

**PLANS, SPECIFICATIONS AND ESTIMATE
Review Comment Disposition Form**

Project Title:		SR104 – Kingston Remote Holding Lot Operational Concepts		Job Charge #:	
Reviewer (name & office: Faith Shuler – Signal Operations; Flint Jackson – Headquarters; Scott Davis – Headquarters – Ken Burt – Signal Operations; Manuel Abarca – Traffic Design; Tim McCall – Freeway and Operations Manager); Leonard Smith (WSF), David Forte (Kitsap County)			Responses By: Perteet, Mike Hendrix, Brent Powell, Patty Buchanan		
Date of Review Comments: March 25, 2020			Date of Disposition: 4/27/2020		
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1 – FS	Sht 1	For the signal at Lindvog my assumption is that you would want the traffic from the holding lot to be allowed to get the green until the lot is empty. Is this true? If so what changes will be needed for the signal? Additional Heads? Additional signal standard?	A	The signal at Lindvog would require 2 additional signal heads and a NO TURN ON RED blank-out sign. These items are quantified in the cost estimate.	
		Please keep in mind that currently when a boat unloads the signal at Washington puts both bannister and lindovg into coordination to prioritize outbound traffic. How would this work with the changes at Lindvog?	A	There may be a delay for incoming traffic but the system would detect travel times for incoming vehicles and adjust the release rate as necessary.	
2 – FS	Sht 1	Is there enough space to add the holding lane lane at the intersection?	A	Yes, there is room for a departure lane.	
3 – FS	Sht 5	If you replace the controllers at Lindvog and Banister you will need to replace the one at Washington as well.	C	The reason Washington was not initially included was due to that signal being replaced as part of the realignment project. Based on information from WSDOT, the communication system will remain as is and no controller changes are required.	
4 – FS	Sht 5	Fiber Optics is shown for interconnect, we currently have 6pcs interconnect, it will need to be verified whether or not the conduit can be used for fiber or not. Also you will need to include all equipment necessary to make the fiber optic interconnect work i.e. Rugged Comm switches for each intersection.	C	The concept has been revised to no longer require a signal timing scheme to provide a consistent green for traffic from the holding lot to the dock. As such, the controllers can remain as is with no changes.	
5 – FS	Sht 5	If Iowa Ave is decided to be a signal instead of a roundabout it would need all the same equipment as the other three signals.	C	Revised traffic modeling indicated that a roundabout could perform well and that this holding lot concept should not be the reason to change to a signal controlled intersection compared to a roundabout.	
6 – FS	Sht 6	It's shown that SR104 would have two lanes each way at the Washington signal that is currently one	D	This would be part of the SR 104 alignment.	

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		way. There will need to be added heads for the inbound traffic as well as stop bar detection.			
7 - FJ		<p>The fundamental concept is ok, but that would be the most elaborate and expensive ferry holding system in the state. I think there are a number of elements that could be trimmed down/ revised to reduce costs and increase service life, including detection types, number of gantries, number of overhead devices, etc.</p> <p>Honestly, they may be better served by putting a tollbooth at the entrance to the holding lanes, and having a staffed position there and at the holding lane release – far less expensive and easier to manage across the board. This is how Orcas Island is managed. Edmonds is similar (they moved the toll booths off the dock to the start of the holding lanes). Orcas is the only one that I can think of that has a surface street traverse between the holding lanes and the dock access – it just isn't very long.</p>	C C	<p>Agree that this would be the most elaborate holding system in the state. This is due to a number of requirements including the desire to not have a full staff in addition to its location compared to the dock.</p> <p>After reviewing both lots, none of these are comparable to this lot. Further, the Partners had agreed to not have the toll booths at this location.</p>	
8-SD		<ul style="list-style-type: none"> • Maintain roundabout at Iowa St. <ul style="list-style-type: none"> ○ Changing traffic control would require a new Intersection Control Evaluation ○ Priority traffic can be managed at a roundabout if needed. • Consider a workgroup discussion for corridor ferry operations. This discussion can help guide future efforts/studies on the 	A	Agree. Revised traffic modeling did not indicate any issue with a roundabout at Iowa Street.	

