MEMORANDUM

505 5th Avenue S, Suite 300, Seattle, WA 98104 | P 206.436.0515

To: Port of Kingston

From: Giancarlo De Simone, PE
Mike Hendrix, PE, PTOE
Patty Buchanan, PE

Date: June 29, 2021

Re: Active Traffic Management and SR104 Holding Lanes – Summary Memo

INTRODUCTION AND DESCRIPTION OF PROJECT NEED

The Kingston-Edmonds Ferry, while operated by Washington State Ferries (WSF), is part of a larger, regional transit and community system that includes WSF, Washington State Department of Transportation (WSDOT), Kitsap Transit, Kitsap County, Port of Kingston ("Project Partners") and the Kingston community and businesses. As is the subject of this study, the ferry vehicle queue extends through Kingston's downtown along State Route 104. The ferry traffic causes heavy congestion in the Kingston downtown area, blocking intersections, commercial driveways, and impeding local access to downtown Kingston.

Perteet has developed an Active Traffic Management System (ATMS) concept to manage eastbound WSF traffic through Kingston. The concept utilizes detection, signing, and signaling tools to create an efficient and safe operating system. This work includes development of an expanded shoulder along SR104, northwest of the intersection with Lindvog Road NE in conjunction with ATMS elements.

ANALYSIS METHODOLOGY

ACTIVE TRAFFIC MANAGEMENT SYSTEMS (ATMS)

In prior studies, Perteet modeled and evaluated traffic operations through Kingston with and without a remote holding lot. The traffic operations review included two main components. First, the active traffic management strategies for a remote holding lot, focusing on how the lot should operate to best achieve the primary goal for the project of managing queuing through Kingston, were reviewed and analyzed on a qualitative level. Second, the simulated traffic demands for the local roadway network and ferries were implemented to test the proposed ATMS. Traffic operations were modeled with the remote holding lot in 2040—consistent with the WSF Long-Range Planning horizon. Observations and analysis from the traffic simulations helped refine the ATMS recommendations.

This effort evaluates the first implementation phase of the ATMS and full holding lot. This first phase includes backbone ATMS components and a holding lane that utilizes the existing shoulder and WSDOT right-of-way. The recommendations for the first implementation phase can be found in the attached ATMS memo.

SITE IMPROVEMENTS

The WSDOT property at Lindvog Road NE and SR104 was evaluated as a location for a remote holding lot. Due to factors such as wetlands, steep grades, and other constraints, the remote lot required a large amount of funds.

Perteet, in conjunction with the Project Partners, developed a scaled-down approach to evaluate the site with a focus on ATMS elements.

The conceptual site plan provided as Attachment B shows the cost constrained plan, which limits the development of the Lindvog site to a total cost of $1.4 million for all site and ATMS improvements. The Lindvog site can efficiently support additional holding lanes beyond the cost constrained plan, should the funding become available. Perteet developed a site plan showing the approximate "easily developed" area in Attachment B. This area is defined as site area that could be developed without direct wetland impacts, site walls, or other major cost element constraints.

Design and operational priorities such as cost, project delivery risks, and operations were prioritized in design. Perteet analyzed several factors that affected on-site design. The developed concept plan causes no direct or buffer impacts to wetlands on the Lindvog site. In addition, the scaled-down approach reduces new development impacts to under Kitsap County Stormwater Design Manual flow control and runoff treatment trigger thresholds.

RECOMMENDED IMPROVEMENTS AND BENEFITS

ATMS elements recommended in the attached ATMS memo provide improvements to WSF passengers and improve the congestion in downtown Kingston. Stop line and departure detection should be utilized to trigger signals and count vehicles entering/exiting the holding lanes to reduce assistance needed by WSF staff and Washington State Patrol (WSP) on high volume days. The ATMS system recommended automates the tracking system to ensure "first-in, first-out" operations at the holding lanes by use of License Plate Reader (LPR) cameras. The ATMS and holding lane should be in operation at all times to provide clarity to Kingston residents and other frequent users. Directional guide signing is to be installed at key decision points to direct motorists to the holding lane. The construction of ATMS elements and site improvements at the Lindvog site would relieve ferry traffic congestion in the Kingston downtown area. Should additional funding become available, expansion of the holding lane(s) at the Lindvog site would increase capacity, reducing the number of vehicles in the SR104 shoulder on high volume days.

