

Overview of Alternatives

Portland/Vancouver I-5
Transportation and Trade Partnership

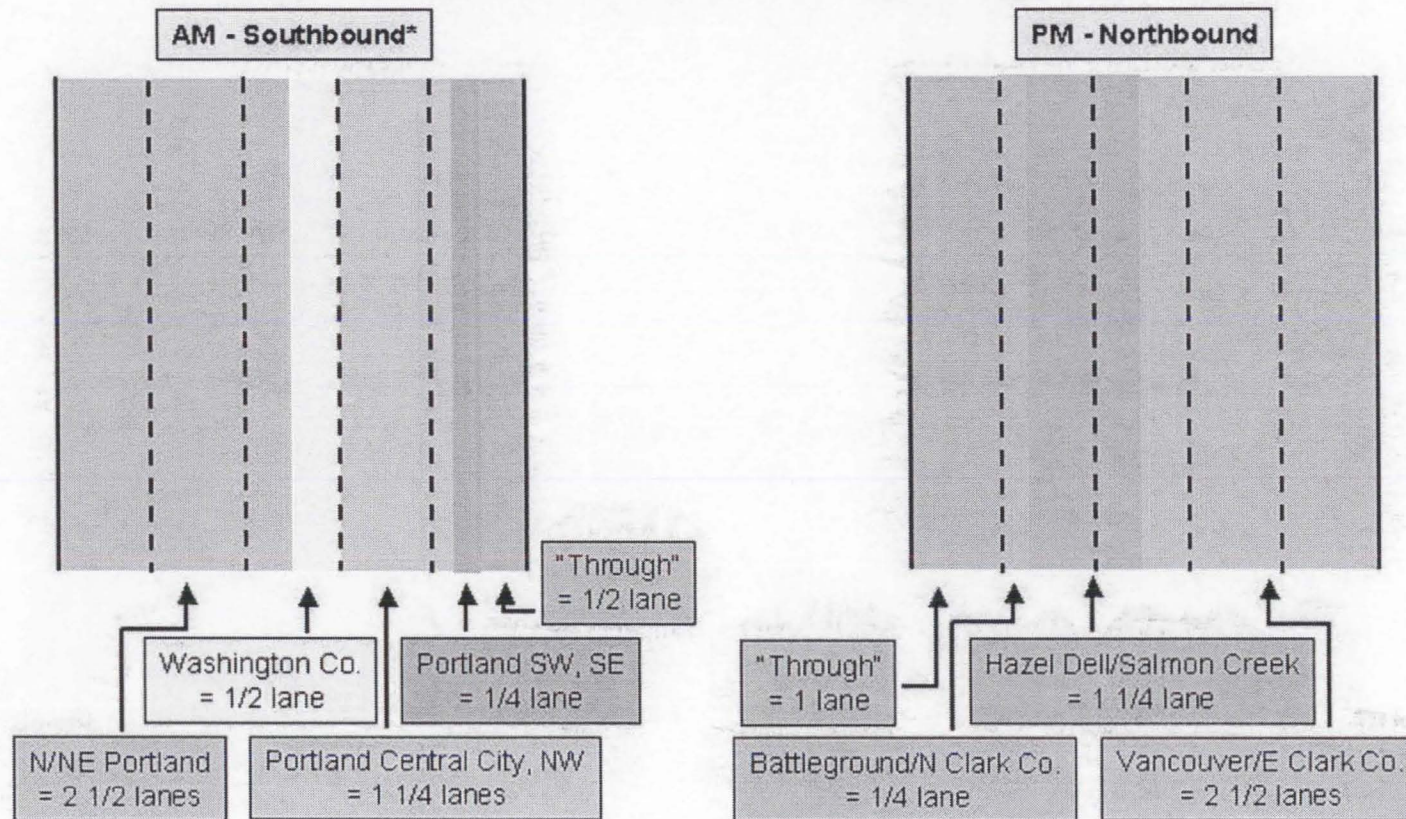
Bridge Analysis

- Options evaluated (all include ten lanes across the river):
 - Four lane supplemental bridge
 - Six lane supplemental bridge
 - Four lane supplemental tunnel
 - Ten lane replacement bridge

Bridge Analysis Conclusions

- 1 To balance upstream and downstream freeway capacity (assuming three through lanes), ten lanes are needed at the river crossing.

