



## A Brief Discussion of a Replacement Bridge for the Future I-5 Transportation Corridor

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## The Problem

The task of negotiating some plan to address the manifold problems associated with the Interstate 5 crossing of the Columbia River is going to be difficult because of the heated political divide between suburbanites in Clark County and the more urban residents of Multnomah County. The venom last time was sufficiently toxic that it killed a generously funded plan. This iteration may not be so gifted.

The two State governments broadly defined have a primary shared goal to ensure efficient and reliable freight movement on this essential roadway, and if this were a project to replace or expand the I-82 Bridge at Umatilla agreement could be reached rapidly. However, it's not out in the sagebrush, but between two quite different cities.

Complicating the political divide between Clark County and the rest of the region, there are obvious technical difficulties to be overcome as shown by the recap of the CRC failure presented at the October Commission meeting. The navigation channel must remain open so the bridge must not be too low. The airplanes landing at PDX and Pearson Field must not be endangered, so the bridge can't be too high. The grades necessary for a fixed bridge high enough to clear navigation would be quite difficult for bicycles, pedestrians and Light Rail Vehicles if the bridge is to include ramps to Hayden Island and downtown Vancouver.

## A Possible Solution

I believe it is worthwhile to study building a CRC-sized “mid-level” bridge higher than the current bridge but low enough that it requires an opening span. I say “CRC-sized” because the ten auto lanes agreed during the negotiations for that project seems “right-sized” for this corridor as I will discuss below.

If the “higher” clearance is *high enough*, common barge and sailing vessels will not require the span to be opened. There will still be the sort of “special” shipments about which there was so much rancor last time, but because they are “special”, by definition they will be rare. They will cause the bridge to be opened perhaps on the order of a dozen times a year.

After some thought I would suggest that such a bridge should probably be a two-leaf Bascule structure rather than a Lift even though a Lift would be faster. A Bascule opening does not require the tall fixed towers that a Lift span does, and with a double-leaf design the leaves need only be half as long as the width of the opening. Thus the intrusion into the airspace above the span would be lessened and present at all only very occasionally.

### Advantages of an Opening Bridge

1. There is an generous height restriction. Very tall vessels can be pass through the opening;
2. If the opening device is a Bascule, there is no structure intruding the airspace above the structure;
3. Gradients between the relatively low banks of the river and the navigation channel are easier; and
4. There would be less visual impact on the newly redeveloped Vancouver Waterfront.

### Disadvantages of a Bascule Opening Bridge

1. The opening machinery is expensive and heavy. The support structures must therefore be sturdier and are themselves heavy. There is apparently a lot of “mucken mire” in the river;
2. Even if a “high enough” bridge does not open often, it does open, delaying traffic during the period it is open;

3. Bascule machinery is slower than Vertical Lift systems so openings take longer;
4. Questions have been raised whether leaves ten lanes wide can be raised; they would be quite heavy; and
5. The channel which can be bridged with a Bascule system at a reasonable cost is narrower than one which is lifted, and either technology is narrower than the channel a fixed bridge can span. The Broadway Bridge has a channel span of very nearly 300 feet.

The Joint Committee needs to decide if a 300 foot channel is adequate for the future and determine if leaves 150 feet in length can be constructed using modern pre-stressed technology without a large enfolding truss. If it is possible this is the optimum solution for a vertically constrained crossing of the Columbia River.

I believe I have a solution to the ten-lane leaf issue. As the bridge approaches the opening span from either side, it could split into two separate structures separated for a few yards. The leaves would then be only five lanes wide. Many Bascule bridges accommodate six-lane roadways, so a five-lane freeway with breakdown should not be a big step.

If a replacement bridge is to include a bike/pedestrian walkway and a transitway, it should be to the west of the southbound lanes, with the transitway between the autos and peds. It too can have its own opening structure also separated from the southbound roadway. By keeping the roadway height to 90 or 95 feet above mean high water at the opening span the climb for transit vehicles and bicycles will be much easier. It will make the addition of Light Rail if the Steel Bridge problem is addressed possible in the future.

And finally, there is nothing to prevent placing a wide fixed structure directly adjacent to the opening span. Given the multi-structure approach outlined above, that long fixed span would have to host the “split” into multiple bridges. But perhaps that’s good since it would be of a non-standard length and so would require special engineering anyway.

## Go Big

People here in Clark County have been agitating for years to add new bridges across the Columbia. There’s no obvious funding source for commuter-only bridges except tolls, but Clark County voters are strongly against any sort of tolling. In any case, leaders in Oregon know that any such new bridge would be a problem for their states, because the traffic generated by it would require collection and distribution, for which Oregon would have to pay and from which it would receive little to no benefit.

