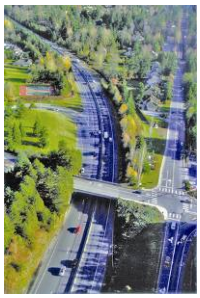


Chapter 5: Project Operation and Permanent Effects

This chapter focuses on the permanent effects that the Preferred Alternative and the SDEIS options would have on traffic, communities, and ecosystems compared to the No Build Alternative. It explains how the transportation system would operate with and without the project. It also describes the permanent direct and indirect effects, both positive and adverse, that the project would have on the built and natural environment.

What type of effects did WSDOT evaluate?

(a) Direct effects, which are caused by the project and occur at the same time and place.

(b) Indirect effects, which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable.

(c) Cumulative effects, which are caused by the incremental effect of the project when added to other past, present, and reasonably foreseeable actions. Chapter 7 addresses the cumulative effects for this project.

5.1 Transportation

The transportation analysis conducted for the Final EIS evaluated an updated No Build Alternative and the Preferred Alternative. The Preferred Alternative and the SDEIS options are designed to improve the corridor safety and mobility by addressing traffic flow and operations of SR 520 and access between the freeway and the local road system. As part of the mobility improvements on the corridor, the Preferred Alternative and the SDEIS options A, K, and L would also improve transit connections and reliability, as well as the interactions of nonmotorized transportation (bicycles and pedestrians) with cars, trucks, and buses along SR 520. This section provides a summary of findings from the SDEIS, which included an analysis of the No Build Alternative and Options A, K, and L, and compares them with the findings from the updated Final EIS No Build Alternative and Preferred Alternative analyses.

How was traffic evaluated for this project?

WSDOT used the Puget Sound Regional Council (PSRC) four-county travel demand model that was updated in 2006 to identify where and how traffic volumes would increase as a result of the growth in population and employment. Taking into account the projected population and employment growth, the transportation analysis identified the average daily traffic by evaluating the number of people and vehicles expected to move through the study area over the course of a day, in terms of person demand (the number of people forecasted to need to travel through an area) and vehicle demand (the number of vehicles forecasted to want to travel through an area). WSDOT also evaluated peak period traffic that would occur on SR 520 during the busiest times of day—in terms of the morning and evening commute times when demand would be highest and traffic conditions would likely be the worst—and modeled the anticipated throughput (the number of vehicles or persons forecasted to be able to travel through an area) for those peak times. Mode choice (the type of vehicle—whether single occupant vehicle, carpool, bus or other type of multi-person transit) was a factor in identifying how much person throughput (number of people modeled who would be likely to make a trip) would occur on cross-lake roadways (I-90 and SR 520) by vehicle type. This led to findings about congestion and travel times on SR 520 under the No Build Alternative and build alternatives during those peak periods, and provided more information about how the highway would operate under all alternatives. WSDOT forecasted traffic volumes on the local streets and at intersections within the study area to determine how local streets would function and intersection levels of service (LOS, a measure of intersection operations) that would be expected with each alternative.

How have growth projections used in the travel demand model changed since the SDEIS?

The population and employment information used for the Final EIS travel demand model has been supplemented by the Puget Sound Regional Council (PSRC) since publication of the SDEIS.

The SDEIS used the population growth estimates that were current at the time, which predicted that the region would add 1.1 million people and 850,000 new jobs between 2010 and 2030. For the SDEIS, this led to a finding that traffic on area roadways would increase by 50 percent. The updated growth estimates used for the Final EIS showed an increase of 1 million people and 640,000 jobs, resulting in an estimated 40 percent increase in traffic by 2030. While less than the previous estimate, this is still a substantial level of traffic growth to be absorbed by an already overburdened transportation system.

The lower increases in employment and population used for the Final EIS generally resulted in less demand for area roadways. Lower levels of demand resulted in lower levels of congestion on study area highways than described in the SDEIS. Nevertheless, as discussed in this chapter, traffic growth would continue to increase congestion on SR 520 between now and 2030. The Preferred Alternative would reduce traffic and congestion on SR 520 compared to the No Build condition without appreciably increasing it on alternate routes. Similar relative findings would likely result for Options A, K, and L as they were described in the SDEIS.

How does the traffic analysis for the Final EIS differ from the analysis conducted for the SDEIS?

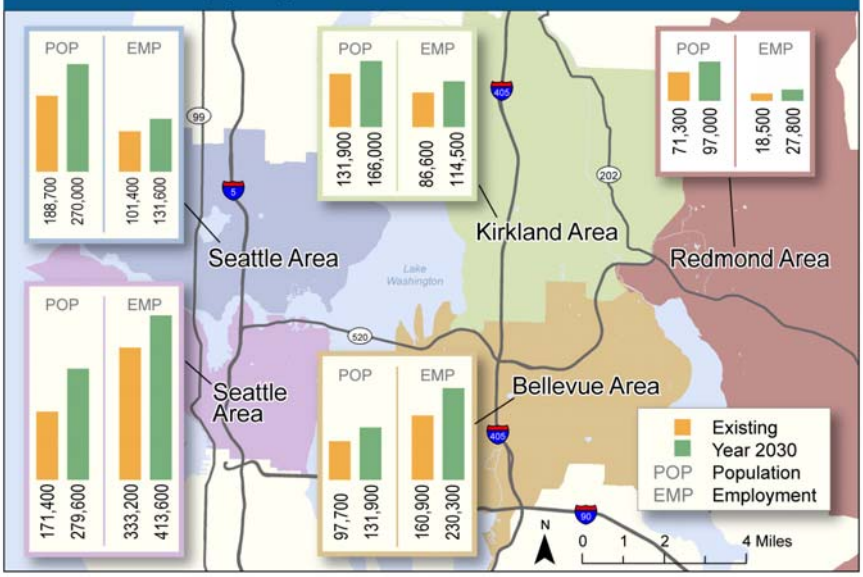
The first step in analyzing traffic for both the SDEIS and the Final EIS was to determine how much the traffic on area roadways is estimated to grow in the region by the year 2030. As noted in the text box on the previous page, this analysis was updated between the SDEIS and the Final EIS because the PSRC released an updated travel demand model and new data to supplement their population and employment estimates. The new estimates indicate that between today and the year 2030, the region's population is expected to grow by 1 million people and employers in the region are likely to add over 640,000 new jobs. This higher population and the expanded employment opportunities generate a need to accommodate close to 40 percent more traffic (PSRC 2010e) on area roadways. This is less than the 50 percent traffic growth estimated under the SDEIS; however, it still represents a large additional increment of demand on a transportation system that is already over capacity for many hours on weekdays. Projected population and employment growth for selected Seattle and Eastside areas are shown on Exhibit 5.1-1. Both Seattle and Eastside forecasts are shown because regional travel patterns, including traffic across SR 520, are influenced by population and employment changes on both sides of the lake.

How did the updated transit assumptions affect the travel demand model used in the Final EIS?

The more extensive light rail network that will be operational by 2030 will provide new travel options to meet demand. Use of light rail by commuters is expected to change vehicle volumes on roadways throughout the region, as well as within the SR 520 corridor.

For instance, with the connection of the North Link and East Link light rail systems, transit riders could have a "one seat" transit trip between Northgate and Seattle on the west side of Lake Washington to Mercer Island, Bellevue, and Overlake on the east side of the lake. With this type of new service, some transit riders that today use SR 520 bus service are forecasted to use light rail service across I-90.

Exhibit 5.1-1. **Forecasted Growth in Population and Employment between Existing (2006) and 2030**



As with the SDEIS, the analysis for the Final EIS was completed in a manner consistent with regional plans and policies in place at the time of the analysis. The transportation system modeled for the Final EIS uses some different assumptions than those used for the SDEIS about the road improvements and transit services that would be in place by 2030.

The Final EIS analysis also includes the latest assumptions for tolling on SR 520 as outlined through the Washington State Legislature in Engrossed Substitute Senate Bill (ESSB) 6392. See Chapter 1 for more information on tolling assumptions. Table 5.1-1 summarizes the differences in daily traffic assumptions between the SDEIS and Final EIS analyses.

Table 5.1-1. Comparison of SDEIS and Final EIS Traffic Modeling

Assumption	SDEIS	Final EIS
Transportation System	Included road and transit projects that were planned and funded when transportation analysis began in spring 2008. East Link light rail and other Sound Transit 2 (ST2) improvements were not included because they had not yet been approved by voters.	Includes road and transit projects that were planned and funded when transportation analysis began in spring 2010. All of the ST2 improvements, including East Link light rail, approved by voters are reflected in the analysis.
Regional Land Use and Economy	Included up-to-date factors for population, employment, and user costs, which were periodically updated based on new regional data.	Uses updated population and employment forecasts provided by PSRC.
2030 Modeling Scenarios	Travel demand and operations analysis for direct project effects: • No Build Alternative – No toll • 6-Lane Options A, K, and L – Segmental toll Travel demand evaluation: • Tolled 4-Lane Alternative	Travel demand and operations analysis for direct project effects: • No Build Alternative – No toll • Preferred Alternative – Single-point toll Travel demand evaluation: • No Build • Tolled, transit-optimized 4-Lane Alternative • 6-Lane Alternative with initial light rail transit (LRT)
Tolling Locations	Included segmental tolling, from an earlier (2007) toll finance analysis, which would have collected smaller tolls at more locations along the SR 520 corridor between I-5 and I-405.	Includes single-point tolling, which was authorized by the legislature in 2009 after analysis by the Tolling Implementation Committee. Tolls to cross Lake Washington on SR 520 would be collected at a single location on the Evergreen Point Bridge.

See Chapter 2 for a more detailed description of the travel demand evaluations.

For the SDEIS, tolling on the SR 520 corridor was assumed to be "segmental." This meant that tolls would be collected from people who traveled between interchanges, but did not necessarily cross the SR 520 floating bridge. In the Final EIS, this was changed to assume a single-point toll (tolls would only be collected for trips that cross the SR 520 floating bridge). The modification occurred after an extensive outreach process was completed with the Tolling Implementation Committee (discussed in Chapter 1) in 2008. They found through their outreach program that there was very little support for segmental tolling and that the benefits of additional revenue might not offset the management costs. Therefore, single-point tolling has been assumed for the Final EIS transportation modeling.

How would a tolled No Build Alternative compare with the untolled No Build Alternative evaluated in this EIS?

Traffic modeling for the Draft EIS, the SDEIS, and this Final EIS have all assumed that the 2030 No Build Alternative would not include a toll on SR 520. Section 1.11 explains the reasons for this assumption. However, FHWA and WSDOT recognize that SR 520 might be tolled in 2030 for reasons unrelated to the SR 520, I-5 to Medina project. In order to determine how this might affect the traffic modeling results, WSDOT performed a sensitivity analysis, which is included in Attachment 19.