I-5 Columbia River Crossing Peak Period Lane Requirements



* Travel Patterns based on PM Peak Period

Bridge Analysis (continued)

- 2 Most bridge capacity is used for trips getting on or off freeway between SR 500 and Columbia Blvd. Options that "bypass" interchanges don't fully address the problem.
- 3 Further study is needed to determine best bridge configurations to balance access and through capacity.
- 4 Even with capacity improvements, peak hour will still be congested. Improvements will shorten the duration and intensity of the peak.

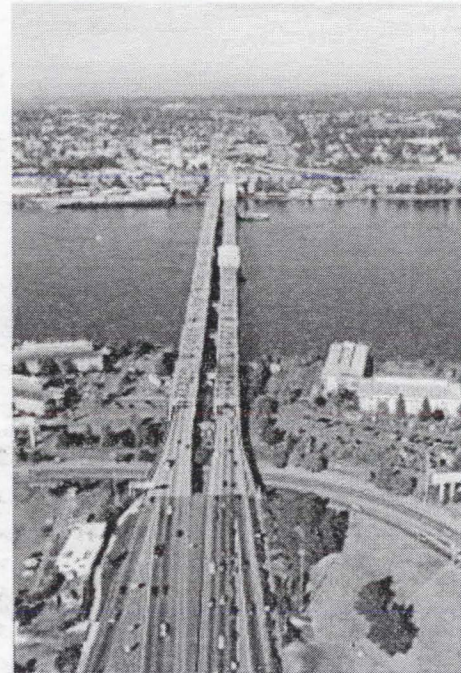
Bridge Analysis (continued)

- 5 Changes in river crossing capacity affect the design requirements for the freeway between Columbia Boulevard and SR 500. Bridge improvements should be considered in conjunction with interchange improvements throughout that segment.

Portland Interchanges

Potential improvements to I-5, Columbia Boulevard to Hayden Island:

- Delta-Lombard widening to three lanes southbound;
- Hayden Island, Marine Drive, and Delta Park interchange improvements as part of bridge project.
- Columbia Boulevard ramps to from the north.



Vancouver Interchanges (SR 14 to SR 500)

If no bridge improvements are made, congestion at the I-5 river crossing will continue to obscure potential problems through downtown Vancouver:

- Northbound bottleneck at bridge restricts traffic entering 4th Plain/SR 500 weave section.



- Southbound queuing backs up traffic beyond the SR 500 merge area.

Vancouver Ramps Analysis

- Improvements to Vancouver ramps should be completed in conjunction with river crossing improvements.
- Interchange improvements will:
 - address congestion caused by SR500 - 4th Plain weaving.
 - improve travel times for traffic using Mill Plain and 4th Plain interchanges.
 - improves safety and travel times for all vehicles
 - provide opportunity for new access to downtown Vancouver.



Task Force Draft Recommendations for the I-5 River Crossing

- **River Crossing Capacity:**
 - New transit and vehicle capacity should be constructed across the Columbia River in the I-5 Corridor.
 - **For vehicles**, there should be no more than 3 through lanes in each direction and up to two supplemental lanes (auxiliary or local access) in each direction across the Columbia River (total 5 lanes in each direction). **For transit**, there should be two light rail tracks across the Columbia River in the I-5 Corridor.
 - In adding river-crossing capacity, every effort should be made to avoid displacements and encroachments.
 - The proposed design should include safety considerations.