Furthermore, any crossing west of the debouchment of the Willamette main channel would intrude on some sort of land use reservation. The Multnomah portion of Sauvie Island is protected agricultural reserve and the portion of Sauvie Island in Columbia County is almost entirely Oregon Department of Fish and Wildlife protected habitat.

So any version of a “Western Crossing” would either have to be closely adjacent to the BNSF railroad bridge or up around Woodland – St. Helens. A far-northern crossing at the point just north of Woodland where the freeway is high above the river might be a excellent location for the northern end of a “bypass”, but it’s not going to satisfy people in Clark County who want a commuter path to Washington County.

In any case, Washington County already **has** a proposed project to connect itself to I-5, the “Northern Connector” with which you are all probably familiar. I would propose *the inclusion of the Connector in a*

*broader I-5 crossing plan.* It would balance the number of high-capacity lanes to both the north and south of the bridge with the capacity of the bridge itself.

Also, please include completion of the *I-5 Rose Quarter Project* in a comprehensive roadways plan to address travel between Washington State and the portions of the Portland/Hillsboro/Vancouver MSA which are currently not well-served. I expect that you representatives from Oregon are waiting for a decision by the Federal Highway Administration before committing to the Rose Quarter and Northern Connector projects. They are obvious and correct uses of the tolling monies to be raised.

## **“BRT” or “LRT”?**

I was unable to attend the previous meeting of the Joint Committee because I was traveling on that day. However, on the topic of the agreed “high capacity transit” pathway, I would like to add my voice to those advocating for “Bus Rapid Transit” rather than a MAX extension **at this time**. There are three reasons for that, all operational.

- 1) The “Steel Bridge” in Portland is nearing its full capacity for train movements. I’m sure that you Oregon members of the Bi-State Committee have mentioned this to the others;
- 2) There are nine stations currently north of Interstate/Rose Quarter. There will certainly be one on Hayden Island, and there are four planned for downtown Vancouver in each direction including the terminal station. That means that for a rider boarding at the planned parking garage next to Clark College there would be thirteen stops between the garage and the first stop in downtown Portland at Union Station. As many people have stated, that would consume nearly fifteen minutes *in stops alone* for a trip beginning near relatively few potential riders who do not arrive by car – the garage would be in a large park next to the freeway; and
- 3) The only reasonable location for a maintenance facility anywhere on such an extended Yellow Line or along a potential extension to Van Mall is in Vanport, but that is parkland. Therefore trains entering or leaving service would do so very far from the end of the line, either at Elmonica or in Gresham. That would increase operating costs non-trivially. It is true that this is a problem for the Yellow Line today, but it would be five stations worse and for many more trains should the Yellow Line be extended.

If the Waterfront, Downtown Vancouver and the neighborhoods directly to the west and north continue to grow, and the Steel Bridge is bypassed at some time in the future by the main East-West MAX line service, the transitway on the suggested mid-level opening bridge could be re-purposed for trains or mixed operation as is the Tillikum Bridge. But for now Oregon should be willing to consider buses as the main commuter transit link to Oregon.

However, to argue that convincingly Washington and Clark County **must** take concrete steps **now** to show that we are financially and politically committed to diverting the majority of future growth in cross-river commuting to high capacity transit and carpools. Otherwise Oregon may rightly refuse to consider anything except MAX as a transit solution and may even opt to obtain reliable freight capacity by other means. The State has the option to provide such capacity relatively inexpensively by building a second span at Longview and improving US 30 instead of replacing the I-5 Bridges. That means we must reserve at least some of the replacement bridge lane capacity for transit and *tightly managed* -- e.g. “enforced!” – High-Occupancy Vehicles.

Oregon has been quite reluctant to enforce the existing northbound afternoon HOV lane. It’s not clear why that is, because 90% of the users of the lane are Washington-tagged cars so leaning on them carries little political price. I do understand that enforcement is not easy to accomplish in that location; the

inner shoulder is quite narrow, and there are no existing ticketing pockets. Camera enforcement normally carries even more political risk than does saturation enforcement, but again, Oregon members, the number of your constituents who will have reason to complain is pretty minimal.

Obviously, if the congestion tolling project is approved by the Federal Highway Administration, Oregon can vary the toll rate to ensure that *all traffic*, including the buses, makes the trip quickly and reliably. No separate HOV facility would then be needed.

