Transportation Results

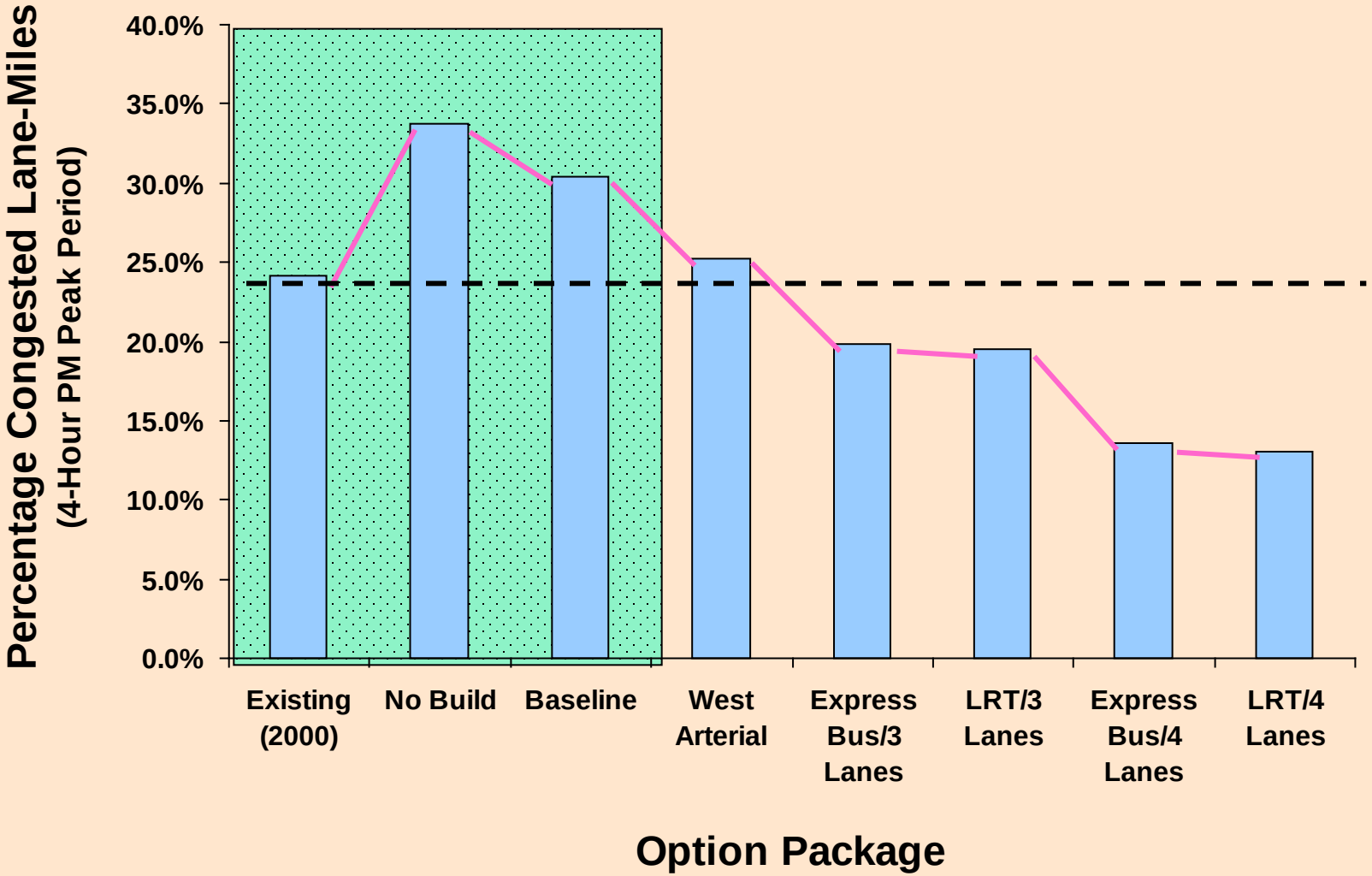
Overview of Concept Packages

Concept Packages Evaluated

- Existing Conditions (2000)
- No Build (2020)
- Baseline (2020)
- West Arterial
- Express Bus/3 Lanes
- LRT/3 Lanes
- Express Bus/4 Lanes
- LRT/4 Lanes

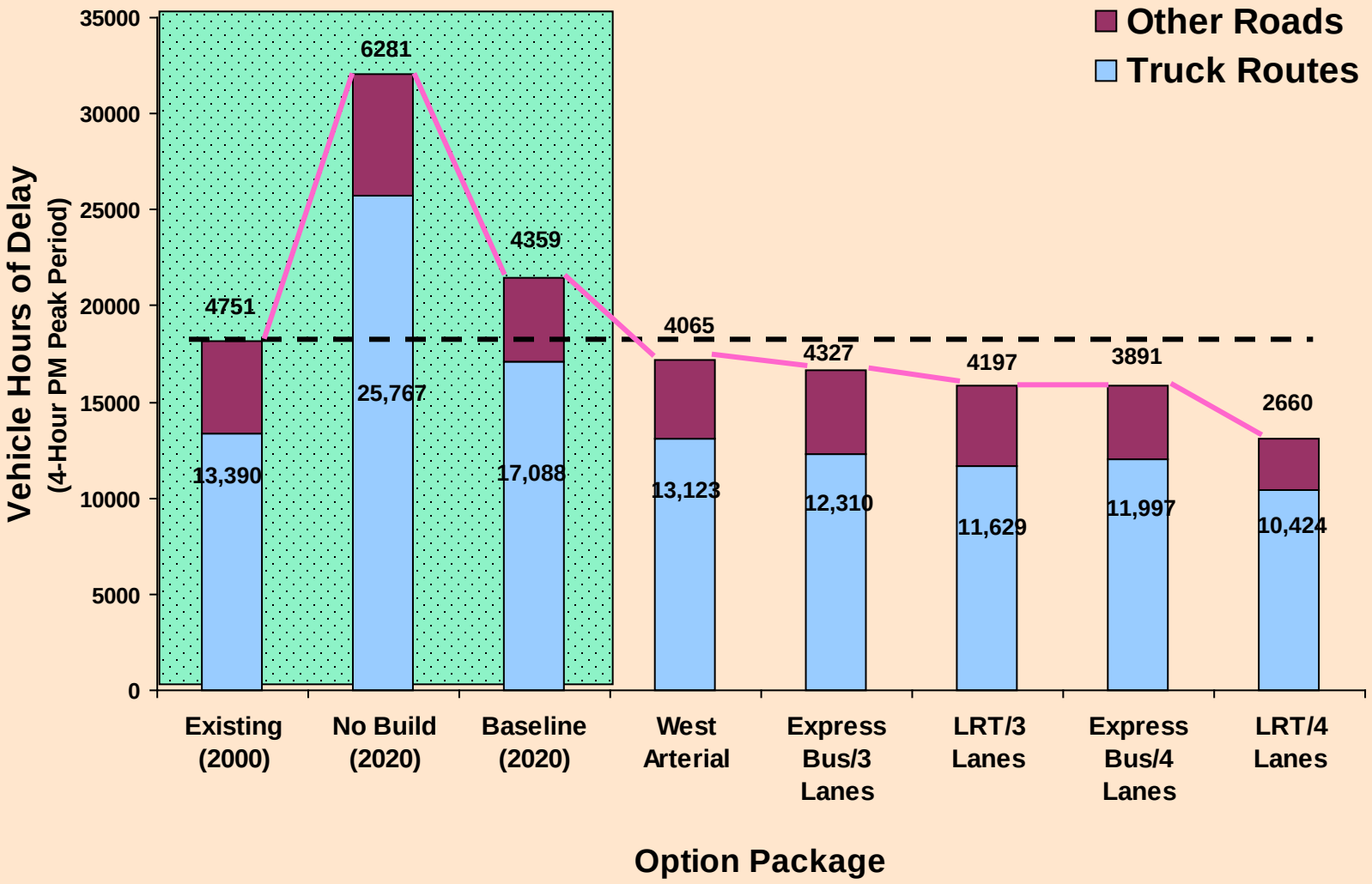
Congested Lane-Miles

On I-5 and I-205 (PM Peak)



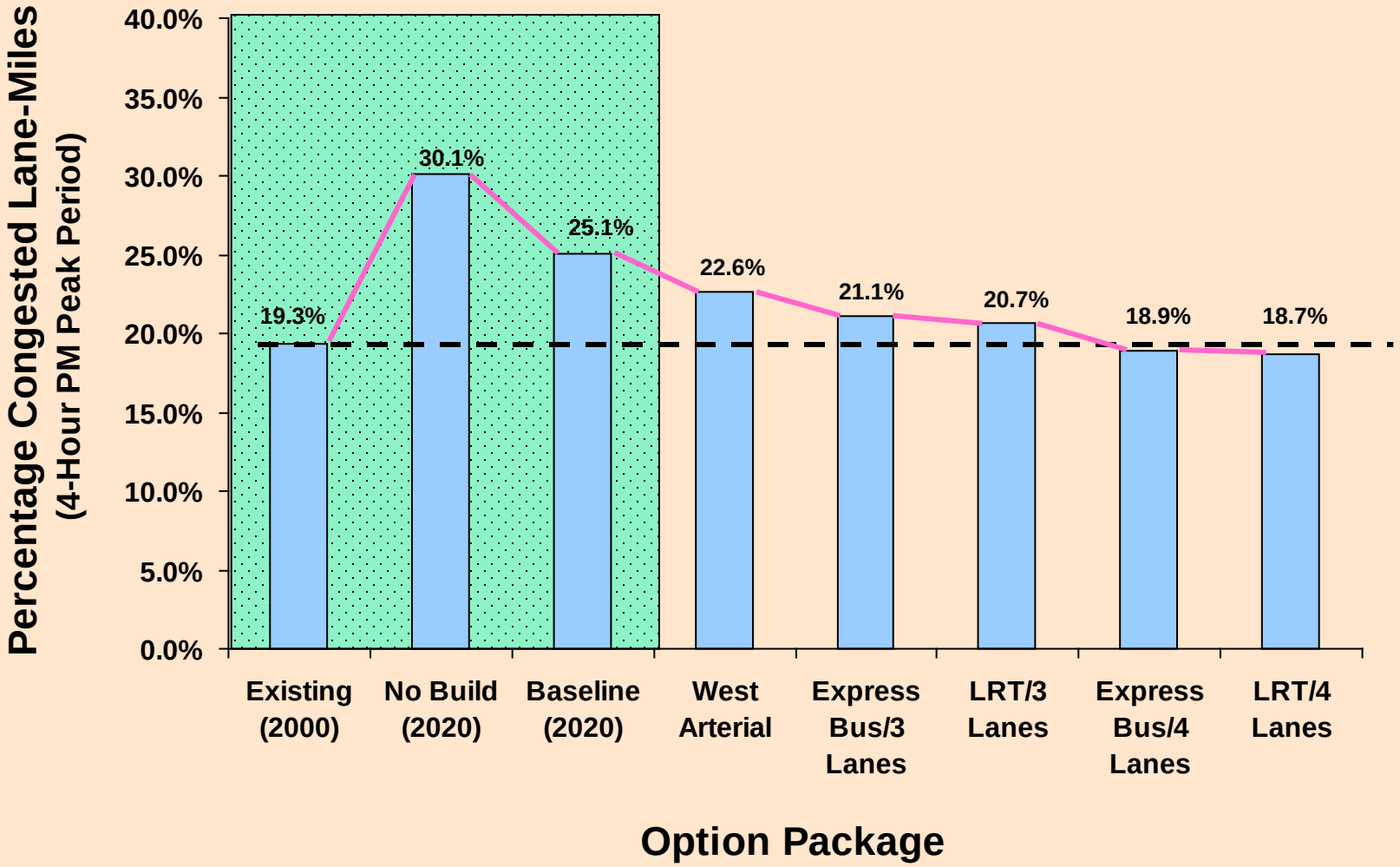
Vehicle Hours of Delay

In the Study Area (PM Peak)



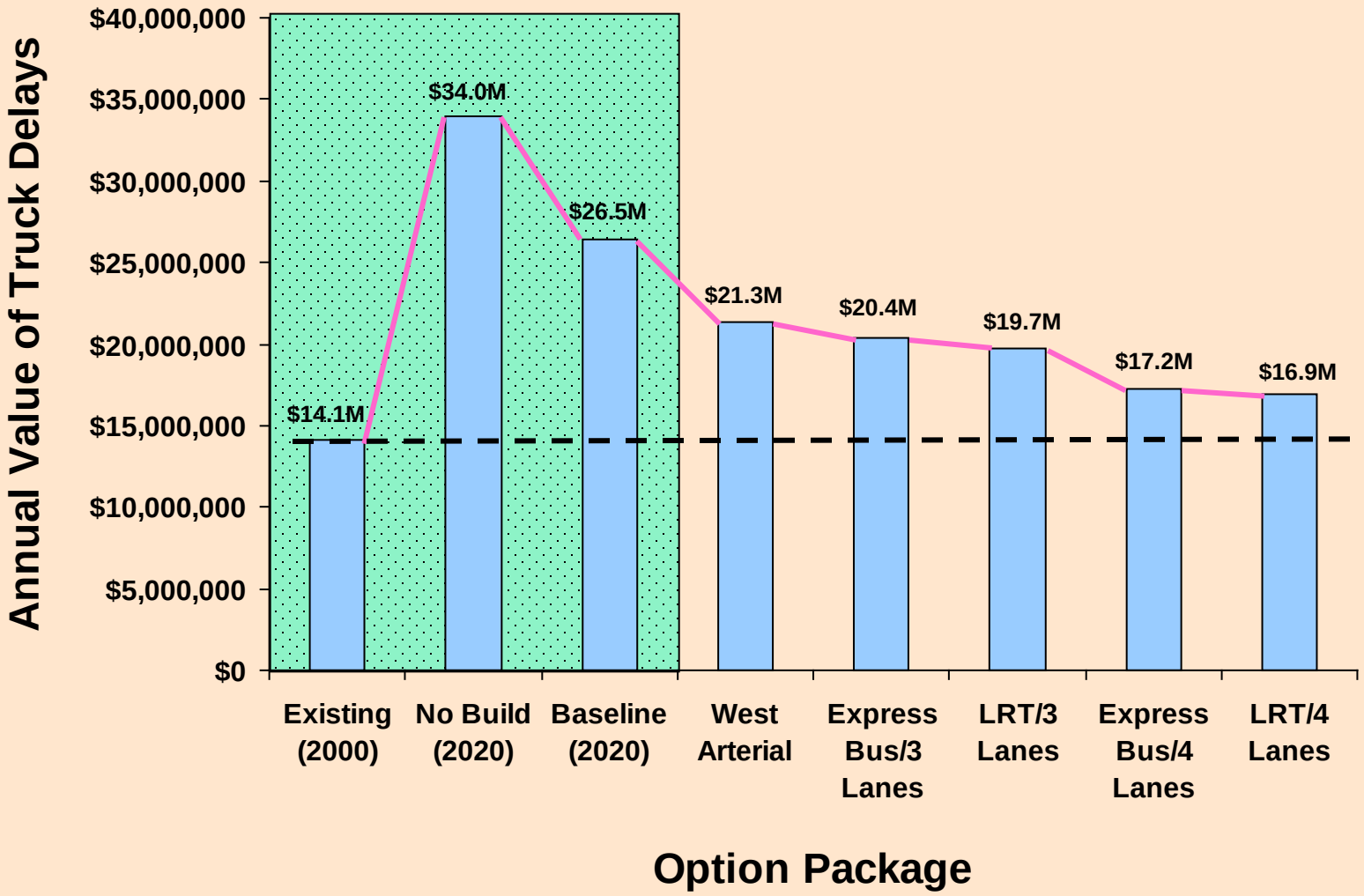
Congestion on Truck Routes

Congested Lane-Miles (PM Peak)

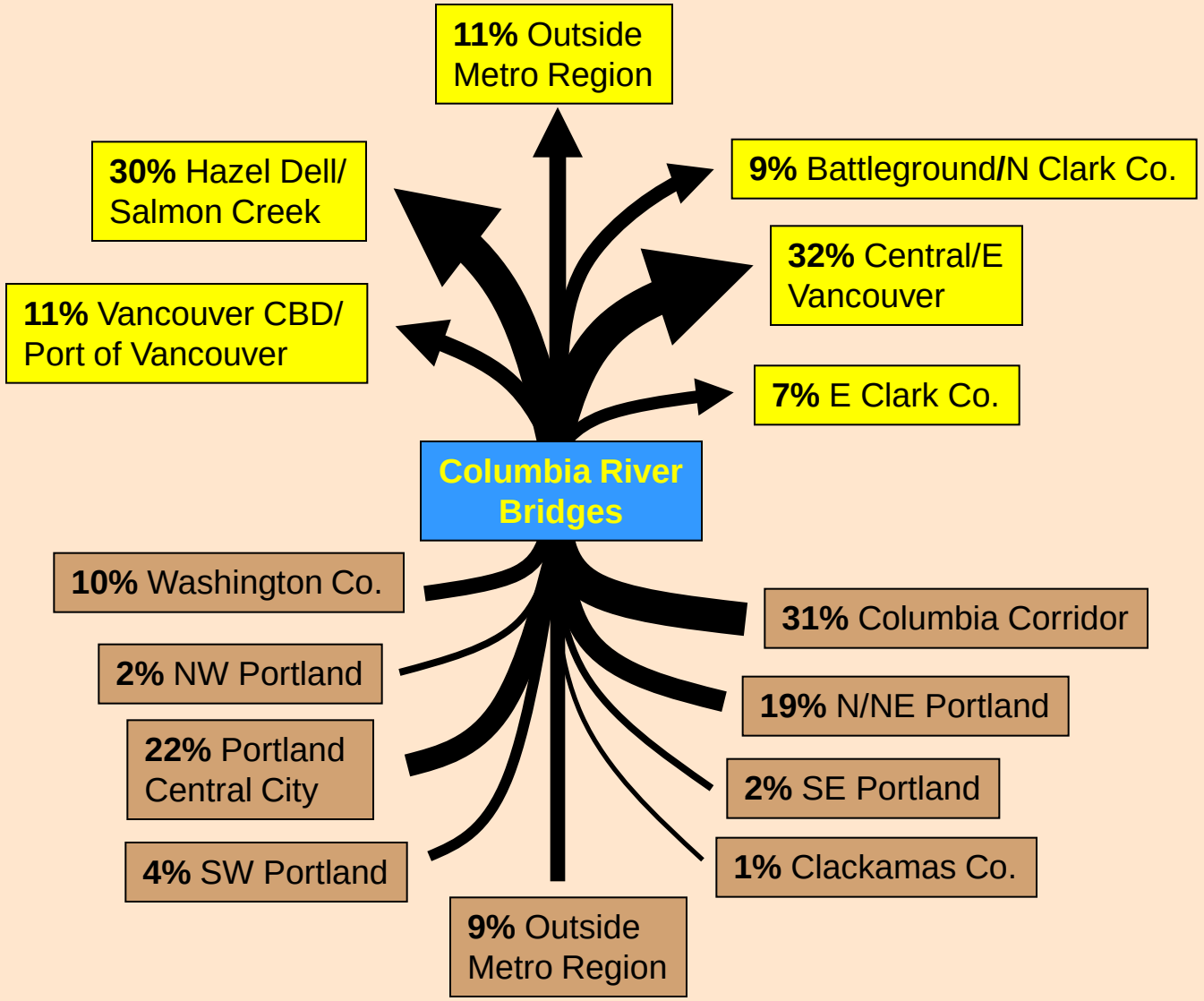


Value of Truck Delay

(In the Study Area)



2020 PM Peak Northbound Traffic Patterns Across the Columbia River



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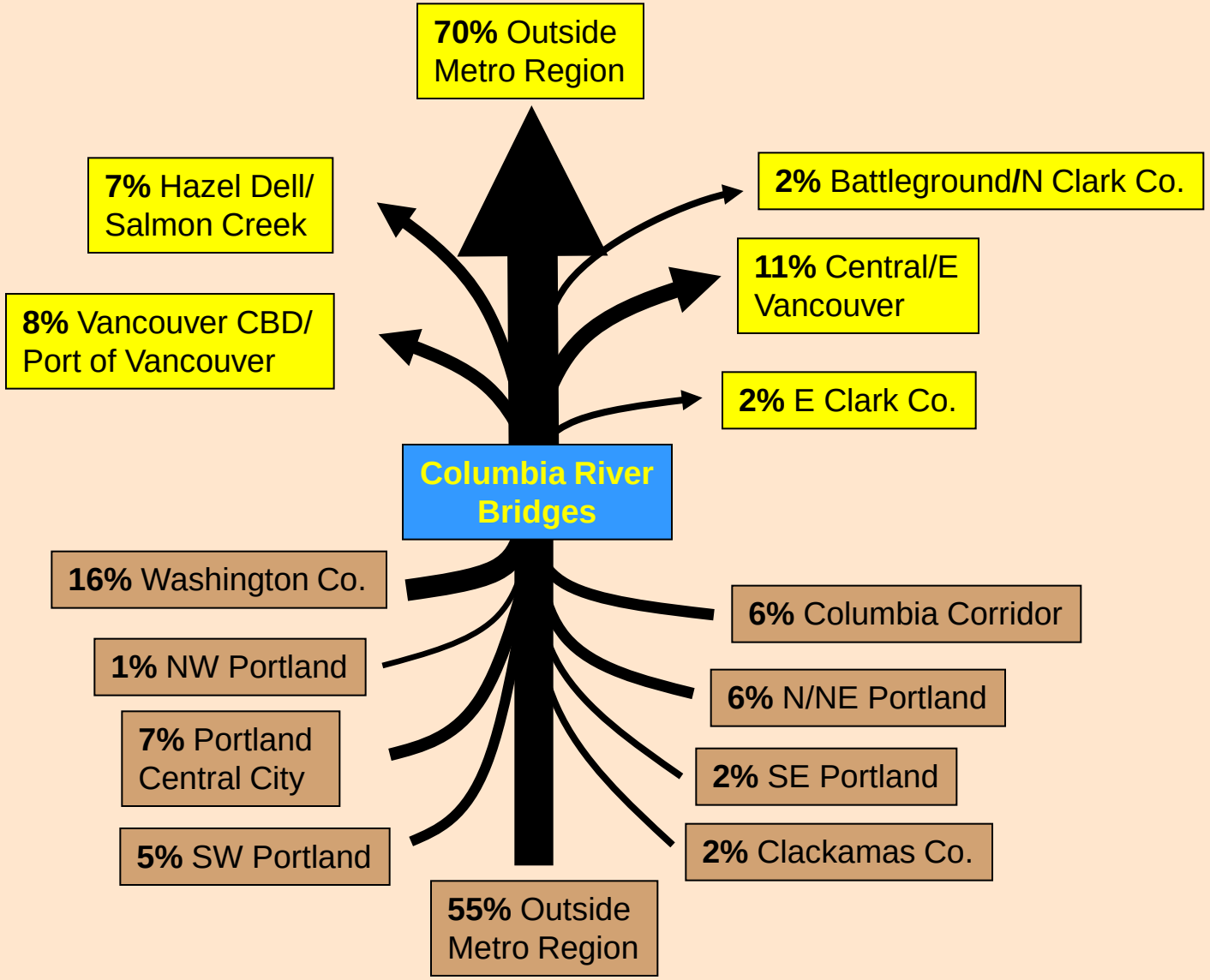


