MEMORANDUM

Date:	August 20, 2021
To:	Chris Regan, Environmental Manager, IBR program
From:	Emma Johnson, Environmental Coordinator, IBR program Angela Findley, Environmental Lead, IBR program
Subject:	Screening and Evaluation of the "Common Sense Alternative II"

1. INTRODUCTION

This memorandum summarizes the evaluation and screening of the "Common Sense Alternative II" (CSA II) as a potential option to address the transportation problems in the Interstate Bridge corridor. Recently, the CSA II has been advocated by members of the public as a possible solution that should be considered by the Interstate Bridge Replacement (IBR) program. The CSA II consists of several improvements and river crossing options that were previously evaluated as part of the screening process for the Columbia River Crossing (CRC) Environmental Impact Statement (EIS). The components were ultimately dismissed from detailed study in the EIS. While this analysis was completed for an earlier version of CSA, CSA II has many similarities to the initial proposal and still presents the same limitations in addressing issues within the I-5 corridor.

The purpose of this memorandum is to summarize the previous work put in to evaluating the CSA II, the results of those evaluations, and to document why the CSA II does not meet the program's Purpose and Need statement and does not warrant further analysis or consideration.

2. ABOUT THE CSA

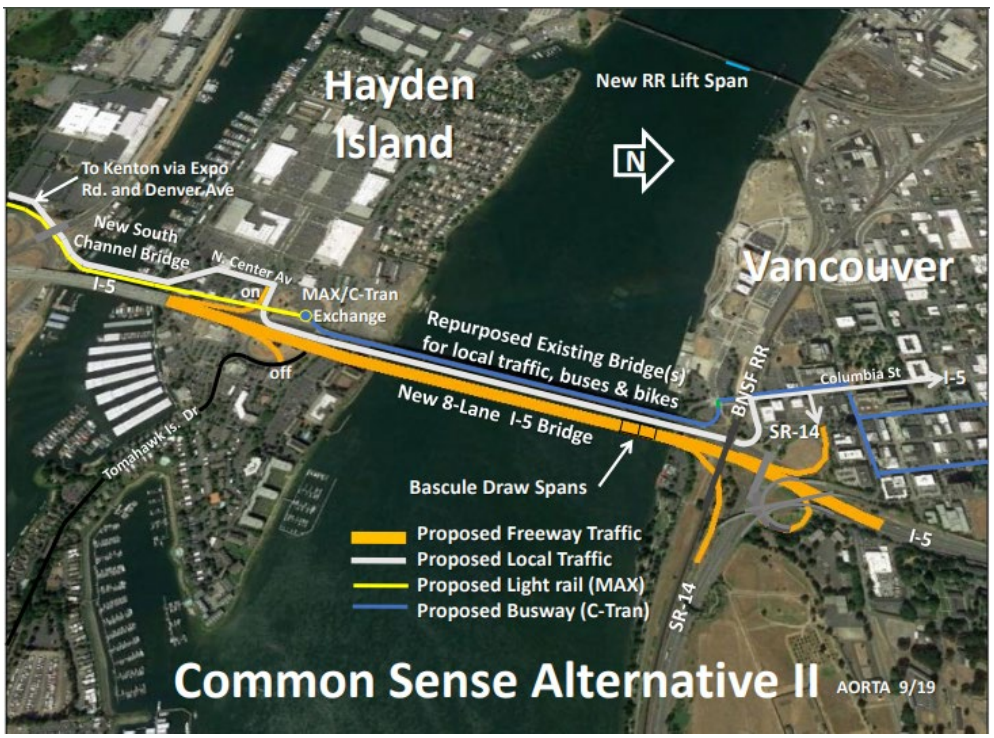
Per materials submitted to the IBR program (and publicly available), the CSA II consists of four improvements, which are described below and illustrated in Figure 1 and Figure 2 (AORTA 2021).

1. **Install a lift span on the BNSF rail bridge.** The addition of a lift span closer to the center of the river would allow for the closure (or discontinuation) of the existing swing span on the BNSF bridge, and align the BNSF lift span more closely with the barge channel of the existing Interstate Bridge. This would allow most marine traffic to pass the Interstate Bridge without requiring a bridge lift.[1] According to CSA II materials, this would allow all commodity barge traffic to navigate under the high spans of the existing Interstate Bridges and reduce the number of lifts by 90%.

