Exhibit 9-6. Potential Effects on Regional Freeway Traffic under the 4-Lane and 6-Lane Alternatives

| Facility | Estimated Number of Haul Route Trips | | | | Effect on Traffic |
|---|---|---|---|---|---|
| | Per day | | Per hour | | |
| | 4-Lane Alt. | 6-Lane Alt. | 4-Lane Alt. | 6-Lane Alt. | |
| SR 520 | 289 | 309 | 36 | 39 | Moderate - substantial |
| I-5 | 179 | 187 | 23 | 24 | Moderate |
| I-405 | 105 | 115 | 13 | 15 | Small - moderate |

With the closure of the westbound SR 520 HOV lane, not only would there likely be a shift of HOV traffic to other regional corridors but also higher demand in the small to moderate range at park-and-ride lots (particularly along the I-405 and I-90 corridors) due to some shift in bus and carpool demand away from SR 520 for both the 4-Lane and 6-Lane Alternatives.

Potential mitigation strategies for closure of the westbound SR 520 HOV lane and the Lake Washington Boulevard ramps include providing the contractor with an incentive for reopening the SR 520 westbound HOV lane quickly, requiring the contractor to minimize and/or prohibit construction truck trips during the peak periods, and implementing strategies aimed at reducing overall peak period traffic levels on SR 520. WSDOT would coordinate with transit agencies to develop bus and rideshare options for these commuters.

## 4-Lane Alternative

### SR 520

As shown in Exhibit 9-4 and Exhibit 9-5, if the peak number of trips across SR 520 is used as a conservative estimate, approximately 140 truck trips per day from the Seattle routes and approximately 149 truck trips from the Eastside routes would travel along SR 520, for a total of 289 truck trips per day traversing some portion of SR 520. This equates to over 36 trips per hour, or one truck trip every 1 to 2 minutes. Given the anticipated peak period congestion levels on SR 520, this volume of truck traffic would likely have a moderate effect on traffic flow. However, coupled with the closure of the westbound SR 520 HOV

lane and the Lake Washington Boulevard ramps, overall traffic effects due to construction would be moderate to substantial.

### I-5

An estimated 75 percent of the haul routes from Seattle would use I-5, representing 105 trips per day. As noted above, the analysis assumed conservatively that construction in Seattle would occur simultaneously with that on the Eastside. From the Eastside, 50 percent of the haul trips, or approximately 74 truck trips per day, are expected to use I-5.

Totaling the Eastside and Seattle haul trips results in an estimate of approximately 179 trips per day using I-5 for some portion of the construction period. This translates into approximately 23 trips per hour, equating to about one trip every 2 to 3 minutes. While peak period congestion on I-5 is expected to be high, the relatively low volume of trucks related to SR 520 construction and the likelihood of some shift in HOV trips using I-5 to and from I-90 is anticipated to result in a moderate additional effect on overall I-5 traffic operations.

### I-405

For the Seattle haul routes, approximately 20 percent of the trips (or approximately 30 trips) are projected to use the I-405 corridor. On the Eastside, 50 percent of the haul routes (75 trips per day) are expected to use I-405. The total of these would add approximately 105 truck trips to I-405 per day, assuming simultaneous construction for the Seattle and Eastside facilities. This represents 13 truck trips per hour, or one every 4 to 5 minutes. The overall effect on I-405 traffic operations with this level of truck traffic is expected to be minimal; however, given the likelihood that some HOV traffic would use I-405 to access I-90, the overall effect on traffic due to construction would be small to moderate.

### I-90

Although haul routes and truck traffic resulting from project construction would not affect I-90, a likely shift in a portion of carpool and bus vehicles would occur. For HOVs using the I-90 corridor, a small to moderate deterioration in operations would occur.

## 6-Lane Alternative

### SR 520

During the peak construction period and assuming simultaneous construction of both Seattle and Eastside facilities, we estimate that up

to 160 truck trips per day from Seattle and approximately 149 truck trips per day from the Eastside would use SR 520, for a total of 309 truck trips per day traversing some portion of the corridor. Assuming 8 hours of hauling, this is equal to approximately 39 trips per hour, or 1 truck trip every 1 to 2 minutes. Based on the anticipated peak period congestion levels on SR 520, this volume of truck traffic would moderately affect traffic flow. However, coupled with the closure of the westbound SR 520 HOV lane and Lake Washington Boulevard ramps, the overall effect on traffic from construction would be moderate to substantial.

### I-5

Up to 70 percent of the haul routes, or approximately 112 trips, from Seattle are expected to use I-5 under the 6-Lane Alternative. Similar to the 4-Lane Alternative, 50 percent of haul trips from the Eastside, or approximately 75 truck trips per day, are also expected to use I-5.

Assuming simultaneous construction of the Seattle and Eastside improvements, a total of 187 truck trips per day would likely use I-5 during the peak construction period. This equates to just over 23 trips per hour, or one truck trip every 2 to 3 minutes. As in the 4-Lane Alternative, this volume of additional trucks is quite low. It is likely that some westbound SR 520 HOV trips that use I-5 would modify their trips to use I-90 because the SR 520 HOV lane would be closed for construction. Thus, this construction is anticipated to have a moderate effect on overall I-5 traffic operations.

### I-405

Approximately 25 percent of haul trips (40 trips per day) are likely to use the I-405 corridor for the Seattle haul routes. On the Eastside, 50 percent of the haul routes, or 75 truck trips per day, would use I-405. This would total approximately 115 additional truck trips on I-405 each day, or 15 truck trips per hour or one every 4 minutes. Overall, the effect on I-405 traffic operations associated with this level of truck traffic would be minimal; however, given the likelihood that some HOV traffic would use I-405 to access I-90, the overall effect on traffic from construction would be small to moderate.

### I-90

Although haul routes and truck traffic resulting from project construction would not likely effect I-90, a probable shift in some HOV

and bus vehicle use to I-90 from SR 520 would occur. For HOVs using the I-90 corridor, a small to moderate deterioration in operations may be observed.