Task Force Draft Recommendations for the I-5 Bridge Influence Area

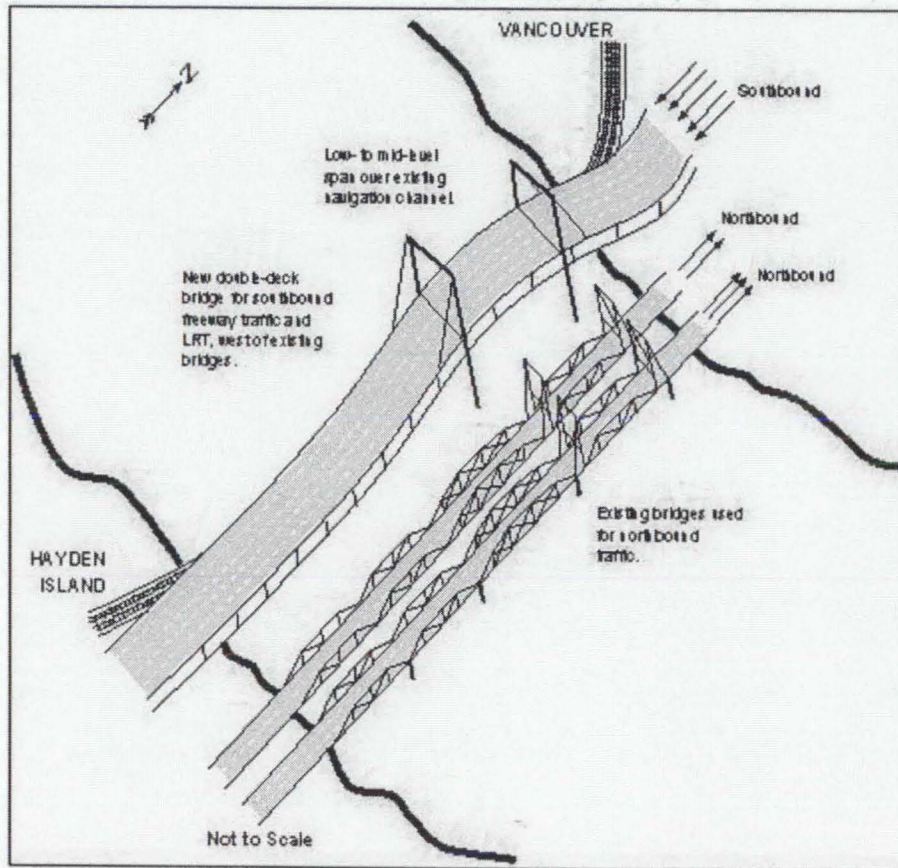
- **Bridge Influence Area:**
 - Between the SR 500 and Columbia Blvd. interchanges, the freeway needs to be designed to balance all of the on and off traffic, consistent with 3 through lane Corridor capacity and 5 lanes of bridge capacity, in each direction.

A Range of River Crossing Concepts Developed to Evaluate:

- Supplemental vs. replacement bridge concepts
- Joint use (LRT-highway) vs. separate bridges
- Alignments east and west of existing bridges
- Freeway lanes and arterial lanes

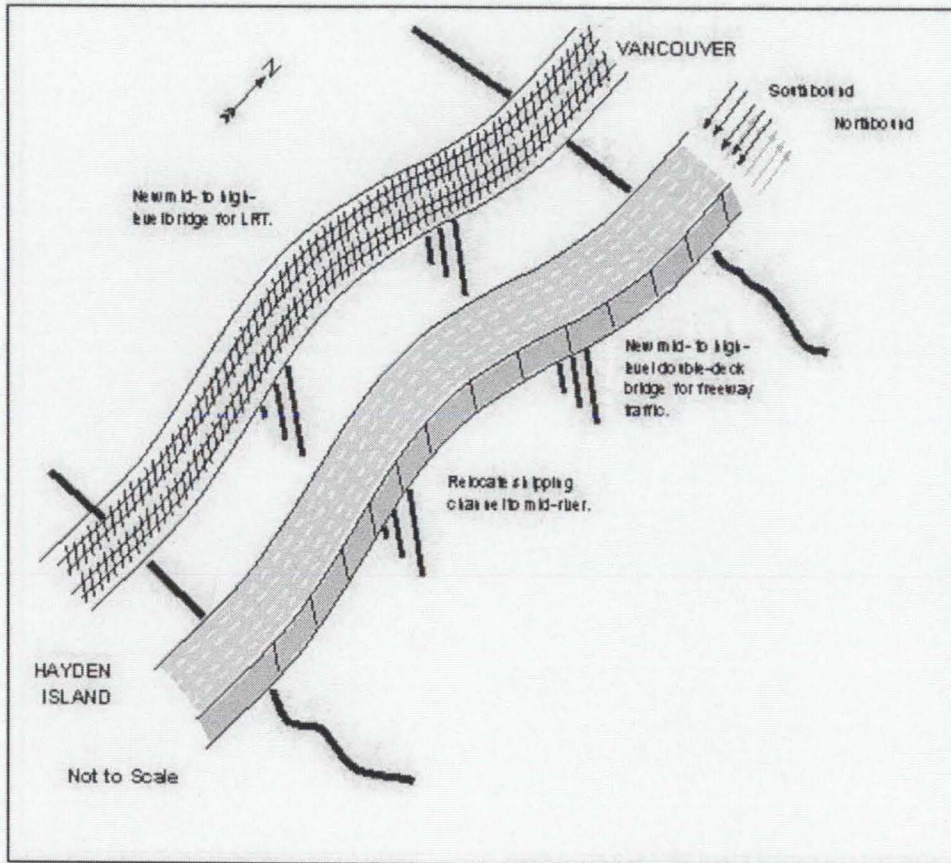
The Range of River Crossing Concepts Fall Into Three Categories:

- Category 1 – River crossings that provide five freeway lanes in each direction (Concepts 1,2,3,4)
- Category 2 – A freeway and river crossing system that provides three mainline freeway lanes in plus four lane collector-distributor (Concepts 5,6)
- Category 3 – River crossings that have four freeway lanes in each direction plus a two lane arterial (Concepts 7,8)



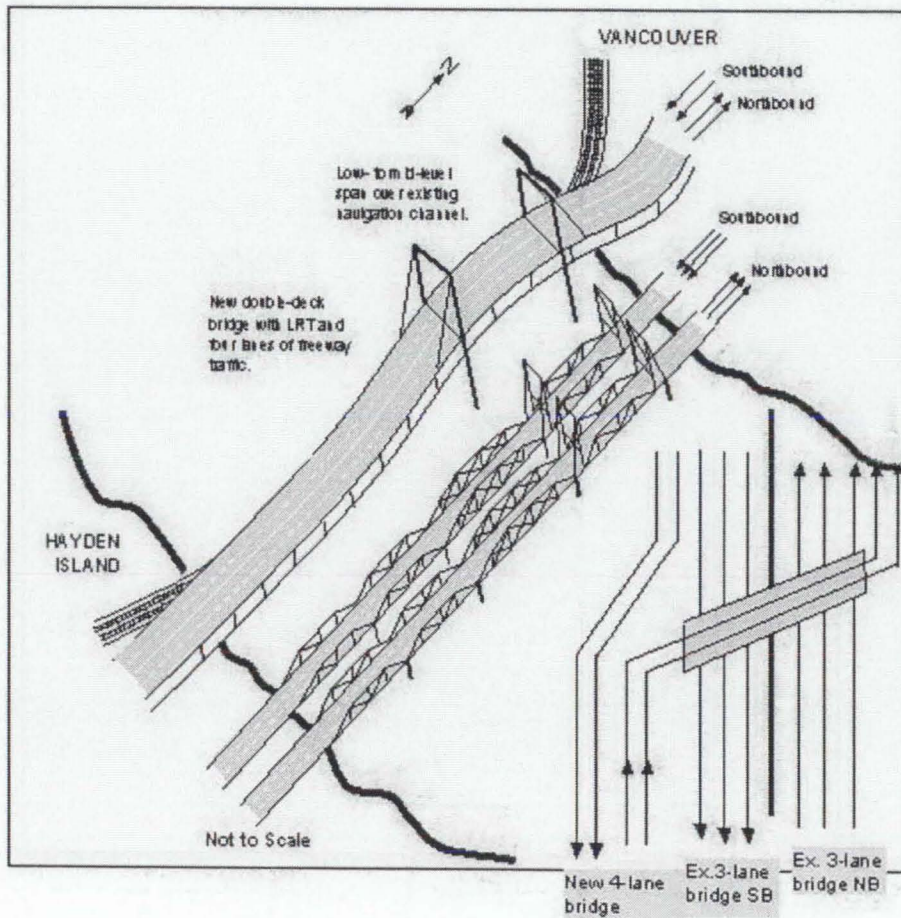
**Concept 1:
5-lane southbound
supplemental bridge for
freeway traffic w/LRT**

1. Southbound traffic on new five-lane bridge, LRT on lower deck -- west of existing bridges
2. Low- to mid-level bridge, with lift span over existing navigation channel
3. Northbound traffic would be split between the two existing bridges