OUTSTANDING ITEMS TO BE RESOLVED

Additional elements to be resolved include:

- Community outreach and feedback.
- Coordination with the cycling community. As identified by WSDOT during the workshop process, SR104 is a prominent route for cyclists. Specific outreach to this community is needed to gather input from roadway users of multiple modes, improve user experience, and increase safety.
- Coordination with franchise utilities for utility work/relocations related to the construction of the holding lane.
- Final determination of available funds for the project. Sizing of the holding lane(s) to be refined to match cost-constraints as applicable.
- Acquiring applicable permits and agency approval.
- Determination of additional ATMS elements to be added, including installation of CCTV cameras, system integration with Traffic Management Center, travel time information, additional detection at infiltration points, signal processing time, and more. The attached ATMS memo includes further discussion of future enhancements.

ATTACHMENT A – ATMS MEMO

ATTACHMENT B – CONCEPTUAL SITE PLAN

ATTACHMENT C – PRELIMINARY OPINION OF COST

ATTACHMENT D – ADDITIONAL COMMENTS

ATTACHMENT A – ATMS MEMO

MEMORANDUM

2707 Colby Avenue, Suite 900, Everett, WA 98201 | P 425.252.7700

To: Port of Kingston

From: Mike Hendrix, PE, PTOE
Patty Buchanan, PE

Date: June 29, 2021

Re: ATMS Design for Shoulder Holding Lanes

INTRODUCTION

Vehicle traffic heading to the Kingston WSF ferry terminal backs up on State Route 104 (SR 104) through Kingston and often extends further to the west during peak hours. A previous effort identified a parcel which can be converted into a vehicle holding lot to remove these vehicles from the roadway network. The lot can also have an active traffic management system (ATMS) that indicates when drivers are to proceed to the dock along with other information such as holding wait times, in-and-out order, etc. Due to the lack of available funding for the full holding lot, the Partner agencies are pursuing a phased project which would include the widening/improvement of the shoulder of eastbound SR 104 to accommodate holding traffic. This approach is expected to be eligibile for PSRC and other funding agency grant opportunities. It is expected that this shoulder will accommodate a single holding lane. The holding lane will be controlled by an ATMS system. This ATMS system development, operation, and recommendation are described in the following sections.

SYSTEM OVERVIEW

The geometric design provides a single holding lane on the shoulder. The holding lane will be positioned on the south side of SR 104 extending from Lindvog Road NE along the frontage of the property planned to be used for a holding lot in the future. Between the holding lane and the through travel lanes on SR 104, a 5-foot wide buffer will be installed to create a gap between SR 104 traffic and the queue. This buffer also provides a location where drivers can exit their vehicles while waiting. No physical barriers are intended to separate moving traffic on SR 104 from the shoulder holding lanes other than the 5-foot buffer. This prevents signal equipment from being placed between the shoulder and through travel lanes. The plan view and cross-sections are shown on the conceptual plans separate from this document.

Shoulder Holding Lanes Concept of Operations

The proposed operation is described from entering the holding lane from the west.

- Driver is directed to use the shoulder holding lane by new static guide signing at key points in both Kingston and along SR 104.
- The ATMS is continuously monitoring the occupancy within the downtown Kingston holding lanes. A user defined threshold will need to be determined based on operations determined during the design process. This threshold is meant to indicate when vehicles are allowed to leave the holding lane near Lindvog Road NE.

- A vehicle is detected at the SR 104 and Lindvog Road NE signal via detection at the stop line. If the ATMS has determined that there is room available in downtown Kingston, a call is placed for the holding lane signal phase. If the ATMS system has determined that there is no room, the call is not placed. However, this process will be continuous if there is a vehicle being detected at the stop line at Lindvog Road NE.
- When the holding lane is being discharged, the eastbound approach at the SR 104 and Lindvog Road NE signal will change to green for ferry traffic only; eastbound general purpose traffic on SR 104 will be stopped by a red signal indication. Note that this signal arm will be modified with an additional red-yellow-green signal head and a blank-out symbolic no right turn sign (MUTCD sign code R3-1). The signal indication for the ferry holding lanes will have a supplementary sign reading FERRY SIGNAL and be louvered to prevent traffic on SR 104 from seeing the indication. This is similar to operations at the intersection of SR 525 and S Ferry Dock Road near the Clinton ferry dock.

A graphic of the operation is attached.

Detection

Detection is critical for proper system operation. There are key points where detection is to be installed. The locations and purpose of the detection are described below:

- Stop line detection and departure detection in the holding lane at Lindvog Road NE. The stop line detection is intended to be used to see if there is a vehicle that is waiting to proceed to the dock. The departure detection (located after the stop line) is meant to count exiting vehicles and respond when the number of vehicles departing meets the available space in downtown Kingston.
- Detection in both ferry holding lanes in downtown Kingston. Detection in the ferry holding lanes in downtown Kingston are meant to indicate if space is available for vehicles traveling from Lindvog Road NE. In addition, this detection system also provides information on how long vehicles are taking to being served. As vehicles fill the holding lanes on the ferry dock, the service rate is expected to slow. Detection will be placed where the dual ferry lanes begin, roughly half way between Iowa Avenue and Ohio Avenue. Follow-up detection are intended to be placed in the holding lanes on both the approach and departure legs of SR 104 at Ohio Avenue and on the approach leg of SR 104 at Washington Boulevard.