# How would the project affect the local arterials?

## Seattle

For the 4-Lane and 6-Lane Alternatives, refer to Exhibit 9-4 for a listing of the projected haul routes, associated truck traffic per day, and estimated construction duration for each route in Seattle. Exhibit 9-2 illustrates the various Seattle haul routes for both alternatives.

Information in Exhibit 9-4 indicates that the effect of the project on the local arterial system would be relatively minor for both alternatives. Few arterials would be affected, and the estimated number of truck trips made along those arterials would be relatively low.

The closure of the Lake Washington Boulevard ramps would have a substantial effect on local arterials in Seattle. Both the SR 520 westbound off-ramp and the eastbound on-ramp at Lake Washington Boulevard would be closed for most of the construction period, affecting the surrounding local arterials. See Exhibit 9-3 for potential detour routes.

Seattle local arterials that may be used as part of a haul route include Montlake Boulevard, 24th Avenue East, East Roanoke Street, Harvard Avenue East, Boylston Avenue East, East Miller Street, East Newton Street, Fuhrman Avenue East, Eastlake Avenue East, Northeast 45th Street, Boyer Avenue East, Northeast Pacific Street, 10th Avenue East, 11th Avenue East, and 15th Avenue East. Construction is not anticipated to substantially affect traffic on the westside local arterial network. On average, truck trips would range from about 2 to 3 trips per hour for the 4-Lane Alternative, and 2 to 5 trips per hour for the 6-Lane Alternative. During the peak of construction activity, truck trips would range from 3 to 12 trips per hour for each alternative. Overall effects on these roadways would be minor, and mitigation measures would not be warranted.

### Eastside

As in Seattle, haul route truck traffic is not anticipated to substantially affect traffic on the Eastside local arterial network. Therefore, mitigation measures would not be warranted. Refer to Exhibit 9-2 for a graphical display of the Eastside haul routes, as well as to Exhibit 9-5, which describes the construction duration and number of trucks anticipated from the Eastside. Local Eastside arterials that could be affected as part of haul routes include Evergreen Point Road, 84th Avenue Northeast, 92nd Avenue Northeast, Bellevue Way Northeast, and Northeast 24th Street. Under both build alternatives, 2 to 8 truck trips per hour, on average, are expected to use Eastside arterials. In the peak of the construction period, trips along these arterials might range from 3 to 9 trips per hour, or one truck trip every 6 to 20 minutes. Even during the peak of construction activity, construction traffic would not substantially affect the overall traffic flow.

For the closure of the westbound HOV lane on SR 520, mitigation measures may include using the arterial network to access other regional highways such as I-90.

## What conclusions can be drawn?

Key assumptions of this analysis include the following:

- Seattle and Eastside construction would occur simultaneously (this assumption provides a conservative estimate of the effect of truck traffic on overall traffic operations).
- Partial closures of local arterials were not evaluated.
- Only weekday peak periods were assessed (i.e., weekend and night-time operations were not evaluated).
- Eight hours of hauling per day were assumed.
- The SR 520 westbound HOV lane on the Eastside would be closed during the majority of the construction period, which would likely shift some HOV and bus trips to other regional highways, such as I-90.
- The Lake Washington Boulevard ramps (westbound off-ramp and eastbound on-ramp) would be closed for the majority of the construction period. This closure would create additional queue and spillback at the Montlake Boulevard ramp areas.

- SR 520 would remain open with two general-purpose lanes operating in each direction.
- The tie-in of the new floating portion of the Evergreen Point Bridge with its approaches, and any associated closure of SR 520, would be of short duration and occur over a weekend period.

Overall, construction of the 4-Lane and 6-Lane Alternatives would have a similar effect on freeway and local traffic operations. The 6-Lane Alternative would produce slightly higher truck traffic volumes, but the effect on both regional and local traffic operations would be similar to the 4-Lane Alternative.

The majority of construction staging areas identified were within WSDOT right-of-way, and therefore would have few effects on private property owners. Other potential staging areas include those properties identified as likely property takes for the project.

We identified three long-term construction closures during the construction period:

- SR 520 westbound HOV lane (Eastside)
- Lake Washington Boulevard ramps in the Montlake interchange area
- Delmar Drive bridge over SR 520 (Roanoke/Harvard interchange area).

The closure of the SR 520 westbound HOV lane and Lake Washington Boulevard ramps would substantially affect traffic operations along westbound SR 520; WSDOT would coordinate with transit agencies to develop bus and rideshare options for these commuters.

10th Avenue East would become a detour route for the Delmar Drive bridge. Given that Delmar Drive experiences relatively low travel demand and that reasonable detour routes exist, this closure is not expected to substantially affect traffic operations in this area. The Lake Washington Boulevard ramps are expected to be closed for the majority of the construction period. These closures would affect traffic operations in the Montlake Boulevard area, as most of the traffic would likely reroute to the SR 520 ramps at this location. Throughout the life of the project, there would be intermittent short-term ramp and road closures, which will be further defined after the project design team develops additional design work and construction phasing.

In terms of regional freeways, the SR 520 corridor is anticipated to receive most of the construction-related truck traffic volumes and additional HOV traffic in the general purpose lanes due to the closure of the SR 520 westbound lane. With up to one to two construction trucks projected per minute, traffic operations on this already congested corridor are likely to be moderately to substantially affected. Potential mitigation strategies include providing the contractor with an incentive for opening the SR 520 westbound HOV lane quickly, requiring the contractor to minimize and/or prohibit construction truck trips during the peak periods, using barges for transporting materials, and developing strategies aimed at reducing overall peak period traffic levels on SR 520. The I-5 and I-405 corridors are also anticipated to receive some truck traffic and HOV volumes that would shift to other regional corridors, such as I-90; the predicted truck trip volumes are likely to affect traffic operations moderately.

Local Seattle and Eastside arterials that are designated as potential haul routes in both alternatives are projected to experience fairly low construction-related truck volumes and some additional bus trips, and hence may likely be moderately affected.