[1] Some marine vessels make an "S" curve maneuver between the Interstate Bridge and BNSF bridge, using the barge channel as opposed to the lift span. When marine vessels are unable to conduct the "S" curve they use the lift span (requiring a bridge lift).

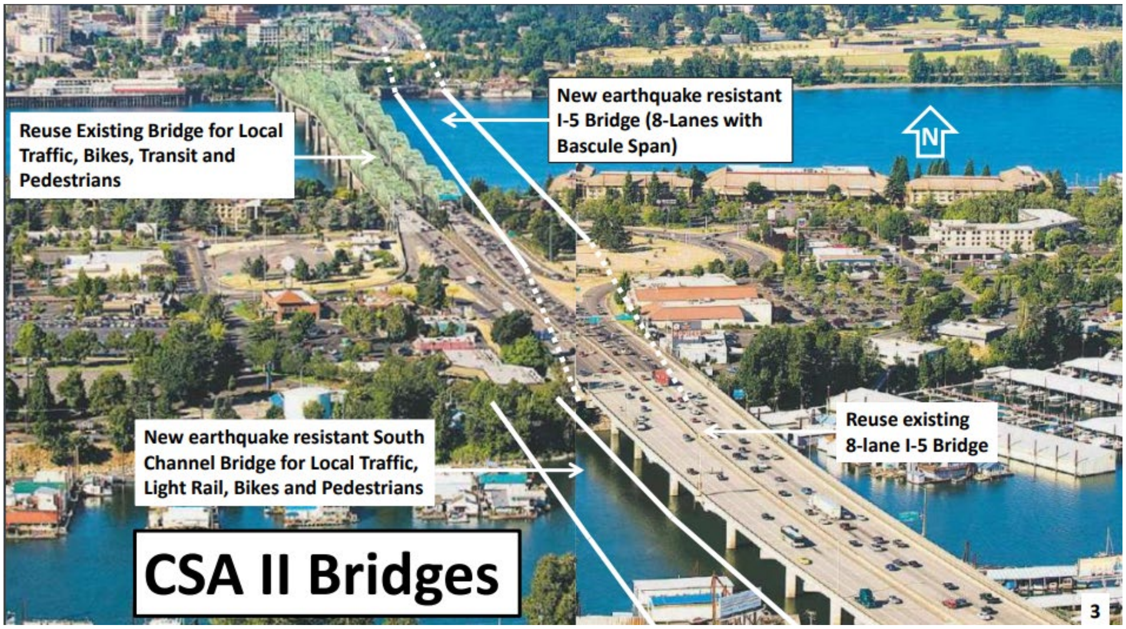
2. **Repurpose the existing Interstate Bridge**. The existing bridge spans would be used for local traffic, transit, and active transportation between Hayden Island and Vancouver. The northbound span would accommodate local vehicle traffic, and the southbound span would accommodate bus rapid transit and bicycles. Seismic retrofitting of the bridge spans would be "optional" under the CSA II.
3. **Construct a new multimodal bridge from Hayden Island to Vancouver**. The "Freeway Bridge" would be located upstream (east of) the existing Interstate Bridge and would be used for longer distance vehicular traffic (referred to as "freeway traffic" in CSA II materials). The new bridge would be aligned so that long distance traffic would connect to the approach of the North Portland Harbor (NPH) Bridge on Hayden Island. The NPH Bridge would then carry traffic and other users to Portland. The Freeway Bridge is envisioned as an eight-lane bridge with bascule draw spans that align with the existing bridge lift.
4. **Construct a new multimodal bridge from Portland to Hayden Island.** The "South Channel Bridge" would be located downstream (west of) the existing NPH Bridge and would accommodate local traffic, the MAX light rail, and active transportation. The bridge would connect to Expo Road and Denver Avenue in Portland and North Center Avenue on Hayden Island. The existing NPH Bridge would remain in place.