Other detection elements include license plate reader (LPR) cameras. The intent of the LPR cameras are to maintain the first-in, first-out order that is currently maintained by tokens issued by the Washington State Patrol (WSP) during peak travel times. For the LPR system to work, two sets of cameras are needed: one to detect when the vehicle has entered the system and one when the vehicle is nearing the toll booth. These locations are described below.

- On the traffic signal pole at Lindvog Road NE. This will detect when the vehicle has left the holding lane and is traveling to the ferry dock.
- On a new pole on the median located between Iowa Avenue and Ohio Avenue in downtown Kingston. There will be two LPR cameras, one for each lane, on the pole. These cameras will check if the license plate detected was read at Lindvog Road NE. If so, there is no additional action. If the license plate was not read at Lindvog Road NE, not read at Iowa Avenue, or not read at either location, then the image of the vehicle is sent to a monitor in the toll booth. The toll booth operator can then view the image of the vehicle and determine if the driver skipped the queue or was just missed by the LPR camera.

Note that the existing ferry holding lanes in downtown Kingston have substantial tree cover. It is expected that this tree cover will remain and will not be disturbed during construction. Therefore, detection will be limited to non-

video types of detection. Detection types proposed include in-ground loop detection which would be configured similar to loops at metered on-ramps, microradar pucks, or radar-detection units mounted on roadside poles.

In addition to active detection that will feed information to the ATMS, a fixed CCTV camera located at the intersection of Lindvog Road NE and SR 104 is proposed to be installed facing the holding lanes. This will assist WSF staff in evaluating operations at the holding lanes.

Additional Equipment Requirements

In addition to the vehicle detection and LPR cameras, there will be additional equipment required to ensure that the system is operational. These are described below:

- System Controller and Cabinet. A controller and cabinet with detector cards, controller, and communication equipment will need to be located close to the ferry dock. This controller is expected to also have a battery backup system to ensure continuous operation, even during power outages. Further, equipment in this cabinet is expected to process images and license plates for distribution to the ferry toll booths. Communication equipment including antennas or fiber optic cables are to be installed to connect to the ferry toll booths. For estimating purposes, wireless antennas are assumed. During design, this may be changed to fiber optic cables depending on budget.
- Wireless communication antennas. The current communication system between traffic signals is a copper wire interconnect. To provide a more enhanced and robust communication network, two-way radio antennas are proposed to connect the system controller at the dock to the controller cabinet at Lindvog Road NE. This will consist of wireless antennas at Lindvog Rd NE, the controller cabinet near the dock, and intermediate hops, as necessary to maintain line-of-sight between antennas. Where possible, existing poles or structures will be used to mount antennas. Note that this is in addition to the wireless antennas described for the system controller.
- New traffic signal controllers at Lindvog Road NE, Bannister Road, and Washington Street. New controllers are required at Bannister Road and Washington Street to ensure that the signals can continue to be in coordination. The existing cabinets are expected to remain in place. The new signal controller at Lindvog Road NE is required to handle the additional signal phase for the ferry. Further, this controller cabinet will also have a battery backup system to ensure continuous operation similar to the system controller.

ASSUMPTIONS

The following assumptions were made for the operation of the system.

1. The ATMS equipment will be on the land-side of the ferry dock. No equipment will be on the dock, other than items such as monitors located in toll booths for license plate/vehicle confirmation as necessary for operation of the system.. Maintenance of the system will need to be determined with a memorandum of understanding (MOU) between the Partner agencies to define maintenance responsibilities.

2. The system will operate continuously. Directional guide signing installed at key decision points will be installed to direct motorists to the holding lane.

FUTURE ENHANCEMENTS

The ATMS will operate effectively as described above. However, there are opportunities to enhance the operations and experience for ferry users. These are described below for consideration.