In the sensitivity analysis, WSDOT used the PSRC travel demand model to estimate traffic volumes on a tolled 4-lane SR 520 in 2030. The tolling assumptions used were the same as those discussed in Chapter 1 and Table 5.1-1. The results of the analysis can be summarized as follows:

- Overall vehicle-trips and person-trips on SR 520 would be lower with a tolled No Build Alternative than with either the untolled No Build Alternative or the Preferred Alternative because the tolls would reduce travel demand in the SR 520 corridor.
- Transit and HOV use would increase with a tolled No Build Alternative, but only by about half as much as they would under the Preferred Alternative. Although the toll would cause some drivers to switch to transit and carpooling, the four existing general-purpose lanes would not provide the travel time and reliability benefits of the dedicated HOV lanes. Hence, there would be less incentive to switch to transit in the SR 520 corridor.
- The tolled No Build Alternative would move about 10,000 fewer people each day through the SR 520 corridor than the untolled No Build Alternative, and about 20,000 fewer people than the Preferred Alternative. In other words, the mobility benefits of the Preferred Alternative are even greater when compared to a tolled No Build Alternative than they are compared to the untolled No Build Alternative used for the EIS analysis.
- Vehicle miles traveled (VMT) would be slightly higher for the Preferred Alternative than for a tolled No Build Alternative, and therefore would result in slightly higher energy use and greenhouse gas emissions in the SR 520 corridor. At a subregional level, the difference between the Preferred Alternative and either a tolled or untolled No Build Alternative in VMT, energy use, and greenhouse gas emissions is expected to be negligible.
- The changes in traffic volume between a tolled and untolled No Build Alternative would not be large enough to affect noise modeling results for the Preferred Alternative.

In response to comments on the SDEIS, WSDOT also evaluated a 4-lane SR 520 with higher tolls to determine whether it could achieve transit benefits similar to those of a dedicated HOV lane. The results of that analysis are discussed in Section 2.4 of this Final EIS.

The differences in predicted traffic volumes and operations between Option A from the SDEIS and the Preferred Alternative as a result of the updated modeling are summarized in Table 5.1-2 and are also highlighted in this section's traffic discussion. Option A is used for comparison because its configuration is most similar to that of the Preferred Alternative. As discussed above, the differences are largely due to the changes in travel demand modeling assumptions rather than differences in how Option A and the Preferred Alternative would operate. More information is provided in the following section.

Table 5.1-2. SR 520 Cross-lake Trips, Year 2030 Daily

Alternative	SDEIS	Final EIS	Findings
No Build Alternative	135,000	127,400	
Option A	131,000 (-3% compared to No Build)	Not updated	Traffic volumes decrease compared to No Build due to addition of toll on the corridor and increased use of HOV lane.
Option A with Suboptions	132,400 (-1% compared to No Build)	Not updated	Not much different than Option A because traffic is mostly governed by 6-lane SR 520 corridor.
Options K, L, and Options K, L with Suboptions	133,800 (-1% compared to No Build)	Not updated	Not much different than Option A because traffic is mostly governed by 6-lane SR 520 corridor.
Preferred Alternative	Not applicable	120,900 (-5% compared to No Build)	Decrease similar to No Build, as shown under Option A in the SDEIS. Additional decrease for 6-Lane Alternative due to travel demand model sensitivity to toll.

How did WSDOT compare the results of the SDEIS and Final EIS transportation analyses?

As discussed above, the use of updated road project, transit service, and tolling assumptions in the travel demand model for the Final EIS analysis led to lower overall projected vehicle and transit demand on study area highways than was projected as part of the SDEIS analysis. This overall finding was true for both the Final EIS No Build Alternative and the Preferred Alternative because both were based on the same PSRC assumptions about traffic growth. These highway findings also affected local traffic and intersection operations. This means that the numeric findings for the SDEIS options cannot be directly compared to those for the Preferred Alternative, since they are based on different baseline conditions. However, the potential effects of the SDEIS options and the Preferred Alternative can be compared in a relative manner. WSDOT reviewed Options A, K, and L as presented in the SDEIS relative to the No Build Alternative, and reviewed the Preferred Alternative relative to the Final EIS No Build Alternative. WSDOT then considered how the SDEIS options would affect the environment relative to the No Build condition and how the Preferred Alternative would affect the environment relative to the Final EIS No Build condition. The degree of improvement in freeway operations and travel times under the Preferred Alternative compared to No Build is relatively similar to the improvement under the SDEIS options compared to No Build. For each topic of discussion below, there is a comparison of the effects of Options A, K, and L to those of the Preferred Alternative. Comparisons are provided in Tables 5.1-2, 5.1-3, and 5.1-4 that describe daily, average morning peak hour, and average afternoon peak hour traffic volumes.

How does tolling affect transportation?

The project demand model was updated to represent the most current transportation network, tolling assumptions, land use, and transit data for the Final EIS analysis. For the transportation analysis included in this Final EIS, HOVs (3+ carpools and buses) were assumed to be exempt from tolling. Tolling on SR 520—along with completion of the HOV lane, which would make transit a faster and more reliable choice—would reduce daily vehicle volumes across SR 520 by up to 6,500 vehicles (or 5 percent) compared to the updated No Build Alternative. This is because some people would choose to take other modes of travel (such as transit, carpools, vanpools, or bicycles), change their time of travel, or select a different route. Chapter 1 includes more information on project tolling assumptions.

Daily SR 520 cross-lake trips under the Final EIS No Build Alternative are lower than the SDEIS No Build Alternative forecasts. Similarly, the SDEIS options would result in proportionately lower daily trips using the Final EIS model updates. An increase in population and employment on the Eastside associated with the planned Bel-Red corridor land use updates may reduce the number of cross-lake trips. Also, light rail across I-90 may reduce the number of trips made across the lake in private vehicles.

Table 5.1-2 illustrates a comparison of year 2030 daily cross-lake vehicle trips between the SDEIS options and SDEIS No Build Alternative. Each of the options evaluated in the SDEIS showed a decrease in daily traffic compared to the SDEIS No Build Alternative. The same pattern is seen in the Final EIS analysis that was completed for the Preferred Alternative and Final EIS No Build Alternative. It is anticipated that Option A, with or without the Lake Washington Boulevard ramps, would result in daily cross-lake trips similar to the Preferred Alternative, if they were evaluated using the updated Final EIS model. It is further anticipated that if the SDEIS options were rerun in the new model, Options K and L would have slightly

higher daily traffic volumes than the Preferred Alternative. If the SDEIS options were updated to reflect current regional plans and policies, it is expected that the daily cross-lake travel demand for SR 520 would be in the range of 120,000 to 127,000 vehicles, which is the range of daily travel demand results for the Final EIS shown in Table 5.1-2.

When are the peak traffic periods on SR 520?

While daily trips are expected to decrease with the Preferred Alternative compared to No Build, during the peak period traffic volume growth still occurs at levels similar to the SDEIS options. This is because most trips made during the peak commute periods are employment-based trips.

The Preferred Alternative and the SDEIS options would all reduce congestion on the corridor and improve vehicle throughput. This would be achieved by reducing the number of bottlenecks on the corridor through measures such as providing shoulders on the floating bridge and extending the HOV lane to I-5 under the Preferred Alternative.

During the morning peak period, the SDEIS No Build and Final EIS No Build Alternative serve 7,600 vehicles per hour (vph) cross-lake. Volumes are consistent between the two models because this represents the throughput of the highway at peak operating conditions (Table 5.1-3). Throughput is primarily a function of the highway design, and is also influenced by the amount of travel demand at a particular time. In other words, the capacity of each design option is constant regardless of variations in travel demand assumptions. The actual throughput during peak periods is closely related to the capacity, with some variation resulting from differences in travel demand.

Table 5.1-3. SR 520 Cross-lake Traffic Throughput, Year 2030 Peak Periods

	AM Peak Period		PM Peak Period		
Alternative	**SDEIS**	**Final EIS**	**SDEIS**	**Final EIS**	**Findings**
No Build Alternative	7,600 vph	7,600 vph	7,400 vph	7,600 vph	Due to capacity constraints on the corridor, the vehicle throughput is the same for the SDEIS and Final EIS No Build Alternatives.
Option A	8,100 vph	Not applicable	7,800 vph	Not applicable	Would likely have similar results if the model were rerun.
Option A with Suboptions	8,400 vph	Not applicable	7,900 vph	Not applicable	Would likely have similar results if the model were rerun.
Options K, L, and Options K, L with Suboptions	8,600 vph	Not applicable	8,400 vph	Not applicable	Would likely have similar results if the model were rerun.
Preferred Alternative	Not applicable	8,300 vph	Not applicable	7,900 vph	Would fall between Option A and Option A with suboption volumes, similar to daily volume comparison.

In the SDEIS morning peak hour analysis, all options would serve between 8,100 and 8,600 vph, an improvement over the SDEIS No Build Alternative. In the Final EIS analysis, the Preferred Alternative would increase the amount of traffic served to 8,300 vph, similar to Option A with the suboption to add Lake Washington Boulevard ramps. It is estimated that if the SDEIS options were updated to reflect current regional plans and policies, the cross-lake trips served would be consistent as reported in the SDEIS (ranging from 8,100 to 8,600 vph).

Afternoon peak hour findings are similar to the morning peak hour. Throughput volumes are consistent between the SDEIS and Final EIS models because of the close relationship between throughput and the highway design. As the SR 520 and adjacent corridors reach congested levels, cross-lake volumes are expected to approach 7,400 to 7,600 vph in the No Build Alternative configuration. In the SDEIS, we found that all 6-Lane Alternative options would serve between 7,800 and 8,400 vph, an improvement over the No Build Alternative. In the Final EIS, we found that the Preferred Alternative increased the amount of afternoon peak hour traffic served to 7,900 vph, similar to Option A with the suboption (Table 5.1-3). It is estimated that if the SDEIS options were updated to reflect current regional plans and policies, the amount of morning peak hour cross-lake trips served would be consistent as reported in the SDEIS (ranging from 7,800 to 8,400 vph).

Demand and Throughput

Demand is a term used to refer to the number of people and/or vehicles that are expected to use a given roadway during a particular time period. Throughput refers to the number of people and/or vehicles that the roadway can actually carry during that period.

More about Travel Demand

Planners use the terms *person demand* and *vehicle demand* to help evaluate and understand total volumes of people and vehicles traveling and the modes of travel that people may choose (e.g., carpools, buses, or single occupant vehicles). Person demand means the number of people who would choose to travel a route, regardless of how many vehicles they would be in. Vehicle demand is then used to relate the likely number of vehicles to the number of persons traveling to identify likely modes of travel for given routes.

How much traffic would cross Lake Washington daily in 2030?

Daily and peak hour traffic volumes were described in the previous section to illustrate the relationship between the SDEIS options (A, K, and L) and the Final EIS Preferred Alternative. This section describes how the changes in traffic volume on SR 520 correlate with traffic volume changes on the two other primary alternate routes (SR 522 and I-90).

Final EIS No Build Alternative and Preferred Alternative

Without the project, the average daily volumes of traffic on SR 520, SR 522, and I-90 would be slightly less than (although similar to) the volumes expected under the SDEIS No Build condition. As seen in Exhibit 5.1-2, traffic on SR 520 and SR 522 without the project would increase by 11 percent and 9 percent, respectively, over existing conditions. Forecasts show that there would be little to no change in traffic volumes on I-90 compared to today because light rail would be in place on I-90, resulting in less vehicular growth on that corridor while still moving more people.