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		corridor.			
9-KB		<p>Since these are "Concepts" we can't get into design specific comments. But the consultant designer must keep in mind every signal in this system is interconnected by an existing 6pcc communication cable. If the plan is for fiber upgrade then the 6pcc can be removed. Verification of the equipment will be required to make sure it is fiber compatible. Most likely there will need new conduits, sweeps, j-boxes, etc. All controllers will have to be upgraded and any additional signals will require a matching controller. The idea of gaining "Adaptive Control" is not a selling point to us. Adaptive control has been proven to be effective where the controlled intersection is in a grid system, our highways are linear, and therefore we are not interested in adaptive. It appears the traffic revision will take traffic down to the dock adjacent to the existing outbound lanes. Care will need to be taken to maintain the detection of vehicles leaving the ferry. This is an item that can't be stressed enough. Maintain the outbound ferry traffic detection. This will be a good topic to share on the job site with the designer and the signal ops and techs.</p>	A	<p>Agree. The need for adaptive signal systems has been removed. Traffic will enter the roadway network and proceed to the dock.</p>	

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10 - TM		Would the vehicle detection system used for ferry queue provide wait time information that could be scooped up and send to nearby VMS for traveler information?	A	Yes, the system should have this capability.	
		Would this system be linked to the existing shoulder control system that extends at Barber Cut-Off?	D	This would be dependent on if the system was time based or if it is continuous in operation. If continuous in operation, the project would remove this element. If not, the system would be integrated within the system.	
		In-ground vehicle detection has proven problematic and unreliable in the past. In lieu of devices such as Sensus “pucks,” consider video or IR vehicle detection.	C	Pucks were used for the simplicity. However, the use of multiple pucks would reduce the chance that one puck failure would result in a system detection failure.	
		The type of changeable message signs being considered may be quite large, are costs associated with sign bridges being considered?	A	The poles chosen for this would need to be upsized to larger poles to accommodate the loads. Our calculations indicate that the 40-ft mast arm would need to be placed on a pole capable of accommodating up to a 60-ft mast arm due to the windload and weights.	
11 - MA		My only concern is if the license plate reading equipment accuracy rate. Does the system provide video verification to an operator to at least ID the vehicle if the plate cannot be read? Thank you.	A	Will verify that this ability exists. However, please note that in addition to the LPR camera system that the ticket issued to a driver is intended to also serve as proof of where they are in line.	

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12 - DF		Provide a flow chart for the data processing	A	Data flow chart has been added.	
13- DF		What are options for Gate Controllers?	A	We added a section in the report to cover different entry options including no control and relying only on LPR cameras, a ramp meter style of entry, and the gate controllers. The gate controllers were chosen for reliability.	
14 - DF		What are the signage requirements given alternative management approaches?	A	A discussion was added to discuss the signing. A continuous operation simplifies the signing as the signs do not need to be activated via radio and have flashing light indications.	
15 – LS		Variable Use Table- not sure why dynamic signage would be required throughout the Port of Kingston	C	Dynamic signage would be required to ensure that people are informed that the holding lot is in operation. If the lot is in operation continuously, the dynamic signing would be replaced with conventional ferry routing signing.	
16 – LS		Page 26 – 4.3.3 Remote Holding Lot Signage – Flashing sign needs to be shown on Miller Bay Road / West Kingston Road to direct everyone to SR 104 in either operational scenario – critical	A	Agree. Added in a revised report.	
17 – LS		Use of LPR's – use of LPR's off WSDOT property / directly associated with the remote holding area process will be difficult to get public acceptance. All that should be required is verification of passing through the remote	B	Agree. However, the use of LPR's will determine if a vehicle has passed by an active sign to get into the dock. It is an attempt to minimize conflicts at the toll booth. LPR's or other detection would be recommended at the Ohio St intersection to have the system process the time for vehicles to enter the dock and adjust the flow rate from the holding lot as necessary.	

