

Alaskan Way Viaduct and Seawall Replacement Program

Holgate to King Stage 2 and Bored Tunnel Interface Options and Decisions

Workshops 1 & 2

MEETING MINUTES

ATTENDEES:

2-17-09	2-20-09	ATTENDEE	2-17-09	2-20-09	ATTENDEE
✓	✓	Ali Amiri, WSDOT	✓	✓	Vic Oblas, VOSK
✓		Bob Chandler, SDOT	✓	✓	Bill Ott, OTT
		Wally Chen, PB	✓	✓	Don Phelps, PB
✓	✓	Gordon Clark, PB	✓	✓	Mike Rigsby, PB
✓	✓	Mike Colyn, PB	✓	✓	Jim Robison, HMM/PMAC
✓	✓	Rick Conte, PB	✓		Kevin Sakai, OTT
✓	✓	Ken Fiorentino, Jacobs	✓		Jim Struthers, WSDOT
✓	✓	Theresa Greco, WSDOT		✓	Bob Valenti, PB
✓	✓	Mike Johnson, SDOT	✓	✓	Alec Williamson, WSDOT
✓		Einer Handeland, PB	✓		Laura Wojcicki, PB
✓	✓	Asvin Mandadi, PB			

SUBJECT: Holgate to King (H2K) Stage 2 and Tunnel Interface Options and Decisions Workshop

DATE/TIME: Workshop 1 - February 17, 2009 / 1:00 p.m. – 4:00 p.m.
Workshop 2 - February 20, 2009 / 1:00 p.m. – 3:00 p.m.

LOCATION: AWVSRP Office, 23rd Floor Training Room South

DISTRIBUTION: Attendees, plus:
Matt Preedy, WSDOT; John White, WSDOT; Chris Wellander, PB; AWVSRP DCC; GEC Document Control

2-17-09 WORKSHOP 1

MEETING AGENDA

1. Goals
2. Workshop Objective
3. Presentation of H2K Stage 2 Transition Area Staging Alternatives
 - Assumptions
 - Walk Thru Alternatives and Construction schedules
 - Present Pros and Cons independent of the Bored Tunnel

Baseline Alternative 1 – 60% PS&E Design – WOSCA Detour
 Alternative 2 – Inline Transition Structures with SR99 Closure
 Alternative 3 – Side Connection Transition Structures with SB SR 99 Closure
 Alternative 4 – Inline Transition Structures with Modified WOSCA Detour
 Alternative 5 – Side Connection Transition Structures with Modified WOSCA Detour
4. Interface with the Bored Tunnel and South Portal Construction
 - Bored Tunnel team responses to the Transition Area Alternatives for H2K
 - Pros and Cons for each for Bored Tunnel Construction
5. Discussions, Pros & Cons Evaluation, and Conclusion
 - Choose preferred alternative or develop Hybrid alternative

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DISCUSSION:

1. Goals

- The stated goals for this workshop:
 - Proceed with H2K design to meet September, 2009 Ad Date
 - Minimize traffic disruptions on SR 99 as well as on City streets
 - Address constructability issues during contract overlaps between H2K and Bored Tunnel
 - Discuss transition area north of Royal Brougham and reconnection to the Existing Viaduct

2. Workshop Objectives

- Objectives stated as follows:
 - Begin construction of H2K as soon as possible; complete as much work as possible before heavy construction for the Bored Tunnel begins.
 - Address Bored Tunnel impacts
 - Discuss the H2K Transition Area Alternatives, and develop pros and cons for each alternative relative to each contract.
 - Collective decision on recommendations on detour strategy for H2K
 - Select transition structure connection; strategy must meet ad date, minimize delays to construction of the Bored Tunnel

