



WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
FERRIES DIVISION

FINAL LONG-RANGE PLAN

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APPENDIX H  
OPERATING STRATEGIES EVALUATION

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# OPERATING STRATEGIES EVALUATION

This Appendix is comprised of four working papers as follows:

1. **Operational Strategies: Situation Assessment.** This document was written at the outset of the long range planning process. It explains the legislative context of this work and includes a preliminary list of strategies to be studied with challenges and considerations for the ferry system.
2. **Evaluative Framework and Criteria:** This document summarizes the criteria against which operational and pricing strategies are evaluated.
3. **Summary of Operational and Pricing Strategy Best Practices.** This document details the review of international transportation best practices that was undertaken to identify strategies that WSF should be considering, highlight successful examples of the adaptive management strategies identified by legislation in action, and discuss applicability of the strategies identified to the ferry system.
4. **Strategy Screening Worksheets.** These worksheets analyze each of the operating strategies identified against the evaluative criteria.

On their own, these papers do not constitute a recommendation on operating strategies. They reflect the process that was undertaken to identify the strategies that are proposed in the Draft Long-Range Plan.

## WASHINGTON STATE FERRIES

### Operational Strategies: Situation Assessment

In the 2007 legislative session, the Legislature passed ESHB 2358 (“the Ferry Bill”) and its biennial transportation budget which contain specific policy and operational directives related to how WSF is currently providing services and how it should be planning to meet the needs of the organization in the future. The legislation identifies specific work that needs to be completed and requires new levels of cooperation and collaboration among the Legislature (through the JTC and the new JTC working group), the Transportation Commission, WSF and WSDOT. These directives follow from the JTC’s Ferry Financing Study and are the next steps in the process of developing a policy framework to address the long-term sustainability of Washington State Ferries.

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 Washington State Ferries 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 Colman 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. Congestion pricing could on one or more routes 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 generally no constraints on passenger walk-on service, reservation policies would be likely 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.

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 is 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.

## EVALUATIVE FRAMEWORK AND CRITERIA

The Revised Long Range Plan is intended to guide future service and investment decisions for the Ferries Division of WSDOT through 2030. In contrast to the Draft Long Range Plan of 2006, which detailed a capital investment plan that responded to growing demand and long-established level of service standards, the Revised Long Range Plan will consider the provisions of ESHB 2358, detail updated LOS standards, and describe a recommended set of operating and pricing strategies intended to maximize efficiency within the system and manage demand.



The overarching challenge inherent in developing the Revised Long Range Plan will be to develop a set of recommendations and strategies that (1) lead to greater operational efficiency (2) help to manage demand, and (3) provide a framework for strategic decision-making around how and when to add system capacity. This framework is consistent with WSDOT's overall mission and strategic direction.

### How will pricing and operating strategies shape the Revised Long Range Plan?

The recommended pricing and operating strategies will be the mechanisms that enable Ferries to more proactively manage its demand and operate more efficiently. Through LOS standards and a revised tariff policy framework, the Plan will detail the conditions under which additional capital investments may be warranted versus the conditions under which additional demand management pricing and operating strategies should be employed.

### How will strategies be evaluated and selected?

All elements of the Long-Range Plan, including pricing and operational strategies will be evaluated using the same overarching criteria. These criteria include:

- **Operating and capital costs.** Short and long term operating and capital costs will be evaluated for all recommendations.
- **Revenue generation.** While an individual pricing strategy's potential for revenue generation is not a criteria against which it will be measured, the combined package of recommendations and strategies included in the long range plan must be able to generate the revenue required by the biennial transportation budget.
- **Terminal and fleet operations.** Recommendations and strategies will be evaluated in terms of their impact on terminal and fleet operations.
- **Customers.** Customer impacts identified through the WSTC-commissioned survey, Local Agency Review Team meetings, Ferry Advisory Committee meetings and general public outreach efforts will be considered for all strategies and recommendations.

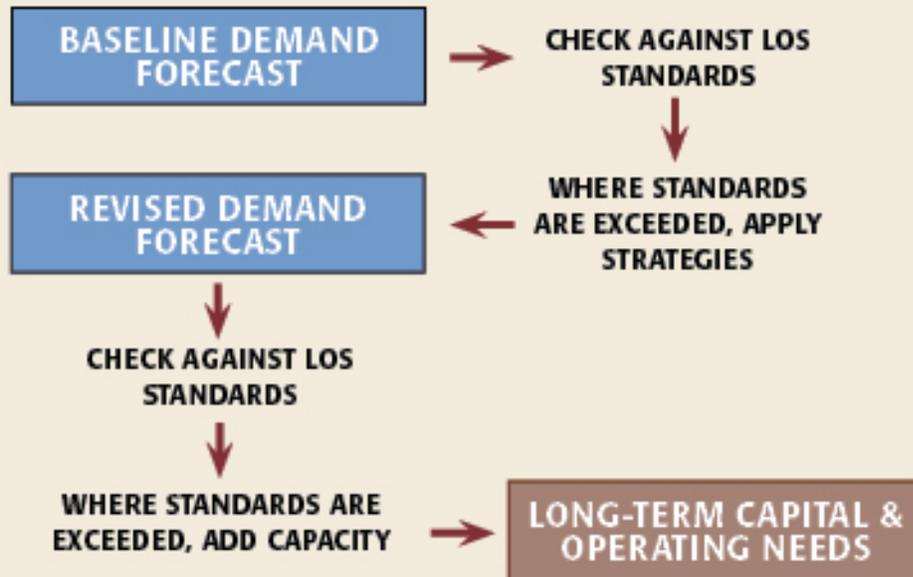
- **Communities.** Impacts on communities located around or near ferry terminals as identified through the WSTC-commissioned survey, Local Agency Review Team meetings, Ferry Advisory Committee meetings and general public outreach efforts will be considered for all strategies and recommendations.

In addition to the above overarching criteria, pricing and operating strategies will also be evaluated in terms of how well they might meet one or both of the following specific criteria:

- **Ability to change customer behavior and manage system demand.** The recommended pricing and operating strategies will be evaluated based on their ability to (1) induce changes in behavior like mode and time shifts or (2) provide supporting systems or mechanisms that make it easier or more desirable for customers to change behavior.
- **Improving service or cost efficiency.** Strategies that improve service or cost efficiencies will be considered even if they are not expected to have an impact on system demand.

## FRAMEWORK FOR EVALUATION OF STRATEGIES

**How will pricing and operating strategies shape the revised Long Range Plan?**



**How will strategies be evaluated and selected?**

### PRINCIPAL EVALUATION CRITERIA

How well does the strategy achieve:

- Changes in customer behavior/shifts in demand
- Improvement in cost or service efficiency

### ADDITIONAL EVALUATION CRITERIA

What are the expected impacts on:

- Operating and capital costs
- Revenue generation
- Terminal and fleet operations
- Customers
- Communities

# Summary of Operational and Pricing Strategy Best Practices

February 21, 2008

## I. Introduction and Research Focus

Recent legislative direction (ESHB 2358 – “the Ferry Bill”) mandated a review of the following operational and pricing strategies with the intent of finding new ways to improve service on the Washington State Ferry System. The strategies included:

- Feasibility of using reservation systems
- Methods of encouraging transportation mode shifts
- Methods of improving on-dock operations
- Cost-benefit analysis of remote vs over-water holding
- Methods of reorganizing holding areas and minimizing on-dock employee parking
- Schedule modifications
- Efficiencies in exit queuing and metering
- Interoperability with other transportation services
- Options for leveling vehicle peak demand
- Options for increasing off-peak ridership

In response to the legislative direction, WSF directed its staff and consultants to research the following initial list of strategies:

- Congestion pricing
- Reservation systems
- High occupancy toll (HOT) lanes
- Mode shift strategies
- Ticketing operations
- Increasing holding facilities
- Entry and exit queuing and metering
- Scheduling
- Fees and discounts that would support operational strategies

An early research step was to compile best practices about how and where such strategies have been applied, what their effect was, and whether the strategy may have potential application to WSF’s system. This memorandum is a summary of the transportation operations best practices research. Each example was selected based on its ability to illustrate a concept, and none of the examples are given detailed descriptions. The purpose of both the examples and this memorandum is to offer some operational and pricing concepts for consideration. Further research will be done on those that interest decision makers as having potential for implementation within the Washington State Ferry System.

The legislative direction and preliminary strategies listed reflect the ultimate and immediate WSF goals to: increase the efficiency of daily operating procedures; to increase vehicle load during off-peak hours; and to increase passenger, rather than vehicle, load altogether. Therefore, operational strategies were selected that accomplish either faster transactions or daily operations; traveler mode shift (choosing an alternative means of travel other than a single occupant vehicle); or a traveler time shift (changing a time of departure based on traffic information or travel preferences.) The following table presents WSF’s goals and strategies and the corresponding research topics:

Goal	WSF Strategy	Corresponding Research Topic
Increase Operating Efficiencies	Ticketing operations	Intelligent Transportation Systems (ITS): Electronic fare collection
	Increasing holding facilities	Parking Management Strategies  ITS: Parking management
	Entry and exit queuing and metering	Reservations systems  ITS: Advanced Traveler Information Systems
	Scheduling	<i>*Topic of a separate study *</i>
Traveler Mode Shift	Congestion pricing	Congestion pricing
	HOT lanes	Congestion pricing (HOT lane applications)
	Mode shift strategies	Congestion pricing  Transit marketing  Car sharing
Traveler Time shift	Congestion pricing	<i>See Congestion Pricing and HOT lanes</i>
	Reservations systems	Reservations systems
Support for Operational Strategies	Fees and Discounts	Pricing Notes  Alternate revenue sources

This memorandum is organized into the following sections:

**i. Existing WSDOT Travel Demand Management programming:**

This section lists and briefly describes the facilities and programs that Washington State Department of Transportation (WSDOT) offers with the intent of reducing peak hour vehicle demand. (This section does not include a description of regional transit agencies and services.) The programs listed in this section represent the current strategies that WSDOT uses to encourage traveler mode shifts and time shifts.

**ii. Operational and Pricing Strategies to Consider:**

This section presents operational and pricing best practices in the transportation industry related to the following research topics:

- Congestion pricing
  - Area-wide
  - Corridor-wide
  - Lane applications (including HOT lanes)
  
  - Pricing Notes
    - Alternate Sources of Revenue
- Reservation systems (examples from aviation, cargo, bus and theme parks)
  
- Parking management
  - Remote parking
  - Shared parking
  - Preferential parking
  - Vehicle valet
  - Employer-driven reduction programs
  
- Transit marketing
  
- Car sharing
  
- Intelligent transportation systems
  - Real time traffic information
  - Parking management
  - Electronic fare collection

**iii. Operational Strategies in Action: Ferry System Applications**

This section describes instances of operational and pricing strategies under study in this analysis being applied to other ferry systems across the world.

**iv. Summary of Findings**

This section provides a summary table that matches WSF operational goals to their corresponding best practices and states the general effects of implementing those strategies.

**v. Bibliography**

This section lists all sources researched, both cited and consulted. It is organized first by section of the document and then by subject.

## II. Existing WSDOT Transportation Demand Management Programs

Through existing programs, WSDOT already encourages commuters in the region, including its own employees, to use alternative times and modes of travel. This list is not inclusive or comprehensive of all the mode shift or time shift strategies or services active in the region. Instead, it focuses on WSDOT programs because they set a baseline for programming that WSDOT currently offers versus what expanded programming it could offer in the future.

Legislative and WSF Strategies*	WSDOT Initiative
Congestion pricing (including HOT lanes)	SR 167 “Good to Go” – coming soon
Ticketing	ORCA card – coming soon
Entry and exit queuing and metering	Puget Sound Traffic Flow Map (and FerryCam.com)
Mode shift strategies	Vanpool program - Priority carpool/vanpool loading on ferries - Rideshare fare discount on ferries RideShare On-Line Park and Ride Lots Trip Reduction Performance Program Commute Trip Reduction Program
Fees and discounts to support operational strategies	Trip Reduction Performance Program Commute Trip Reduction Program Rideshare fare discount on ferries

\*WSF strategies were only listed that apply to existing WSDOT programming

“Good to Go”: The electronic form of payment accepted at the Tacoma Narrows Bridge and, eventually, for SR 167 HOT lanes. This form of payment avoids the inconvenience of toll booths, but recognizes a varying payment schedule by vehicle or time of day as applicable<sup>1</sup>.

<sup>1</sup> WSDOT website: <http://www.wsdot.wa.gov/GoodToGo/about.htm>

*Vanpool:* Legislative efforts to encourage vanpool use started in 1998 and increased in 2003 when a five-year, nine million dollar vanpool grant program was approved to help transit agencies with the capital costs of buying vehicles. In 2004, the Legislature also approved the use of financial incentives to encourage new vanpool riders and drivers. Van requests have exceeded the projected amount and WSDOT has projected being unable to meet the demand<sup>2</sup>.

- In addition to helping promote to WSDOT vanpool program, WSF rewards carpools and vanpools by offering them preferential loading and by giving rideshare vehicles reduced fares. Exclusive staging area “diamond lanes” are available for carpool and vanpool vehicles, and those lanes get loaded first. In addition, carpools with three or more passengers and vanpools with five or more passengers are eligible for an annual vehicle permit at the cost of \$20.00. This cost covers both the vehicle and driver. Additional passengers pay the applicable passenger fare<sup>3</sup>.

*RideShare On-Line:* “WSDOT invested in expanding RideshareOnline statewide early in 2005, contributing to nearly doubling the number of visitors in the first nine months of the year compared with the same period in 2004. As of September 2005, nearly 13,000 individuals had sought ridematch information from the online service. A survey is being developed to track successful matches and the persistence of the groups formed.”<sup>4</sup>

*Park and Ride Lots:* Although there is no dedicated state funding for park and ride lots, approximately 270 lots (and more than 30,000 parking spaces) have been built, owned and operated through successful partnerships with transit agencies, other government agencies and local jurisdictions. Washington offering more than 30,000 parking spaces<sup>5</sup>.

*Puget Sound Traffic Flow Map:* WSDOT maintains real-time traffic information related to incidents and congestion online<sup>6</sup>. WSF also has cameras showing dock and queuing conditions online.<sup>7</sup>

*Trip Reduction Performance Program:* WSDOT started a competitive grant program in 2003 to employers, agencies, nonprofits, developers and property managers to provide incentives to their employees for utilizing alternative modes of transportation to single occupant vehicle trips and/or other

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<sup>2</sup> WSDOT website: <http://www.wsdot.wa.gov/TDM/vanpool.htm>

<sup>3</sup> Washington Administrative Code

<sup>4</sup> Ibid.

<sup>5</sup> WSDOT website: <http://www.rideshareonline.com/prlots.htm>

<sup>6</sup> WSDOT website: <http://www.wsdot.wa.gov/Traffic/Seattle/>

<sup>7</sup> WSDOT website: <http://www.wsdot.wa.gov/ferries/cameras/>

travel demand management measure such as telework. \$1.5 million was appropriated for 2005-2007, and an additional \$1.5 million was appropriated for 2007-2009<sup>8</sup>.

*Commute Trip Reduction Program:* The Legislature passed the Commute Trip Reduction (CTR) Law in 1991, incorporating it into the Washington Clean Air Act. The goals of the program were to “reduce traffic congestion, reduce air pollution, and petroleum consumption through employer-based programs that decrease the number of commute trips made by people driving alone.” At participating worksites, the drive-alone rate dropped from 70.8 percent in 1993 to 65.7 percent in 2005. Beginning in March 2006, new requirements were implemented that direct municipalities to develop Commute Trip Reduction Plans for eligible employers. (Employers with over 100 employees are required to comply.) Municipalities may also opt to designate areas with employers of smaller size to participate on a voluntary basis. These areas are referred to as Growth and Transportation Efficiency Centers and they have their own planning guidelines. The planning targets of the new requirements are<sup>9</sup>:

- 10% reduction in drive-alone travel in participating municipalities by 2011
- 13% reduction in VMT by commuter in participating municipalities by 2011
- Additional local targets as necessary to meet Urban Growth Area goals

*ORCA card:* One Regional Card for All is the Puget Sound’s version of a “SmartCard” a plastic card with an embedded computer chip that will serve as fare media for Sound Transit, King County Metro, Washington State Ferries, Community Transit, Everett Transit, Pierce Transit, and Kitsap Transit. Implementation of the card has been tested and is awaiting final approval to begin operations.<sup>10</sup>

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<sup>8</sup> WSDOT website: <http://www.wsdot.wa.gov/TDM/TRPP/>

<sup>9</sup> WSDOT website: <http://apps.leg.wa.gov/WAC/default.aspx?cite=468-63-030>

<sup>10</sup> <http://soctech.cs.washington.edu/wiki/ORCA/ORCA> and <http://www.kitsaptransit.org/OrcaFactSheet.html>

### III. Operational and Pricing Strategies to Consider

In this section, each research area is presented with the following descriptions:

- **Definition:** explains the concept and its general intent or why it typically gets implemented (the “what?” and “why?”)
- **Examples and Effectiveness:** gives a few examples of a concept’s application and outcomes. (The level of detail is general and brief, focused on “who?” “where?” and “how?”.)
- **Considerations for Ferry Implementation:** assesses the concepts using some preliminary criteria to assist decision makers in selecting the most interesting concepts for further study.

#### Congestion pricing

**Definition:** Also referred to as “value pricing” this means the application of a toll, fee or tax for access to transportation facilities during set hours (usually peak travel periods) with the intent of using the price to limit the demand. The intent of redistributing traffic away from the most congested periods is what distinguishes congestion pricing from general tolling. (Tolling can be implemented to create, even maximize, revenues, or to manage congestion. Different pricing strategies are used to realize each goal.) As a means of managing traffic, congestion pricing has three general applications:

- Area-wide - meaning that access is tolled to an entire downtown or activity center area
- Corridor - meaning that access is tolled along a facility such as a bridge or freeway that connects an activity center or downtown to a commute shed
- Specific lanes – meaning that only certain lanes on a bridge or freeway are tolled (this includes High Occupancy Toll, or “HOT” lanes)

#### **Examples and Effectiveness:**

- Area-wide :
  - London: Since 2003 drivers have been charged 8 pounds per entry into Central London (transit vehicles, ADA vehicles, motorcycles and taxis are exempt, residents receive a discounted rate.) Congestion pricing was implemented as a means of reducing traffic in the city’s core, thereby creating a more walkable environment. The fee is assessed all

day and every day by mounted cameras photographing vehicle license plates and a license plate recognition database.<sup>11</sup>

RESULT: There has been a 22% decrease in entering traffic and a 30% increase in transit ridership.

- Singapore: Since 1975 drivers have been assessed a flat fee to enter into central Singapore during peak periods. Congestion pricing was implemented to reduce traffic and the need for parking in the city's central area. The program started with the morning peak and eventually expanded to morning and evening peak and most of Saturdays. (Transit, motorcycles, cabs and 4+ carpools are exempt all day.) Means of collection began manually and then progressed to ERP (a transponder).<sup>12</sup>

RESULT: When it was first implemented, traffic decreased in the central region by 44%. With each additional tolled period, traffic decreased a minimum of 25%.

- Stockholm: Since its successful demonstration in 2006 and successful vote in 2007, taxes have been imposed on vehicles entering central Stockholm on weekends. The program was initiated as a demonstration program to measure the potential reduction of traffic and the improvement in air quality. Video cameras and a license plate recognition database charges each owner a fee per entry (the rate varies by time of day). Owners may settle their accounts on-line or at kiosks located throughout the city.<sup>13</sup>

RESULT: There has been a 20-25% decrease in vehicle traffic during tolled periods, and a 6% increase in transit use.

- Corridor

- Toronto: Since its construction, drivers on SR 407 have been tolled by transponder and license plate recognition cameras and databases. Tolls have been charged on this facility since its construction as a means of managing traffic. Drivers pay their accounts monthly. Before 2002, the fee was variable, increasing to its highest point during peak periods. Since 2002, the fee has been a flat rate all day every day, with a surcharge imposed for drivers with no transponder<sup>14</sup>.

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<sup>11</sup> Transit Cooperative Research Program. "Chapter 14: Road Value Pricing" AND "Scanning Tour"

<sup>12</sup> Transit Cooperative Research Program. "Chapter 14: Road Value Pricing"

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

RESULT: Since the change to the flat rate, there has been a 30% decline in vehicle traffic.

- Port Authority of New York and New Jersey: Since 2001, drivers have been assessed a toll to utilize bridges and tunnels owned by the Port Authority at a rate that varies by both time of day and by means of collection. The new pricing scheme was implemented as a means of better managing traffic, giving drivers an incentive to drive during off-peak periods. Cash paying drivers are charged \$6 all day. EZ Pass (transponder) users are charged \$5 during the peak period and \$4 during the off-peak period.<sup>15</sup>

RESULT: There has been a 7% reduction in the morning peak and a 4% reduction in the evening peak. There has also been an increase in EZ Pass users.

- Specific lanes

- SR 167: In Spring of 2008, the existing HOV lane on SR 167 in King County will be converted to a HOT lane. Tolls will vary by level of congestion, and will be collected via electronic transponder. This will be a demonstration project to determine the feasibility to of tolling as a means of traffic management in the Seattle region.<sup>16</sup>

RESULT: To be determined

- I-394 Minneapolis: Since 2005, the HOV lane on I-394 in Minneapolis has been converted to a HOT lane with tolls that vary by level of congestion (\$1 to \$4 generally with a maximum charge of \$8.) 2+ carpools, transit and motorcycles are exempt. The lane was converted to a HOT lane as a means of better managing traffic.<sup>17</sup>

RESULT: Vehicle throughput in the corridor has increased 5% since the system's inception.

- SR 91 Orange County: Since 1995 drivers have been tolled on SR 91 at published rates that vary by time of day and day of week (generally between \$1 and \$4.75.) Congestion pricing was implemented as a means of better managing corridor traffic. 3+ carpools

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<sup>15</sup> Transit Cooperative Research Program. "Chapter 14: Road Value Pricing"

<sup>16</sup> WSDOT website. SR 167 Project page.

<sup>17</sup> Munnich and Buckeye

receive a discount and a subscription service discount is available for those who use the lanes over 25 times a month. Tolls are collected by electronic transponder.<sup>18</sup>

RESULT: The tolled lanes handle 33% of corridor traffic (up from 14% before the tolls were imposed.) There has also been a 40% increase in carpools and vanpools in the corridor.

- Other Notable Applications:

- Kennedy Airport, New York City: In late 2007, as a means of avoiding the summer delays that result from heavy summer travel, the USDOT proposed auctioning peak summer slots at Kennedy Airport to avoid delays of previous years.<sup>19</sup>

RESULT: Ultimately, the Air Transport Association refused the idea of congestion pricing and the idea was dropped. The ATA claimed that congestion pricing has been proven to fail when applied to aviation, and the airlines prefer the approach of capping the number of flights that has been applied to La Guardia and Reagan Washington National.

- Tappan Zee Bridge, New York: In 1997, as a means of improving traffic flow and reducing congestion, the Tappan Zee Bridge performed a demonstration project involving freight vehicles only. Cash-paying trucks utilizing the bridge during peak periods were charged double the regular toll. Trucks with transponders and trucks using the bridge during off-peak periods were exempt from the surcharge<sup>20</sup>.

RESULT: Unfortunately results were negligible because outreach and education was lacking (trucking company management didn't know of the demonstration project until after it had already scheduled its trucks for delivery.) An exit survey at the conclusion of the project revealed that if management had known it would have purchased transponders and/or scheduled the trucks differently.

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<sup>18</sup> Transit Cooperative Research Program. Chapter 14: Road Value Pricing

<sup>19</sup> Conkey, December 11, 2007

<sup>20</sup> Transit Cooperative Research Program. Chapter 14: Road Value Pricing

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	YES
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	YES
Improves convenience and attractiveness to customers?	NO
Requires capital outlay?	NO
Requires additional operating budget?	NO
Potential for revenue generation?	YES
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	YES

WSF could implement congestion pricing in the following role(s):

Service provider	X	Employer		Community partner	
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**Pricing Notes:**

Pricing strategies generally focus on either imposing a surcharge (price increase) or offering an incentive (price decrease). Congestion pricing examples are classified by their pricing strategy in the table below.

	<b>Example</b>	<b>Details</b>
<b>Examples of Price Increase</b>	London	Flat rate all day
	Singapore	Flat rate all day
	Stockholm	Entry taxed on weekends; price fluctuates by time of day (higher during demonstrated peak periods)
	Toronto	Surcharge for peak periods and additional surcharge for cash payment
	Minneapolis	Price increases as congestion increases
	New York	Surcharge for peak periods; additional surcharge for cash payment
<b>Examples of Price Decrease</b>	Port Authority of NY and NJ	Discount for EZ pass users Discount for off-peak use
	Orange County	Discount for subscription users; discount for carpools

In the case of transit, fare increases typically result in fare elasticity of about .33: for every fare increase of 10%, system ridership will drop by 3.3%<sup>21</sup>. However, the elasticity also varies by type of service, by size of service area, and by time of day.

- Peak hour fares are less elastic than off-peak fares.
- Fares in smaller areas are more elastic than fares in larger areas.
- Bus fares are more elastic than rail fares.

<sup>21</sup> Gardner

### Alternate Revenue Sources

Because fare increases are political, and often problematic, many transit properties consider other options for increasing revenue before they impose a price increase<sup>22</sup>. These may include:

- New fare programs
  - To employers: In 1991, the Regional Transportation District (RTD) in Denver, Colorado introduced the EcoPass, a program that invited employers to purchase tax-deductible annual farecards to offer their employees as a pre-tax employee benefit. To participate in the program, employers were required to buy farecards for all their employees whether or not the employees used transit. Participation exceeded RTD's forecasts, transit ridership increased, and RTD has had few employers drop out, even after prices increase.<sup>23</sup>
  - To tourists: The SkyTrain system in Bangkok was experiencing ridership levels 1/3 lower than forecast levels. It launched a major campaign including new (higher) tourist fares and fare media (a day pass), special information and maps, and improved signage and advertising. In four years, tourist ridership increased from 3,000/day to 45,000/day.<sup>24</sup>
  - To shoppers: Downtown businesses in Iowa City, IA participate in "Park and Shop" and "Bus and Shop" programs: for every \$15 purchase, customers receive a parking validation or a transit pass. Merchants settle up with the agency at the end of each month for the cost of the fares and/or parking; merchants also pay the advertising costs of the marketing campaign<sup>25</sup>.
- Parking revenue
- Advertising revenue
  - In May of 2007, Los Angeles MTA made \$146,000 off of one McDonald's ad campaign in Union Station alone<sup>26</sup>.

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<sup>22</sup>Gardner

<sup>23</sup> Transit Cooperative Research Program "Cases on Revenue Generated by Public Transit Agencies"

<sup>24</sup> Anderson

<sup>25</sup> Transit Cooperative Research Program "Cases on Revenue Generated by Public Transit Agencies"

<sup>26</sup> "Los Angeles MTA Goes Commercial"

- Transit oriented development and/or joint development projects
  - In fifteen years, joint development generated over \$150 million for WMATA<sup>27</sup>.
  
- Innovative financing
  - “Tax advantaged leases, diesel fuel swaps and strategic borrowing and refinancing have generated over \$100 million for WMATA<sup>28</sup>”.

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<sup>27</sup> Gardner

<sup>28</sup> Ibid.

## Reservation systems

Definition: Capability of transferring demand management to passengers, as Internet-hosted computer systems allow passengers to reserve their travel slot (at the time and price of their choice).

### Examples and Effectiveness

- Passenger airline examples:

- For the sake of customer convenience and cost-savings, Southwest Airlines was the first airline to host their own website with ticket-booking capability in 1996<sup>29</sup>.

RESULT: In the third quarter of 2007, 74% of SWA bookings were made on-line using its own website. In June of 2007, 69% of passengers checked in on-line or at a kiosk.

- Southwest has also launched SWABIZ, a service that allows business clients to plan, purchase and track business travel on-line<sup>30</sup>.

RESULT: Enrollments continue to rise; they increased by 23% in 2006.

- American Airlines developed the Semi Automatic Business Research Environment (SABRE), a computerized passenger booking program internal to American, in 1964<sup>31</sup>. As other airlines developed their own software and computerized bookings through travel agencies became more and more common, the need developed for a common software that would work across airlines and be accessible by external users (such as passengers wanting to book their own tickets.) SABRE software was eventually used to start Travelocity, an on-line booking website for American Airlines as well as four other major carriers. In 1999, Travelocity had grown to be the world's largest on-line booking website with sales over \$808 million.<sup>32</sup>

RESULT: SABRE became so profitable in not only selling on-line booking software but also consulting to and outsourcing services for other airlines, hotels and rental car companies that in March of 2000 American Airlines spun off SABRE as its own independent business, but remained its largest client. In 1999, SABRE's total revenues were \$2.4 billion.

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<sup>29</sup> Southwest Airlines Fact Sheet AND Zellner

<sup>30</sup> Southwest Airlines Fact Sheet

<sup>31</sup> McDonald

<sup>32</sup> Naim

- As of September 25, 2007 Transportation Security Administration (TSA) is considering reservations for passenger screening times to reduce passenger wait times at security checkpoints<sup>33</sup>.

RESULT: *To be determined*

- Freight and cargo examples:
  - In 2005, to offer more convenience to shippers, and to incur less cost from erroneous orders or argumentative clients, DHL cargo services introduced Import Express Online. Users can specify all instructions for their shipments including terms of sale, pickup schedule and amount of insurance desired. Shipment status can be accessed on demand or retrieved from automatic status notifications via email<sup>34</sup>.

