		Composite Truss / Existing NPH	Cable-Stayed / Existing NPH	Arch / Existing NPH
Alignment				
	Washington approach	**The freeway superelevation increases from 4% to 6% - still within standards, but less desirable.** The superelevation is 4% with the LPA alignment.	As proposed, this design places the MUP and transit between NB and SB I-5 in a 52'4" gap. This arrangement creates challenges in transitioning the two facilities onto land from the main river bridge in order to avoid further ROW impacts in downtown Vancouver. **The freeway superelevation increases from 4% to 6% - still within standards, but less desirable.**	As proposed, this design places the MUP and transit between NB and SB I-5 in a 52'4" gap. This arrangement creates challenges in transitioning the two facilities onto land from the main river bridge in order to avoid further ROW impacts in downtown Vancouver. **The freeway superelevation increases from 4% to 6% - still within standards, but less desirable**.
	Oregon approach	**The freeway superelevation increases from 4% to 6% - still within standards, but less desirable.** The superelevation is 4% with the LPA alignment.	As proposed, this design places the MUP and transit between NB and SB I-5 in a 52'4" gap. This arrangement creates challenges in transitioning the two facilities onto land from the main river bridge in order to transition back into the existing NPH alignment and cross section. The freeway superelevation increases from 4% to 6%, still within standards, but less desirable.	As proposed, this design places the MUP and transit between NB and SB I-5 in a 52'4" gap. This arrangement creates challenges in transitioning the two facilities onto land from the main river bridge in order to transition back into the existing NPH alignment and cross section. The freeway superelevation increases from 4% to 6%, still within standards, but less desirable.
	Transit Oregon	no changes required to meet current commitments	changes necessary - the transit alignment OR LRT Approach bridge is shifted closer to the intersection of Hayden Island Drive and the Hayden Island to I-5 South ramp. The structure type causes the approach bridges to be no more than 4.5 feet deep in order to accommodate the light rail vertical clearances. This would require a significant reduction in span length and may have other impacts	changes necessary - the transit alignment OR LRT Approach bridge is shifted closer to the intersection of Hayden Island Drive and the Hayden Island to I-5 South ramp. The structure type causes the approach bridges to be no more than 4.5 feet deep in order to accommodate the light rail vertical clearances. This would require a significant reduction in span length and may have other impacts
	Transit Washington	no changes required to meet current commitments	changes necessary - The structure type causes the approach bridges to be no more than 4.5 feet deep in order to accommodate the light rail vertical clearances. This would require a significant reduction in span length and may have other impacts	changes necessary - The structure type causes the approach bridges to be no more than 4.5 feet deep in order to accommodate the light rail vertical clearances. This would require a significant reduction in span length and may have other impacts
	MUP Oregon	no changes required to meet current commitments	MUP can touch down to TID. In order to maintain a 4.5% downgrade, the vertical clearance must be reduced to 10'. Emergency vehicle access will need to change to inside shoulder on freeway.	MUP can touch down to TID. In order to maintain a 4.5% downgrade, the vertical clearance must be reduced to 10'. Emergency vehicle access will need to change to inside shoulder on freeway.
	MUP Washington	no changes required to meet current commitments	Additional 600' length for touchdown require 180 degree switchback to get down to waterfront area. Switchback does not allow emergency vehicle access on MUP - Emergency vehicle access will need to change to inside shoulder on freeway.	Additional 600' length for touchdown require 180 degree switchback to get down to waterfront area. Switchback does not allow emergency vehicle access on MUP - Emergency vehicle access will need to change to inside shoulder on freeway.
	MUP Profile	no changes required to meet current commitments	MUP at 30' higher across main river channel - requires longer approaches to touch down increasing average travel time for bicycles by approximately 1.5 minutes each direction. More eyes on path from street. More exposure to noise, exhaust, wind, debris. More potential for scenic views and sense of openness.	MUP at 30' higher across main river channel - requires longer approaches to touch down increasing average travel time for bicycles by approximately 1.5 minutes each direction. More eyes on path from street. More exposure to noise, exhaust, wind, debris. More potential for scenic views and sense of openness.