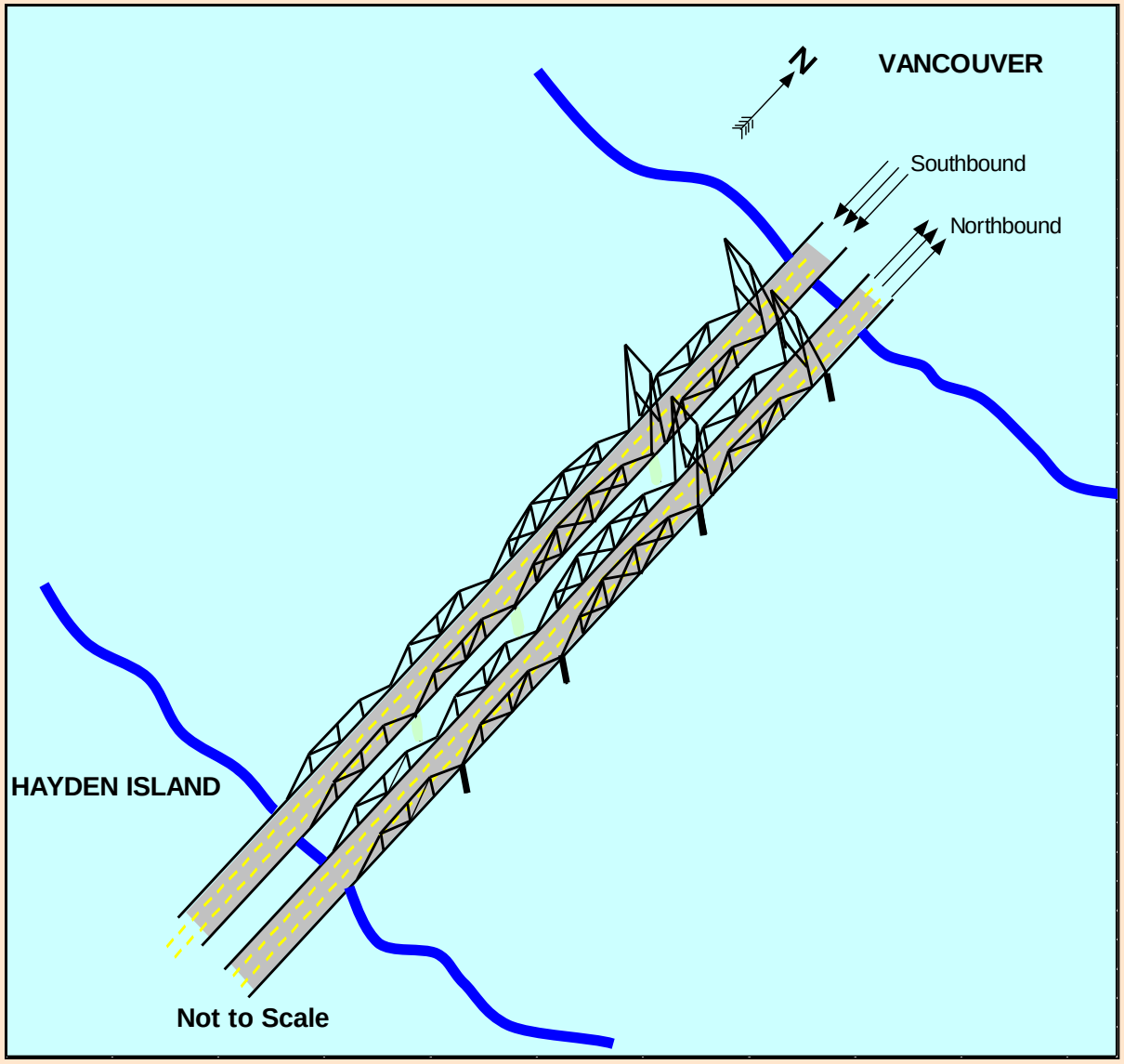
Task Force
Draft Bridge Influence Area Recommendations

- Provide three through lanes throughout corridor.
- Provide more capacity across the Columbia River (up to 2 new lanes in each direction for vehicles and 2 light rail tracks).
- Consider interchange improvements between SR500 and Columbia Blvd., where necessary for the Interstate to function smoothly and safely.
- Make the Columbia Blvd. interchange into a full interchange to facilitate freight movement.

Bridge Influence Area Concepts

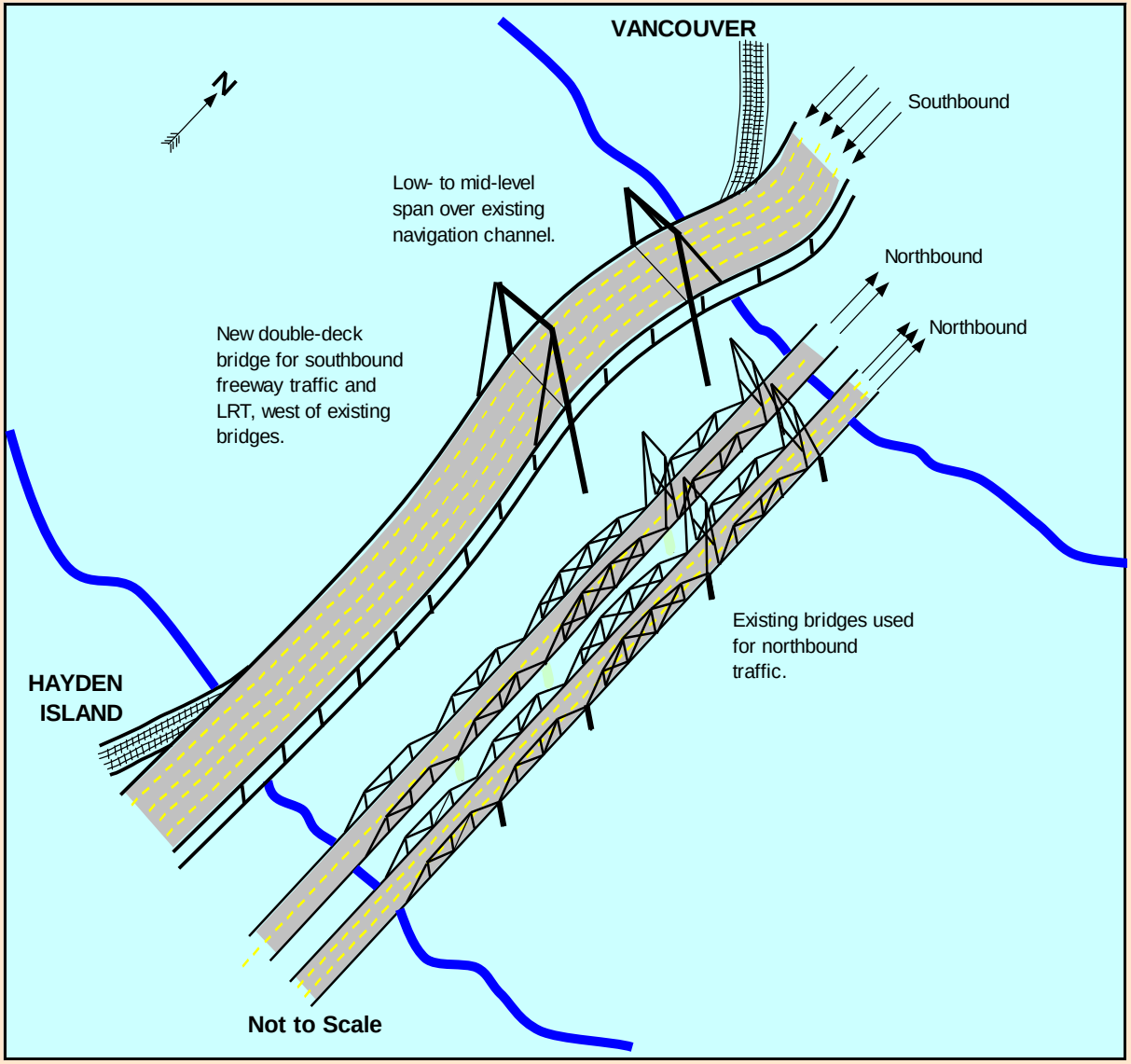
Range of River Crossing Concepts

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



Existing configuration:

Two three-lane, low-level lift span bridges

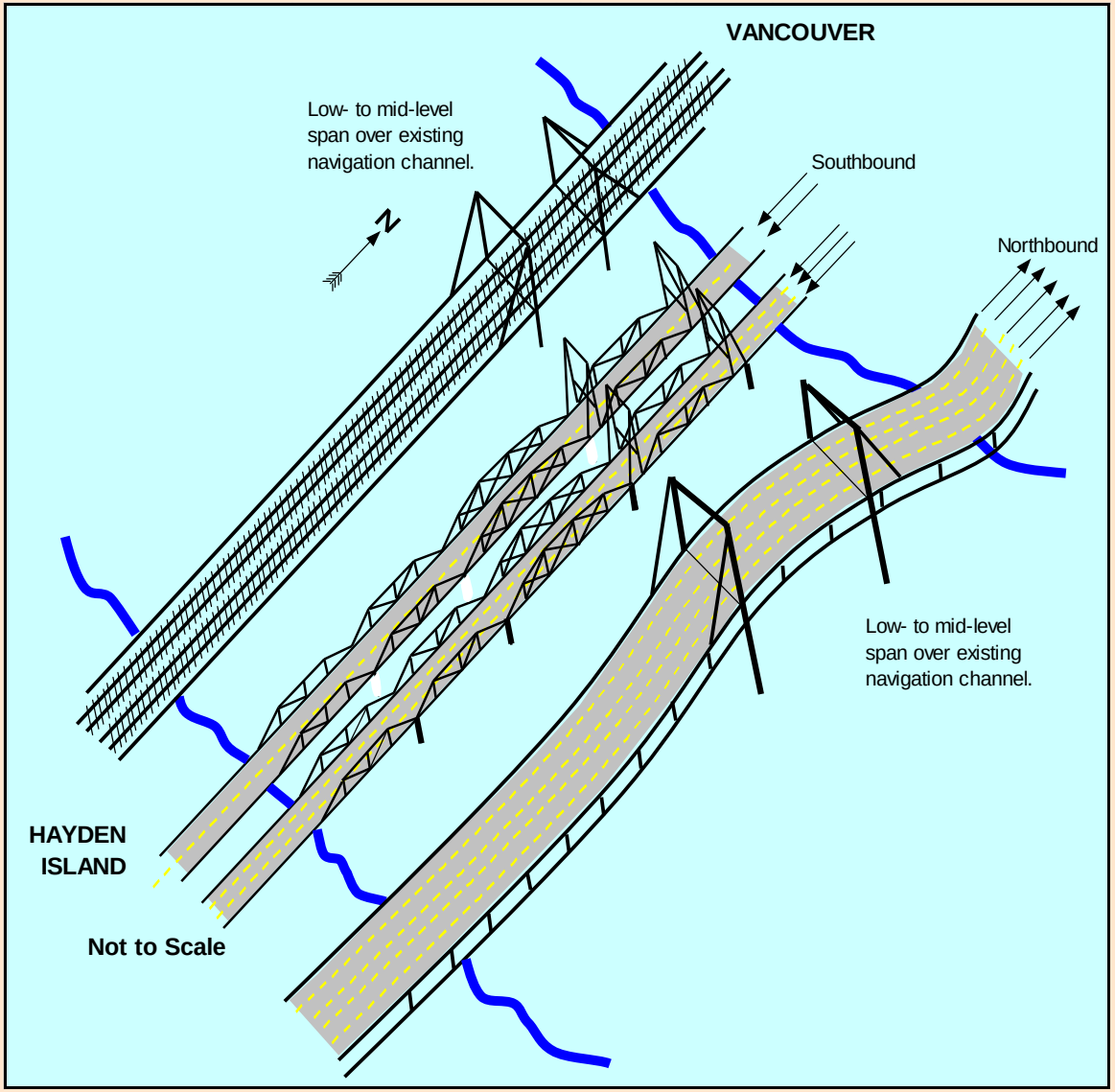


Concept 1:
Five-lane supplemental bridge w/LRT, west of existing bridges

1. Southbound traffic on new five-lane bridge, LRT on lower deck

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

3. Northbound traffic would be split between the two existing bridges



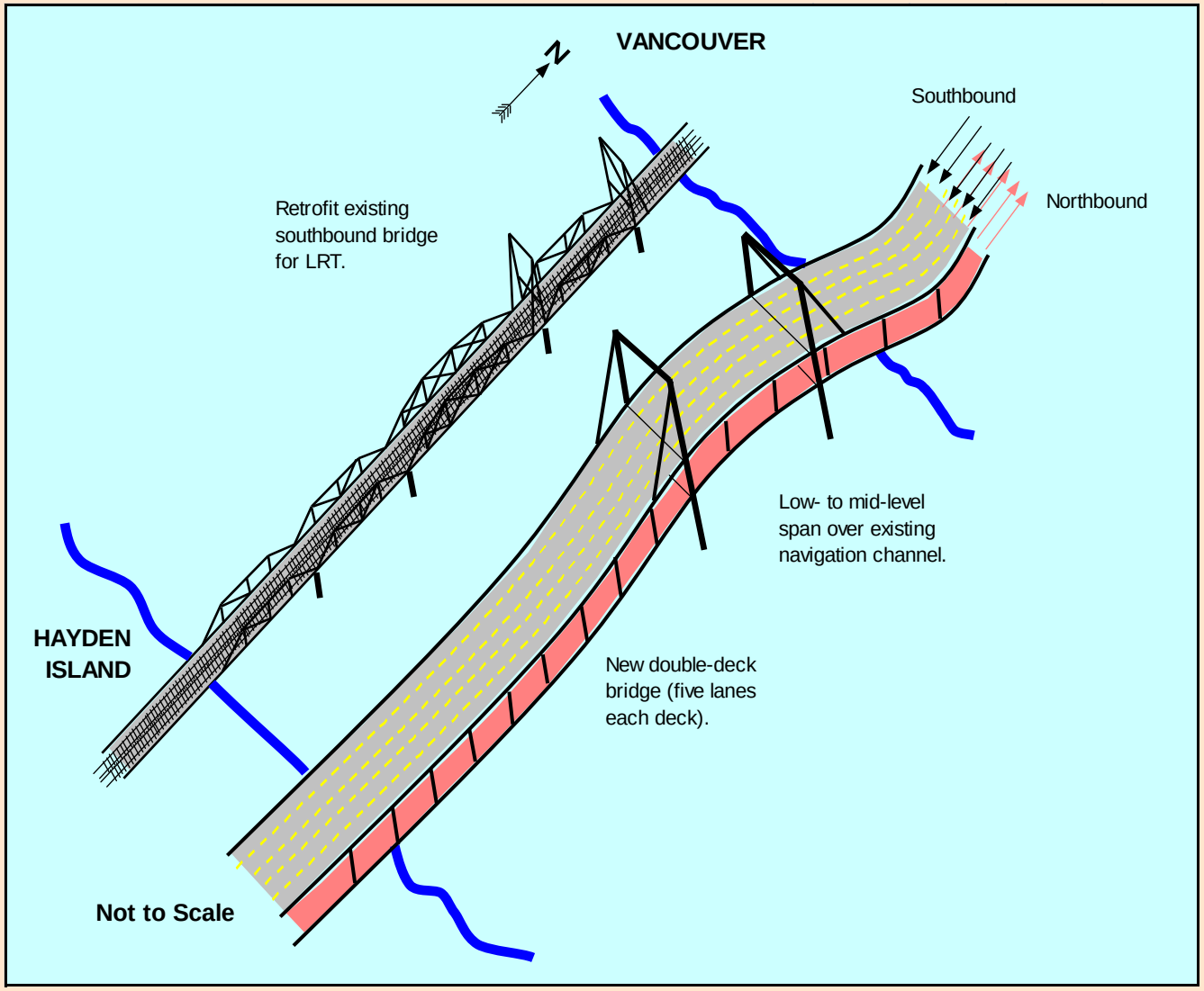
Concept 2:
Five-lane supplemental bridge east of existing bridges, separate LRT bridge to the west

1. Northbound traffic on new five-lane bridge

2. LRT on new "stand-alone" bridge

3. Low- to mid-level bridges, with lift spans over existing navigation channel

4. Southbound traffic would be split between the two existing bridges, providing five to six lanes

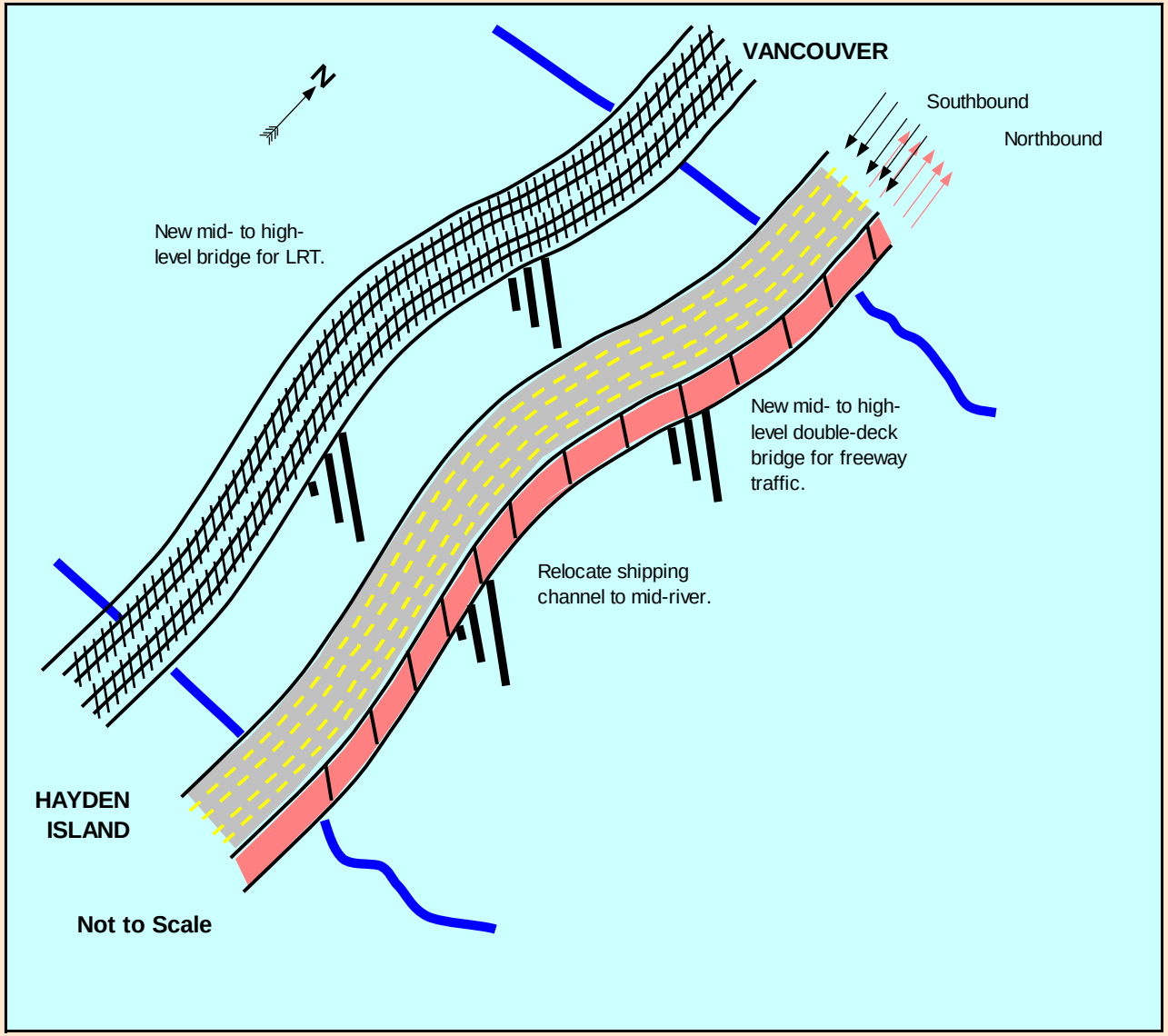


Concept 3:
Ten lanes on double-deck five-lane bridge, with LRT retrofitted on existing bridge

1. Low- to mid-level bridge with lift span over existing navigation channel

2. Requires retrofitting existing bridge for LRT

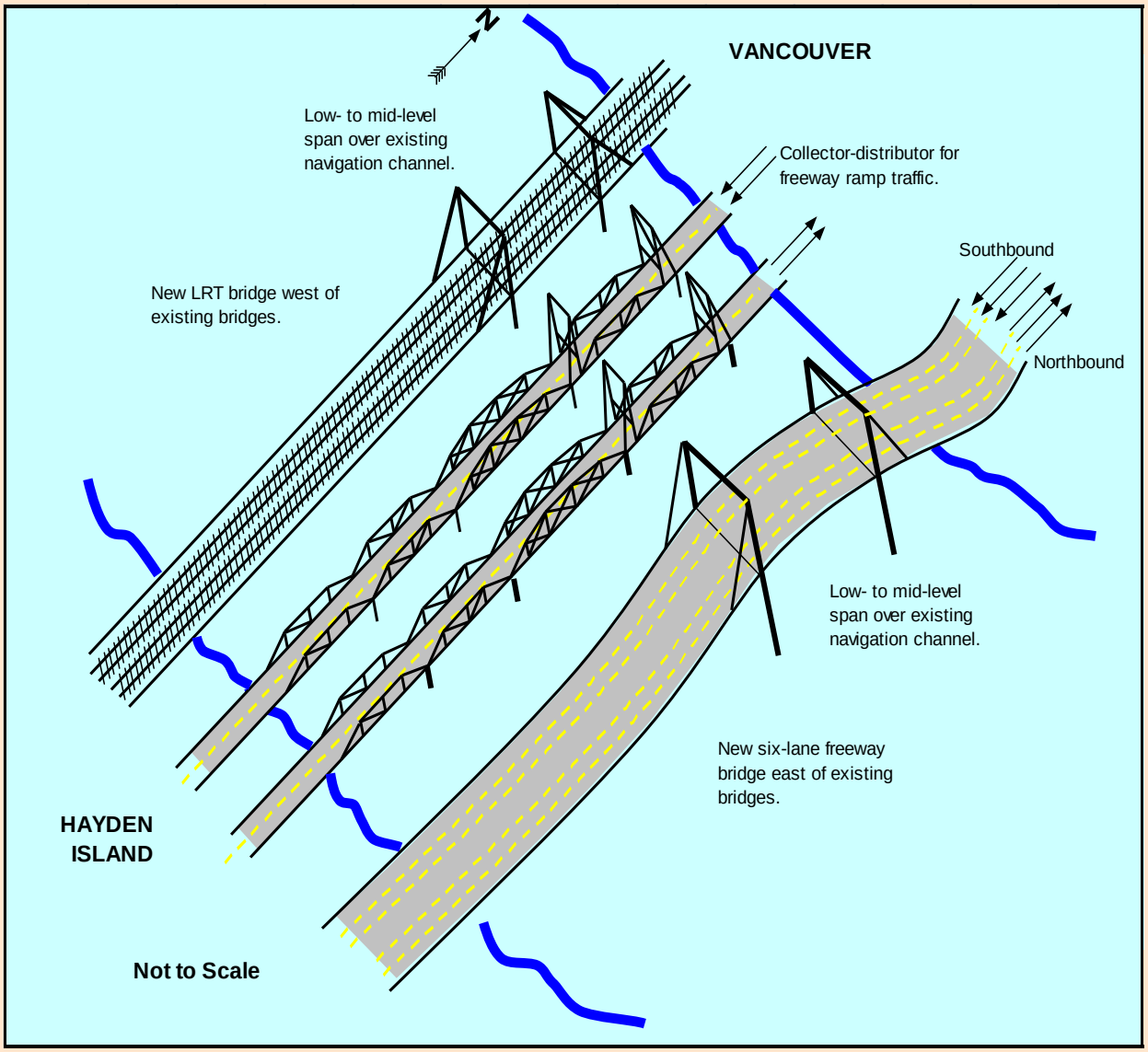
(feasibility may be questionable)