**Concept 4:
10-lane double deck,
replacement bridge,
plus LRT on
separate new bridge**

1. Mid- to high-level bridges. Navigation channel relocated to center of river
2. Potential fixed spans for highway and LRT (with Coast Guard reduction of existing lift requirements), or lift spans

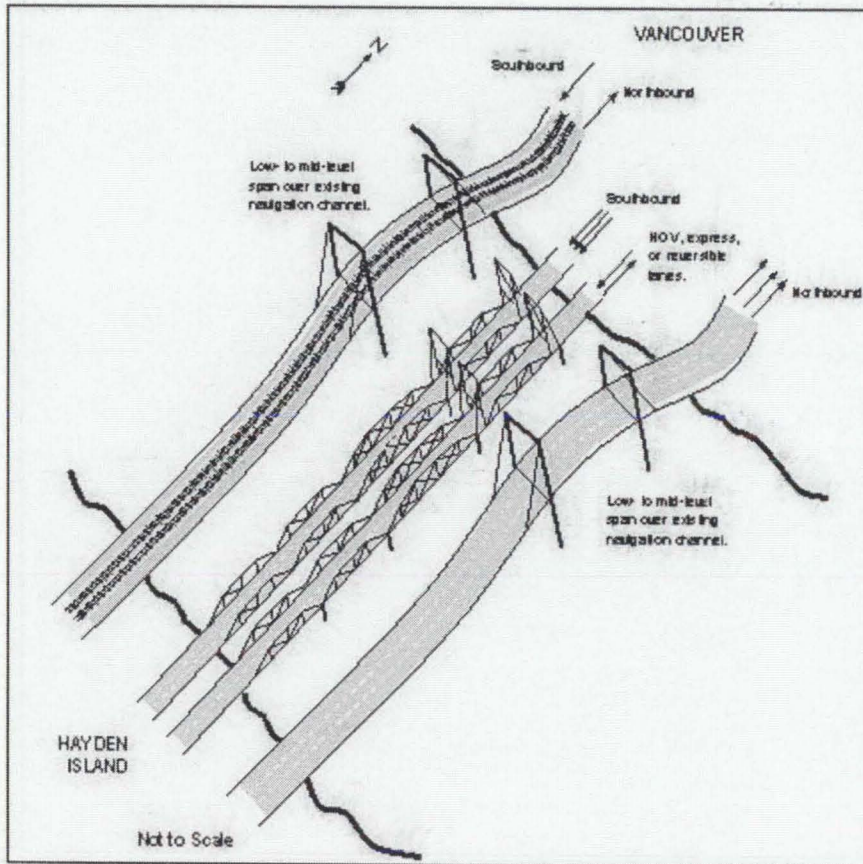


Concept 6:
**4-lane supplemental
 collector-distributor
 bridge w/LRT, plus 6
 lane freeway**

1. Provides for new four-lane bridge with LRT west of the existing bridges

2. Low- to mid-level bridge with lift span over current navigation channel

3. Use four-lane bridge as collector-distributor (i.e., ramp access for Hayden Island, etc.). Requires fly-over ramps north and south, as shown in the schematic on the left