Cost				
	Entire Project	BERP I-1 Alignment (XXX)	BERP I-1 Alignment (XXX)	BERP I-1 Alignment (XXX)

Bridge Only*	The composite deck truss option represents a proven and economical bridge type solution. The BRP Report states that the composite deck truss would cost $340 million which is approximately 21% less than the tied arch option or 15% less than the cable-stayed option. The BRP Report quantities do not appear to account for the flared sections or the end transition piers. One transition pier would be located in water and one would be on land. The additional costs associated with the flared sections and the transition spans is $XXX million - in current year costs.	The BRP Report states that the cable-stayed option would cost $400 million which is more expensive than the composite deck truss but would provide a more predictable cost and would be less expensive than a tied arch. The BRP Report quantities do not appear to account for the flared sections or the end transition piers. One transition pier would be located in water and one would be on land. The additional costs associated with the flared sections and the transition spans is $XXX million - in current year costs.	The most expensive cost alternative according to the BRP Report ($430 million). The BRP Report quantities do not appear to account for the flared sections or the end transition piers. One transition pier would be located in water and one would be on land. The additional costs associated with the flared sections and the transition spans is $XXX million - in current year costs.
Transit funding	The least cost apportionment to transit and would be less than the current New Starts Submittal. Cost apportionment to transit is difference between a concrete segmental bridge and the composite truss (for SB only).	More costs would be apportioned than currently submitted in the New Starts Submittal. Cost apportionment to transit should be based on the square footage differential that is added by transit (180' wide vs. 240' wide) and the "supertruss" spine.	Similar to the cable-stayed, more costs would be apportioned to transit than in the current New Starts Submittal. Cost apportionment to transit should be based on the square footage differential that is added by transit (180' wide vs. 240' wide) and the "supertruss" spine.
Maintenance Costs / Life Cycle	Typical truss considerations	Higher due to more flexible nature, unique framing	Higher due to more flexible nature, unique framing
Inspection	Steel requirements, can be inspected from deck	Steel Requirements, Flexible structure (fatigue, more onerous requirements), requires river access	Steel Requirements, Flexible structure (fatigue, more onerous requirements), required river access
Painting	Approximately $500 million over the 150 year lifespan.	Approximately $500 million over the 150 year lifespan. Difficult access could result in a moderate increase.	Approximately $500 million over the 150 year lifespan. Difficult access could result in a moderate increase.
Project Schedule			
Require Supplemental DEIS	No.	Likely yes. This bridge type was documented and dropped before DEIS; DEIS documented no intrusion into Pearson Part 77 space, and no need for (what action required??) from FAA. Likely substantial public controversy (both positive and negative) surrounding change to this type of bridge (need more FTA and FHWA input)	Likely yes. Same as cable-stayed.
FEIS	Issue FEIS approximately summer 2011	If no SDEIS required, issue FEIS approx. spring 2012. If SDEIS, issue FEIS approx. early 2013. Steps: 2-4 mo. for regional agreement; 4 mo. to design; 4 mo to analyze, prepare, review Draft SEIS locally; 4 mo for federal review/approval to issue SDEIS; 2 mo public comment period; 3 mo to refine design; 3 month to analyze, prepare review new FEIS locally; 3 mo for federal review/approval to issue FEIS.	Same as cable-stayed.