Figure 1: Common Sense Alternative II – Overview



Source: AORTA 2021

Figure 2: Common Sense Alternative II – Bridges



Source: AORTA 2021

3. PREVIOUS ALTERNATIVES SCREENING

Throughout the CRC's development, the project team worked in tandem with the CRC Task Force, which was a 39-member group composed of leaders representing a broad cross section of Washington and Oregon communities.[2] The Task Force met regularly to advise the CRC project team and provide guidance and recommendations at key decision points.

During the initial component screening process, the CRC Task Force and project team reviewed various types of river crossing components and transit components to narrow the range of alternatives. The initial screening effort in April 2006 evaluated a wide variety of river crossing and transit components using a pass/fail test designed to eliminate ideas well outside the scope of the project and/or that clearly could not address the relevant elements of the project's Purpose and Need (CRC 2006a, CRC 2006b). The components were evaluated by asking six pass/fail questions:

[2] Public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups were represented on the Task Force.

"Does the component…"

1. Increase vehicular capacity or decrease vehicular demand?
2. Improve transit performance?
3. Improve freight mobility?
4. Improve safety and decrease vulnerability to incidents?
5. Improve bicycle and pedestrian mobility?
6. Reduce seismic risk of the I-5 Columbia River Crossing?

River crossing and transit components that passed the questions were recommended to advance to Step B for further consideration and screening, while components that failed were recommended to be dropped from further consideration. During Step B, components were scored on the following project values, which were developed and formalized by the CRC Task Force in October 2005:

- Community livability and human resources
- Mobility, reliability, accessibility, congestion reduction, and efficiency
- Safety
- Regional economy, freight mobility
- Stewardship of natural resources
- Distribution of benefits and impacts

No components were dismissed under the Step B screening (CRC 2006c). Additional screening efforts took place during and after the Step B screening, with the subsequent dismissal or revision of various components. Later in the screening process, the river crossing and transit options were combined into multimodal alternatives that represented a reasonable range of combinations for further evaluation. As detailed below, the four components of CSA II were considered and evaluated during different phases of the CRC screening process.

Install a lift span on the BNSF rail bridge

The option of adding a lift span to the BNSF bridge was evaluated early in the project development. In the 2002 Final Strategic Plan, the Governors' Task Force concluded that a lift span in the center of the railroad bridge would result in greater and safer use of the center span of the Interstate Bridge by barge traffic, resulting in fewer bridge lifts and reducing delay on I-5 (Portland/Vancouver I-5 Transportation and Trade Partnership 2002). The Final Strategic Plan recommended that the Bi-State Coordination Committee "explore means to facilitate the operation of the BNSF Columbia River Rail Bridge by seeking funding for the replacement of the existing "swing span" with a "lift span" located closer to the center of the river channel." (Portland/Vancouver I-5 Transportation and Trade Partnership 2002).

CSA II materials state that the addition of a lift span on the BNSF bridge would "allow all commodity barge traffic to navigate under the high spans of the existing Interstate Bridges and reduce the number of lifts by 90%". While adding a bridge lift to the BNSF bridge would likely reduce some of the bridge lifts at the Interstate Bridge, many bridge lifts would still be required for bridge maintenance or when marine vessel heights exceed the vertical clearance provided by the bridge (without raising the lift span).

It is worth noting that the BNSF bridge is over 100 years old and likely seismically vulnerable, similar to the Interstate Bridge. It is not certain that BNSF, federal agencies, and/or the state departments of transportation would invest in a new movable span with the balance of the bridge over the river (and the bridge over the slough) remaining as is. As documented in the 2011 EIS, a replacement crossing would require fewer piers, creating less of an obstacle to river navigation than the existing bridge or a supplemental crossing. In addition, the new primary channel under the I-5 crossing would have a better alignment with the channel through the BNSF railroad bridge, which would improve navigation even though the two crossings would be slightly closer together (CRC 2011a).