The Preferred Alternative would result in 5 percent lower volumes of traffic on SR 520 than the Final EIS No Build condition, and slightly more traffic on both SR 522 (2 percent) and I-90 (1 percent). The increases on SR 522 and I-90 would result from people diverting from SR 520 to non-tolled

Exhibit 5.1-2. **Daily Vehicle Demand Volumes on SR 522, SR 520, and I-90**

SR 522 West of 61st Ave NE

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	49,000	
Year 2030 No Build Alternative	53,200	9%[1]
Year 2030 Preferred Alternative	54,400	2%[2]

SR 520 at Mid-span

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	115,000	
Year 2030 No Build Alternative	127,400	11%[1]
Year 2030 Preferred Alternative	120,900	-5%[2]

I-90 at West Bridge

ALTERNATIVE	VEHICLES	% CHANGE
Existing Conditions	149,000	
Year 2030 No Build Alternative	149,400	0%[1]
Year 2030 Preferred Alternative	151,500	1%[2]

[1] Compared to existing conditions
[2] Compared to year 2030 No Build Alternative

Source: King County (2008) GIS Data (Streams, Streets, Water Bodies), CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

routes across the lake. Traffic volumes on all three of these roadways would still be higher than today under both the No Build and build alternative conditions.

Exhibit 5.1-3 compares expected vehicle demand and person demand on SR 520 in 2030. Note that overall demand for transit in the SR 520 corridor is expected to decrease by 2030 because implementation of the East Link project would absorb much of the demand for cross-lake transit. However, significantly more people per day (39 percent) would choose to travel across SR 520 in carpools or by bus under the Preferred Alternative than under No Build. This is because transit would be a more attractive option, allowing users to avoid the toll and also to gain the benefit of increased transit speed and reliability in the HOV lanes.

Even considering that relatively more people would choose to travel in carpools or by bus in 2030, the total (person and vehicle) demand would exceed throughput on SR 520 during the peak periods with the Preferred Alternative because of congestion within the general transportation system, as demonstrated by Exhibit 5.1-4. Even with the proposed improvements, the roadway would simply not have the capacity to handle the traffic.

More about Throughput

Throughput refers to the number of vehicles that a roadway can actually carry during a particular period—a number influenced by the road's physical features (such as the number of lanes) and the level of traffic congestion. When transportation planners say that demand exceeds throughput, it's simply a way of saying that a roadway has more traffic than it can handle.

Exhibit 5.1-3. **Daily Vehicle and Person Demand by Mode Across the SR 520 Bridge (mid-span)**

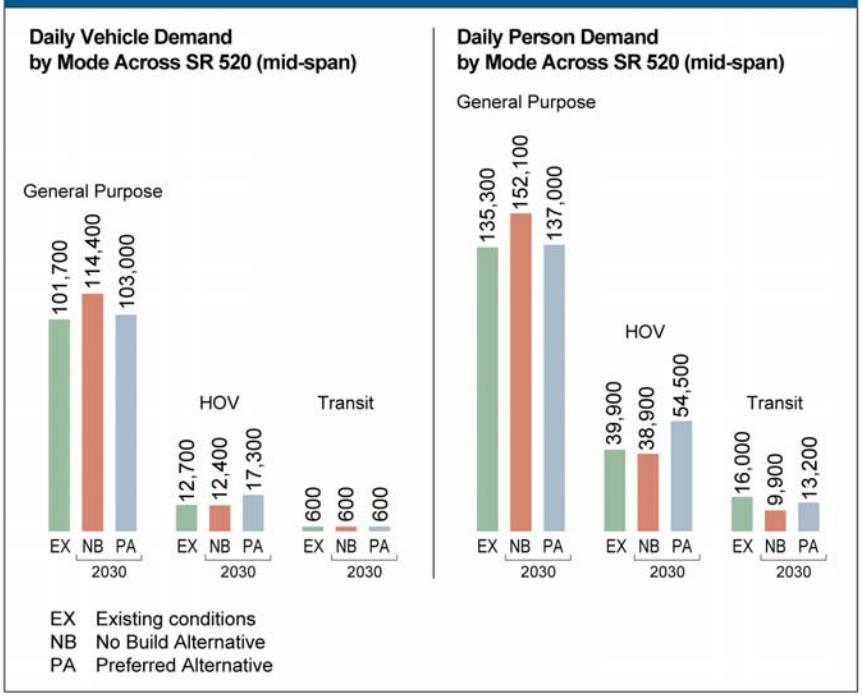
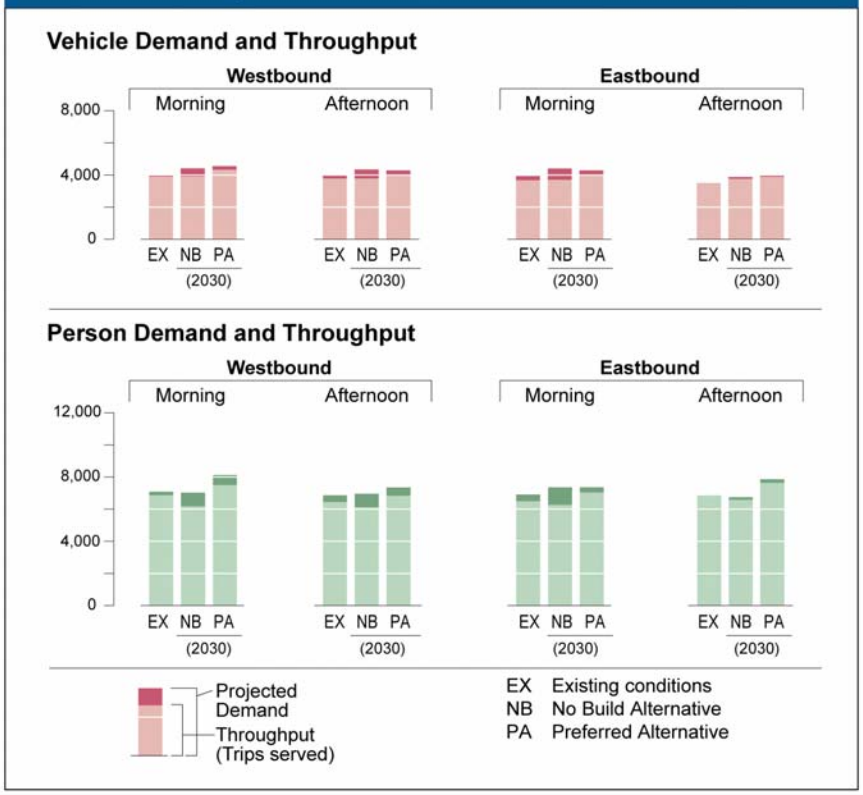


Exhibit 5.1-4. **Traffic Demand and Throughput during Peak Periods Today and in 2030**



However, as noted above, a significant benefit of the project would be the continuous HOV lanes and new transit access facilities, which would increase transit and HOV use and reliability.

The next section discusses the effects (including benefits to both general purpose and HOV travel times) with the project compared to the effects without it. Since the peak periods represent the worst-case scenario on local roadways and freeways, the following discussion focuses on the findings about SR 520 and local roadway operations during the morning and evening peak periods.

SDEIS No Build Alternative and Options A, K, and L

While average daily vehicle traffic is expected to grow considerably between now and 2030, the vehicle demand for the SDEIS options is not expected to be much different than for the SDEIS No Build Alternative. This is, in part, because during the off-peak periods, when traffic flows best, travelers may opt to avoid SR 520 tolls by traveling in a bus or carpool or on a different corridor, or canceling their trip entirely. Also, the addition of the toll, improved HOV reliability, and reduced travel times would increase the incentive to carpool or take the bus. As a result, the SDEIS options would actually result in a small net decrease in daily vehicle traffic demand on SR 520 and a minor increase on SR 522 and I-90 compared to the No Build Alternative (Table 5.1-4).

Table 5.1-4. SDEIS Analysis – Daily Vehicle Demand – Area Freeways

Alternative	SR 522	SR 520	I-90
Existing	49,000	115,000	149,000
2030 No Build	63,100	135,000	199,100
2030 Option A	65,100	131,000	201,800
2030 Option K or L	64,000	133,800	200,100

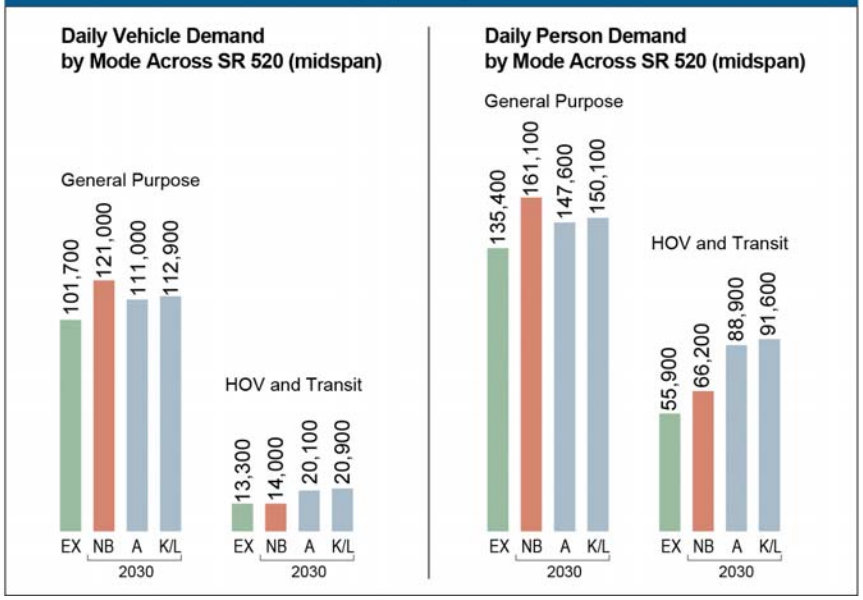
Note: Adding the suboptions to Options A, K, and L would result in no substantial change in the daily vehicle demand listed in this table.

However, daily person demand on SR 520 is expected to increase more under the SDEIS options than under No Build. This is because the toll on SR 520, along with improved HOV reliability and travel times, would encourage greater use of transit and carpooling. In 2030, the SDEIS options would carry up to 6 percent more people per day than the SDEIS No Build Alternative in about the same number of vehicles. Changes in daily person demand between now and 2030 are summarized in Exhibit 5.1-5. All options result in improved person mobility in fewer vehicles. This is the result of completing the HOV lane system and tolling the bridge.

How do general purpose and HOV lanes differ?

HOV lanes typically accommodate fewer vehicles and more people than general purpose lanes, making them more efficient. How many people an HOV lane accommodates will vary from corridor to corridor, depending on the level of bus service and ridership, the minimum carpool occupancy requirement, and the incentive for using bus or carpool. Travel time benefits for buses and carpools, along with no payment of toll to cross the SR 520 bridge, are good examples of incentives. An HOV lane typically accommodates up to 1,500 vehicles per hour compared to 2,200 vehicles per hour for general purpose lanes, but those vehicles can accommodate many more riders. If the two general purpose lanes are full, they would accommodate about 5,800 people; the single HOV lane could operate at just over 75% of its capacity and still accommodate the same number of people as both general purpose lanes combined. Thus, the HOV lanes may look "empty" compared to the general purpose lanes, even while accommodating as many or more people than the two adjacent lanes.