3. Presentation of H2K Stage 2 Transition Area Staging Alternatives

- Assumptions
 - Vacating the Whatcom Lead could save 8 months in the H2K schedule
 - SR99 Traffic would be detoured to 1st Avenue during closures. The minimum closure would be 1 month. A different profile would tie in to transition structures.
 - Alaskan Way South would be closed between S. King Street and Atlantic Street for the first 8 months of the project. It could then re-open, with 2-lanes/2 way traffic. This would provide a 3 month gain in schedule to build the U-Tube,
 - The WOSCA staging area would be shared between the Bored Tunnel and H2K contractors.
 - The south end portal construction begins April 2011.
 - The assumption that the Tunnel Boring Machine (TBM) will be set up starting Nov 2011 was revised to June 2012.
- Asvin Mandadi walked through Alternatives and Construction schedules
 - Alternative 1 was presented as the baseline scenario (WOSCA detour with Inline Transition Structures) that was progressed beyond the 60% PS&E design and work was stopped on the WOSCA detours in January 2009 pursuant to the Bored Tunnel announcement.
 - Alternative 2 presented the most advantage for the Bored Tunnel contractor in terms of use of WOSCA staging area, and the schedule for completing the Transition Structures by August 2011. This alternative does not meet the objective of minimizing traffic disruptions on SR 99 and City streets.
 - Alternative 3 has the same staging area and schedule advantages as Alternative 2 for the Bored Tunnel contractor. This alternative on one hand does not meet the

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objective of minimizing traffic disruptions on SR 99 and City Streets, and on the other hand requires several spans of the mainline Viaduct be retrofitted.

- Alternatives 4 and 5 were removed from consideration. WOSCA detour via 1st Ave and Railroad Way Ramps in both alternatives presents a challenge to access the Staging area constrained by the detour on one side, and by the Railroad Ramps on the other.
- Alternative 6 was introduced for further study. This alternative would re-align WOSCA detour in two stages from its connection to the RR Ramps in Alternative 1 to a direct connection to the newly built SB mainline with the Viaduct removed. This would become the long-term detour for H2K until the Bored Tunnel construction is complete. The Transition Structures would not be built.
- Ken Fiorentino presented the following as considerations for the Bored Tunnel work:
 - The assumption for Tunnel Boring Machine setup in Nov 2011 was removed
 - Between WOSCA and S King St. the method of construction chosen was to build secant walls on either sides of the excavation pit, support the utilities, deck the surface at about 8 feet below ground, relocate the utilities and back fill. Excavation then takes place between the shafts before the TBM is launched in June of 2012.
 - Construction for the South Portal in all cases would begin on 1st Ave from S King St. to the South and proceed south into the WOSCA property. Contractor would need Railroad Way ramps removed to proceed into WOSCA.
 - Once the South Portal work is complete within WOSCA, the entire WOSCA site is needed for the Tunnel contractor to stage for the TBM.
 - The length required to assemble the TBM is 250 feet. Fabrication takes 16 months. The actual time to bore the tunnel is 11 months. It will take 5 months to set up machines, construction office, cages, slurry plant etc., requiring an approximate area with dimensions 120' X 1,300'.

The comparison matrix for each alternative was updated to develop Pros and Cons for the Bored Tunnel. The matrix updated during 2-20-09 Workshop 2 is attached.

DECISIONS 2-17-09:

- Alternatives 1, 4 and 5 were removed from further consideration, leaving 2-3 and the 6 for further consideration.

ACTIONS for 2-10-09:

- The H2K Team will develop Alternative 6.
- The Bored Tunnel team will assess WOSCA staging for Alternative 6.
- A follow-up workshop will be held February 20, 2009, from 1:00 P.M. to 3:00 P.M. in the 23rd Floor Training Rooms.

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2-20-09 WORKSHOP 2

MEETING AGENDA

1. Present Alternative 6
2. Present Alternative 3A – Developed new by Project Team
3. Discuss Pros and Cons of remaining Alternatives
4. Select remaining alternatives for Sr. Management Decision making

DISCUSSION:

Goals and Objectives are the same as set on 2-17-09

Presentation:

- Alternative 6 and 3A were presented with Pros and Cons.
- Alternative 6 was presented and the staged construction of WOSCA detour from its alignment in Alternative 1 to the final location was discussed.
- RR Ramps can be removed in Nov 2011 as soon as NB WOSCA detour is tied-in.
- Construction of a the relocated WOSCA detour is very constrained in Stages 3 & 4
- Approximately 1.25 Ac of WOSCA in the NW corner is not available to the Bored Tunnel contractor. The final alignment of WOSCA detour occupies this space.
- The initial reaction to Alternative 6 was that the Tunnel Team would need all of WOSCA
- Closing RR Ramps to all traffic to facilitate accelerated WOSCA detour construction to its final location was considered. Project team responded as follows:
 - SB SR99 must be detoured first on to WOSCA as soon as the SB mainline bridge and west 1/3rd of the south approach fill are complete
 - The central 1/3rd of the south approach fill is completed with SB SR99 on WOSCA detour
 - The Viaduct has to be demolished to build NB WOSCA detour
 - NB WOSCA detour must then be completed and detoured on to the SB mainline bridge
 - This sequence must be followed for any alignment of WOSCA. With the Viaduct in place, SB WOSCA detour to be closer to its final location would require several geometric deviations rendering the movement very constrained and unsafe.
- Alternative 3A was developed by the Project Team as a variation to Alternative 3 with a 25 MPH design speed for the Transition Structure tie-in to the Ex Viaduct
 - The SB transition structure tie-in connects north of the NB transition structure tie-in
 - The mainline traffic is always maintained on SR 99 before it is diverted on to the Transition Structures
 - The number of frames that need to be retrofitted drops from 6 to 4.

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- The SB SR 99 traffic in 2 x 11' lanes has to snake through the existing columns at a lowered design speed.
- Barriers would be placed on both sides of the traffic lanes to protect columns
- The entire WOSCA site is available to the Bored Tunnel contractor as early as Jan 2011
- RR ramps can be removed by Oct 2011 as soon as the replacement ramps are built
- This alternative was favored by all due to the fact that it meets the objective of not disrupting SR99 and City street traffic, maintains traffic on SR 99 at all times, maintains the Bored Tunnel construction schedule, and the entire WOSCA site is available to the Bored Tunnel contractor in Jan 2011.

The comparison matrix was updated for alternatives 3A and 6. For all alternatives to the team developed considerations in lieu of pros and cons for the Bored Tunnel. The matrix is attached (updated to 2-20-09 discussions).

DECISIONS:

- Alternative 3 was eliminated and replaced with Alternative 3A which would be considered in the decision making
- Baseline Alternative 1 will be shown for comparison purposes

ACTIONS:

- Alternatives 2, 3A and 6 will be presented to Ali Amiri for furthering to Sr. Management for Decision making week of 2/23/09

Alaskan Way Viaduct Replacement S – Holgate St to S. King St.- H2K and Bored Tunnel Interface Workshop

Goal:

Decision on Transition Area Alternative for Holgate to King Project (H2K)

Objective:

Minimize Traffic and Business disruptions on SR 99 and Surface Streets; Maintain Holgate to King September Ad Date.

Assumptions:

1. Whatcom Lead Vacated during Construction; 2. SR 99 traffic detoured on to 1st Ave during closures; 3. Alaskan Way S closed between S King St. and Atlantic St.; 4. WOSCA Staging Area is shared between Holgate to King (H2K) Contractor and Bored Tunnel (BT) Contractor; 5. South End Portal Construction begins April 2011