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

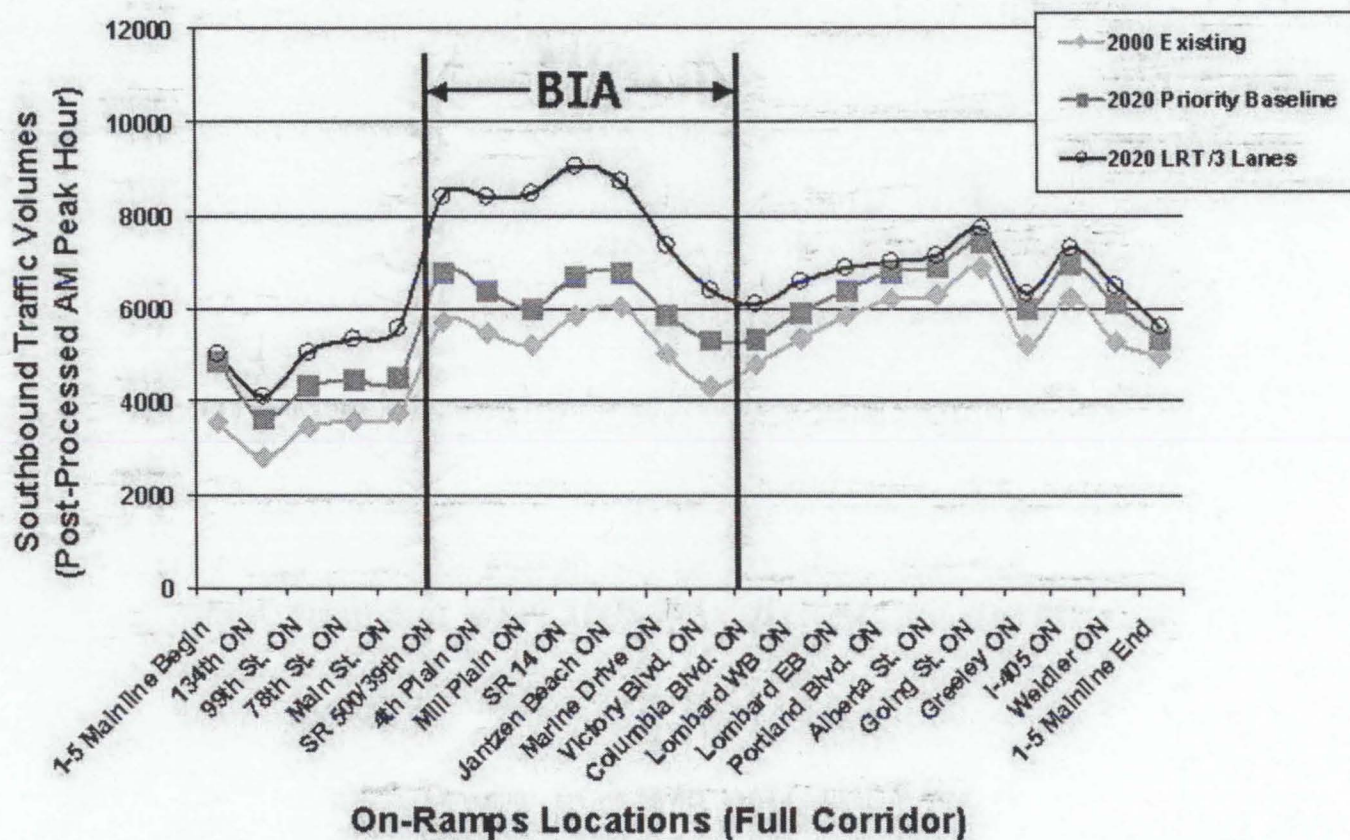
1. Provides for new four-lane bridge with LRT
2. Low- to mid-level bridges with lift spans over current navigation channel
3. Two lanes on existing northbound bridge could be used for HOV, express lanes, or (potentially) reversible lanes

Performance of Concepts

- Overall, the concepts show a reduction in delay and an improvement in speeds compared Existing Conditions and Baseline 2020.
- Some important differences:
 - 10-lane replacement bridge performs the best
 - 8-lane plus arterial system also provides improvements, but has less flexibility for managing ramp and arterial traffic
 - The collector-distributor system performs worst -- design problems will be very difficult to overcome