Exhibit 5.1-5. **SDEIS Analysis – Daily Vehicle and Person Demand by Mode Across the SR 520 Bridge (mid-span)**



It is anticipated that if the SDEIS options were updated to reflect current regional plans and policies, they would show similar vehicle and person trip demand as shown for the Preferred Alternative while maintaining their relative differences.

How would the project affect freeway operations and travel times during peak periods?

The term "freeway traffic operations" refers to how freely traffic is flowing and is discussed here in terms of congestion and travel times. This section discusses freeway operations in terms of congestion during the peak periods of the day, including how congestion affects travel times.

Before looking at the details of operations for the east and west directions by peak time of day below, we can summarize freeway operations by saying that, without the project, congestion and travel times during the morning and evening commute would continue to worsen over existing conditions. Similar to the SDEIS findings about Options A, K, and L, the Preferred Alternative would reduce congestion and travel times for both general purpose and HOV trips, particularly during the westbound afternoon and eastbound morning peak periods. The project would also improve transit travel times and provide more reliable bus timing with the new HOV lanes. However, even with the improved throughput and travel times, not all the forecasted demand for SR 520 in 2030 would be served, due to congestion on I-405 and I-5.

Peak Period versus Peak Hour

When we refer to **peak period** in this analysis, we are referring to a 4-hour peak period.

The morning peak period for the SR 520 I-5 to Medina project occurs weekdays between 6:00 a.m. and 10:00 a.m. The evening peak period occurs weekdays between 3:30 p.m. and 7:30 p.m.

When we refer to **peak hour** in this analysis, we are referring to the "worst" hour within the peak period.

The project would improve the ramp designs for the Montlake Boulevard interchange with SR 520 in the study area to current design standards, which would address current safety issues and is expected to lead to:

- A decrease in overall crash frequencies and crash rates as a result of widening the roadway and improving traffic operations
- A decrease in fixed-object crashes as a result of widened shoulders, which would provide increased recovery area for errant vehicles
- A decrease in some ramp crashes as a result of improved roadway designs that more closely meet current roadway standards

Since the SDEIS analysis, there have been changes in regional planning and policies that would affect the year 2030 No Build and build alternative conditions. These include the following:

- The travel demand model used for the program has been updated for the Final EIS to be consistent with the current PSRC model for year 2030 conditions.
- ST2 improvements were assumed complete in the year 2030 in the Final EIS analysis. This includes light rail on I-90, which reduces the person trips on SR 520 compared to the SDEIS analysis in the year 2030.
- The build alternative was assumed to be tolled under both the SDEIS and Final EIS analyses. However for the SDEIS analysis, the toll was defined as a segmental toll. This means trips that used SR 520 but did not cross the lake would also pay a toll. Since the SDEIS was published, legislation has determined that the toll associated with the build alternative would be a single-point toll. This means only trips that use the Evergreen Point Bridge would pay the toll.

The following describes the Final EIS No Build and Preferred Alternative forecasted traffic operations for SR 520 and I-5 (express lanes and the main line). Following the Final EIS findings is a summary of the SDEIS No Build Alternative and 6-Lane Alternative options. Exhibits from the SDEIS are included and a description of how the SDEIS options would operate if they were rerun in the Final EIS travel demand model.

Final EIS No Build Alternative and Preferred Alternative

Morning Peak Period - Westbound

In 2030 without the project, SR 520 would continue to be congested approaching the Evergreen Point Bridge from the Eastside because of the termination of the HOV lane near the floating bridge east approach in Medina (Exhibit 5.1-6; Exhibit 5.1-7 shows the average travel times). Congestion would last several hours.

Average travel times during the peak period for the Final EIS 2030 No Build Alternative between SR 202 and I-5 would be 27 minutes for general

What do the project's travel times assume about the Eastside portion of SR 520?

All travel times shown in this chapter, including the updated No Build, assume that the SR 520, Medina to SR 202: Eastside Transit and HOV Improvement Project is completed. The SR 520, Medina to SR 202 project would complete the SR 520 HOV system east of Lake Washington and build new inside transit stops. It would reduce congestion and travel times on SR 520 on the Eastside, improving baseline conditions for the SR 520, I-5 to Medina project.

Exhibit 5.1-6. **Westbound Areas of Congestion during the Morning Commute Peak Period**

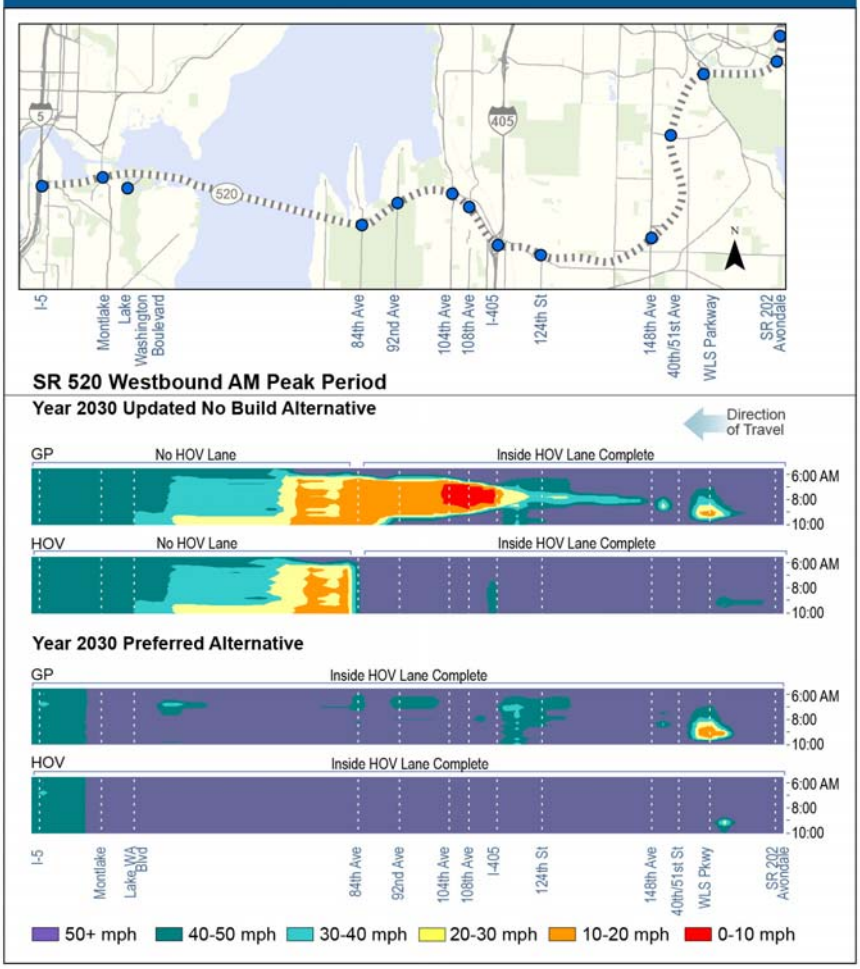
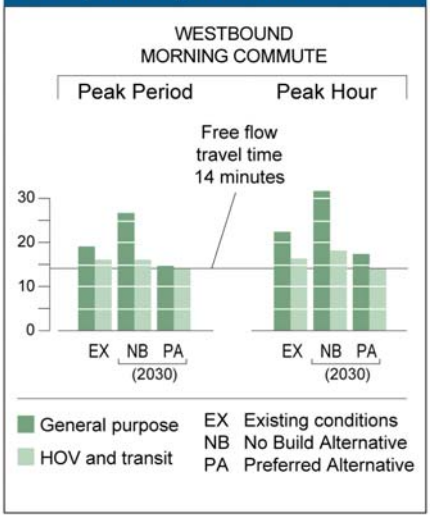


Exhibit 5.1-7. **Westbound Average Travel Times (in minutes), SR 202 to I-5, Morning Commute**



purpose traffic and 16 minutes for HOV traffic, compared to 19 minutes and 16 minutes, respectively, today (Exhibit 5.1-7).

Under the Preferred Alternative, congestion on westbound SR 520 approaching the Evergreen Point Bridge would decrease substantially because the HOV lanes would be extended across the bridge to the I-5 express lanes, eliminating the westbound merge just before the bridge. Travel times would be faster than under the 2030 No Build conditions (and faster than today) for both general purpose and HOV traffic. As a result, vehicle and person throughput across the Evergreen Point Bridge would increase.

In year 2030 the average travel time for general purpose traffic between SR 202 and I-5 under the Preferred Alternative would be 15 minutes compared to 27 minutes under the Final EIS No Build Alternative. The HOV lane travel time would be 14 minutes compared to 16 under the No Build condition (Exhibit 5.1-7) between SR 202 and I-5. There is less improvement to be seen for the HOV lane because there is an existing

inside HOV lane westbound east of the floating bridge, helping HOV traffic bypass some of the congestion on SR 520.

Travel time improvements would be even more noticeable with the project during the peak hour of the peak period. General purpose trips would go from 32 minutes under the No Build condition to 17 minutes under the Preferred Alternative. HOV times would go from 18 minutes under the No Build condition to 14 minutes under the Preferred Alternative.

Morning Peak Period - Eastbound

In 2030 without the project, SR 520 eastbound would continue to be congested between I-5 and the west transition span of the floating bridge near the Arboretum (Exhibit 5.1-8; Exhibit 5.1-9 shows the average travel times). SR 520 congestion would spill back onto mainline I-5, affecting the I-5 northbound operations. Congestion would occur at the west transition span because of the short acceleration lane for traffic merging from the Lake Washington Boulevard on-ramp, the mainline grade change approaching the west transition span, and shoulder widths that are much narrower than prescribed by the current Washington state design guidelines.