Mitigation would be warranted primarily where closures for most of the construction period are anticipated (temporary closures were not assessed here); this includes the westbound SR 520 HOV lane, the Lake Washington Boulevard ramps, and the Delmar Drive bridge over SR 520. Mitigation measures could include additional bus and rideshare service, detour signing, or improvements to intersection channelization and/or signal operations along the detour routes. More specific improvements would be developed in conjunction with WSDOT, transit operators, and local jurisdictions during later phases of project design.

# Chapter 10: Cumulative Transportation Effects

## What is in this chapter?

The objective of this chapter is to identify and summarize the cumulative effects of the project alternatives in combination with a regional package of transportation facilities improvements that are considered reasonable for future implementation but are not currently funded. The cumulative effects scenarios provide a conservative estimate of anticipated travel demand throughout the region, taking into account the variety of projects that may be constructed during the same time frame as the SR 520 Bridge Replacement and HOV project.

The regional transportation capacity improvements included in the cumulative effects scenarios are in addition to those assumed in the project alternatives. Several conclusions can be drawn by comparing projected travel demand and travel patterns from the project alternatives with those from the cumulative effects scenarios. These conclusions are briefly summarized below.

Under the cumulative effects scenarios, a considerable shift to HOV/transit demand along SR 520 would occur with the 4-Lane and 6-Lane Alternatives compared to the No Build Alternative. Despite a slight decrease in HOV/transit demand across SR 520 in the cumulative effects scenarios (when compared to the project alternatives), the overall cross-lake HOV/transit demand would remain high.

The following sections describe the methods used to determine the regional transportation improvements included in the cumulative effects scenarios, as well as how those scenarios were modeled. The results of the analysis are presented primarily in terms of screenline and cross-lake travel demand for both daily and p.m. peak periods. Screenline results encompass the entire Puget Sound region and include the following major regional corridors: I-5, I-405, I-90, SR 522, and SR 520.

The evaluation of cross-lake travel specifically compares travel demand and mode choice between SR 520 and I-90. The No Build, 4-Lane, and 6-Lane Alternatives were evaluated against the cumulative effects

scenarios for both the screenline and cross-lake travel demand assessments.

The following terms are used throughout this section:

- **Cumulative Effects Scenarios**—Scenarios used for traffic analysis that assume the future implementation of an extended regional package of transportation capacity improvements (as defined in the next section).
- **SR 520 Project Alternatives**—The "baseline" No Build, 4-Lane, and 6-Lane Alternatives for the cumulative effects analysis. They include the transportation network assumptions described in other chapters of this report for the SR 520 Bridge Replacement and HOV Project, but do not include the additional regional package of capacity improvements assumed in the cumulative effects scenario.

# What was included in the regional package for the cumulative effects scenarios?

WSDOT decided that the transportation system modeled for the cumulative effects scenarios should include the following:

- Regional high-priority projects, including the *I-405 Corridor Congestion Relief and Bus Rapid Transit Projects Implementation Plan* (WSDOT 2003)
- High-priority local arterial projects within the study area that have either undergone or are currently undergoing some form of environmental review

Exhibit 10-1 summarizes projects considered "high priority regional projects" included in the cumulative effects scenarios. Exhibits 10-2 and Exhibit 10-3 provide a list of high-priority local arterial projects in Seattle and on the Eastside, respectively.

# How was the travel modeling conducted?

The transportation discipline team used the 2030 Puget Sound Regional Council (PSRC) regional travel demand model to analyze potential future cumulative effects throughout the region, and specifically their effect on cross-lake travel demand. The team then compared the

cumulative effects scenarios with the project alternatives alone for both daily and p.m. peak periods. The primary measures used to make the comparisons included vehicle-trips and person-trips.

Exhibit 10-1. Regional High Priority Projects

| Corridor | Regional Capacity Improvements |
|---|---|
| I-405 | • Add one lane in each direction from I-90 in Bellevue to SR 520<br>• Add one lane in each direction from I-5 to SR 167 in Tukwila<br>• Add two lanes in each direction from SR 167 in Tukwila to Southeast 8th Street in Bellevue<br>• Add one lane in each direction from Southeast 8th Street in Bellevue to SR 520<br>• Add two additional lanes from SR 520 to Northeast 124th Street<br>• Add two lanes in each direction from SR 520 to Northeast 124th Street<br>• Add one lane in each direction from Northeast 124th Street to SR 522<br>• On SR 167, add one additional lane in each direction between I-405 and South 180th Street<br>• Construct Bus Rapid Transit line with stations, HOV direct access ramps, park-and-ride lots, and bus service<br>• Expand the vanpool program |
| I-90 | • Two-way, all-day transit and HOV lanes<br>• Alternative R-8A (no rail crossing)<br>• Reversible operations remain in center roadway<br>• Outer roadways would be modified to provide one additional travel lane in both directions for use by HOV traffic |
| Sound Transit | • Sound Transit Link Light Rail between SeaTac and Northgate, Sounder Commuter Rail, and Sound Transit Regional Express Bus (included in the SR 520 Bridge Replacement and HOV Project travel model) |
| Alaskan Way Viaduct | • Existing capacity (4/6 lane expressway) (included in the SR 520 Bridge Replacement and HOV Project travel model) |
| SR 167 | • Add one general purpose (GP) lane in each direction from South 180th Street to the Pierce/King County line vicinity<br>• Add one HOV lane in Auburn (15th Northwest to 15th Southwest) |
| SR 509 | • 6-Lane freeway with HOV lanes between I-5 and South 188th<br>• Six miles of improvements on I-5 from South 320th in Federal Way to South 200th and connection of Sea-Tac International Airport's South Access Expressway to SR 509 and I-5 |
| SR 519 Phase I and Phase II Improvements | • South Royal Brougham Way and Atlantic Street grade-separated |
| SR 518 | • Add direct access ramp from southbound SR 509 to eastbound SR 518<br>• Construct a third eastbound lane on SR 518 from the Airport North Access Expressway |
| SR 99 North Bus Rapid Transit (BRT) Facilities | • Complete Business, Access, and Transit (BAT) lanes, build sidewalks, upgrade traffic signals, and expand selected intersections in accordance with the Aurora Corridor Improvement Plan |