Concept 4:
Ten lanes on double-deck bridge, with 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



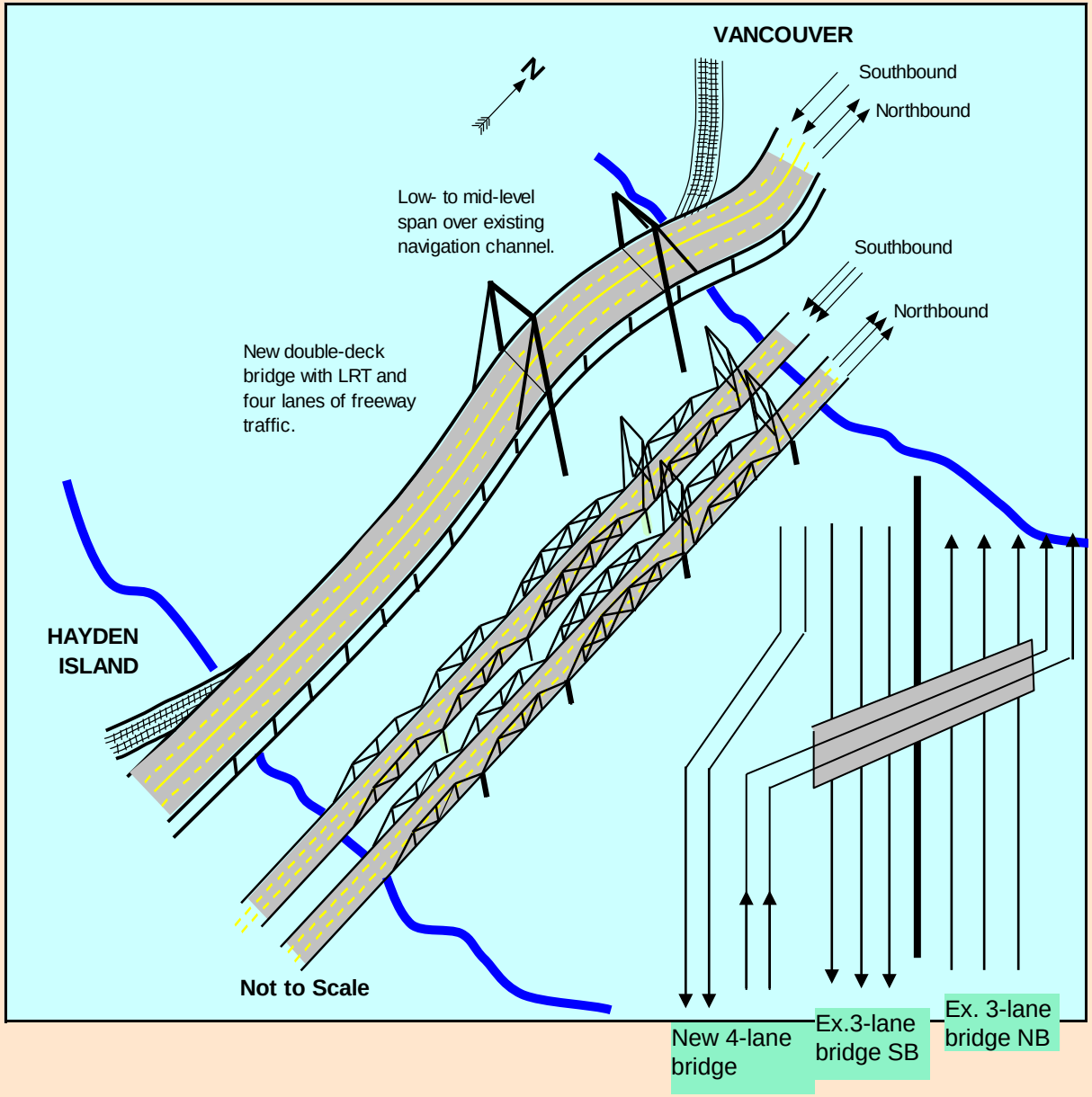
Concept 5:
New six-lane supplemental bridge, use existing bridges for collector-distributor, new LRT bridge

1. Through traffic on new six-lane bridge

2. Existing bridges used for collector-distributor (moving freeway access away from through traffic)

3. LRT on new bridge

4. Low- to mid-level bridges, with lift span over existing navigation channel

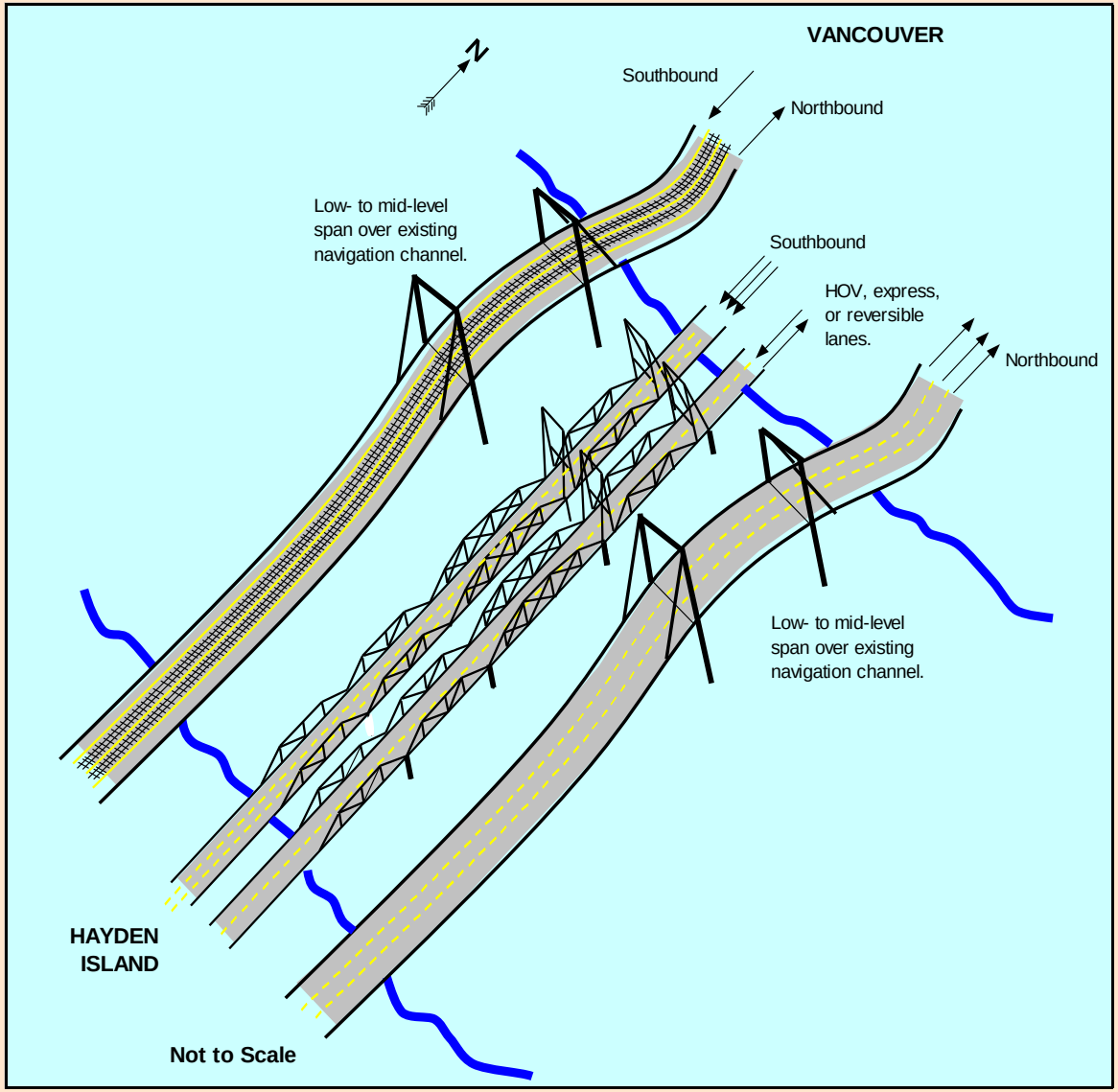


Concept 6:
Four-lane supplemental bridge w/LRT, west of existing bridges

1. Provides for new four-lane bridge with LRT

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

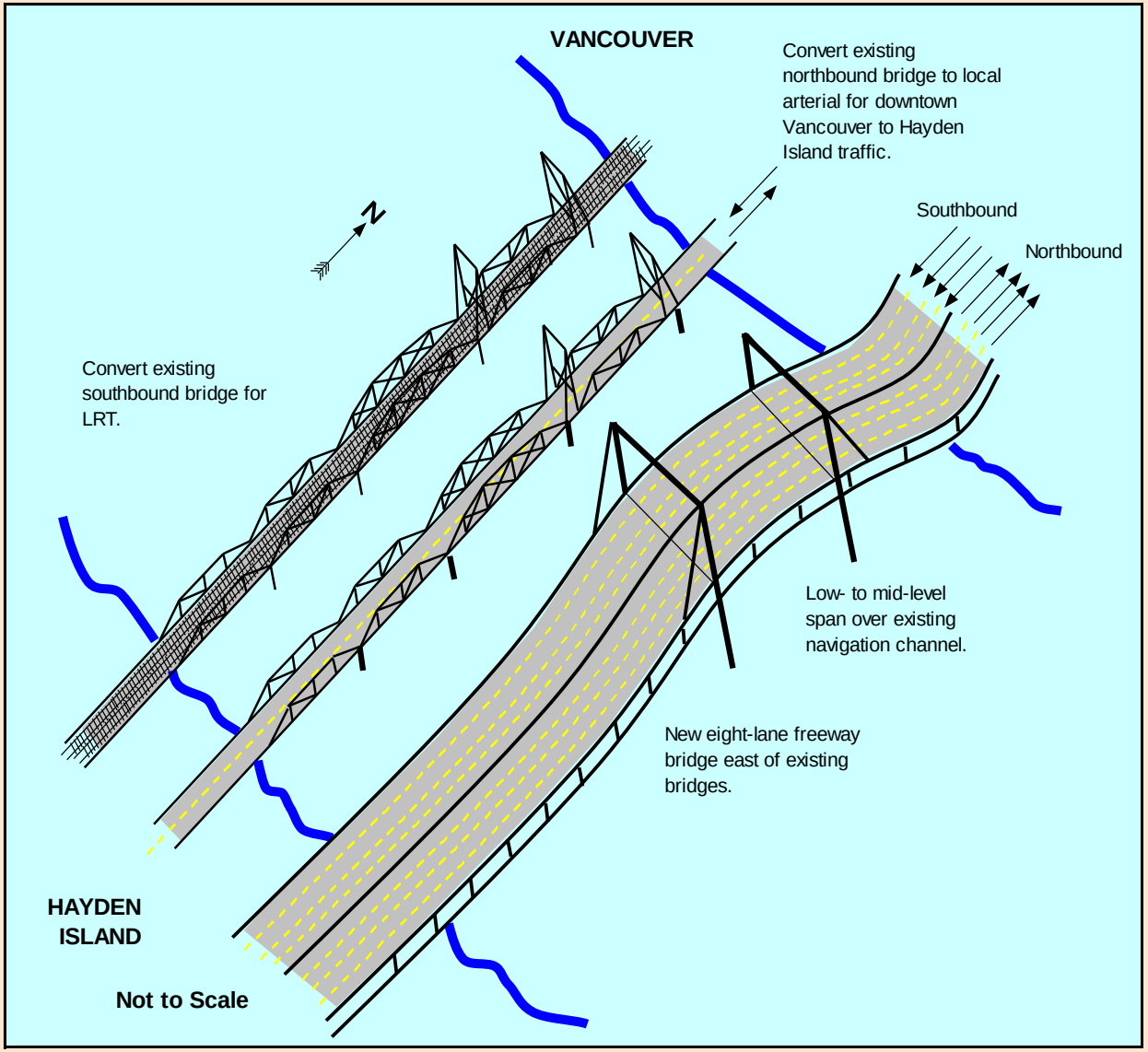


Concept 7:
LRT bridge with two-lane arterial, plus new three-lane supplemental bridge for freeway traffic

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



Concept 8:
Eight-lane supplemental bridge east of existing bridges, LRT retrofit and two-lane arterial

1. Through traffic on new eight-lane bridge

2. Existing northbound bridge converted to local arterial between Hayden Island and downtown Vancouver

3. LRT on retrofitted southbound bridge

4. Low- to mid-level bridge, with lift span over existing navigation channel

River Crossing Concepts Evaluated

Concepts with ten freeway lanes (#1-4):

1: New five lane southbound bridge with LRT

4: New double deck freeway bridge, with separate new LRT bridge

Concepts with 6 freeway lanes plus 4-lane CD system(#5-6)

6: New four lane/LRT bridge for ramp traffic

Concepts with 8 freeway lanes and 2 arterial lanes (#7-8)

7: New LRT bridge with two arterial lanes, plus new three lane freeway bridge

Transportation Performance

Findings

- Additional freeway capacity is needed to address the “bottleneck” caused by the existing bridges and to serve future demand.
- Additional river-crossing capacity plus interchange improvements significantly enhance system performance compared to today and compared to 2020 priority baseline.
- Concepts with 10 freeway lanes, and concepts with 8 freeway plus arterial lanes, appear promising. Trade-offs to be evaluated in future studies should include the balance of traffic on the freeway vs. local streets.

Findings

- Concepts that split freeway traffic across the river (i.e., supplemental bridge plus existing bridge) do not perform as well as concepts that keep traffic in contiguous lanes.
- HOV utilization and performance is highly dependent on the facilities provided:
  - Additional river crossing capacity is needed for HOV system continuity
  - Direct access ramps should be considered at key locations (i.e., SR 500)
  - Bridge design affects HOV performance (separated bridges limit access)
- add arterial summary bullet

Performance Measures

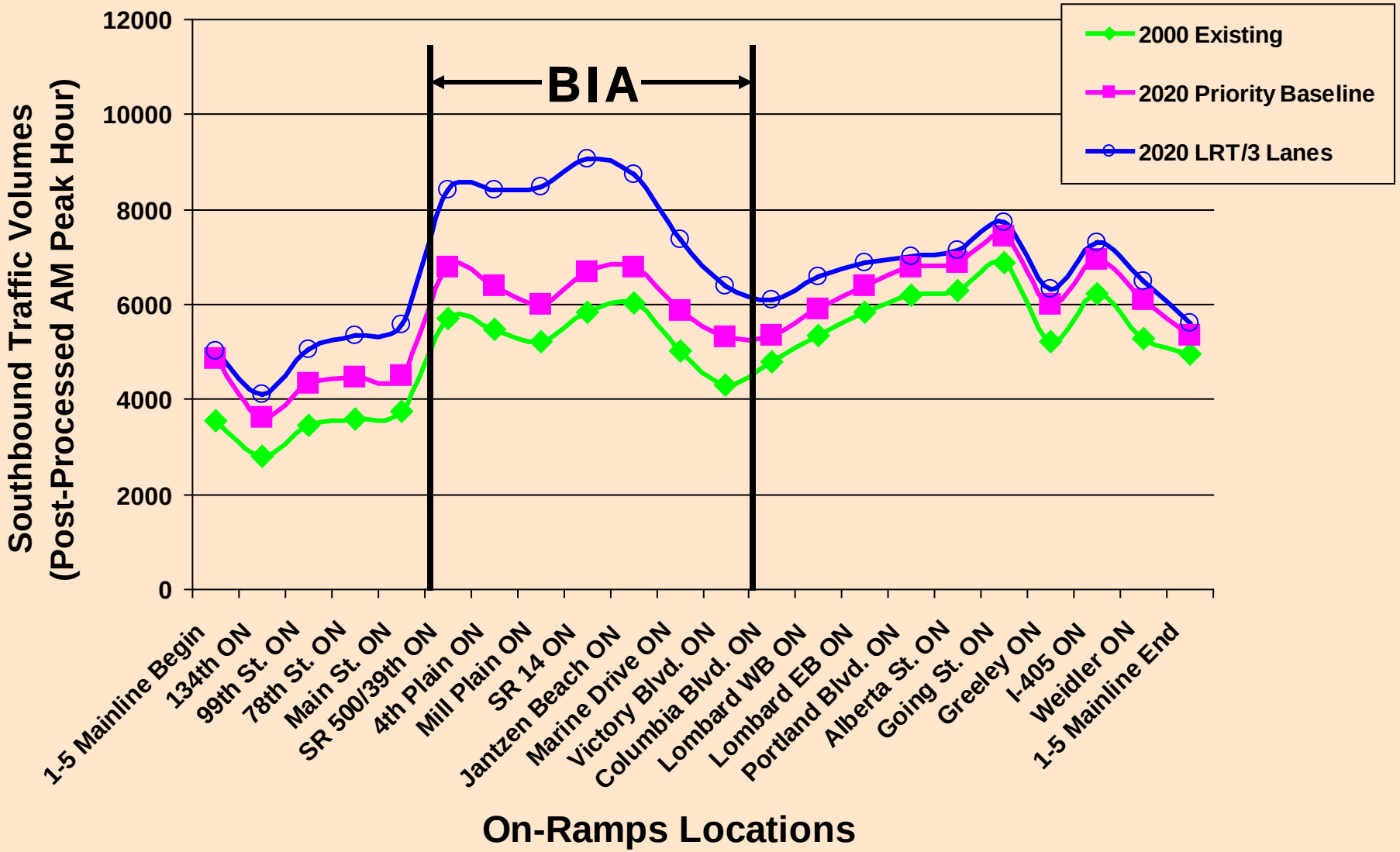
- Bridge Influence Area (BIA) Freeway Performance
- Arterial River Crossing Performance
- Regional Changes in Travel Volumes on Affected Arterials

Bridge Influence Area
Freeway Measures of Effectiveness

- Traffic Volumes
- Travel Time
- Speed
- Delay
- Queuing

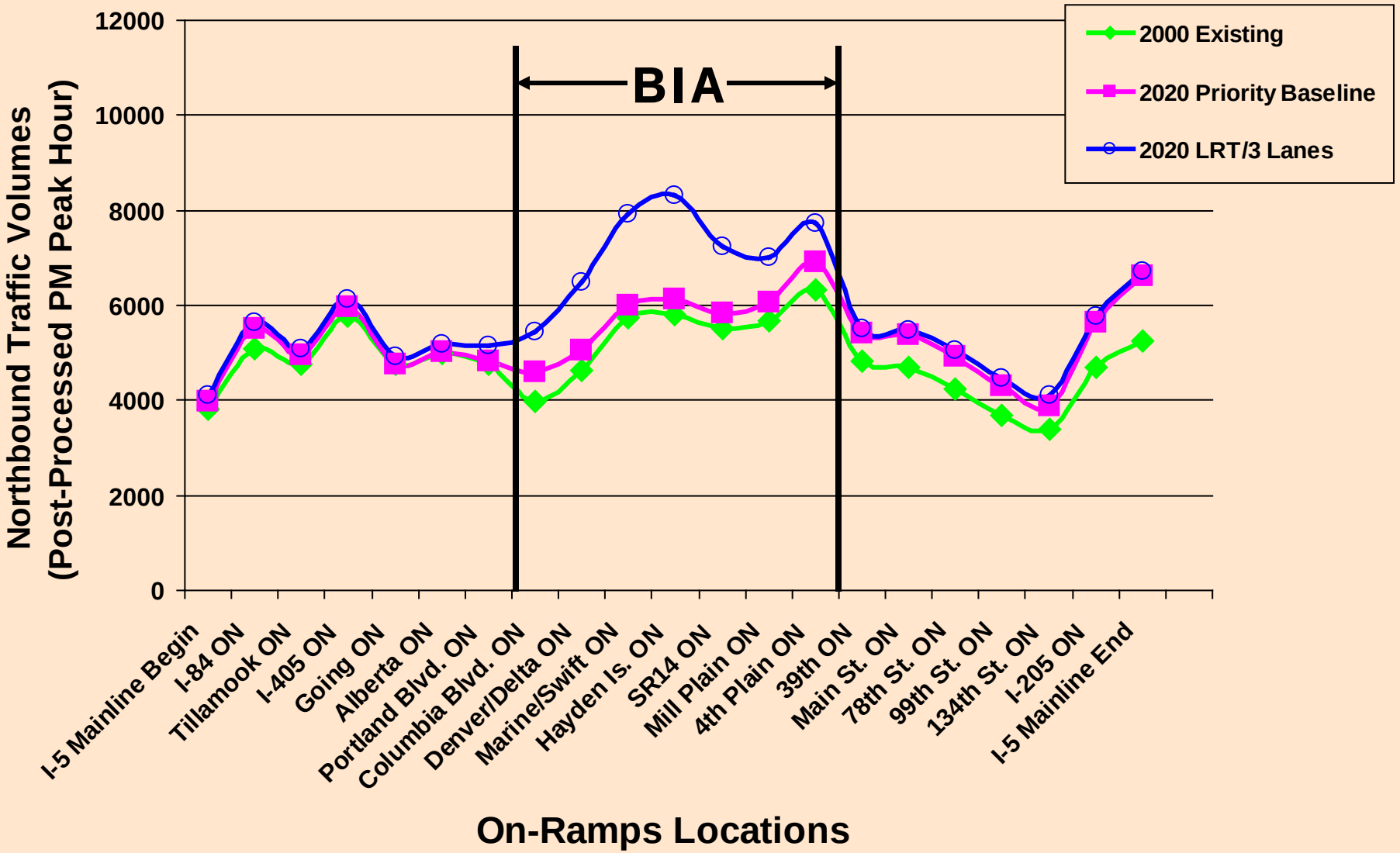
Southbound Travel Demands

Along I-5 (AM Peak Hour)