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		lot.			
18 – LS		4.3.5 These section should be other items required for a fully functional ATM system. This reads to me that other project funds would be required, installed separately to make the overall project communications, not a good cohesive approach.	A	We can revise this to reflect that approach. The intent was to capture the needs from other Partners since this is a collaborative project.	
19 – LS		Page 37 – Departure volumes from the remote holding area to the lower dock – Optimum departure intervals are 7 minutes / 420 seconds What does this mean? Sending how many vehicles every 7 minutes. How does this work with toll booth processing rates? How long does it take to fill the lower dock / vessel capacity? This is not clear to me other than we are assuring no impact to Iowa with a departure rate of 7 minutes. What am I missing?	A	We will expand discussion of release rates in the revised traffic report. The release rate that we “optimized” via the Vissim traffic model was 35 vehicles every 7 minutes from the remote holding lot. This rate resulted in queueing operations that never backed up to the Iowa roundabout. This release equates to 5 vehicles per minute, meaning the site would release 300 vehicles per hour. This does assume that the dock lot has open space and that all three toll booths are active. If those conditions are not present at any given moment, we recommend the system be built to be adaptive so it can revise release rates as needed.	
20 - TM	4.1	If the LPR are going to be used to check for line cutters. Will these LPR be considered enforcement cameras warranting a possible RCW change?	A	Noted. The report has now emphasized the recommendation to operate continuously which would no longer require the use of LPR cameras.	
21 – TM	4.1	LPR may miss a number of vehicles including motorcycles and semis. How will those vehicle	C	The ticket gate would provide a backup system where the number on the ticket would provide the order.	

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		classes be accommodated?			
22 – TM	4.1	If the ticket dispenser is providing the lane numbers for drivers to use, will there be vehicle classification detection at or immediately prior to the ticket booth?	C	None are scheduled at this time for classification. And it is anticipated that primary sorting will occur at the main lot.	
23 – TM	4.1/4.1.4	Typically, the Olympic Region Traffic Management Center handles incident management on mainline SR 104 outside of the ferry terminals. The TMC also deploys VMS based on information from the ferry operations center.	A	Noted. We added notes in the report that connection to the TMC would be required.	
24 – TM	4.1.2	6'x6' signs will most likely need to be placed on a sign bridge (truss or monotub) in lieu of a signal mast arm.	C	Based on calculations of preapproved poles, a signal mast arm is able to hold the poles. However, they will need to be upsized (e.g. a 40-ft mast arm would need to be mounted on a pole for a 65-ft arm).	
25 – TM	4.1.2	While loop detection has it's own issues, loops can be placed in between lifts of asphalt or cast into concrete with great success. Pucks have a relatively short life span requiring them to be replaced with some level of regularity. Previous use of pucks has been less than desirable.	A	A description of why the sensor type was chosen was added to the report.	
26 – TM	4.1.4	WB-67 design vehicle should be used for turning movements.	A	Noted.	
27 – TM	4.1.4	PA use may be undesirable to nearby homes.	C	Per comments from WSF, a PA system is required per	

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		Are there alternates to the use of a PA system?		ADA regulations. Design efforts will need to consider PA placement to minimize adjacent residents concerns.	
28 – TM	4.1.4	In operation, what happens if a driver wishes to stop in Downtown Kingston while travelling between the remote holding lot and the main ferry holding lanes? Can they re-enter the ferry holding queue? ...or will signs be used to discourage stopping in Downtown Kingston?	C	No. They will need to return to the holding lot.	
29 – TM	4.3.3 (Figure 6)	What happens if the ferry queue extends beyond Barber Cutoff?	C	The calculations assumed the shoulder being able to hold up to the 85th percentile of the maximum demand. If the queue does extend, it is expected to occur a minimal amount of time.	
30 – TM	4.3.3	We recommend the usage of VMS to provide more messaging and more flexibility. It also allows for coordination and automation with the ATM system.	A	The VMS style signs are the recommended treatment.	
31 – TM	General	Will a wait time be sent to the TMC for deployment on VMS approaching ferry terminal? Comparative ferry wait time messaging has been regularly requested to manage demand to cross Puget Sound.	A	This information can be utilized by the system and is discussed in the report as a system option.	
32 – TM	General	While ATM system for SR 520 and I-90 are referenced, has there been discussion on what the user interface would look like and how users would be able to implement overrides and changes to lane control operation?	D	The interface has not been designed at this point. This is expected to be in a systems engineering element of the future design.	

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33 – TM	4.3.5	Recommend added extending fiber to Barber Cut-Off Road. **Install CCTV camera at Barber Cut-off road. **Consider updating and including existing lane control system into proposed ATM system. **Add loops to provide queue detection and allow for wait time calculation	A	Based on information from WSDOT, it appears that there is already communication. This project would not require the upgrading of this work, however, this can be added to an enhanced scope for the 60% effort. A new CCTV camera will be noted in next steps. The lane use system is incorporated in to the system. The proposed detection will be able to provide detection and calculated wait time.	

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