

# Reducing Congestion Near Hayden Island

a concept study by Sam Churchill



## INTRODUCTION

This proposal aims to reduce I-5 congestion near Hayden Island. It combines the best of rail and automated people movers. It would whisk people to and from the Yellow Line at the Expo Center under a covered tube. It spans North Portland Harbor first, then the Columbia River. It allows Washington commuters to bypass freeway congestion. Call it "The Portal".

The Portal uses 12 passenger, rubber tired automated transit. The tube accommodates pedestrians, bikes and small shops. A mini-mall on stilts. Shops inside the tube subsidize its operation. Jantzen Beach Mall provides a connection to a separate mall shuttle.

Viability would be demonstrated over North Portland Harbor, then connections would expand over the Columbia River.

It connects Vancouver's Waterfront, Ester Short Park and Clark College to the Jantzen Beach Mall and the Expo Center.

No light rail. No rail bridge. No torn up streets.

It reduces congestion by offloading traffic onto the existing Max line. You get to the WARP

(Washington Autonomous Regional Portal) from your home or parking garage by using autonomous Uber taxis, contracted by cities for that purpose. Autonomous taxis arrive in 5 years. Plan on it. They're expected to be cheaper, faster, and nicer than buses.

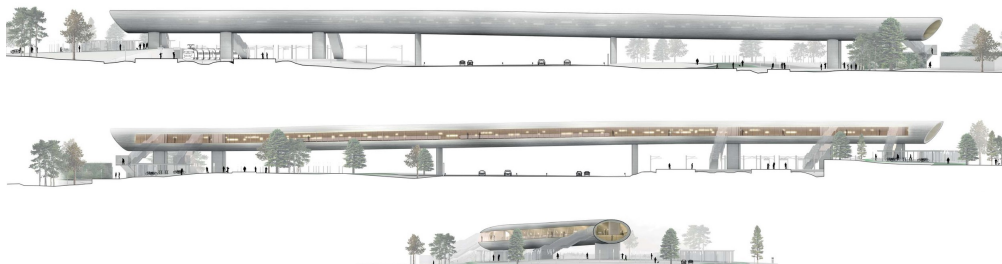
The Model-T was the motivation for our current bridge. We need a NEW bridge. For THIS century.



## OPERATIONAL OVERVIEW



**1. The Portal over North Portland Harbor.** Walk or take the WARP to Expo Center & Max. Stop at Starbucks inside the Tube. Warm and dry. View the Columbia from the portal. Here's a video: <https://youtu.be/NhA3oMMfPbc>



**2. The inspiration.** This concept is based on a Pedestrian bridge for urban development in Køge, Denmark. Their covered PRT bridge looks cool. <http://www.dw.dk/kge-nord-station/>

**3. Phase one:** The South Portal terminus. Connects Hayden Island to the Max Yellow line and Expo. Spans North Portland Harbor. Hayden Island commuters and The Mall get convenient access to Max. Fast, clean & quiet. Bypasses I-5 congestion completely.



**4. View from The Portal looking North:**

<https://goo.gl/maps/EVtMWHCZAWp>



**5. The South Portal tube.**

The South Portal runs parallel to I-5 on the West side, over Lottery Row.

The route is similar to the original CRC Light Rail proposal. Unlike the CRC it does NOT use ANY rail.

Twelve passenger Personal Rapid Transit would be faster and cheaper for taxpayers. It requires NO rail infrastructure. Autonomous shuttles at Expo Center and The Jantzen Beach Mall deliver passengers directly to their destination. On rubber tires, not rails.

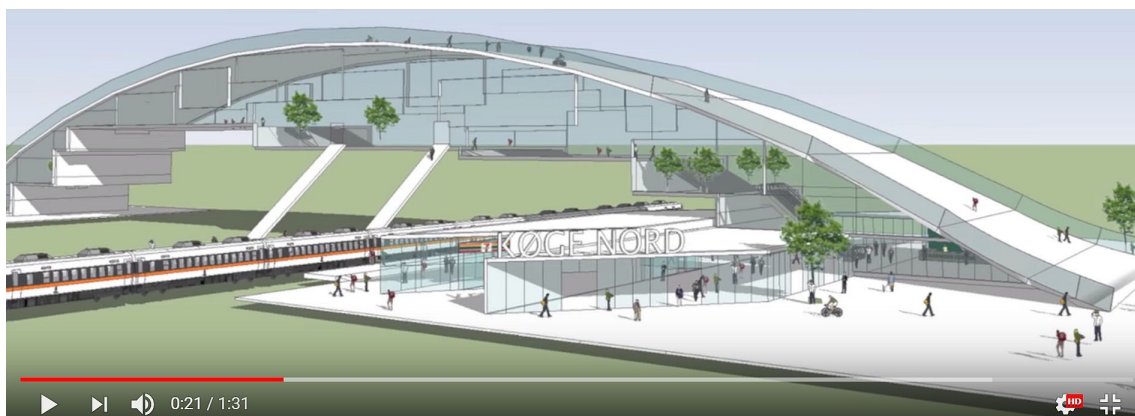


**6. The Washington Autonomous Regional Portal.** It connects Clark College, Ester Short Park and the Vancouver Waterfront to Hayden Island and Expo's Yellow Line. The North Portal runs parallel to the current I-5 bridge, but uses small autonomous rapid transit vehicles that share enclosed space with pedestrians, bikes and small shops.