Exhibit 10-2. High-Priority Local Arterial Projects in Seattle

| Corridor | Arterial Capacity Improvements | |
|---|---|---|
| | Direction | Number of Lanes |
| **Mercer Corridor**[a] | | |
| Valley Street | Eastbound and Westbound | 1 through lane/ direction and turn pockets |
| Mercer Street From 5th Avenue North to Dexter Avenue North | Eastbound and Westbound | 3 lanes/direction |
| Mercer Street From Dexter Avenue North to Fairview Avenue North[b] | Eastbound<br>Westbound | 4 lanes<br>3 lanes |
| Westlake Avenue North Aloha Street to Denny Way | Northbound and Southbound | 2 lanes/direction |
| 9th Avenue North Aloha Street to Denny Way | Northbound and Southbound | 1 through lane/ direction and turn pockets |
| Broad Street: Dexter Avenue North to 5th Avenue North | | Removed from roadway network |
| Thomas Street: From 6th Avenue North to Dexter Avenue North | Eastbound and Westbound | 1 through lane/ direction |
| **Lake City Way**[c] | | |
| Bus Only (and right turns) lane from 3 p.m. to 7 p.m. This is accomplished by restricting on-street parking during this time. The bus-only lane is for the following areas:<br>• Northgate Way to 30th Avenue Northeast/Northeast 123rd Street<br>• Northeast 130th Street to Northeast 145th Street | Northbound | 1 bus-only lane |
| Bus Only (and right turns) lane from 6 a.m. to 9 a.m. This is accomplished by restricting on-street parking during this time. The bus-only lane is for the following areas:<br>• Northeast 145th Street to Northeast 130th Street<br>• 30th Avenue Northeast/Northeast 123rd Street to Northgate Way | Southbound | 1 bus-only lane |

[a] (http://www.ci.seattle.wa.us/transportation/ppmp_mercer.htm). This description of improvements assumes the "Two-Way Mercer with Alaskan Way Viaduct Widened Mercer Option" (http://www.ci.seattle.wa.us/transportation/pdf/mercerwidenoption.pdf).

[b] By 2030, it is assumed that four lanes will be needed in the eastbound direction.

[c] (http://www.ci.seattle.wa.us/transportation/lakecitywayne.htm).

Exhibit 10-3. 2014 Committed High-Priority Local Arterial Projects on the Eastside

| Corridor (Jurisdiction) | Arterial Capacity Improvements |
|---|---|
| 120th Northeast/39th Southeast (Bothell, Snohomish) | • Northeast 195th to Maltby Road: 4/5 lanes including new connection |
| Northeast 29th Place (Bellevue) | • 148th Avenue Northeast to Northeast 24th Street: Construct new 2-lane road |
| SR 524 (Snohomish County) | • 24th Street Southwest to SR 527: Widen to 4/5 lanes including sidewalks, bicycle lanes |
| Northeast 120th Street (Kirkland) | • Slater Avenue to 124th Avenue Northeast: Construct new 3-lane roadway with bicycle/pedestrian facilities |
| SR 202 (Redmond) | • East Lake Sammamish Parkway to Sahalee Way: Widen to 3/5 lanes; intersection improvements with bicycle/pedestrian facilities |
| Northeast 90 Street (Redmond) | • Willows Road to SR 202: Construct new 4/5 lanes + bike facilities |
| West Lake Sammamish Parkway (Redmond) | • Leary Way to Bel-Red Road: Widen to 4/5 lanes + CGS, bike lanes |
| Oakesdale Avenue Southwest (Renton) | • Southwest 31st to Southwest 16th: Construct new 5-lane roadway with CGS |
| 140th Avenue Southeast (King County) | • SR 169 to Southeast 208th Street: Widen 140th Avenue Southeast to 5 lanes from SR 169 to Southeast 196th Street, widen for turn channels on Southeast 196th. 140th Avenue Southeast is a major north-south arterial which serves the Soos Creek Plateau and Fairwood. |
| Juanita-Woodinville Way (King County) | • Northeast 145th Street to 112th Avenue Northeast: Widen to 4/5 lanes + CGS, walkway/pathway |
| Northeast 124th Street (King County) | • Willows Road to SR 202: Widen to 3/4 lanes + CGS, bike facilities; traffic signal. |
| Woodinville-Snohomish Road/140th Avenue Northeast (Woodinville) | • Northeast 175th Street to SR 522: Widen to 4/5 lanes + CGS, bike lanes |
| 150th Avenue Southeast (Bellevue) | • Southeast 36th to Southeast 38th: Widen to 7 lanes; add turn lanes |
| Willows Road (Redmond) | • Channelization of Willows Road/Redmond Way intersection and widening of Willows Road from Northeast 116th to Northeast 124th |
| 39th Avenue Southeast (Snohomish County) | • Realignment at SR 524 and York Road: Construct 4-way intersection to replace two offset intersections |
| SR 520/SR 202 Interchange (Redmond) | • Complete interchange by constructing a new ramp and through lane on SR 202 to SR 520. Note: Part of Nickel Package (see Chapter 4 for a discussion of Nickel projects) |

Source: WSDOT (2003).

CGS = curb, gutter, and sidewalk
CIP = Capital Improvement Program

The steps in developing the cumulative effects scenarios model runs were as follows:

1. The output of the travel demand model for the cumulative effects scenario (travel time skims) for each of the project alternatives, including No Build, was used as input to the regional land use model (DRAM/EMPAL). The DRAM/EMPAL model was run for each project alternative to determine potential changes to the distribution of population and employment within the region as a result of the cumulative effects scenario.
2. The No Build, 4-Lane, and 6-Lane Alternatives were coded and run in the regional transportation demand model assuming the cumulative effects package of other regional projects identified in Step 1.
3. Output from the transportation model runs for the cumulative effects scenarios was then compared to the project model runs.

