Kitsap Transit
Connecting Communities

Reservation System

Recommendations Report - FINAL

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1 Background & Approach

Kitsap Transit (KT) began fast passenger-only ferry service from Bremerton to Seattle in July 2017. In conjunction with the introduction of service, KT rolled out an online reservation system. The reservation system allowed advance reservations for up to 88 seats per sailing, with the remaining 30 available seats held for walk-up passengers. The concept of a reservation system proved very popular with members of the public prior to introduction of the Fast Ferry, in part due to the certainty it would provide to travelers because ridership demand for the peak commute periods exceeds capacity. While the reservation system at introduction has provided significant benefits for some riders, it has also been the subject of customer and agency complaints.

To launch the reservation system concurrently with the Fast Ferry, KT had to rapidly design, procure, and implement the reservation system. Although ticketing and reservation systems are common in the transportation industry, the applications for passenger ferries have usually been developed for events such as dinner cruises and may be linked to the sale of a ticket. By design, the current version of KT's reservation system does not offer prepaid boarding and does not charge a reservation fee. KT signed a contract with an online ferry ticketing vendor to provide a ferry reservation system. The vendor willingly made modifications to make their ticketing system work as a no fee reservation system for Kitsap Fast Ferries. The vendor has been amenable to implementing additional modifications since system launch to improve the customer experience and to meet KT's unique needs.

Four Nines conducted an evaluation of KT's current Fast Ferry reservation system to determine where it could be improved to provide a convenient, fast, intuitive customer experience. We also evaluated whether a reservation system provides enough benefits to be advantageous. Our first task for the reservation system study was to develop an understanding of the current state through discussions with KT staff, review of the existing system and background materials, and by soliciting rider input through rider intercepts. We evaluated the information we collected and compiled it in a Fit/Gap Analysis which explored basic system desired functionality and to what degree, if any, the current system meets that need. We then conducted a Peer Analysis, which allowed us to compare KT's needs to a selection of industry peers. Our goals for the Peer Analysis were to understand how other agencies made their decisions related to the usage or non-usage of a reservation system for customers. We also surveyed the vendor landscape for ticketing and reservation system vendors that may be suitable for KT's needs. In the Alternatives Analysis we examined possible paths forward for KT and evaluated viable alternatives across project goals and key attributes such as customer experience, system flexibility, and cost. We worked with KT to develop a survey for customers, and the results of that survey informed our findings and recommendations. We discussed the alternatives and recommendations with KT staff and the KT Board of Commissioners prior to delivering this report.

This document, the Recommendations Report, is the culmination of those efforts. First, we describe the recommended alternative from the Alternatives Analysis and discuss why other alternatives were not selected. We then identify other recommendations, including system changes and policy changes, for KT to consider. Next, we provide a high level cost estimate of the recommended alternative. Finally, we present necessary next steps and action items for KT to undertake in pursuing our recommendations. The Recommendations Report includes a revised list of system requirements and a roadmap outlining opportunities for integration with the regional electronic fare collection system, ORCA, as well as the project deliverables that were developed during the project.

2 Findings

Supply and demand are imbalanced. Much of the source of customer dissatisfaction with the KT Fast Ferry reservation system can be traced to limited vessel capacity and excess demand for the service. We briefly reviewed previous consultant modeling of demand in the Alternatives Analysis (Attachment 7.4). This supply-demand imbalance places a significant emphasis on the reservation system to guarantee a seat. Changes to the reservation system and an increased number of peak sailings (given the constraint of fixed vessel capacity) are likely to improve customer satisfaction. Addressing the need for additional capacity on the Bremerton-Seattle route is not as simple as it might seem and Kitsap Transit cannot put a larger vessel in service. High speed vessels, such as a fast passenger ferry, can generate wake energy that adversely impacts the shoreline in confined waterways such as Rich Passage. Previous fast ferry operations were halted due to shoreline damage and Kitsap Transit has invested in many years of scientific research to design a vessel capable of operating through Rich Passage without impacting the shorelines. Kitsap Transit is building additional Rich Passage 1 sized vessels and will be testing them in a two boat service schedule in Rich Passage later this year.

Desired system functionality remains unmet. The current system meets only some of the system requirements initially identified by KT and some of those requirements customers expressed as desirable. Our Fit/Gap Analysis (Attachment 7.3) explored basic system desired functionality within each area of the customer experience and identified to what degree, if any, the current system meets the need. The current system's degree of fit across all identified desired functionalities when the Fit/Gap Analysis was conducted in October 2018 was approximately 50%. However this did not take into account the relative importance of each need or functionality.

