

DRAFT

*I-5 Columbia River Crossing Partnership:
Traffic and Tolling Analysis*

Traffic Performance for
Two 2-lane Arterial Roadways
With 6-lane Freeway Option

Working Paper 12.32

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OVERVIEW

In the “Final Strategic Plan, June 2002” of the Portland/Vancouver I-5 Transportation and Trade Partnership project (hereinafter I-5 Partnership), one of the recommendations within the Bridge Influence Area (BIA) was to: “Evaluate whether or not a 6-lane freeway plus two, 2-lane arterials, one in the vicinity of the I-5 corridor and one in the vicinity of the railroad bridge, is a viable alternative for consideration in the EIS.” This working paper (WP) reviews the potential traffic performance of a scenario that retains the I-5 mainline crossing at six lanes and includes two, 2-lane arterial bridges across the Columbia River. This WP is based on travel demand modeling and traffic operational assessments conducted as a part of the I-5 Partnership study. This WP contains four sections:

1. Description of Scenario: A description of an option that includes an arterial bridge just to the west of the I-5 mainline and a western arterial bridge and roadway near the existing Burlington Northern-Santa Fe (BNSF) railroad line.
2. Travel Demands for Both Arterial Bridges: A discussion of estimated future travel demands that each arterial bridge could serve.
3. I-5 Traffic Performance: A description of the scenario’s impacts to I-5 traffic performance.
4. Conclusions: A recap of conclusions related to the scenario.

1.0 Description of Scenario

The scenario, which was not explicitly studied as a part of the I-5 Partnership study, would consist of the following Columbia River crossing components:

- I-5 consisting of three lanes in each direction, either in the form of the existing Interstate Bridges, or through replacement of one or both of the bridges;
- An “arterial bridge” with one lane in each direction, likely located just west of the I-5 mainline and connecting downtown Vancouver, Hayden Island, and Marine Drive; and
- A “western arterial” bridge and roadway (hereinafter, western arterial) with one lane in each direction, located near the existing BNSF railroad bridge west of I-5, and connecting Mill Plain Boulevard, Marine Drive, and Columbia Boulevard.

The I-5 Partnership study considered two scenarios that included combinations of the above components.

“Option Package No. 8: New Arterial Corridor/Columbia River Crossing” included I-5 with three lanes in each direction plus a western arterial bridge and roadway parallel to the railroad tracks (see **Figure 1** titled “Option Package No. 8”). This option originally extended the western arterial roadway to US 30, but the arterial corridor was “shortened” by the Governor’s Task Force due to several issues associated with the southern segment, including sensitive cultural and environmental resources and low traffic demand projections for this segment. The Mill Plain Boulevard-Columbia

Boulevard segment was retained for analysis since it would provide port and industrial access. However, it should be noted that neither of the western arterial segments (i.e., those north and south of Columbia Boulevard) are included in currently adopted transportation plans for Vancouver or Portland.

Traffic operation assessments were also conducted for a different scenario that consisted of I-5 with three lanes in each direction, plus an arterial bridge with one lane in each direction just west of I-5. The arterial bridge would connect downtown Vancouver, Hayden Island, and Marine Drive.

In addition to the above two scenarios, the I-5 Partnership study analyzed another concept that included an arterial bridge with one lane in each direction, but with I-5 reconstructed with four lanes in each direction. It did not include a western arterial near the BNSF railroad tracks. This scenario was titled “Option Package 7” or “Concept 7” (see **Figure 2** titled “Concept 7”).

2.0 Travel Demands for Both Arterial Bridges

The I-5 Partnership study did not consider a scenario that included both the arterial bridge adjacent to I-5 and the western arterial bridge near the railroad. Analysis of year 2020 projected traffic demands and travel patterns show that provision of just the arterial bridge next to I-5 (without the western arterial) would serve both the western arterial’s travel shed as well as many local vehicle-trips between downtown Vancouver, Hayden Island, and Marine Drive (see **Figure 3** titled “An Arterial Bridge Can Provide Transportation Benefits”). In other words, many of the vehicle-trips between the ports and industrial areas on either side of the Columbia River and west of I-5 would be inclined to use any arterial bridge west of I-5, and not the I-5 mainline, if such an arterial bridge were developed, whether it be the western arterial bridge and roadway parallel to the railroad tracks found in Concept 8 or the arterial bridge found in Concept 7.