To compare results from the model runs, the team developed six screenlines at the following locations:

- Screenline ❶: Mid-span bridge (Evergreen Point and I-90 bridges)
- Screenline ❷: East of I-405 (between SR 520 and I-90)
- Screenline ❸: North of SR 520 (between Lake Washington Boulevard Northeast and 148th Avenue Northeast)
- Screenline ❹: Lake Washington Ship Canal (Fremont Bridge to Montlake Bridge, a combination of Seattle screenlines 5.12, 5.13, and 5.16)
- Screenline ❺: South of I-90 (East Marginal Way to Rainier Avenue South, a combination of Seattle screenlines 9.12 and 9.13)
- Screenline ❻: South of I-90 (118th Avenue Southeast, I-405, Factoria Boulevard Southeast, and 150th Avenue Southeast)

# What are the modeling results?

The travel demand modeling yielded extensive data, which the transportation discipline team consolidated and summarized. The following discussion represents both results from the screenline data and more specific cross-lake travel trends that the team observed.

## What are the key findings for the screenlines?

We developed several exhibits that depict the results of the cumulative effects modeling in comparison to the project alternatives model results. Both daily and p.m. peak period screenlines were developed for vehicle- and person-trips. Exhibits 10-4 and 10-5 present screenline daily results for vehicle- and person-trips, respectively. Exhibits 10-6 and 10-7 present screenline p.m. peak period results for vehicle- and person-trips, respectively.

The screenline exhibits show percentage differences in vehicle- and person-trips for the cumulative effects scenarios as compared to the No Build Alternative. The No Build Alternative results from the travel demand model was used as the basis of comparison for the project alternative model runs as well as the cumulative effects model runs for each alternative.

Exhibits 10-4 through 10-7 show that the screenline vehicle- and person-trip trends for the cumulative effects scenarios are similar (with only slight variation) between the 4-Lane and 6-Lane Alternatives in both the daily and p.m. peak periods. General observations are as follows:

- In general, the effect of the cumulative scenarios on the screenline volumes is consistent across alternatives.
- On the Eastside, the increased capacity provided in the cumulative effects scenario would cause trips to increase. This is particularly true for north-south trips, and is likely due to the fact that increased capacity on I-405 and SR 167 would create a more attractive regional north-south route in comparison to I-5.
- Cross-lake trips would be reduced in the cumulative effects scenarios in comparison to the project alternatives, likely due to increased capacity on Eastside facilities (e.g., I-405) that would improve Eastside traffic circulation and make it more attractive for more trips to stay on the Eastside rather than travel across the lake.
- Seattle screenlines show a mix of results. The screenline south of I-90 shows a relatively uniform decrease in north-south trips caused by the cumulative scenarios. This would likely be due to the diversion of trips between south King County and the Eastside away from the I-5/I-90 route. The Seattle screenline north of SR 520 (Ship Canal Bridge) does not show a similar decrease in north-south

trips. It appears that the net effect of the cumulative scenarios in this area would be minimal.