RESULT: A survey of over 500 shippers conducted by Business Week concluded that “40 percent of respondents are booking more than a quarter of their shipments electronically. They expect to substantially increase this with a full 60 percent expecting to be doing the majority of their bookings electronically by mid-2005.”<sup>35</sup> In addition, “three-quarters of the respondents said that the ability to book shipments through the Web is very important and 87 percent said that it is important or very important for them to be able to see and manage their bookings online.”

- In 2007, to update their cargo services, offer more convenience to customers and streamline their own operations, Southwest Airlines introduced on-line cargo booking services that allow shippers to book shipments over the Internet instead of delivering their goods to a Southwest warehouse facility first<sup>36</sup>.

RESULT: To be determined.

- Bus example

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<sup>33</sup> Frank

<sup>34</sup> Seemuth

<sup>35</sup> “Freight Forwarders Responses”

<sup>36</sup> Ibid.

- GoToBus.com started as the “Chinatown Bus,” a low cost inter-city bus service to help connect people to jobs. It kept costs down by using on-line reservations to organize routes.<sup>37</sup>

RESULT: GoToBus.com and has been so successful that it has expanded to other parts of the country as well as into tour services.

- Other examples for consideration

- To regulate crowds at the most popular rides at its theme parks, and to allow an option for bypassing long queues, Disney launched the FastPass system. Patrons visit a kiosk to draw advance tickets for popular rides (the kiosk regulates the number of patrons per advance ride time in increments of 15 minutes. FastPass holders have their own line and priority boarding)<sup>38</sup>.

RESULT: FastPass has been popular enough that Disney is now considering a text message or cell phone application to allow patrons to book remotely.

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<sup>37</sup> McClure

<sup>38</sup> Powers

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	NO
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	YES
Improves convenience and attractiveness to customers?	YES
Requires capital outlay?	YES
Requires additional operating budget?	YES
Potential for revenue generation?	YES
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	YES

WSF could implement congestion pricing in the following role(s):

Service provider	X	Employer	X	Community partner	
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## Parking management

Definition: The attempt to limit the need for parking capacity in the most congested locations travel periods. (For WSF this applies both to the queuing that results from unmet passenger vehicle demand, but also to WSF employee parking which is currently offered “on-dock” in the ferry staging areas.) The following examples have been selected to be applied to WSF as follows:

- For ferry patrons:
  - Remote parking: providing the means to park away from the activity center, and to distribute parking demand over a wider area and more facilities.
  - Preferential parking based on vehicle type and/or occupancy: making access to some or all parking available to drivers on a conditional basis.
  - Shared parking: providing the means to utilize parking spaces for more than one purpose or land use.
  - Vehicle valet service: providing the service whereby for a fee, drivers leave their cars with a third party service that will park them and then retrieve them at the appointed time.
- For ferry employees
  - Employer –driven parking reduction programs: utilizing financial incentives, disincentives or service provisions to encourage employees to use alternative modes to single occupant vehicle travel.

### Examples and Effectiveness

- Remote parking:
  - In Denver, Colorado, to facilitate employee travel to and from the airport and to offer transit patrons a direct connection, the Regional Transportation District (RTD) offers non-stop bus connections to the airport from select park-and-Ride lots. SkyRide bus service costs \$7, \$9 or \$11 each way to and from the airport, depending on the park-and-Ride lot served, but there is no parking charge at the park-n-Ride lots. However, EcoPasses, or employer-sponsored transit passes, are also applicable to SkyRide routes making it a free service for airport employees.

RESULT: In 2006, SkyRide served an average of over 19 boardings per hour<sup>39</sup>.

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<sup>39</sup> Regional Transportation District Service Development Archive, 2006 Family of Services Tables and Charts

- From 2002-2004, to provide commuters an option to downtown parking prices and to solve a parking shortage, the Downtown Business Partnership of Baltimore began funding a Downtown Area Shuttle (DASH) that circulated through downtown destinations from the Ravens Stadium. Patrons paid \$50 per month to park in any of the 1200 stadium lots; carpools paid \$20 per month<sup>40</sup>. Shuttle service is free to those who use monthly parking and \$0.50 a ride to those using it as a circulator service downtown. After 2004, (and the termination of the 3-year federal grant) the service was cancelled both due to funding shortage and due to the 4500 additional parking spaces that got built downtown<sup>41</sup>.

RESULT: Over 725 commuters utilized the DASH commuter service.

- In 1992, “to encourage urban development in downtown Chattanooga while limiting congestion and air pollution, the Chattanooga Area Regional Transit Authority (CARTA) developed a strategy to provide peripheral parking and a free shuttle service. . . The two parking garages Shuttle Park South (550 spaces) and Shuttle Park North (650 spaces), are owned by CARTA and operated privately. The free shuttle buses are financed through the garages’ parking revenues.<sup>42</sup>”

RESULT: Between 1992 and 1998, over 1 million riders were served, and over \$400 million was spent on development in Chattanooga, including the aquarium, over 100 retail shops and over 60 restaurants.

- Preferential parking based on vehicle type and/or occupancy: In 1977, to reduce the need for parking, the Pentagon offered guaranteed parking for carpools.

RESULT: 10,000 parking spaces were available. 4960 carpool passes were distributed.

- Shared parking:
  - In 1994, the Lloyd District in Portland (an area across the river from downtown that includes land uses such as the convention center and the Rose Garden Arena) started a Transportation Management Association, a non-profit business association of large and small employers. The goal was to reduce the parking demand and better manage area traffic using improvements and programs funded by member support, City of Portland funds and grants. Through its partnership with city, the TMA manages parking supply including on-street parking. It was re-designated to carpool only, 5-hour parking, etc.

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<sup>40</sup> Zimbler

<sup>41</sup> Fieser

<sup>42</sup> Parking Spaces Community Places: Finding the Balance through Smart Growth Solutions

The TMA and City share revenues, which are used to fund more transportation demand management programs<sup>43</sup>.

RESULT: Through its promotion of transit, parking management, ride share programs, and other travel demand management programming, the Lloyd District achieved a drive-alone rate of only 42% in 2005<sup>44</sup>.

- In 2006, the 65-acre Commons PUD in Denver, CO established a 63-20 corporation to own and manage parking within the PUD. The 63-20 corporation will build the parking facilities and contract out the operations and maintenance to a parking district. The parking district will be comprised of property owners and will direct the parking revenues to pay debts to the 63-20 and to finance TDM programs. A 63-20 Corporation is a private, not-for-profit corporation created for the purpose of financing public improvements on behalf of a political subdivision<sup>45</sup>.

RESULTS: The mode split will be assessed as area develops; there is already a mode split of 55% on alternate modes to Downtown Denver.

- Metropolitan Place TOD across the street from Renton Transit Center includes a 2-story parking garage (240 spaces) with 4,000sf of ground level retail space and 90 apartments above.

RESULTS: 150 building spaces are used as park and ride spaces. The residential parking stall use is .6 per unit<sup>46</sup>.

- Vehicle valet services

- The City of Pasadena utilizes a “Universal Valet service” downtown that enables drivers to leave their car at the valet stand of their choice, and request a pick up time and place (valet stand) of their choice. The cost is \$7 with a validation and \$10 without one.<sup>47</sup>

RESULT: *Utilization information pending*

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<sup>43</sup> Lloyd District TMA website

<sup>44</sup> Lloyd TMA Annual Report 2006

<sup>45</sup> Boulder Village Area Plan: Parking Management Case Studies

<sup>46</sup> Ibid.

<sup>47</sup> City of Pasadena website: <http://www.oldpasadena.org/info.asp>

- Employer-driven parking reduction programs

- In 1992, California enacted “parking cash out” legislation that allowed employers to pay employees either as an incentive to encourage use of alternative transportation modes or in lieu of providing them parking.

RESULT: A study of eight Southern California employers performed after the legislation by TCRP found that an average subsidy of \$2 per employee per month reduced the need for employee parking by 12%<sup>48</sup>.

- From 1993 to the present, to encourage the use of alternate modes of travel, San Diego Savings and Trust Bank has paid employees 125% the cost of monthly parking.

RESULT: 37% of their employees carpool and 14% use transit<sup>49</sup>.

- In 1990, to encourage the use of alternate modes of travel, Ventura County Government, rather than offering direct payment, has allowed employees to earn cash prizes through accruing points. Points are awarded each day an employee doesn’t drive.

RESULT: In the first 5 months, the County's vehicle trips decreased by 13 percent, with only 69 percent of employees driving alone<sup>50</sup>.

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<sup>48</sup> TCRP. Chapter 13: Parking Pricing and Fees

<sup>49</sup> Comsis Corporation.

<sup>50</sup> Ibid.

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	YES
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	NO
Improves convenience and attractiveness to customers?	NO
Requires capital outlay?	NO
Requires additional operating budget?	NO
Potential for revenue generation?	YES
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	NO

WSF could implement congestion pricing in the following role(s):

Service provider	X	Employer	X	Community partner	X
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## Transit marketing

Definition: The promotion of public transportation services by public agencies with the intent of encouraging more ridership. For the purposes of this report, there are four categories of transit marketing that will be covered:

- Mass market promotions: focused on increasing ridership or knowledge of a particular route or service by distributing a high volume of materials rather than delivering materials to select audiences or rider groups.
- Mass market promotions with incentives: mass market promotions that offer participating riders a gift or reward for their ridership.
- Targeted information: focused on increasing ridership by advertising a specific goal, service or route or advertising in a specific geographic area.
- One on One promotions: encouraging ridership by offering the services of someone who will act as a guide throughout the transit system.

### Examples and Effectiveness:

- In general the following trends apply to the effectiveness of transit and alternative modes marketing<sup>51</sup>):
  - Providing information only does not decrease vehicle trips but does result in smaller increases.
  - Providing both information and access to alternative modes (such as vanpool programs) can reduce vehicle trips by an average of 8.5%.
  - Programs that focus on financial incentives or disincentives to using alternative modes can reduce vehicle trips by an average of 16.4%.
  - Employers that combine both access to alternative modes (such as vanpools) with financial incentives or disincentives can decrease vehicle trips by an average of 24.5%.

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<sup>51</sup> Commuter Choice Primer

- Mass market promotions (the following examples involve marketing a new phone-in automated route information service to encourage its use<sup>52</sup>):
  - In the 1980's the Central Ohio Transit Authority (Cleveland) advertised using a "door drop" of printed information about the service onto people's front doors in neighborhoods across the city.
 

RESULT: After the door drop calls to the new service increased by 400%.
  - In 1990, the Hamilton Street Railway in Ontario Canada advertised using TV commercials, phone directory ads and flyers.
 

RESULT: After the campaign calls to the new service doubled.
  - In 1995, Calgary advertised using a "wrapped" bus (a bus covered with advertisement material), radio and newspaper ads.
 

RESULT: During the promotion, calls to the new service increased 26%.
  
- Mass market promotions with incentives<sup>53</sup>:
  - In the mid-1980's to increase awareness and use of the transit system, Pembroke County Transit started a "Try Transit Week" that included a \$0.25 ride day and free rides given to special needs riders such as elderly and disabled. The week also included special public events and campaigns.
 

RESULT: During the week, ridership increased by 35%. After that week, ridership remained 30% higher than before, and continued at a higher level for three years.
  - Beginning in 1997, to increase public awareness, Houston METRO held a "Try Transit Week" event where unlimited ride passes were made available for \$5 during that week.
 

RESULT: Each year ridership has increased over the previous year's.

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<sup>52</sup> TCRP. Chapter 11: Transit Information and Promotion

<sup>53</sup> Ibid.

- Targeted information

- In 1993, the Hamilton Street Railway in Ontario, Canada wanted to increase ridership on relatively new routes. They printed ride coupons and mailed them directly to residents within  $\frac{3}{4}$  mile of the routes they wanted to promote<sup>54</sup>.

RESULT: Ridership on the targeted routes increased by 50%.

- In 1995, to increase awareness about a new service instituted along I-94, the Metropolitan Transit Development Board in San Diego mailed new service and safety program information to residents located within the I-94 corridor with a free round-trip ticket<sup>55</sup>.

RESULT: The ticket redemption rate was 22% and ridership on the route increased by 5%.

- In 1996, the Central Ohio Transit Authority wanted to increase ridership on its special event routes (especially during sports game days). They mailed a postcard advertising the service to all residents within  $\frac{1}{4}$  mile of the route<sup>56</sup>.

RESULT: As a result game day ridership increased by 46% and revenue increased by 77%.

- In 2006, Arlington Rapid Transit in Arlington, VA started advertising to teens to increase transit ridership among teenagers. They printed t-shirts, Frisbees and started a website dedicated to the program<sup>57</sup>.

RESULT: The program was successful in capturing teen attention and participation and is seeking permanent funding.

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<sup>54</sup> TCRP. Chapter 11: Transit Pricing and Information

<sup>55</sup> Ibid.

<sup>56</sup> Ibid.

<sup>57</sup> Markon

- One-on-One promotions:
  - In Portland, Oregon, to increase awareness and transit ridership, Tri-Met experimented with a telemarketing program, where each telemarketer would speak personally to each person he called and offer them transit information and free-ride coupons<sup>58</sup>.

RESULT: 85% of those contacted accepted the offer and 20% kept riding transit after the promotion.

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	YES
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	NO
Improves convenience and attractiveness to customers?	NO
Requires capital outlay?	NO
Requires additional operating budget?	NO
Potential for revenue generation?	NO
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	NO

WSF could implement congestion pricing in the following role(s):

Service provider		Employer		Community partner	X
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<sup>58</sup> TCRP. Chapter 11: Transit Pricing and Information

## Car sharing

Definition: Programs typically run by commercial businesses that allow members access to a fleet of vehicles on an as-needed basis. Vehicle fleets of varying sizes may be dispersed throughout a metropolitan area in downtown areas, office buildings, dense neighborhoods, or shopping districts. Typically members call or book on-line to reserve a pick-up time and a duration of use. National brands of car sharing companies include Seattle-based Flexcar and Boston-based Zipcar (though the two companies announced a merger in October of 2007.)

### Examples and Effectiveness

- Local Examples:
  - Flexcar began a car-sharing business in the Seattle area in 1998 as a joint venture with King County to encourage the use of alternate modes of travel.

RESULT: In October 2005, the Association of Washington Business presented Flexcar with an award for, among other accomplishments, “removing over 7,000 cars from the road in King County alone since its inception.”<sup>59</sup>

In October of 2006, Flexcar and King County announced a Job Access program at White Center, whereby King County Metro would utilize Flexcar to supplement Metro Transit service. “In an average month more than 1,300 trips are taken by Job Access participants.”<sup>60</sup>
- National Examples:
  - In January 2007, Flexcar reported 30,000 participants nationally. Zipcar reported 80,000 members<sup>61</sup>.

RESULT: Surveys of car-sharing participants indicated that between 11% and 26% of participants sold a personal vehicle and between 12% and 68% delayed the purchase of a vehicle. They also indicate that each car-sharing vehicle removes between 6 and 23 vehicles from the road<sup>62</sup>.

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<sup>59</sup> Williams, October 20, 2005

<sup>60</sup> Williams, October 9, 2006

<sup>61</sup> Hodges

<sup>62</sup> Shaheen

In September of 2006, Flexcar and Zipcar both received over \$21 million in private capital to fund expansion plans<sup>63</sup>.

- Three companies compete for car-sharing business in San Francisco: Flexcar, Zipcar and City CarShare (a local non-profit).

RESULT: In January 2007 in San Francisco, there are 13,000 car-sharing participants, 4,000 of whom joined in the 2006<sup>64</sup>.

- Flexcar and Zipcar started university campus pilots programs in 2002.

RESULT: In September of 2007, 70 colleges and universities participated in car-sharing programs nationwide<sup>65</sup>.

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<sup>63</sup> Goo

<sup>64</sup> Cabanatuan

<sup>65</sup> Bruno

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	YES
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	NO
Improves convenience and attractiveness to customers?	YES
Requires capital outlay?	NO
Requires additional operating budget?	NO
Potential for revenue generation?	NO
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	YES

WSF could implement congestion pricing in the following role(s):

Service provider	X	Employer		Community partner	X
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## Intelligent Transportation Systems (ITS)

Definition: ITS utilize advanced communications technology to provide real-time information about the operational condition of transportation infrastructure and services. It is the technological means to assess and manage conditions within the transportation system. As such, it has been applied to transit and highway systems, utilized to estimate travel time information, relied on to track the location of transit vehicles, utilized to monitor and manage traffic signal systems, and used to provide signal pre-emption to emergency vehicles. It also provides the technological means to collect tolls and to vary toll levels by level of congestion. This document summarizes some successful applications of the following forms of ITS:

- Advanced Traveler Information Systems
  - 511 Programs
- Parking Management
- Fare Collection

### Examples and Effectiveness

- Advanced Traveler Information Systems
  - Local examples
    - From 1993-1997, WSDOT participated in a field operations test of ITS technology that included camera coverage and VMS signs at the Edmonds Ferry Terminal in 1999.

RESULT: In the final report submitted in 1998, WSDOT claimed its success as defined by the improved efficiencies of monitoring by camera, rather than by drive-by queue length counts, and the utilization of the WSF website by passengers checking terminal conditions before beginning their trip. Terminal condition information was made available to the public through freeway and arterial-based variable messaging signs (VMS) and on-line<sup>66</sup>.

- In 1996, WSDOT and other partners in the Seattle region formed a partnership known as Smart Trek to participate in the ITS Metropolitan Model Deployment Initiative (MMDI). They offered services including a new WSDOT website with links to real-time traffic information, King County Metro Online (a transit route planning feature), Traffic TV, Transit Watch (real-time transit arrival and departure information at transit centers) and Fastline (a subscriber service for real-time traffic information sent to portable handheld devices<sup>67</sup>).

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<sup>66</sup> Wetherby

<sup>67</sup> Metropolitan Model Deployment Initiative

RESULT: The WSDOT website has been maintained and is rated as one of the top ten websites for advanced traveler information services in the nation.

- 511 Systems: On July 21, 2000, the Federal Communications Commission designated “511” as the national traveler information number. The general goal behind the 511 service is to provide travelers with timely information to allow them to make informed travel decisions and to avoid compounding delays caused by incidents and peak hour traffic. The following examples illustrate how states, regions and localities have utilized it.
  - San Francisco Bay Area uses voice recognition technology and a series of menus to connect callers with transit, vanpool, carpool, and highway information. It also provides a call transfer to a regional or local rideshare operator<sup>68</sup>.
  - I-81 Region in Virginia provides callers the option of listening to tourist information including lodging, restaurants and “things to do” in the 35 county coverage area. This system uses voice recognition for the queries and is fully automated using both text to speech and recorded messages<sup>69</sup>.
  - iFlorida offers travel times on all of the limited access highways and most of the major arterials in Central Florida and current weather information and time-slice (starting and ending time) forecasts for defined road segments. Projected conditions from 15 minutes to two or three days out are provided for each identified roadway segment<sup>70</sup>.

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<sup>68</sup> 511 America’s Traveler Information Number

<sup>69</sup> Ibid.

<sup>70</sup> Ibid.

- Arizona DOT improved its 511 system in 2003 to include touchtone and voice recognition options for use, road-segment information, transit information, "quick report" congestion and incident summaries, a 2-minute recorded message option for airport information, statewide coverage, and call transfer options to airports, the Arizona Office of Tourism, and all of Arizona's rural/regional transit operators.

RESULT: Usage increased from approximately 20,000 calls per month to 60,000 calls per month. (A week-long promotion by DMS signs spiked calls to over 150,000.)<sup>71</sup>

- Parking Management

- In 2001-2002 Acadia National Park (located on Mount Desert Island in Maine) introduced a comprehensive ITS program with the intent to decrease their need for parking facilities, to better manage traffic around the island, and to improve air quality. The ITS programming included real-time parking information, "next bus" technology to complement the new island circulator/shuttle, and a traveler information system which counted and summarized all the data received and relayed it to travelers over the web, the telephone and the parking display signs<sup>72</sup>.

RESULT: Of visitors using the parking information, 43% changed the time they visited a destination and 38% changed destinations based on the information.

44% of the users of the real time parking information said it helped them decide to use the Island Explorer bus.

The average number of excess parked vehicles per day fell from 325 in 2001 to 274 in 2002 even though total number of visitors to the Park grew.

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<sup>71</sup> Battelle Memorial Institute and University of Arizona

<sup>72</sup> Zimmerman, Coleman, Daigle

- From 2004-2006, to better manage traffic around park and rides, Bay Area Rapid Transit (BART) started a reservation program at specific park and ride lots where drivers could reserve a parking space on-line or on the phone through voice recognition technology.

RESULT: The program was successful enough that it has been continued indefinitely. Part of its success was in attracting new riders: 45% of those surveyed who utilized the service said they had never ridden BART before the service was available<sup>73</sup>.

- WMATA offers a reserved parking program that it hosts on its website. Customers pay a monthly premium of \$45 to be sent a hanging “reserved” car tag each month which allows them to access the lot and be guaranteed a space until 10am, when the lot is made available to the general public. Reservations patrons are also charged a daily exit fee. (SmarTrip cards must be used to exit the facility.)

RESULT: 5,000 users (about 10% of the daily park and ride volume) utilize the reservations service<sup>74</sup>.

- Private parking providers have also entered the market using ITS.

RESULT:

Mobile Parking LLC owns 400 parking facilities in 50 cities across the U.S. Service, and sells parking spaces by reservation. Drivers call a toll-free number from their cellular telephones to check parking availability in their city. After the driver provides the operator with his or her final destination, the operator directs the driver to the closest available space. The first reservation is free. Additional reservations cost \$1.75 each. At some of MobileParking’s partner garages, customers can also pay the parking fee itself through MobileParking<sup>75</sup>.

Spot Scout sells parking spaces either online or through Web-enabled cellular telephones. A text message is sent to the driver’s cell phone with a confirmation code and directions to the facility. SpotScout™ also allows users to sell their personal parking spaces to other motorists for short-term use<sup>76</sup>.

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<sup>73</sup> Shaheen

<sup>74</sup> Smartcard Alliance. “Smartcards and Parking.”

<sup>75</sup> Advanced Parking Management Systems

<sup>76</sup> Ibid.

- Electronic Fare Collection (The following are examples of SmartCard technology: cards containing computer chips that track expenditures and act like credit cards, automatically deducting the price of access to a service from the account balance at each time of use.)
  - In 1999, the Washington Metropolitan Area Transit Authority became the first transit agency in the United States to utilize SmartCard technology with the goal of making travel on the system more convenient for passengers. The SmarTrip card could be used on any METRO service (bus and rail) and for access and payment at park and ride lots.

RESULT: Within five years over 650,000 SmarTrip cards were in circulation<sup>77</sup>.

The popularity of the SmarTrip card is such that CitiBank is partnering with WMATA to offer a combined SmarTrip and credit card: a credit card that rewards users for using it on METRO (5% credit for the first five months) with the same touch and go technology at METRO stations as the SmarTrip card.<sup>78</sup>

- In 1997, Hong Kong introduced the “Octopus card.” Patrons can utilize it at parking meters, on all transit services (bus, rail and ferry), at selected shops and retail centers, selected vending machines, phone booths and photos booths.

RESULT: Over 7 million transactions per day are recorded on Octopus cards, representing a daily value of over \$6.5 million<sup>79</sup>.

“While Octopus cards are anonymous by default, over 500,000 personalized cards have been issued and are used for the Octopus Automatic Add-Value Service. Twelve Hong Kong banks and one credit card company support the automatic add-value service. Because each personalized card has a unique identification number, up to 40,000 cards are also being used as security passes at housing estates, for staff identification cards, and as loyalty cards.”<sup>80</sup>

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<sup>77</sup> Smartcard Alliance “Washington Metropolitan Area Transit Authority SmarTrip”

<sup>78</sup> <http://www.wmata.com/riding/smartrip.cfm#combo>

<sup>79</sup> Smartcard Alliance “Hong Kong Octopus Card”

<sup>80</sup> Ibid.

Considerations for Ferry Implementation

Assessment Question	YES/NO
Encourages passenger mode shift?	NO
Reduces negative land side impacts?	YES
Encourages higher off-peak vessel utilization?	YES
Improves convenience and attractiveness to customers?	YES
Requires capital outlay?	YES
Requires additional operating budget?	YES
Potential for revenue generation?	YES
Potential for alternative funding measures/public-private partnerships?	YES
Systemwide breadth of impact?	YES

WSF could implement congestion pricing in the following role(s):

Service provider	X	Employer		Community partner	X
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#### IV. Operational Strategies in Action: Ferry System Applications

There are several international examples of the strategies that WSF is considering being put into practice by ferry systems seeking to make their services both more efficient and more attractive to customers. This chapter will provide current examples of the following kinds of strategies being utilized:

- Reservations systems
- Mode shift strategies
- Ticketing operations

##### *Reservations Systems*

Several ferry systems offer reservations for specific sailings by phone, e-mail or on-line. Generally, the policy is that at the time of reservation the full sailing fare is charged (plus, in the case of Cape May-Lewes ferries, an additional reservations fee.) The fare is considered non-refundable, though all systems offer changes in reservations, or their use as stand-by in case the reserved sailing time is missed. All systems require that vehicles arrive at least 20-30 minutes ahead of their sailing time, or their reservation is considered cancelled. (Their fare may still be accepted on other sailings as space is available, but the missed reservation means the loss of guaranteed and priority loading on other sailings.)

- Northumberland Ferries, serving Prince Edward Island in Eastern Canada, offers the NOW Pass and the NOW Assured Pass, both different applications of pre-paid reservations<sup>81</sup>.
  - The NOW Pass is issued at the time of reservation, or a confirmation number is given in the case of phone-in reservations. It is non-refundable, can be used on other sailings, space permitting, is good for up to a year, and limited to vehicles under 20-feet in length.
  - The NOW Assured Pass can be purchased from ferry offices or other participating locations and may be used for guaranteed access onto any sailing as long as the vehicle arrives at least 20 minutes ahead of the sailing time. The pass is good for up to one year, and is also limited to vehicles less than 20 feet in length.
- BC Ferries in western Canada offers "RBI" (Reserved Boarding on the Internet) as well as reservations by phone and e-mail for some routes in their system, though they are required on specific northern routes<sup>82</sup>. Reservations are non-refundable, but can be changed for a fee. Discounts are given for booking at least two weeks in advance.
- Cape May-Lewes Ferries in New Jersey sells reservations on-line and by phone, and advertises selling up to 100% by reservations: "required for guaranteed sailing time." A non-refundable

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<sup>81</sup> Northumberland Ferries website.

<sup>82</sup> BC Ferries website.

booking fee is also applied at the time reservations are made, though the ticket price is transferable to a different sailing.<sup>83</sup>

- Fjord 1<sup>84</sup>, a ferry operator in Western Norway, is also a collective of transport companies including bus tours, railroads and car ferries. It offers on-line registration for any of its modes once customers have registered on its website.
- North Carolina DOT<sup>85</sup> offers reservations on a few routes only, and they can only be made by calling the departure terminal. Vehicles must arrive at least 30 minutes prior to loading or reservations are cancelled.
- The Steamship Authority<sup>86</sup> serving Martha's Vineyard, Woods Hole and Nantucket offers reservations on-line or by phone. Unused reservations may be used up to a day after the reserved sailing as space is available, but priority loading is no longer applicable. Reservations may be changed or cancelled, and fully refunded, with at least two hours notice ahead of the reserved sailing time.

### *Mode Shift Strategies*

Ferry systems across the world are trying a variety of ways to make car-free travel more possible and attractive.

- Cape May Lewes ferries operates its own shuttles, which have differing seasonal and weekend hours and frequencies, from ferry terminals into towns and points of interest.
- IDO<sup>87</sup>, the ferry operator in Istanbul, offers free fares to passengers arriving at terminals using ground or rail transport services.
- Fjord 1 offers reservations on all their modes of transport services, as previously noted, but they also offer automated route planning with travel distance and travel time noted by mode.
- Fosen Trafikklag<sup>88</sup>, the ferry operator around Trondheim Fjord in Norway, offers free fares to walk-ons and to car passengers. This is a new program that started with a pilot project. Despite the fact that more people took advantage of the new program, the operator did not lose revenue.

### *Ticketing Operations*

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<sup>83</sup> Cape May-Lewes Ferries website.

<sup>84</sup> Fjord1 website.

<sup>85</sup> NCDOT Ferries website.

<sup>86</sup> The Steamship Authority website.

<sup>87</sup> IDO Company 2006 Annual Report.

<sup>88</sup> Fosen Trafikklag website.

Simplifying or expediting the ticketing process saves time and expense for ferry operators and improves the customer experience. Utilizing a reservation system aids in ticketing by managing the demand for each sailing, and making ticket sales accessible to customers on their own schedules through the use of computer technology. Simplifying the fare structure by offering free fares to walk-ons, as they do around Trondheim in Norway, also helps expedite the ticket process by requiring fewer passengers to be processed by ferry staff, and by simplifying vehicle transactions. All vehicles can be ticketed using the same process instead of having to account for number of passengers. The following examples serve to illustrate additional means of improving the ticketing process:

- Cape May-Lewes<sup>89</sup> offers a discount on return-fare passage if the return sailing is booked at the same time as the crossing reservation.
- IDO is beginning the use of thermal tickets with barcodes to replace conventional tickets as a means of expediting the ticket process. In addition, the IDO ferries already utilize camera technology to scan vehicle license plates and match them with license plate databases<sup>90</sup>.
- The Steamship Authority issues a Fast Ferry ID to registered customers that can be used and referred to when purchasing tickets, making reservations or using a coupon from the 10-ride ticket book<sup>91</sup>.

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<sup>89</sup> Cape May-Lewes Ferries website.

<sup>90</sup> IDO Company 2006 Annual Report.