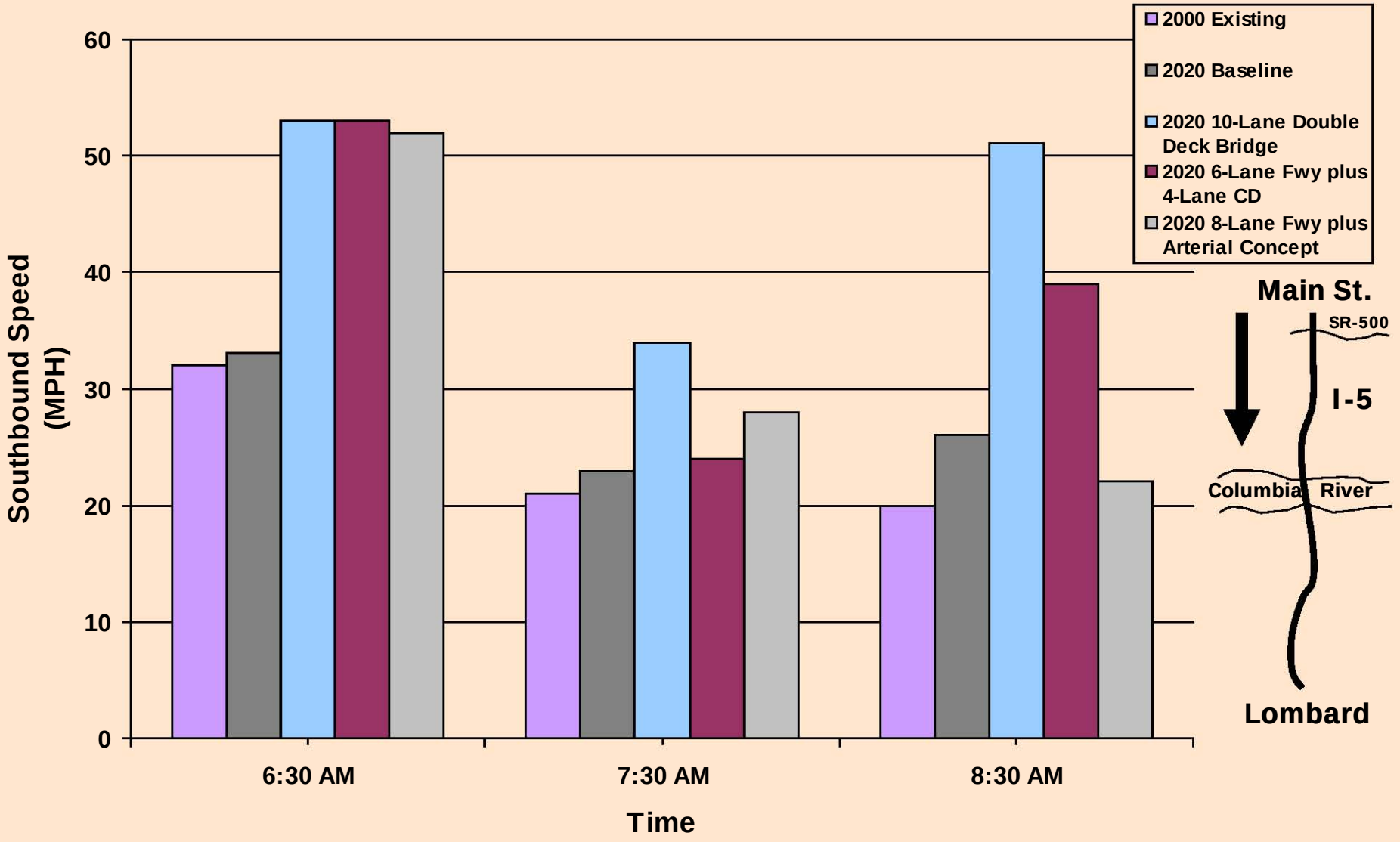
Northbound Travel Demands

Along I-5 (PM Peak Hour)



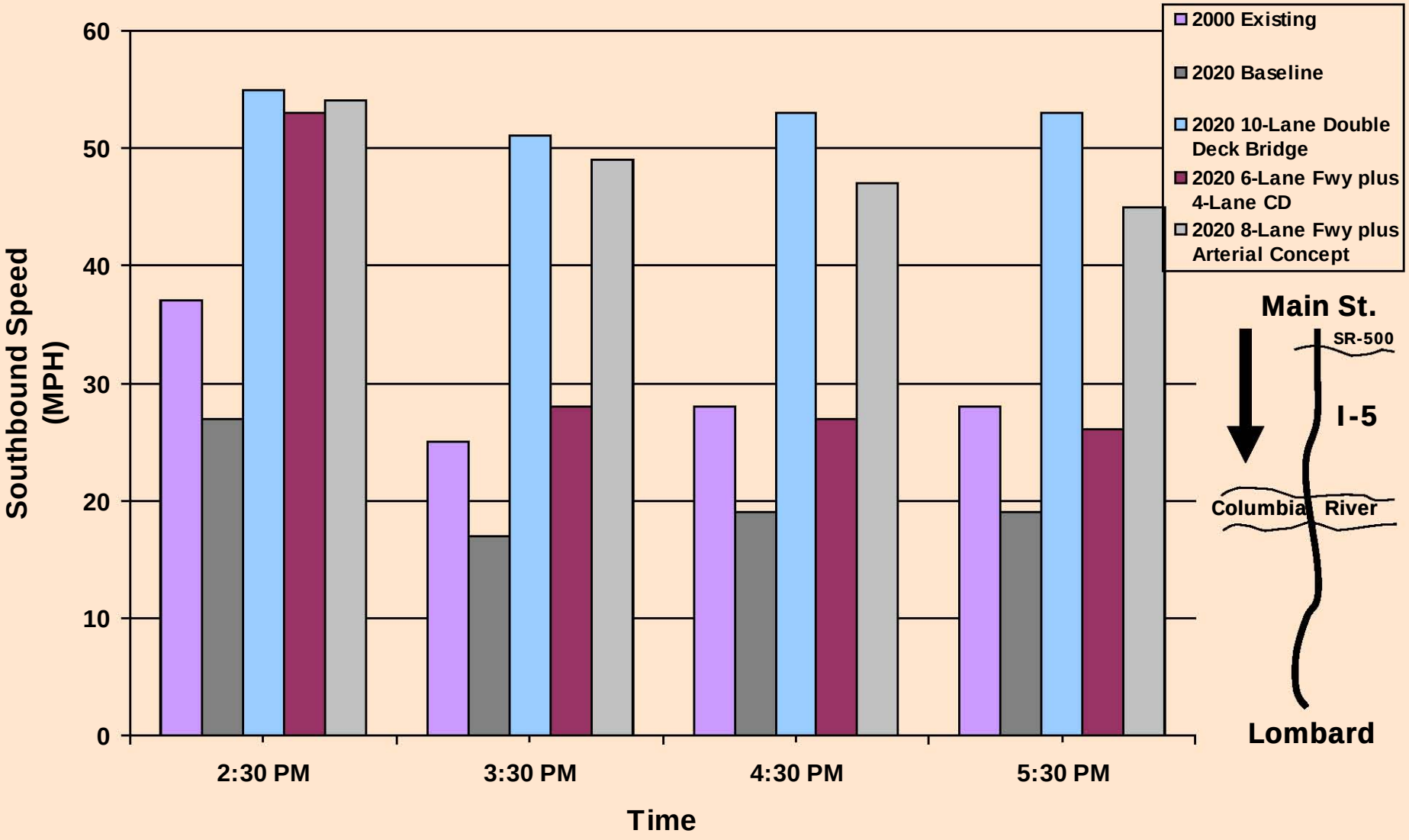
Average Speed

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



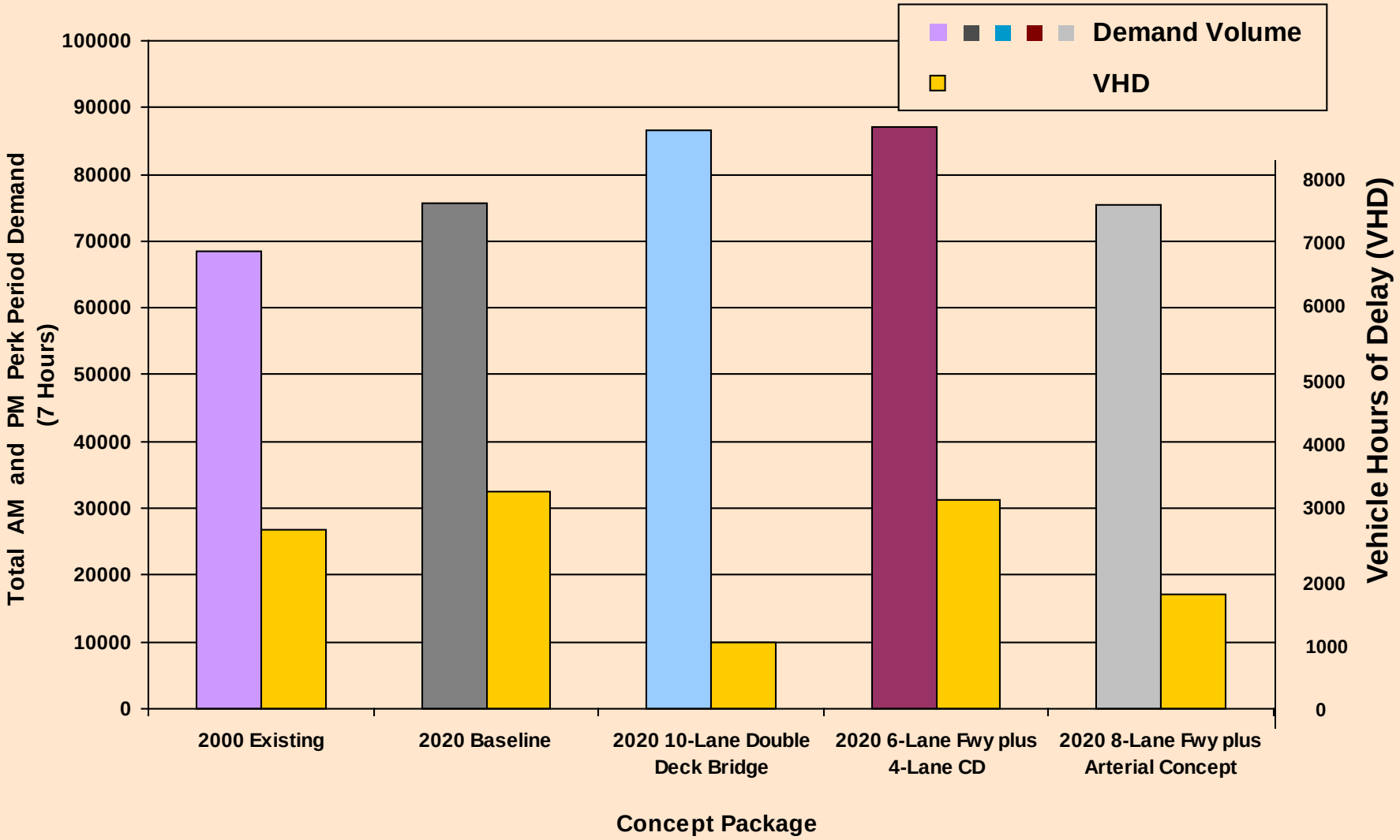
Average Speed

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

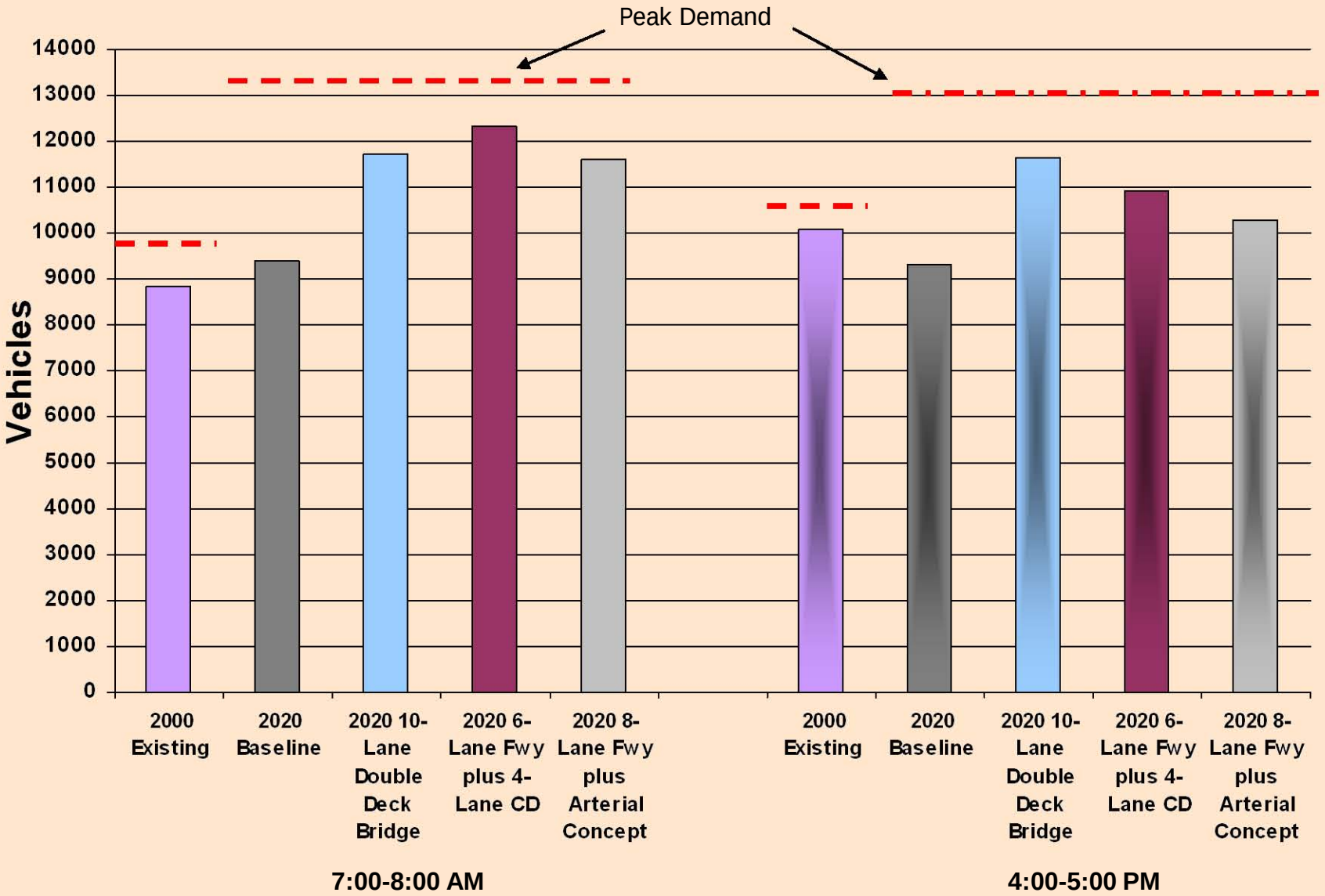


Demand and Vehicle Hours of Delay

(AM and PM Peak Periods)



Served Demand
AM and PM Peak Hours



Two-Lane Arterial Results

- Projected Demands vs. Capacity
- Travel Patterns
- Travel Distances

Arterial Travel Demands

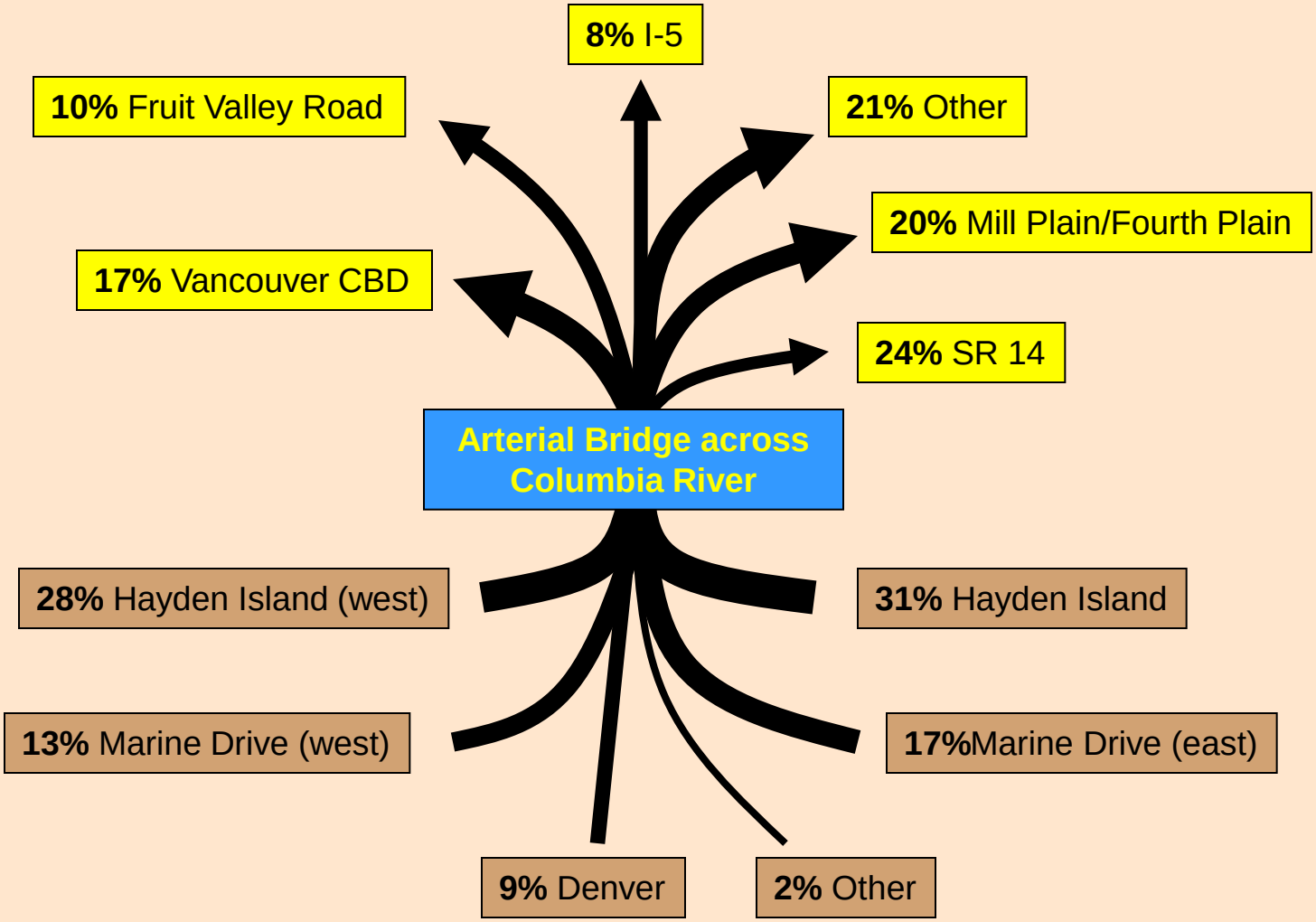
- Two-lane arterial modeled from:
  - Vancouver CBD to Hayden Island
  - Hayden Island to Marine Drive
  - Marine Drive to Denver Avenue
- Vancouver CBD - Hayden Island segment would operate at capacity conditions during PM peak - slightly under during AM peak

Arterial Travel Demands

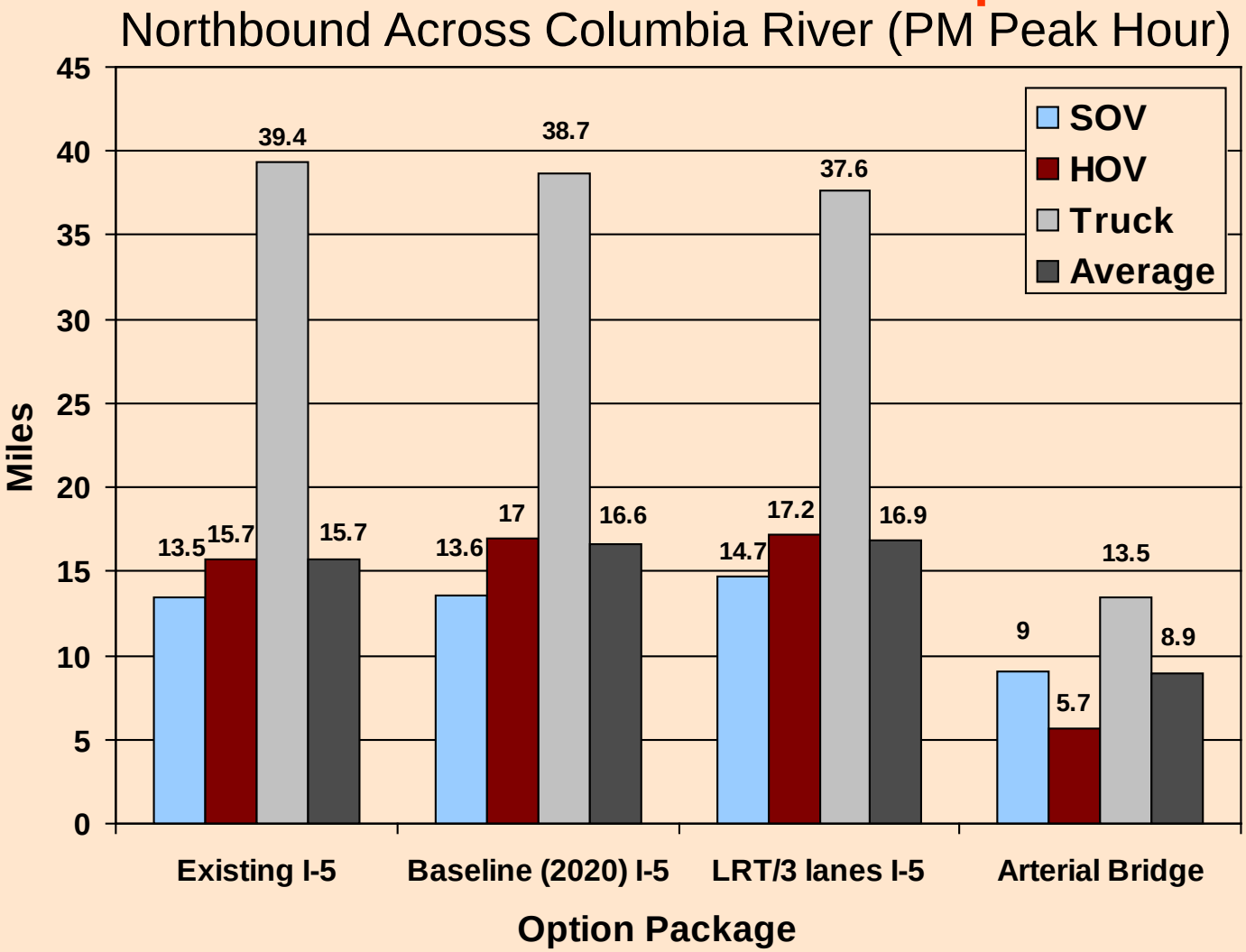
- 10% of PM Arterial traffic from/to I-5
- 24% of AM Arterial traffic from/to I-5
- Arterial reduces peak direction volumes on I-5 bridge by 1,100 - 1,500 during peak hour

Arterial Travel Patterns

Northbound Across Columbia River (PM Peak Period)



Average Trip Distances - Dave needs to ask Metro for Mainline Results for Option 7