With provision only of the arterial bridge, year 2020 peak hour two-way traffic volumes along this bridge would be up to 1,500 vehicles per hour, resulting in at-capacity to over-capacity conditions. It should be noted that while the 2-lane arterial bridge would serve “local” trips across river, due to I-5’s congestion under a 6-lane scenario (see next section), the arterial bridge would also be serving some vehicle-trips that would otherwise use an uncongested I-5.

Because both bridges would serve similar travel sheds and because the arterial bridge by itself could accommodate most of the traffic demands of both arterial bridges, traffic operations along I-5 within the BIA would likely be similar for a scenario that included only the arterial bridge west of I-5 or for a scenario that included both arterial bridges. Therefore, the remaining discussion is valid for a scenario that includes the provision of both an arterial bridge adjacent to I-5 and the western arterial and roadway near the railroad tracks.

3.0 I-5 Traffic Performance

Provision of both an arterial bridge adjacent to I-5 and a western arterial could benefit traffic operations along I-5. The arterial connections would provide a linkage for short trips that would be able to avoid the freeway and its ramps. However, analysis of the trips using the I-5 corridor indicates these arterial connections would not provide as much relief to congestion on the I-5 bridge as other options.

Although prior analysis conducted during the I-5 Partnership study revealed that 70 to 80 percent of weekday vehicle-trips using I-5 within the BIA enter or exit I-5 within the BIA, the majority of trips across the Columbia River are not local in nature. The average trip length for vehicles using the I-5 Interstate Bridges is 16 miles, compared to an average regional trip length of just six miles. Furthermore, year 2020 peak period travel demands along I-5 in the BIA, excluding the localized trips that would use the arterial bridges, would still exceed the capacity provided by three (and even four) freeway lanes in each direction.

Under a scenario with both arterial bridges but only three lanes in each direction on I-5 in the BIA, motorists along the freeway would experience substantial congestion and delays. In fact, by 2020, motorists would experience substantially greater delays and vehicular queuing than is experienced under current conditions.