Exhibit 5.1-8. **Eastbound Areas of Congestion during the Morning Commute Peak Period**

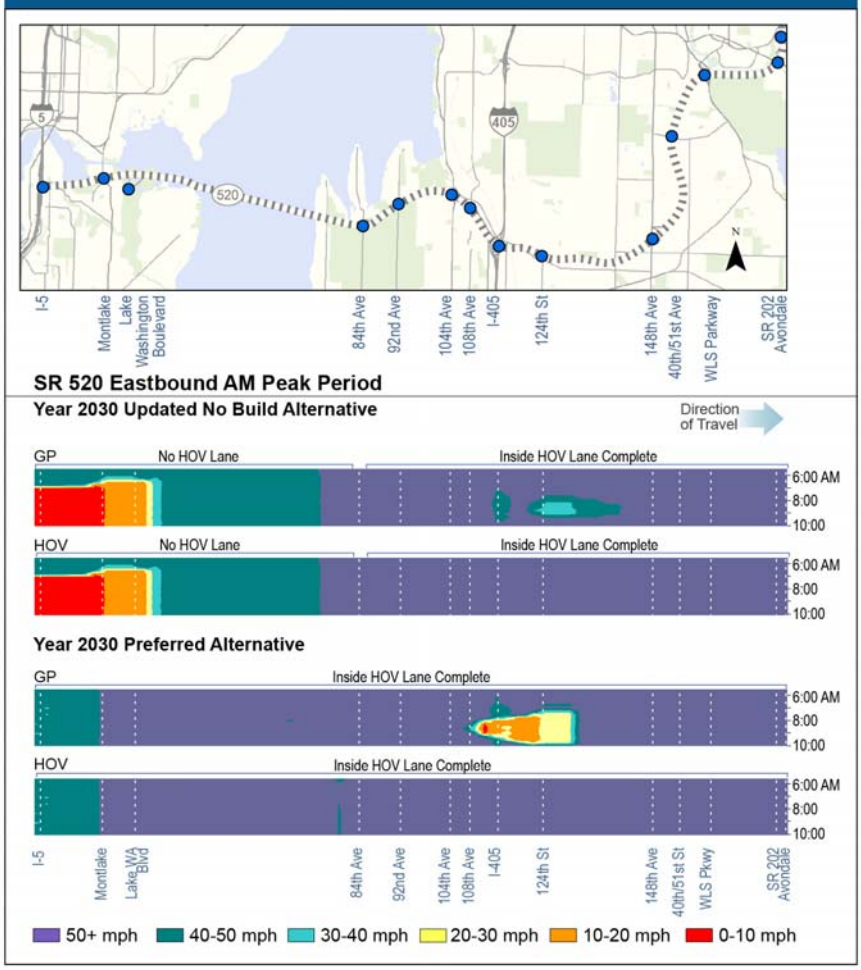
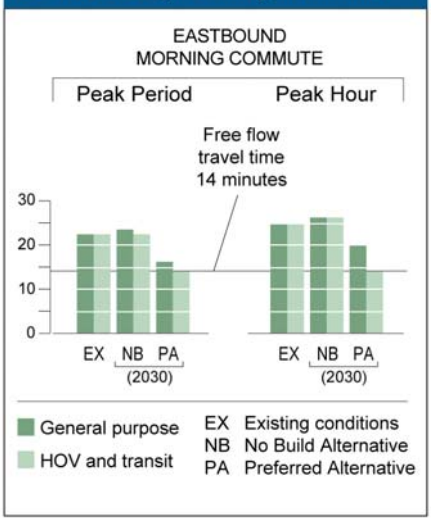


Exhibit 5.1-9. **Eastbound Average Travel Times (in minutes), I-5 to SR 202, Morning Commute**



Without the project, congestion would last for about 3 hours and would limit the amount of traffic that could cross the floating bridge. General purpose and HOV average travel times would be 23 minutes and 22 minutes, respectively, from I-5 to SR 202 (Exhibit 5.1-9). With the additional congestion that would spill back to I-5, a trip starting from downtown Seattle on I-5 across SR 520 to Bellevue would take up to 44 minutes for general purpose vehicles at the peak of congestion.

With the project, average travel times between I-5 and SR 202 would improve compared to the No Build Alternative. It would take 16 minutes for general purpose traffic and 14 minutes for HOV trips to travel from I-5 to SR 202 (Exhibit 5.1-9).

The improvements to SR 520 would result in less congestion spilling back onto mainline I-5 than under No Build conditions. During the peak hour, the travel time for general purpose trips between Seattle and Bellevue would be 11 minutes—33 minutes faster than No Build conditions. HOV trips would take 10 minutes, 28 minutes faster than without the project.

As in the SDEIS analysis (and as shown in Exhibit 5.1-9), the additional throughput on SR 520 west of the lake would result in more traffic moving faster east of the lake toward a heavily congested area (Exhibit 5.1-8) at the merge from I-405 northbound to eastbound SR 520. Although the more efficient movement of traffic on the west side would allow eastbound traffic to reach the Eastside congestion points sooner, and that congestion would be worse than No Build conditions, overall congestion and travel times on the SR 520 corridor would be improved.

Evening Peak Period - Westbound

Under current afternoon commute conditions, SR 520 is congested in the project area between the Montlake Boulevard on-ramp merge point and I-5 due to the short acceleration lane. Drivers using the Montlake on-ramp do not have the space to accelerate to freeway speeds, and drivers on the SR 520 main line must slow down to accommodate entering vehicles. Today, moderate congestion lasts approximately 2 to 3 hours in this area.

Without the project in 2030, the SR 520 westbound general purpose lanes would continue to be congested at the three worst current locations—approaching the east side of the floating bridge and at I-405, as well as at the Portage Bay Bridge (Exhibit 5.1-10). The congestion at the approach to the floating bridge and at I-405 would compound each other, and general purpose vehicle travel times from SR 202 to I-5 under the No Build condition would increase from an average 33 minutes today during the peak period to 39 minutes in 2030. However, peak period HOV travel time would improve over existing conditions from 23 minutes to 18 minutes due to implementation of the SR 520, Medina to SR 202 project. The HOV travel time would be much faster than general purpose travel time because HOVs would bypass congestion east of the floating bridge (Exhibit 5.1-11).

Congestion across the Portage Bay Bridge itself would last approximately 3 to 4 hours. Westbound drivers changing lanes to access the I-5 off-ramps and congestion from the Montlake Boulevard on-ramp merge contribute to congestion in this area (Exhibit 5.1-10).

Exhibit 5.1-10. **Westbound Areas of Congestion during the Evening Commute Peak Period**

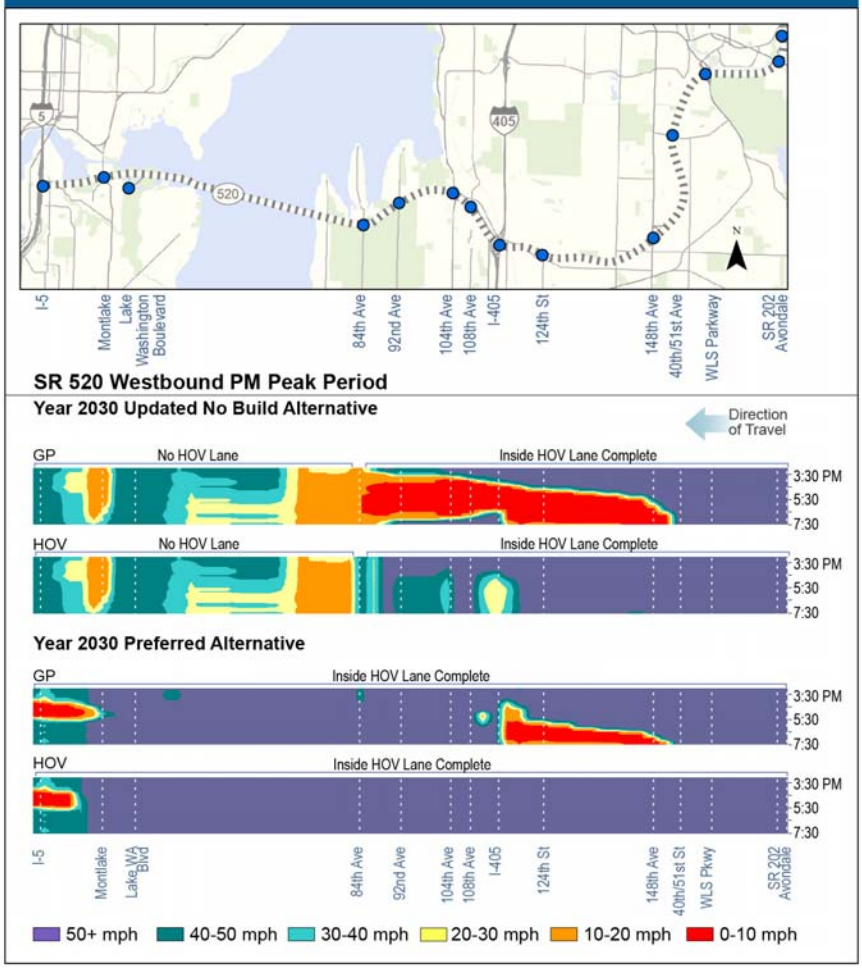
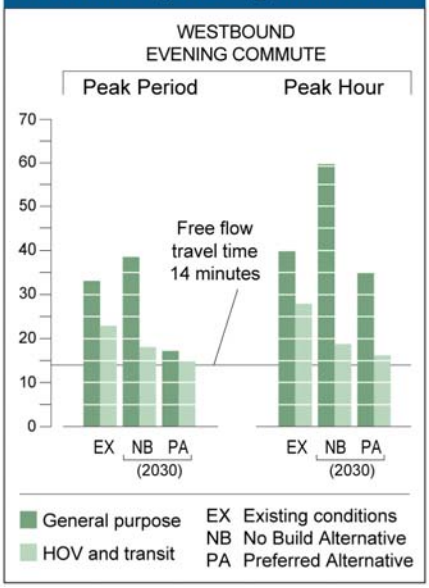


Exhibit 5.1-11. **Westbound Average Travel Times (in minutes), SR 202 to I-5, Evening Commute**



Similar to the SDEIS options, congestion across the Portage Bay Bridge would continue under the Preferred Alternative, but the duration would be shorter (2 hours or less) than under No Build conditions. Under the No Build Alternative, this congestion occurs because the on-ramp merge from Montlake Boulevard does not provide enough distance for people to accelerate and find a gap in traffic to merge. Also, the westbound on-ramp is not metered. The safety and operating conditions near the Montlake on-ramp would be improved under the Preferred Alternative with the ramp meter and the shoulder-running auxiliary lane. However, enough traffic would get to I-5 so that congestion would start to spill back onto SR 520.

With the completion of the HOV lane to I-5 and an improved corridor with shoulders, the average general purpose travel times westbound across

the corridor would improve from 39 minutes without the project to 17 minutes (Exhibit 5.1-11). Under the Preferred Alternative, peak hour travel times through the corridor would also improve. General purpose travel times would be 35 minutes as opposed to 60 minutes without the project. HOV travel times with the project would be 16 minutes, only 3 minutes faster than the 19 minutes without the project.