Reservation system seen as valuable & important. The reservations system provides advantages that riders value. A reservation system is also necessary to preserve the time advantage of the Fast Ferry. Without it riders would either have to show up so early that catching a state ferry would be as fast or risk missing the ferry, which would also obviate the speed advantage. Additionally, the reservation system provides a degree of certainty for riders who have need to be at a certain place at a certain time. Without the reservation system, many of the advantages of the Fast Ferry over competitive modes are negated.

Reservation usage is unique among peers. Among North American ferry systems operating as a public transit service, the use of reservations is rare. Where implemented, reservations are generally limited to special events, or particular services (vehicles, bikes). As discussed in our Peer Analysis (Attachment 7.1) peer agencies that serve commuters tend to manage supply/demand imbalances by adding supply, either by increasing the size of the vessels or the number of sailings offered, or both, and agencies with more frequent headways than KT currently offers are comfortable letting excess demand fall to earlier or later sailings.

Fast Ferry services are attractively priced. As compared to peer services on the U.S. West Coast, KT Fast Ferry services are priced on the lower end of commuter fast ferry peers, when considering price and length of sailing. Adjusting KT's pricing by increasing fares on peak sailings to manage demand, and introducing a reservation convenience fee to manage demand for reservations were considered as part of the Alternatives Analysis (Attachment 7.4).

There is not an off the shelf system capable of meeting all of KT's needs. KTs Fast Ferry service design is most suited to a reservation system designed to support one-time & frequent, recurring reservations, with ticketing capabilities. There are no viable providers of this type of system that could be identified (see Vendor Landscape, Attachment 7.2): there is not a dedicated commuter ferry reservation system space, so vendors tend to be those

who handle reservations for other entities, like dinner cruises and theme parks, or in other modes of transportation like bus or air travel.

KT Fast Ferry customers are diverse, with different travel preferences. KT's Fast Ferry appeals to both frequent and occasional customers, each with different preferences. Of those that responded to the December 2018 Fast Ferry Customer Survey, approximately one-third were frequent customers making use of the reservation system on a consistent basis. The table below summarizes the customer segments that responded to the survey:

December 2018 KT Fast Ferry Customer Survey	Responses	Percent
Freq. FF Customer, Mostly Reserve	248	31%
Freq. FF Customer, Mostly Walk-Up	90	11%
Occasional FF Customer, Mostly Reserve	48	6%
Occasional FF Customer, Mostly Walk-Up	171	21%
Kingston FF Customer	166	21%
Non-FF Respondent	77	10%

Some of the findings from the survey included:

- Support for continuing the reservation system was higher among frequent Bremerton Fast Ferry customers (70%) than among occasional Bremerton Fast Ferry customers (43%), however….
- ...occasional customers were more willing to pay a convenience fee of some amount (63%) to secure a reservation, whereas frequent customers were slightly less willing to pay (59%).
- Among all groups, there was a greater willingness to consider reservation system removal once the second operating vessel was introduced (28% willing to consider system removal under status quo situation, 39% willing to consider system removal after second operating vessel).

3 Recommendations

Based on the research conducted throughout this project, the findings identified in earlier components of the study, and the customer feedback we received directly and through surveys, we offer the following recommendations regarding the Fast Ferry reservation system.

These recommendations are made in advance of solid cost estimates and the implementation of these recommendations will be dependent on the vendor's willingness to make them, and on the acceptability to Kitsap Transit of the cost compared to the perceived benefit. We also recommend that all of near-term recommendations be evaluated in light of the second operating vehicle that is expected to be in service in mid-to-late 2019.

These recommendations are a combination of technical and policy approaches to meet KT's goals. We also acknowledge that the introduction of the second operating vessel in 2019 is likely to result in some fundamental changes in the customer experience, so we have outlined which recommendations can be implemented immediately, and which are tied to the introduction of the second operating vessel. Also included within this section are a number of blue callout boxes that answer some questions that came up during our discussions with riders.

3.1 Recommendations to be Implemented in the Near Term

1. Retain the current reservations system and seek prioritized enhancements from the current vendor. One of our key findings is that there are no vendors of off the shelf reservation systems that can support the range of customer reservation needs required by KT, namely one-time & frequent, recurring reservations. As such, it is more than likely that any Commercial Off the Shelf (COTS) system procured by KT would require a degree of customization to meet customer needs. Some of that customization has already been undertaken by the current vendor, and we recommend continuing to engage with that vendor for further enhancements.