<sup>91</sup> The Steamship Authority website.

## V. Summary of Findings

Traveler mode shifts and time shifts can be accomplished in a variety of ways, and most effectively by combining a mix of services with a mix of financial incentives or disincentives (i.e. a mix of “carrots” and “sticks”). In addition, several strategies can accomplish multiple goals at the same time. Congestion pricing, for example, both decreases traffic in peak periods and increases transit ridership and/or ridesharing in every example. However, in both London and Singapore, it was also implemented along with an increase in transit service that travelers could utilize. The following table presents the strategies whose implementations in other places are best suited to meeting WSF goals.

Strategy	General Effects	Meets WSF Goals		
		Increase Operational Efficiencies	Time Shift	Mode Shift
Congestion pricing	Reduces traffic during higher priced periods Increases transit ridership Shifts demand to off peak periods	X	X	X
Passenger reservations	Reduces queuing Reduces customer /employee confrontation Manages demand (some forced to off peak periods) Increases vendor competition	X	X	
Shared parking	Increases ridesharing Increases transit use	X		X
Remote parking	Decreases activity center traffic Increases transit use	X		X
Car sharing	Decreases personal vehicle use and/or purchase			X

Meets WSF Goals				
Strategy	General Effects	Increase Operational Efficiencies	Time Shift	Mode Shift
ITS: Parking Management	Customer appreciation Decreases activity center traffic	X	X	X
ITS: Advance Traveler Information Systems	Customer appreciation Increases interest in fee-based services Increases use of other promoted facilities and services	X	X	
ITS: Electronic fare collection	Reduces ticketing time Reduces or removes cost of toll booth or meter upkeep Increases revenues	X		

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# Strategy Evaluation Worksheet

**Name:** Automated Route Planning

**Description:** Utilize computer technology to offer passengers a point-to-point route guide including highway routes, ferry sailings, and transit connections as applicable

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Could show customers how to use alternate modes to connect to ferries.
- b. **Encourages time shift:** Medium. If the system is programmed with “expected” and potentially “real-time” arrival and departure information loading conditions for various sailings, and even in concert with a reservation system. This would provide valuable information to customers on avoiding peak sailings and finding those less traveled. In addition, automated route planning could display fare information, which if peak-period pricing goes into effect, would further encourage customers to ride off-peak sailings.
- c. **Attracts new demand to available capacity:** Medium. ,With information beyond simply the sailing time, this tool could effectively communicate where capacity and pricing allow for a less delay prone passage.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. Although if this is combined with e-ticketing it could have a positive effect.
- c. **Reduces queue lengths:** Low. Although if combined with e-ticketing and real time arrival and departure information, it could prevent customers from arriving too early and then holding, which would have a positive effect.
- d. **Improves operating cost per rider:** Low. Has no effect.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** High. Most customers would benefit from this service, and it would be of even greater customer benefit if combined with e-ticketing, reservations and automated real arrival and departure times.
- 2. **Positive community impact:** Low. Little positive impact if implemented in a basic form, but positive community impacts would ensue if it were combined with e-ticketing, reservations and real arrival and departure times, which together, would serve to reduce queues and associated negative traffic impacts.
- 3. **Environmental impacts:** Medium. By creating some shift to transit mode of access, could show some positive environmental benefit.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** High. Such systems are in use and common, and could be applied relatively easily.
2. **Capital costs:** Medium
3. **On-going operating cost:** Low

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but it would achieve maximum benefit if applied in concert with real arrival and departure times and demand information, e-ticketing, and reservations
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend
  - l. Keystone
  - m. Anacortes
  - n. San Juans
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** All. It would be a system-wide application.

### VI. Strategy Disposition

Carry the strategy forward for its customer convenience and potential mode shift benefits.

# Strategy Evaluation Worksheet

**Name:** Automated Vehicle Advance System

**Description:** Similar to carwash technology, vehicles could be mechanically advanced and queued as appropriate to sailing times, allowing passengers to reclaim the time they would have otherwise spent queuing.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. By making driving an even more convenient mode of access, may even have a negative impact.
- b. **Encourages time shift:** Low. Does nothing to encourage people to shift time
- c. **Attracts new demand to available capacity:** Low. By allowing customers to recapture lost queue time, making peak sailings with their long waits more attractive, it could have a negative impact.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Could have an adverse impact with more customers leaving their vehicles if they do not return in time to load the sailing.
- b. **Reduces ticketing time:** Low. No effect.
- c. **Reduces queue lengths:** Low. No effect.
- d. **Improves operating cost per rider:** Low. Has no effect.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Customer impacts:** Medium. Many customers would benefit from this service by allowing them to leave their vehicles if desired.
- 2. **Community impacts:** Medium. Allowing more customers to leave their vehicles could benefit adjacent business districts.
- 3. **Environmental impacts:** Low. No impact.

### III. Implementation and Cost

- 1. **Ease of implementation:** Low. This is a novel concept, and the technology has not been commonly applied to transportation systems such as WSF. Land to vessel transitions, marine environment, vehicle pick-up after crossing are all issues that none of these systems have been designed to accommodate.
- 2. **Capital costs:** High
- 3. **On-going operating cost:** Medium.

## Strategy Evaluation Summaries

### III. Interaction With Other Strategies

3. Does this strategy need other strategies to work? No.
4. Are there other strategies that might compromise this strategy's effectiveness? No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. The capital cost would be prohibitive to system-wide application.
2. **Terminal by Terminal Applicability:** It is unlikely that any single route would see operational benefits from this strategy.
  - a. Mukilteo: Low
  - b. Clinton: Low
  - c. Edmonds: Low
  - d. Kingston: Low
  - e. Bainbridge: Low
  - f. Bremerton: Low
  - g. Colman Dock: Low
  - h. Southworth: Low
  - i. Vashon: Low
  - j. Fautleroy: Low
  - k. Pt. Townsend: Low
  - l. Keystone: Low
  - m. Anacortes: Low
  - n. San Juans: Low
  - o. Pt Defiance: Low
  - p. Tahlequah: Low
3. **What would be a good test route?** No single route lends itself to this strategy in particular. For demonstration purposes, a lower volume route such as Pt. Defiance-Tahlequah would serve best.

### VI. Strategy Disposition

There is little or no need to advance vehicles from the time they enter the queue until it's time to load the vessel, at which time customers must be in their vehicles regardless. It may also pose a security risk if unattended vehicles are able to be loaded onto vessels. This strategy offers little or no benefit compared to the significant cost it would take to implement, and should be screened out.

# Strategy Evaluation Worksheet

**Name:** Congestion Pricing

**Description:** Similar to peak period pricing on airlines, hotels, and even local bus services, WSF would apply a peak period surcharge, or charge higher fares, for vehicle access on to vessels during high-demand times of day, and/or during peak seasons. This could apply to only some routes (corridor-based), or on all routes (system-wide).

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** High. By making it more expensive to drive on during the high demand peak periods, customers will have an incentive to shift mode of access.
- b. **Encourages time shift:** High. Making it more expensive to drive on to ferries during peak times and less expensive where there is available capacity, gives customers an incentive to shift the time they travel.
- c. **Attracts new demand to available capacity:** High. Demand would be diverted to relatively lower cost off-peak sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Assuming auto capacity on vessels would still be full even with peak period pricing, loading and unloading type is probably unaffected.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Medium. By encouraging both time and mode shift, auto queues during peak hours/seasons would be shortened, although queues for off-peak sailings may lengthen.
- d. **Improves operating cost per rider:** High. By attracting walk-on demand to peak sailings, and increased ridership on off-peak sailings, operating cost per rider would fall.

## II. Evaluation of Secondary Screening Criteria:

1. **Customer impacts:** High. There would be negative customer reaction to increased fees for peak period sailings, although at the same time many customers would benefit from potentially shorter queues and wait times for peak period sailings.
2. **Community impacts:** High. Many communities would benefit from potentially shorter queues on the adjacent street network.
3. **Environmental impacts:** High. Shifting mode of access away from SOVs would result in positive air and water quality impacts

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** High. It would not be difficult to charge and collect a peak period surcharge or change the fare structure. Although to be most effective this charge needs to be dynamic. Under current operating practices this would be impractical as the communications necessary between the fare determination mechanism, ticket sellers and customers would be highly problematic. Also the current state of the tariff would require considerable overhaul with specific performance criteria and fare level setting in place to ensure the fares are being set within adopted policy.
2. **Capital costs:** Low.
3. **On-going operating cost:** Low.

### 5. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** The success of this strategy would rely on improved transit service, connections and facilities, and to a lesser degree improved bicycle and pedestrian connections and amenities. It would also help to have an expanded carpool definition to allow unregistered carpools, and additional carpool staging areas. Any additional support for alternate modes of access would bolster this strategy's success, such as carsharing pods, additional parking near terminals, and improved wayfinding and user information for transit users, bicyclists, carpoolers and pedestrians.

It would be beneficial to implement this strategy in concert with other fare changes, such as greater fare differentials for various classes of vehicle and/or passenger vs. auto fares. It would also benefit (see above discussion related to dynamic pricing) from an optimized electronic fare collection system, reservations and E-ticketing.

2. **Are there other strategies that might compromise this strategy's effectiveness?** No

### II. Applicability to Terminals

1. **Potential for System-wide Application:** High. It would be less confusing to the customer to apply peak period pricing as part of system-wide fare changes.
2. **Terminal by Terminal Applicability:** The more auto demand exceeds capacity during peak hours and seasons on routes serving the terminal, the higher the score received.
  - a. **Mukilteo:** High
  - b. **Clinton:** High
  - c. **Edmonds:** High
  - d. **Kingston:** High

## Strategy Evaluation Summaries

- e. **Bainbridge:** High
  - f. **Bremerton:** High
  - g. **Colman Dock:** High
  - h. **Southworth:** High
  - i. **Vashon:** Low. Currently no fares are collected leaving Vashon.
  - j. **Fauntleroy:** High
  - k. **Pt. Townsend:** High (during peak summer season and weekends in shoulder seasons)
  - l. **Keystone:** High (during peak summer season and weekends in shoulder seasons)
  - m. **Anacortes:** High (during peak summer season and weekends most of the year)
  - n. **San Juans:** High (during peak summer season and weekends most of the year). Because fares are not currently collected leaving the islands for Anacortes, there may be little benefit in terms of attracting people to less used sailings, But, it would result in higher revenue generation.
  - o. **Pt Defiance:** Low. Although if pricing is in place on Vashon it would probably be necessary to put it on the Pt. Defiance-Tahlequah route as well to counteract potential traffic diversion effects.
  - p. **Tahlequah:** Low. Currently no fares are collected leaving Tahlequah. Although if pricing is in place on Vashon it would probably be necessary to put it on the Pt. Defiance-Tahlequah route as well to counteract potential traffic diversion effects.
3. **What would be a good test route?** Any route that experiences a large imbalance of auto demand and capacity between peak and off-peak times would be a good test route, including Bainbridge-Seattle,. Edmonds/Kingston, Mukilteo/Clinton, Port Townsend-Keystone, and/or Anacortes-San Juans.

### III. Strategy Disposition

Carry strategy forward for its potential large, system-wide impacts in shifting mode of access at terminals, potential to shift travel to off-peak periods, and environmental benefits—all for relatively low implementation, capital and operating cost.

# Strategy Evaluation Worksheet

**Name:** Increase Parking Capacity at Terminals

**Description:** Increase parking capacity at terminals by building parking structures, lots, or implementing shared parking to capture underutilized nearby parking space.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Making driving an even more convenient mode of access may induce more people to drive to terminals. However, depending on how the parking fee compares to the fare to drive the vehicle on the ferry, the strategy has good potential for reducing the number of customers who drive their vehicle onto vessels.
- b. **Encourages time shift:** Low. Does nothing to encourage people to shift time.
- c. **Attracts new demand to available capacity:** High. Enabling more people to park their vehicles near terminals and walk on to vessels would help fill existing capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No anticipated impact.
- b. **Reduces ticketing time:** Low. No effect.
- c. **Reduces queue lengths:** Medium. More people parking and walking on would help reduce queues.
- d. **Improves operating cost per rider:** Medium. Attracting walk-on demand to existing capacity would help reduce the operating cost per rider.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Customers would enjoy the added choice of leaving their vehicles behind if desired. The cheaper parking is compared to driving the vehicle onto the vessel, the greater the customer convenience benefit.
- 2. **Positive community impact:** Low. Increased infrastructure devoted to parking would likely be seen as a negative community impact by some. If more people are circling local streets in the terminal area looking for parking, this would be seen as a negative impact as well. However, potentially decreased queues would be viewed positively by local communities.
- 3. **Positive environmental impact:** Low. Depending on parking fees, this strategy could induce more people to drive, creating additional air and water pollution in ferry terminal communities.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Shared parking arrangements would require negotiations between WSF, local jurisdictions and local businesses. New parking structures take time and money to build, as well as land use permits.
2. **Capital costs:** Medium. Costs are high in the case of parking structures, medium in the case of new parking lots, and low in the case of shared parking.
3. **On-going operating cost:** Low.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but it would benefit from an integrated parking reservation and pricing system, real time parking capacity information, and improved transit service and connections (for those customers parking their vehicle and needing transit to connect to their destination on the other side).
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. Every terminal has different levels of existing parking and parking demand. It would only be applicable to some terminals.
2. **Terminal by Terminal Applicability:** Routes with strong demand for auto access yet relatively little affordable parking available on one or both ends receive higher scores for applicability.
  - a. **Mukilteo:** High
  - b. **Clinton:** Medium
  - c. **Edmonds:** High
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High
  - f. **Bremerton:** Medium
  - g. **Colman Dock:** Medium
  - h. **Southworth:** Medium
  - i. **Vashon:** Medium
  - j. **Fauntleroy:** Medium
  - k. **Pt. Townsend:** High
  - l. **Keystone:** Medium
  - m. **Anacortes:** High
  - n. **San Juans:** Medium
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low

## Strategy Evaluation Summaries

- 3. What would be a good test route?** Bainbridge Island, since parking demand is definitely strong but supply is limited indicated by existing utilization rates. It would be a good place to test parking strategy impacts on mode of access and queue lengths. Shared parking opportunities exist here.

### VI. Strategy Disposition

This strategy should be carried forward due to its ability to potentially increase the walk-on mode share, attract demand to underutilized passenger capacity, decrease operating cost per rider, and increase customer convenience and choice. To develop detailed parking recommendations by terminal, more information is needed on utilization rates at each parking area, as well as the potential unmet parking demand by terminal, which can be partially gleaned from the results of the WSTC Customer Survey currently underway.

# Strategy Evaluation Worksheet

**Name:** Decentralized Holding

**Description:** Vehicles are ticketed for a specific sailing and are given a time slot to access the on dock holding facility. Outside of the time slot, it is up to drivers to choose where to wait.

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Medium. By making it difficult to find a place to park and wait for the ferry, some users may be deterred from driving on.
- b) **Encourages time shift:** Medium. Regular customers may be discouraged from traveling at peak times if they know they must use the remote holding system, preferring to drive directly onto the terminal in off-peak times.
- c) **Attracts new demand to available capacity:** Medium. Does very little to encourage people to take underutilized off-peak sailings, but by creating more walk-on traffic it may allow better use of existing passenger capacity. There is the potential that this strategy would attract demand to sailings where the remote holding system is not in place..

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. It may even have a negative impact on loading and unloading times if cars are queuing from the adjacent signalized street network rather than from on-dock holding lanes.
- b) **Reduces ticketing time:** Low. No impact on ticketing time.
- c) **Reduces queue lengths:** Medium. Ongoing queues adjacent to terminals would be largely eliminated. However, queues would be dispersed into the community or drivers would not leave their initial origin point until they could approach the terminal, creating the potential for informal queuing areas in local streets, thus creating even longer queues that would back up into the community and adjacent street network at time of loading and unloading, given little or no centralized holding space on or near the dock.
- d) **Improves operating cost per rider:** Medium. May result in an improved operating cost per rider if enough riders switch to walk-on as a result of the added inconvenience.

## II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Low. Customers would be greatly inconvenienced if they were unable to accurately predict travel time to reach the terminal at their appointed entry time. .

## Strategy Evaluation Summaries

- 2) **Positive community impact:** Medium. There could be a negative community impact with additional cars circling on the city streets creating congestion and taking up available parking capacity as their drivers waited for their departure. If parking were abundant and convenient, a positive benefit might be seen with greater local business patronage.
- 3) **Positive environmental impact:** Low. Any potential improvements made by increased walk on access could be negated by circling autos, and related traffic and automobile emissions.

### III) Implementation and Cost

- 1) **Ease of implementation:** High.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** It would achieve maximum benefit if applied in concert with real time arrival and departure information, improved wayfinding, real time parking capacity information and e-ticketing. Decentralized holding would also likely require increased metering of entering and existing vehicles, improved traffic management systems, and possibly increased parking capacity in the greater terminal area.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** Poor wayfinding, limited parking capacity, and substandard traffic management in the terminal community could hamper this strategy's effectiveness.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** Low. Many terminal areas simply could not absorb the traffic and parking demand that would be generated by decentralized holding. Others have ample existing holding capacity and would have little use for this strategy.
- 2) **Terminal by Terminal Applicability:**
  - a) **Mukilteo:** Low
  - b) **Clinton:** Medium
  - c) **Edmonds:** Medium
  - d) **Kingston:** Low
  - e) **Bainbridge:** Low
  - f) **Bremerton:** Medium
  - g) **Colman Dock:** Low
  - h) **Southworth:** Medium
  - i) **Vashon:** Medium

## Strategy Evaluation Summaries

- j) **Fauntleroy:** Low
  - k) **Pt. Townsend:** High
  - l) **Keystone:** Medium
  - m) **Anacortes:** High
  - n) **San Juans:** Medium
  - o) **Pt Defiance:** High
  - p) **Tahlequah:** Low
- 3) **What would be a good test route?** A low-density rural location would be a good test bed, since it would be less susceptible to the negative system-wide traffic impacts of additional vehicles on the road network that a more urban location might experience. Possible test routes may be Port Townsend - Keystone or Anacortes – San Juans, where the strategy could be tested in off-peak hours and/or the low season first.

### VI) Strategy Disposition

Any positive operational effects generated by this strategy would likely be counteracted or overshadowed by a host of negative operational and/or community impacts. At the same time, there are not many terminal locations where the strategy would make good sense due to insufficient parking or already congested street networks, among other factors. This strategy should be retained although considered for only specific locations where communities are readily accepting of people with vehicles looking for some way to use available time .

# Strategy Evaluation Worksheet

**Name:** Optimize Use of Electronic Fare System (EFS)

**Description:** Optimize performance of the Electronic Fare System with full employee training, removal of the requirement to issue paper receipts; and the keeping of electronic rather than manual sales records.

### I) Evaluation Against Primary Screening Criteria:

#### 1) Manages Demand

- a) **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time.
- c) **Attracts new demand to available capacity:** Low. Does nothing to attract new demand to available capacity.

#### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. This strategy does nothing to impact loading and unloading times.
- b) **Reduces ticketing time:** High. Taking steps to optimize the EFS could greatly reduce the average time processing each customer at the tollbooth.
- c) **Reduces queue lengths:** Medium. Moving vehicles more quickly through the ticketing process will result in shorter queues waiting for the ticketing window.
- d) **Improves operating cost per rider:** Low. Although there might be a slight improvement to operating cost per rider due to moving more passengers through more quickly, the difference would be negligible.

### II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. Customers would see quicker processing times as an added convenience.
- 2) **Positive community impact:** Medium. Moving vehicles off adjacent roadways, out of traffic flow, and through the toll booth more quickly constitutes a positive community impact.
- 3) **Positive environmental impact:** Medium. Moving vehicles queuing for the ferry out of the adjacent street network's traffic flow could help relieve nearby congestion hotspots and reduce idling in the terminal area. Getting rid of the need for paper records would reduce the state's paper consumption.

## Strategy Evaluation Summaries

### III) Implementation and Cost

- 1) **Ease of implementation:** Medium. Would require new employee training programs.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No, but it would benefit from having employee reviews linked to ticketing processing time. Also, the use of electronic vehicle transponder systems would complement this strategy to further expedite the ticketing process.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** High.
- 2) **Terminal by Terminal Applicability:** N/A. Would be a system-wide application.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:
- 3) **What would be a good test route?** N/A

### VI) Strategy Disposition

Carry forward due to the strategy's positive operational, customer, community and environmental impacts for a relatively small cost.

## Strategy Evaluation Summaries

# Strategy Evaluation Worksheet

**Name:** Encourage Preferred Payment Methods

**Description:** WSF offers a discount for preferred payment methods, or alternately, a surcharge for non-preferred payment methods.

### I) Evaluation Against Primary Screening Criteria:

#### 1) Manages Demand

- a) **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b) **Encourages time shift:** Low. Does nothing to encourage time shift.
- c) **Attracts new demand to available capacity:** Low. Does nothing to attract new demand to available capacity.

#### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. This strategy does nothing to impact loading and unloading times.
- b) **Reduces ticketing time:** Medium. A portion of customers would switch to preferred payment methods, reducing the average time spent processing each customer at the tollbooth. However, the additional surcharges also serve to complicate the fare system, which may result in more customers questioning the fee and negating any time savings at the ticket window.
- c) **Reduces queue lengths:** Low. The increased portion of customers using preferred payment methods is unlikely to have a noticeable impact on queues.
- d) **Improves operating cost per rider:** Low. There would not be an improvement to operation cost per rider.

### II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Low. Customers would be confused by the further complicated fare structure and take issue to additional fees that only affect certain users. There would likely be widespread negative customer reactions.
- 2) **Positive community impact:** Low. No positive community impacts are likely to result from this strategy.
- 3) **Positive environmental impact:** Low. No environmental impacts are likely to result from this strategy.

### III) Implementation and Cost

- 1) **Ease of implementation:** High.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low

## Strategy Evaluation Summaries

### IV) Interaction With Other Strategies

- 1) Does this strategy need other strategies to work? No.
- 2) Are there other strategies that might compromise this strategy's effectiveness? No.

### V) Applicability to Terminals

1. Potential for System-wide Application: High.
2. Terminal by Terminal Applicability: N/A. Would be a system-wide application.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend:
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance:
  - p. Tahlequah:
3. What would be a good test route? N/A

### VI. Strategy Disposition

This strategy serves to further complicate the fare structure and with its additional surcharges and fees and as a result would likely see resistance from customers, all for negligible operational benefit. The strategy "Limit Payment Forms Accepted" would achieve the same ends with less negative attention from riders. This strategy should be screened out.

## Strategy Evaluation Worksheet

**Name:** Limit Payment Forms Accepted

**Description:** WSF could begin accepting preferred payment methods and cash only

### I) Evaluation Against Primary Screening Criteria:

#### 1) Manages Demand

- a) **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b) **Encourages time shift:** Low. Does nothing to encourage time shift.
- c) **Attracts new demand to available capacity:** Low. Does nothing to attract new demand to available capacity.

#### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. This strategy does nothing to impact loading and unloading times.
- b) **Reduces ticketing time:** High. With reduced payment methods, the average time spent processing each customer at the tollbooth would decrease.
- c) **Reduces queue lengths:** Medium. Moving vehicles more quickly through the ticketing process will result in shorter queues waiting for the ticketing window.
- d) **Improves operating cost per rider:** Low. There would not be an impact to operating cost per rider.

### II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Low. Although reduced methods of payment would be considered a minor inconvenience by most, customers would likely adapt to the new system over time.
- 2) **Positive community impact:** Low. No positive community impacts are likely to result from this strategy.
- 3) **Positive environmental impact:** Low. No positive environmental impacts are likely to result from this strategy.

### III) Implementation and Cost

- 1) **Ease of implementation:** High.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low

## Strategy Evaluation Summaries

### IV) Interaction With Other Strategies

- 1) Does this strategy need other strategies to work? No.
- 2) Are there other strategies that might compromise this strategy's effectiveness? No.

### V) Applicability to Terminals

- 1) Potential for System-wide Application: High.
- 2) Terminal by Terminal Applicability: N/A. Would be a system-wide application.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:
- 3) What would be a good test route? N/A

### VI) Strategy Disposition

Carry forward due to the strategy's positive operational impacts that can be achieved at no, or very little, cost.

# Strategy Evaluation Worksheet

**Name:** Fare Card Coordination – ferries and parking

**Description:** WSF could automate WSF parking access to accept Wave 2 Go or other SmartCard payment.

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Medium. By making terminal area parking easier, this strategy may encourage more people to park and walk on the ferry.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time.
- c) **Attracts new demand to available capacity:** Medium. Making it easier for more people to park their vehicles and walk on to vessels would help fill existing passenger capacity.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. No anticipated impact.
- b) **Reduces ticketing time:** Low. No impact on average ticketing time.
- c) **Reduces queue lengths:** Medium. If sufficient numbers of customers shift to walk-on mode of access, there would be a positive impact on queue length.
- d) **Improves operating cost per rider:** Medium. Attracting walk-on demand to existing capacity would help reduce the operating cost per rider.

## II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impacts:** Medium. Customers would enjoy this added benefit of their Wave2Go cards.
- 2) **Positive community impacts:** Low. Little or no community impact.
- 3) **Positive environmental impacts:** Medium. Encouraging more people to park and leave their vehicles behind would help reduce overall vehicle miles traveled by ferry users, would help shorten queues and decrease associated negative traffic impacts associated with queuing.

## III) Implementation and Cost

- 1) **Ease of implementation:** Medium. Wave2Go already exists, but it would take some time and effort to add the parking feature. It may also require negotiations with private owners of parking adjacent to terminals.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low.

## Strategy Evaluation Summaries

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** Yes, it would require wayfinding so that drivers could find the participating lots.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** Low. Some terminals have little or no parking.
- 2) **Terminal by Terminal Applicability:** Could apply to any terminal with parking, but would be most applicable to terminals where nearby parking is fully or mostly owned by the state.
  - a) **Mukilteo:** Medium. Nearby parking is privately owned.
  - b) **Clinton:** High
  - c) **Edmonds:** Medium. Nearby parking is privately owned or owned by the Port.
  - d) **Kingston:** High
  - e) **Bainbridge:** High
  - f) **Bremerton:** Medium. Nearby parking is privately owned.
  - g) **Colman Dock:** Medium. Nearby parking is privately owned.
  - h) **Southworth:** High
  - i) **Vashon:** High
  - j) **Fauntleroy:** Low. Minimal parking nearby.
  - k) **Pt. Townsend:** Low. Minimal parking nearby.
  - l) **Keystone:** Low. Minimal parking nearby.
  - m) **Anacortes:** High
  - n) **San Juans:** Low. Only one of four San Juan terminals has parking (Orcas, 40 spaces)
  - o) **Pt Defiance:** Medium. Nearby parking is privately owned.
  - p) **Tahlequah:** High
- 3) **What would be a good test route?** A route with high parking demand and where lots are owned by the state, such as Bainbridge Island.

### VI) Strategy Disposition

Carry the strategy forward for its potential mode shift benefit, operational benefits, and positive customer and environmental effects, all at little cost and effort.

## Strategy Evaluation Summaries

# Strategy Evaluation Worksheet

**Name:** Fare Reductions for Commuters

**Description:** WSF expands its existing program by offering a greater discount for monthly or annual passes.

### (1) Evaluation Against Primary Screening Criteria:

#### 1) Manages Demand

- a) **Encourages mode shift:** Low. This only creates even more demand for travel during peak times.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time.
- c) **Attracts new demand to available capacity:** Low. Does nothing to attract demand to existing capacity.

#### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. Does nothing to impact loading time.
- b) **Reduces ticketing time:** Medium. Assuming pass-holders can be processed more quickly, this reduces ticketing time.
- c) **Reduces queue lengths:** Low. No effect.
- d) **Improves operating cost per rider:** Low. Has no effect.

### II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. Regular users would benefit financially.
- 2) **Positive community impact:** Low. No community impacts.
- 3) **Positive environmental impact:** Low. No impact.

### III) Implementation and Cost

- 1) **Ease of implementation:** High.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

## Strategy Evaluation Summaries

### V) Applicability to Terminals

1) **Potential for System-wide Application:** High. This would be a system-wide strategy.

2) **Terminal by Terminal Applicability:** N/A.

- a) Mukilteo:
- b) Clinton:
- c) Edmonds:
- d) Kingston:
- e) Bainbridge:
- f) Bremerton:
- g) Colman Dock:
- h) Southworth:
- i) Vashon:
- j) Fautleroy:
- k) Pt. Townsend
- l) Keystone
- m) Anacortes
- n) San Juans
- o) Pt Defiance
- p) Tahlequah

3) **What would be a good test route?** No single route lends itself to this strategy in particular. For demonstration purposes, a lower volume route such as Pt. Defiance-Tahlequah would serve best.

### VI) Strategy Disposition

Screen out. This strategy only increases peak-period demand for auto access onto ferries and has very little operational benefit. It also has the potential to lower overall system revenues, unless enough new riders are gained due to the lower cost for frequent users.

# Strategy Evaluation Worksheet

**Name:** Fare Surcharges for Premium Access

**Description:** WSF offers a monthly or annual pass guaranteeing drive-on access to any vessel at any times for a premium rate. Similarly, WSF could offer a special tourist pass guaranteeing drive-on access to any vessel at any time for a premium rate.

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Low. This only creates an incentive for people to drive on (at least for those who can afford it).
- b) **Encourages time shift:** Low. Attracts additional demand to sailings already experiencing high demand levels.
- c) **Attracts new demand to available capacity:** Low. Attracts additional demand to sailings already experiencing high demand levels.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. Does nothing to impact loading.
- b) **Reduces ticketing time:** Low. No impact.
- c) **Reduces queue lengths:** Low. If anything, this strategy may create even longer queues for high demand sailings.
- d) **Improves operating cost per rider:** Low. No impact.