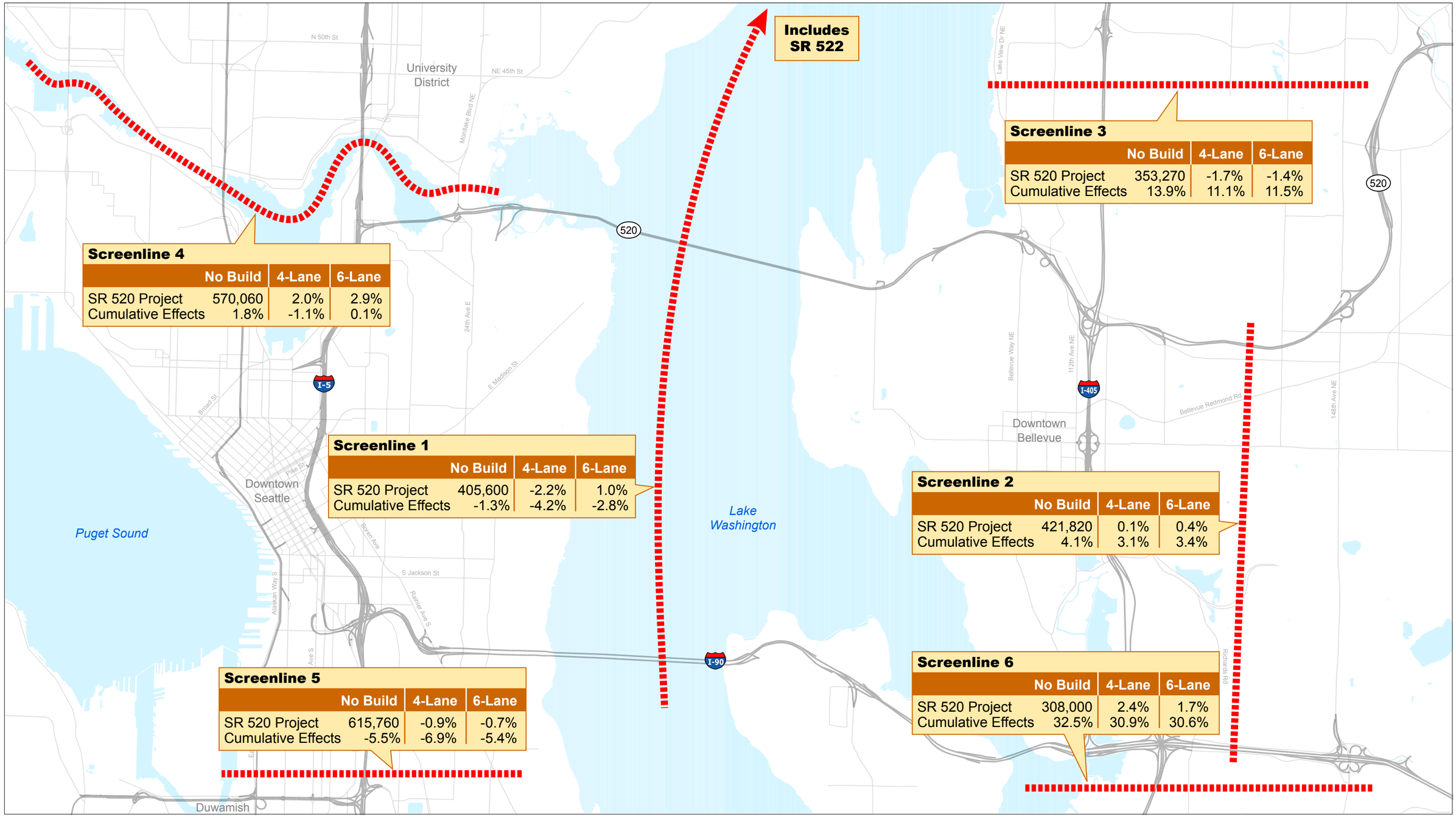
## Cross-Lake Travel Demand

The screenline of cross-lake travel demand for cumulative effects shows similar trends in both vehicle- and person-trips between the 4-Lane and 6-Lane Alternatives in both the daily and p.m. peak periods. The cumulative effect on cross-lake travel demand suggests a slight decrease in demand over the project No Build Alternative. This slight decrease can primarily be attributed to several regional corridor capacity improvements on the east side of Lake Washington. The daily screenline shows a decrease in demand across the lake ranging from 1.3 to 4.2 percent in vehicle-trips and a 1.4 to 3.5 percent range of decrease in person-trips. This suggests that the demand to use SR 520 would still remain substantial, with or without the added regional corridor improvements.

The model results suggest that several specific capacity improvements, in combination with tolling on the Evergreen Point Bridge, would encourage cross-lake trips to remain on the Eastside. The incorporation of the 10 to 15 year Implementation Plan for I-405 assumes an increase in capacity on I-405 between I-5 in Tukwila and SR 522 in Bothell. Additional capacity is also planned for SR 167 (from Southeast 180th Street to I-405) and SR 522 (bus lane); both regional facilities tie into I-405 and would provide a viable alternative to the cross-lake bridges, given the additional capacity on these facilities.

## North-South Travel Demand

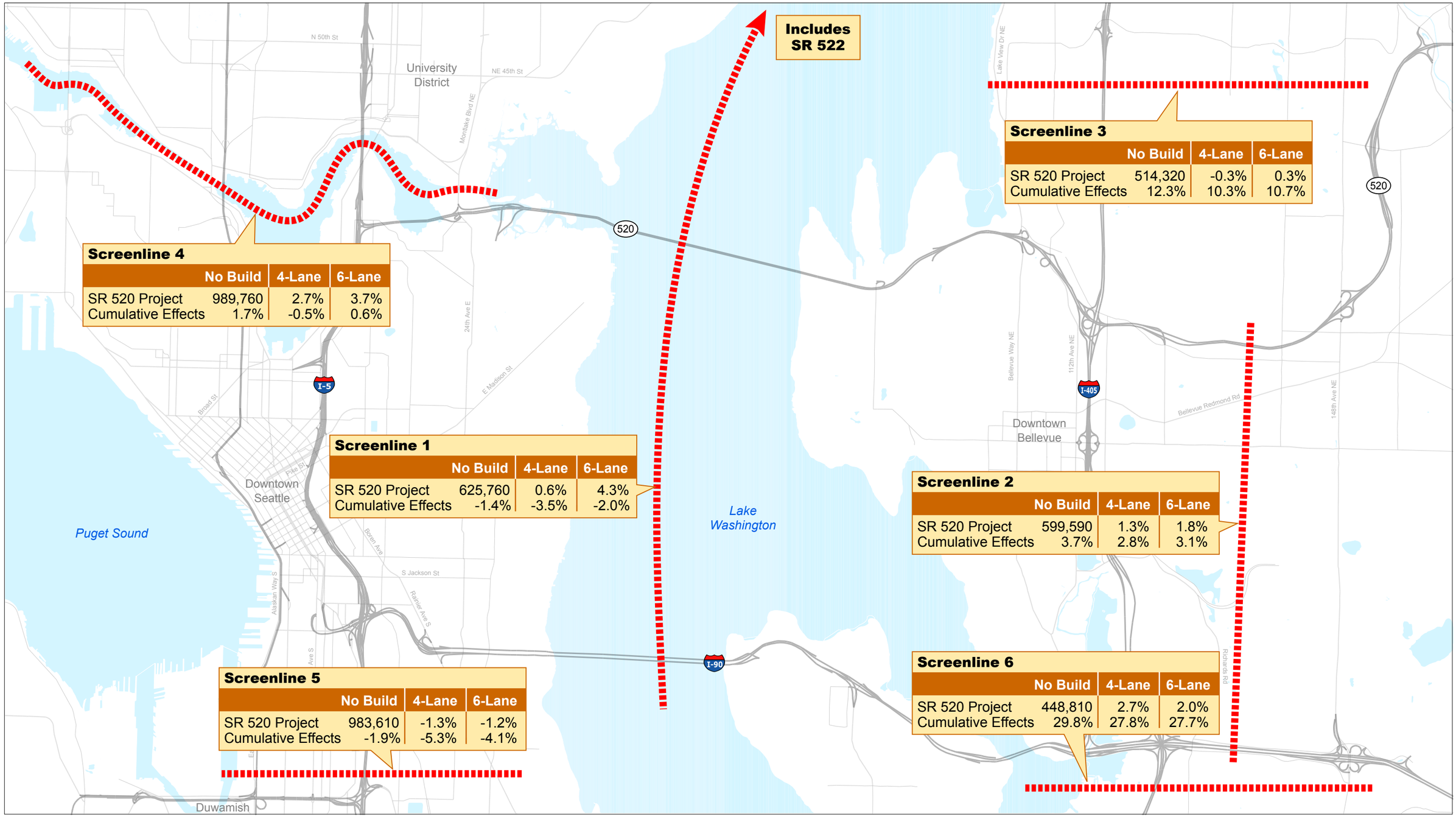
The north-south travel demand screenlines for cumulative effects shows similar trends in both vehicle- and person-trips between the 4-Lane and 6-Lane Alternatives in both the daily and p.m. peak periods. Exhibits 10-4 through 10-7 show the increase in north-south trips on the Eastside south of I-90 (screenline 6). Cumulative effects scenarios indicate that daily trips would increase by 30.6 to 32.5 percent in vehicle-trips, and by 27.7 to 29.8 percent for daily person-trips as compared to the No Build Alternative. This reflects the capacity improvements assumed along I-405 and SR 167. In fact, given that I-405 would become more attractive with its additional capacity, travel demand on the I-5 corridor south of I-90 would decrease between 4 and nearly 8 percent.