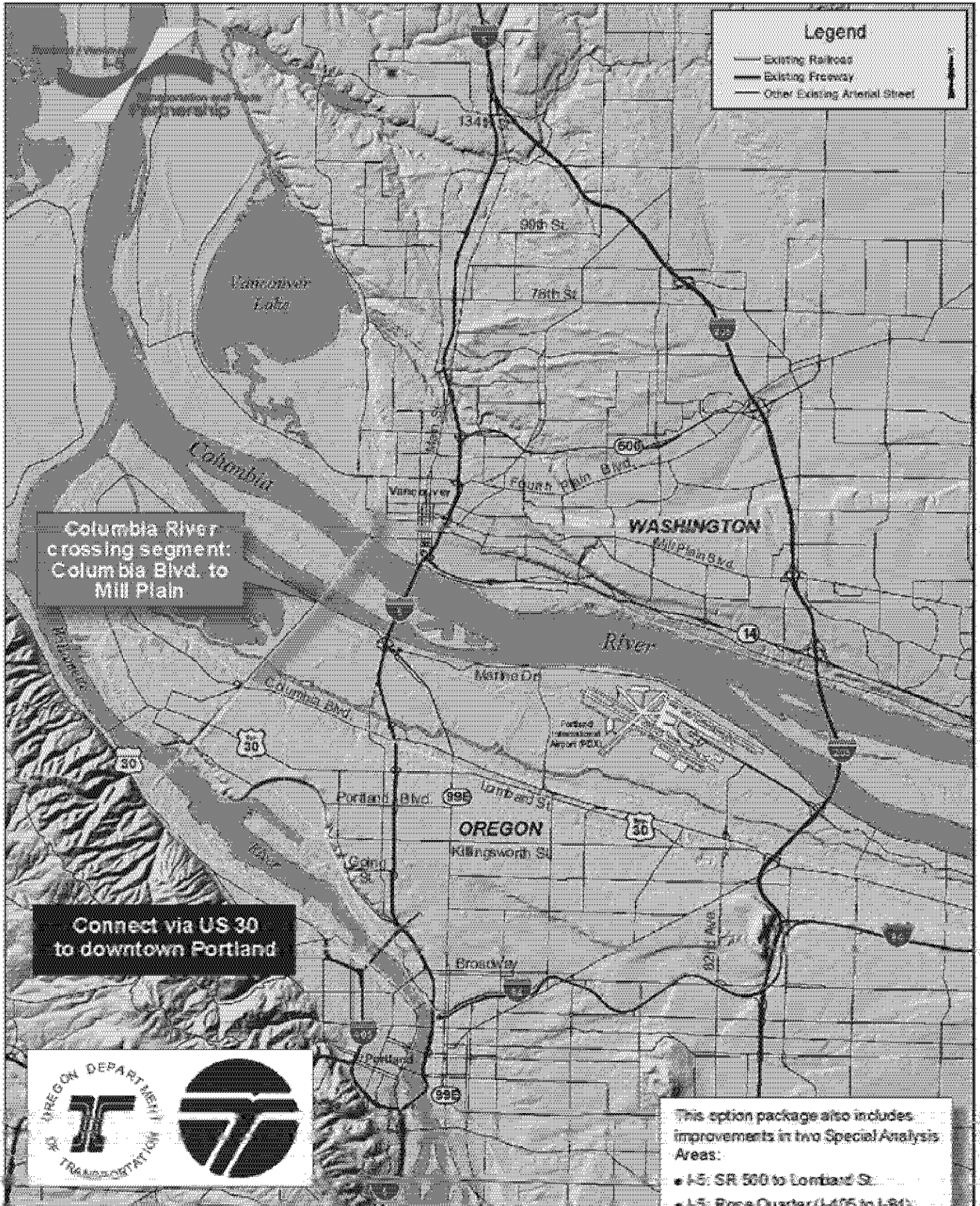
As noted previously, Bridge Option No. 7 (see **Figure 2**) analyzed a scenario that included an arterial bridge with one lane in each direction, but with I-5 reconstructed with four lanes in each direction. Although this option would provide additional I-5 mainline capacity (four lanes in each direction instead of three) plus an arterial bridge across the Columbia River, it would still result in substantial congestion and slow travel speeds throughout the BIA (see **Figure 4** titled “Average Speed”). Based on travel demand and traffic operations analysis, in order to maintain or improve today’s level of performance for I-5 by the year 2020, up to two additional lanes of freeway capacity in each direction across the Columbia River would be needed. This data collected for the I-5 Partnership demonstrates that arterial-only bridge concepts do not show promise for addressing the corridor’s problems.

4.0 Conclusions

This WP reviews the traffic performance of a scenario that includes two, 2-lane arterial bridges across the Columbia River and maintaining I-5’s crossing at six lanes. This WP is based on travel demand modeling and traffic operational assessments conducted as a part of the Portland/Vancouver I-5 Transportation and Trade Partnership study. The following is a summary of key conclusions:

- Within the BIA, the I-5 mainline with three lanes in each direction would operate similarly if both arterial bridges were provided or if just the arterial bridge west of I-5 was provided.
- With the provision of one or both arterial bridges and without providing additional mainline capacity to I-5, motorists using the freeway would experience substantial congestion and delays. In fact, by 2020 motorists would experience substantially greater delays and vehicular queuing than is experienced under current conditions.
- To maintain or improve today’s level of performance for I-5 by the year 2020, up to two additional lanes of freeway capacity in each direction across the Columbia River would be needed. The data collected for the “Final Strategic Plan for the Portland/Vancouver I-5 Transportation and Trade Partnership” demonstrates that arterial-only bridge concepts do not show promise for addressing the corridor’s problems.