## II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. Users in the higher economic strata would enjoy this benefit, but at the same time it creates longer queues for everyone else and would likely be seen as inequitable by many.
- 2) **Positive community impact:** Low. No impact.
- 3) **Positive environmental impact:** Low. No impact.

## III) Implementation and Cost

- 1) **Ease of implementation:** Low. It would be challenging to properly communicate to the public about this strategy, and it would be very difficult to integrate this strategy with reservations and congestion pricing schemes.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low.

## Strategy Evaluation Summaries

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** Reservation systems would negate the need for this strategy, since they also provide guaranteed access onto sailings for a fee. Congestion pricing also partially serves the same function, in that it charges a premium fee for individuals wanting to ride high-demand sailings. The difference between congestion pricing and fare surcharges for premium access is that under congestion pricing, all people trying to ride high demand sailings would be impacted similarly.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** High. It would probably be easiest and simplest to apply this system-wide.
- 2) **Terminal by Terminal Applicability:** N/A
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:
- 3) **What would be a good test route?** N/A

### VI) Strategy Disposition

Screen out. This strategy would be viewed as inequitable by the public and brings very few, or even negative, benefits in terms of mode and time shift. Congestion pricing is a much more promising strategy and would bring larger, system-wide benefits.

## Strategy Evaluation Worksheet

**Name:** Round Trip Ticketing

**Description:** Begin selling round-trip vehicle fares, possibly with a fare discount for those opting for round-trip purchase. Round trip tickets could also entitle holders to priority boarding on one or both legs of their trip (i.e. HOT lane access, or queue jump lane through toll booth area).

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. Added convenience for vehicles could even have an adverse impact by encouraging more drive-ons.
- b. **Encourages time shift:** Low. Little or no impact on time shift. In fact, the added convenience to drive on and added guarantee of getting on the return ferry could attract more vehicle demand to some routes during peak times.
- c. **Attracts new demand to available capacity:** Low. Does nothing to attract new demand to available capacity.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact
- b. **Reduces ticketing time:** High. With round-trip tickets more people could pass through the tollbooth via a queue jump lane where they electronically scan their ticket.
- c. **Reduces queue lengths:** Medium. Moving vehicles more quickly through the ticketing process will result in shorter queues waiting for the ticketing window.
- d. **Improves operating cost per rider:** Low. There would not be an impact to operating cost per rider.

### II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** High. Many customers would see round-trip ticketing as an added convenience.
2. **Positive community impact:** Medium. Moving vehicles off adjacent roadways, out of traffic flow, and through the toll booth more quickly constitutes a positive community impact.
3. **Positive environmental impact:** Medium. Moving vehicles queuing for the ferry out of the adjacent street network's traffic flow could help relieve nearby congestion.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Would require integration with enhanced electronic record-keeping as well as any reservation and e-ticketing systems.
2. **Capital costs:** Low
3. **On-going operating cost:** Low

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes, it would require an optimized electronic fare system so up-to-date records can be referenced to check space on future sailings before selling return tickets. It would greatly benefit by being integrated with a reservation system and electronic ticketing. In fact this might be the only effective way to control demand for return trips in the San Juan Islands without establishing ticket sales in the islands.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend
  - l. Keystone
  - m. Anacortes
  - n. San Juans
  - o. Pt Defiance
  - p. Tahlequah

## Strategy Evaluation Summaries

- 3. What would be a good test route?** A route with lower demand would be best (i.e. Pt. Defiance-Tahlequah) to observe impacts before applying to higher demand routes with more extreme peaks.

### VI. Strategy Disposition

This strategy should be carried forward for its ability to speed ticketing times and reduce ticket booth queues, added customer convenience, and its interoperability with reservation systems and e-ticketing. However, care should be taken in its application since it has the potential to create mode shift towards auto access. Being able to purchase a ticket for the return leg of the trip hours or even days in advance is similar to a reservation, a premium service which should cost more rather than be discounted. Also, if round-trip ticketing is combined with priority loading this would be an added incentive to drive on unless it is counteracted with an appropriately high fee for the premium service, which shouldn't necessarily be linked to round-trip ticketing but comprises a separate strategy (see *Fare Surcharges for Premium Access, HOT Lanes, and HOT Sailings*).

# Strategy Evaluation Worksheet

**Name:** Tandem Ticketing

**Description:** Booths could be added to each ticket lane, to allow two vehicles in each lane would be processed simultaneously.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. No impact on mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage people to shift time
- c. **Attracts new demand to available capacity:** Low. No impact.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact
- b. **Reduces ticketing time:** Medium. With tandem ticketing more people could potentially pass through the tollbooth line more quickly, but this potential benefit would be partially diminished in the case where the front car takes longer to ticket, delaying the back car as well.
- c. **Reduces queue lengths:** Medium. Moving vehicles more quickly through the ticketing process will result in shorter queues waiting for the ticketing window. Again, this benefit relies on both cars being processed at the same rate. If the front car takes longer and holds up the rear car, some of the queue length benefit could be negated.
- d. **Improves operating cost per rider:** Low. This strategy would increase operating cost per rider with the added staff needed to operate tandem ticketing.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Many customers would view the shorter ticket line queues as a benefit.
- 2. **Positive community impact:** Medium. Moving vehicles off adjacent roadways, out of traffic flow, and through the toll booth more quickly constitutes a positive community impact.
- 3. **Positive environmental impact:** Medium. Moving vehicles queuing for the ferry out of the adjacent street network's traffic flow could help relieve nearby congestion.

## III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Gaining enough extra space in the terminal area for added tollbooths could be problematic in some locations.

## Strategy Evaluation Summaries

- 2. Capital costs:** Medium. New tollbooths will require moderate capital investment.
- 3. On-going operating cost:** Medium. New tollbooth attendants would be needed to support this strategy.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** Low. This strategy will require extra space at terminals to locate the additional booth(s) and new vehicle access lane(s), and each terminal has different holding and ticket booth space issues.
- 2. Terminal by Terminal Applicability:** Terminals with apparent extra space to accommodate new toll booths receive higher ratings.
  - a. Mukilteo:** Low
  - b. Clinton:** High
  - c. Edmonds:** High
  - d. Kingston:** High
  - e. Bainbridge:** High
  - f. Bremerton:** High
  - g. Colman Dock:** High
  - h. Southworth:** High
  - i. Vashon:** N/A- no tolls collected at Vashon
  - j. Fauntleroy:** Medium
  - k. Pt. Townsend:** High
  - l. Keystone:** Low
  - m. Anacortes:** High
  - n. San Juans:** N/A- no tolls collected on San Juans
  - o. Pt Defiance:** Medium
  - p. Tahlequah:** N/A- no tolls collected at Tahlequah
- 3. What would be a good test route?** A medium volume route would make good sense for testing this strategy, such as Edmonds-Kingston. A good approach might be to implement tandem ticketing in only one ticket line to start, and compare how many passengers the tandem line processes compared to the non-tandem line.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

The strategy should be advanced due to its potential to reduce ticketing time and ticket line queues, but given the capital and operating costs associated with it, should be piloted in one or two locations to assess impacts before applying it more broadly. This strategy would be most helpful in a scenario where the processing time for autos entering the terminals would be more equalized. Currently the differential from one car to the next from one transaction to the next is far too high at nearly every location to make this a practical application. However, if nearly every vehicle has already completed the fare transaction prior to reaching the terminal, and the process is one of checking in the car or checking against a reservation system, this could prove to be a useful way to add processing ability with out adding more lanes approaching the terminal entrance area. Under the current method of terminal operations, this strategy has little positive benefit.

# Strategy Evaluation Worksheet

**Name:** Link employee reviews to ticketing processing times.

**Description:** Evaluate employees based on how efficiently they serve customers and load and offload boats

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time.
- c) **Attracts new demand to available capacity:** Low. Does nothing to attract new demand to available capacity.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. This strategy does nothing to impact loading and unloading times.
- b) **Reduces ticketing time:** Medium. This strategy encourages employees to decrease the average time they spend processing customers at the tollbooth.
- c) **Reduces queue lengths:** Medium. Moving vehicles more quickly through the ticketing process will result in shorter queues waiting for the ticketing window.
- d) **Improves operating cost per rider:** Low. Although there might be a slight improvement to operating cost per rider due to moving more passengers through more quickly, the difference would be negligible.

## II) Evaluation Against Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. Customers would see quicker processing times as an added convenience.
- 2) **Positive community impact:** Medium. Moving vehicles off adjacent roadways, out of traffic flow, and through the toll booth more quickly constitutes a positive community impact.
- 3) **Positive environmental impact:** Medium. Moving vehicles queuing for the ferry out of the adjacent street network's traffic flow could help relieve nearby congestion.

## III) Implementation and Cost

## Strategy Evaluation Summaries

- 1) **Ease of implementation:** Medium. It would rely on new/updated employee training in EFS and ticketing procedures. This would also be considered a change in working conditions and would require negotiations to be included in employee expectations. While it would not necessarily require inclusion in contract language, there would have to be a memorandum of understanding about how this strategy is to be employed and to ensure equal application.
- 2) **Capital costs:** Low.
- 3) **On-going operating cost:** Low.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No, but it would greatly benefit from optimization of the Electronic Fare System, elimination of the need for paper records and receipts, and most importantly, employee training in EFS.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** High.
- 2) **Terminal by Terminal Applicability:** N/A. Would be a system-wide application.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:

- 3) **What would be a good test route?** N/A

### VI) Strategy Disposition

Carry forward due to the strategy's positive operational, customer, community and environmental impacts for a relatively small cost. Although if systems were employed

## Strategy Evaluation Summaries

that essentially eliminate auto level ticketing sales at terminals, application would be limited.

# Strategy Evaluation Worksheet

**Name:** Extended ferry schedule

**Description:** Implement more frequent early morning, mid-day, and late-night ferries to help “flatten” the existing peak demand curves.

### I) Evaluation Against Primary Screening Criteria:

#### 1) Manages Demand

- a) **Encourages mode shift:** Low. In fact, by flattening the peak hour demand curve, it could lead more people to choose auto access.
- b) **Encourages time shift:** Medium. More choice in sailings would lead to demand shifting more evenly among various sailings.
- c) **Attracts new demand to available capacity:** Low. This doesn’t do much to attract new demand to existing capacity.

#### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. No anticipated impact.
- b) **Reduces ticketing time:** Low. No effect.
- c) **Reduces queue lengths:** Medium. With added sailings in or flanking the peak periods, demand would be siphoned off of the highest demand sailings, reducing queue lengths on those “peak of peak” sailings.
- d) **Improves operating cost per rider:** Low. More sailings will significantly increase operating costs and lead to increased operating costs per rider.

### II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impact:** High. Customers would enjoy the increased level of service.
- 2) **Positive community impact:** Medium. There may be shorter queues for the “peak of the peak” sailings, which removes traffic from the adjacent street network during critical times. However, at the same time added service would add ferry traffic at new times of the day.
- 3) **Positive environmental impact:** Low. Increased level of service and sailings ups creates added fuel consumption and emissions.

### III) Implementation and Cost

- 1) **Ease of implementation:** Low. Added sailings require potentially more vessels and crews and revised service schedules.
- 2) **Capital costs:** Low, assuming the existing fleet could be used for additional sailings.

## Strategy Evaluation Summaries

- 3) **On-going operating cost:** High. Added service necessitates additional labor hours and fuel.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No, but it could be viewed as a variation on, *Reorient Basic System Design*.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** Low. Each route has a different demand curve so it would be applied on a route by route basis.
- 2) **Terminal by Terminal Applicability:** Routes with the strongest peak-period demand are deemed most appropriate for application of this strategy.
  - a) **Mukilteo:** Medium
  - b) **Clinton:** Medium
  - c) **Edmonds:** Medium
  - d) **Kingston:** Medium
  - e) **Bainbridge:** High
  - f) **Bremerton:** High
  - g) **Colman Dock:** High
  - h) **Southworth:** Medium
  - i) **Vashon:** Medium
  - j) **Fauntleroy:** Medium
  - k) **Pt. Townsend:** High (peak season)
  - l) **Keystone:** High (peak season)
  - m) **Anacortes:** High (peak season)
  - n) **San Juans:** High (peak season)
  - o) **Pt Defiance:** Low
  - p) **Tahlequah:** Low
- 3) **What would be a good test route?** Bainbridge-Seattle, since this has some of the highest peak-hour demand in the system. Alternately, it could be tested on the Port Townsend and/or San Juans routes during high season.

### VI) Strategy Disposition

This strategy should be carried forward due to its ability to shift the time people travel and reduce peak period queues at high demand locations. However, due to the high capital and operating costs associated with it, careful attention will need to be paid to size of vessel needed for any new service. The strategy also needs to be considered carefully in tandem with, or folded into the strategy *Reorient Basic System Design* which achieves many of the same benefits.

# Strategy Evaluation Worksheet

**Name:** Remote Holding

**Description:** Store vehicles waiting for the ferry in a designated storage area near the terminal rather than in traffic lanes leading to or at the terminal.

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Low. No incentive to shift from auto to another mode. May have the opposite effect by clarifying vehicle access process.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time, and eases the possible deterrent of high vehicle congestion on near-to-terminal streets even during peaks.
- c) **Attracts new demand to available capacity:** Low. Does nothing to encourage people to take off-peak sailings.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. Crew will still need to guide the same number of vehicles on and off the boats and direct vehicle movement from remote holding to the dock. Unloading time may improve if travel time out onto nearby streets is significantly reduced due to removal of the on-street vehicle queues.
- b) **Reduces ticketing time:** Low. Unless coupled with new, more efficient ticketing technologies, ticketing time will remain the same as the same number of drivers (or more) need to pay.
- c) **Reduces queue lengths:** Medium. Drivers waiting at a remote holding area do reduce the linear length of queues in on-street lanes. Still, overall wait time would not be reduced because vehicles are simply displaced from on-street traffic queues into the holding area.
- d) **Improves operating cost per rider:** Low. Additional operating costs will be incurred due to the new staffing and monitoring processes needed to direct traffic from the remote holding area.

## II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. At first, drivers may have difficulty while learning the new queuing process, and may be disoriented if they cannot see ferry arrivals and departures while in the holding area. But, the system may improve driver experience by reducing time spent in long street queues, and remove swaths of vehicles from streets, shoulders, and the dock that otherwise interrupt or constrain bicycle and pedestrian movements.

## Strategy Evaluation Summaries

- 2) **Positive community impact:** Medium. Removing ferry queues from the streets will reduce traffic impacts on the community.
- 3) **Positive environmental impact:** Low. No real mode shift benefit. May have moderate positive air quality impact if drivers spend less time idling or making the stop-and-go movements characteristic of queuing.

### III) Implementation and Cost

- 1) **Ease of implementation:** Low. Land must be acquired for remote holding areas, and staff and passengers re-trained to use the new queuing system.
- 2) **Capital costs:** High, especially if land must be purchased. Creating remote holding areas would involve construction, possibly including new pavement and signage, curb cuts or roadway realignments, and/or toll booth relocation.
- 3) **On-going operating cost:** High, with increased staffing to sort vehicles (e.g., staging HOV, large trucks, and motorcycles separately) and guide traffic from holding area to the dock. In locations where Washington State Patrol officers are hired to monitor off-dock traffic, savings may be achieved if long queues are eliminated and fewer officers needed.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No, though moving ticketing booths to the remote holding area, revamped ticketing procedures to make ticketing time faster, or real-time wait-time information may make this strategy more attractive as part of a comprehensive remote holding system.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** Low. It is unlikely that any single route would see operational benefits from this strategy, and the capital and ongoing operational cost would be prohibitive to system-wide applications.
- 2) **Terminal by Terminal Applicability:** All are low.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:

## Strategy Evaluation Summaries

- k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:
- 3) **What would be a good test route?** No single route lends itself to this strategy in particular. Port Townsend may offer an opportunity for a demonstration, as WSF is already planning to create a new remote holding area for 80 cars to serve this terminal.

### **VI) Strategy Disposition**

Screen out. The operational benefit is negligible, and both capital and operational costs are high. Screen out in favor of real-time information, parking consolidation, re-oriented basic system design, and revamped ticketing operations that could also reduce queue lengths (the only significant benefit of remote holding).

# Strategy Evaluation Worksheet

**Name:** Remote Ticketing

**Description:** Tickets could be sold and received in a remote holding location. Vehicles entering on-dock holding or loading would already be ticketed.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Low. Does nothing to encourage people to take off-peak sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Drivers already pay and are ticketed before entering on-dock holding, so ticketing time and location have no effect on actual loading time.
- b. **Reduces ticketing time:** Low. Again, the same amount of time is required for ticketing before on-dock holding or before remote holding.
- c. **Reduces queue lengths:** Medium. However, this is mainly a result of the necessary remote holding area that removes queues from streets.
- d. **Improves operating cost per rider:** Low. Employees will still need to oversee ticketing, the toll booths will just be moved off-terminal. Due to the remote holding, new operating costs will be incurred to sort and direct vehicles from the remote area to the terminal.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Low. Drivers will have the same experience paying in a remote ticketing area as paying at an on-dock tollbooth.
- 2. **Positive community impact:** Medium, due to removing ferry vehicle queues from the street into the remote holding area and reducing impacts on traffic congestion.
- 3. **Positive environmental impact:** Low. No mode shift benefit, no change in the amount of vehicle idling time during ticketing.

## III. Implementation and Cost

- 1. **Ease of implementation:** Low. While simply moving tollbooths and continuing current ticketing procedures is relatively easy, this strategy depends on the complicated acquisition and construction of remote holding areas.

## Strategy Evaluation Summaries

2. **Capital costs:** Low. However, capital costs related to remote holding are high.
3. **On-going operating cost:** Low. Same level of staffing needed for ticketing. However, operating costs for the entire remote holding process are high.

## IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** This strategy by definition depends on the acquisition, construction, and operation of a remote holding area. Making other changes to ticketing technology and procedures would have an actual benefit to customer service and operating cost that remote ticketing alone does not offer.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

## V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. It is unlikely that any single route would see operational benefits from this strategy, and the capital and ongoing operational costs of remote holding would be prohibitive to system-wide applications.
2. **Terminal by Terminal Applicability:** All are low.
  - a. **Mukilteo:**
  - b. **Clinton:**
  - c. **Edmonds:**
  - d. **Kingston:**
  - e. **Bainbridge:**
  - f. **Bremerton:**
  - g. **Colman Dock:**
  - h. **Southworth:**
  - i. **Vashon:**
  - j. **Fauntleroy:**
  - k. **Pt. Townsend**
  - l. **Keystone**
  - m. **Anacortes**
  - n. **San Juans**
  - o. **Pt Defiance**
  - p. **Tahlequah**
3. **What would be a good test route?** No single route lends itself to this strategy in particular. Port Townsend may offer an opportunity for a demonstration, as WSF is already planning to create a new remote holding area for 80 cars to serve this terminal, and remote ticketing procedures could be added to the pilot.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

Screen out. The operational benefit is negligible, as ticketing at a remote holding area is essentially the same operationally as ticketing at an on-dock holding area. Capital and operational costs are high for creating the remote holding area itself. Screen out in favor of revamped ticketing operations that would allow more efficient fare verification, such as transponders; policies that will streamline payment procedures, such as accepting limited forms of payment or automating EFS record keeping; or technology that allows ticket purchase before leaving home or work, such as pre-paid reservations or e-ticketing.

# Strategy Evaluation Worksheet

**Name:** Re-orient Basic System Design

**Description:** Purchase larger amount of smaller vessels with lower vehicle capacity on each vessel. Offer increased number of sailings to meet the vehicle demand.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Greater sailing frequencies may encourage drive-on ridership as drivers would not have to wait as long between boats in order to get the next boat. However, greater frequency would offer more support compared to today for the use of transit, bike, or walking to access the ferry dock, as these riders need not be as concerned with arriving at a specific time in order to avoid the risk of missing a ferry and waiting an hour or more for the next sailing.
- b. **Encourages time shift:** Medium. Many more options for departure time allow for more flexible schedules. Less time will be spent waiting if one sailing is missed. In addition, where it may not be possible for many people to change their work start and stop times by an hour or more in order to catch an earlier or later ferry, smaller schedule shifts may be possible. (i.e., instead of arriving at work at 9AM, a passenger may be able to start at 9:30AM, whereas the necessity of delaying arrival to 10AM due to long headways may preclude choosing a later sailing.)
- c. **Attracts new demand to available capacity:** Medium. This strategy may support mode shift which leads to more walk-ons, but drivers will also benefit from increased frequencies. Allowing for more frequent sailings all day lends more convenience to mid-day sailings, which can support choosing mid-day, off-peak travel times.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** High. Lower-capacity boats mean fewer vehicles moving on and off during each stop, reducing dwell time.
- b. **Reduces ticketing time:** Low. Though a significant shift away from vehicular modes could reduce ticketing time, this strategy would not have a large effect without other changes to ticketing procedures.
- c. **Reduces queue lengths:** High. Moving vehicles in and out of the holding area with greater frequency reduces the queue for any individual run. For example, if frequency is increased from hourly to every half-hour, queue lengths may be reduced by up to half as fewer vehicles need storing through the wait time between vessels.
- d. **Improves operating cost per rider:** Low. Though smaller vessels require smaller crews, a greater number of vessels would require more individual crews. Reduced vehicle queues may reduce the number of staff

## Strategy Evaluation Summaries

needed to sort and direct traffic flow. Greater sailing frequency may balance out the fuel cost savings of using smaller vessels, depending on multiple variables (i.e., actual vessel fuel efficiency, distance traveled, and number of trips per day).

### II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** High. Greater frequency gives ferry customers more options in terms of travel times and mode of access to the terminal, significantly reduces wait times between vessels, and specifically improves customer service and user experience for passengers arriving via non-motorized modes and transit.
2. **Positive community impact:** High. Reduces ferry vehicle queues congesting neighboring streets and lowers the traffic pulse during unloading.
3. **Positive environmental impact:** Low. The environmental impacts will be low if greater sailing frequencies counteract the fuel savings of using smaller vessels. However, environmental benefits may be achieved by making targeted decisions about vessel fuel efficiency, and reducing the amount of time drivers spend idling and making start-and-stop movements in long queues.

### III. Implementation and Cost

1. **Ease of implementation:** Medium. While vessel acquisition will take time and significant investment, WSF staff re-training should be minimal as the same basic loading and unloading procedures can be scaled for smaller vessels.
2. **Capital costs:** High. Vessel acquisition costs, possible terminal retrofitting.
3. **On-going operating cost:** Medium. Will depend on whether additional staff are needed for smaller but more crews, how fuel efficient the smaller boats are, and whether the number of employees assigned to sort and direct large pulses of loading and unloading vehicles can be reduced. In locations where Washington State Patrol officers are hired to monitor off-dock traffic, savings may be achieved if long queues are eliminated and fewer officers needed.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but streamlined ticketing procedures and would significantly improve customer experience and confidence with more frequent sailings. The quality and convenience of bike, pedestrian, and transit connections will directly affect the amount of mode shift that is possible related to this strategy.
2. **Are there other strategies that might compromise this strategy's effectiveness?** In the event that ticketing procedures and fare verification times became so slow that ticketing cannot keep up with loading, the benefits achieved through more frequent sailings would decline if vehicles are stuck at tollbooths and boats leave less than full.

## Strategy Evaluation Summaries

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. This strategy is being advanced as a system-wide application and will be most beneficial on routes and runs with highest demand, large vehicle surges, and long vehicle queues under current conditions.
2. **Terminal by Terminal Applicability:** High for all. Terminals with higher peak season demand and surges will experience the most benefit during that season.
  - a. **Mukilteo:** High (especially during peak season)
  - b. **Clinton:** High (especially during peak season)
  - c. **Edmonds:** High
  - d. **Kingston:** High (especially during peak season)
  - e. **Bainbridge:** High
  - f. **Bremerton:** High
  - g. **Colman Dock:** High
  - h. **Southworth:** High
  - i. **Vashon:** High
  - j. **Fauntleroy:** High
  - k. **Pt. Townsend:** High
  - l. **Keystone:** High (especially during peak season)
  - m. **Anacortes:** High (especially during peak season)
  - n. **San Juans:** High (especially during peak season)
  - o. **Pt Defiance:** High
  - p. **Tahlequah:** High
3. **What would be a good test route?** All routes offer an opportunity for pilot projects, but the Bainbridge to Seattle route may be the most immediately successful and highly beneficial test.

### VI. Strategy Disposition

Advance for study as a system-wide application due to the high operational benefits for customers, WSF, and neighbor communities, and the efficiencies of acquiring, staffing, and maintaining smaller vessels system-wide.

# Strategy Evaluation Worksheet

**Name:** Reorganize the Flow and Lane Usage

**Description:** Load and store vehicles in the staging area in such a way as to maximize use of space and minimize vehicle movement.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. May improve conditions for cyclists also navigating the staging area, but otherwise no effect on mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Low. Does nothing to encourage off-peak sailings or walk-on passengers. In fact, by improving flow conditions that are worst at peak times, this strategy may reduce the existing 'time penalty' for traveling at peak times, and therefore potentially discourage off-peak travel.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Medium. Can reduce loading time at terminals where loading procedures differ for drivers, HOV, motorcycles, and cyclists (for example, Fauntleroy's extremely confusing loading process); where vehicles must essentially stage twice by shifting into new lanes (as at Bainbridge); or where maximizing the use of space may allow for adding dedicated, safe, and clear pedestrian or bicycle access routes.
- b. **Reduces ticketing time:** Low. No change to ticketing procedures.
- c. **Reduces queue lengths:** Medium. Maximizing the use of space in the staging area can increase the vehicle holding capacity and move more cars out of on-street queues.
- d. **Improves operating cost per rider:** Low. No real impact, except in reduced labor costs if these changes allow for the redeployment of personnel managing the vehicle circulation/staging areas.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Reorganizing staging areas to clarify loading procedures will improve the usability of the ferry system for all vehicle passengers, including new riders who have never boarded the ferry before.
- 2. **Positive community impact:** Low. May reduce on-street vehicle queues that impact neighborhood traffic, but maximizing the use of space in the staging area is unlikely to open up a significant amount of additional capacity for cars.
- 3. **Positive environmental impact:** Low. No effect on mode shift. May slightly reduce the amount of vehicle idling time and fuel usage to make on-dock movements.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** High. WSF and dock employees must be willing to change long-held procedures, and drivers must learn slightly adjusted loading patterns, but overall this is an easily implemented strategy with no costly physical or capital changes necessary.
2. **Capital costs:** Low. At most, may require a change in painted lane markings or signage.
3. **On-going operating cost:** Low. No additional staff needed, and may allow for redeployment of staff in some instances; simply retrain current employees on the adjusted holding pattern.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** In many cases, employee parking on the dock constrains holding patterns and leads to complicated flow and lane usage patterns. Employee parking may need to be removed, reduced, or shifted in order to accomplish flow and lane usage reorganization.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. This strategy may only apply at terminals with confusing or constrained circulation patterns or staging areas, especially those where the current configuration requires additional personnel to manage and therefore results in increased labor costs.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** High
  - b. **Clinton:** Low
  - c. **Edmonds:** Medium
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High
  - f. **Bremerton:** Low
  - g. **Colman Dock:** Medium
  - h. **Southworth:** Medium (especially as relates to transit access and vehicles that must load backwards)
  - i. **Vashon:** Low
  - j. **Fauntleroy:** High (though here, the problem is more due to space constraints rather than how the available space is used)
  - k. **11. Pt. Townsend:** Medium
  - l. **Keystone:** Medium
  - m. **Anacortes:** Low
  - n. **San Juans:** Low

## Strategy Evaluation Summaries

- o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** The Bainbridge Island terminal employs a uniquely complex staging process. HOV vehicles must drive around the perimeter to access priority lanes (4 through 6). Once a boat is full, vehicles remaining in the last staging lanes are directed to make on-dock movements and refill the first lanes before any new cars are let in. During this movement, all ticket sales must stop. Careful change in lane assignment and alternating loading order can address these problems. This makes Bainbridge a good candidate for a test.

### VI. Strategy Disposition

Suspend for future consideration if needed, on a terminal-by-terminal basis. Overall, the operational benefit of this strategy is small, as only very small improvements in capacity and loading time may be achieved, and any benefits may not be significant enough to be noticeable by customers.

# Strategy Evaluation Worksheet

**Name:** Reservation Systems

**Description:** Passengers buy a vehicle fare for a specific sailing and for a specific vehicle. Reservations are made at automated walk-up kiosks, over the phone, or online. Kiosks at ferry terminals, the airport, and various other locations (including possibly on board) would immediately issue a ticket for the selected sailing. This assumes there is a computerized system capacity available to track tickets sold by all kiosks. Phone sales could be automated with voice recognition technology or handled by WSF staff acting as ticket agents. For phone and online sales, an electronic record of license plate numbers with reservations is kept and verified before access to the terminal is granted. An alternative to using staff to verify license plates is installing camera technology that matches license plate numbers to the electronic record. The technology sends a bill to each driver whose license plate does not match the reservations record for that sailing.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b. **Encourages time shift:** High. Shows passengers an obvious limit on the capacity of each sailing and makes clear the extent of peak demand. With a reservation, motorists know exactly which sailing they will ride and need not arrive at the terminal hours early to ensure a desired departure time. Passengers will also be better able to plan for off-peak sailings when they can be certain of getting a spot on a specific boat and confident about the time they will arrive at their destination terminal. Coupling this strategy with demand-responsive pricing would emphasize the financial cost of peak period travel to passengers and encourage even greater shifts to lower-priced off-peak sailings.
- c. **Attracts new demand to available capacity:** High. By making clear the delay and capacity limitations involved in traveling during peak periods, reservations systems encourage motorists and freight drivers who do not need to travel during the high peak to travel when there is more available capacity. As with 1.b. above, this effect will be strengthened if reservations are coupled with demand-responsive pricing.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Does not reduce the time needed to load any individual vehicle.
- b. **Reduces ticketing time:** High. Ticketing may be done before motorists ever arrive at the dock, or may be done automatically using cameras at the terminal. The more automated the fare verification system, the greater the ticketing time savings. Removing toll gates entirely and relying on

## Strategy Evaluation Summaries

automatic license plate and transponder billing would most reduce ticketing time.