Evening Peak Period – Eastbound

Under the Final EIS No Build conditions, by 2030 traffic congestion on the I-405 main line would affect the SR 520 eastbound afternoon commute, but to a much lesser degree than found in the SDEIS analysis. Exhibit 5.1-12 shows the eastbound areas of congestion; Exhibit 5.1-13 shows the average travel times during the evening peak period. The SDEIS analysis found that general purpose congestion would extend as far back as I-5, blocking eastbound carpools and buses from reaching the HOV lane that would then be in place starting near the eastern lake shore. As discussed earlier in this chapter, the difference is due to the updated travel demand model, which predicts less growth in traffic volumes by 2030 than the SDEIS forecast, but would still be 30 percent higher than existing conditions. The Final EIS

Exhibit 5.1-12. **Eastbound Areas of Congestion during the Evening Commute Peak Period**

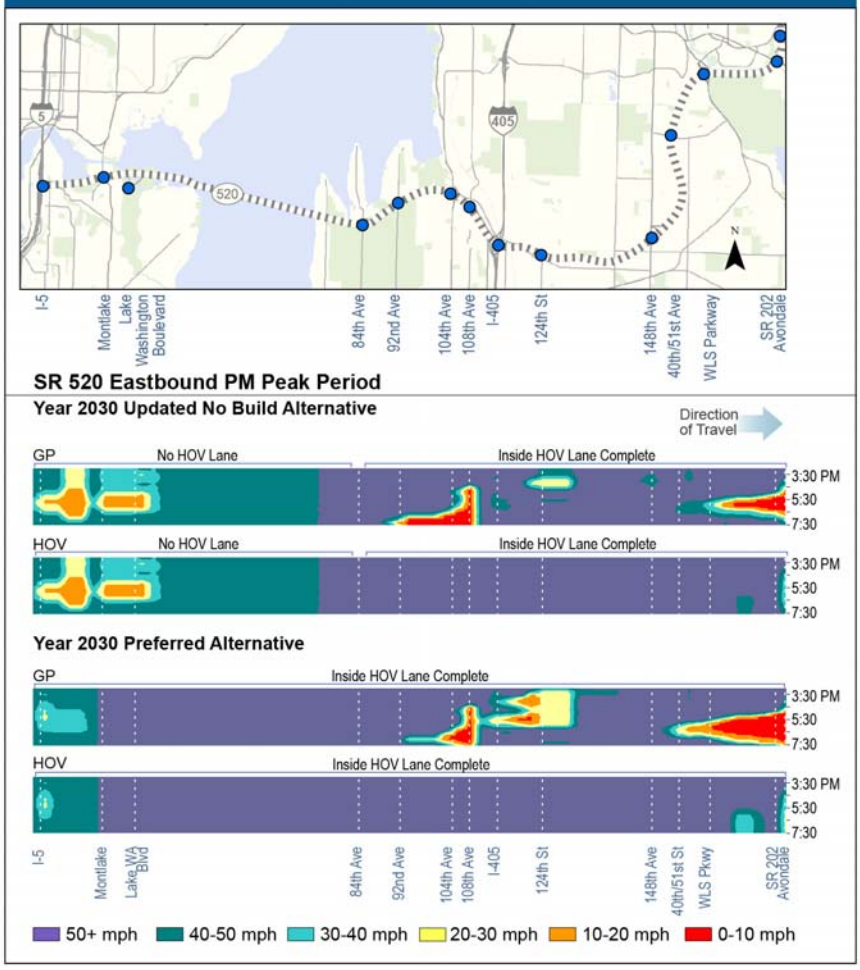
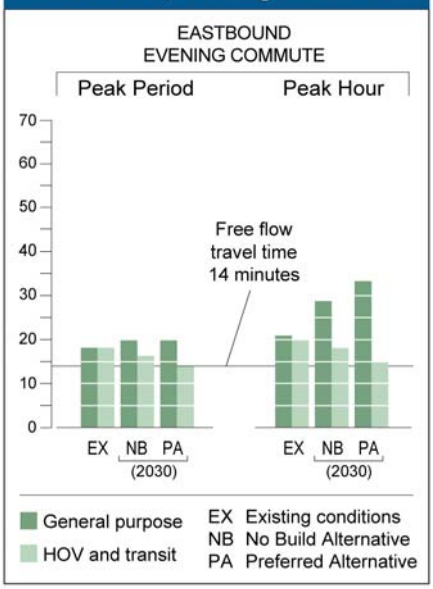


Exhibit 5.1-13. **Eastbound Average Travel Times (in minutes), I-5 to SR 202, Evening Commute**



No Build analysis shows a lesser degree of congestion, with some traffic from I-405 backing up onto eastbound SR 520 in 2030. However, congestion would only extend back as far as the 92nd Avenue NE on-ramp.

The Final EIS No Build analysis also found that congestion would occur near the Montlake Boulevard and Lake Washington Boulevard interchange areas. This would occur because the intersection of the SR 520 off-ramp with Montlake Boulevard would operate over capacity, and traffic would back up onto SR 520 eastbound.

Under the Preferred Alternative, general purpose traffic from I-405 would still back up onto eastbound SR 520 in 2030, with the same congestion as under the Final EIS No Build conditions. The HOV lane improvements constructed as part of the SR 520, Medina to SR 202 project would facilitate HOV and transit traffic movements around the congested general purpose lanes. HOV traffic trips would take 14 minutes instead of 16 minutes without the project.

There would be no overall improvement in peak period travel times for general purpose traffic under the Preferred Alternative—the average would remain at 20 minutes as shown in Exhibit 5.1-13.

Under the Preferred Alternative, demand for eastbound SR 520 during the evening peak hour would be slightly higher than under the Final EIS No Build Alternative, and vehicle throughput would increase with the reduction in congestion on the west side of the lake. This increased throughput across the lake would lead to an increase in trips approaching the back of the queue at Avondale and SR 202. While the peak *period* average travel time for general purpose vehicles would not change between the No Build condition and Preferred Alternative, the time for peak *hour* trips for general purpose traffic would, in fact, take longer than the No Build (33 minutes as opposed to 29 minutes without the project). However, with the inside HOV lane from I-5 to SR 202, buses and carpools would bypass the additional congestion and still receive an average 3-minute travel time savings compared to the No Build Alternative.

SDEIS No Build Alternative and Options A, K, and L

Consistent with the Final EIS analysis, the SDEIS analysis found that without the project, congestion and travel times during the morning and evening commute would continue to worsen over existing conditions. With the project, congestion and travel times for both general purpose and HOV trips would be reduced, particularly during the westbound afternoon and eastbound morning peak periods. Table 5.1-5 and the following discussion highlight some of the key changes in findings between the SDEIS and Final EIS analysis, including operations for SR 520 and I-5 in the morning and evening commutes.

Table 5.1-5. Regional Land Use and Transportation Plans – Comparison of SDEIS and Final EIS Assumptions and Findings

Assumption	SDEIS	Final EIS	Findings
ST2 – Light rail on I-90	Light rail on I-90 not included in year 2030 background assumptions. East Link light rail and other Sound Transit 2 (ST2) improvements were not included because they had not yet been approved by voters.	Light rail on I-90 included in year 2030 background conditions. Results in lower transit ridership and fewer trips by other modes on SR 520	The Preferred Alternative and SDEIS options would result in increased person trips compared to the No Build Alternative. The SR 520 cross-lake person trips under the No Build and SDEIS options would be similar to the results in the Final EIS due to changes in the travel demand model.
I-405 severely congested north of SR 520 interchange area through downtown Bellevue	Traffic volumes were forecasted to increase by 80 percent during the evening.	Traffic volumes are forecasted to increase by 40 percent during the evening.	Traffic forecasts on I-405 under the No Build Alternative and SDEIS options would be consistent as reported in the Final EIS due to updates with the current travel demand model. This means less congestion would spill back onto SR 520 than reported in the SDEIS.
Toll definition	The analysis assumed a segmental toll. This means it would cost a driver to travel between I-5 and Montlake across Portage Bay Bridge. Under the SDEIS options, this movement would decrease compared to the No Build Alternative.	The analysis assumes a single-point toll. This means it would not cost a driver to travel between I-5 and Montlake across Portage Bay Bridge. Under the Final EIS Preferred Alternative, this movement would increase compared to the No Build Alternative.	Some additional congestion would occur on Portage Bay Bridge and approaching I-5 under the SDEIS options as shown in the Final EIS analysis due to changes in the toll definition.

It is important to note that the Preferred Alternative and SDEIS options are similar in terms of the SR 520 traffic operations improvements. The Preferred Alternative and SDEIS options would differ primarily in local circulation in the Montlake area. Levels of congestion and vehicle trips reported for the Final EIS and SDEIS differ mainly because of regional-level decisions that affect the way future traffic volumes are forecasted. These include updates to the travel demand model, to include currently planned and programmed projects, and changes in toll definition. At the freeway corridor level, however, the SDEIS options provide similar safety and HOV/transit improvements and, therefore, would operate similar to the Preferred Alternative.

Morning Peak Period – Westbound

As shown in the SDEIS analysis, congestion from the I-405 main line would spill back onto SR 520 westbound (Exhibit 5.1-14; Exhibit 5.1-15 shows the travel times).

Exhibit 5.1-14. **SDEIS Analysis – Westbound Areas of Congestion during the Morning Commute Peak Period**

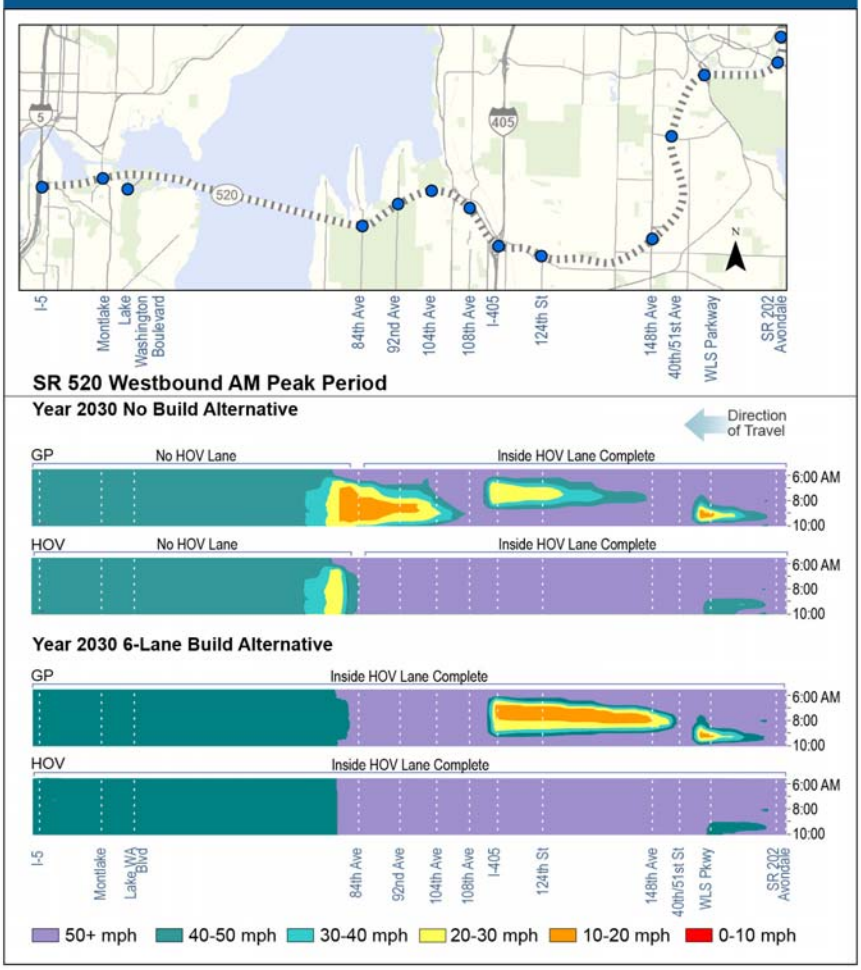
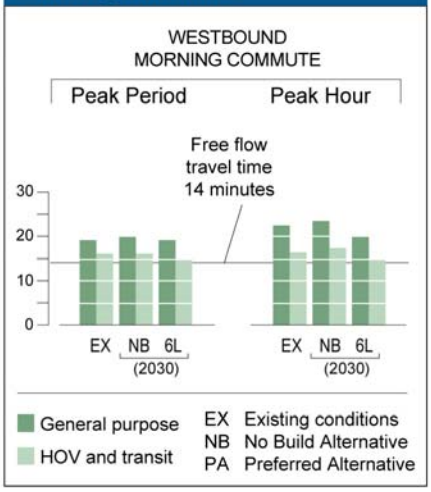


Exhibit 5.1-15. **SDEIS Analysis – Westbound Average Travel Times (in minutes), SR 202 to I-5, Morning Commute**



In the SDEIS analysis, traffic growth (as compared to today) on I-405 increased up to 90 percent in the vicinity of the SR 520 interchange. With the updated travel demand model forecasts completed for the Final EIS, this growth on I-405 was projected to be less, at about 30 percent (as compared to today). If the SDEIS options were updated with the Final EIS travel demand model forecasts, operations on I-405 would be better than reported in the SDEIS analysis and SR 520 would operate similar to the Preferred Alternative. In the morning, congestion would not spill back from I-405 onto the SR 520 corridor, resulting in near free-flow operations westbound for both HOV and general purpose trips.