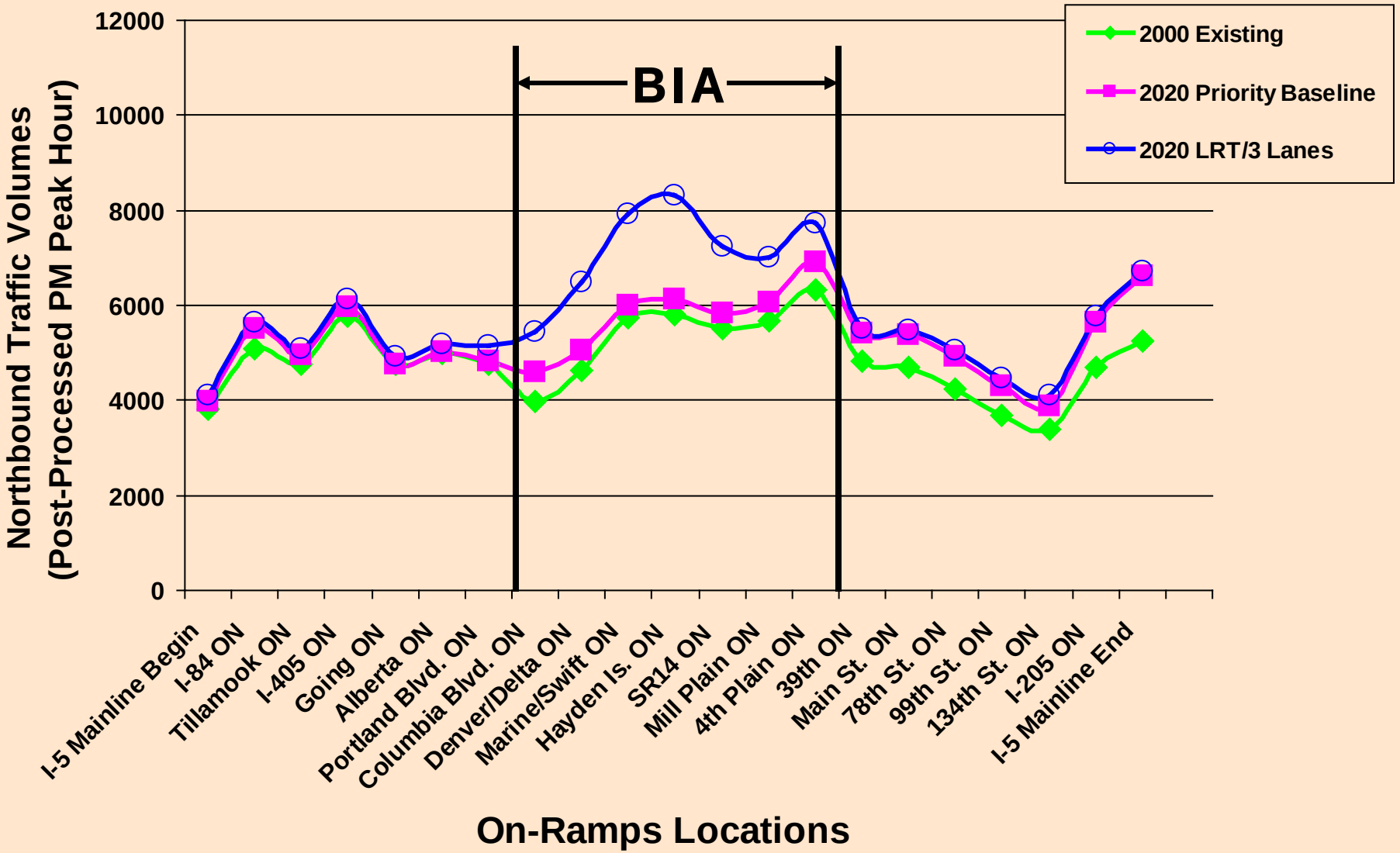


Changes in Volumes on Affected Roadways

- Freeway System
- Arterials

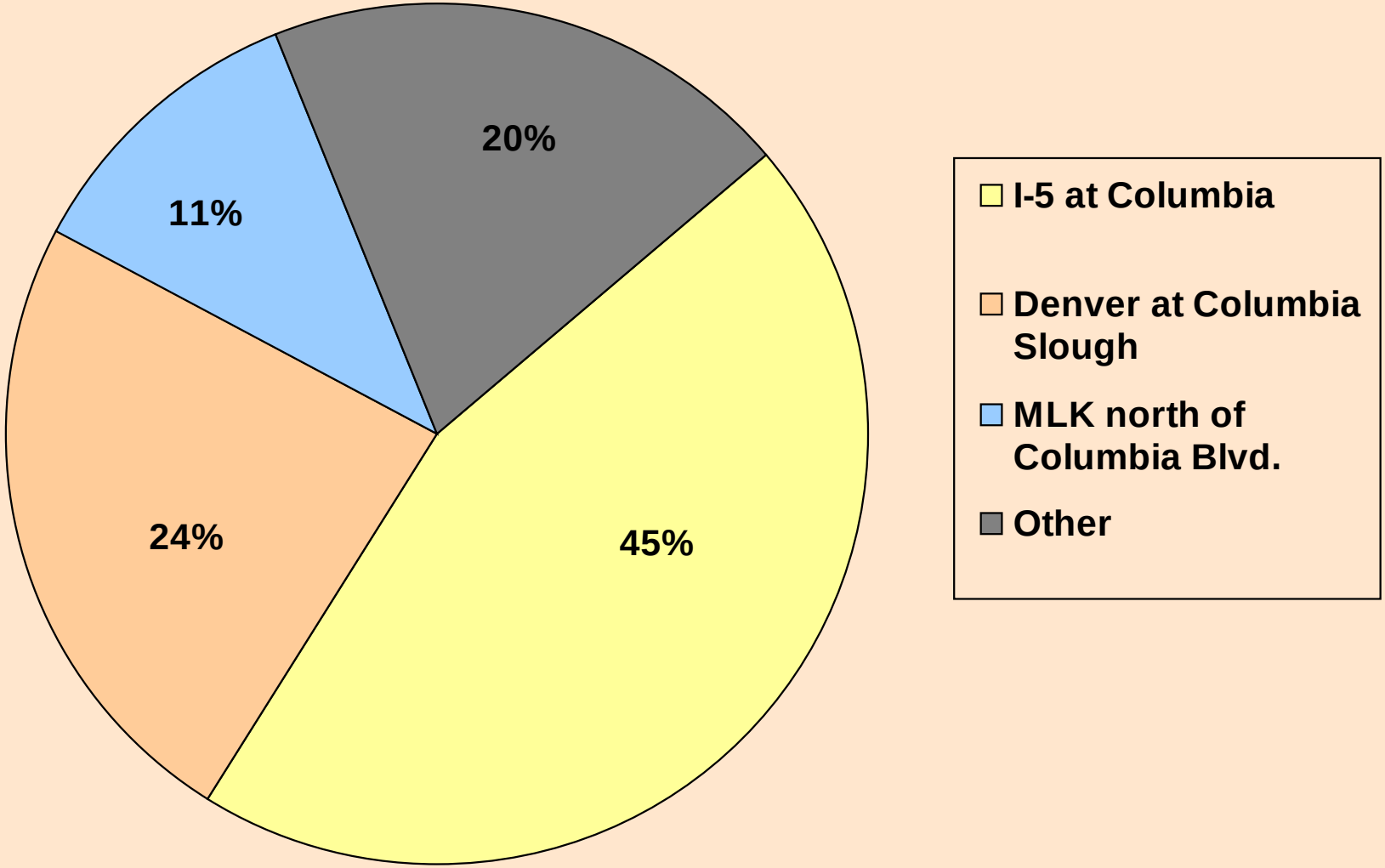
Northbound Travel Demands

Along I-5 (PM Peak Hour)



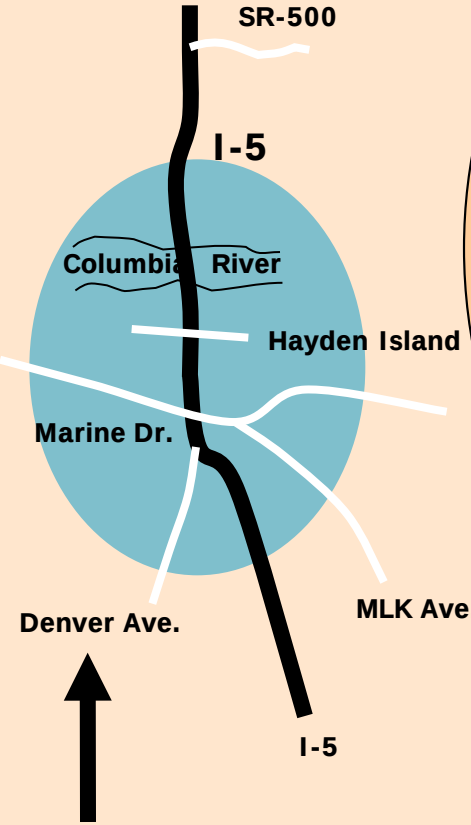
Increased Trips Across the Columbia River from Major Arterials

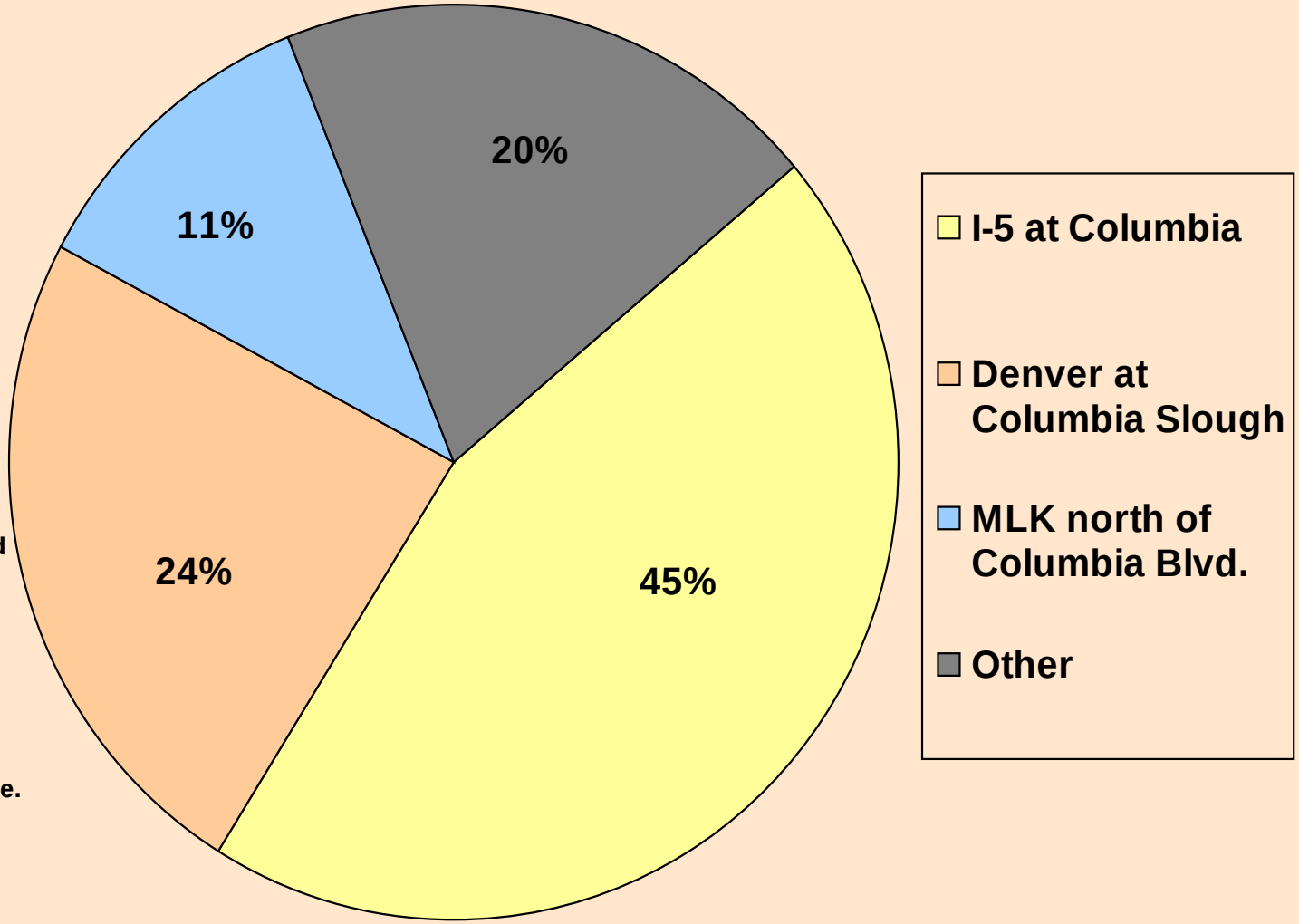
Northbound traveling to I-5 Columbia River Bridge (PM Peak Period)



Traffic Distribution of Increased Trips Across the Columbia River

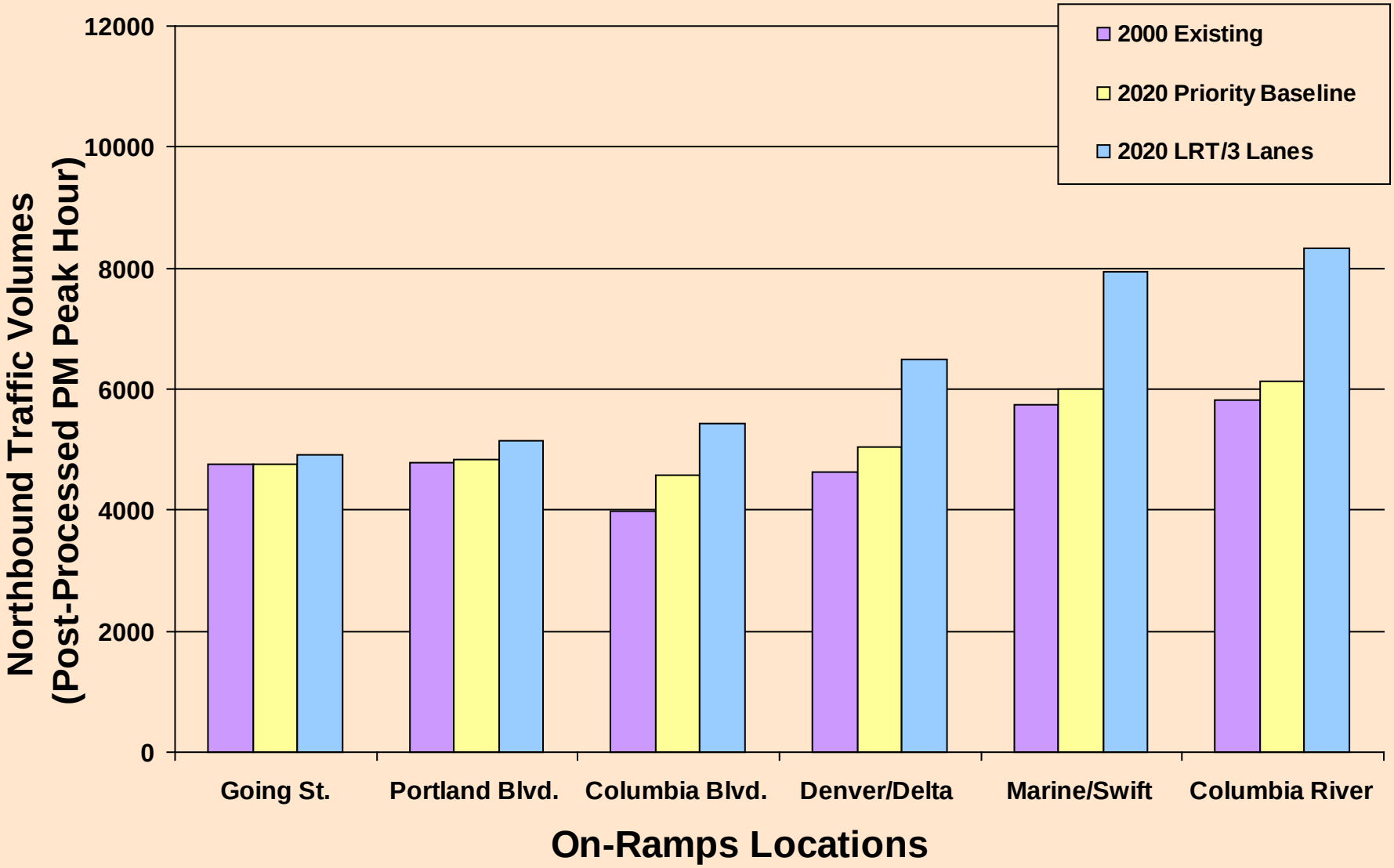
Northbound traveling to I-5 Columbia River Bridge (PM Peak Period)





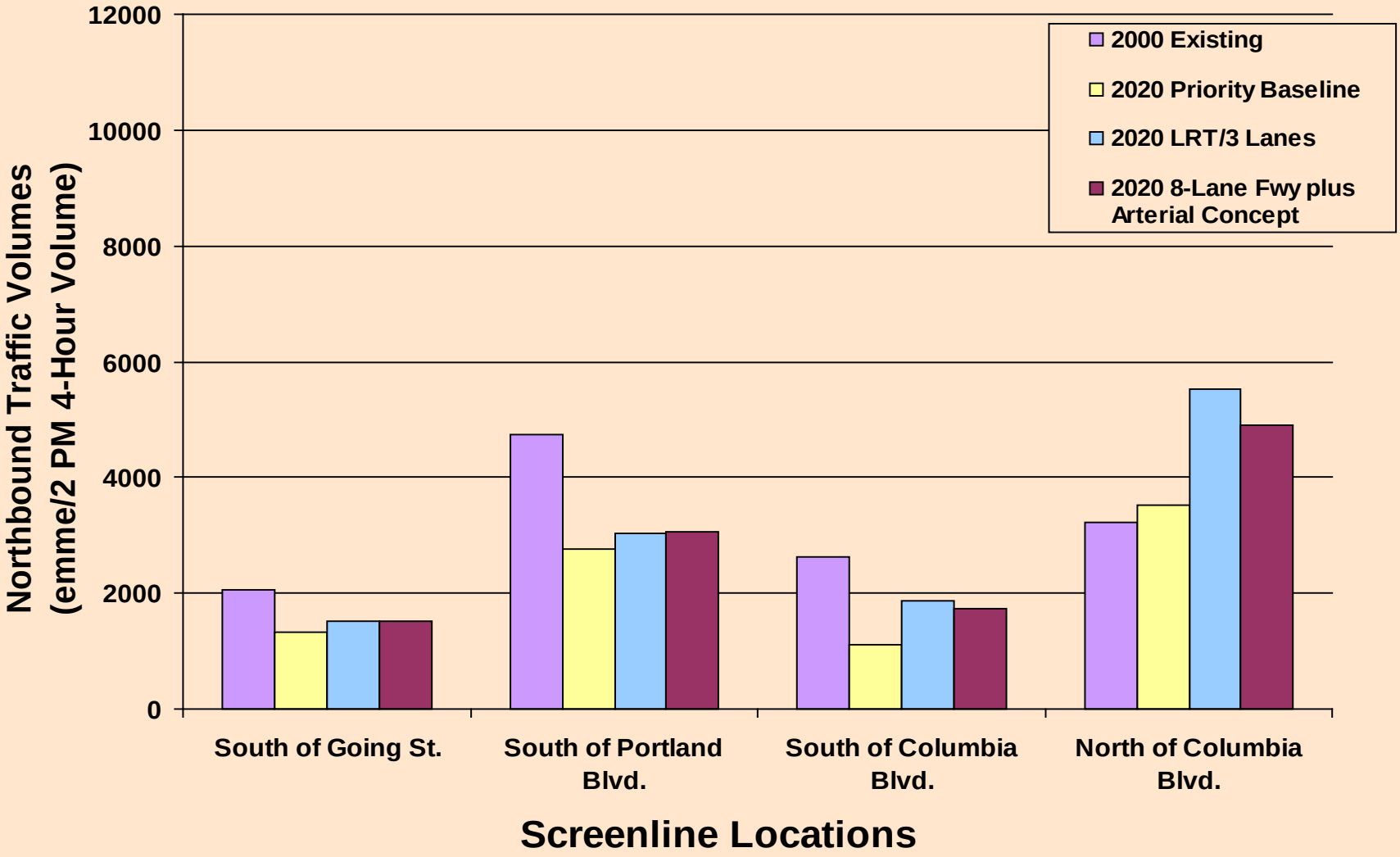
Northbound Travel Demands

Along I-5 (PM Peak Hour)



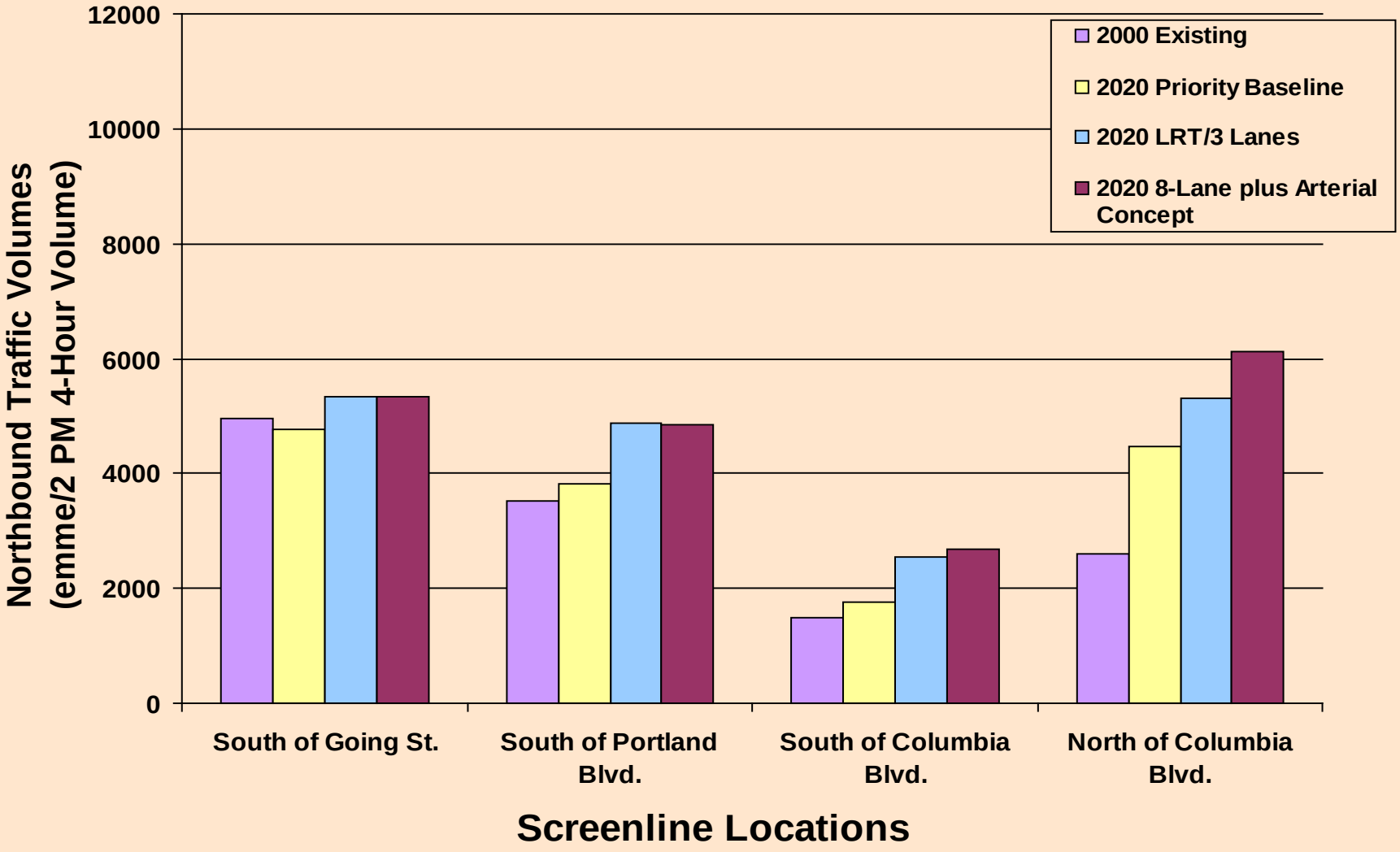
Northbound Travel Demands

Along Denver/Interstate Corridor (PM Peak Period)