I would also draw your attention to the other document in this bundle. Washington County has proposed the “Northern Connector” I mentioned between the Cornelius Pass Road interchange of US 26 West and the Marine Drive interchange of I-5. Such a project would absorb a good percentage of the traffic a new, widened bridge would deliver to Oregon and divert it around Portland directly to the Tech Corridor. As I said above, I would urge you to consider that project as an integral part of this I-5 Bridge Replacement. It will make it worthwhile in terms of user satisfaction **and** balance the traffic capacity of the collector/distributor system south of the bridge with the capacity of the bridge itself. It should be built with bus queue jumps at important intersections and perhaps a reversible transit-only lane over Cornelius Pass. The plan proposes a “new roadway” between the intersection of Cornelius Pass Road with Kaiser Road and a new crossing of the Willamette River around Linnton, so adding a reversible transit lane shouldn’t be ruinously expensive.

However, that’s probably eight to ten years in the future, and getting some sort of reliable “bus-bypass” so that commuters to the Tech Corridor are attracted to transit now, is key to providing some near-term congestion relief. The second document attached shows a means by which it is possible to piece-together a bus-bypass which can take ten to twelve minutes less transit time than single-occupancy vehicles currently require for a very few million dollars.

## **It's Actually “Express Bus In Managed Lanes”**

As a bit of an aside, I’d mention that “Bus Rapid Transit” or “BRT” isn’t really the correct term for what we should be building and using in Clark County. It normally applies to a service like *The Vine* provides: an urban semi-express which operates in exclusive lanes through congested sections and has “queue jumps” at important intersections. It can also operate completely separated from other traffic in a busway as does LA’s “Orange Line”.

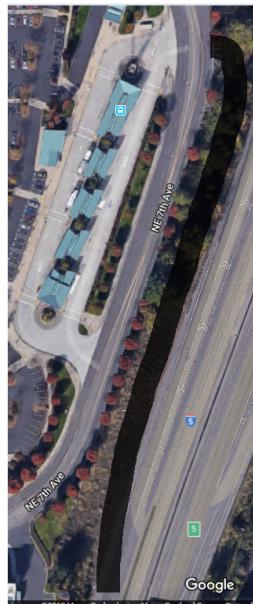
It’s OK to use the term as a verbal short-cut as long as it’s clear that Oregon won’t be building a dedicated busway parallel to the MAX line for use by Clark County buses. What we would actually be choosing instead is “Express Bus in Managed Lanes”, and Washington will depend on Oregon to do most of the managing.

I should be clear that it is a good idea to extend *The Vine* and Mill Plain BRT across the Columbia River in the transitway to be provided on a replacement bridge. Whether they continue to Delta Park as the #60 bus does today or terminate at an extended MAX station on Hayden Island depends on Tri-Met’s plans and available funds for an extension. But they should connect directly with MAX when the ultra-reliable transitway opens.

WashDOT has announced a project to allow bus-on-shoulder running in the I-5 corridor beginning sometime in 2021 or 2022. At the same time ramp metering will begin. This should improve the performance of the I-5 Corridor express buses noticeably, making them more competitive with driving alone.

However, I have a request for the Washington representatives here today: **Please work to get a bus bypass lane added to the 99<sup>th</sup> Street southbound on-ramp to jump ahead of cars in the ramp meter lane.**

Or, if there are a few hundred thousand lying around – unlikely, I understand given I-976 – ask WashDOT to add a direct, gated, bus-only ramp which begins right across from the northern exit from the 99<sup>th</sup> Street TC stops. The buses would drive directly across the NE 7<sup>th</sup> Avenue, through the gate, curve right on an up-sloping private roadway and merge with the slip lane about even with the Party City building, and well past the ramp meters. Like this (the wide black line represents the new bus-only roadway):



This could easily save four to five minutes *per bus* during the rush hour when the on-ramp is going to be seriously backed up, and it wouldn't cost much because no bridgework is involved. It's in the morning that riders require the greatest reliability and during which people most value a quick, reliable ride.

Also, please discuss lane with your Oregon committee partners and their ODOT staff the possibility of declaring a morning southbound HOV lane. In the best of all possible worlds the HOV lane would be 3+ rather than 2+, but I realize that would be a very heavy lift. However, if Oregon could at least enforce both HOV lanes more aggressively, the buses should be able to get riders downtown more quickly than they do now. And again, Oregon representatives, enforcing the HOV lane isn't going to upset your constituents very much. A driver exiting at Rosa Parks or Lombard who qualifies to use the HOV lane isn't going to bother getting in it most days, because it takes time to merge into it and then across two lanes to get out of it.

Thank you for reading this document. Please don't forget the much more "techy" document about the potential temporary bus pathway which is available until the Northern Connector is built.

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