Re-initiate B.O.	No.	Yes. Would likely need to reinitiate consultation. However, if a Supplemental DEIS is required for NEPA compliance, that will be the critical path, not the ESA reinitiation. If no SDEIS is required, then reinitiation could be completed by late 2011 (4 mo for design/construction details; 4 mo for actual reinitation with NMFS)	Yes. Same as cable-stayed
Re-initiate Marine Mammal Protection Act approval	No.	Yes. Would likely need to reissue application for Letter Authorization (LOA). This would delay LOA approval from NMFS, but LOA not needed to issue FEIS. Should not affect overall schedule.	Yes. Same as cable-stayed
4f Legal Review	No change in impacts to parks or historic resources so legal review would not need to restart	Because impacts to 4(f) resources may change, review can not begin until after receipt and analysis of new design files	Because impacts to 4(f) resources may change, review can not begin until after receipt and analysis of new design files
Transit Final Design	Current schedule can be met.	Cannot meet current schedule based on delay for SDEIS and FTA approval to proceed into FD	Cannot meet current schedule based on delay for SDEIS and FTA approval to proceed into FD
FFGA	Current schedule can be met.	Cannot meet current schedule based on delay for SDEIS and FTA approval to proceed into FD	Cannot meet current schedule based on delay for SDEIS and FTA approval to proceed into FD
Construction Start	No delay to construction start	Follows critical path delay for NEPA of 18-30 months.	Follows critical path delay for NEPA of 18-30 months.
Tolling Start	No delay to tolling start	Follows critical path delay for NEPA of 18-30 months.	Follows critical path delay for NEPA of 18-30 months.

Transit Revenue Operations Date	Current revenue operation date can be met.	Cannot meet current schedule for LRT revenue operations date due to delay to the start of main river crossing construction.	Cannot meet current schedule for LRT revenue operations date due to delay to the start of main river crossing construction.
Staging			
Interchanges	Comparable to current staging plans	Comparable to current staging plans	Comparable to current staging plans
Main river crossing	Comparable to current staging plans	Reduces flexibility to use one bridge as workbridge for building second bridge.	Reduces flexibility to use one bridge as workbridge for building second bridge.
Procurement	Comparable to current plans	Comparable to current plans	Comparable to current plans
Environmental Impacts			
Right of Way			
Oregon	No change	No change	No Change
Washington	No change	No change	No Change
In Water Work			
Number of Piers (Columbia)	5 pairs of bridge piers and 1 transition pier in water, 1 transition pier on land	3 tower piers and 1 transition piers in water, 1 transition pier on land	4 arch piers and 1 transition pier in water, 1 transition pier on land
Number of Shafts (Columbia)	74 in water (66 BRP Report + 8 for transition), 8 on land (trib span is 135)	84 tower and 12 transition in water and 12 transition on land (pro rated based on width and span of CT - trib span is 170)	96 arch and 8 transition in water and 8 transition on land (pro rated based on width and span of CT - trib span is 130)
In-Water Footing Size (ft2)	75x75 (piers 3-6) and 75x45 (pier 2 &7) = 58,500 ft2	100x175 (piers 2-4) and 50x150 (pier1 or 5) = 60,000 ft2 (Note curvature on backspan will increase shaft and footing size on tower at pier 2 and 4)	100x150 (piers 2-5) and 50x100 (pier 1 or pier 6 - shafts spaced out) = 65,000 ft2 (Note curvature on backspan will increase shaft and footing size on pier 2 and 5)
Duration of In-Water construction (CRB)	Shortest	Longer	Longest
Number of Piers (NPH)	13 new piers, Same as biological opinion	13 new piers, Same as biological opinion	13 new piers, Same as biological opinion
Number of Shafts (NPH)	30 new shafts, Same as biological opinion	30 new shafts, Same as biological opinion	30 new shafts, Same as biological opinion
Duration of In-Water construction (NPH)	Shortest	Shortest	Shortest
Temporary Works	Same number of temporary work platforms as the BO (6 pairs). Less temporary piles (10%) than BO	Fewer, but larger temporary work platforms than in the BO (3 tower and 1 transition). More temporary piles (10%) than BO	Fewer, but larger temporary work platforms than in the BO (4 arch piers and 1 transition). More temporary piles (10%) than BO
Construction methods	foundation and cap same as biological opinion	foundation same as biological opinion, floating caps not practical in due to size (100x175) - cofferdam would be most likely scenario to construct cap	foundation same as biological opinion, floating caps not practical in due to size (100x175) - cofferdam would be most likely scenario to construct cap