Repurpose the existing Interstate Bridge

This CSA II component calls for using the existing northbound bridge span for local vehicle traffic, and the southbound span for bus rapid transit and bicycles. During the Step B screening process, additional analysis was completed to further screen components and the CRC project team prepared a memorandum summarizing the benefits and negatives of replacing versus keeping the existing I-5 bridge (CRC Project Team 2006). Per the memo, alternatives that would replace the existing bridge would perform better on nearly all of the project values (listed above) than alternatives that would supplement and reuse the existing bridge. Specifically, the replacement options would perform better for transit, traffic, navigation, community resources, natural resources, transportation equity, and seismic safety (detailed below).

The following findings are relevant to the CSA II proposal to repurpose the existing bridge:

- **Vehicles, Freight, and Transit:** Traffic on the existing bridge would continue to be affected by bridge lifts. The bridge lifts would have substantial operational disadvantages for both light rail transit and/or bus rapid transit, interrupting service, and reliability.
- **Active Transportation:** The lifecycle cost of using one or both of the existing bridge spans for bicycles and pedestrians would likely be substantially higher than the cost of accommodating bikes and pedestrians on a new highway and transit bridge. Minimal upgrades would be required to convert one of the existing bridges for bicycle/pedestrian use. However, seismic safety may still require substantial seismic upgrades, thus adding substantial cost to this bicycle/pedestrian option, compared to accommodating pedestrians and bicycles on a new multi-use bridge. In addition, the lift span would be allowed to open at any time and would require 24-hour staffing. This could make the bridge a very expensive bicycle/pedestrian facility and it is doubtful that there is a public entity that would be willing and able to assume ownership.
- **Land Use:** Adverse land use and right-of-way impacts would be greater for supplemental options. Not only does reusing the bridges require more right-of-way, these alternatives will oblige the project to maintain ownership of all the existing land that is currently occupied by elements of the existing bridges and roadways. In contrast, replacement alternatives entail a new bridge that is either east or west of existing bridge and could allow some of the area used by the existing bridge and interstate to be sold to new owners and converted to other uses. Therefore, it is reasonable to assume that reuse alternatives generally consume considerably more land compared to replacement options. This will cause reuse alternatives to have greater impacts to existing land use and neighborhood resources such as commercial amenities at Jantzen beach or riverfront property that is valuable to Vancouver's revitalizing downtown that faces the Columbia River.

- **Natural resources:** Natural resource impacts are greater for supplemental versus replacement alternatives, especially from a long-term perspective. Seismic retrofits to the existing bridges, coupled with construction of a new supplemental bridge, would cause more temporary disruption to stream flow and aquatic species than the deconstruction and construction associated with a replacement bridge. A replacement bridge would also have less long-term effects because it allows more thorough and efficient treatment of stormwater and would require substantially less in-water structure.
- **Marine navigation:** The supplemental options would result an increase in the number of piers in the water, impacting river navigation as well as fish and wildlife habitat.
- **Seismic:** All of the supplemental river crossings would also require a major seismic upgrade to the Interstate Bridge.

As noted previously, under the CSA II any seismic upgrades to the existing bridge would be considered optional. However, any alternative that does not address the seismic deficiencies of the existing Interstate Bridge would not meet the program's Purpose and Need statement. Subsequent evaluations of seismic retrofitting have determined that seismic retrofits would be prohibitively expensive and would incur additional impacts to the environment (due to the need for expansion in the Columbia River). In addition, seismic retrofits may not be sufficient to reliably ensure that the bridge could handle a 500-year earthquake (with little to no damage) or a 2,500-year earthquake (with no collapse). Therefore, any alternative that involves the seismic retrofitting of the existing bridge does not meet the program's Purpose and Need statement.

Construct a new multimodal bridge from Hayden Island to Vancouver

This component of the CSA II calls for a supplemental bridge with a bascule lift span located upstream (east of) the existing bridge, which would be used for long-distance traffic. As detailed above (under "Repurpose the existing Interstate Bridge"), the CRC project team identified several downsides to the general concept of a supplemental bridge in any location, including increased impacts to land use and natural resources (detailed above).

Three concepts for a supplemental bridge located upstream of the existing bridge were evaluated in the Step A screening analyses, including two fixed span bridges and one with a moveable span (CRC 2006a). The moveable bridge option, known as River Crossing (RC) 8: Supplemental Bridge Upstream Low Level/Moveable in the screening document, is most similar to the supplemental bridge included under the CSA II.