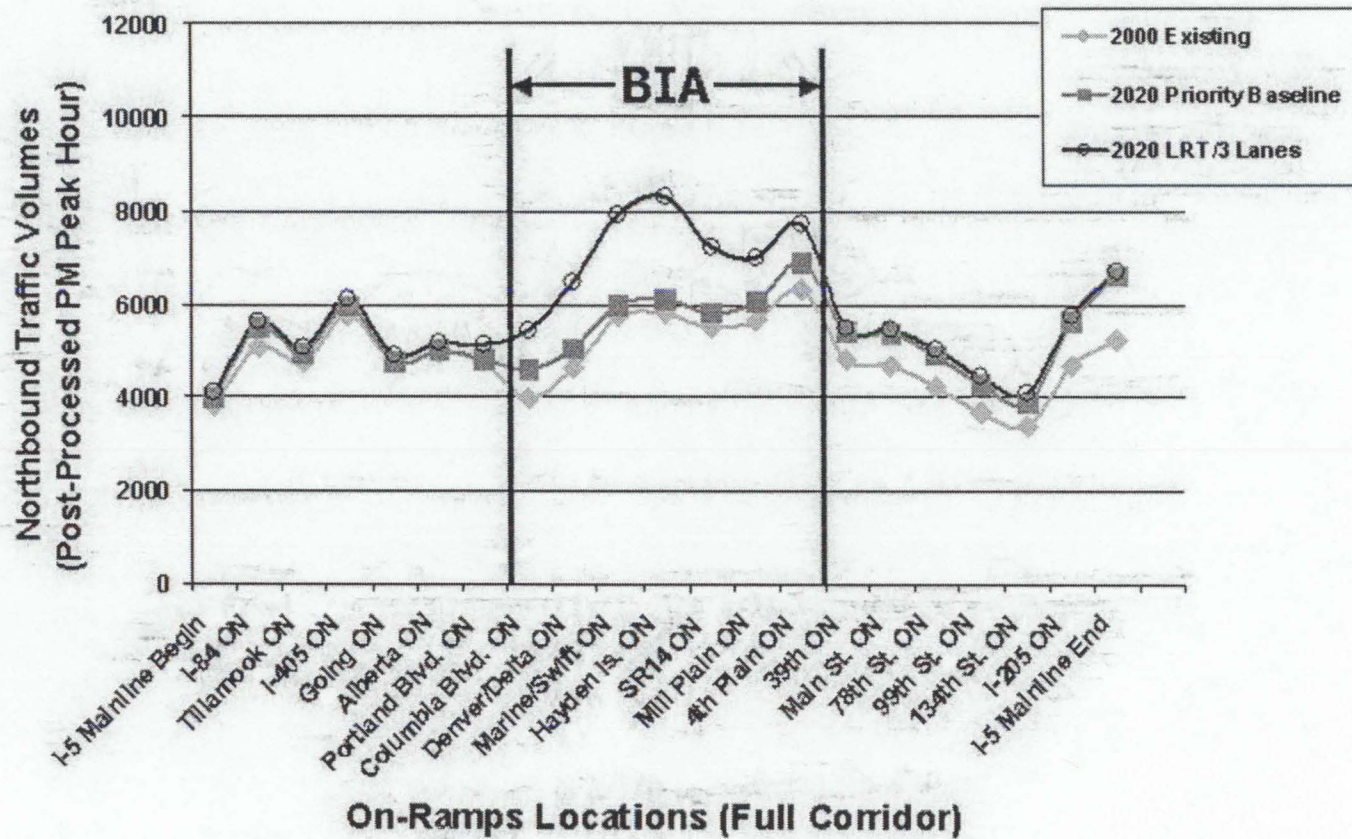
Southbound Travel Volumes

Along I-5 (AM Peak Hour)



Northbound Travel Volumes

Along I-5 (PM Peak Hour)