N 0 2,500 5,000 Feet

Note: The screenline percentage differences presented are all compared to the No Build Alternative travel demand model output. The No Build Alternative travel model result is listed in the first cell in each table (in the No Build, SR 520 project cell).

Exhibit 10-4. **Screenline Daily Vehicle-Trips**
SR 520 Bridge Replacement and HOV Project

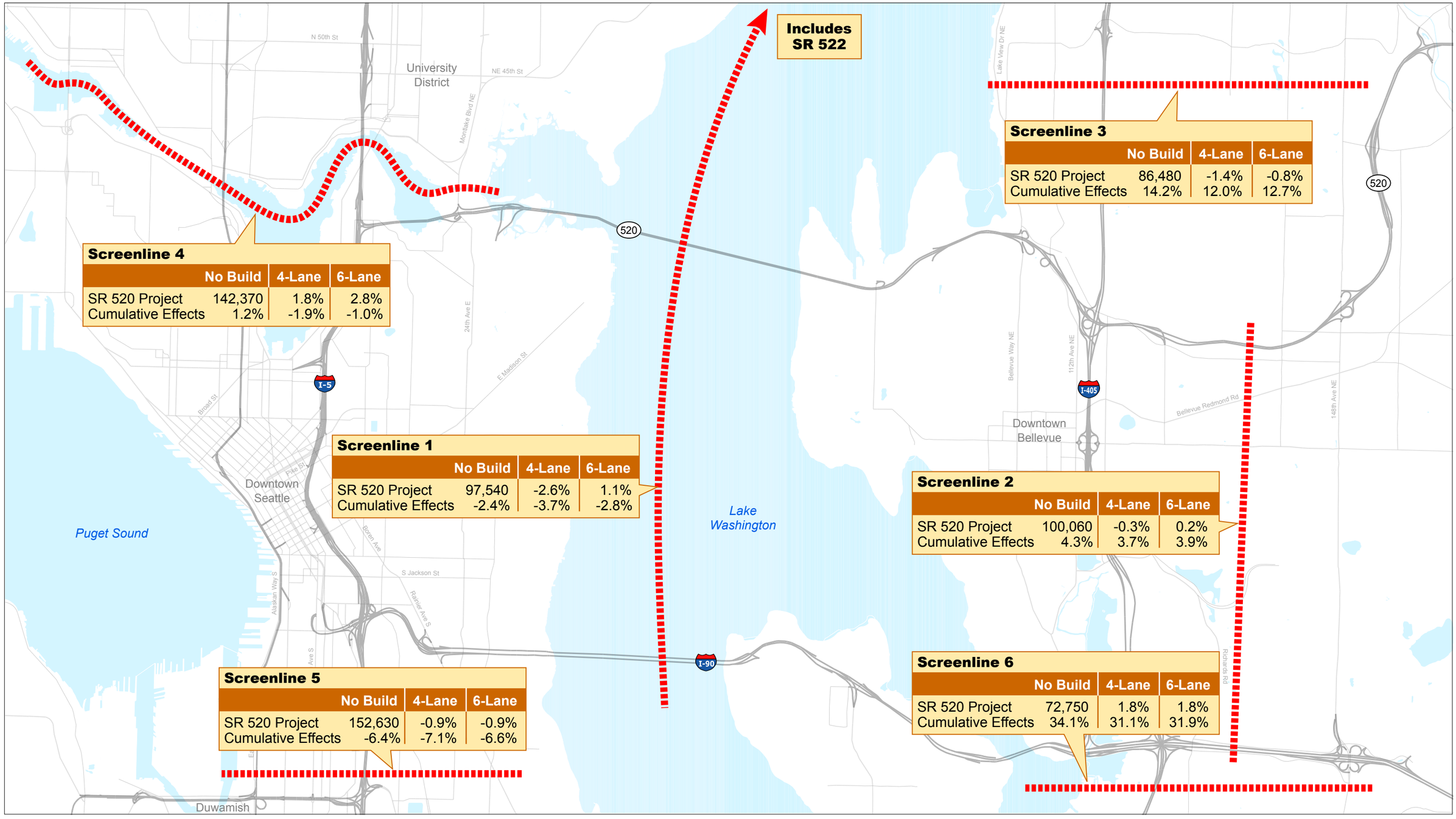



N 0 2,500 5,000 Feet

Note: The screenline percentage differences presented are all compared to the No Build Alternative travel demand model output. The No Build Alternative travel model result is listed in the first cell in each table (in the No Build, SR 520 project cell).

Exhibit 10-5. **Screenline Daily Person-Trips**
SR 520 Bridge Replacement and HOV Project