Drainage	No Change/Possible slight decrease in impervious surface	Additional 3-4 acres of impervious surface; limited WQ treatment space in OR and WA	Additional 3-4 acres of impervious surface; limited WQ treatment space in OR and WA
Natural Environment			
Fish, Wildlife and Water Quality	Slight decrease in construction-related impacts to fish. No change in impacts to wildlife or water quality.	A wider bridge increases impervious surface area which increases runoff. 10% or more increase in temporary pile driving impacts to fish and marine mammals. Additional coffer-dam use during construction.	Same as cable-stayed
Visual			
General	Very similar impacts to open-web design	Bridge type would be aesthetically more vivid and distinct. Would also increase view obstruction from Vancouver National Historic Reserve toward south and west, and views of Mt. Hood from Vancouver waterfront west of I-5	Similar to cable-stayed

Historic Reserve	No change	Higher degree of visual impact to the Reserve from this bridge may affect MOA negotiations.	Same as cable-stayed
Footprint			
Landuse	No change.	Increased impervious surface area of bridge will increase stormwater runoff, requiring an additional half acre of land between Hayden Island and SR 14 interchanges for stormwater management.	Same as cable-stayed
Noise	No change	Noise impacts very similar except for on multi-use path that would be located between and slightly above NB and SB traffic lanes across the river.	Same as cable-stayed
Historic	No change	Similar impacts	Same as cable-stayed
4F Impacts	No change	Additional shading from wider bridge passing over Waterfront Park.	Same as cable-stayed
Commitments to Stakeholders	See other tab		
Minimize Risk**			
Constructability	Lower risk - traditional truss const. & equip.	Higher risk - staged cantilever const., heavy picks for cantilever	Higher risk - staged cantilever const., heavy picks for cantilever, concrete filled arch
Overall Project Staging	Comparable risk	Comparable risk	Comparable risk
Long term performance	Higher risk - more steel (corrosion)	Higher risk - more steel and flexible (fatigue, bearings, cracking, joints, corrosion, unique framing)	Higher risk - more steel and flexible (fatigue, bearings, cracking, joints, corrosion, unique framing, fracture critical tension tie)
FAA	Comparable	More - violates VUO part 77	More - violates VUO part 77
Operational Reliability	Comparable risk - same cross section/config. (2-bridge)	Higher risk - higher risk of one mode affecting another (1-bridge)	Higher risk - higher risk of one mode affecting another (1-bridge)
Fire, Life Safety	Comparable risk - more potential damage to steel in fire	More risk - accessibility to LRT, potential need for ventilation	More risk - accessibility to LRT, potential need for ventilation
Design	Lower risk - traditional truss system	Higher risk - cable stayed technology is proven, but not in the proposed config. (width, aspect ratio, cantilever length, width between stays, torsional stiffness, cable size - number of strands in the cables). Need to conduct a wind tunnel test to verify aerodynamic stability	Higher risk - cable stayed technology is proven, but not in the proposed config. (width, aspect ratio, cantilever length, width between stays, torsional stiffness). Need to conduct a wind tunnel test to verify aerodynamic stability
Aesthetics (alt. user perspectives)			
Auto:	Provides unobstructed views at deck level.	Towers are simple and repetitive. Towers act as reference points to define travelers' position.	Arch ribs act as reference points to define travelers' position.
bike/Ped:	Covered, horizon view to east, cannot see above deck.	A-frame structure of the arch allows light to penetrate.	A-frame structure of the arch allows light to penetrate.
Distance:	Utilitarian design should be detailed to provide a simple, clean structural system that is unobtrusive and blends into the landscape.	Vertical elements define the crossing position and define the bridge's identity. The height of the towers dominate the surrounding landscape.	Basic form and scale of the arch make this a landmark bridge.
Transit:	Covered, cannot see structure overhead	Covered, cannot see structure overhead	Covered, cannot see structure overhead
Local Job opportunity	more typical steel member fabrication, with higher potential for local mfg, supply, bidding	orthotropic steel members less typical and complex	orthotropic steel members less typical and complex

* Bridge only is transition span to transitions span not OHWM to OHWM

** All risks are relative to Oct 2010 CEVP risk elicitation