- c. **Reduces queue lengths:** High. Vehicles without a reservation would be less likely to arrive during peaks and cause disruptive and inefficient queuing backups on neighboring streets. In order to discourage drivers from arriving early to take their chances with stand-by, an extra fee should be applied to non-reservation tickets.
- d. **Improves operating cost per rider:** Medium. Removes the need for on-site tollbooth employees, especially if cameras are used to verify fare payment using license plates. Personnel who would otherwise staff tollbooths or direct off-site traffic or queues can be redeployed. Ridership should increase, as people who are today discouraged by the long queues and unpredictable wait times become new paying passengers. Increased services will be necessary to administer the reservation system (i.e., machines, software, quality control), but much of the work can be automated, and overall, labor costs will decline. Careful planning is necessary to balance the number of reserved spaces and standby spaces reserved per sailing, and set appropriate fees for reservation, standby, and non-reservation passengers to ensure that boats do not leave less-than-full and negatively impact revenue and efficiency.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** High. Improves reliability and convenience, reduces long delays and time spent waiting, and especially builds better customer service for regular ferry riders. May decrease customer service for infrequent riders who may not be able to get a reservation during high-demand commute peaks or who may arrive unaware of the reservation system and be turned away from fully reserved sailings. Overall, should significantly increase ridership by eliminating long wait times, making departure and arrival times predictable, and improving the quality of peak-time travel.
- 2. **Positive community impact:** High. Reduces queuing and the ferries' impact on traffic congestion. Opens up routes to businesses and homes. May result in traffic pulses just before departure times, but reduces overall traffic surges and congestion peaks during high-demand periods. Could provide additional economic development for host communities, as customers will know the exact departure time of the boat they will be on and will be a "captive market" for local businesses (rather than sitting in their vehicles on the dock as under the current system).
- 3. **Positive environmental impact:** Medium. Can reduce emissions by reducing the amount of time drivers spend idling or sitting in stop-and-go queue traffic.

## III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Requires analysis to select an appropriate system and time to purchase and install new equipment/software, hire and train staff, and educate customers. Some passengers may oppose implementation of a reservation system if they feel it imposes a constraint on their ability to ride a ferry spontaneously, if regular riders feel they should receive greater priority over

## Strategy Evaluation Summaries

- infrequent riders, or if infrequent riders perceive competition with regular riders to obtain reservations.
- 2. Capital costs:** Medium costs to select, purchase, and install the most user-friendly and cost-effective reservation ticketing and enforcement technology and to train staff. Capital costs would be lower for phone reservations than for on-line or kiosk systems. Importantly, reducing queues would avoid major capital costs by eliminating the need to expand holding area capacity. Expanding holding areas would involve extremely costly construction and increased environmental concerns especially for over-water holding. Constructing new on-land holding areas would require and high land costs and result in loss of opportunities for revenue-supportive ferry-oriented development.
  - 3. On-going operating cost:** Low. Costs for staff to monitor and administer the new systems can be offset by the reduction in labor costs as a result of simplifying and automating most of the ticketing process. Staff currently dedicated to taking tickets or managing off-site traffic and queues could be redeployed. For this and other technology strategies, ongoing operating costs could additionally be reduced through contract agreements in which the vendor is required to install and maintain the technology, perhaps as part of a revenue sharing agreement. In this way, up-front costs can be spread out over time, and these annualized costs may be lower than the labor costs (salary + benefits) for otherwise necessary fare collection and technology maintenance personnel.

## IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** Demand-responsive pricing is essential to make the reservation system fully effective at balancing variable demand with the vessels' fixed capacity. The strategy will be most cost- and time-efficient if supported with technology that automates the ticketing process (e.g., cameras that automatically check license plates for fare verification or billing). Transponders could also be used for reservation verification or attached to automatic debit accounts for frequent riders. Sufficient space must be available in holding areas to maintain separate queues for reservation passengers and those without reservations. May require off-dock holding areas, especially if passengers with reservations arrive before the previous sailing boards. However, with enough queue reduction, the capacity of the existing terminal holding area will suffice. Electronic message signs informing passengers of current fees and alerting both drivers and WSF personnel when an arriving vehicle needs to redirect to a non-reservation stand-by queue will allow better holding-area management and passenger understanding of the fare system.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** The price charged for reservations and/or for traveling during congested periods must be carefully set at an "optimum" level, so as to make reservations attractive enough that many drivers use the service, but not too low that demand exceeds reservation supply or too high that passengers simply revert to non-reservation stand-by. Non-reservation tickets must also bear the congestion price and an additional premium fee, in order to strongly encourage riders to make a reservation. Still, stand-by ridership and transferring reservations must always be possible, so boats can be filled for highest efficiency even when there are reservation no-shows. If a video-automated license plate tolling system is not employed, kiosks for passengers who arrive without a

## Strategy Evaluation Summaries

reservation may be located on board the boats for optimum time-efficiency. A small number of stand-by spaces should be reserved on even the highest demand sailings so that emergency vehicles and other priority riders can be accommodated. Overall, the reservation system and fare structure must be made as clear and easy to use as possible.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. Phone and e-ticketing options should be considered for system-wide application, with an analysis of whether reservations should be allowed for all passengers, or limited to commuters only or recreational riders only. Kiosk systems should be advanced for study on a route-by-route basis, particularly at terminals with high recreational traffic (i.e., likely serve many infrequent passengers).
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. **Mukilteo:**
  - b. **Clinton:**
  - c. **Edmonds:**
  - d. **Kingston:**
  - e. **Bainbridge:**
  - f. **Bremerton:**
  - g. **Colman Dock:**
  - h. **Southworth:**
  - i. **Vashon:**
  - j. **Fauntleroy:**
  - k. **Pt. Townsend** : include evaluation of a kiosk system
  - l. **Keystone:**
  - m. **Anacortes:** include evaluation of a kiosk system
  - n. **San Juans:**
  - o. **Pt Defiance:**
  - p. **Tahlequah:**
3. **What would be a good test route?** All. This would be a system-wide application. Port Townsend and Anacortes with high recreational and seasonal peak demand may offer the best opportunities for piloting a kiosk system test.

### VI. Strategy Disposition

Carry reservations forward for evaluation on all routes and at all terminals for the operational, community, and environmental benefits, and the opportunity to vastly improve customer service and reliability.

# Strategy Evaluation Worksheet

**Name:** Shared Parking

**Description:** Pursue shared-use and access contracts to use underutilized parking facilities at adjacent land uses (churches, schools, shopping malls) for customer and/or employee parking.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** High. With added parking capacity, more passengers can choose to park and leave their vehicles at their terminal of origin and walk on to the ferry.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift, unless off-site parking availability is limited to off-peak times. If additional off-site parking is made available during peak times, then this strategy could encourage additional “drive to/walk-on” passengers during peak times.
- c. **Attracts new demand to available capacity:** Medium. Does nothing to encourage off-peak sailings unless off-site parking availability is limited to off-peak times, but supports more “drive to/walk-on” passengers.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Only effect on loading and unloading time would occur if drivers shift to walking on instead of driving on in large enough numbers that peak period boats leave less-than-full in terms of vehicle capacity. Otherwise, the same number of vehicles will load per boat, though fewer will be left waiting for the next boat.
- b. **Reduces ticketing time:** Low (see 2.a.)
- c. **Reduces queue lengths:** Medium. If drivers park and walk on, fewer vehicles will be queuing on-street in between sailings as additional space will open in the holding and staging areas.
- d. **Improves operating cost per rider:** Low, unless a substantial number of riders shift to parking and walking on such that more individual passengers are carried per sailing even as the vehicle capacity of the boat remains the same. If current parking is provided for free, and off-site parking is priced, could reduce the parking subsidy for “drive to/walk-on” customers.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Additional parking capacity offers more choice to passengers with respect to their final mode of access. Sharing lots with

## Strategy Evaluation Summaries

- a business offering services or retail gives an additional amenity to those who park.
- 2. Positive community impact:** Medium. May reduce queue lengths that affect neighborhood traffic, and may increase on-foot customers to local businesses at the parking lot or along a pedestrian route to the ferry terminal. Creates a financial premium for the preservation of parking lots in the vicinity of ferry terminals, which may not be a locally-desired land use.
  - 3. Positive environmental impact:** Medium, if the drivers who use the new parking spots would otherwise have driven aboard and made longer vehicle trips on the destination side. Environmental impacts will be low if passengers who currently access their “home” ferry terminal via transit, bicycle, or on foot due to its constrained parking capacity are incentivized by the off-site parking to switch to driving and parking instead.

### III. Implementation and Cost

- 1. Ease of implementation:** Low. Shared use opportunities must be identified, and pricing, availability, maintenance responsibility, and liability agreements must be negotiated with owners.
- 2. Capital costs:** Low. WSF would not construct new parking, but pursue agreements to provide customer and employee access to parking built and funded by others.
- 3. On-going operating cost:** Low, unless substantial monitoring or maintenance is required by the lot owner.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** May require a shuttle and/or investments in pedestrian and bicycle infrastructure to link ferry passengers from the off-site parking lot to the terminal, if safe, convenient connections do not already exist.
- 2. Are there other strategies that might compromise this strategy’s effectiveness?** A lack of safe transit, pedestrian, and cycling infrastructure and wayfinding between the terminal and the parking lot would limit the usefulness of this strategy.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** High. Shared parking opportunities should be investigated for all terminals.
- 2. Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:**
  - b. Clinton:**
  - c. Edmonds:**
  - d. Kingston:**
  - e. Bainbridge:**

## Strategy Evaluation Summaries

- f. Bremerton:
- g. Colman Dock:
- h. Southworth:
- i. Vashon:
- j. Fauntleroy:
- k. 11. Pt. Townsend:
- l. Keystone:
- m. Anacortes:
- n. San Juans:
- o. Pt Defiance:
- p. Tahlequah:

3. **What would be a good test route?** Opportunities for shared parking should be investigated for all terminals.

### VI. Strategy Disposition

Carry the strategy forward for its customer convenience, potential mode shift benefits, and small capital costs.

# Strategy Evaluation Worksheet

**Name:** Stagger Departures and Arrivals

**Description:** Schedule vessel arrival and departure in such a way that there is only one arrival and departure at any given time.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift, unless staggering effectively results in more frequent departures for the same destination, so passengers need not worry about missing a sailing and having to wait for an hour or more for the next boat. Such frequency could make ferries more convenient for non-motorized and transit access.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift, unless frequency increases enough that passengers may make small shifts to their schedules and not have to wait an hour or more for the next ferry to their desired destination (see 1.a.).
- c. **Attracts new demand to available capacity:** Low. Does nothing to encourage off-peak sailings, unless frequency increases (see 1.a.). By reducing time penalty to customers traveling at peak times, increasing the frequency could incentivize some additional peak period travel.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Medium. Streamlines and clarifies loading and unloading procedures, as vehicles need only be staged and moved for one dock at a time. At terminals where vehicles cross paths to and from different docks and the staging areas, altering schedules to completely separate ferry arrivals and departures would remove this crossing conflict that forces one group of cars to wait for the other and increase overall loading and unloading time.
- b. **Reduces ticketing time:** Low. No decrease in the overall number of vehicles needing ticketing, and no change to the speed with which vehicles can be processed.
- c. **Reduces queue lengths:** Medium. Staggering arrival and departures for different sailings would allow drivers bound for different boats to arrive at staggered times, reducing the overall queue to enter the staging area. This would be especially effective where vehicles bound for or coming from different docks would otherwise cross paths and require that one group of vehicles pause while waiting for the other group to clear.
- d. **Improves operating cost per rider:** Low. May slightly reduce the number of staff needed to direct and sort traffic queues.

## Strategy Evaluation Summaries

### II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** Medium. Reducing queues, waiting times, and crossing conflicts between vehicles bound for different docks or boats simplifies the loading process and improves customer experience.
2. **Positive community impact:** Medium. May reduce queue lengths and traffic surges that affect neighborhood traffic and livability.
3. **Positive environmental impact:** Low. No impact on mode shift. By reducing time penalty for drive-on customers, may reduce the existing incentive to walk, bike, or take transit to terminals as well as to “drive to/walk-on.”

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Schedules must be carefully analyzed and coordinated, and staff and passengers retrained to manage the new scheduling and queuing system.
2. **Capital costs:** Low. No need for new construction or capital acquisition.
3. **On-going operating cost:** Low. May even slightly reduce the need for staff to direct and sort traffic queues.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but staggered arrivals/departures increases the importance of schedule adherence as boats must be strictly on time to avoid cascading delays into subsequent arrival/departures. A reservation system and real-time departure and arrival information would help support the strategy.

2. **Are there other strategies that might compromise this strategy’s effectiveness?**

Re-orienting the basic system design to accommodate more frequent departures with fewer vehicles per boat would reduce the window of time between arrivals/departures and could hamper the ability to significantly stagger arrival and departure schedules.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. Few terminals have different boats arriving and departing simultaneously.

2. **Terminal by Terminal Applicability:** Only terminals with more than one slip receive any rating higher than “low.”

- a. **Mukilteo:** Low
- b. **Clinton:** Medium
- c. **Edmonds:** Low
- d. **Kingston:** Medium

## Strategy Evaluation Summaries

- e. **Bainbridge:** Medium
  - f. **Bremerton:** Low
  - g. **Colman Dock:** Medium
  - h. **Southworth:** Low
  - i. **Vashon:** Medium
  - j. **Fauntleroy:** Low
  - k. **Pt. Townsend** : Low
  - l. **Keystone:** Low
  - m. **Anacortes:** Medium
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** At Colman Dock, the single access point to enter the terminal results in boats sometimes departing half-full because drivers who want to be on that boat are stuck behind vehicles headed for a different slip. This would be a good terminal for a pilot program.

### VI. Strategy Disposition

Screen out in favor of strategies that have a much greater potential for improving queue lengths, convenience, and loading/unloading time. This strategy would have negligible beneficial impact on overall operations.

# Strategy Evaluation Worksheet

**Name:** Subsidize Taxi, Carsharing, and/or Rental Car Service

**Description:** Provide operational fee support to customer access to “non-owned” vehicles via cab companies, car sharing organizations, and/or rental car agencies to offer new and/or increased services at ferry terminals. For carsharing, all monthly pass holders could be enrolled in the program for free and/or pay reduced usage charges. Allows passengers to travel to/from their arrival terminal by vehicle when needed, without needing their personal automobile, thereby reducing the number of vehicles driven on board and transported by ferries.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Supports passengers’ ability to travel without driving on to the boats in a private vehicle, even when they need the flexibility of a car to travel to or from either the origin terminal or the destination terminal. Most effective for those riding for recreation, tourism, or services, or for daily commuters who may need a car only infrequently.
- b. **Encourages time shift:** Medium. May enable walk-on, bike-on, or transit-riding passengers to postpone trips to off-peak hours with the knowledge that a fast, direct vehicle connection is available at the other terminal. Additionally, may allow those who currently drive on and off to park their vehicle at either terminal and use these automobile options to reach final destinations.
- c. **Attracts new demand to available capacity:** Medium. May support off-peak travel and walk-on ferry access.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Only affects loading/unloading time to the extent that a sailing might leave less-than-full of vehicles if enough people leave their cars behind.
- b. **Reduces ticketing time:** Low. Same as 2.a. Ticketing will take the same amount of time for the same amount of vehicles, but if a significant number of people walk-on as a result of the taxi and rental car options, ticketing time for individual runs may decrease slightly.
- c. **Reduces queue lengths:** Low. Same as 2.a. and 2.b.
- d. **Improves operating cost per rider:** Low. Improves operating cost per rider only to the extent that boats carry more total people even as vehicle capacity remains constant, if more riders than usual park and walk on. Operating cost savings could be offset by operating subsidies to support the non-owned vehicle system.

## Strategy Evaluation Summaries

### II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** Medium. Provides another land-side amenity for riders.
2. **Positive community impact:** Low. May slightly reduce queuing. The additional taxi and car rental offerings will also be available and benefit neighboring residents, and may enable ferry passengers to more easily access local businesses.
3. **Positive environmental impact:** Low. No net effect on emissions if private vehicles are still used to reach one terminal and a taxi or rental car used at the other. May have greater benefit if current drivers switch to transit or non-motorized modes at one end of the route as a result.

### III. Implementation and Cost

1. **Ease of implementation:** Medium. WSF provides funding, but private companies operate the service. More difficult to implement at terminals where rental, carsharing, or taxi companies do not see a strong market demand.
2. **Capital costs:** Low. May need to create a dedicated space for rental/taxi pickup.
3. **On-going operating cost:** Medium, depending on whether the private companies profit from the service without operational support.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes. Transit, bike/ped, and/or rental/taxi/carsharing connections must be strong at both the “origin” and “destination” terminals in order for this strategy to have beneficial impacts. Strategies to continue or expand existing fare surcharge for vehicles would encourage more passengers not to bring private vehicles on board ferries at their “origin” station, and, when a vehicle is needed at their “destination” terminal, to use a “non-owned” vehicle instead.
2. **Are there other strategies that might compromise this strategy’s effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Medium. May only apply at terminals with excellent tourist, recreational, or service opportunities that attract infrequent visitors.
2. **Terminal by Terminal Applicability:** Terminals rated “high” are located in high-demand tourist and recreational destinations. Colman Dock ranks “medium” because many other transportation options are already available from the Seattle terminal.
  - a. **Mukilteo:** Low
  - b. **Clinton:** Low

## Strategy Evaluation Summaries

- c. **Edmonds:** Low
- d. **Kingston:** Low
- e. **Bainbridge:** Low
- f. **Bremerton:** Low
- g. **Colman Dock:** Medium
- h. **Southworth:** Low
- i. **Vashon:** Low
- j. **Fauntleroy:** Low
- k. **Pt. Townsend:** High
- l. **Keystone:** Low
- m. **Anacortes:** High
- n. **San Juans:** High
- o. **Pt Defiance:** Low
- p. **Tahlequah:** Low

3. **What would be a good test route?** Port Townsend, with high seasonal peak demand.

### VI. Strategy Disposition

Advance for consideration on a route-by-route basis. No strong system-wide benefits.

# Strategy Evaluation Worksheet

**Name:** Traffic Management

**Description:** Restrict the formation of queues on local streets with signal coordination, traffic regulation ordinances, signage, channelization, and enforcement.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Low.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Only improves unloading time to the extent that signal coordination and other traffic management strategies also speed vehicle flow out of and away from the terminal.
- b. **Reduces ticketing time:** Low. Vehicles must still stop to pay or show fare verification.
- c. **Reduces queue lengths:** Medium. Clarifying and enforcing allowable and preferable vehicle flow toward and into the terminal can reduce the backup on neighboring streets, especially any such queuing that is exacerbated by driver confusion.
- d. **Improves operating cost per rider:** Low. May require more ongoing operational costs dedicated to enforcement if WSF cannot simply redeploy current staff.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Streamlines, simplifies, and eases driver access.
- 2. **Positive community impact:** Medium. May reduce queuing; signal coordination will benefit all road users.
- 3. **Positive environmental impact:** Low. May slightly reduce vehicle emissions if drivers spend less time circulating, idling, or starting-and-stopping in queues and at confusing interchanges and unsynchronized signals.

## III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Will require funding, study, and buy-in from multiple agencies, jurisdictions, and community stakeholders.
- 2. **Capital costs:** High. Will vary based on actual costs of re-construction, road engineering design, and costs for new signals or signage.

## Strategy Evaluation Summaries

3. **On-going operating cost:** Low, depending on how many net new WSF staff would be needed for enforcement. Alternately, WSF could subsidize assignment of traffic enforcement personnel from host communities. The current policy of having state troopers provide traffic management at some terminals is not a cost-effective arrangement for expansion of traffic management strategies.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?**  
No, but any changes related to remote or nearby holding, ticketing procedures, and transit and non-motorized access would need to be coordinated with these traffic management decisions.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. All terminals can benefit from an evaluation of and commitment to improving traffic management on impacted roads and intersections.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend:
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance:
  - p. Tahlequah:
3. **What would be a good test route?** All. This would be a system-wide application.

### VI. Strategy Disposition

Carry the strategy forward for evaluation on all routes and at all terminals.

# Strategy Evaluation Worksheet

**Name:** Transponder-Only Lanes

**Description:** Drive-on passengers with electronic transponders linked to pre-paid accounts or credit cards could access premium transponder-only queuing lanes. Open road tolling technology would recognize transponders and activate a traffic arm (or similar automated access management mechanism) to allow the drive-on passenger into the holding area.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift. May create even more encouragement for transponder users to arrive during peaks since they can access the faster transponder-only lanes.
- c. **Attracts new demand to available capacity:** Low.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No change in the number of vehicles needing to load and unload during dwell times.
- b. **Reduces ticketing time:** Medium. Drivers with transponders bypass the entire queue and move quickly through the tollbooth with only a brief stop. Drivers without a transponder would still need to use staffed tollbooths.
- c. **Reduces queue lengths:** Medium. Transponder users passing through an automated transponder lane would move through the tollbooth area more quickly than when using a human-staffed tollbooth. This time savings could lead to shorter queues in the transponder-only lanes. This system should be managed dynamically, so that if enough drivers shift to transponder use and backups begin to occur in the automated lanes, WSF would convert more lanes to transponder-only access and reduce this queue formation. Also, if the on-dock holding area beyond the tolling point fills up, then a queue will still form before the transponder access point outside of the holding area. In this case, WSF will need to stage off-site holding areas to get the cars off the streets.
- d. **Improves operating cost per rider:** Medium. Automation can reduce the number of staff needed to manage tollbooths and ticketing services.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Streamlines and eases driver access.
- 2. **Positive community impact:** Medium. Shorter queue lengths will contribute less disruptive traffic congestion to neighborhood streets.

## Strategy Evaluation Summaries

3. **Positive environmental impact:** Low. Has no impact on mode split and may even encourage more driving as ticketing is simplified.

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Will require a feasibility study, technology selection and installation, and passenger marketing and education.
2. **Capital costs:** Medium, to evaluate, select, and install technology.
3. **On-going operating cost:** Low. Reduces need for tollbooth staff.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes. If the on-dock holding area beyond the tolling point fills up with drivers who have passed through the transponder lanes and are waiting to board, a queue will still form outside of the holding area before the transponder access point. In this case, WSF will need to stage off-site holding areas to get these cars off the streets. Additionally, all accounting should be made paperless, unlike the current Electronic Fare System (EFS) system where card holders must still stop, have their card scanned, and wait for a printed receipt.
2. **Are there other strategies that might compromise this strategy's effectiveness?** If the time savings of a transponder isn't significant enough, WSF may need to offer a discount for transponder use as compared to cash fare, or offer some discount initially to entice drive-ons to make the switch to transponders.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. All terminals can benefit from any simplification of the fare collection and verification process.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. 11.                      Pt. Townsend        :
  - l. Keystone:
  - m. Anacortes:

## Strategy Evaluation Summaries

- n. San Juans:
- o. Pt Defiance:
- p. Tahlequah:

3. What would be a good test route? All. This would be a system-wide application.

### VI. Strategy Disposition

Carry the strategy forward for evaluation on all routes and at all terminals.

# Strategy Evaluation Worksheet

**Name:** Transponders: Fully Automated System

**Description:** All vehicles could be required to purchase electronic transponders linked to pre-paid accounts and/or credit cards. Automatic Vehicle Identification (AVI) camera technology would be utilized to bill drivers whose license plate numbers do not match the electronic transponder record.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Low.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No change in the number of vehicles needing to load/unload during dwell times as long as boats still carry the same capacity.
- b. **Reduces ticketing time:** High. Stopping for fare verification or ticketing no longer necessary nor supported.
- c. **Reduces queue lengths:** Medium. Automated transponders allow users to pass through the tollbooth area more quickly than when using a human-staffed tollbooth. This time savings could lead to shorter queues. However, if the on-dock holding area beyond the tolling point fills up, then a queue will still form before the transponder access point outside of the holding area. In this case, WSF will need to stage off-site holding areas to get these excess cars off the streets.
- d. **Improves operating cost per rider:** Low. Automation would reduce the number of staff needed at the terminal to manage tollbooths and ticketing services, but a transponder system may involve different or new staffing, mailing, or on-going technology costs for electronic billing and processing off-site. If driving on alone is encouraged through easy payment systems, total drive-on trips may increase without a corresponding increase in walk-on trips that would drive down per-capita costs. The need to maintain a non-transponder lane or to have on-board fare collection for infrequent drive-ons could undermine the operational cost savings. For this and other technology strategies, ongoing operating costs could additionally be reduced through contract agreements in which the vendor is required to install and maintain the technology, perhaps as part of a revenue sharing agreement. In this way, up-front costs can be spread out over time, and these annualized costs might be lower than the labor costs (salary + benefits) for otherwise necessary fare collection personnel.

## Strategy Evaluation Summaries

### II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** Medium. Streamlines, simplifies, and eases driver access for those with transponders, but may confuse, deter, or alienate infrequent or new passengers who do not know the system ahead of time, thereby requiring preservation of at least one non-transponder lane booth at each terminal or on-board fare collection for the infrequent drive-on passengers without transponders.
2. **Positive community impact:** Medium. Shorter queue lengths will contribute less disruptive traffic congestion to neighborhood streets. If the holding area past the transponder booth starts filling to capacity and leading to backup onto neighborhood streets, WSF would need to utilize off-site holding areas that could remove these queues from the streets.
3. **Positive environmental impact:** Low. Has no impact on mode split and may even encourage more driving as ticketing is simplified. However, some positive environmental benefit could be achieved by reducing idling time and stop-and-go driving patterns associated with waiting in a queue.

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Will require feasibility study, technology selection and installation, and passenger marketing and education.
2. **Capital costs:** Medium, to evaluate, select, and install technology.
3. **On-going operating cost:** Low. Reduces need for tollbooth staff, though some investment may be shifted to new, different off-site staffing needs to process billing. (See I.2.d. regarding annualized costs)

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes. In order to ensure on-street queue reduction, off-site holding areas will be needed during peak times and at terminals where the on-dock holding area beyond the transponder fare collection access point is constrained.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. All terminals can benefit.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:

## Strategy Evaluation Summaries

- e. Bainbridge:
- f. Bremerton:
- g. Colman Dock:
- h. Southworth:
- i. Vashon:
- j. Fauntleroy:
- k. Pt. Townsend:
- l. Keystone:
- m. Anacortes:
- n. San Juans:
- o. Pt Defiance:
- p. Tahlequah:

3. **What would be a good test route?** All. This would be a system-wide application.

### VI. Strategy Disposition

Carry the strategy forward for evaluation on all routes and at all terminals.

# Strategy Evaluation Worksheet

**Name:** Vehicle Valet Service

**Description:** For a fee, drivers could choose to have their vehicles stored and staged by a third party service at the appropriate times.

## I) Evaluation Against Primary Screening Criteria:

### 1) Manages Demand

- a) **Encourages mode shift:** Low. Does nothing to encourage mode shift.
- b) **Encourages time shift:** Low. Does nothing to encourage time shift.
- c) **Attracts new demand to available capacity:** Low. By reducing the time penalty and direct inconvenience for drive-on passengers during peak travel periods, could potentially increase number of drive-on passengers at these times.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. No change in the number of vehicles needing to load and unload during dwell times.
- b) **Reduces ticketing time:** Low. No change in ticketing process.
- c) **Reduces queue lengths:** Low. Same number of cars would still be queuing even if some are stored by individuals other than the owner.
- d) **Improves operating cost per rider:** Low. No effect.

## II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impact:** Medium. May represent a desirable, luxury service for a few passengers.
- 2) **Positive community impact:** Low. Does nothing to reduce queues, though drivers who are willing to pay the valet fee may patronize local businesses while their vehicles are being staged for them.
- 3) **Positive environmental impact:** Low. Has no impact on mode split.

## III) Implementation and Cost

- 1) **Ease of implementation:** High. Need only find an interested valet operator.
- 2) **Capital costs:** Low. May need to create a dedicated space for valet drop-off.
- 3) **On-going operating cost:** Low. No expense to WSF.

## Strategy Evaluation Summaries

### IV) Interaction With Other Strategies

- 1) Does this strategy need other strategies to work? No.
- 2) Are there other strategies that might compromise this strategy's effectiveness? No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** Low. Negligible benefit for any terminal.
- 2) **Terminal by Terminal Applicability:** All are low.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend:
  - l) Keystone:
  - m) Anacortes:
  - n) San Juans:
  - o) Pt Defiance:
  - p) Tahlequah:
- 3) **What would be a good test route?** No terminal would be more appropriate than any other for a pilot valet program, though routes with higher-income passenger ridership, or terminals with multiple nearby amenities, businesses, or high seasonal peak demand such as Port Townsend may offer more drivers interested in the novelty, luxury service.

### VI) Strategy Disposition

Screen out due to negligible to zero positive operational benefit.