Other items that may be considered for future operations of the holding lots include the following:

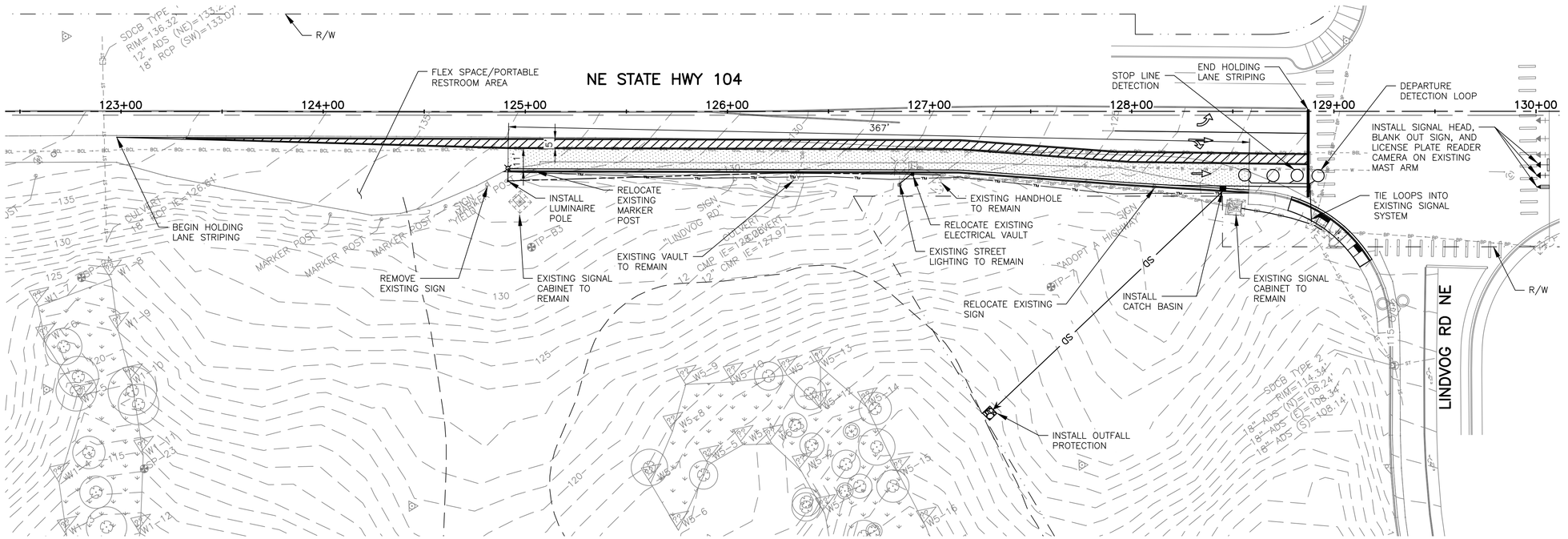
- Installation of CCTV cameras for monitoring both the holding lane and to confirm the signal and lane control signs are operating properly.
- Integration of the system to the Olympic Region's Traffic Management Center to allow direct monitoring and communication to the traveling public via variable message signs, social media, or other platforms.
- Integration of the system with existing or future variable message signs when traffic backups are severe. There are limited alternative routes for traffic utilizing the Kingston to Edmonds ferry. One alternative is using SR 307 to connect to SR 305 to connect to the Bainbridge Island to Seattle ferry. However, drivers will need to make this decision before encountering any ferry queue. Automated messages triggered by additional sensors would provide additional enhancements to the system.
- Implementation of travel time information. The system will have some limited capacity to determine the Queue Wait Time between the holding lane and the dock due to the license plate readers. However, this time will be heavily dependent on the ferry schedule and actual real-time status. Potential integration of the LPR cameras with other devices such as Bluetooth readers could provide an accurate time estimate. These times could be conveyed via platforms such as WSDOT websites, social media, and available variable message signs.

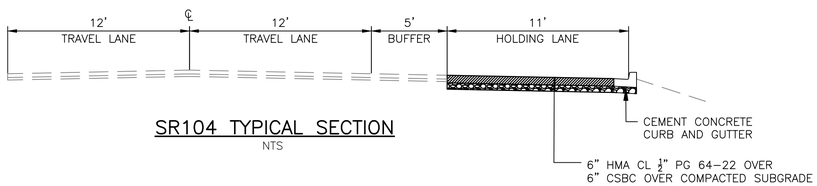
ATTACHMENT B – CONCEPTUAL SITE PLAN

SEC 26, T 27 N, R 2 E, W.M.

LEGEND:

- 6" HMA CL ½" PG 58H–22 OVER 6" CSBC OVER COMPACTED SUBGRADE
- CEMENT CONCRETE SIDEWALK
- CEMENT CONCRETE CURB AND GUTTER
- CURB RAMP
- CATCH BASIN
- SD — STORM DRAIN PIPE
- FLOW ARROW
- OUTFALL PROTECTION
- HANDHOLE
- STREET LIGHT ASSEMBLY
- POWER (BURIED)
- SIGNAL HEAD
- LED BLANK OUT SIGN
- LICENSE PLATE READER CAMERA
- ROUND LOOP DETECTOR
- WETLAND BUFFER BOUNDARY
- —FILL— FILL LINE