**7. North Portal clearance over the Columbia would be 115 ft, the same clearance as the final CRC bridge proposal.** This bridge would be far cheaper since support for heavy trucks, trains or cars would not be necessary. The rubber-tired, electric shuttles, which are lighter than most cars, require less maintenance than internal combustion transit or rail. No rails on streets. No rails on bridges.

The current I-5 bridge has a clearance of 72 feet in the center hump with 176 ft clearance at the lift. The CRC bridge, originally planned for 95 feet, was rejected by the Coast Guard, so a new plan of 116 feet was proposed.



**8. Cheaper bridge.** [Early estimates for the Columbia River bridge](#) put the cost between \$575 million and \$650 million, the single most expensive element in the five-mile \$3.1 billion CRC project.

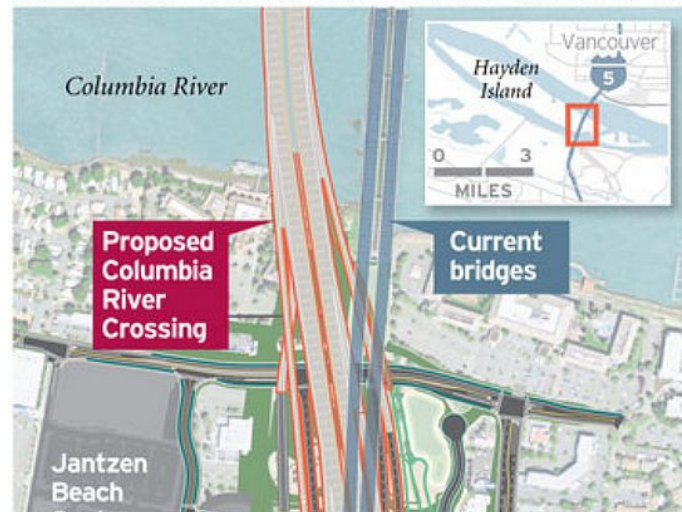
Some 35 floating homes would have been in harm's way, 39 businesses, including the Safeway and its pharmacy, would be slated for demolition in the CRC proposal.

This proposal eliminates the \$600 million, 17-22 lane CRC behemoth with a lighter, simpler, cheaper bridge. It's built to whisk commuters to light rail at the Expo Center.

If 10% of the current and projected traffic (150K vehicles/day) can be routed to Light Rail, then congestion may be reduced at less cost and with longer term benefit. More trains can simply be added to the existing line. Can this shuttle system handle the equivalent of 15,000 vehicles/day (perhaps 20,000 people) and provide a practical alternative to a new bridge?

## Hayden Island interchange

- Cost: \$575 million+
- 450 feet wide
- Up to 45 feet high
- 17 lanes
- 35 homes displaced
- 39 businesses demolished



**9. Personal Rapid Transit (PRT)**, is a [public transport](#) mode featuring small automated vehicles operating on a network of specially built guideways. They don't need the sophistication of a totally autonomous vehicle. They are generally rubber-tired, electric vehicles that hold 8-12 people and can be summoned or operate on a fixed route. These vehicles transport passengers from Vancouver to Hayden Island and the Expo Center.



The [Navya](#), one of several options, has 15 seats and no steering wheel. The automated electric tram requires no overhead power. Rubber tires enable it to travel on ordinary streets.

Providers of autonomous transports today include the [Navya](#) (Meridian), [Local Motor's Local Motor's Olli](#), [EasyMile](#), and [2getthere](#). Pretty much off the shelf. [Zoox](#), a Robo-Taxi start-up, was granted permission by California to use public roads.