# Strategy Evaluation Worksheet

**Name:** Wayfinding: Bicycles and Pedestrians

**Description:** Provide/improve pedestrian and bicycle wayfinding signage around terminals and throughout nearby business districts.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Makes bicycling and walking more attractive, easier to use for ferry access, and more visible as potential modes for ferry access.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Medium. May promote more walk-on and bike-on ridership.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Wayfinding signage is an important part of an overall effort to increase bike-on and walk-on passengers; however, implemented alone it likely won't promote enough mode shift to walk-on and bike-on to significantly affect vehicle capacity or the total number of vehicles loading and unloading during dwell time.
- b. **Reduces ticketing time:** Low. No change in vehicle ticketing process, as per 2.a above.
- c. **Reduces queue lengths:** Low. Only contributes to reduced queue lengths if substantial numbers of drive-on passengers decide to walk-on or bike-on instead, as per 2.a above.
- d. **Improves operating cost per rider:** Medium. Mode shift to bike- and walk-on access can increase the total number of individual passengers on a given sailing even as vehicle capacity stays constant. The ferry system may attract more, new riders by making it clearer to potential customers how to safely and conveniently access ferries by bike or on foot.

## II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** Medium. Improves the ferry experience and a feeling of security for non-motorized travelers.
2. **Positive community impact:** Medium. Wayfinding can improve neighbors' walking and cycling environments. Wayfinding can support local businesses by drawing people on foot and bicycle through the main business district.
3. **Positive environmental impact:** Medium. Supporting mode shift to walk-on and bike-on can reduce vehicle travel and its related environmental impacts, including emissions and storm water runoff.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Need to work with local community to identify sign types, messages, and locations, and order and place signs.
2. **Capital costs:** Low. Signage costs inexpensive.
3. **On-going operating cost:** Low. Signs may need occasional maintenance.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes. Good, clear, and safe bicycle and walking infrastructure and robust financial incentives for walk-on and bike-on passengers must be in place in order to achieve significant additional mode shift to non-motorized modes, with or without improved wayfinding.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. All terminals can benefit from better wayfinding.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fautleroy:
  - k. Pt. Townsend:
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance:
  - p. Tahlequah:
3. **What would be a good test route?** All. This would be a system-wide application. Colman Dock or Bainbridge Island would be good terminals to begin the wayfinding program, as this route has significant bicycle and pedestrian ridership, and bicycles must navigate vehicle traffic even within the holding area in order to access these docks.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

Advance for further analysis as a system-wide application.

# Strategy Evaluation Worksheet

**Name:** Wayfinding: Parking

**Description:** Utilize wayfinding signage including real time occupancy information to direct motorists to available parking.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. This strategy would simplify the otherwise time-consuming task of searching for an available parking spot when in a hurry to catch a ferry. Prominent wayfinding signage and real-time information even advertises that the option is available for drivers to park, leave their vehicle, and walk on the ferry, reducing vehicle travel at the other terminal.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Medium. Does nothing to encourage off-peak sailings, but does support more walk-on passengers during peak travel times.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Only effect on loading and unloading time would occur if drivers shift to walking on instead of driving on in large enough numbers that peak period boats leave less-than-full in terms of vehicle capacity. Otherwise, the same number of vehicles will load per boat to reach full capacity, and the time to move any individual vehicle in and out does not change.
- b. **Reduces ticketing time:** Low (see 2.a.)
- c. **Reduces queue lengths:** Low. May have a slight positive effect if enough additional drivers park instead of driving on that space opens in the terminal holding and staging areas to accommodate some of the vehicles that would otherwise queue in the streets. Drivers lining up to enter the parking area still contribute to queues.
- d. **Improves operating cost per rider:** Low, unless a substantial number of riders shift to parking and walking on such that more individual passengers are carried per sailing even as the vehicle capacity of the boat remains the same.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Improves the experience and shortens the time needed to search for parking for those who already park and walk on. Bolsters the “drive to/walk on” alternative as a feasible, attractive access mode for passengers.

## Strategy Evaluation Summaries

- 2. Positive community impact:** Low. May slightly reduce queue lengths that affect neighborhood traffic. By directing motorists to appropriate long-term parking, may reduce “spillover” parking impacts where WSF customers park in residential or commercial areas adjacent to terminals.
- 3. Positive environmental impact:** Medium, if the drivers who use the new parking spots would otherwise have driven aboard and made vehicle trips on the destination side. Environmental impacts will be low if passengers who currently access the ferry via transit, bicycle, or on foot decide to switch to driving and parking instead.

### III. Implementation and Cost

- 1. Ease of implementation:** High. Where parking infrastructure is already in place, WSF need only analyze the wayfinding needs and design and install an appropriate solution (including real-time occupancy information).
- 2. Capital costs:** Low. No expensive construction or land acquisition necessary.
- 3. On-going operating cost:** Low. Some costs associated with monitoring and maintenance of signs (whether done by WSF or a vendor under contract).

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** A lack of safe pedestrian and cycling infrastructure and wayfinding between the parking lot and the terminal could limit the usefulness of this strategy.
- 2. Are there other strategies that might compromise this strategy’s effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** High. All terminals can benefit from better parking wayfinding.
- 2. Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:**
  - b. Clinton:**
  - c. Edmonds:**
  - d. Kingston:**
  - e. Bainbridge:**
  - f. Bremerton:**
  - g. Colman Dock:**
  - h. Southworth:**
  - i. Vashon:**
  - j. Fautleroy:**
  - k. Pt. Townsend:**
  - l. Keystone:**

## Strategy Evaluation Summaries

- m. Anacortes:
- n. San Juans:
- o. Pt Defiance:
- p. Tahlequah:

**3. What would be a good test route?** All. It would be a system-wide application. Terminals that already have multiple nearby parking options, such as Bremerton with 13 nearby lots and garages, would offer good test cases.

### VI. Strategy Disposition

Carry the strategy forward for its customer convenience, potential mode shift and capacity management benefits (via increased incentive for “drive to/walk on” passengers), and small capital costs.

# Strategy Evaluation Worksheet

**Name:** Wayfinding: Vehicles

**Description:** Improve signage to help drivers navigate each terminal's specific procedures for on-street queuing, HOV holding, and motorcycle entrances/exits.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage mode shift. Increases the ease and convenience of driving on to the ferry.
- b. **Encourages time shift:** Low. Does nothing to encourage time shift.
- c. **Attracts new demand to available capacity:** Low. Does nothing to encourage off-peak or walk-on travel.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No change in the number of vehicles needing to load and unload during dwell times. Only affects the time it takes for vehicles to make it into the holding area.
- b. **Reduces ticketing time:** Low. No change in ticketing process.
- c. **Reduces queue lengths:** Low. Same number of cars would still be queuing even if motorists are less confused about the process. This strategy simply reduces the time it takes drive-on passengers to get *into* the appropriate queue.
- d. **Improves operating cost per rider:** Low. Would reduce the number of staff needed to direct traffic and sort vehicles for holding; however, this strategy alone would not reduce the number of drive-on vehicles during peak travel periods (and in fact might even incentivize more by reducing the existing time penalty related to slow or confusing auto circulation patterns). Overall, then, this wayfinding strategy would not have a significant impact on operational costs (the number of boats needed at peak times to accommodate drive-ons, fuel costs for boats loaded with heavy and space-inefficient cars, etc).

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Makes driving on to a ferry easier and clearer for first-time passengers. Frequent passengers already know the circulation and queuing procedures at their daily terminals.
- 2. **Positive community impact:** Low. Does little to reduce queue lengths, though this strategy might reduce "confusion-related" circling and lane changes and thereby improve queue flow.
- 3. **Positive environmental impact:** Low. Has no positive impact on mode split.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** High. WSF need only analyze the wayfinding needs and design and install an appropriate solution.
2. **Capital costs:** Low. No costly construction or other capital costs.
3. **On-going operating cost:** Low. Some costs associated with monitoring and maintenance of signs (whether done by WSF or a vendor under contract).

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Medium. Negligible operational benefit system-wide.
2. **Terminal by Terminal Applicability:** Would be most helpful for new passengers, for routes carrying infrequent users (such as recreational traffic), and at terminals with non-obvious holding and loading procedures.
  - a. **Mukilteo:** Medium
  - b. **Clinton:** Medium
  - c. **Edmonds:** Low
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High (reorganizing flow and lane usage may be more helpful here)
  - f. **Bremerton:** Low
  - g. **Colman Dock:** High
  - h. **Southworth:** Medium (especially for vehicles needing to back on to the boat)
  - i. **Vashon:** Low
  - j. **Fauntleroy:** High
  - k. **Pt. Townsend:** Medium
  - l. **Keystone:** Medium
  - m. **Anacortes:** Medium
  - n. **San Juans:** Medium
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** Colman Dock with its convoluted queuing and access process and high ridership to multiple destinations may provide a good test route.

### VI. Strategy Disposition

Screen out due to negligible operational benefit.

# Strategy Evaluation Worksheet

**Name:** Mode Shift Pricing

**Description:** WSF expands existing program and offers greater rideshare, walk-on and bike-on discounts during peak periods. Allow unregistered carpools and vanpools the same fares, staging and loading privileges as registered carpools

## I) Evaluation Against Primary Screening Criteria

### 1) Manages Demand

- a) **Encourages mode shift:** Medium. Existing discounts are moderate, and a high percentage of person-trips are non-SOV. Additional discounts should encourage additional mode shift. However, since existing non-SOV spare capacity is high on all sailings, even when spare SOV capacity is zero, there is a limit to the amount of potential mode shift - even with 100% discounts.
- b) **Encourages time shift:** Low. Does nothing to encourage people to shift time unless combined with off-peak period discounts.
- c) **Attracts new demand to available capacity:** Low. Does nothing to encourage people to take off-peak sailings, unless combined with off-peak period discounts.

### 2) Increases Operational Efficiency

- a) **Reduces loading/unloading time:** Low. No impact.
- b) **Reduces ticketing time:** Low. No impact unless walker and biker fares are entirely removed. However, benefit does not affect vehicle ticketing.
- c) **Reduces queue lengths:** Low. No impact.
- d) **Improves operating cost per rider:** Medium. Cost per rider reduction is directly proportional to the mode shift.

## II) Evaluation of Secondary Screening Criteria:

- 1) **Positive customer impacts:** Medium. Any customers who could shift modes would benefit from these discounts, but SOV drivers would not see any benefit.
- 2) **Positive community impacts:** Low. Some potential for greater exchange and tourist activity in terminal communities.
- 3) **Positive environmental impacts:** Medium. By creating some shift to alternative modes, this could show some positive environmental benefits.

## III) Implementation and Cost

- 1) **Ease of implementation:** High. This is a simple fare adjustment.
- 2) **Capital costs:** Low. No additional capital costs.

## Strategy Evaluation Summaries

- 3) **On-going operating cost:** Low. No additional operating costs. Potential to save significant fare processing costs if walkers and bikers ride for free.

### IV) Interaction With Other Strategies

- 1) **Does this strategy need other strategies to work?** No, but it would work well with off-peak pricing incentives.
- 2) **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V) Applicability to Terminals

- 1) **Potential for System-wide Application:** High.
- 2) **Terminal by Terminal Applicability:** N/A. If implemented, this strategy would need to be applied to all terminals equally.
  - a) Mukilteo:
  - b) Clinton:
  - c) Edmonds:
  - d) Kingston:
  - e) Bainbridge:
  - f) Bremerton:
  - g) Colman Dock:
  - h) Southworth:
  - i) Vashon:
  - j) Fauntleroy:
  - k) Pt. Townsend
  - l) Keystone
  - m) Anacortes
  - n) San Juans
  - o) Pt Defiance
  - p) Tahlequah

- 3) **What would be a good test route?** All. It would be a system-wide application.

### VI) Strategy Disposition

Carry this strategy forward for its ease of implementation, potential mode shift benefits, and potential operational cost savings.

## Strategy Evaluation Worksheet

**Name:** Financial Incentives for Small Vehicles

**Description:** Restructure fares to charge by vehicle length, with the smallest vehicles being charged the least.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. No impact.
- b. **Encourages time shift:** Low. No impact.
- c. **Attracts new demand to available capacity:** Low. No impact unless paired with peak-period pricing.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact. Likely to increase processing time while vehicle length is determined.
- c. **Reduces queue lengths:** Low. No impact. Likely to increase queues while vehicle lengths are determined.
- d. **Improves operating cost per rider:** Low. Marginal efficiency gains may be attributed as operators of longer vehicles and trailers switch to shorter vehicles, leaving room for some additional vehicles on a vessel.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Low. The pricing incentive is likely to be perceived as an unfair penalty for anyone with a larger vehicle, especially since the cost to change vehicle types can be very high.
- 2. **Positive community impacts:** Low. No impact.
- 3. **Positive environmental impacts:** Low. Minor air quality benefits may be derived if there is a shift to use smaller vehicles which typically consume less gasoline and produce lower emissions than larger vehicles.

### III. Implementation and Cost

- 1. **Ease of implementation:** Low. A new system for determining vehicle length would need to be implemented at the point of ticket processing or through a pre-screening system.
- 2. **Capital costs:** High. In addition to installing automated or assisted length detection devices at every ticket booth, the new pricing system would have to be advertised and incorporated into all existing fare collection systems and media.

## Strategy Evaluation Summaries

- 3. On-going operating cost:** Medium. Once the new measuring and pricing system is in place and training completed, labor costs would be similar to current costs. However, additional maintenance costs for maintaining the length measurement equipment are expected.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** High.
- 2. Terminal by Terminal Applicability:** N/A. If implemented, this strategy would need to be applied to all terminals equally.

- a. Mukilteo:**
- b. Clinton:**
- c. Edmonds:**
- d. Kingston:**
- e. Bainbridge:**
- f. Bremerton:**
- g. Colman Dock:**
- h. Southworth:**
- i. Vashon:**
- j. Fauntleroy:**
- k. Pt. Townsend**
- l. Keystone**
- m. Anacortes**
- n. San Juans**
- o. Pt Defiance**
- p. Tahlequah**

- 3. What would be a good test route?** All. It would be applied system-wide.

### VI. Strategy Disposition

This strategy represents a significant impact on consumer convenience, capital costs, and operating procedures with a very marginal benefit to vessel capacity and no shift to other modes or sailings. It is not recommended.

# Strategy Evaluation Worksheet

**Name:** HOT (High Occupancy Toll) Lanes

**Description:** WSF designates priority-loading diamond lanes for carpools and vanpools, and sells single-occupant vehicle access to them for a surcharge. (Access sold only until lanes are at capacity.)

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Existing vanpool programs already occupy much of the potential HOT lane capacity, limiting new participants. Furthermore, allowing SOVs that pay a surcharge could limit HOT lane capacity or even negatively impact existing vanpools whose members see a greater delay in the HOT lane or revert to SOVs themselves.
- b. **Encourages time shift:** Low. HOT lane users receiving priority boarding may shift to more desired sailings, but this will be offset by displaced non-HOT lane users.
- c. **Attracts new demand to available capacity:** Low. No impact unless paired with peak period pricing.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Little or no impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Low. A shift to carpools and vanpools would reduce per rider costs, but little shift is expected.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Medium. A higher-level of service available to carpools or SOVs for a price will provide customers with a new convenience feature. However, a perception of inequity may develop among those unable to afford the HOT lane toll.
- 2. **Positive community impacts:** Low. No impact.
- 3. **Positive environmental impacts:** Low. Minor air quality benefits may be derived if there is a shift to increased carpooling and vanpooling. This would be offset by SOVs paying to use the HOT lanes.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. At most terminals, existing lane capacity can be converted to HOT lanes. Modest physical separation and a dedicated toll both would be needed. At some terminals there is limited capacity for lanes.
2. **Capital costs:** Low. Simple markings and signing can designate the lanes.
3. **On-going operating cost:** Low. No impact.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** Applies to all terminals equally, with the following exception:
  - a. **Mukilteo:**
  - b. **Clinton:**
  - c. **Edmonds:**
  - d. **Kingston:**
  - e. **Bainbridge:**
  - f. **Bremerton:**
  - g. **Colman Dock:**
  - h. **Southworth:**
  - i. **Vashon:**
  - j. **Fauntleroy:** Due to landside constraints, a HOT lane cannot be implanted easily. Vanpools today are already forced to stage remotely and enter on the exit lanes.
  - k. **Pt. Townsend**
  - l. **Keystone**
  - m. **Anacortes**
  - n. **San Juans**
  - o. **Pt Defiance**
  - p. **Tahlequah**
3. **What would be a good test route?** All except Fauntleroy and lower volume routes such as Keystone where there is little advantage to having priority boarding on most sailings.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

HOT lanes are not recommended. While implementation costs are very low and there is some potential to further encourage ridesharing, allowing toll-paying SOVs to utilize the lanes could defeat any savings in per rider operating costs. HOT does not create any real disincentive to using SOV, and the priority loading for vanpools and carpools is not substantially different from the priority these HOVs receive today.

# Strategy Evaluation Worksheet

**Name:** "HOTS"- High Occupancy Tolled Sailing

**Description:** WSF requires either 2+ passengers in every vehicle OR a vehicle surcharge on peak period sailings.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** High. The incentive to carpool or vanpool will be very high unless surcharges do not discourage SOV riders sufficiently.
- b. **Encourages time shift:** Medium. Rideshare users will have an incentive to shift to HOTS vessels. SOV riders will have to shift to other sailings unless the surcharge is insufficient.
- c. **Attracts new demand to available capacity:** High. Rideshare users will be attracted to this exclusive service. SOV riders will be forced to shift to other sailings unless the surcharge is insufficient.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact. Some potential of added delay while redirecting SOVs unwilling to pay the HOTS surcharge.
- c. **Reduces queue lengths:** Medium. Demand for HOTS vessels is likely to be lower than normal sailings, reducing queues during that sailing.
- d. **Improves operating cost per rider:** High. For each HOTS sailing, cost per rider will be nearly halved or more.

## II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impacts:** Medium. A higher-level of service available to rideshares or to SOVs for a price will provide customers with a new convenience feature. However, SOV users unwilling to pay a surcharge will have to shift to other sailing times, likely producing negative feedback.
2. **Positive community impacts:** Medium. Reduced queues for HOTS vessels will lessen local street impacts.
3. **Positive environmental impacts:** Medium. Increased ridesharing and reduced queues will reduce overall emissions.

## III. Implementation and Cost

1. **Ease of implementation:** High. Other than advertising and timetable changes, this strategy utilizes existing infrastructure and systems.

## Strategy Evaluation Summaries

2. **Capital costs:** Low. No impact.
3. **On-going operating cost:** Low. No impact.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fautleroy:
  - k. Pt. Townsend
  - l. Keystone
  - m. Anacortes
  - n. San Juans
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** All. It could be implemented on any route.

### VI. Strategy Disposition

Carry this strategy forward. It has a very high potential to shift trips to other modes and other sailings. Unfortunately, it may be difficult to implement due to opposition from SOV riders unwilling to shift modes or to pay the surcharge.

# Strategy Evaluation Worksheet

**Name:** Improved Bike Connections and Facilities

**Description:** Install bike parking within passenger areas at terminals. Designate bicycle lanes in and out of ferry terminals separated from vehicle traffic. Make bicycles available for rent or checkout similar to a car-sharing program (through WSF or a private contractor).

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. New non-SOV trips can be made with secure bike parking available for bicycles that can be used at the beginning or end of a trip linked to another mode. Riders can utilize vessels to change clothes during crossings.
- b. **Encourages time shift:** Low. No impact, except for riders who can now park and ride a bike onto a better-timed sailing.
- c. **Attracts new demand to available capacity:** Medium. Drivers shifting to park and bike trips will produce new capacity in other sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Medium. Increased walk-on or bike-on riders will reduce per rider costs.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Medium. Additional rider conveniences will benefit bike riders as well as vehicle users who see or perceive reduced vehicle traffic and bicycle conflicts.
- 2. **Positive community impacts:** Medium. Additional bicycle use will reduce traffic and queues.
- 3. **Positive environmental impacts:** Medium. Additional bicycle use will reduce overall emissions.

## III. Implementation and Cost

- 1. **Ease of implementation:** High. Bicycle parking is generally space efficient.
- 2. **Capital costs:** Low. Bike racks are rather inexpensive compared to capital solutions for other modes.

## Strategy Evaluation Summaries

- 3. On-going operating cost:** Low. Some bicycle rack maintenance is necessary. Personnel for bike rentals and security for private bike parking may be necessary in certain terminals.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** High.
- 2. Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:**
  - b. Clinton:**
  - c. Edmonds:**
  - d. Kingston:**
  - e. Bainbridge:**
  - f. Bremerton:**
  - g. Colman Dock:**
  - h. Southworth:**
  - i. Vashon:**
  - j. Fautleroy:**
  - k. Pt. Townsend:**
  - l. Keystone:**
  - m. Anacortes:**
  - n. San Juans:**
  - o. Pt Defiance:**
  - p. Tahlequah:**
- 3. What would be a good test route?** All. It could be implemented on any route, though routes connecting to Colman Dock would see the highest utilization.

### VI. Strategy Disposition

Carry this strategy forward. It is a very cost-effective way to move some vehicle trips to other modes. However, benefits are likely to be limited mostly to routes serving work destinations that are within reasonable biking distance of the terminal, particularly Colman Dock. Tourist trips will also benefit, potentially increasing ridership.

# Strategy Evaluation Worksheet

**Name:** Improved Pedestrian Connections and Facilities

**Description:** Build/expand sidewalks to and from ferry terminals to connect with parking, transit and other sidewalk systems. Provide covered, separated pedestrian walkways connecting directly to the vessel passenger deck.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Some riders with destinations within walking distance may start walking, and some who currently drive on to the ferry may shift to parking near the terminal and walking on.
- b. **Encourages time shift:** Low. Some riders with destinations within walking distance may start walking to more convenient sailings.
- c. **Attracts new demand to available capacity:** Low. Some mode shift will open up new capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Some time savings will be produced by removing walk-ons from the vehicle level.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Medium. Increased walk-on riders will reduce per rider costs.

## II. Evaluation Against Secondary Screening Criteria:

- 1. **Positive customer impacts:** Medium. Improved pedestrian operations will benefit most users and increase customer safety.
- 2. **Positive community impacts:** Medium. Improved pedestrian amenities will improve the built environment around terminals.
- 3. **Positive environmental impacts:** Low. Minimal mode shift from motorized modes is anticipated. Some benefits may be achieved if drivers choose to park their cars at one terminal and eliminate the driving trip on the other end of their route.

## III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Pedestrian improvements generally require careful above and below-grade design.

## Strategy Evaluation Summaries

- 2. Capital costs:** Medium. Many improvements are inexpensive, but new sidewalks and possible drainage changes are moderately expensive.
- 3. On-going operating cost:** Low. Pedestrian facilities are low maintenance, with the exception of mechanized boarding structures.

## IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No, but additional near-terminal parking areas connected directly to the dock with the improved pedestrian infrastructure may improve the opportunity for park-and-ride mode shift.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

## V. Applicability to Terminals

- 1. Potential for System-wide Application:** High.
- 2. Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:**
  - b. Clinton:**
  - c. Edmonds:**
  - d. Kingston:**
  - e. Bainbridge:**
  - f. Bremerton:**
  - g. Colman Dock:**
  - h. Southworth:**
  - i. Vashon:**
  - j. Fauntleroy:**
  - k. Pt. Townsend**
  - l. Keystone**
  - m. Anacortes**
  - n. San Juans**
  - o. Pt Defiance**
  - p. Tahlequah**
- 3. What would be a good test route?** All. It could be implemented at any terminal.

## VI. Strategy Disposition

Carry this strategy forward. Improved pedestrian connections benefit users of all other modes and improve overall safety. Some shifts from SOV are possible.

## Strategy Evaluation Worksheet

**Name:** Improved Transit Connections and Frequencies

**Description:** WSF contracts with existing agencies and organizations to provide new transit services that connect terminals with park and ride lots, transit hubs, rental car agencies and employment and activity centers.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** High. Targeting transit services to key rider destinations can produce substantial mode shift.
- b. **Encourages time shift:** Medium. New transit riders can reliably use different sailings convenient to their transit connections, but new capacity for remaining drivers is only likely to open up on sailings that are less-convenient.
- c. **Attracts new demand to available capacity:** High. SOV riders shifted to transit will utilize available walk-on capacity and increase available vehicle capacity on congested sailings.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact, unless drivers shift to transit in such high numbers that vehicle demand for peak sailings declines significantly.
- d. **Improves operating cost per rider:** High. Shifts from vehicular trips to walk-on trips produce high operating efficiency gains.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Medium. Improved transit services dedicated to ferry customers will be beneficial to most users.
- 2. **Positive community impacts:** Medium. New transit services may reduce vehicle traffic and provide ancillary public transportation benefits to communities.
- 3. **Positive environmental impacts:** High. If well-designed and utilized, new transit service can substantially reduce emissions by reducing SOV travel.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Low. Extensive coordination and funding is required for each new transit service.
2. **Capital costs:** Medium. Capital costs to WSF will be low unless the transit agencies require WSF to fund new vehicles or leases under the contract agreement.
3. **On-going operating cost:** High. New transit services have substantial on-going operating costs.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but improving transit access to terminals and paying careful attention to pedestrian connections from the transit stop to the dock will help support significant mode shift.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally, subject to cost considerations.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** Colman Dock is a likely candidate for improved transit service due to the potential of building off of existing services and the high concentration of rider destinations.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

Carry this strategy forward. Improved transit services have a very high potential to expand walk-on ridership and decrease operating costs per passenger. However, this strategy requires a high amount of coordination and financial investment to accomplish successfully.

# Strategy Evaluation Worksheet

**Name:** Improved Transit Access at Terminals

**Description:** Provide hand-held radios, cell phones and/or some other means of communication between transit drivers and toll booth operators or WSF traffic staff to convert tollbooth lane or vehicle access lane to transit access lane when necessary. Provide bus access and loading/offloading area at terminals or within vehicle staging areas.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Improving the convenience of transit connections greatly improves the acceptance of transit as a travel option.
- b. **Encourages time shift:** Medium. New transit riders can reliably use different sailings convenient to their transit connections, but new capacity for remaining drivers is only likely to open up on sailings that are less-convenient..
- c. **Attracts new demand to available capacity:** Medium. SOV riders shifted to transit will utilize available walk-on capacity and increase available vehicle capacity on sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. At most terminals, dedicating space and time to bring transit close to vessels will impose a time penalty on loading/unloading.
- b. **Reduces ticketing time:** Low. No impact, assuming bus riders do not need to purchase tickets at their boarding terminal.
- c. **Reduces queue lengths:** Low. No impact, unless drivers shift to transit in such high numbers that vehicle demand for peak sailings declines significantly.
- d. **Improves operating cost per rider:** High. Shifts from vehicular trips to walk-on trips produce high operating efficiency gains.

## II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Medium. Improved transit connections will be well-received by transit riders but may not be welcomed by SOV riders who experience delayed loading/unloading.
- 2. **Positive community impacts:** Low. Improved transit connections may reduce vehicle traffic.
- 3. **Positive environmental impacts:** Medium. Some benefit will result from mode shifts to transit.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. The cost and operational impact is limited to improved communications services and staging. However, careful planning and coordination is necessary to efficiently operate this strategy, especially at space-constrained terminals.
2. **Capital costs:** Low. Communications devices are relatively inexpensive.
3. **On-going operating cost:** Low. WSF staff will require new training and procedures, but little or no additional staffing is necessary.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but improved transit connections and frequency would greatly bolster this strategy's effectiveness by providing even greater incentives and opportunities to use transit.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Medium.
2. **Terminal by Terminal Applicability:** Application is only possible at terminals that have transit service nearby. Of those, some have efficient transit operations already. At others, difficulty exists due to landside space constraints for maneuvering buses.
  - a. **Mukilteo:** Low. Not feasible. Narrow dock prevents on-dock transit operations. Existing transit stop is already as close as possible without a new dock.
  - b. **Clinton:** High. Feasible.
  - c. **Edmonds:** Medium. Somewhat feasible. Narrow dock prevents on-dock transit operations, but transit could be staged close to terminal building with a parking lot re-configuration.
  - d. **Kingston:** High. Feasible.
  - e. **Bainbridge:** N/A (transit is at terminal)
  - f. **Bremerton:** N/A (transit is at terminal)
  - g. **Colman Dock:** N/A (transit is at terminal)
  - h. **Southworth:** Medium. Somewhat feasible. Narrow dock can accommodate on-dock transit operations with maneuvering.
  - i. **Vashon:** High. Feasible. Transit is already at terminal, but a dedicated lane operation can be added.
  - j. **Fauntleroy:** Medium. Somewhat feasible. Narrow dock can accommodate on-dock transit operations with maneuvering.
  - k. **Pt. Townsend:** High. Feasible
  - l. **Keystone:** High. Feasible
  - m. **Anacortes:** N/A (transit is at terminal)

## Strategy Evaluation Summaries

- n. **San Juans:** N/A (transit is at terminal)
  - o. **Pt Defiance:** High. Feasible. Transit is already at terminal, but a dedicated lane operation can be added.
  - p. **Tahlequah:** Low. Not feasible. Narrow dock prevents on-dock transit operations. Existing transit stop is already as close as possible without a new dock.
3. **What would be a good test route?** Clinton and Kingston terminals are the most likely candidates.

### VI. Strategy Disposition

Carry this strategy forward. Improved transit access will benefit existing riders and attract new riders. The marginal gain in ridership may not warrant this strategy where its provision may be difficult.

# Strategy Evaluation Worksheet

**Name:** Construct sheltered transit facilities within terminals

**Description:** Include covered transit loading zones in all terminal expansion plans.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** High. Integrating transit service seamlessly into terminals greatly increases the attractiveness and convenience of transit as a modal option.
- b. **Encourages time shift:** High. New transit riders can reliably use different sailings convenient to their transit connections, but new capacity for remaining drivers is only likely to open up on sailings that are less-convenient.
- c. **Attracts new demand to available capacity:** High. SOV riders shifted to transit will utilize available walk-on capacity and increase available vehicle capacity on congested sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact, unless drivers shift to transit in such high numbers that vehicle demand for peak sailings declines significantly.
- d. **Improves operating cost per rider:** High. Shifts from vehicular trips to walk-on trips produce high operating efficiency gains.