SR104 TYPICAL SECTION
NTS

GENERAL NOTES:

1. PROJECT WORK INCLUDES ADDITIONAL SIGNAGE AND ATMS EQUIPMENT NOT SHOWN ON THIS PLAN. SEE ATMS MEMO FOR LOCATIONS AND DESCRIPTIONS.
2. THE FLOW CONTROL MINIMUM REQUIREMENT IS TRIGGERED WHEN TOTAL EFFECTIVE IMPERVIOUS AREA IS 10,000 SF OR MORE, OR WHEN 100–YEAR FLOW FREQUENCY IS INCREASED 0.15 CUBIC FEET PER SECOND OR MORE. SEE KITSAP COUNTY STORMWATER MANUAL.
3. THE RUNOFF TREATMENT MINIMUM REQUIREMENT IS TRIGGERED FOR PROJECTS WITH A TOTAL OF 5,000 SF OR MORE OF PGHS OR WHERE THE TOTAL PGPS IS ¾ OF AN ACRE OR MORE. SEE KITSAP COUNTY STORMWATER MANUAL.

SCALE
30 0 30 60
FEET

PRELIMINARY
NOT FOR CONSTRUCTION

PERTEET
505 FIFTH AVENUE S, SUITE 300
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

FILE NAME	\\perteet.com\Files\Clients\Kingston, Port of\Projects\20190109 - Remote Ferry Holding Lot Feas Study\CADD\02 - Plan Sheets\20190109 - SITE.dwg Layout Name: PV1				REGION NO.	STATE	FED.AID PROJ.NO.
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DATE	5:51pm				JOB NUMBER		
DESIGNED BY	GC. DE SIMONE				20190109		
ENTERED BY	J. RED				CONTRACT NO.		LOCATION NO.
CHECKED BY							
PROJ. ENGR.	P. BUCHANAN						
REGIONAL ADM.		REVISION	DATE	BY			

PATRICIA A BUCHANAN — STATE OF WASHINGTON — 19794 — REGISTERED PROFESSIONAL ENGINEER

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Washington State Department of Transportation