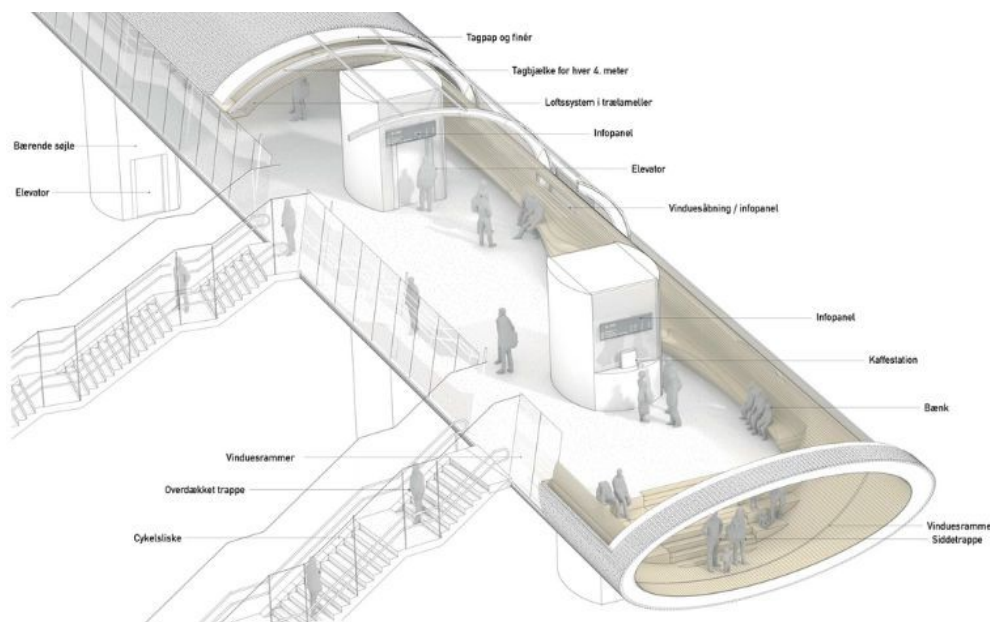
**10. Economics.** If a shuttle to Expo (a bi-state venture) could shave off 10% of the congestion and congestion pricing could shave off another 10% of vehicular congestion, we might be ahead of the game. Currently, a self-driving NAVA leases for about \$10,000/month. Even with the inflated cost of a prototype system it could be cheaper and faster than buses. If one NAVA transported 500 people/day at \$1 each, that's \$500x30 days or \$15,000. Pays for itself. Cheaper than the bus. Then add Max revenue. BTW, nearly 74 percent of the \$350 million Yellow Line cost was federally funded.

The five **MAX** lines averaged a total of 121,420 weekday, 85,430 Saturday and 66,830 Sunday boardings in September. Weekday ridership on each of the five MAX lines averaged 55,330 on the Blue Line, 21,070 on the Red Line, 13,220 on the Yellow Line, 20,390 on the Green Line, and 11,410 on the Orange Line. Total MAX ridership increased 0.8% during weekday peak and 0.9% during weekday off-peak periods, resulting in a 0.8% increase in weekday MAX ridership. The weekend ridership increased 3.4% on Saturday but decreased 2.6% on Sunday, leading to a 0.8% increase in weekly MAX rides in September.

The [Yellow Max line carries more than 12,000 riders a day](#). That's about 10% of the daily traffic over the I-5 bridge. Could an autonomous shuttle direct from Vancouver to the Expo Center Max double ridership? That would be about 20% of the I-5 bridge traffic.

Tolls from "congestion pricing" will likely increase ridership on Max, no matter what happens. Who wouldn't want a 10% cut in I-5 congestion? Especially if it costs only \$300 million instead of \$3 billion. How would YOU spend the other \$2.7 billion? It's YOUR money.

## SUMMARY



This paper does not presume to have all the answers. But the facts are clear:

- Autonomous transit IS coming. Before another bridge. [Here's Portland's RFI.](#)
- Shared Autonomous vehicles may be utilized to reduce congestion.
- [35 cities including San Francisco, Austin, Nashville, and Washington](#) are testing autonomous vehicles.
- A Seattle-based venture capital firm, foresees [a major portion of Interstate 5 becoming entirely dedicated to autonomous vehicles](#) by 2040.
- Transportation in cities across the U.S. could be greatly impacted by autonomous services offered by Lyft and Uber for the “last mile”. One study, [Driverless Future: A Policy Roadmap for City Leaders](#), found driverless cars [could cause a shift of up to 60 percent from traditional vehicles](#) in the New York metro area alone over the next 15-20 years.
- The overall economic impact of congestion in the U.S is estimated at \$2.8 trillion by 2030 – [the same amount Americans collectively paid in U.S. taxes last year](#),
- Within a decade, [1 in 8 cars sold around the world will have autonomous features.](#)

**Table 6 Autonomous Vehicle Implementation Projections**

Stage	Decade	Vehicle Sales	Veh. Fleet	Veh. Travel
Available with large price premium	2020s	2-5%	1-2%	1-4%
Available with moderate price premium	2030s	20-40%	10-20%	10-30%
Available with minimal price premium	2040s	40-60%	20-40%	30-50%
Standard feature included on most new vehicles	2050s	80-100%	40-60%	50-80%
Saturation (everybody who wants it has it)	2060s	?	?	?
Required for all new and operating vehicles	???	100%	100%	100%

*Autonomous vehicle implementation will probably take several decades.*

## LINKS

- <http://www.hayden-island.com/self-driving-car-proposal/>
- [https://en.wikipedia.org/wiki/Personal\\_rapid\\_transit](https://en.wikipedia.org/wiki/Personal_rapid_transit)
- <http://navya.tech>
- <https://www.2getthere.eu/driverless-parkshuttle/>
- <https://www.vbjusa.com/news/news-briefs/10-things-pangea-motors-ceo-ken-montler/http://navya.tech>
- <https://www.2getthere.eu/driverless-parkshuttle/>
- <https://www.vbjusa.com/news/news-briefs/10-things-pangea-motors-ceo-ken-montler/>
- <http://www.driverless-future.com/>
- <https://www.portlandoregon.gov/transportation/73493>
- [http://www.debunkingportland.com/cost\\_of\\_transit\\_&\\_cars](http://www.debunkingportland.com/cost_of_transit_&_cars)