

2020 Traffic Operations

- Adding more lanes across the Columbia River on a new supplemental four-lane bridge would increase directional traffic-carrying capacity by about 70 percent, substantially improving corridor accessibility and reducing the duration of peak periods and the effects of bottlenecks, including vehicle back-ups.

Without Vancouver Ramp Modifications

Southbound

- Increased demands along the mainline and SR 500 on-ramp result in the formation of a bottleneck at the SR 500 on-ramp to 4th Plain/Mill Plain off-ramp weave section.
- Capacity increases in the SR 500 weave section would move the bottleneck north to the 39th off-ramp vicinity.
- Traffic demands within the SR 500/I-5 junction are high enough that the bottleneck would not be eliminated by simply adding one more lane of mainline capacity to diffuse traffic flow in this area.
- During peak periods, however, the bottleneck would enable smoother southbound traffic flows between 4th Plain and the Columbia River Bridge.
- The SR 14 on-ramp would operate over capacity with long delays due to ramp metering. The SR 500 on-ramp, although not modeled under ramp meter control, is expected to experience long queues and associated delays.

Northbound

- Increased Columbia River crossing capacity improves corridor accessibility and therefore enables higher traffic demands to be served.
- Increased demands along the mainline and along SR 500 would worsen **northbound** vehicular weaving, merging and diverging along I-5 in Vancouver. While the Columbia River Bridge's bottleneck would be minimized or eliminated, a new pinch point would result within and adjacent to the Mill Plain/Fourth Plain on-ramp to SR 500 off-ramp weaving area. This bottleneck could be more severe than that experienced at the Bridge under Baseline conditions. During peak periods, however, the bottleneck would enable smoother northbound traffic flows north of SR 500.
- Traffic demands are such that adding one more lane of mainline capacity within the weave section could alleviate the bottleneck. Alternatively, braiding the Mill Plain on-ramp so that it enters the mainline north of SR 500 off-ramp, similar to the 4th Plain on-ramp braid, would eliminate the weave as well as the bottleneck in this location. If this ramp modification was completed, it is expected that a third mainline general purpose lane would be required up to 78th Street to accommodate on-ramp demands from Mill Plain, 4th Plain, 39th St., and Main St.
- Even at increased meter rates relative to today, on-ramps at Interstate Avenue, Marine Drive, and Mill Plain would operate with long delays due to ramp metering.

With Vancouver Ramp Modifications

- With **southbound** ramp improvements in Vancouver (as currently conceptualized), SR 500 would still pose a southbound bottleneck, but it would be substantially less severe compared to a scenario with no ramp improvements. With further design, it may be possible to mitigate this potential bottleneck (e.g., re-configured lanes, ramp metering, etc.).
- Ramp modifications result in eliminating the existing Mill Plain on-ramp to SR 14 off-ramp weave and the associated traffic conflicts associated with these maneuvers.
- Relocating the Mill Plain/4th Plain off-ramp to a location north of the SR 500 on-ramp provides the following operational benefits:
 1. Improves travel times for traffic destined to Mill Plain and 4th Plain by allowing trips to exit the freeway (and congestion) sooner.
 2. Reduces mainline traffic flow (approximately 15 percent) through the SR 500 bottleneck by exiting Mill Plain and 4th Plain traffic north of the bottleneck.

3. Reduced traffic flow through the bottleneck reduces the magnitude of queuing and the period of congestion caused by the bottleneck. It further reduces the number of potential conflicts, which supports improved safety.
 4. Lengthens the existing 4th Plain on-ramp to Mill plain off-ramp weave section, supporting improved traffic flow through this section.
- With **northbound** ramp improvements in Vancouver (as currently conceptualized), the weaving section between Mill Plain and SR 500 remains a bottleneck but would be less severe compared to the scenario with no ramp improvements, resulting in substantially reduced congestion.
 - As conceptually designed, relocating the 4th Plain on-ramp north of SR 500 provides the following benefits:
 1. Improves travel times for 4th Plain on-ramp traffic by allowing trips to enter the freeway north of (or after) the bottleneck.
 2. Reduces mainline traffic flow (approximately 10 percent) through the Mill Plain to SR 500 weave bottleneck by shifting 4th Plain on-ramp traffic north of the bottleneck.
 3. Reduced traffic flow through the bottleneck reduces the magnitude of queuing and the period of congestion caused by the bottleneck. It further reduces the number of potential conflicts, which supports improved safety.
 4. Eliminates part of the existing compound weave section (4th Plain on-ramp to SR 500 weave section) and the associated traffic conflicts associated with these maneuvers.
 5. Freeway entrance operations for 4th Plain on-ramp traffic improved by relocating the on-ramp outside of the existing weave section.
 - **Therefore**, with added capacity across the Columbia River and ramp improvements within Vancouver, the duration of the peak periods would decrease substantially. While peak period traffic flow would improve, non-peak traffic operations would benefit as well due to the reduction in complex weaving areas and the elimination or reduction of traffic conflict areas.