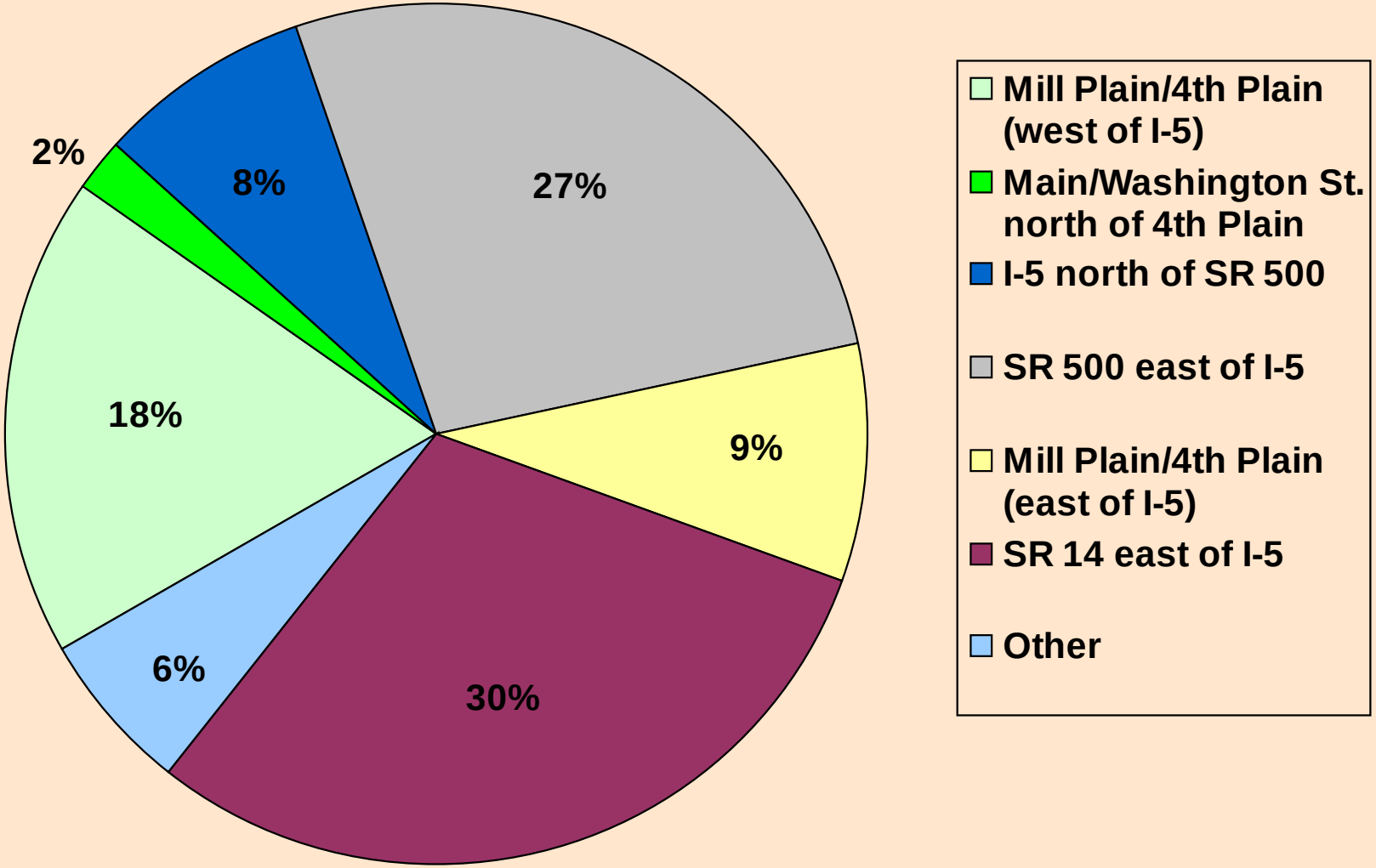
Northbound Travel Demands

Along MLK Blvd. Corridor (PM Peak Period)



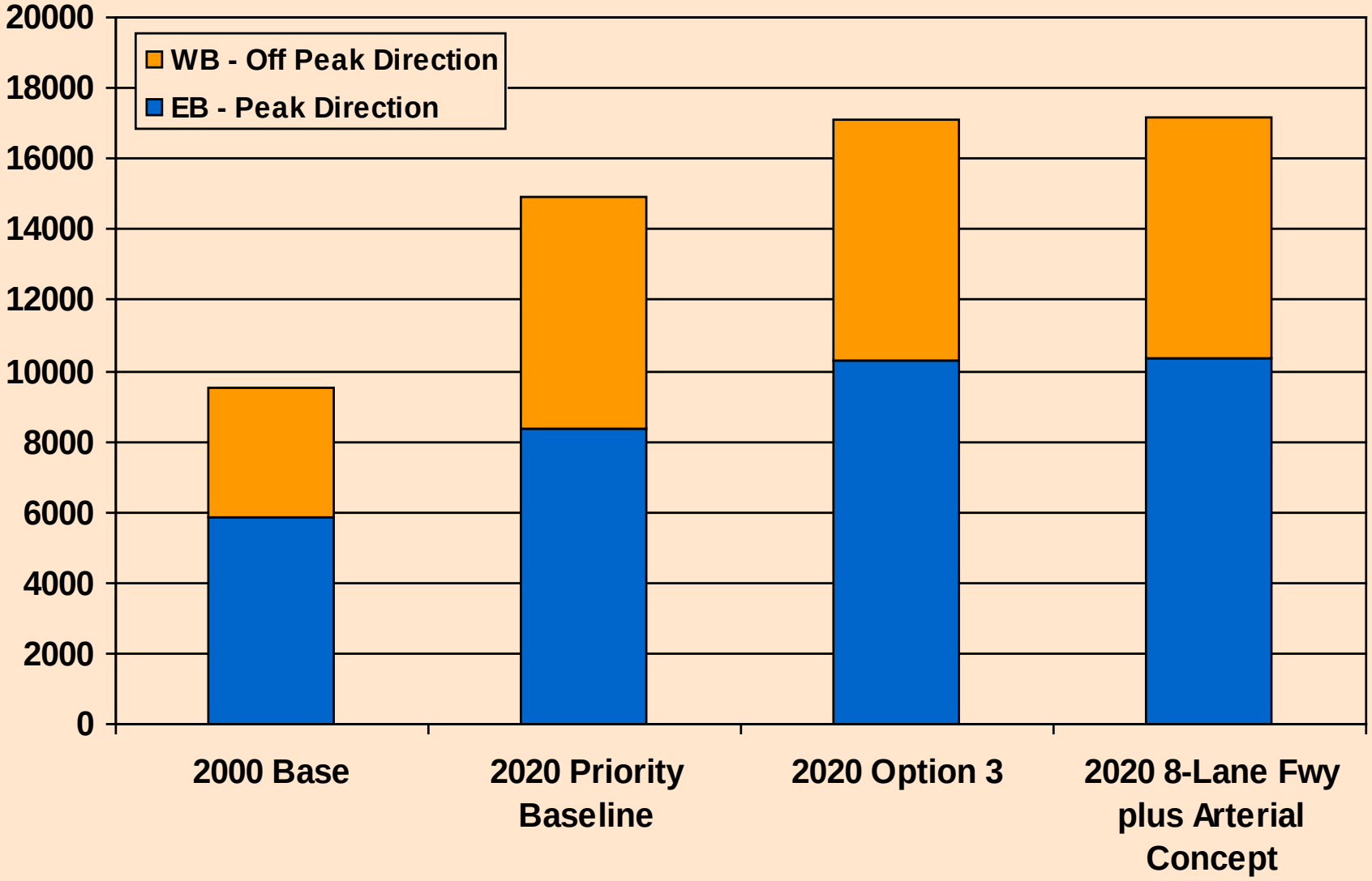
Traffic Distribution of Increased Trips Across the Columbia River

Northbound traveling to I-5 Columbia River Bridge (PM Peak Period)



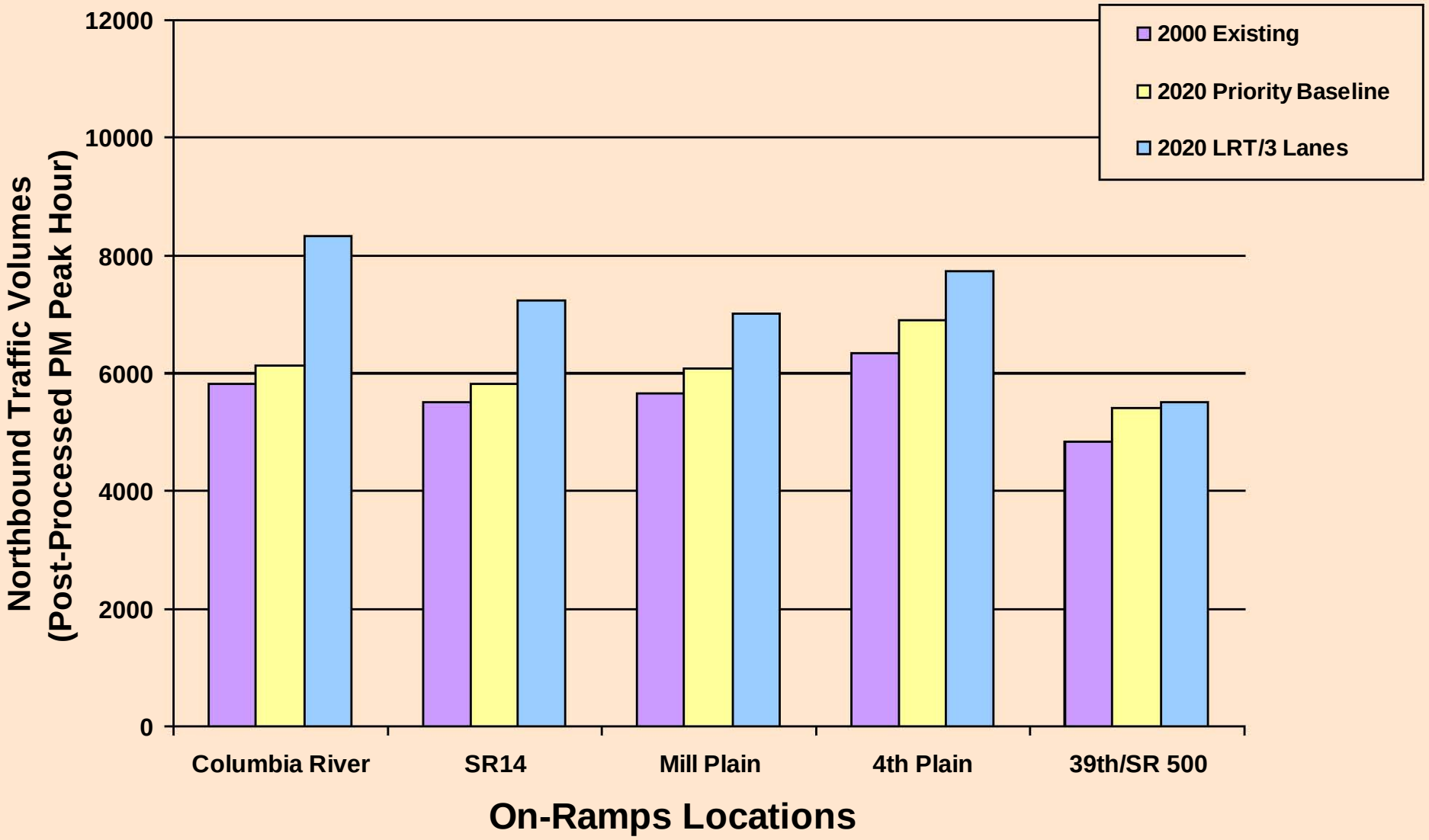
SR 500 - east of I-5

(4-Hour PM emme/2)



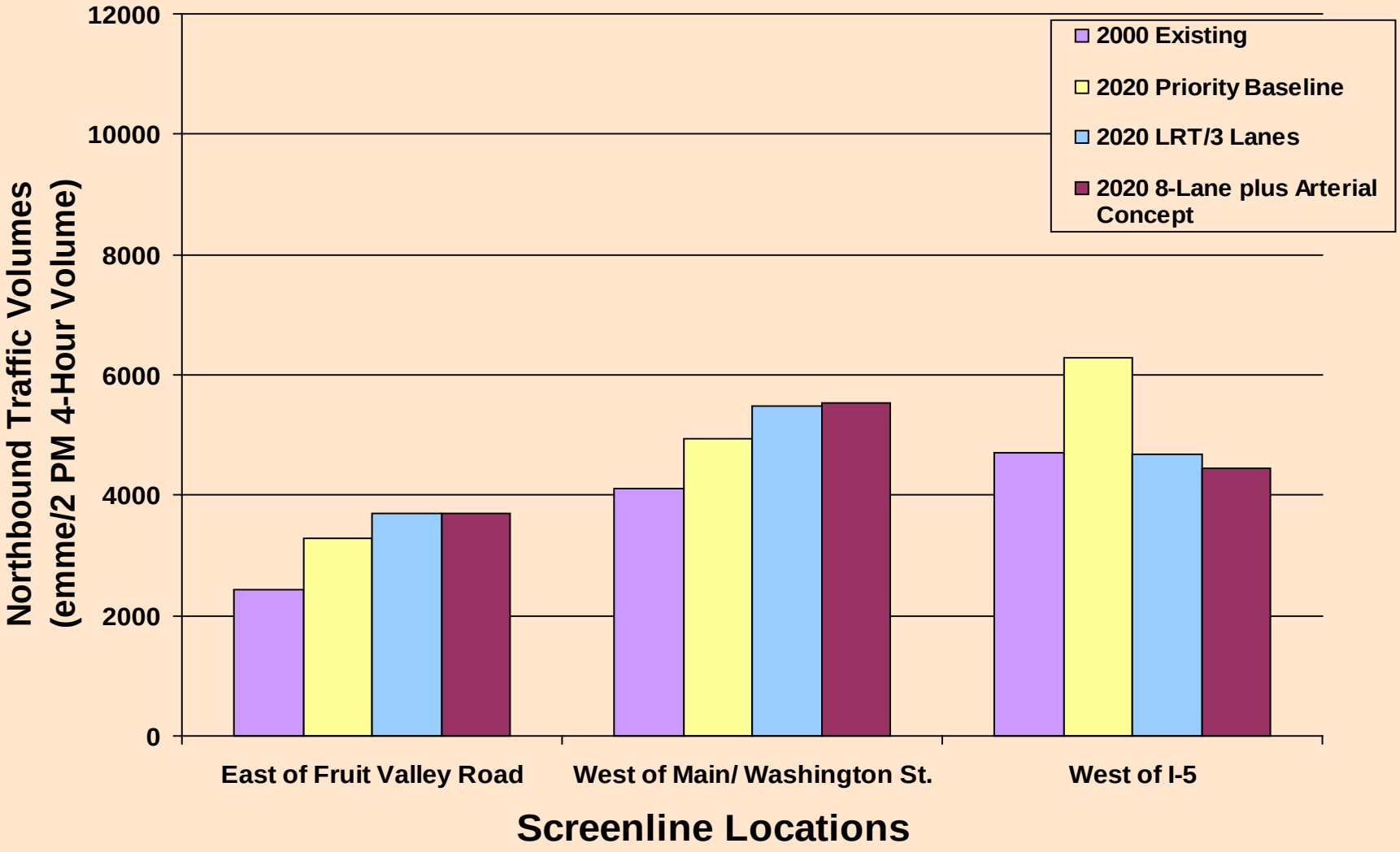
Northbound Travel Demands

Along I-5 (PM Peak Hour)



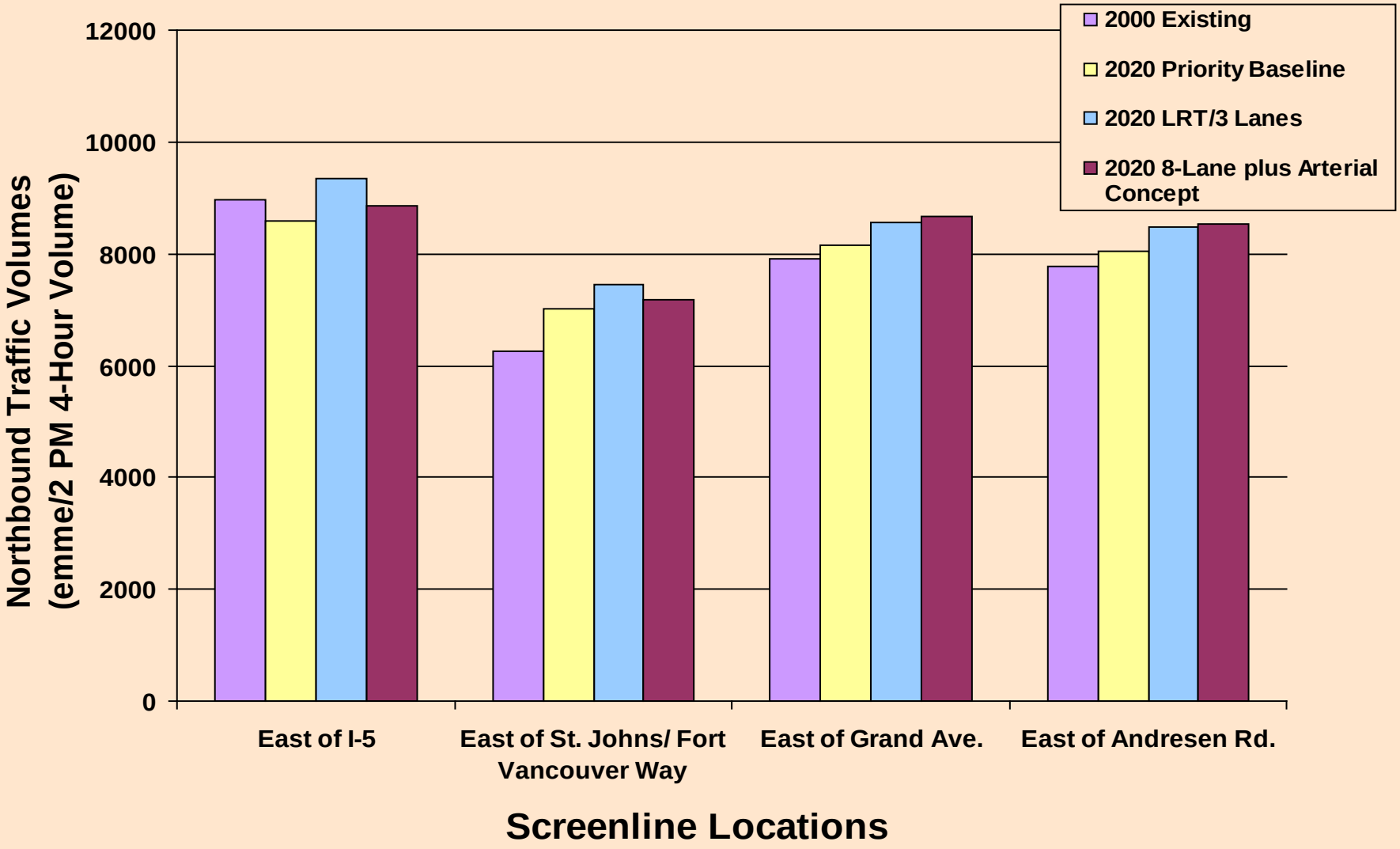
Northbound Travel Demands

Along Mill Plain/4th Plain Blvds. - west of I-5 (PM Peak Period)



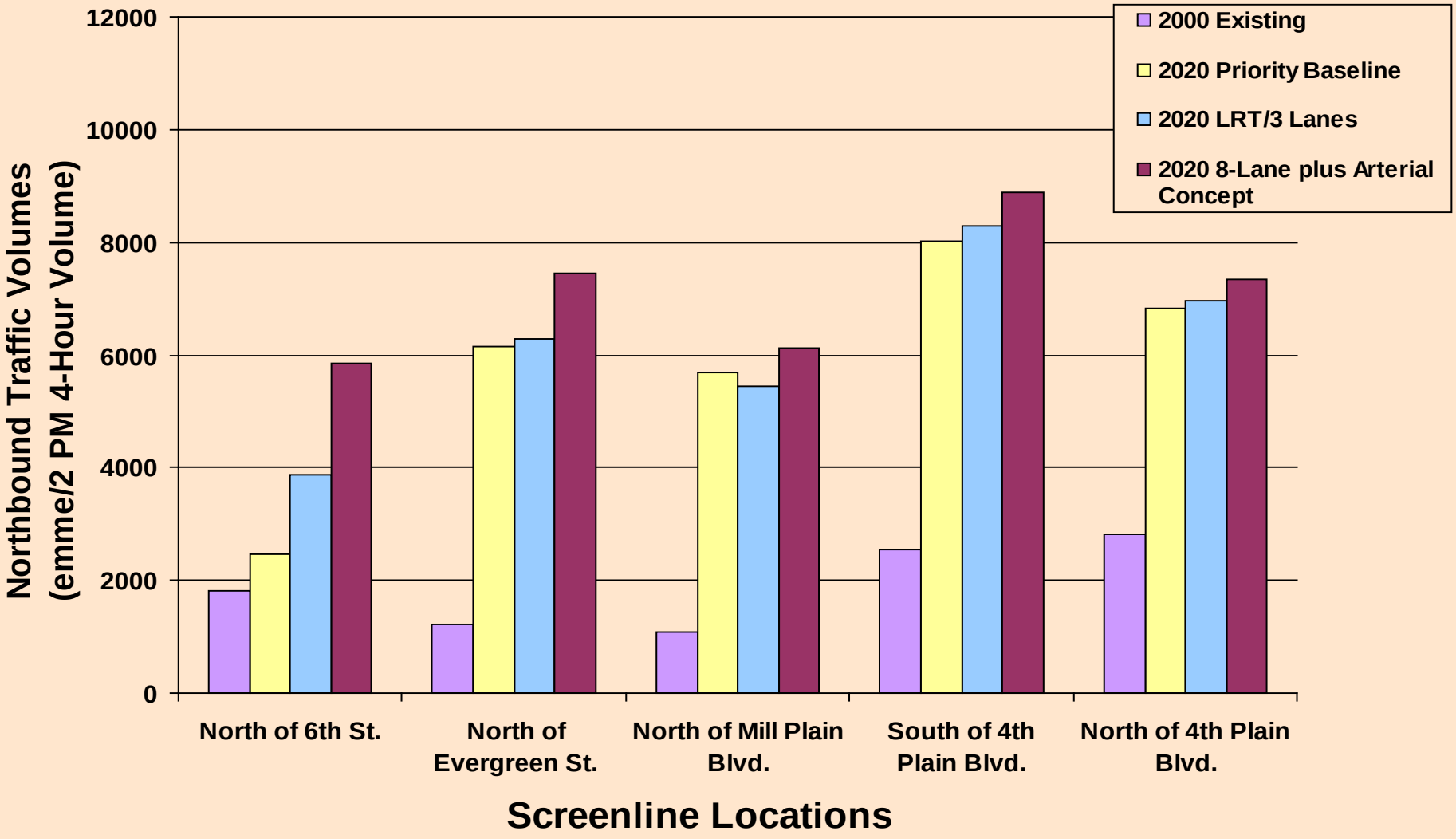
Northbound Travel Demands

Along Mill Plain/4th Plain Blvds. - east of I-5 (PM Peak Period)