There is relatively broad-based support among customers for maintaining some reservation capabilities. This comes from both frequent and occasional customers, with some of the strongest support (and willingness to pay for a reservation) coming from occasional customers with time sensitive travel plans (e.g.: medical appointments across the Sound, onward travel to SeaTac, etc.) who have less tolerance for travel uncertainty.

2. Charge a non-refundable, reservation convenience fee, payable by credit/debit at the time of reservation. The introduction of a non-refundable reservation convenience fee acknowledges that the certainty of travel provided by a reservation is desirable and has value to some subset of KT Fast Ferry customers. The fee would likely discourage the practice of "reservation hoarding", whereby customers book reservations even when they are unsure whether travel will be necessary. Based on a KT analysis undertaken over several weeks in August 2018, the share of reservations made, but not used (no-show reservations) was measured at 42%. Depending on the size of the fee, the revenue received will help cover the cost of the reservation system, payable by those who benefit from the reservation system.

> **Why retain the same vendor? Many other reservation systems exist that provide a user friendly experience.**
> - Most well-known reservation interfaces serve a different type of need; one-time reservations or ticketing.
> - No one vendor is able to meet KT's needs with off-the-shelf software.
> - Custom development would be cost-and time-prohibitive.
> - The existing vendor understands the agency and customers and can improve the existing system.

Many Fast Ferry customers have their transit costs subsidized by their employers; by making the fee payable by credit/debit (rather than by the ORCA card), a level of personal financial responsibility is introduced with reservation costs borne directly by the customer. It is likely that the introduction of this fee will result in some current reservation customers opting to forego reservations and using the walk-up line; KT should observe customer behavior and evaluate whether to allocate a larger share of capacity to walk-up customers (additional details on this recommendation are included later).

> **Why have a reservation system at all? Why not move to first-come, first-served like the Kingston route?**
> - Based on survey responses from KT Fast Ferry customers, there is an appreciation for the certainty provided by a reservation system in the current situation, where the demand for seats exceeds the supply.
> - First-come, first-served necessarily prevents customers from being guaranteed a seat on a specific sailing.

The amount of the reservation fee will likely require additional analysis, but should be large enough to discourage reservation hoarding, but not so substantial that customers cease using the reservation system or switch away from the Fast Ferry. KT should consider the value of time associated with Fast Ferry use for different customer groups and whether the addition of the fee keeps KT Fast Ferry services in line with the prices charged by peer agencies.

3. Amend the reservation system policy to allow each unique user to make only one reservation per direction per day. Currently, customers may reserve two one-way or one round trip reservation per day, and they can reserve up to two seats per reservation (up to four seats per day). We recommend changing this policy so that customers can only reserve one seat per sailing, and are limited to one reservation per direction per day (up to two seats per day). While this approach may cause some inconvenience for couples or families that frequently travel together, it will discourage excessive reservation making with the intent of trading reservations through social media or between colleagues/acquaintances.

4. Review other key policy issues related to the reservation system. KT should review key policy issues that impact the reservation system. The reservation cancellation time frame is currently set at 2-hours prior to the sailing, however many customers stated that a shorter cancellation window may result in greater use of the cancellation feature. Additionally, the agency may want to consider changes to how the reservation period is opened up to customers. Some customers felt that the 9am weekday timing was challenging, and thought that it may exclude some potential reservation customers from being able to secure reservations. The agency may also want to consider whether to release smaller increments of reservations at a time, closer to the sailing dates so that those customers that receive their work schedules with shorter lead times would have a greater chance of utilizing the system.

> **Why charge for reservations? Why not just charge the price of the sailing at the time of reservation, or offer free reservations with a fee for no-shows?**
> - Charging a reservation fee discourages acquisition of multiple reservations, some of which are never used.
> - The ORCA card, which is the predominant form of fare payment on KT Fast Ferry, does not currently have the capacity to add a reservation fee and pay for the price of the sailing & reservation fee in advance.
> - Free reservations with a penalty for no-shows require accounts to have a valid credit or debit card on file, which has security implications because of the required compliance with the Payment Card Industry-Digital Security Standard (PCI-DSS) It also places an additional burden on KT dock staff to ensure accurate validation.

5. Provide customers with real-time visibility into the availability of walk-up spaces on each sailing. Providing notification of walk-up space availability for each sailing, ideally through the website and a mobile application and possibly through variable message signs at the pier, will allow customers to make appropriate choices about which sailing or service best meets their needs on that specific day. This may help in reducing the number of frustrated walk-up customers that are left behind on full sailings.