Alternative	Description	Traffic Operations	Cost	H2K Pros & Cons	Bored Tunnel Considerations
Baseline – Alternative 1 Inline Connection with WOSCA – (Not being considered further 2/20/09)	Design Speed: WOSCA Detour <ul style="list-style-type: none"> • 25 MPH – Superelevation deviated Transition Structures <ul style="list-style-type: none"> • 45-50 MPH with approved deviations Channelization: WOSCA Detour <ul style="list-style-type: none"> • 2 x 2 lanes with temporary NB on and SB off ramps Transition Structures <ul style="list-style-type: none"> • 2 x 2 lanes with temporary NB on and SB off ramps 	SR99 mainline: <ul style="list-style-type: none"> • Weekend and nightly closures for Viaduct demolition and tie-in of WOSCA detour to RR Way Ramps 1 st Ave <ul style="list-style-type: none"> • No impacts Alaskan Way S <ul style="list-style-type: none"> • Detoured to 1st Ave S. via the RR Way S (Feb 2010–Feb 2011) • 2 Way connection between S King St and Atlantic St starting March 2011 	60% CEVP estimate - \$55M <ul style="list-style-type: none"> • Transition Structures (Inline) plus WOSCA detour 	Pros: <ul style="list-style-type: none"> • H2K EA not impacted • Night and Weekend closures of SR 99 for WOSCA Detour tie-ins Cons: <ul style="list-style-type: none"> • High cost of constructing two sets of temporary structures • Lower Speed and deviated geometrics for WOSCA Detour 	Considerations: <ul style="list-style-type: none"> • Railroad Ramps removed – March 2011 • WOSCA Detour removed and entire site available – July 2012 • No impact to work north or RR on 1st Ave – Jan 2011 to Nov 2011 • Some work can be completed on WOSCA – 110' width available starting – Nov 2011 • Increased cost of Bored Tunnel – Production slowed due to working inside shafts • Excavation of Tunnel and U-tube operations are concurrent • WOSCA Detour work is concurrent with the south portal excavation operations • Excavation activities along 1st Ave use 1st Ave for hauling

Page 1 – Baseline Alternative shown for comparison with other alternatives – Not being considered further

Page 2 – Alternative 2, 3A, and 6 are being presented for Sr. Management Decision making

Page 3 – Alternatives eliminated and not being considered further are highlighted in yellow

Alaskan Way Viaduct Replacement S – Holgate St to S. King St.- H2K and Bored Tunnel Interface Workshop