SR 104

LINDVOG HOLDING AREA

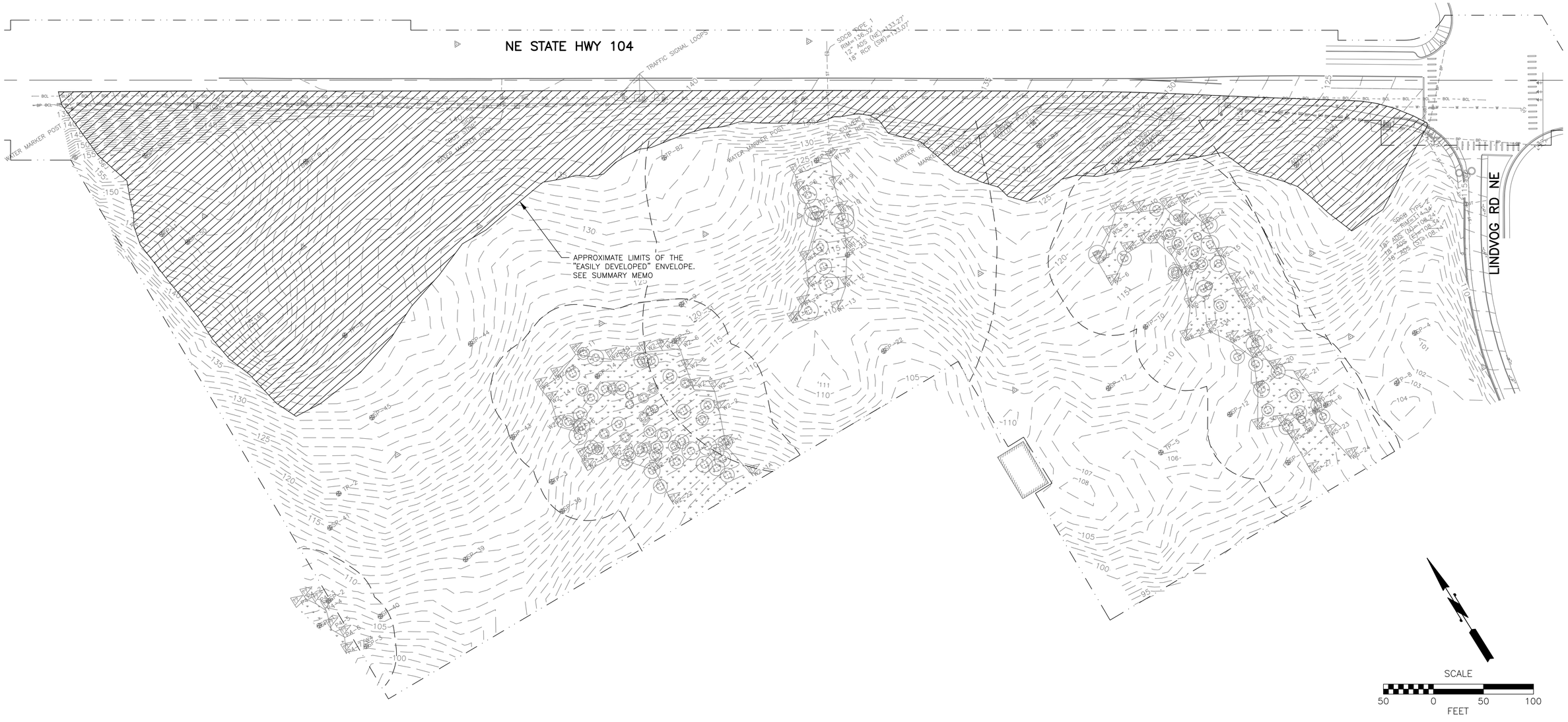
KITSAP COUNTY JUNE, 2021

CONCEPTUAL SITE PLAN

PLAN REF NO
CSP1

SHEET 1 OF 2 SHEETS

SEC 22, T 24 N, R 4 E, W.M.



PRELIMINARY
NOT FOR CONSTRUCTION

PERTEET
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206.436.0515 | 800.615.9900

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DATE	5:51pm				JOB NUMBER		
DESIGNED BY	GC. DE SIMONE				20190109		
ENTERED BY	J. RED				CONTRACT NO.		LOCATION NO.
CHECKED BY							
PROJ. ENGR.	P. BUCHANAN						
REGIONAL ADM.		REVISION	DATE	BY			

PATRICIA A. BUCHANAN
STATE OF WASHINGTON
40794
REGISTERED
PROFESSIONAL ENGINEER

Y:\CADD\Logos\Client Logos\Olympic Transit\OT Logo Chevron JPG - Black.jpg

Washington State Department of Transportation

SR 104

LINDVOG HOLDING AREA

KITSAP COUNTY JUNE, 2021

EASILY DEVELOPABLE AREA PLAN

PLAN REF NO
CSP2

SHEET 2 OF 2 SHEETS

ATTACHMENT C – PRELIMINARY OPINION OF COST

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	ATM Holding Lanes	Client:	Port of Kingston
Corridor Section:	SR 104	Date:	17-Jun-21
Location:	SR104 & Lindvog Rd - Kingston	Date of Cost Index:	2021
		Calculated By/Entered By:	GRD
		Checked By:	BMP

ATMS Holding Lanes

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$120	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$70	-	$0
		TEMPORARY CONSTRUCTION EASEMENTS (urban developed)	SF	$12	-	$0
		TEMPORARY CONSTRUCTION EASEMENTS (urban undeveloped)	SF	$7	-	$0
		RELOCATIONS: BUSINESSES	EA	$400,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$300,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (titles, appraisals, negotiations consultant, etc.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
			Inflation	**ROW Year**	**Cost Index**	**Future Cost**
		FUTURE ROW COST BASED ON INFLATION RATE	**2%**	**2024**	**2021**	**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$5,000	0.2	$1,000
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL. HAUL	CY	$40	170	$6,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$45	-	$0
		BORROW INCL. HAUL	TON	$30	-	$0
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,500	1	$1,500
		CATCH BASIN TYPE 2	EA	$5,000	-	$0
		SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	LF	$65	180	$11,700
		SCHEDULE A STORM SEWER PIPE 18 IN. DIAM.	LF	$85	-	$0
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$300	-	$0
		CONCRETE BRIDGES WIDENING (Including Removal)	SF	$200	-	$0
		PEDESTRIAN BRIDGES	SF	$550	-	$0
		STEEL BRIDGES	SF	$270	-	$0
		BRIDGE APPROACH SLAB	SY	$250	-	$0
		CONCRETE BRIDGE REMOVAL	SF	$35	-	$0
		RETAINING WALLS (Reinforced Cast in Place Concrete)	SF	$60	-	$0
		RETAINING WALLS (Soil Nail with Concrete Fascia Panel)	SF	$140	-	$0
		NOISE WALLS	SF	$30	-	$0
3		**SURFACING**				
		CEMENT CONCRETE PAVEMENT	SY	$150	-	$0
		HOT MIX ASPHALT	TON	$125	170	$21,250