6. All additional technical work should be built with the next generation ORCA architecture and APIs in mind. The next generation ORCA system is currently being designed. The high level architecture has been completed and the Application Programming Interfaces (APIs) will be defined during the first half of 2019. As the ferry reservation system is updated, all the new elements should be built for interfacing with the next generation ORCA system. As an example, if a mobile application is built it should be designed to interface with ORCA from the beginning. Although (as described more fully in the Appendix) the completion and testing of the integration can't be completed for several years, having the architecture in place will make the implementation and testing quicker and less expensive when the time comes.

3.2 Recommendations to be Implemented after Introduction of the Second Operating Vessel

1. Analyze the demand for reservations and determine whether the reservation system can be eliminated. Once the second operating vessel has been in place for a period of time, KT will want to track trends in reservations and further gauge customer support for maintaining the reservation system. The demand analysis suggests that two vessels should be sufficient to meet Bremerton service demand, suggesting the possibility of eliminating the system. However, current customer feedback indicates there remains support for maintaining the system even after the introduction of the second operating vessel, to improve travel certainty in some circumstances. KT will want to evaluate the second operating vessel's success at better balancing demand, and reach out to Fast Ferry customers for their views before making a decision on reservation system removal.

2. If retaining the reservation system, consider lowering the number of reservations available per sailing to increase walk-up availability. If the operational situation after the introduction of the second operating vessel is such that KT determines that the reservation system should be retained, we would strongly recommend lowering the number of reservations available per sailing and increase walk-up availability. It is likely that the increase in vessel capacity, combined with the introduction of a reservation fee will increase walk-up demand. By continuing to offer some reservations (even if sufficient vessel capacity exists to meet total demand), those customers with occasional, time-sensitive travel needs will still benefit from travel certainty.

3. If retaining the reservation system, provide customers with a mobile application option for presenting/redeeming their reservations. The request for a mobile application has been made by customers frequently and would improve the customer experience and vessel boarding process. A mobile application could be developed by the vendor themselves, or through the provision of an API into the reservation system. A mobile application would be a relatively expensive addition to the system and the cost must be considered in light of the benefits that would accrue to the riders.

4 Cost Estimate

In support of the recommendations outlined previously, we have developed a high level cost estimate for the ongoing development and maintenance of the current system. This cost estimate is focused on the direct costs associated with the development and maintenance of the current system and does not focus on internal KT costs that may be incurred to support system updates and ongoing use; these agency-specific costs are real, but we have not attempted to quantify them. These estimates were based on our understanding of COTS system development costs; however, we did not work with the existing vendor when developing these estimates. Further discussions with the vendor and clarifications on which design elements are likely to drive cost decisions are required.

The major system design elements that are likely to drive the cost of the system enhancements include:

- Revised screen flows to accommodate both one-time and recurring reservations, based on the type of user signing in
- New verification features that do not require guest or third-party applications (e.g.: Google, Facebook, etc.) in order to login

- Implementation of a convenience fee, payable by credit/debit card, at time of reservation for each reservation made
- Development of an API for linking reservations to a mobile application
- Development of an API for real time reservation availability per sailing to other platforms
- Ensuring that cancellation timeframes, number of directional/daily reservations, etc. is a configurable parameter, modifiable by KT
- Improvements to the printed/online barcodes to allow for more consistent scanning of reservations on the dock
- Improved reports and query capabilities to extract data from the reservation system, and
- Consideration of next generation ORCA integration opportunities in ongoing design updates

Based on our understanding of which of these elements may be more or less challenging to develop, we anticipate a high-level estimate of an implementation cost range of $75,000 to $125,000 to enhance the current system. These are anticipated to be one-time costs. This includes the cost of providing an interface for variable message signs, but not procurement and deployment of the signs themselves.

Development, integration, and testing of a mobile reservation application, while strongly desired by the riders, would be comparatively costly. Similar applications have cost between $200,000 and $500,000 for the full development. This application could continue to support reservations for a number of years, including integrations with next generation ORCA. Those integrations would require additional development and testing at additional costs but would not require a replacement of the application provided it is architected correctly from the outset.

Ongoing costs to maintain the reservation system are anticipated to be similar to the existing cost structure, with some marginal increases, based on the enhancements requested. Operational costs will vary based on the number of reservations made available once the second operating vessel is placed in service.

5 Conclusion

We presented the alternatives during a workshop with KT staff. The conclusions reached here were shaped by the discussions during that meeting, and captured in part in the Alternatives Analysis, Attachment 7.4.