Morning Peak Period – Eastbound

Eastbound operations for the SDEIS No Build and Options A, K, and L are similar to the Final EIS No Build and Preferred alternatives (Exhibits 5.1-16 and 5.1-17).

Exhibit 5.1-16. **SDEIS Analysis – Eastbound Areas of Congestion during the Morning Commute Peak Period**

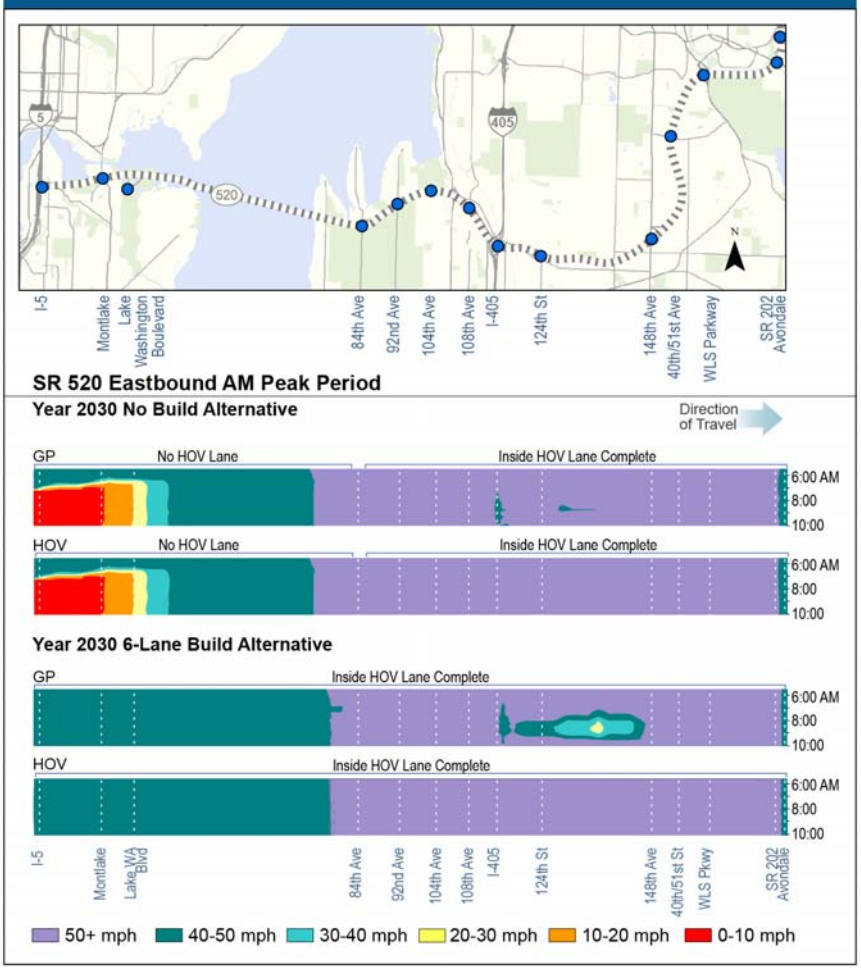
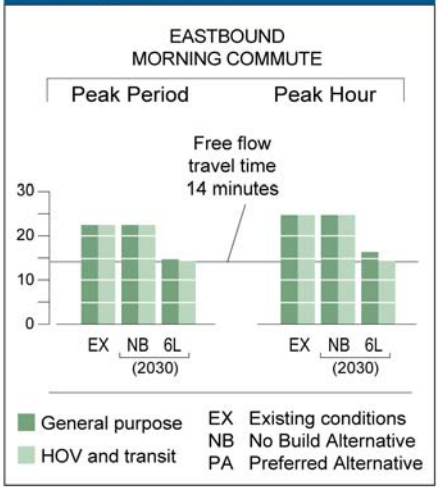


Exhibit 5.1-17. **SDEIS Analysis – Eastbound Average Travel Times (in minutes), I-5 to SR 202, Morning Commute**



Under the No Build Alternative, a driver would experience congestion on SR 520 eastbound approaching the west highrise and Lake Washington Boulevard on-ramp. This congestion on SR 520 would actually spill back onto I-5 and affect I-5 operations. The Final EIS Preferred Alternative and SDEIS options both improve this area by providing an HOV lane from I-5 to Medina, and by improving shoulders and merge conditions at the ramps to SR 520 from the Montlake interchange.

Evening Peak Period – Westbound

The congestion shown in Exhibits 5.1-18 and 5.1-19 is due to congestion from the I-405 main line spilling back onto SR 520 westbound. In the SDEIS analysis, traffic was forecasted to increase up to 80 percent compared to today on I-405 near the SR 520 interchange during the evening peak period. With the updated travel demand model forecasts completed for the Final EIS, growth on I-405 is projected to be less, an increase of about 30 percent (compared to today).

Traffic System Management Center

WSDOT's Traffic System Management Center (TSMC) collects traffic volume data along the state highways that can be used to create speed-flow diagrams (congestion diagrams) to visually determine areas of congestion. These surface plots, similar to a topographical map, plot average vehicle speeds against time and space and create speed contour plots.

These plots help engineers determine the intensity, duration, and length (queue) of congestion throughout the day. The SR 520 transportation team worked with WSDOT's NW Region traffic engineers to develop these diagrams. These speed-flow diagrams show that congestion occurs on SR 520, I-5, and I-405 for several hours each day at a number of locations.

Exhibit 5.1-18. **SDEIS Analysis – Westbound Areas of Congestion during the Evening Commute Peak Period**

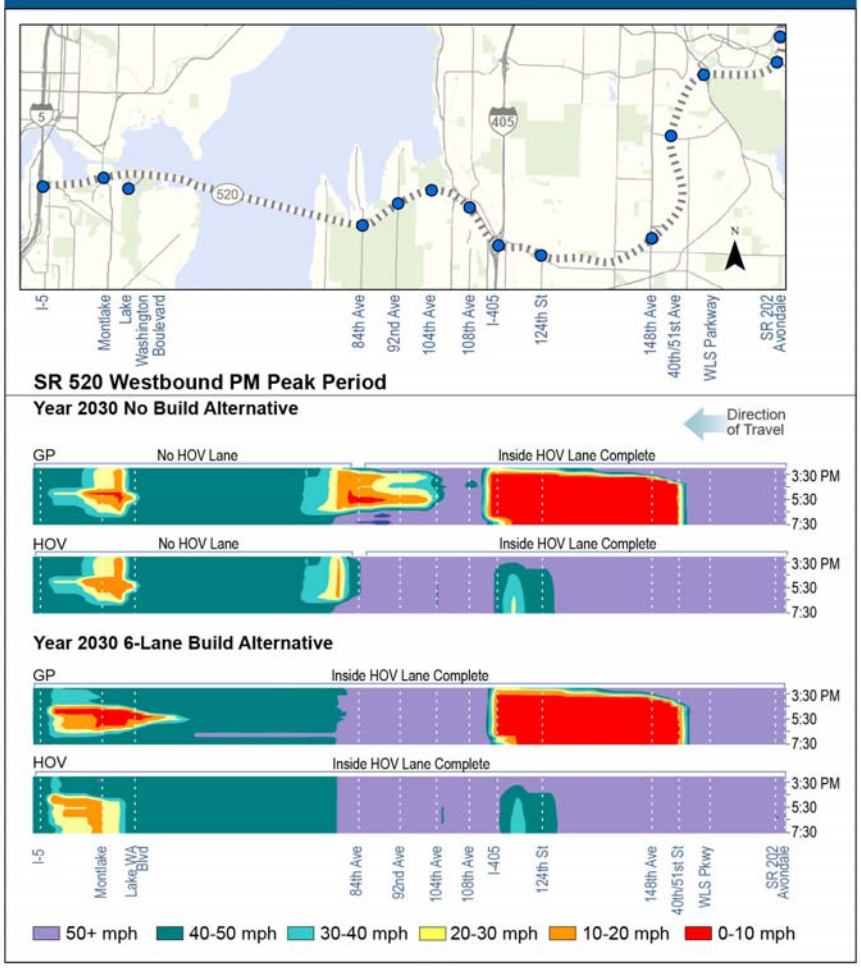
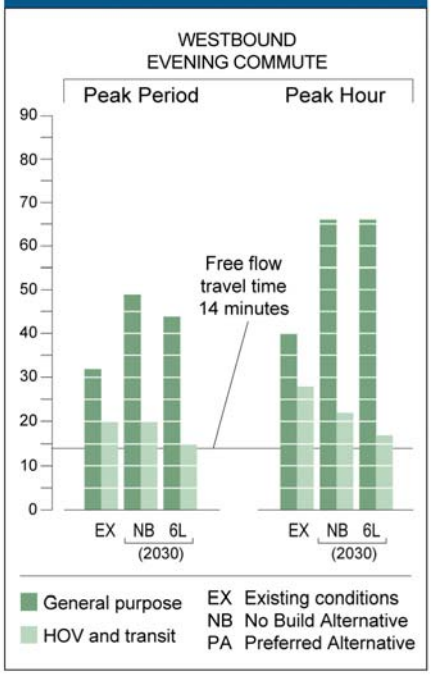


Exhibit 5.1-19. **SDEIS Analysis – Westbound Average Travel Times (in minutes), SR 202 to I-5, Evening Commute**



If the SDEIS options were updated with the Final EIS travel demand model forecasts for I-405, operations on I-405 would improve and spillback onto SR 520 would be as reported in the Final EIS. Congestion would affect general purpose trips from I-405 to the 40th/51st Street interchange area for up to 2 hours. The SDEIS analysis indicated congestion spilling back to the 40th/51st Street interchange area for the entire evening commute. Travel in the HOV lane approaching I-405 would be free flowing. Travel times for the SDEIS No Build and Options A, K, and L would be similar to the Final EIS No Build and Preferred alternatives.

Evening Peak Period – Eastbound

The congestion shown in Exhibits 5.1-20 and 5.1-21 is due to the I-405 main line spilling back onto SR 520 eastbound. As discussed in the Evening *Peak Period – Westbound* section, in the SDEIS analysis, traffic volumes were forecasted to increase up to 80 percent compared to today on I-405 in the vicinity of the SR 520 interchange. With the updated travel demand model

forecasts completed for the Final EIS, traffic volumes on I-405 are projected to increase about 30 percent (compared to today).