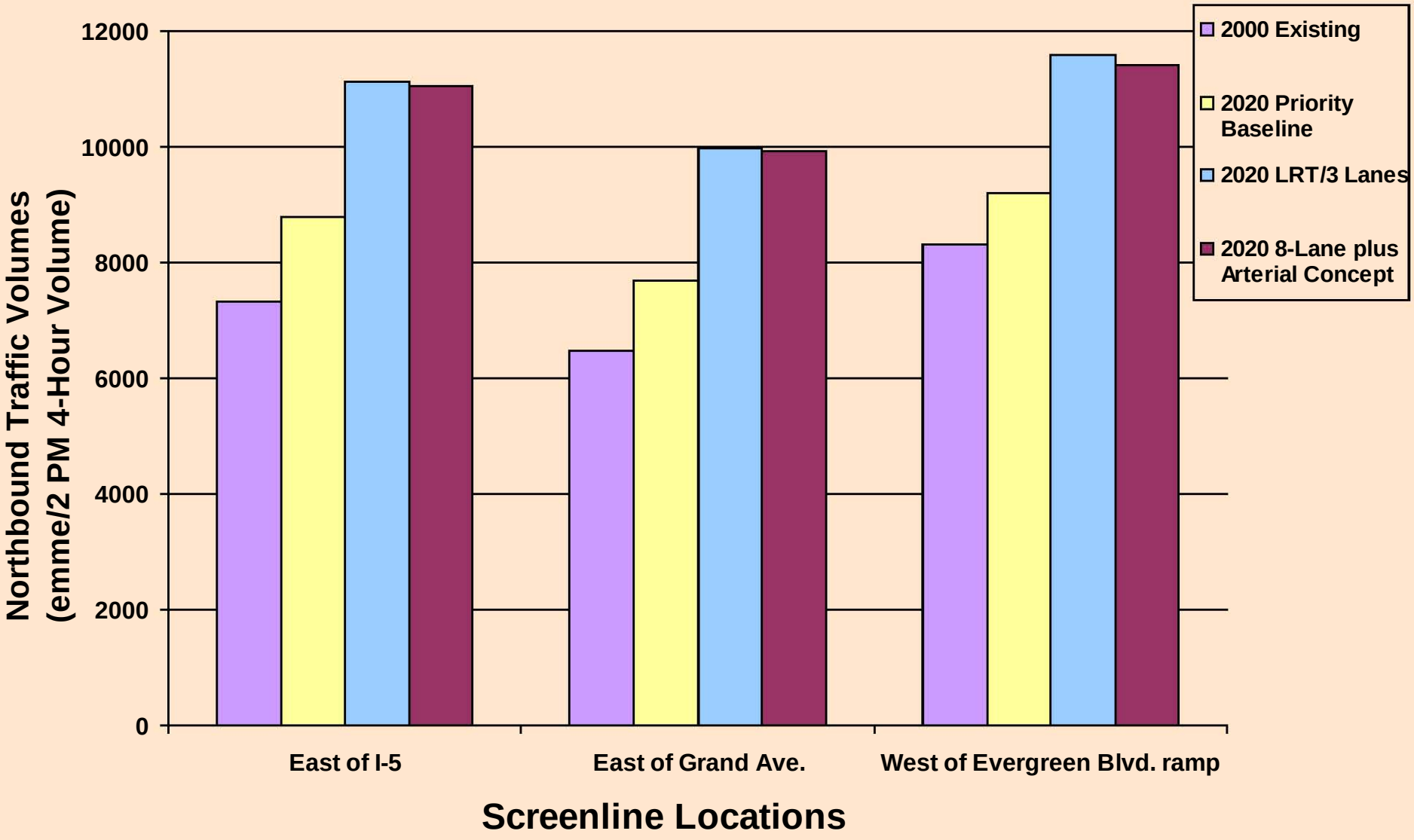
Northbound Travel Demands

Along Columbia/Washington Corridor - (PM Peak Period)



Northbound Travel Demands

Along SR 14 - east of I-5 (PM Peak Period)



Findings

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- Additional river-crossing capacity plus interchange improvements significantly enhance system performance compared to today and compared to 2020 priority baseline.
- Concepts with 10 freeway lanes, and concepts with 8 freeway plus arterial lanes, appear promising. Trade-offs to be evaluated in future studies should include the balance of traffic on the freeway vs. local streets.

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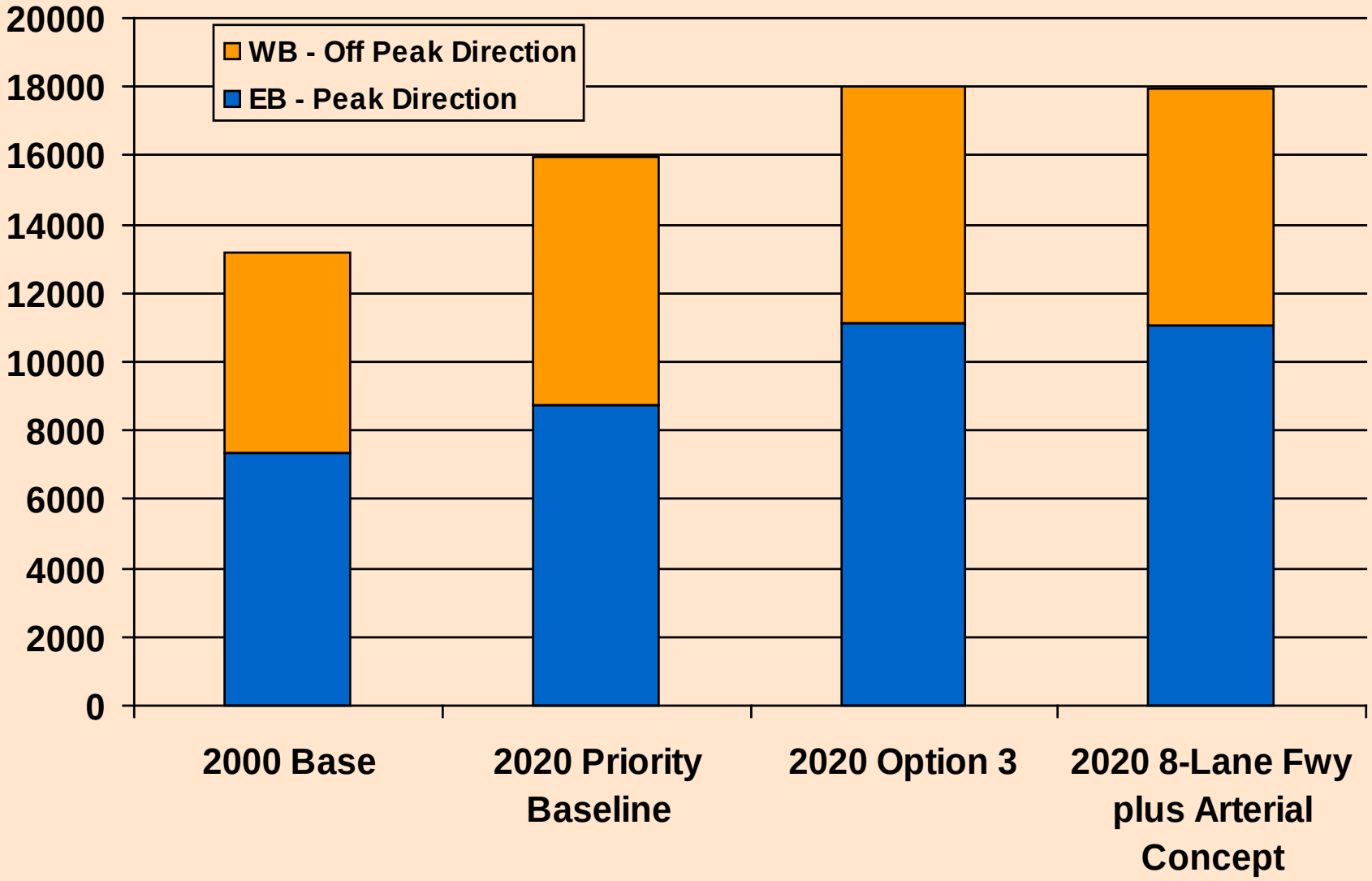
- HOV utilization and performance is highly dependent on the facilities provided:
  - Additional river crossing capacity is needed for HOV system continuity
  - Direct access ramps should be considered at key locations (i.e., SR 500)
  - Bridge design affects HOV performance (separated bridges limit access)

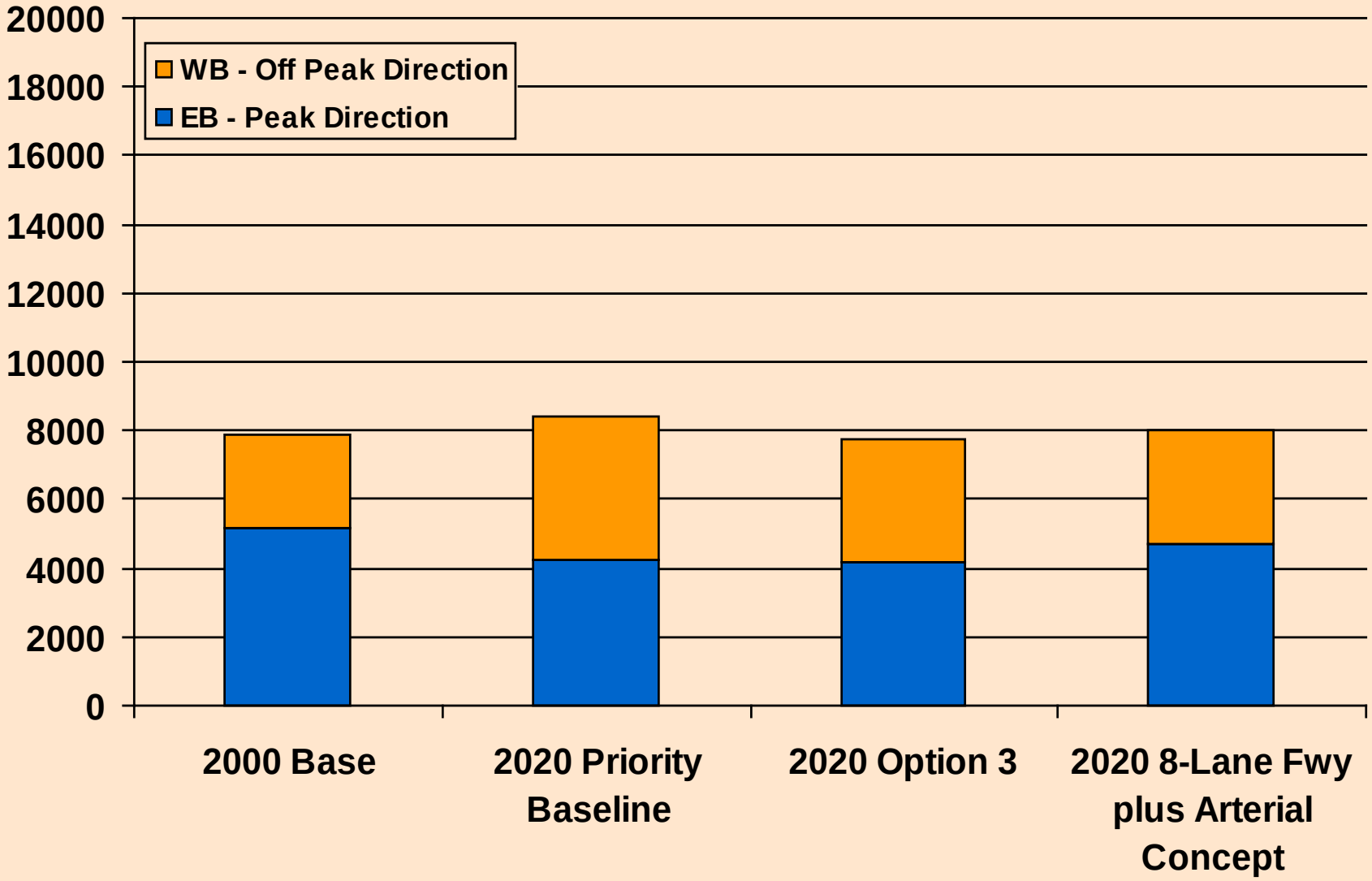
SR 14 - east of I-5

(4-Hour PM emme/2)



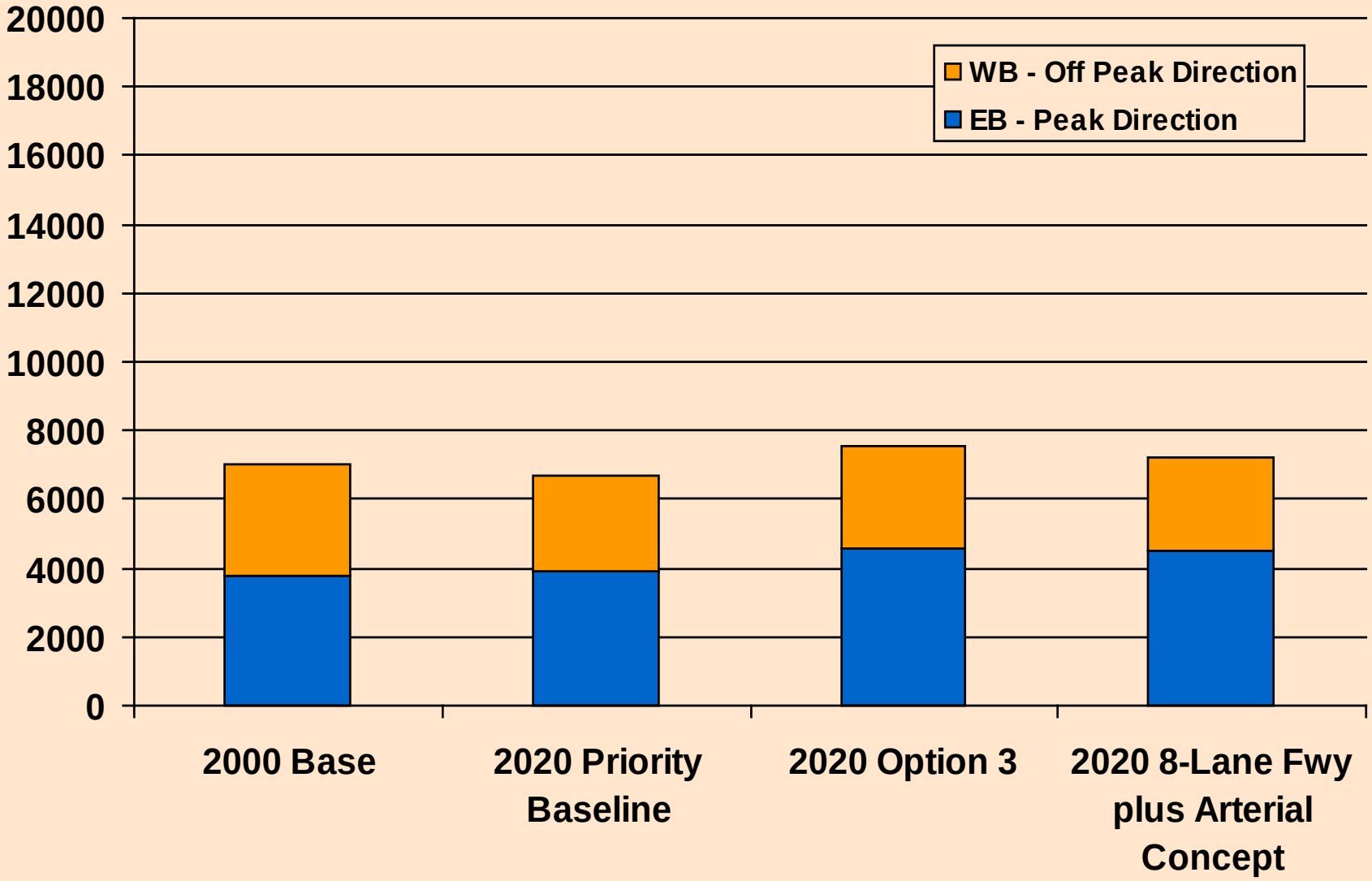
Fourth Plain Blvd. - west of I-5

(4-Hour PM emme/2)

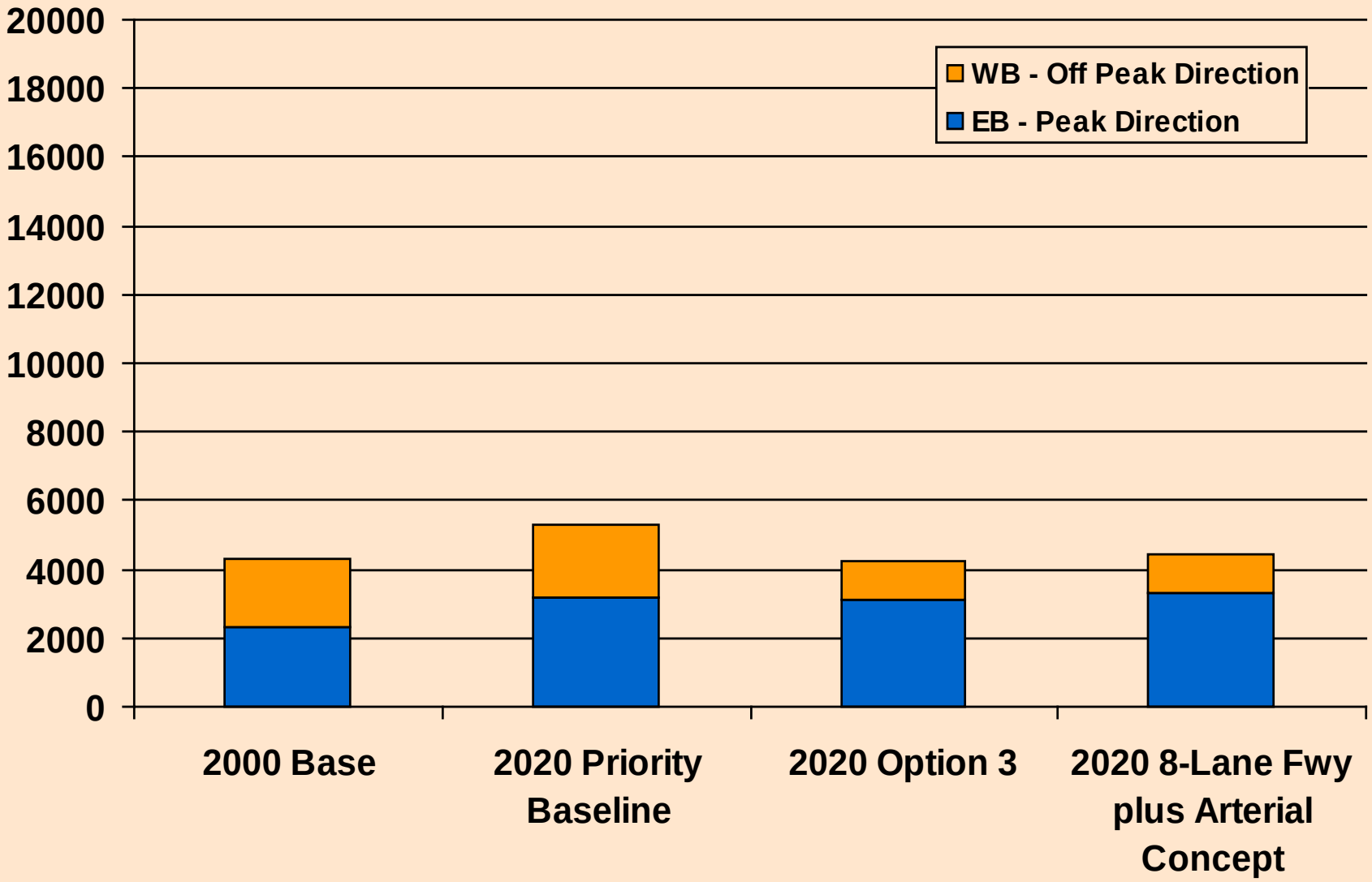


Fourth Plain Blvd. - east of I-5

(4-Hour PM emme/2)