Option Package No. 8: New arterial corridor / Columbia River crossing

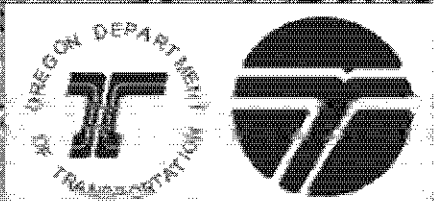


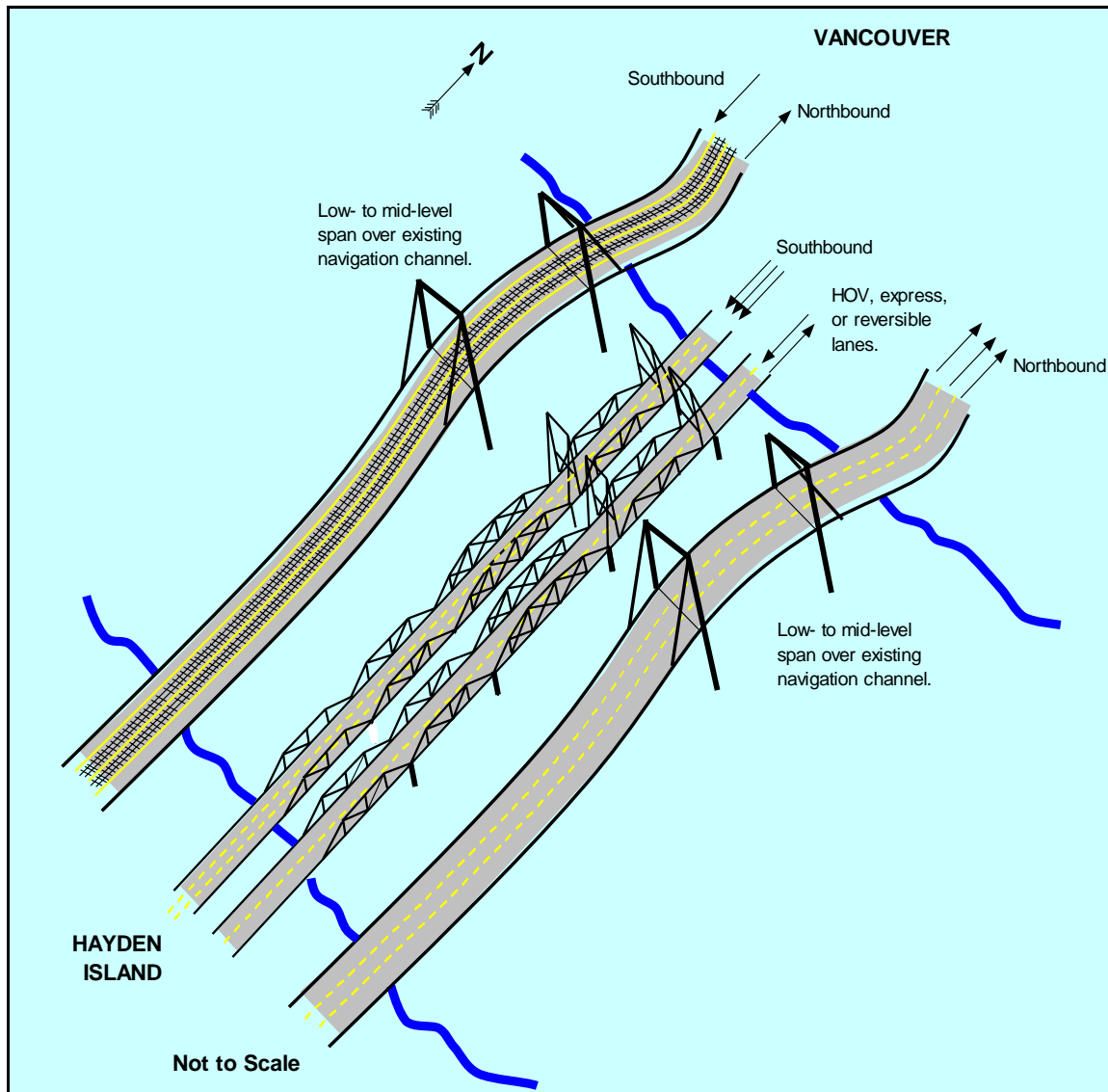
Columbia River crossing segment: Columbia Blvd. to Mill Plain

Connect via US 30 to downtown Portland

This option package also includes improvements in two Special Analysis Areas:

- I-5: SR 500 to Lombard St.
- I-5: Rose Quarter (I-405 to I-84)