Alternative	Description	Traffic Operations	Cost	H2K Pros & Cons	Bored Tunnel Considerations
Alternative 2 Inline Connection	<p>Design Speed:</p> <ul style="list-style-type: none"> 50mph – Super, SSD, Deviated to 40 MPH <p>Channelization:</p> <ul style="list-style-type: none"> 2 x 3 lane stacked transition structures Temporary NB on and SB off constructed by Tunnel Contractor prior to removing RR Ramps 	<p>SR99 mainline</p> <ul style="list-style-type: none"> Closed – 6 Months (Feb-Aug 2011) <p>1st Ave S</p> <ul style="list-style-type: none"> Expected level of service - LOS E or F <p>Alaskan Way South</p> <ul style="list-style-type: none"> Detoured to 1st Ave S. via the RR Way S (Feb 2010–Feb 2011) 2 Way Connection between Atlantic St and King St (Feb-Aug 2011) SB movement provided after Transition Structures completed (Oct 2011) 	<p>30% CEVP estimate - \$35M</p> <ul style="list-style-type: none"> 60,000SF of structure (\$34M) Additional MOT Costs (\$1M) for 1st Ave improvements 	<p>Pros:</p> <ul style="list-style-type: none"> Existing Viaduct structural integrity maintained Potential re-use of existing Viaduct foundations for the NB transition structure BT Construction Schedule maintained WOSCA Staging area utilized efficiently <p>Cons:</p> <ul style="list-style-type: none"> H2K EA re-eval required for SR 99 closure 1st Ave traffic and businesses impacted for 6 months 	<p>Considerations:</p> <ul style="list-style-type: none"> Railroad Ramps removed – Oct 2011 Entire WOSCA site available – Jan 2011 No WOSCA Detour Costs are lowered compared to other alternatives Major Excavation activities along 1st Ave uses WOSCA Excavation of Tunnel and U-tube operations are concurrent Excavation activities along 1st Ave use 1st Ave for hauling
Alternative 3A 25 MPH - Side Connection	<p>Design Speed:</p> <ul style="list-style-type: none"> 25mph – Super, SSD, Deviated <p>Channelization:</p> <ul style="list-style-type: none"> 2 lanes on SB and 3 lanes on NB structure connecting with existing SR 99 just south of RR Way ramps Temporary NB on and SB off constructed by Tunnel Contractor prior to removing RR Ramps 	<p>SR99 mainline</p> <ul style="list-style-type: none"> Open at all time <p>1st Ave S</p> <ul style="list-style-type: none"> Not impacted <p>Alaskan Way South</p> <ul style="list-style-type: none"> Detoured to 1st Ave S. via the RR Way S (Feb 2010–Jan 2012) 1 lane SB can be provided after Transition Structures completed (Oct 2011) 	<p>Order of Magnitude Estimate - \$35M</p> <ul style="list-style-type: none"> 40,000SF of structure (\$27M) <p>Additional SR 99 retrofitting costs (\$9M)</p>	<p>Pros:</p> <ul style="list-style-type: none"> SR 99 traffic maintained at all times H2K EA re-evaluation not required <p>Cons:</p> <ul style="list-style-type: none"> Existing Viaduct needs shoring and retrofitting over 4 frames, skewed tie-in, monitoring for settlement of fills. Lower design speed (25MPH) for 4+ years Vertical Clearance 14' – 5" 	<p>Considerations:</p> <ul style="list-style-type: none"> Railroad Ramps removed – Oct 2011 Entire WOSCA site available – Jan 2011 No WOSCA detour Costs are lowered compared to other alternatives Major Excavation activities along 1st Ave uses WOSCA Excavation of Tunnel and U-tube operations are concurrent Excavation activities along 1st Ave use 1st Ave for hauling
Alternative 6 WOSCA Detour optimized – No Transition Structures	<p>WOSCA detour alignment shifted west to maximize WOSCA staging area for Bored Tunnel Contractor.</p> <p><u>Transition Structures</u></p> <ul style="list-style-type: none"> Not built <p><u>WOSCA Detour</u></p> <p>Design Speed:</p> <ul style="list-style-type: none"> 25mph <p>Channelization:</p> <ul style="list-style-type: none"> 2 x 2 lanes with temporary NB on and SB off ramps 	<p>SR99 mainline:</p> <ul style="list-style-type: none"> Weekend and nightly closures for Viaduct demolition <p>1st Ave:</p> <ul style="list-style-type: none"> Not impacted <p>Alaskan Way S</p> <ul style="list-style-type: none"> 2 Way connection between S King St and Atlantic St 	<p>Order of magnitude - \$25M – \$30M</p> <ul style="list-style-type: none"> Two construction stages for WOSCA detour 	<p>Pros:</p> <ul style="list-style-type: none"> No Transition structures – Cost Savings SR 99 traffic maintained majority of the time H2K EA re-evaluation not required <p>Cons:</p> <ul style="list-style-type: none"> Lower design speed (25MPH) for 4+ years Short duration SR 99 Closures Multiple stages of WOSCA detour construction Constrained construction of NB WOSCA alignment final location 	<p>Considerations:</p> <ul style="list-style-type: none"> Railroad Ramps removed – Nov 2011 75% WOSCA site available – March 2012

Page 1 – Baseline Alternative shown for comparison with other alternatives – Not being considered further
 Page 2 – Alternative 2, 3A, and 6 are being presented for Sr. Management Decision making
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EXHIBIT H

Alaskan Way Viaduct Replacement S – Holgate St to S. King St.- H2K and Bored Tunnel Interface Workshop