## II. Evaluation Against Secondary Screening Criteria:

- 1. **Positive customer impacts:** High. Superior intermodal connections give equal priority to customers traveling by any mode.
- 2. **Positive community impacts:** Medium. Transit integrated into new terminals opens existing transit stops to new development; helps remove many pedestrian-vehicle conflicts.
- 3. **Positive environmental impacts:** Medium. Increased transit utilization can substantially reduce emissions by reducing SOV travel. This is offset by any additional waterfront construction impacts.

## III. Implementation and Cost

- 1. **Ease of implementation:** Low. Extensive coordination, engineering and funding is required to integrate transit into new terminals.

## Strategy Evaluation Summaries

- 2. Capital costs:** High. Building a new terminal with an intermodal transit component can be significantly more expensive than a simple terminal design.
- 3. On-going operating cost:** Medium. The transit elements of a new terminal would require on-going maintenance and operations.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No, but improved transit connections and frequency would greatly bolster this strategy's effectiveness by providing even greater incentives and opportunities to use transit.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** High.
- 2. Terminal by Terminal Applicability:** N/A. Applies to all terminals equally, subject to cost considerations.

- a. Mukilteo:**
- b. Clinton:**
- c. Edmonds:**
- d. Kingston:**
- e. Bainbridge:**
- f. Bremerton:** N/A (transit services are part of the new terminal)
- g. Colman Dock:**
- h. Southworth:**
- i. Vashon:**
- j. Fautleroy:**
- k. Pt. Townsend**
- l. Keystone:**
- m. Anacortes:**
- n. San Juans:**
- o. Pt Defiance**
- p. Tahlequah**

- 3. What would be a good test route?** Colman Dock is a likely candidate for a terminal redesign with an intermodal transit component.

### VI. Strategy Disposition

Carry this strategy forward. Intermodal transit connections should be an integral part of any terminal reconstruction. Direct transit access is a key component to encouraging new ridership and therefore fewer SOV ferry riders.

# Strategy Evaluation Worksheet

**Name:** Improved Transit/Ferry Schedule Coordination

**Description:** Provide hand-held radios, cell phones and/or some other means of communication between ferry pilots and transit drivers to confirm contingency plans in case of late arrival. Interview transit users and providers to ensure transit arrival and sailing times leave adequate time for passenger transfers.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Reliable connections are central to successful intermodal transit. Better schedule coordination and a system to ensure buses or vessels are not missed greatly increases reliability and encourages new transit users.
- b. **Encourages time shift:** Low. Increased reliability will attract some riders to sailings with improved coordination between bus and vessel arrivals.
- c. **Attracts new demand to available capacity:** Medium. Shifts from SOV trips to transit would open up capacity on some sailings.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Slight vessel delays may result from waiting for buses.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. Significant shifts from drive to walk-on access would help shorten vehicle queues.
- d. **Improves operating cost per rider:** Medium. If transit ridership grows, shifts from SOV to walk-on trips improve operating cost per rider.

## II. Evaluation of Secondary Screening Criteria:

1. **Positive customer impact:** Medium. This strategy will produce a high level of satisfaction from transit riders and attract new riders.
2. **Positive community impact:** Medium. Adjacent streets would see less queuing with a shift towards more walk-on passengers..
3. **Positive environmental impact:** Medium. Improvements to air quality would result from SOV riders that switch to transit.

## III. Implementation and Cost

1. **Ease of implementation:** Medium. Only notable hurdle for accommodating late arrivals is establishing effective coordination and communication protocols. However, transit schedule adjustments to improve coordination may require extensive system adjustments.

## Strategy Evaluation Summaries

2. **Capital costs:** Low. Communications devices are very inexpensive relative to infrastructure items.
3. **On-going operating cost:** Low. Communications charges are minimal. No new labor is required.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fautleroy:
  - k. Pt. Townsend
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** High transit ridership terminals such as Colman Dock, Bainbridge or Bremerton are the best candidates for initial implementation.

### VI. Strategy Disposition

Carry this strategy forward. This is an extremely cost-effective solution that can greatly improve the reliability of intermodal connections, enabling transit riders and providers to plan trips with less fear of missing a vessel sailing. This reliability will attract new transit riders. Careful coordination with broader transit system scheduling needs is necessary.

## Strategy Evaluation Worksheet

**Name:** Construct new park and rides with transit connections to terminals

**Description:** Partner with local transit agencies, sharing construction costs of park and rides in exchange for direct transit service to ferry terminals.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Park and ride facilities enable SOV riders to switch to a bus to bypass terminal queues. This advantage is offset by the inconvenience of adding new modal connections and any associated delays or inconveniences at both ends of the ferry trip.
- b. **Encourages time shift:** Low. Riders can reliably take preferred sailings without queue delays, which increases walk-on demand for peak sailings, but doesn't necessarily shift demand to off-peak sailings.
- c. **Attracts new demand to available capacity:** Medium. Shifts from SOV trips to transit would open up capacity on some sailings.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Medium. Queue length will lessen if utilization of park & rides is high enough.
- d. **Improves operating cost per rider:** Medium. If park & ride use grows, shifts from SOV to transit improve operating cost per rider.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Low. While this strategy provides a service to increase reliability for riders, it requires riders to shift modes in order to receive the benefit.
- 2. **Positive community impacts:** Low. The benefit of reduced queues is offset by the impact of a new parking facility.
- 3. **Positive environmental impacts:** Low. Little impact on air quality. While vehicle may be eliminated at ferry destinations with more walk-on riders, new driving trips may be created at origins by new customers using the park-and-ride. Additionally, the construction of and run-off from new parking facilities could impact adjacent environmental resources.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. While dock limitations are avoided, park & ride locations must be found and developed and transit services must be coordinated.
2. **Capital costs:** Medium. Remote parking facilities can be developed at lower cost than those in valuable dock-side locations.
3. **On-going operating cost:** Low. Parking facility maintenance costs can be minimal.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. Some terminals are already well served by park-and-rides and/or not appropriate for this type of transit connection.
2. **Terminal by Terminal Applicability:** Terminals with high auto demand coupled with limited terminal parking and lower density development patterns are most appropriate for park-and-ride development.
  - a. **Mukilteo:** High. Three park-and-rides are in the vicinity, none of which appear to serve the ferry terminal.
  - b. **Clinton:** Low.
  - c. **Edmonds:** Low. Three park-and-rides serve the terminal.
  - d. **Kingston:** Low. Two park-and-rides serve the terminal.
  - e. **Bainbridge:** Medium. Could use another park-and-ride north of terminal off of SR 205.
  - f. **Bremerton:** Low. Four park-and-rides serve the terminal.
  - g. **Colman Dock:** Low. The dense, mixed-use setting is not conducive to park-and-ride development.
  - h. **Southworth:** Medium. Could use another park-and-ride west of the terminal.
  - i. **Vashon:** Low. Three park-and-rides serve the terminal.
  - j. **Fauntleroy:** High. Two park-and-rides are in the vicinity, neither of which appear to serve the ferry terminal.
  - k. **Pt. Townsend:** Medium. An additional park-and-ride could be warranted here, especially to accommodate peak season demand.
  - l. **Keystone:** Medium. Rural location combined with very little area parking could support a park-and-ride.
  - m. **Anacortes:** Medium. Only one park-and-ride serves the terminal with low frequencies.

## Strategy Evaluation Summaries

- n. **San Juans:** Low. Rural island setting is probably not supportive of new park-and-rides.
  - o. **Pt Defiance:** Medium. No park-and-rides currently serve the terminal.
  - p. **Tahlequah:** Low. Three park-and-rides serve the terminal.
3. **What would be a good test route?** Mukilteo or Fauntleroy which have high auto demand today with limited capacity. Both have existing park-and-rides through which to route connecting transit service.

### VI. Strategy Disposition

Carry this strategy forward but only for certain terminals. For this strategy to shift trips from SOV, the terminal must currently be difficult to drive to and park at; have auto demand that far outstrips capacity; and/or be located in a rural or suburban environment without expansive local transit service. Otherwise motorists have little reason to get out of their vehicle and add another mode to their trip.

## Strategy Evaluation Worksheet

**Name:** Integrated parking reservation and pricing system

**Description:** Allow passengers to reserve parking online or by phone and to pay for parking online, by phone, or with same fare media used to pay for ferries.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. Where parking capacity is limited, this strategy will ensure some riders of the ability to park and ride. However, other users will be displaced and take their vehicle on the ferry.
- b. **Encourages time shift:** Medium. Where parking access is not impacted by queues, motorists can reliably board preferred sailings.
- c. **Attracts new demand to available capacity:** Low. No impact. Demand is simply displaced.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Low. No impact, or may even increase operating cost per rider with the system's ongoing operating costs.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** Low. While this strategy provides a premium service that greatly improves reliability for some, motorists that benefit from the current first-come, first-served system may be opposed.
- 2. **Positive community impacts:** Low. No impact.
- 3. **Positive environmental impacts:** Low. No impact.

### III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Strategy requires a reservation system and new enforcement, access control, and/or payment systems.
- 2. **Capital costs:** Medium.
- 3. **On-going operating cost:** Medium. Reservations and parking control equipment require new on-going operating costs.

## Strategy Evaluation Summaries

### IV. Interaction With Other Strategies

1. Does this strategy need other strategies to work? No.
2. Are there other strategies that might compromise this strategy's effectiveness? No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** Applies to all terminals equally with the exception of those that do not have parking.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock: N/A
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy: N/A
  - k. Pt. Townsend
  - l. Keystone: N/A
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** All. It could be implemented at any terminal (except for Colman Dock, Keystone or Fauntleroy).

### VI. Strategy Disposition

Carry this strategy forward as a mechanism to provide additional customer services and to collect additional revenues. However, it is not very effective at shifting SOV trips to other modes, shifting SOV trips to off-peak sailings, or attracting new demand to existing capacity.

## Strategy Evaluation Worksheet

**Name:** Metered exit queuing

**Description:** Route offloaded vehicles through terminal holding areas and release them at a set rate.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. No impact.
- b. **Encourages time shift:** Low. No impact.
- c. **Attracts new demand to available capacity:** Low. No impact.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. May increase unloading time.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Low. No impact.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Low. Benefits to local traffic operations and pedestrian/bicycle safety would be off-set by inconvenience to SOV customers.
- 2. **Positive community impact:** High. Controlling the pace of exiting traffic can alleviate intersection congestion problems in terminal communities while encouraging safer pedestrian crossings.
- 3. **Positive environmental impact:** Low. No impact.

### III. Implementation and Cost

- 1. **Ease of implementation:** Medium. New signalization or other intersection coordination and timing strategies or devices will be necessary. Additional holding area may need to be obtained.
- 2. **Capital costs:** Medium. New signals and associated wiring and inter-connects may need to be installed. Additional terminal holding capacity may be needed.
- 3. **On-going operating cost:** Medium. On-going coordination systems and labor may be necessary.

## Strategy Evaluation Summaries

### IV. Interaction With Other Strategies

1. Does this strategy need other strategies to work? No.
2. Are there other strategies that might compromise this strategy's effectiveness? No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low.
2. **Terminal by Terminal Applicability:** Benefits accrue mostly to terminals located close to problematic intersections or activity centers.
  - a. **Mukilteo:** Medium
  - b. **Clinton:** Low
  - c. **Edmonds:** High
  - d. **Kingston:** High
  - e. **Bainbridge:** High
  - f. **Bremerton:** High
  - g. **Colman Dock:** High
  - h. **Southworth:** Low
  - i. **Vashon:** Low
  - j. **Fauntleroy:** Medium
  - k. **Pt. Townsend:** Medium
  - l. **Keystone:** Low
  - m. **Anacortes:** Low
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** Colman Dock.

### VI. Strategy Disposition

Carry this strategy forward limitedly. While significant traffic benefits are possible, there are few places where the benefit is substantial enough to justify the cost.

## Strategy Evaluation Worksheet

**Name:** Off peak pricing

**Description:** WSF offers vehicle fare discounts on off-peak sailings.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. May encourage more people to drive.
- b. **Encourages time shift:** High. Likely to encourage more off-peak trips.
- c. **Attracts new demand to available capacity:** High. Off-peak sailings will see more trips.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Medium. Shifting auto demand away from congested peak period sailings will help shorten queues during those times.
- d. **Improves operating cost per rider:** Medium. Additional trips on off-peak sailings will improve their cost per rider.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impact:** Medium. Customers will appreciate the opportunity to save when traveling off-peak. However, many peak-hour riders will consider the off-peak discounts to be a surcharge.
- 2. **Positive community impact:** Low. No impact.
- 3. **Positive environmental impact:** Low. While queues and idling will be reduced during peak periods, additional off-peak vehicle trips will produce more air pollution and offset any gains.

### III. Implementation and Cost

- 1. **Ease of implementation:** High. Only fare structure and ticketing system changes are necessary.
- 2. **Capital costs:** Low. Minor system change costs.
- 3. **On-going operating cost:** Low. No impact.

## Strategy Evaluation Summaries

### IV. Interaction With Other Strategies

1. Does this strategy need other strategies to work? No.
2. Are there other strategies that might compromise this strategy's effectiveness? No.

### V. Applicability to Terminals

1. Potential for System-wide Application: High.
2. Terminal by Terminal Applicability: Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fauntleroy:
  - k. Pt. Townsend
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance
  - p. Tahlequah
3. What would be a good test route? All. It would be a system-wide change.

### VI. Strategy Disposition

Carry this strategy forward. While no mode shift is likely to be encouraged, underutilized vessel capacity on off-peak sailings will be better utilized, improving the average operating cost per rider.

## Strategy Evaluation Worksheet

**Name:** On-board ticketing

**Description:** Vehicle tollbooths could be removed and staging areas controlled by traffic management staff only. Staff could collect vehicle fares once vehicles are on-board.

### I. Evaluation Against Primary Screening Criteria:

#### 1. Manages Demand

- a. **Encourages mode shift:** Low. No impact.
- b. **Encourages time shift:** Low. No impact.
- c. **Attracts new demand to available capacity:** Low. No impact.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** High. Ticketing is handled on-board during overwater transit.
- c. **Reduces queue lengths:** High. Since most queues are the result of delays at ticketing, queues would be reduced significantly.
- d. **Improves operating cost per rider:** Low. Landside ticketing labor costs are removed at all terminals on a route and replaced by one group of on-board ticketing staff per vessel, reducing operating cost per rider slightly.

### II. Evaluation of Secondary Screening Criteria:

- 1. **Positive customer impacts:** High. Delay before boarding or entering holding areas is removed. Motorists are further benefited by having ticketing staff come directly to customer vehicles.
- 2. **Positive community impacts:** High. Many queues are shortened or eliminated.
- 3. **Positive environmental impacts:** Medium. Some idling emissions are eliminated.

### III. Implementation and Cost

- 1. **Ease of implementation:** Low. New ticketing and enforcement procedures must be established, trained and advertised since fare evasion will become a significant issue.
- 2. **Capital costs:** Low. Requires only hand-held electronic payment devices and fare gates.

## Strategy Evaluation Summaries

3. **On-going operating cost:** Low. Strategy has the potential to lower labor costs.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High.
2. **Terminal by Terminal Applicability:** Applies to all terminals equally.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fautleroy:
  - k. Pt. Townsend
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance
  - p. Tahlequah
3. **What would be a good test route?** It would be a system-wide change, but could be piloted on any route.

### VI. Strategy Disposition

Carry this strategy forward. While no mode shift is likely to be encouraged, overall system efficiency, cost savings and customer convenience would be increased.

# Strategy Evaluation Worksheet

**Name:** Double-decked holding areas

**Description:** At terminals where limited capacity or constrained layout of holding areas impacts operations (e.g. vehicle circulation patterns, queuing, loading/unloading times), holding areas could be “double-decked” to provide additional capacity and improve operations for drive-ons.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage passengers to shift to non-auto modes to access the terminal.
- b. **Encourages time shift:** Low. Does nothing to encourage passengers to shift to off-peak travel times.
- c. **Attracts new demand to available capacity:** Low. Does nothing to incentivize passengers to travel at times or on routes with surplus capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. While double-decking holding areas could make loading/unloading marginally faster (due to less confusing circulation patterns, reduced need to “lane shift”, etc due to increased holding capacity), the primary constraint on loading/unloading time is the “bottleneck” of the boat itself. Time savings from avoiding “lane shift” could be offset by time required to travel down holding area ramps to the at-grade access ramp to the boat.
- b. **Reduces ticketing time:** Low.
- c. **Reduces queue lengths:** Medium. Would reduce queues that occur outside the fare collection/verification “access point”, but queues in the holding areas would not be reduced.
- d. **Improves operating cost per rider:** Low.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** Medium. Drive-ons would potentially benefit from improved circulation patterns and marginally improved loading/unloading times. Could also help reduce vehicle conflicts with transit vehicles and walk-on/bike-on passengers.
- 2. **Positive community impacts:** Low. At peak times, additional holding capacity could help reduce queues on surrounding streets. At the same time, multi-story holding areas could block community views of the waterfront compared to existing surface configurations.

## Strategy Evaluation Summaries

- 3. Positive environmental impacts:** Low. By getting drive-ons out of circulation queues and into the holding area more quickly, could potentially reduce vehicle idling and related emissions.

### III. Implementation and Cost

- 1. Ease of implementation:** Low. Construction would likely require disruption to current operations and have impacts on host communities, and require new permits from local jurisdictions.
- 2. Capital costs:** High (depending on terminal configuration). New parking structures are expensive to build.
- 3. On-going operating cost:** Low. Will likely have higher operating and maintenance costs compared to current surface configuration of holding areas.

### IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** No.
- 2. Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

- 1. Potential for System-wide Application:** Low. Limited holding space is not a problem at all terminals. This strategy is only cost effective at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities.
- 2. Terminal by Terminal Applicability:**
  - a. Mukilteo:** Medium
  - b. Clinton:** Low
  - c. Edmonds:** Medium. Although no dock holding exists today, adjacent surface parking lots could potentially be acquired for a new double-decked holding structure.
  - d. Kingston:** Medium
  - e. Bainbridge:** High
  - f. Bremerton:** Low
  - g. Colman Dock:** High
  - h. Southworth:** Low
  - i. Vashon:** Low
  - j. Fautleroy:** Medium
  - k. Pt. Townsend:** Low
  - l. Keystone:** Low
  - m. Anacortes:** Medium
  - n. San Juans:** Low
  - o. Pt Defiance:** Low

## Strategy Evaluation Summaries

p. Tahlequah: Low

3. What would be a good test route? Colman Dock or Bainbridge.

### VI. Strategy Disposition

Due to the high capital costs of this strategy, potential negative environmental effects, and relative difficulty to implement it, carry it forward in a limited fashion at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities, and where all other feasible mode shift and time shift strategies have already been implemented.

## Strategy Evaluation Summaries

# Strategy Evaluation Worksheet

**Name:** Minimize employee parking at terminals

**Description:** At terminals where limited capacity or constrained layout of holding areas impacts operations, employee parking could be located off-site with access to the terminal by shuttle bus or multi-passenger fleet vehicle.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage passengers to shift to non-auto modes to access the terminal.
- b. **Encourages time shift:** Low. Does nothing to encourage passengers to shift to off-peak travel times.
- c. **Attracts new demand to available capacity:** Low. Does nothing to incentivize passengers to travel at times or on routes with surplus capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. While removing employing parking from holding areas could make loading/unloading marginally faster (due to less confusing circulation patterns, reduced need to “lane shift”, etc due to increased holding capacity), the primary constraint on loading/unloading time is the “bottleneck” of the boat itself.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. By providing more capacity in the holding area for drive-ons, could reduce queues that occur outside the fare collection/verification “access point”, but queues in the holding areas would not be reduced.
- d. **Improves operating cost per rider:** Low.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** Medium. Drive-ons would potentially benefit from improved circulation patterns and marginally improved loading/unloading times. Could also help reduce vehicle conflicts with transit vehicles and walk-on/bike-on passengers.
- 2. **Positive community impacts:** Medium. At peak times, additional holding capacity could help reduce queues on surrounding streets. Suitable off-site employee parking areas would need to be identified to ensure that employees do not cause spillover parking impacts in host communities.

## Strategy Evaluation Summaries

3. **Positive environmental impacts:** Medium. By getting drive-ons out of circulation queues and into the holding area more quickly, could potentially reduce vehicle idling and related emissions.

### III. Implementation and Cost

1. **Ease of implementation:** Medium. Current labor agreements explicitly provide for on-dock employee parking only for Terminal Supervisors. However, because employee parking at terminals has been allowed for many years, it would be deemed a “past practice” and to remove it would potentially require renegotiated labor contracts as well as plans for alternate off-dock employee parking locations.
2. **Capital costs:** Low, depending on cost to purchase and/or improve off-site parking. If off-site parking is located farther than walking distance, a shuttle bus, van, or other multi-passenger fleet vehicle may need to be purchased to transport employees from off-site parking to terminal.
3. **On-going operating cost:** Low, including labor costs for shuttle/van operator and any maintenance costs for vehicle and off-site parking facility. If parking is leased instead of purchased as assumed above, lease costs would add to annual operating costs.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy’s effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low, as not all terminals provide on-dock employee parking. Only worth pursuing at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** Low. Employee parking is in a location unusable for holding.
  - b. **Clinton:** Low. Employees do not park in the holding area.
  - c. **Edmonds:** Low
  - d. **Kingston:** Medium. Employee spaces could be used for holding, especially during peak season.
  - e. **Bainbridge:** High. Employee parking space could be used for staging bikes and carpools, and/or vehicle transitions.
  - f. **Bremerton:** Low
  - g. **Colman Dock:** High

## Strategy Evaluation Summaries

- h. Southworth:** Low
- i. Vashon:** Low
- j. Fauntleroy:** Low. There are only a couple of employee parking spaces in the holding area.
- k. Pt. Townsend:** Medium
- l. Keystone:** Low
- m. Anacortes:** Medium (especially applicable during peak season)
- n. San Juans:** Low
- o. Pt Defiance:** Medium.
- p. Tahlequah:** Medium.

**3. What would be a good test route?** Bainbridge or Colman Dock.

## VI. Strategy Disposition

Carry the strategy forward by pursuing renegotiation of on-dock employee parking provision in labor agreements. Could initially limit to a 'pilot' at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities. Quantifiable benefits of this pilot can be used to justify expansion to other appropriate terminals.

# Strategy Evaluation Worksheet

**Name:** Relocate non-essential functions off of on-dock holding area.

**Description:** Re-locate non-essential functions (such as waste disposal, vending, and materials storage) off of the dock area to alternate locations in order to increase capacity of vehicle holding areas.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Low. Does nothing to encourage passengers to shift to non-auto modes to access the terminal.
- b. **Encourages time shift:** Low. Does nothing to encourage passengers to shift to off-peak travel times.
- c. **Attracts new demand to available capacity:** Low. Does nothing to incentivize passengers to travel at times or on routes with surplus capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. While removing non-essential functions from on-dock holding areas could make loading/unloading marginally faster (due to less confusing circulation patterns, reduced need to “lane shift”, etc. with increased holding capacity), the primary constraint on loading/unloading time is the “bottleneck” of the boat itself.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. By providing more capacity in the holding area for drive-ons, could reduce queues that occur outside the fare collection/verification “access point”, but queues in the holding areas would not be reduced.
- d. **Improves operating cost per rider:** Low.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** Medium. Drive-ons would potentially benefit from improved circulation patterns and marginally improved loading/unloading times. Could also help reduce vehicle conflicts with transit vehicles and walk-on/bike-on passengers.
- 2. **Positive community impacts:** Medium. At peak times, additional holding capacity could help reduce queues on surrounding streets.
- 3. **Positive environmental impacts:** Medium. By getting drive-ons out of circulation queues and into the holding area more quickly, could potentially reduce vehicle idling and related emissions.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. However, this will depend on the availability of space in or near the terminal to relocate non-essential functions.
2. **Capital costs:** Low.
3. **On-going operating cost:** Low.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low, as not all terminals have non-essential functions located on-dock in space that could be used for vehicle holding. This strategy is only worth pursuing at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities.
2. **Terminal by Terminal Applicability:** Although a medium or high score indicates a terminal where non-holding functions are currently using potential holding space, additional research is needed to establish which functions must be located on-dock due to security and other requirements and which could be relocated.
  - a. **Mukilteo:** Low
  - b. **Clinton:** Low
  - c. **Edmonds:** Medium
  - d. **Kingston:** Medium
  - e. **Bainbridge:** Low
  - f. **Bremerton:** Low
  - g. **Colman Dock:** Low
  - h. **Southworth:** Low
  - i. **Vashon:** Low
  - j. **Fauntleroy:** Low
  - k. **Pt. Townsend:** Medium
  - l. **Keystone:** Medium
  - m. **Anacortes:** Medium
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** Kingston, since there appears to be a large amount of adjacent space that could be utilized for relocated functions.

## Strategy Evaluation Summaries

### VI. Strategy Disposition

Carry the strategy forward by pursuing system-wide review of what terminals have non-essential functions located on-dock and which of those functions could be feasibly located elsewhere. However, because re-located non-essential functions are unlikely to open up significant amounts of holding space, the application of this strategy should be limited to a 'pilot' at terminals with high demand, extremely constrained holding areas, and significant on-street queuing impacts to host communities. Quantifiable benefits of this pilot can be used to justify expansion to other appropriate terminals.

# Strategy Evaluation Worksheet

**Name:** Participate in existing Transportation Management Associations (TMAs) and/or form new TMA.

**Description:** TMAs are quasi-public organizations that develop and administer programs that reduce vehicle trips and improve access by non-auto modes. Where TMAs exist, WSF could increase the agency's coordination and collaboration to improve WSF customer access issues (e.g. send staff to existing TMA meetings, promote existing TMA activities to WSF passenger, consider cost-sharing with existing TMAs on programs that benefit WSF passengers and achieve WSF operational goals).

Alternately, WSF could provide initial funding (or secure outside funding through grants) to establish a TMA that would coordinate with existing TMAs in host communities but specifically focus on addressing WSF access issues. This WSF-specific TMA would focus especially on strategies that promote mode shift and time shift for WSF, such as promoting ride-sharing, providing financial incentives to take transit to ferry terminals, etc.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** High, depending on programs/incentives ultimately implemented.
- b. **Encourages time shift:** High, depending on programs/incentives ultimately implemented.
- c. **Attracts new demand to available capacity:** High, depending on programs/incentives ultimately implemented.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. While promoting mode shift and time shift could make loading/unloading marginally faster especially at peak travel times, the primary constraint on loading/unloading time is the "bottleneck" of the boat itself.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium, depending on the effectiveness of the mode shift and time shift programs/incentives ultimately implemented.
- d. **Improves operating cost per rider:** Medium, depending on the effectiveness of the mode shift and time shift programs/incentives ultimately implemented (it is often cheaper to pay people not to drive than it is to accommodate their vehicle trip).

## Strategy Evaluation Summaries

### II. Evaluation of Secondary Screening Criteria

1. **Positive customer impacts:** Medium. Regardless of the effectiveness of the mode shift and time shift programs/incentives ultimately implemented, TMAs play a valuable role in making WSF customers aware of the full range of their travel choices for accessing terminals.
2. **Positive community impacts:** Medium, depending on the effectiveness of the mode shift and time shift programs/incentives ultimately implemented, this has the potential to significantly reduce terminal queues and associated negative traffic impacts on adjacent streets.
3. **Positive environmental impacts:** Medium, depending on the effectiveness of the mode shift programs/incentives ultimately implemented.

### III. Implementation and Cost

1. **Ease of implementation:** High if WSF simply increases collaboration and coordination with existing TMAs. Low if WSF forms a new system-wide TMA. This also depends on the mode shift and time shift programs/incentives ultimately implemented.
2. **Capital costs:** Low.
3. **On-going operating cost:** Medium, depending on the mode shift programs/incentives ultimately implemented.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High if WSF forms a new system-wide TMA, which would probably be a good approach given only one terminal area (Seattle) has an existing TMA.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** Low
  - b. **Clinton:** Low
  - c. **Edmonds:** Low
  - d. **Kingston:** Low
  - e. **Bainbridge:** Low
  - f. **Bremerton:** Low
  - g. **Colman Dock:** High
  - h. **Southworth:** Low
  - i. **Vashon:** Low

## Strategy Evaluation Summaries

- j. **Fauntleroy:** Low
- k. **Pt. Townsend:** Low
- l. **Keystone:** Low
- m. **Anacortes:** Low
- n. **San Juans:** Low
- o. **Pt Defiance:** Low
- p. **Tahlequah:** Low

3. **What would be a good test route?** Colman Dock, since Seattle already has an active TMAs with a wide variety of programs.

## VI. Strategy Disposition

Carry the strategy forward by increasing WSF coordination and collaboration with the Seattle Urban Mobility Group to improve WSF customer access issues (e.g. send staff to existing TMA meetings, promote existing TMA activities to WSF passenger, consider cost-sharing with existing TMAs on programs that benefit WSF passengers and achieve WSF operational goals).

Depending on the success of this partnership in achieving WSF's mode shift and time shift goals, pursue a feasibility study of formation of a WSF-specific TMA that would coordinate with existing TMAs in host communities but specifically focus on addressing WSF access issues.