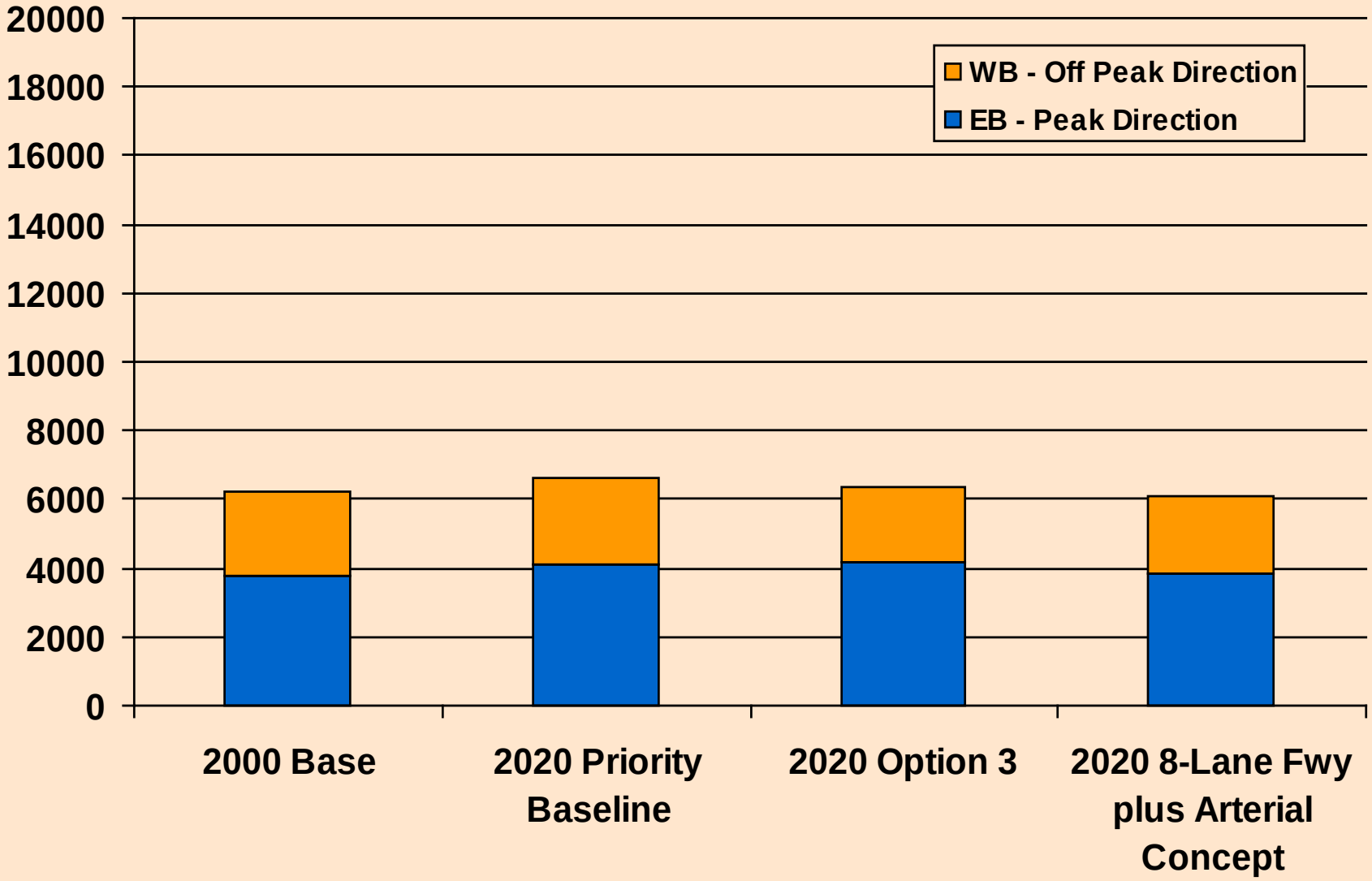


Mill Plain Blvd. - west of I-5



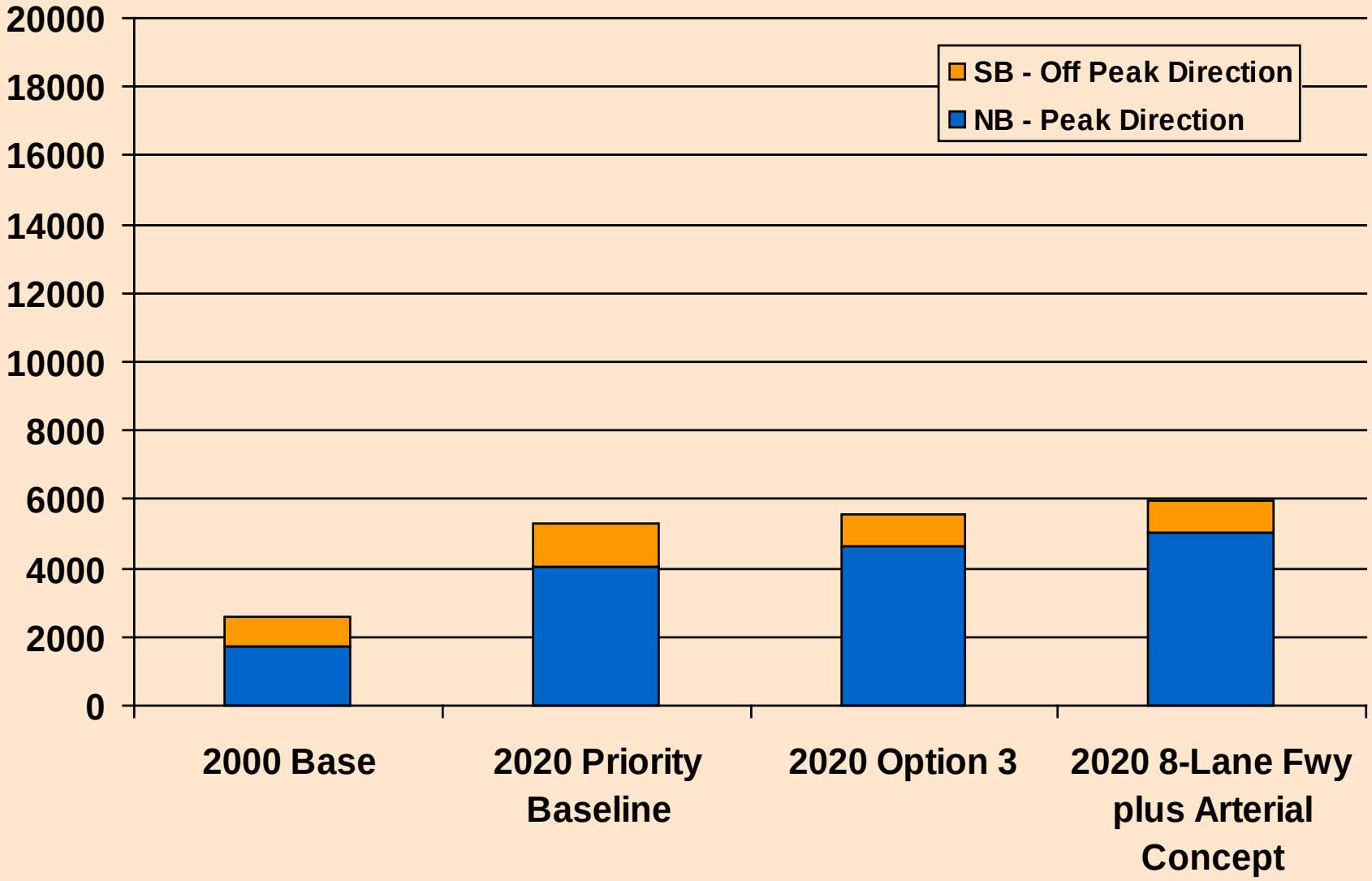
Mill Plain Blvd. - east of I-5

(4-Hour PM emme/2)

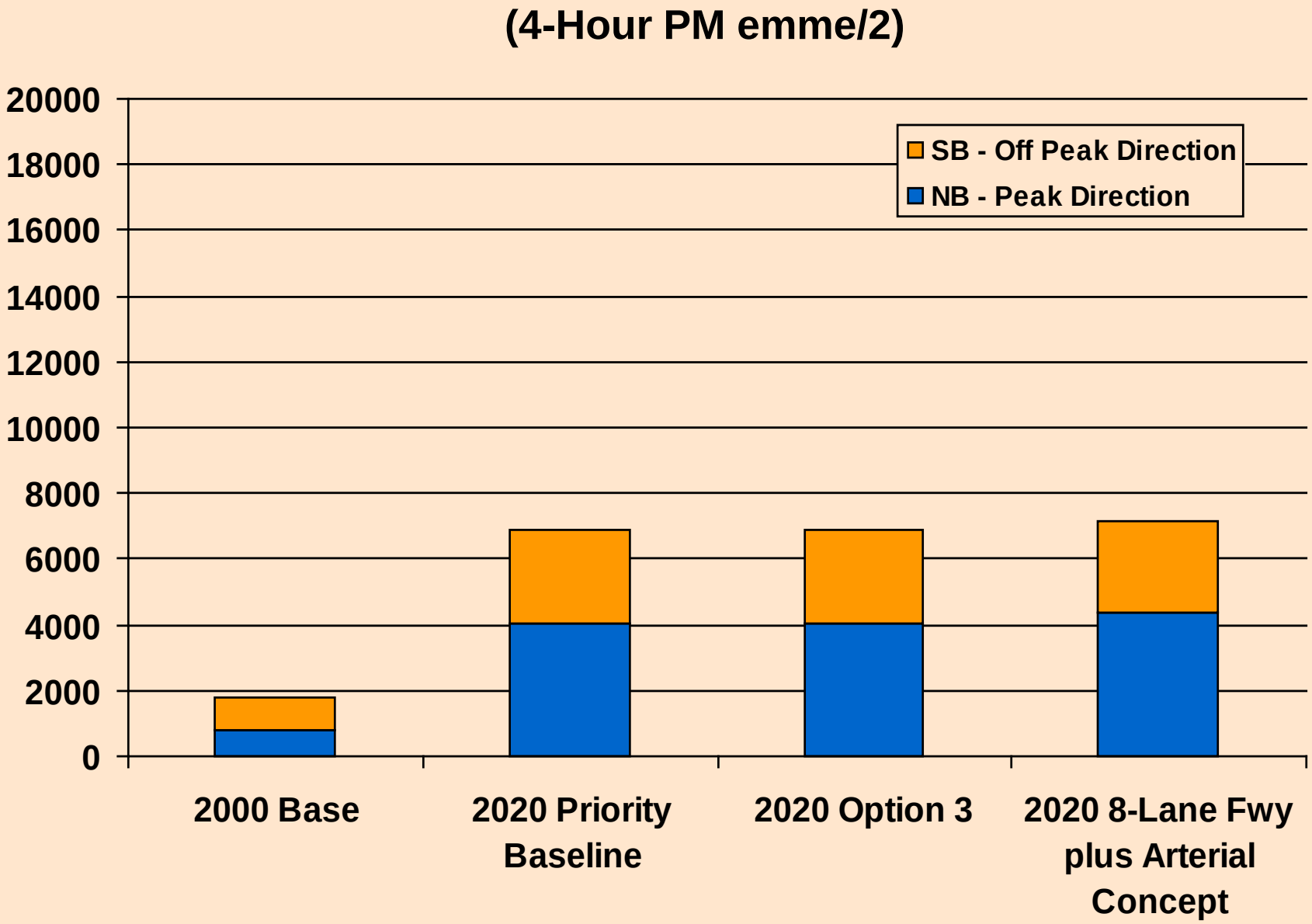


Main St. - south of Fourth Plain Blvd.

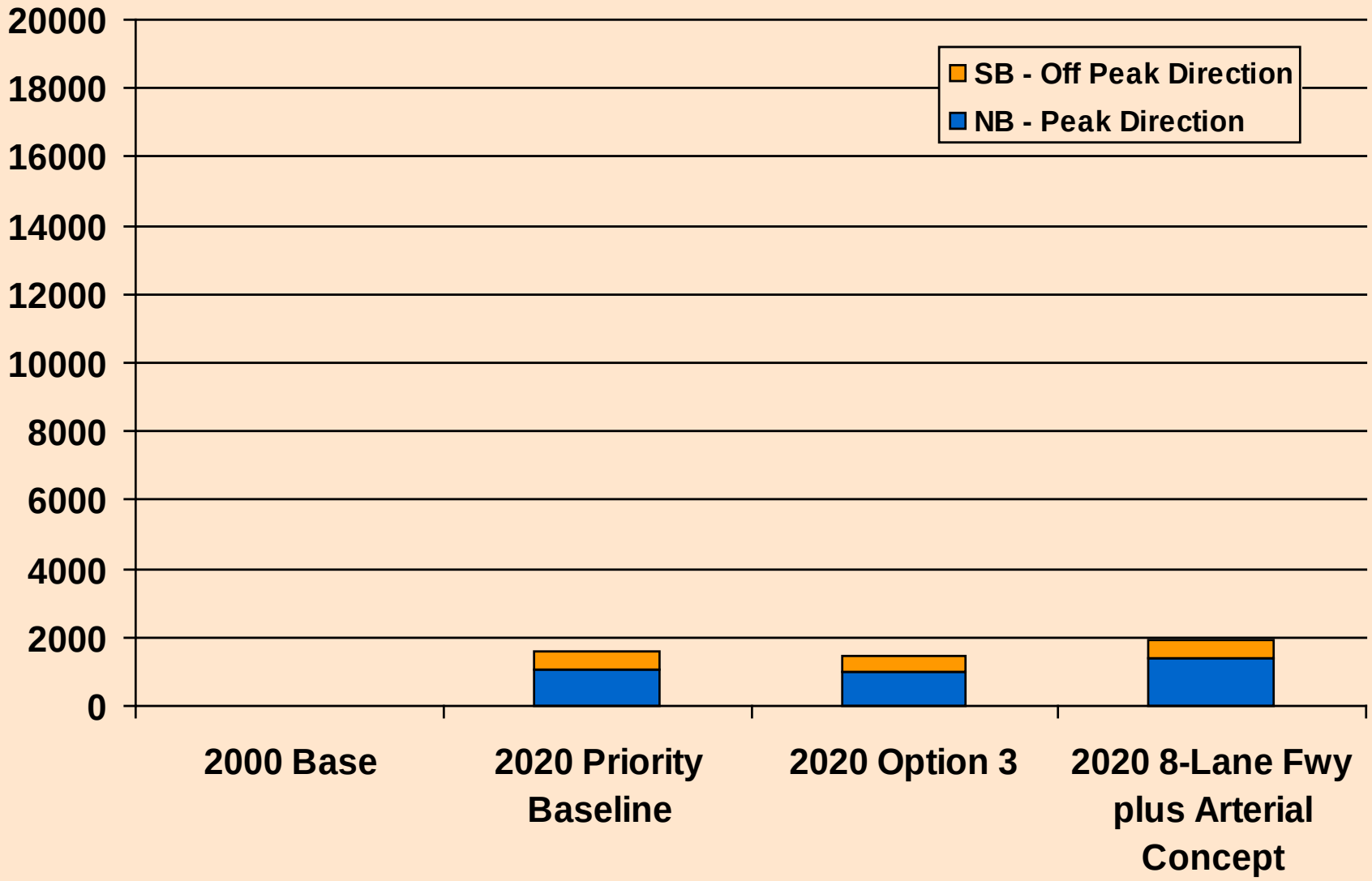
(4-Hour PM emme/2)



Columbia St. - south of Mill Plain Blvd.

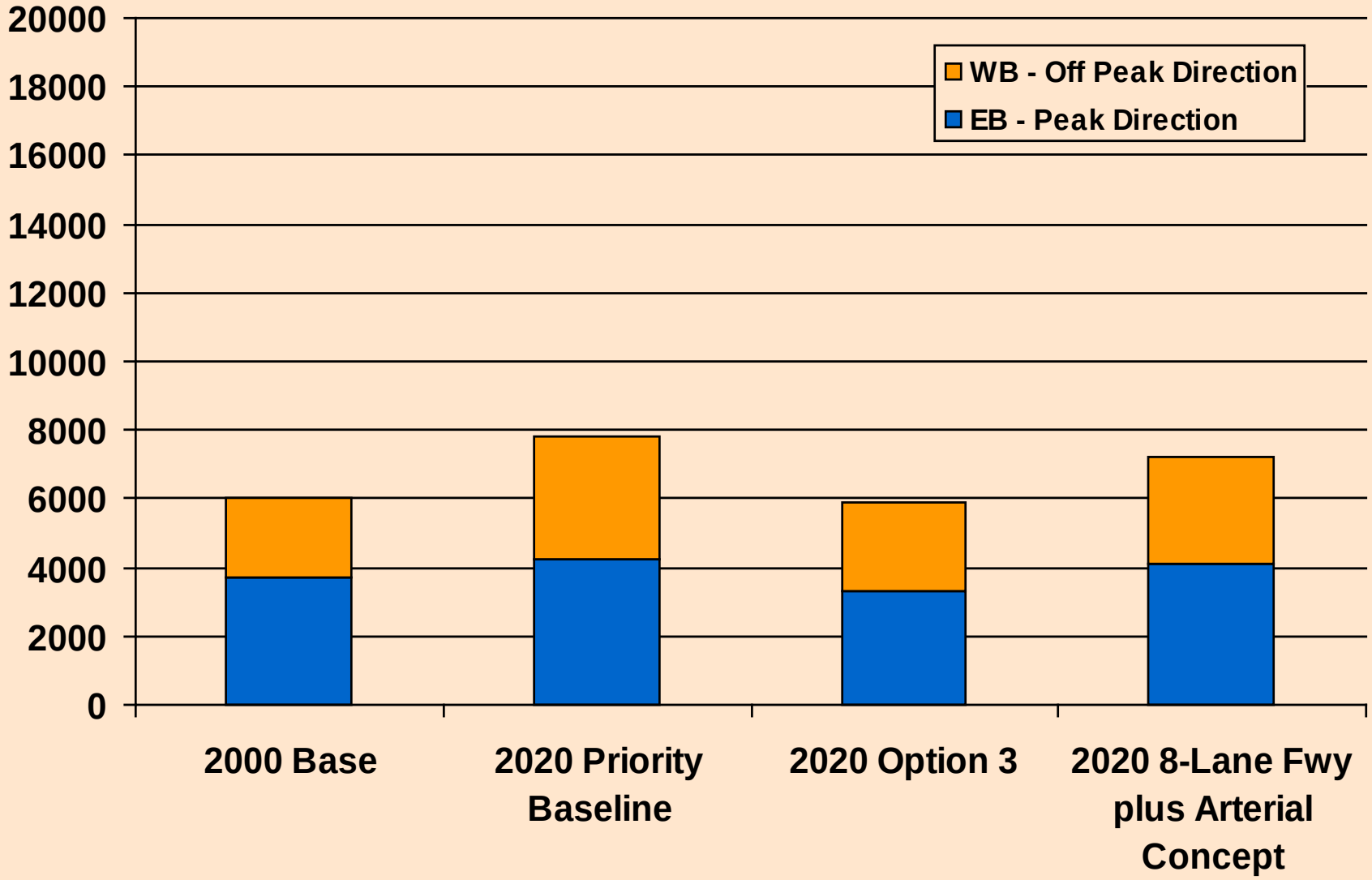


Washington St. - south of Mill Plain Blvd.

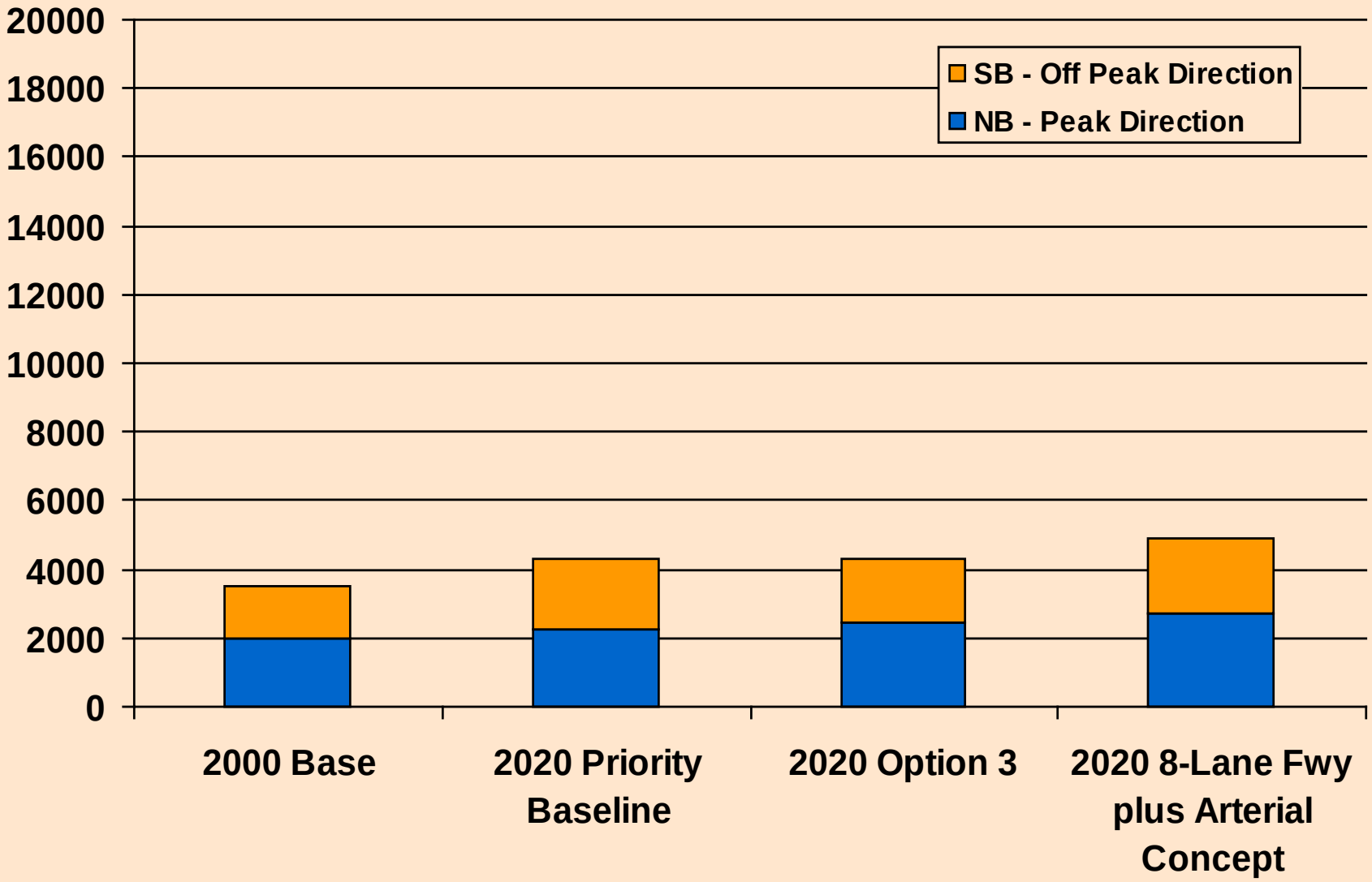


Marine Dr. - west of I-5

(4-Hour PM emme/2)

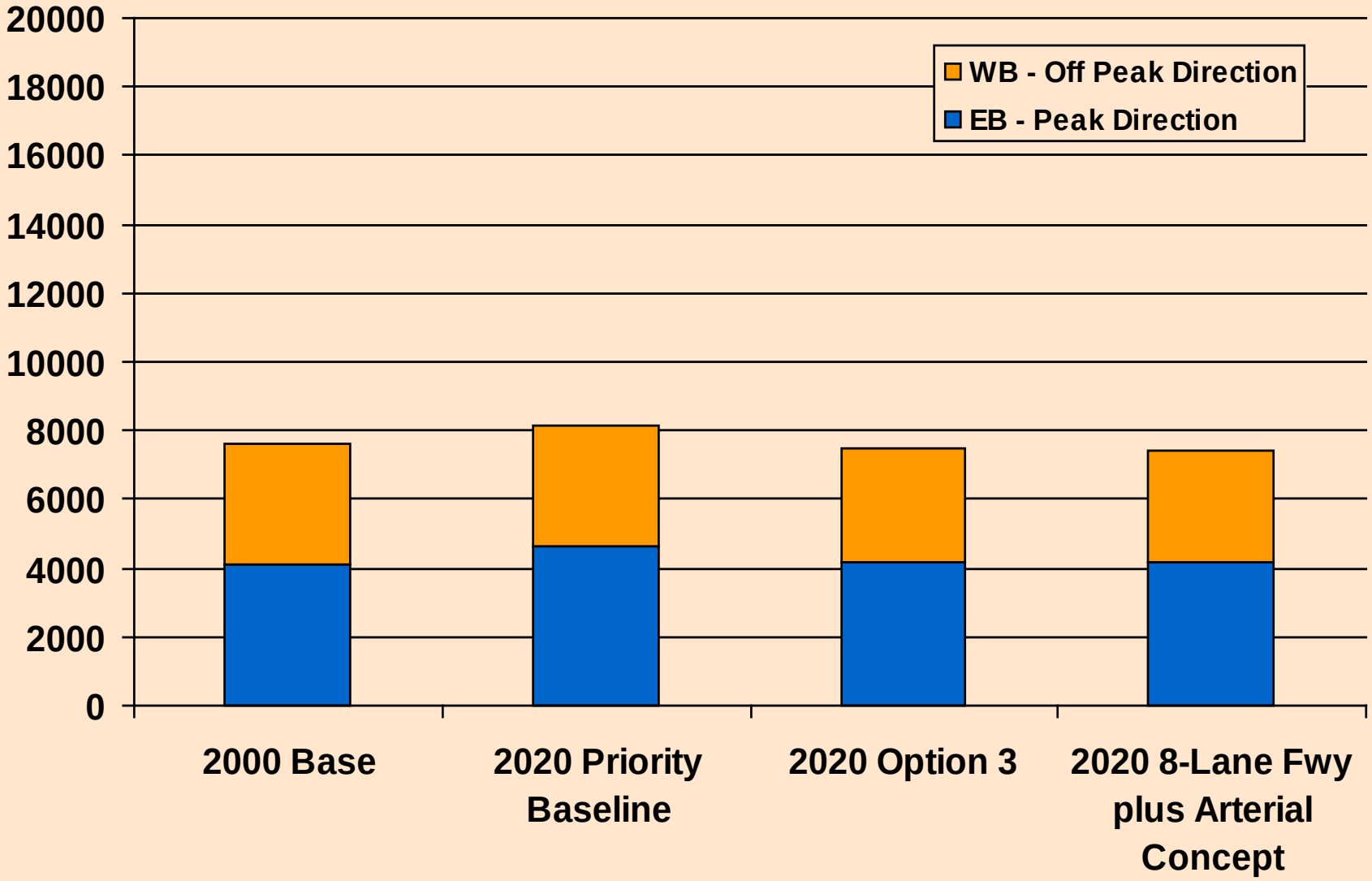


N Portland Rd. - south of Marine Dr.



Columbia Blvd. - west of I-5

(4-Hour PM emme/2)



Columbia Blvd. - east of I-5

(4-Hour PM emme/2)