Alternative	Description	Traffic Operations	Cost	H2K Pros & Cons	Bored Tunnel Considerations
Alternative 3 Side Connection (Alternate 3A is an improvement – Alternative not being considered further 2/20/09)	Design Speed: <ul style="list-style-type: none"> 50mph – Super, SSD, Deviated to 40 MPH Channelization: <ul style="list-style-type: none"> 2 x 2 lane NB and SB structures connecting with existing SR 99; NB between S. King St and S. Jackson St.; SB just south of RR Way ramps Temporary NB on and SB off constructed by Tunnel Contractor prior to removing RR Ramps 	SR99 mainline <ul style="list-style-type: none"> SB SR 99 Closed - 5 months (Aug 2011-Jan 2012) NB SR 99 on existing Viaduct at all times 1st Ave S <ul style="list-style-type: none"> LOS on SB 1st Ave S. degraded Alaskan Way South <ul style="list-style-type: none"> Detoured to 1st Ave S. via the RR Way S (Feb 2010–Feb 2011) 2 Way connection between Atlantic St and King St (Feb-Oct 2011) SB movement provided after Transition Structures completed (Oct 2012) 	Order of Magnitude Estimate - \$50M <ul style="list-style-type: none"> 80,000SF of structure (\$41M) Additional SR 99 retrofitting costs plus MOT costs for 1st Ave detour (\$9M) 	Pros: <ul style="list-style-type: none"> None Cons: <ul style="list-style-type: none"> Existing Viaduct needs shoring and retrofitting over 6 frames, skewed tie-in H2K EA re-evaluation required for SR 99 closure SB 1st Ave. traffic and businesses impacted for 5 months 	Considerations: <ul style="list-style-type: none"> RR Ramps removed January 2012 Entire WOSCA Site available – Jan 2011 All of WOSCA available starting August 2011 Other pros same as Inline Connection above 5 month wait for South Portal construction completion Excavation activities along 1st Ave use 1st Ave for hauling
Alternative 4 Inline Connection with Modified WOSCA Detour (Alternative not being considered further 2/17/09)	Transition Structures <ul style="list-style-type: none"> Design Speed and Channelization same as Alternative 2 WOSCA Detour <p>Design Speed</p> <ul style="list-style-type: none"> 25mph <p>Channelization:</p> <ul style="list-style-type: none"> 2 x 2 lanes with temporary NB on and SB off ramps 	SR99 mainline: <ul style="list-style-type: none"> Weekend and nightly closure for Viaduct Demolition Closed – 1 Month (May 2012) for tie-in to Transition Structures 1st Ave S <ul style="list-style-type: none"> Maintain 1 Lane 2 Way between RR Ave and Royal Brougham Way Alaskan Way South similar to Alternative 2 	Order of Magnitude Estimate - \$45M <ul style="list-style-type: none"> Added cost of modified WOSCA Detour (\$10M) 	Same as inline connection except noted below <p>Pros:</p> <ul style="list-style-type: none"> EA re-evaluation not required <p>Cons:</p> <ul style="list-style-type: none"> 1st Ave traffic and businesses impacted for 1 month 11 month wait for TBM Machine setup 	Considerations: <ul style="list-style-type: none"> RR Ramps removed July 2012 WOSCA Site available July 2012 Access to WOSCA restricted at either ends by Detour and RR Ramps until July 2012
Alternative 5 Side Connection with Modified WOSCA Detour (Alternative not being considered further 2/17/09)	Transition Structures <ul style="list-style-type: none"> Design Speed and Channelization same as Alternative 3 WOSCA Detour <p>Design Speed:</p> <ul style="list-style-type: none"> 25mph <p>Channelization:</p> <ul style="list-style-type: none"> 2 x 2 lanes with temporary NB on and SB off ramps 	SR99 mainline: <ul style="list-style-type: none"> Weekend and nightly closure for Viaduct Demolition Closed – 1 Month (Feb 2012) for tie-in to Transition Structures 1st Ave S <ul style="list-style-type: none"> Maintain 1 Lane 2 Way between RR Way Ave and Royal Brougham Way Alaskan Way South similar to Alternative 3 	Order of Magnitude Estimate - \$60M <ul style="list-style-type: none"> Added cost of modified WOSCA Detour (\$10M) 	Same as side connection except as noted below <p>Pros:</p> <ul style="list-style-type: none"> H2K EA re-eval not required <p>Cons:</p> <ul style="list-style-type: none"> 1st Ave traffic and businesses impacted for 1 month BT construction within WOSCA constrained for a 7 months 	Considerations: <ul style="list-style-type: none"> RR Ramps removed May 2012 WOSCA Site available May 2012 Access to WOSCA restricted at either ends by Detour and RR Ramps until May 2012

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