180171.AF.14 TDR_10-05_ScreenlineDailyPerson_19oct04

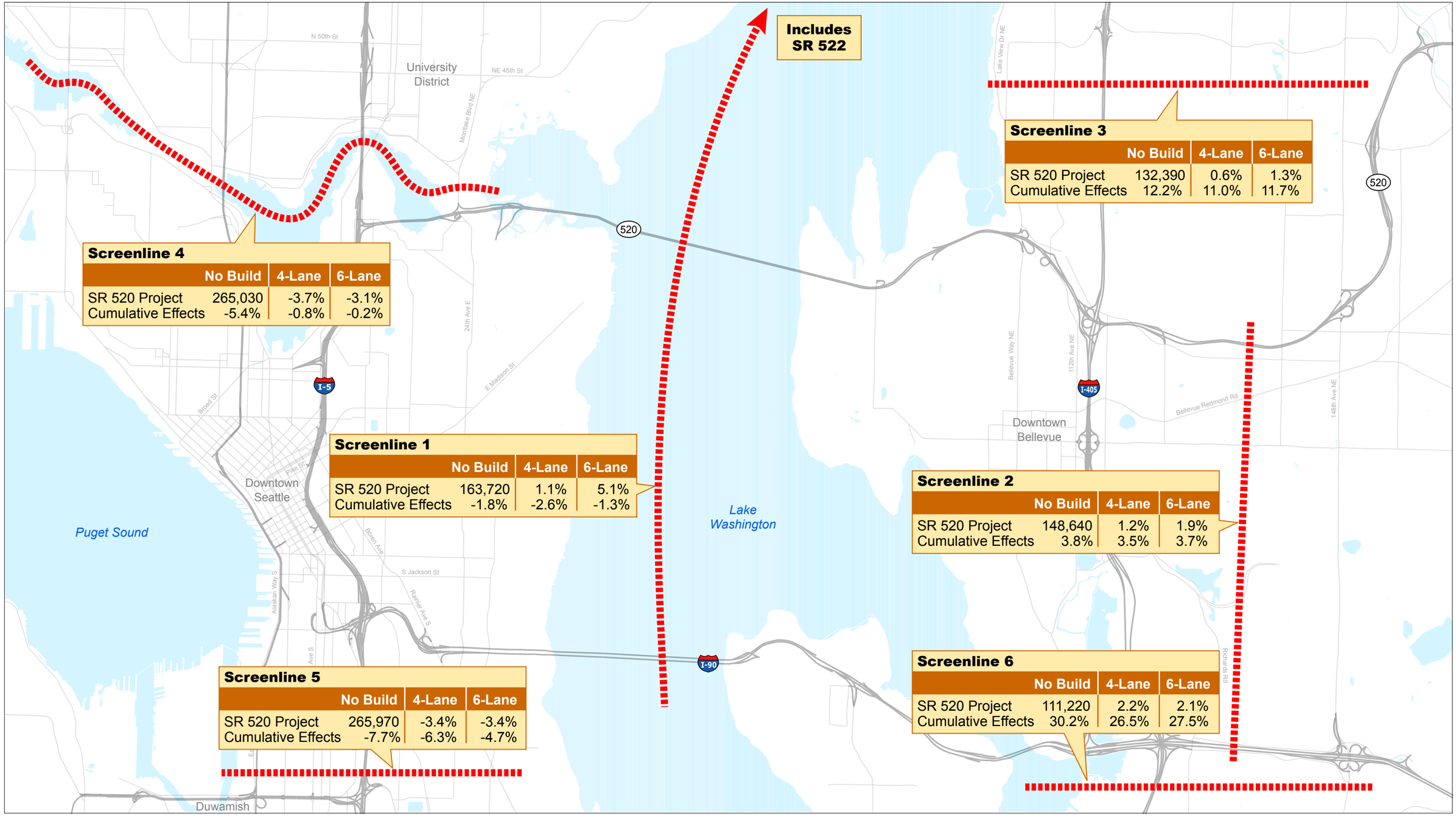



N 0 2,500 5,000 Feet

Note: The screenline percentage differences presented are all compared to the No Build Alternative travel demand model output. The No Build Alternative travel model result is listed in the first cell in each table (in the No Build, SR 520 project cell).

Exhibit 10-6. **Screenline P.M. Peak Period Vehicle-Trips**

SR 520 Bridge Replacement and HOV Project




N 0 2,500 5,000 Feet

Note: The screenline percentage differences presented are all compared to the No Build Alternative travel demand model output. The No Build Alternative travel model result is listed in the first cell in each table (in the No Build, SR 520 project cell).

Exhibit 10-7. **Screenline P.M. Peak Period Person-Trips**

SR 520 Bridge Replacement and HOV Project

The north-south screenline north of SR 520 and east of Lake Washington (screenline 3) also shows increases for the cumulative effects scenario ranging from 11.1 to 13.9 percent for daily vehicle-trips, and an increase range of 10.3 to 12.3 percent for daily person-trips. This increase for the cumulative effects scenario is also reflective of the capacity improvements planned along the I-405 and SR 522 corridors. We can conclude that more trips would remain on the Eastside because of the attractiveness of the capacity improvements on several regional transportation corridors.

East-west demand would increase east of I-405 in the cumulative effects scenarios. The daily increase would range from 3.1 to 4.1 percent vehicle-trips and from 2.8 to 3.7 percent daily person-trips. Given the increased attractiveness of the I-405 corridor and the fact that more trips would remain on the Eastside, an increase in trips along this stretch of SR 520 seems reasonable.

The cumulative effects scenarios show a general decrease in the number of person and vehicle-trips in some areas west of Lake Washington. This result would be a consequence of the decrease in the number of trips on I-5, which is related to transportation facility improvements on the I-405 corridor. Decreases in travel demand on the I-5 corridor south of I-90 would range from 5.4 to 6.9 percent in daily vehicle-trips. Decreases in daily person-trip demand would range between 1.9 and 5.3 percent. North of I-90, I-5 demand would remain relatively close to the No Build Alternative.

## What happens to cross-lake mode choice?

The transportation discipline team compared cross-lake travel demand between HOVs and GP vehicles across the SR 520 and I-90 bridges. The daily and p.m. peak-period vehicle- and person-trip effects of the cumulative scenarios would remain similar across alternatives. Exhibits 10-8 and 10-9 present daily cross-lake vehicle- and person-trips for both SR 520 and I-90. Exhibits 10-10 and 10-11 present cross-lake p.m. peak-period vehicle- and person-trips, respectively.

Total daily vehicle-trips would decrease slightly (-2.2 percent, see Exhibit 10-4) for the 4-Lane Alternative compared to the No Build Alternative, and would increase slightly (1.0 percent) for the 6-Lane Alternative. However, daily *person*-trips would increase for both (see Exhibit 10-5). The cause for the increase in person-trips is that both the 4-Lane and 6-Lane Alternatives would experience a considerable shift