KT's system requirements are unique, at least in North America. Specifically, Kitsap Fast Ferries is the only regularly scheduled commuter ferry transit service with a reservation system for specific trips on specific days for passengers (as opposed to vehicles). Because of that, there is not a market for commercial software which addresses the need. Thus, while COTS systems have been developed for ferries as well as for the reservation of limited resources of a similar nature, none of it is purpose-built to support repeat users in the nature of commuters, with a repeating schedule. This means that most COTS software is likely to be ill-suited to the task without significant customization. Any custom system will be expensive with a long implementation timeline, making it a poor fit for KT, which needs a fast solution in a rapidly changing landscape. Even if KT could afford to build the perfect system, it might well be obsolete before it was deployed.

Our key recommendations, therefore, are to keep and improve the existing system while adding a reservation fee. These two options can be implemented together and each appear to present a viable option. KT should evaluate the cost benefits of developing a mobile application for reservation management if they system is retained past the introduction of the second operating vessel, which would respond to the requests made by

many riders. Integration with next generation ORCA should also be designed into any technical improvements to the system.

5.1 Next Steps

We suggest several next steps for KT to improve the reservation system. The project team should review the amended requirements, which include those that KT initially included in their Request for Proposals for a reservation system consultant, and additional requirements that the Four Nines team identified through the stages of the project. The team should prioritize these and rank them by importance and urgency, so that when they engage with the vendor, KT's direction and specifics for the enhancements is clear. KT should work with the vendor to develop a product roadmap, cost estimate and schedule for the improvements to be made, and communicate the appropriate details to customers. We have included basic requirements for mobile access in the amended requirements, and recommend that KT prioritize these if possible.

We strongly recommend that KT adopt a fee for reservations that is collected at the time of the reservation and is a non-refundable charge. There are a number of advantages to this, including reducing the number of multiple reservations (reservation hoarding) and reservations made by riders who don't yet know if they will need them for a specific sailing. It will also reduce no-shows and lessen demand pressure overall for reservations. Survey information has indicated that customers, particularly casual users, will be willing to pay this to be certain that they will get on the sailing that they want.

KT should develop metrics to gauge the success of all of the enhancements, with a particular focus on two areas. For the reservation fee, KT should measure the number of no-shows over time once the fee is implemented, and whether customer satisfaction with the reservation system improves. With the addition of a second operating vessel in 2019, KT should look at whether use of the reservation system falls off or remains active, and what overall impact the second operating vessel has on customers and their relationship to the reservation system.

6 Appendix - ORCA Roadmap

Currently, there is little integration between the reservation system and the ORCA regional fare system beyond the ability to pay fares. Fares can be paid using ORCA by tapping an ORCA card on a mobile validator held by KT staff while boarding. This is irrespective of whether a rider has a reservation or not.

Desired Integrations. Additional integration between the reservation system and ORCA could have many advantages for riders and for KT. For example, through integration, an ORCA account could be definitively linked to a reservation. Further, an ORCA account could be tied to a reservation so that when the ORCA account was used for boarding, the reservation was marked as used. If desired, ORCA funds could be used to pay a reservation fee. Through integration a rider could have a common sign on (username and password) for their ORCA account and the reservation system. Finally, reservations and an ORCA account could be managed in a single mobile application.

Legacy ORCA. None of these integrations are currently possible under the existing (legacy) ORCA system. To add further integration beyond the current mobile validator fare acceptance would likely not be possible at all under the current technology and agreements with the current vendor.

Phase I next generation ORCA. The launch of the next generation of ORCA is scheduled for the third calendar quarter of 2021. At that time a new ORCA system, including a mobile application, an improved website, and the ability for riders to add value instantly will be operational. With this launch, KT will be required to change the

devices used for ORCA fare collection on the ferries. It is possible that a single device could be procured which will both accept ORCA fares and manage reservations for KT staff. Due to next generation ORCA schedule constraints, no additional integration will be possible during this phase, Phase I.

Phase II next generation ORCA. After the transition to the next generation of ORCA is complete, in the third quarter of 2022, scoping will begin for Phase II of the system. At this time additional integrations will be possible. Because the next generation ORCA system is being designed from the ground up as an open system that is built for integrations, integrations will be relatively easy to implement. There will be a framework and a set of APIs which third parties will be able to develop to. There will also be a process and environment purpose built to support the design, development, testing, and rollout of integrations such as those that KT might want to implement. Because this framework will be put in place during Phase I of the system, developers will know in advance how to design their applications for future integrations and we recommend above that this be a part of the design process for any improvements to the reservation system.

7 Attachments (Project Deliverables)

7.1 Peer Analysis

7.2 Vendor Landscape

7.3 Fit/Gap Analysis

7.4 Alternatives Analysis

7.5 Revised Requirements