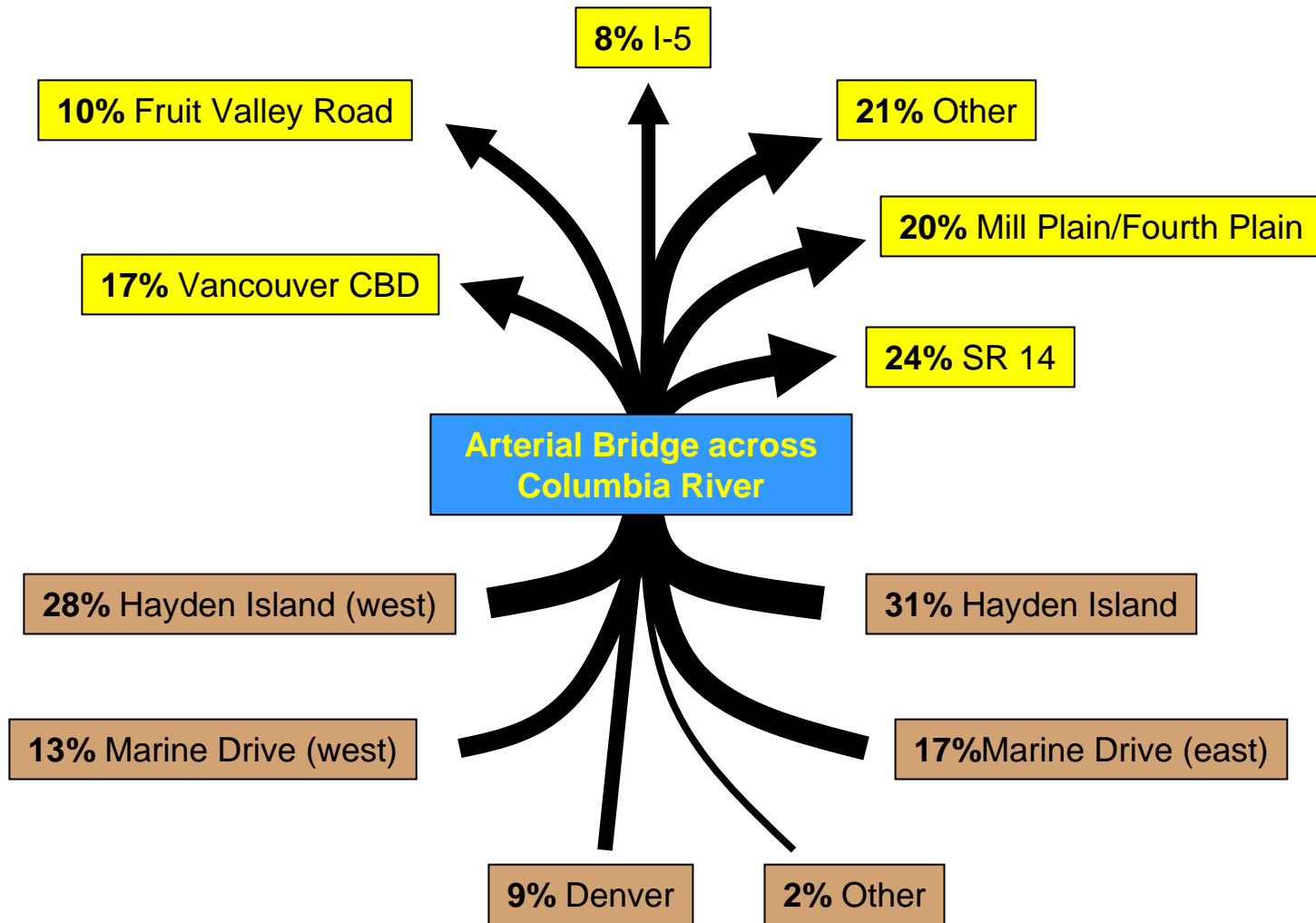


Concept 7: 8-lane freeway concept plus new LRT bridge with two-lane arterial

1. Provides for new four-lane bridge with LRT
2. Low- to mid-level bridges with lift spans over current navigation channel
3. Two lanes on existing northbound bridge could be used for HOV, express lanes, or (potentially) reversible lanes

An Arterial Bridge Can Provide Transportation Benefits

Trip Patterns, NB Across Columbia River (PM Peak Period)



Average Speed

I-5 Southbound - Main St. to Lombard (All Traffic)