# Strategy Evaluation Worksheet

**Name:** Promote and market non-single-occupant-vehicle (SOV) modes of ferry access.

**Description:** Market and promote carpooling, vanpooling, transit, bicycling, and walking to access ferry terminals in order to reduce auto demand on WSF's system. Studies have shown that lack of information on transit, bicycling, and walking options and resources is a significant barrier to getting people to make fewer trips by auto. For example, the Travel Choice Program in the Bay Area provided personalized information on transit, biking, and walking to 4,500 households, resulting in a 14% reduction in drive alone trips by program participants. WSF could actively promote and market carpooling, transit, bicycling, and walking to access to ferry terminals in order to reduce drive-alone rates of WSF passengers. Examples include:

- **Advertise bicycle and walk-on amenities.** Initiate advertising campaign to publicize pedestrian and bicycle promotions, connections, fare types, and passenger benefits on the ferry system. Develop a long-term marketing plan. Develop and commit to a long-term multi-media, system-wide messaging plan that encourages preferred passenger behaviors and discourages undesired behaviors.
- **Promote car-free recreation/tourism information.** Develop materials for distribution to departments of tourism, SEA-TAC airport and other tourist destinations and organizations that advertise available connecting transit routes, cab services, parking and access to bicycles and other alternate modes from ferry terminals.
- **Provide additional transit, pedestrian, car-sharing and bicycle information.** Employ a "mobility concierge" at all terminals to assist walk-on and bike-on passengers with reaching their destinations.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- Encourages mode shift:** High, depending on robustness of the promotional/marketing campaign ultimately implemented.
- Encourages time shift:** Low.
- Attracts new demand to available capacity:** High, depending on robustness of the promotional/marketing campaign ultimately implemented and its effectiveness in promoting mode shift.

### 2. Increases Operational Efficiency

- Reduces loading/unloading time:** Low. Promoting non-drive-alone modes could result in a significant enough mode shift to make loading/unloading marginally faster (especially at peak travel times).

## Strategy Evaluation Summaries

However, the primary constraint on loading/unloading time is the “bottleneck” of the boat itself.

- b. Reduces ticketing time:** Low. Does not impact ticketing times.
- c. Reduces queue lengths:** Medium, depending on the robustness of marketing campaigns and the degree of the mode shift achieved.
- d. Improves operating cost per rider:** Medium, depending on the robustness of marketing campaigns and the degree of the mode shift achieved.

## II. Evaluation of Secondary Screening Criteria

- 1. Positive customer impacts:** Medium. Regardless of the effectiveness of the promotional/marketing campaign ultimately implemented, making more information available about non-drive-alone modes helps WSF customers become more aware of the full range of their travel choices for accessing terminals.
- 2. Positive community impacts:** Medium. Depending on the robustness of marketing campaigns and the degree of the mode shift achieved, queues and associated negative traffic impacts could be significantly reduced.
- 3. Positive environmental impacts:** High. Positive air and water quality impacts could be high if marketing and promotions are successful in achieving significant mode and time shifts.

## III. Implementation and Cost

- 1. Ease of implementation:** Medium., Additional funding and staffing would likely be needed.
- 2. Capital costs:** Low.
- 3. On-going operating cost:** Medium. This would depend on the robustness of the promotional/marketing campaign ultimately implemented.

## IV. Interaction With Other Strategies

- 1. Does this strategy need other strategies to work?** Yes, the effectiveness of this strategy will require reasonably good transit, bicycle, and pedestrian service/infrastructure and wayfinding.
- 2. Are there other strategies that might compromise this strategy’s effectiveness?** No.

## V. Applicability to Terminals

- 1. Potential for System-wide Application:** High.
- 2. Terminal by Terminal Applicability:** Although this strategy lends itself best to system-wide application, it could also be targeted to users of terminals where auto demand greatly exceeds available capacity.

## Strategy Evaluation Summaries

- a. **Mukilteo:** High
- b. **Clinton:** Low.
- c. **Edmonds:** High
- d. **Kingston:** High
- e. **Bainbridge:** High
- f. **Bremerton:** High
- g. **Colman Dock:** High
- h. **Southworth:** Medium
- i. **Vashon:** Medium
- j. **Fauntleroy:** High
- k. **Pt. Townsend:** High
- l. **Keystone:** Low
- m. **Anacortes:** High
- n. **San Juans:** High
- o. **Pt Defiance:** Low
- p. **Tahlequah:** Low

3. **What would be a good test route?** Seattle-Bainbridge.

### VI. Strategy Disposition

Carry the strategy forward, in partnership with TMAs and other stakeholders (e.g. for car-free tourism: convention and visitor's bureaus, state tourism/recreation departments). Initial steps would be to develop a long-term marketing plan to publicize non-drive-alone options. Consider a pilot program to employ a "mobility concierge" at terminals with good transit, bicycle, and pedestrian access to assist non-drive-alone passengers. Given the difficulty of targeting programs and promotions to users of particular routes, it is highly recommended to pursue this on a system-wide basis.

# Strategy Evaluation Worksheet

**Name:** Increase provision of priority ticketing, staging, and loading for carpools and vanpools and expand the carpool definition to include non-registered carpools.

**Description:** WSF currently provides priority access for carpools and vanpools at some highly-constrained terminals such as Colman Dock and Bainbridge Island. In order to incentivize more passengers to travel to/from terminals in carpools and vanpools, the agency could expand this priority access to all terminals current practices, especially where queuing problems are severe and holding capacity is constrained. Via dedicated ticketing booths and “diamond lanes”, carpools and vanpools would receive priority ticketing, staging, and loading. At the same time, WSF could revise their definition of “carpools” to include non-registered carpools, since currently only registered carpools get priority loading and access.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Expanding the carpool definition and making carpool and vanpool access to and from the terminal more convenient would help encourage drive-on passengers to shift to carpools and vanpools. Additionally, time savings for carpools/vanpools could cause passengers currently accessing terminals by transit, bike, and on foot to shift to carpools/vanpools.
- b. **Encourages time shift:** Low. Does nothing to encourage passengers to shift to off-peak travel times.
- c. **Attracts new demand to available capacity:** Medium. Shifting a portion of passengers who currently access vessels via SOV to HOV will attract new walk-on demand to available passenger capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. While prompting some mode shift to carpools/vanpools could make loading/unloading marginally faster, the primary constraint on loading/unloading time is the “bottleneck” of the boat itself.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. Some mode shift to carpools/vanpools could reduce auto queues.
- d. **Improves operating cost per rider:** Low, depending on the robustness of the mode shift achieved.

## Strategy Evaluation Summaries

### II. Evaluation of Secondary Screening Criteria

1. **Positive customer impacts:** Medium. Since priority loading for carpools already exists, marginal benefits would accrue to existing carpools & vanpoolers. However an expanded carpool definition would benefit a significant number of customers..
2. **Positive community impacts:** Low, depending on the robustness of the mode shift achieved.
3. **Positive environmental impacts:** Low. Depending on the robustness of the mode shift achieved, could potentially reduce vehicle trips and related emissions. These benefits would be offset if time savings for carpools/vanpools caused passengers currently accessing terminals by transit, bike, and on foot to shift to carpools/vanpools.

### III. Implementation and Cost

1. **Ease of implementation:** High. Simply requires dedicating one or more existing ticketing booths and queuing lanes to exclusive use for carpools/vanpools, and a shift to the carpool definition is a simple policy change.
2. **Capital costs:** Low.
3. **On-going operating cost:** Low.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but the likely negligible mode shift impacts and operational benefits of implementing this strategy alone could be significantly leveraged by increased financial incentives for carpools and vanpools.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. An expanded carpool definition would be system-wide.
2. **Terminal by Terminal Applicability:** All terminals already provide some degree of priority loading for carpools and vanpools, but it could be bolstered, especially at terminals where auto demand greatly outstrips capacity and there is a large proportion of commuters.
  - a. **Mukilteo:** High
  - b. **Clinton:** Low
  - c. **Edmonds:** High
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High
  - f. **Bremerton:** High
  - g. **Colman Dock:** High
  - h. **Southworth:** Low

## Strategy Evaluation Summaries

- i. **Vashon:** Low
- j. **Fauntleroy:** High
- k. **Pt. Townsend:** Low
- l. **Keystone:** Low
- m. **Anacortes:** Low
- n. **San Juans:** Low
- o. **Pt Defiance:** Low
- p. **Tahlequah:** Low

3. **What would be a good test route?** Terminals with queuing problems such as Mukilteo or Edmonds.

## VI. Strategy Disposition

Carry this strategy forward for its operational and customer convenience benefits, which can be gained at little cost or effort to WSF.

# Strategy Evaluation Worksheet

**Name:** Provide hill-climb assistance for pedestrians and bicyclists.

**Description:** The geography surrounding many WSF terminals includes steep grades, which can limit the feasibility of biking and walking to access the terminals for many passengers who otherwise might be able to (especially passengers with mobility impairments and/or those that live within ¼ to ½ mile from the terminal). Offering hill-climb assistance to pedestrians and bicyclists via specialized “people mover” or “bike stairs” infrastructure or a circulator shuttle service to supplement existing fixed-route transit at terminals where hill climbs are especially steep could result in increased biking and walking to the terminals.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Hills can be a significant obstacle influencing the decision to walk or bike.
- b. **Encourages time shift:** Low. No impact
- c. **Attracts new demand to available capacity:** Medium. By encouraging a shift to walk and bike on modes of access, excess passenger capacity will be better utilized.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Does not apply.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. With enough mode shift, auto queues could be shortened..
- d. **Improves operating cost per rider:** Low. Any mode shift would be offset by additional capital and operating/maintenance costs for hill climb assistance infrastructure or circulator service.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** High. Improves access for walking and biking passengers, especially those with mobility impairments.
- 2. **Positive community impacts:** Medium. In addition to shortening queues, hill climb assistance would also benefit the surrounding community.
- 3. **Positive environmental impacts:** Medium. Making bike-on and walk-on access more attractive could potentially reduce vehicle trips and related emissions.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Low. People movers or bike stairs infrastructure would require designing, permitting, and/or constructing in public right-of-way of host communities.
2. **Capital costs:** High. Any uphill hill climb assistance requires mechanical devices or vehicles.
3. **On-going operating cost:** Medium. Varies depending on particular hill climb assistance method implemented.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but the likely negligible mode shift impacts and operational benefits of implementing this strategy alone could be significantly leveraged by increased financial incentives for passengers who walk and bike and partnering with host communities to build complete bicycle and pedestrian networks.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. The strategy is only worth considering at terminals where surrounding geography includes steep grades that are so severe as to limit the feasibility of biking and walking for a significant number of passengers and it is not cost-effective to increase existing fixed-route transit service in hilly areas.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** Medium
  - b. **Clinton:** Medium
  - c. **Edmonds:** Low
  - d. **Kingston:** Low
  - e. **Bainbridge:** Low
  - f. **Bremerton:** Low
  - g. **Colman Dock:** High
  - h. **Southworth:** Low
  - i. **Vashon:** Medium
  - j. **Fauntleroy:** Low
  - k. **Pt. Townsend:** High
  - l. **Keystone:** Low
  - m. **Anacortes:** Low
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low

## Strategy Evaluation Summaries

- 3. What would be a good test route?** Colman Dock connections into Seattle's central business district and Third Avenue transit corridor..

### VI. Strategy Disposition

This strategy should be carried forward, but on a very limited basis. Due to its relative implementation difficulty and associated cost, it should only be considered for terminals where the surrounding geography includes steep grades that are so severe as to limit the feasibility of biking and walking for a significant number of passengers, and where many nearby destinations and attractions exist within biking and walking distance of the terminal.

# Strategy Evaluation Worksheet

**Name:** Expanded fare card coordination and marketing

**Description:** WSF's Wave to Go electronic fare cards allow users to use their cards to pay their bus and ferry fares. The cards significantly reduce ticketing time for walk-ons compared to cash fare payment, increase customer convenience and reduce the agency's fare collection and verification costs. In order to expand usage of Wave to Go and leverage the benefits to both customers and the agency, WSF could increase marketing of Wave to Go electronic fare cards, and allow users to use their cards to pay for bike sharing and car sharing, and expand the application of the card to additional connecting transit services.

## I. Evaluation Against Primary Screening Criteria

### 3. Manages Demand

- a. **Encourages mode shift:** Medium. Making it more convenient to pay for transit fares, bikes and carshare vehicles can help shift customers to walk on and bike on access.
- b. **Encourages time shift:** Low. Does nothing to encourage passengers to shift to off-peak travel times.
- c. **Attracts new demand to available capacity:** Low. It is unlikely that expanding the applicability of the fare card to new services, and encouraging expanded use of the cards, would alone incentivize passengers to travel at times or on routes with surplus capacity.

### 4. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Does not apply.
- b. **Reduces ticketing time:** High. Fare cards are more quickly processed at the ticketing window, so increased use of the cards would speed up the ticketing time.
- c. **Reduces queue lengths:** Low. This strategy would do little to reduce queues.
- d. **Improves operating cost per rider:** Low. A reduction in total ticketing agents may reduce costs somewhat, but some live ticket sales would continue to be necessary for non-Wave to Go riders.

## II. Evaluation of Secondary Screening Criteria

- 4. **Positive customer impacts:** High. Improves customer convenience.
- 5. **Positive community impacts:** Low. No impact.
- 6. **Positive environmental impacts:** Low. No significant impact.

## Strategy Evaluation Summaries

### III. Implementation and Cost

4. **Capital costs:** Medium. Some initial costs may be necessary to support technology integration with transit, carshare and bikeshare programs. New and/or additional automated card readers may need to be installed.
5. **Ease of implementation:** Medium. would first need to coordinate with existing and new bikesharing, carsharing, and transit providers in the region to ensure that Wave to Go technology could interface with these services.
6. **On-going operating cost:** Low. Labor costs are reduced and only replaced by any promotional/marketing costs.

### IV. Interaction With Other Strategies

3. **Does this strategy need other strategies to work?** Yes. Requires bikesharing and carsharing programs to exist and be located in reasonable proximity to the ferry terminal. Requires reasonably good transit service to be available.
4. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

4. **Potential for System-wide Application:** High.
5. **Terminal by Terminal Applicability:** N/A. Applies to all terminals equally.
  - q. Mukilteo:
  - r. Clinton:
  - s. Edmonds:
  - t. Kingston:
  - u. Bainbridge:
  - v. Bremerton:
  - w. Colman Dock:
  - x. Southworth:
  - y. Vashon:
  - z. Fauntleroy:
  - aa. Pt. Townsend:
  - bb. Keystone:
  - cc. Anacortes:
  - dd. San Juans:
  - ee. Pt Defiance:
  - ff. Tahlequah:
6. **What would be a good test route?** Any terminal where carsharing, bikesharing, and/or where a good variety of connecting transit services exists.

### VI. Strategy Disposition

Carry the strategy forward for its potential to shift mode of access and reduce ticketing time.

# Strategy Evaluation Worksheet

**Name:** Incentivize carsharing pods to locate at all appropriate terminals

**Description:** WSF could encourage less drive-on traffic by incentivizing carsharing operators like Flexcar to locate at all appropriate terminals. Allows passengers to travel to/from their arrival terminal by vehicle when needed, without needing their personal vehicle, thereby reducing the number of vehicles driven on board and transported by ferries. Incentives provided by WSF to expand carsharing could include offering new/additional parking spaces, promotional support, and direct financial subsidy.

## I. Evaluation Against Primary Screening Criteria:

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Supports passengers' ability to travel without driving on boats in a private vehicle, even when they need the flexibility of a car to travel to or from either the origin terminal or the destination terminal. Most effective for daily commuters on urban-to-urban routes who may need a car only infrequently.
- b. **Encourages time shift:** Medium. May enable riders to walk-on, bike-on, or use transit during off-peak hours with the knowledge that a fast, direct vehicle connection is available at the other terminal.
- c. **Attracts new demand to available capacity:** Medium. May support off-peak travel and walk-on ferry access.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. No impact.
- c. **Reduces queue lengths:** Medium. A significant shift of SOV riders to other modes could reduce queues.
- d. **Improves operating cost per rider:** Medium. Improves operating cost per rider if boats carry more walk-ons. Could be offset by operating subsidies to support carsharing system.

## II. Evaluation of Secondary Screening Criteria:

1. **Customer impacts:** Medium. Provides another land-side amenity for riders.
2. **Community impacts:** Medium. May slightly reduce queuing. The carsharing service will be available as a benefit for neighboring residents and may enable ferry passengers to more easily access local businesses.
3. **Environmental impacts:** Low. No net effect on emissions if private vehicles are still used to reach one terminal and carsharing vehicles are used at the other terminal. May have greater benefit if current drivers switch to transit or non-motorized modes at one end of the route as a result.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Medium. While providing dedicated parking spaces and promotional support is simple, coordination with or development of carsharing services will require development of operating agreements.
2. **Capital costs:** Low.
3. **On-going operating cost:** Low. However, WSF may have to provide a direct financial subsidy for operational support.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** Yes. Transit, bike/ped, and/or rental/taxi connections must be strong at the “origin” and “destination” terminal for this strategy to have beneficial impacts. Strategies to continue or expand existing fare surcharge for vehicles would encourage more passengers not to bring private vehicles on board ferries at their “origin” station and utilize carshares at their “destination” terminal.
2. **Are there other strategies that might compromise this strategy’s effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low. Utilization is highest and operating subsidies lowest on urban-to-urban routes where a high number of WSF passengers are already members of the carsharing operators system and where pods will be utilized by community members when not in use by WSF passengers.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** Low
  - b. **Clinton:** Low
  - c. **Edmonds:** Medium
  - d. **Kingston:** Low
  - e. **Bainbridge:** High
  - f. **Bremerton:** High
  - g. **Colman Dock:** High
  - h. **Southworth:** Low
  - i. **Vashon:** Low
  - j. **Fauntleroy:** Medium
  - k. **Pt. Townsend:** Medium
  - l. **Keystone:** Low
  - m. **Anacortes:** Low
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low

## Strategy Evaluation Summaries

**What would be a good test route?** Colman Dock.

### **VI. Strategy Disposition**

Carry the strategy forward. Carsharing provides immense flexibility for travelers and may represent a noticeable cost savings for SOV commuters avoiding ferry fares.

# Strategy Evaluation Worksheet

**Name:** Real-time transit arrival, departure, and connections information

**Description:** Develop Geographic Positioning System to track the progress of ferry vessels and estimated time of arrival and departure; integrate this system with similar technology for arrivals and departures of transit vehicles connecting to terminals; display real-time information to passengers to allow them to coordinate connecting trips.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Medium. By making transit access to and from the terminal more convenient (especially at terminals/times where transit service is infrequent), could help encourage passengers to shift to non-auto modes.
- b. **Encourages time shift:** Medium. By making access to and from the terminal more convenient (especially at terminals/times where transit service is infrequent), could help encourage passengers to travel at off-peak times.
- c. **Attracts new demand to available capacity:** Medium. By making access to and from the terminal more convenient (especially at terminals/times where transit service is infrequent), could help encourage passengers to travel at off-peak times or on routes with surplus capacity (which correspond to terminals/times when transit service is infrequent).

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. A significant shift of SOV riders to transit could reduce queues..
- d. **Improves operating cost per rider:** Medium. Depends on the robustness of the mode shift achieved.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** High. Provides passengers with additional information to make accessing the terminal by transit more convenient.
- 2. **Positive community impacts:** Low, depending on the robustness of the mode shift achieved.
- 3. **Positive environmental impacts:** Low. Depending on the robustness of the mode shift achieved, could potentially reduce vehicle trips and related emissions.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** Low. In order to implement this strategy, WSF would first need to coordinate its own GPS system with multiple regional transit operators, many who may not have such a system. In addition, a signage system for displaying such information would need to be installed at all terminals.
2. **Capital costs:** Medium. Depending on the number of regional transit operators currently using GPS systems, new equipment may be needed for each bus/train. Electronic passenger information signs would be needed.
3. **On-going operating cost:** Low.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but would be leveraged by integration with other real-time information (e.g. parking availability and queuing, departure, and wait times)
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High. Note that while it is simple for WSF to make ferry arrival and departure information available at all terminals, real-time transit arrival and departure information depends on the extent to which regional transit operators are using GPS technology or WSF is capable of supporting its installation.
2. **Terminal by Terminal Applicability:** Applies equally to all terminals.
  - a. Mukilteo:
  - b. Clinton:
  - c. Edmonds:
  - d. Kingston:
  - e. Bainbridge:
  - f. Bremerton:
  - g. Colman Dock:
  - h. Southworth:
  - i. Vashon:
  - j. Fautleroy:
  - k. Pt. Townsend:
  - l. Keystone:
  - m. Anacortes:
  - n. San Juans:
  - o. Pt Defiance:
  - p. Tahlequah:

## Strategy Evaluation Summaries

- 3. What would be a good test route?** Wherever GPS technology is being utilized, real-time arrival and departure information should be made available to WSF passengers.

## VI. Strategy Disposition

Carry the strategy forward. Real-time transit information is a highly cost-effective strategy for encouraging transit use.

# Strategy Evaluation Worksheet

**Name:** Real-time parking capacity information.

**Description:** Display real-time parking access and capacity information on variable messaging signs in the vicinity of the terminal. Make this information available to customers *before* they begin their trip, online and via cell phone.

## I. Evaluation Against Primary Screening Criteria

### 3. Manages Demand

- a. **Encourages mode shift:** Low. Some mode shift may be possible if drivers realize parking is not available at the terminal if they have other modes available.
- b. **Encourages time shift:** Medium. Real time parking information provided in advance of arrival may encourage drivers to utilize lower-demand sailings.
- c. **Attracts new demand to available capacity:** Low. Advanced knowledge about parking availability will enable new users who prefer to drive and walk-on to use terminals that may reach capacity occasionally.

### 4. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Low. No impact.
- d. **Improves operating cost per rider:** Low. Some additional walk-ons may be attracted, reducing per rider costs.

## II. Evaluation of Secondary Screening Criteria

- 4. **Positive customer impacts:** High. Provides passengers with additional information to make more convenient travel choices. If passengers know in advance that parking is not available, they may travel by alternate modes or at alternate times.
- 5. **Positive community impacts:** Medium. Reduces cruising for parking and spillover parking impacts in host communities.
- 6. **Positive environmental impacts:** Low. Depending on the robustness of the mode shift effects, could reduce vehicle trips and related emissions associated with the “circling” of vehicles looking for available parking.

## III. Implementation and Cost

- 4. **Ease of implementation:** Medium. Requires information systems, parking monitoring staff or systems, and information dissemination technologies.

## Strategy Evaluation Summaries

5. **Capital costs:** Medium. Requires data systems, electronic signing, and possibly parking control equipment. WSF's costs could be reduced by partnering with a private vendor that receives a revenue incentive from a small fee for premium services (such as cell phone text alerts).
6. **On-going operating cost:** Low. WSF's costs could be reduced by partnering with a private vendor.

### IV. Interaction With Other Strategies

3. **Does this strategy need other strategies to work?** No, but it would be leveraged by integration with real-time queuing, departure, and wait information.
4. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High, but initial implementation should focus on terminals with constrained customer parking.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** Medium.
  - b. **Clinton:** Medium
  - c. **Edmonds:** Medium
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High
  - f. **Bremerton:** Low (no WSF parking)
  - g. **Colman Dock:** Low (no WSF parking)
  - h. **Southworth:** High
  - i. **Vashon:** High
  - j. **Fauntleroy:** Low (no parking)
  - k. **Pt. Townsend:** High
  - l. **Keystone:** Low
  - m. **Anacortes:** Medium
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Medium
  - p. **Tahlequah:** Medium
3. **What would be a good test route?** Terminals with periodically constrained parking availability, such as Bainbridge or Southworth.

### VI. Strategy Disposition

Carry this strategy forward. Real-time parking information has the potential to increase ferry utilization, especially where parking is somewhat constrained. However, technology costs may not prove cost-effective, and little mode shift is anticipated for existing drivers. A pilot project at one terminal will help assess the cost-effectiveness of the required infrastructure.

# Strategy Evaluation Worksheet

**Name:** Real-time queuing, departure, and wait information.

**Description:** Display next departure, wait time, and queue length information on variable messaging signs in the vicinity of the terminal. Make this information available to customers *before* they begin their trip online and via cell phone.

## I. Evaluation Against Primary Screening Criteria

### 1. Manages Demand

- a. **Encourages mode shift:** Low. If drivers have other modal options and are not price sensitive, this information could encourage mode shift if queues are not consistent day to day.
- b. **Encourages time shift:** High. Real time vessel & queue information provided in advance of arrival may encourage drivers to utilize lower-demand sailings.
- c. **Attracts new demand to available capacity:** Medium. Some customers will decide to ride off-peak sailings with available capacity.

### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. No impact.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Medium. May encourage some drivers to shift to other sailings or modes, reducing queues.
- d. **Improves operating cost per rider:** Low, depending on the robustness of the mode shift and time shift effects.

## II. Evaluation of Secondary Screening Criteria

- 1. **Positive customer impacts:** High. Provides passengers with additional information to make more convenient travel choices. Improves convenience for walk and bike riders waiting in terminals.
- 2. **Positive community impacts:** Medium. This strategy could help shorten peak period queues spilling into adjacent roadways.
- 3. **Positive environmental impacts:** Low. Impact would be negligible.,

## III. Implementation and Cost

- 1. **Ease of implementation:** Medium. Requires communications with the ferry and a queue monitoring system as well as information dissemination technology.
- 2. **Capital costs:** Medium. An active queue monitoring system is likely to be necessary, as well as communications technologies.

## Strategy Evaluation Summaries

3. **On-going operating cost:** Low. WSF's costs could be reduced by partnering with a private vendor.

### IV. Interaction With Other Strategies

1. **Does this strategy need other strategies to work?** No, but would be leveraged by integration with real-time information on availability of customer parking.
2. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** High, but initial implementation should focus on terminals with constrained holding areas and/or severe queuing problems.
2. **Terminal by Terminal Applicability:**
  - a. **Mukilteo:** High
  - b. **Clinton:** Medium
  - c. **Edmonds:** High
  - d. **Kingston:** Medium
  - e. **Bainbridge:** High
  - f. **Bremerton:** Medium
  - g. **Colman Dock:** High
  - h. **Southworth:** High
  - i. **Vashon:** Medium
  - j. **Fauntleroy:** High
  - k. **Pt. Townsend:** Low
  - l. **Keystone:** Low
  - m. **Anacortes:** Low
  - n. **San Juans:** Low
  - o. **Pt Defiance:** Low
  - p. **Tahlequah:** Low
3. **What would be a good test route?** Terminals with queuing problems, such as Bainbridge or Southworth.

### VI. Strategy Disposition

Carry the strategy forward. Real time departure and queue information improves the overall ease of using the ferry system, encouraging greater flexibility by its users to travel closer to departure times or by a different mode.

## Strategy Evaluation Worksheet

**Name:** Reduced schedule

**Description:** Reduce schedule frequency by eliminating sailings determined to be too expensive to run due to lack of utilization.

### I. Evaluation Against Primary Screening Criteria

#### 1. Manages Demand

- a. **Encourages mode shift:** Medium. Many will be forced to other modes reluctantly due to reduced vehicle capacity. Reduced frequency may cause some customers to forgo ferry trip altogether and travel by other means (most likely by private vehicle).
- b. **Encourages time shift:** Low.. Most likely impact is to shift some passengers formerly traveling on low-demand sailings to higher-demand sailings.
- c. **Attracts new demand to available capacity:** Low. Overall demand will reduce.

#### 2. Increases Operational Efficiency

- a. **Reduces loading/unloading time:** Low. Does not apply.
- b. **Reduces ticketing time:** Low. Does not apply.
- c. **Reduces queue lengths:** Low. Likely to greatly increase queues on many sailings.
- d. **Improves operating cost per rider:** High. Greater utilization of remaining sailings increases efficiency. Improved cost per rider also comes from savings due to reduced sailing frequency net any lost revenues from customers who forgo ferry trips.

### II. Evaluation of Secondary Screening Criteria

- 4. **Positive customer impacts:** Low. Reduces customer choice, convenience, and flexibility.
- 5. **Positive community impacts:** Low. Could increase existing queues, reduce access to and from host communities, as well as limit economic development.
- 6. **Positive environmental impacts:** Low. Increased queues will cause more idling and congestion, negatively impacting air quality.

## Strategy Evaluation Summaries

### III. Implementation and Cost

1. **Ease of implementation:** High.
2. **Capital costs:** Low.
3. **On-going operating cost:** Low. Goal is to reduce per-rider operating costs.

### IV. Interaction With Other Strategies

3. **Does this strategy need other strategies to work?** No.
4. **Are there other strategies that might compromise this strategy's effectiveness?** No.

### V. Applicability to Terminals

1. **Potential for System-wide Application:** Low.
2. **Terminal by Terminal Applicability:** Varies, but largely routes with significantly underutilized sailings.
  - a. **Mukilteo:** Low
  - b. **Clinton:** Low
  - c. **Edmonds:** Low
  - d. **Kingston:** Low
  - e. **Bainbridge:** Low
  - f. **Bremerton:** Low
  - g. **Colman Dock:** Low
  - h. **Southworth:** Medium
  - i. **Vashon:** Medium
  - j. **Fauntleroy:** Medium
  - k. **Pt. Townsend:** Medium
  - l. **Keystone:** Medium
  - m. **Anacortes:** Medium (in off peak season)
  - n. **San Juans:** Medium (in off peak season)
  - o. **Pt Defiance:** Medium
  - p. **Tahlequah:** Medium
3. **What would be a good test route?** Routes with underutilized sailings could pilot test a reduced schedule to evaluate both operational and community access impacts.

### VI. Strategy Disposition

Screen out due to negative impacts on customers and host communities. Implement strategies to manage existing capacity more efficiently and achieve operational savings.