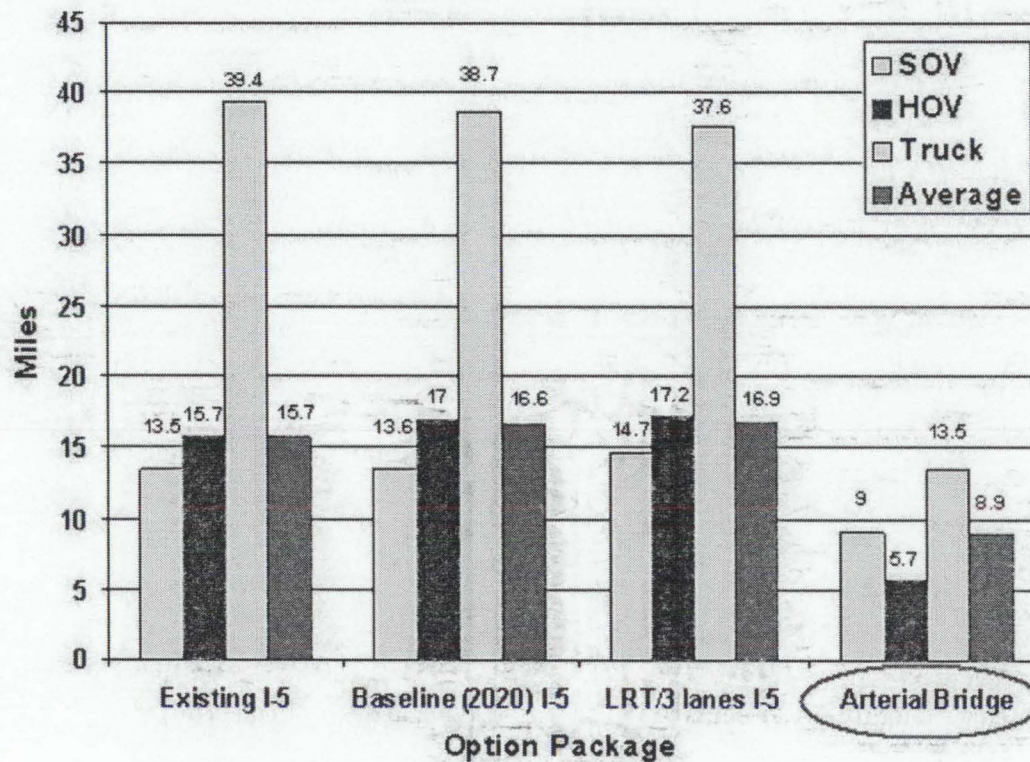


Changes in Travel Demand on Other Major Corridors

- BIA improvements are likely to result in minimal traffic increases on I-5 outside the Bridge Influence Area.
- In Portland, traffic will increase on arterials near the BIA (Denver, MLK, Columbia), but the effect of the capacity increase is dispersed as you travel away from the BIA.
- In Vancouver, BIA capacity increases will result in additional growth in traffic on SR 500 and SR 14 (beyond the background changes from 2000 to 2020).

Most Trips Are Regional -- Not Local

Average Trip Length
Northbound Across Columbia River (PM Peak Hour)



What about HOV?

- A corridor-wide HOV lane is a possibility with a new river crossing
- HOV utilization and performance is highly dependent on how it is designed
 - Direct access ramps should be considered at key locations (i.e., SR 500)
 - Bridge design affects HOV performance (a supplemental bridge splits freeway traffic, which limits HOV access)
- Further design work in an EIS is needed to ensure that it will operate well and have good utilization

Bottom Line Findings

- Concepts with 10 freeway lanes, and concepts with 8 freeway plus arterial lanes, appear promising.
- Trade-offs need to be evaluated in future studies, including the balance of traffic on the freeway vs. local streets
- Draft recommendations for the BIA and the river crossing support the Task Force's Problem, Vision and Values statement.

Draft Recommendations

1. New transit and vehicle capacity should be constructed across the Columbia River in the I-5 Corridor.
2. For vehicles, there should be 3 through lanes (and not more than 3) in each direction and up to two short-distance lanes in each direction across the Columbia River (total 5 lanes in each direction). For transit, there should be two light rail tracks across the Columbia River in the I-5 Corridor.

Draft Recommendations - Cont.

3. In the Bridge Influence Area, SR 500 to Columbia Blvd., the freeway needs to be designed to balance all of the on and off traffic, consistent with 3 through lane Corridor capacity and up to 5 lanes of bridge capacity, in each direction.
4. In adding river-crossing capacity and making improvements in the Bridge Influence Area, every effort should be made to: 1) avoid displacements and encroachments, 2) minimize the highway footprint in the corridor and 3) minimize use of the freeway for local trips.
5. The proposed design should include safety considerations.

Draft Recommendations - Cont.

6. As a first step towards making improvements, the bi-state region should undertake an Environmental Impact Study for a new River Crossing and potential improvements in the Bridge Influence Area.
7. In the EIS, the following BIA elements should be studied:
 - A) 8 or 10 lane freeway concepts
 - B) Replacement or Supplemental bridge
 - C) Joint use or non-joint use freeway/LRT bridge
 - D) 8-lane freeway with joint LRT/2-lane arterial
 - E) HOV throughout the I-5 Corridor

Draft Recommendations - Cont.

8. The following concepts do not show promise for addressing the corridor's problems and should not be considered in an EIS:
 - Collector-Distributor bridge concepts
 - Arterial-only bridge concepts
 - Tunnel concepts

Draft Recommendations - Cont.

One of the 3 through lanes should be designated for use as a high occupancy vehicle (HOV) lane during the peak period, in the peak direction. Further exploration is required in the environmental impact statement to optimize its design, particularly within the Bridge Influence Area; and to determine its overall effectiveness in meeting the Regional objectives for the I-5 Corridor.