The CRC component studied would be located immediately east (upstream) of the existing Interstate Bridge. The component was envisioned as a low-level bridge (meaning it would not be high enough to accommodate all marine traffic) and would provide approximately 65 feet of vertical clearance for traffic traveling down the Columbia River. The moveable portion of the bridge would be opened to allow marine traffic taller than 65 feet to pass through the channel. RC-8 passed the Step A screening and was recommended for further study, however it received scores of "Unknown" for question 4 (does the component improve safety and decrease vulnerability to incidents?) and question 6 (does the component reduce seismic risk of the I-5 Columbia River Crossing?).

Additional screening by the project team identified several deficiencies with the RC-8 component (Ficco and Osborn 2006). The need for accommodating marine traffic through bridge openings results in poor performance for five of the six Step A screening questions when compared to higher fixed-span components:

Q1. Does the component increase vehicular capacity or decrease vehicular demand within the Bridge Influence Area? Moveable spans require continued I-5 closures during bridge openings or continued marine restrictions when the bridge must remain closed. Bridge openings have a negative impact on increasing vehicular capacity within the Bridge Influence Area.

Q2. Does the component improve transit performance within the Bridge Influence Area? Bridge openings have a negative impact for maintaining speed and reliability for transit that uses I-5 within the Bridge Influence Area.

Q3. Does the component improve freight mobility within the Bridge Influence Area? Bridge openings have a negative impact for maintaining speed and reliability for freight mobility within the Bridge Influence Area. Even though bridge openings may be restricted to off-peak periods, freight traffic also relies on off-peak periods for maximum efficiency.

Q4. Does the component improve safety and decrease vulnerability within the Bridge Influence Area? Some crashes can be attributed to the queuing that occurs following each bridge lift, and those crashes would continue with a new moveable span bridge. The need for marine traffic to rely on bridge openings also increases risk to marine navigation. For a bascule-type span, there would be intermittent encroachments into Pearson's airspace during bridge openings. In contrast, a fixed-span at a minimum would maintain the existing airspace encroachment condition with a supplemental bridge (one that kept the existing bridges), and with a replacement bridge it would actually serve to enhance the safety by eliminating the existing airspace encroachment.

Q5. Does the component improve bicycle and pedestrian mobility within the Bridge Influence Area? A fixed span would provide better connectivity for bike and pedestrian facilities as it eliminates the potential for interrupted travel associated with low-level moveable bridges.

Although cost was not a Step A screening criteria, it was estimated in 2005 that the construction cost for a moveable span is in the range of $100 million more than a fixed span and that operations and maintenance for the moveable span would be in the range of $400,000 more per year.

The memo concluded that low-level moveable spans carry significant costs to mobility, safety, freight economy, and financial resources with no benefits over a fixed span. A higher mid-level fixed span can perform the same function as a low-level moveable span at lower cost and with no significant differences in impacts to the surrounding communities. For these reasons, RC-8 was not recommended for continued development.

Under the CSA II, the existing NPH Bridge would be used to carry long-distance traffic between the Hayden Island-Vancouver bridge and Portland. It is not clear whether the CSA II involves retrofitting the existing NPH Bridge; however, the seismic deficiencies of the NPH Bridge would need to be addressed in order to meet the program's Purpose and Need statement. The program team is currently evaluating whether the NPH Bridge should be retrofitted or replaced as part of the IBR program.

Construct a new multimodal bridge from Portland to Hayden Island

This component of the CSA II calls for a supplemental bridge located downstream (west of) the existing NPH Bridge for local traffic, light rail transit, and active transportation. A similar component was included in the Locally Preferred Alternative (LPA) described in the 2011 Final EIS and Record of Decision (CRC 2011b). This individual component remains under evaluation as part of the IBR program.

4. CONCLUSION

The evaluation conducted under CRC of the group of components comprising the CSA II is still valid. The needs for the program have not changed, and the CSA II would not meet the program's Purpose and Need statement. A new bridge over North Portland Harbor is still under consideration to provide access to Hayden Island, and the IBR program would not preclude improvements to the BNSF bridge, such as adding a lift span to replace the swing span.

5. REFERENCES

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