costs down, but does not speak on the point of a strategy's revenue-generating potential. Before evaluating individual strategies, it is important to ask: What level of revenue generation is desirable and expected? For example, HOT lane and congestion pricing tolls may be priced in a way to recover the costs associated with implementing the systems or in a way to make money for WSF general operations.

- How should pricing and revenue be evaluated?

**Impacts on users capacity and communities.** WSF is an extension of the state highway system. The analysis of options should consider the potential for perceived and/or actual impacts on users, capacity and communities and identify how these might be mitigated while achieving the broader customer service, demand management and revenue goals. Questions could include by route:

- How does this strategy affect users, system capacities and communities?

### **Relationship to Other Work Elements**

The identification, analysis and recommendation of operational strategies will be closely aligned with several other concurrent tasks including: the WSTC customer survey; the development of terminal design standards; the re-establishment of vehicle LOS standards; and, the updated and reconciled ridership forecasts. In addition, the operational strategies will be a key component of a revised Long Range Plan.

### **Schedule and Next Steps**

This situation assessment memo is a first step in the identification, formulation, and analysis of operational strategy recommendations. The following time line and actions are tentative and are subject to revision. JTC review of recommendations will occur throughout the process.

- **October 2007-February 2008:** Preliminary investigation and analysis of operational strategies by WSF/WSDOT and its consultant teams.
- **March-May 2008:** Incorporation of survey results to analysis and recommendations.
- **May-June 2008:** First draft of operational strategy recommendations.
- **June-July 2008:** Public outreach and feedback on first draft through FAC and other meetings.
- **August-October 2008:** Incorporation of operational strategy recommendations into LRP.
- **December 2008:** Adoption of the Long Range Plan.