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	ATM Holding Lanes		Client: Port of Kingston		
Corridor Section:	SR 104		Date: 17-Jun-21		
Location:	SR104 & Lindvog Rd - Kingston		Date of Cost Index: 2021		
	CRUSHED SURFACING	TON	$60	200	$12,000
4	**ROADSIDE DEVELOPMENT**				
	FENCING	LF	$20	-	$0
	SEEDING, MULCHING & FERTILIZING	ACRE	$3,000	-	$0
	WETLAND MITIGATION (BUFFER IMPACTS)	LS	$0	1	$0
	TEMP. WATER POLLUTION & EROSION CONTROL (2%)	LS	$4,000	1	$4,000
	LANDSCAPING	LS	$1,000	1	$1,000
5	**TRAFFIC**				
	GUARDRAIL	LF	$60	-	$0
	CONCRETE BARRIER	LF	$200	-	$0
	ATMS & SIGNAL SYSTEMS	LS	$470,000	1	$470,000
	ILLUMINATION	LS	$50,000	1	$50,000
	SIGNING	LS	$14,000	1	$14,000
	STRIPING	LF	$2	4,000	$8,000
	CURBS	LF	$45	410	$18,450
	CURB RAMP	EA	$8,000	2	$16,000
	SIDEWALKS	SY	$150	10	$1,500
	ADJUST MANHOLE OR CATCH BASIN	EA	$800	-	$0
	TRAFFIC CONTROL (3%)	LS	$5,000	1	$5,000
6	**OTHER ITEMS**				
	SURVEYING (2%)	LS	$4,000	1	$4,000
	SPECIAL ITEMS	EST	$0	-	$0
	FRANCHISE UTILITY RELOCATIONS	EST	$2,000	-	$0
7	**ROADWAY SUBTOTAL (ITEMS 1 THRU 6)**				**$176,200**
	ATMS SUBTOTAL				**$470,000**
8	**MOBILIZATION (10%)**				
	10% OF ROADWAY ITEM 7	EST	$17,700	1	$17,700
	10% OF ATMS ITEM 7	EST	$47,000	1	$47,000
9	**ROADWAY SUBTOTAL (ITEMS 7 & 8)**				**$193,900**
	ATMS SUBTOTAL (ITEMS 7 & 8)				**$517,000**
10	**SALES TAX**				
	9.8% FOR NEW UTILITIES	EST	$0	1	$0
11	**AGREEMENTS (Utilities, WSP, etc.)**	EST	$0	1	$0
12	**ROADWAY SUBTOTAL (ITEMS 9 THRU 11)**				**$193,900**
	ATMS SUBTOTAL (ITEMS 9 THRU 11)				**$517,000**
13	ROADWAY CONTINGENCY (30% OF ITEM 12)	EST	$58,200	1	$58,200
	ATMS CONTINGENCY (15% OF ITEM 12)	EST	$77,600	1	$77,600
14	**CONSTRUCTION SUBTOTAL (ITEMS 12 & 13)**				**$846,700**
		Inflation	**Const. Year**	**Cost Index**	**Future Cost**
15	**FUTURE CN COST BASED ON INFLATION RATE**	**5%**	**2024**	**2021**	**$981,000**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	ATM Holding Lanes		Client: Port of Kingston		
Corridor Section:	SR 104		Date: 17-Jun-21		
Location:	SR104 & Lindvog Rd - Kingston		Date of Cost Index: 2021		
16	**CONSTRUCTION ADMINISTRATION**				
	CONSTRUCTION ENGINEERING (15% OF ITEM 14)	EST	$127,100	1	$127,100
	A.H.J. ENGINEERING & ADMINISTRATION (5% OF ITEM 14)	EST	$42,400	1	$42,400
		Inflation	**Const. Year**	**Cost Index**	**Future Cost**
17	**FUTURE CN ADMIN COST BASED ON INFLATION RATE**	**5%**	**2024**	**2021**	**$197,000**
III.	**PRELIMINARY WORK**				
	PRELIMINARY ENGINEERING (20.0% OF ITEM 14)	EST	$169,400	1	$169,400
	A.H.J. ENGINEERING & ADMINISTRATION (5% OF ITEM 14)	EST	$42,400	1	$42,400
	ENVIRONMENTAL PERMITS/DOCUMENTS	EST	$0	1	$0
		Inflation	**Design Year**	**Cost Index**	**Future Cost**
	FUTURE PE COST BASED ON INFLATION RATE	**5%**	**2022**	**2021**	**$223,000**
IV.	**TOTAL ESTIMATED COST (ITEMS I, 15, 17, & III)**				
	TOTAL PROJECT COST (BASED ON INFLATION RATE)				**$1,401,000**

SUMMARY (Including inflation)	
Right of Way	**$0**
Design Engineering, Administration, Environmental Permitting (Item III)	**$223,000**
Construction Contract (Incl. Administration)	**$1,178,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. Perteet Inc. does not guarantee or warrant the accuracy of this planning level estimate.

ATTACHMENT D – ADDITIONAL COMMENTS

From: Ott, Sarah <OttSara@wsdot.wa.gov>
Sent: Tuesday, June 22, 2021 7:14 AM
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Subject: RE: [EXTERNAL] POK Kingston Ferry Holding Lanes - Final Documents

Good morning,

I apologize for missing the previous meeting, but attached please find comments to the recent documents.

- Can WSF fund an FTE to maintain and operate the system? This a complex system that will require several signal operations and maintenance reviews per year. Our crews are not meeting their required operations and maintenance reviews for our existing assets. This is outside the scope of the feasibility study. Items such as this would be covered under an MOA or other method between agencies as necessary.
- WSF will need to purchase spare parts for maintenance (thinking about lag time with ordering in the event of equipment failure) See response to comment above.
- The plan sheet appears to show 600' of storage (Sta 123+00 to 129+00), but the memo states 750' of storage. What's accurate? Documents have been updated. That equates to about 24-30 vehicles, respectively, and the project removes the current vehicle storage on SR 104 downtown, so there is a net loss in parking. With the limited storage, is the expectation that any additional vehicles would store on the upstream shoulder? Yes. The intent of the project was to minimize vehicles waiting on the shoulder between Lindvog and downtown. Storage in downtown will still remain but the intent is to minimize this queuing as much as possible. If upstream storage reaches capacity, are vehicles expected to turn around and try again? No. Vehicles will behave as they are today and queue on the shoulder. Will upstream VMSs be provided as part of this project to communicate to those upstream motorists? VMS will not be provided as part of this project. However, we have noted that VMS should be considered in the future if additional funding for this project is available.
- Will the equipment as part of the ferry holding lane be forward compatible with the future parking lot build-out? For example, will ingress and egress from the parking lot be from the ferry holding lane? Yes, the system will be forward compatible. The design of the holding lanes may change with a future built lot (for example, one or more lanes may be reduced).
- The memo states that the design includes a 5' bike lane/buffer, but bicycles are defined as vehicles, and vehicles cannot legally drive on a hachured space. Recommend removing the bike lane term. We will remove the notation of a bike lane in the buffer. We believe that the inclusion of the bike lane was a request from WSDOT in prior comments.
- The ITS sign at Barber Cut-off requires frequent maintenance and needs to be rebuilt. Please replace the existing sign with a VMS Per WSF, the sign isn't currently used. With the change in operations here, a VMS is not required. A future project could replace these signs with static signs. The controller equipment is recommended to stay for potential future traffic monitoring via in ground loops and CCTV camera located here.
- Will the system allow for a manual override? This can be added as an option during the design phase. However, due to the distance from the WSF toll booths, the operation would likely not be effective and could be complicated. This will be evaluated in future phases.
- Does the LPR process the data quickly enough to provide information to the WSF booth by the time the

vehicles arrive? What is the data processing capability? What is the efficiency of the toll booth operator for processing vehicles with this type of system? Will this slow down the toll both operation, and create queuing in downtown? Following coordination with Western Systems, the equipment can process this in time. This is covered in the ATMS memorandum.

- We need to verify how the signal corridor will operate, and what type of controllers are necessary to operate the system. Currently the signal system is coordinated to help offload the ferry traffic, so the signal timing shown in the memo will affect that coordination. There will be an operational test and review component as part of this work. However, the proposed signal work is well within the capabilities of current controllers. The addition of a phase 9 at the Lindvog intersection will take time away from the EB phase (phase 6), of which, this is the last signal on SR 104 in the eastbound direction. The WB direction has the two signals at Bannister and Washington and that phasing is not impacted. Also, note that signal timing is not included in the scope and will be determined during design.
- We need to verify how the signal at Lindvog will communicate with the ferry terminal to know if there space for ferry traffic, while simultaneously communicating with the signal controller at Lindvog. The approach is covered in the ATMS memorandum. Similar to other items, this will need an operational test to work out timing, etc.
- Has the Lindvog signal mast arm been confirmed to have wind load capacity for the additional signal head and signs? Based on WSDOT pre-approved pole drawings and approximate locations of the existing signal heads and new equipment, the proposed wind load will be under the maximum allowed.
- Please include a CCTV camera at the SR 104/Lindvog intersection to monitor signal operation and ferry queuing. We also recommend adding a CCTV upstream of the VMS sign (see comment above about Barber Cut-off) to verify whether messages are displaying accurately WSF has asked and we have included in the final memo and cost estimate a CCTV camera at the Lindvog intersection. See note about the CCTV need at Barber Cut-Off Road. We can add a CCTV camera at that location as part of future efforts.

Thank you,
Sarah