Exhibit 5.1-20. **SDEIS Analysis – Eastbound Areas of Congestion during the Evening Commute Peak Period**

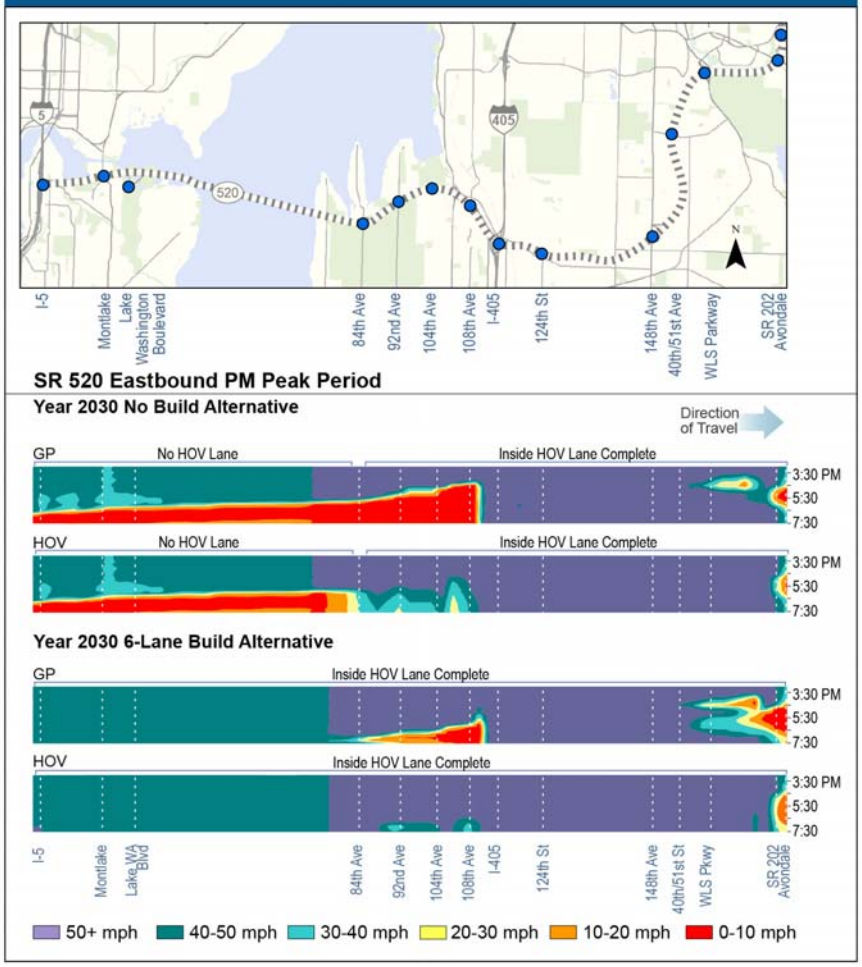
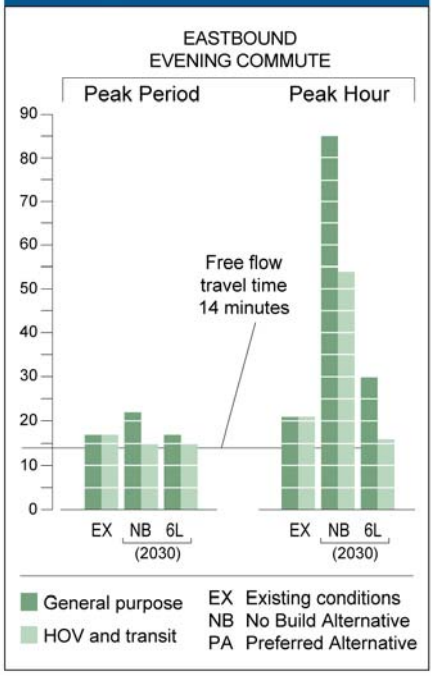


Exhibit 5.1-21. **SDEIS Analysis – Eastbound Average Travel Times (in minutes), I-5 to SR 202, Evening Commute**



If the SDEIS options were updated with the Final EIS travel demand model forecasts for I-405, operations on I-405 would improve and the amount of congestion on SR 520 would be substantially less. Congestion from I-405 would spill back onto SR 520 in the eastbound direction, affecting operations between the 92nd Avenue NE interchange area to I-405 at the peak of congestion. Most of the peak period congestion would affect only the area between Bellevue Way and I-405. This is substantially less than the congestion shown in the SDEIS analysis from I-5 to I-405.

How would the project affect I-5 during the morning and evening peak periods?

Congestion on the I-5 corridor impacts the operations of SR 520 and *vice versa*. In addition, the project includes a reversible ramp between SR 520 and the express lanes to and from the south. The transportation study area

included the I-5 corridor through the entire EIS process, including the Draft EIS, the SDEIS, and the Final EIS. Based on comments received on the SDEIS, the transportation analysis for the I-5 corridor has been added into the Final EIS.

Final EIS No Build Alternative and Preferred Alternative

By reducing congestion or bottlenecks on SR 520 with the construction of the Preferred Alternative and improving throughput, I-5 would operate differently. In 2030, the No Build Alternative would exhibit substantial congestion during the morning hours from the Montlake area on SR 520 back onto mainline I-5. As a result of the SR 520 congestion, I-5 northbound would be congested from I-90 to SR 520 for over 3 hours. The travel time from Seattle to Bellevue would be over 44 minutes at the peak of the commute.

Improvements made to the SR 520 corridor as part of the Preferred Alternative would result in near free-flow conditions on I-5 northbound during the morning. Travel times between Seattle and Bellevue would be improved to 11 minutes—a savings of 33 minutes compared with the No Build Alternative.

In 2030, under the No Build Alternative, I-5 southbound would be congested in the afternoon through downtown Seattle from the SR 520 interchange area to the I-90 collector-distributor roadway. The travel time from Bellevue to Seattle would increase up to 41 minutes during the evening commute.

With the congestion relief on SR 520 provided by the Preferred Alternative, up to 200 vph more would be served on I-5 southbound. A 200-vph increase on I-5 is an increase in volume of about 3 percent in the downtown Seattle area. Because this section of roadway is operating at capacity today, this increase in trips would result in some increase in congestion on I-5 southbound, with congestion lasting an hour longer than under the No Build Alternative. However, with the improvements to the SR 520 corridor, the travel time between Bellevue and Seattle would still improve to 28 minutes during the evening peak commute under the Preferred Alternative—a 12-minute savings compared to the No Build Alternative.

I-5 Express Lanes Morning Peak Period

The reversible express lanes on I-5 operate southbound in the morning and northbound in the afternoon between downtown Seattle and the Northgate area. Under the Final EIS No Build Alternative, congestion in the morning would occur for four hours beginning north of SR 522 (Lake City Way), where the three-lane corridor narrows down to two lanes. This congestion would extend north to the express lane entrance at Northgate. Because the congestion would serve to meter traffic onto the express lanes, they would

not experience any congestion between the Ship Canal Bridge and their southern end point.

To provide space for a single new HOV ramp to and from SR 520, the Preferred Alternative would convert the 42nd Street NE express lanes on-ramp to a merge rather than an add lane. The resulting throughput across the Ship Canal Bridge is expected to be similar to today, with a volume of about 5,000 vehicles per hour. This volume could be served by the remaining three through lanes across the Ship Canal Bridge, with the new HOV ramp adding capacity for buses and carpools during the morning peak period. Travel times for the southbound express lanes in the morning between Northgate and the downtown/I-5 main line under the Preferred Alternative would be the same as the No Build Alternative, as shown in Table 5.1-6.

Table 5.1-6. Peak Commute Travel Times for General Purpose and Transit Trips on I-5 in 2030

	AM Peak Period			PM Peak Period		
Location	**Existing**	**No Build Alternative**	**Preferred Alternative**	**Existing**	**No Build Alternative**	**Preferred Alternative**
General Purpose Trips						
I-5 Express Lanes Southbound from Northgate to I-5 Main Line	26	31	31	13	34	34
Transit Travel						
I-5 Express Lanes Southbound from SR 520 Interchange to Stewart Street	N/A	N/A	1	N/A	N/A	1
I-5 Main Line Southbound from SR 520 Interchange to Stewart Street	2	5	5	3	4	5

The travel time for transit in the express lanes between SR 520 and Stewart Street under the Preferred Alternative would improve by 4 minutes compared to travel on the main line.

I-5 Express Lanes – Evening Peak Period

By 2030, traffic volumes on the express lanes are expected to increase by 10 percent during the evening peak period under the Final EIS No Build Alternative. This increase in demand would result in increased congestion compared to today. In the afternoon, congestion from northbound express lane traffic merging onto the I-5 main line at Northgate would affect operations on the express lanes for 4 hours, with the peak of congestion

extending as far south as Mercer Street. Where there is no HOV lane on the mainline freeway, transit and carpools would be in the same congested lanes as other traffic, but the HOV lanes would operate at free-flow speeds between SR 522 and Northgate, and operations would be near free flow south of the Mercer Street interchange.

Under the Preferred Alternative, northbound traffic volumes in the express lanes would be higher between downtown Seattle and the I-5/SR 520 interchange than under No Build with the new ramp connection. However, because congestion occurs near the north end of the express lanes, overall travel time for trips between downtown Seattle and Northgate would be the same under both the No Build and Preferred alternatives (34 minutes) (Table 5.1-6). Travel for HOVs going to the SR 520 interchange ramp would be faster in the express lanes than on the I-5 main line (1 minute from downtown Seattle to the interchange in the express lanes compared to 5 minutes for the main line).

I-5 Main Line – Morning Peak Period

Under the No Build Alternative, eastbound SR 520 traffic would back up from the Lake Washington Boulevard on-ramp on SR 520 back onto I-5 for over 3 hours during the morning peak period, similar to today. This backup limits throughput on the northbound I-5 main line and doubles the existing travel time from I-90 to NE 45th Street by year 2030. Westbound SR 520 congestion caused by the bottleneck at the Evergreen Point Bridge limits the throughput to the floating bridge and I-5 during the morning commute.

Removing the Lake Washington Boulevard ramps and building a continuous 6-lane freeway section with inside HOV lanes would reduce congestion and increase throughput on SR 520. These improvements to SR 520 would remove the eastbound congestion that backs up the northbound and southbound on-ramps from I-5. The Preferred Alternative would also improve the northbound I-5 main line, and peak operations on the southbound I-5 main line by improving SR 520 conditions.

The Preferred Alternative would improve the Seattle to Bellevue travel time by 11 minutes (a 33-minute travel time savings compared to the No Build Alternative) for Seattle to Bellevue traffic using eastbound SR 520. The average speed for travel from Seattle to Bellevue would improve from 15 mph under the No Build Alternative to 50 mph under the Preferred Alternative.

Improvements to westbound SR 520 would allow over 200 more vehicles per hour to reach southbound I-5. The increase in westbound throughput (more vehicles), combined with the reduction in congestion from eastbound SR 520 backing onto I-5 southbound, results in similar travel times between the No Build and Preferred alternatives. Travel between NE

45th Street and I-90 would decrease from 19 minutes under the No Build Alternative to 17 minutes under the Preferred Alternative (Table 5.1-7).

Table 5.1-7. Peak Commute Travel Times for General Purpose Trips on I-5 and SR 520 in 2030

Location	AM Peak Period			PM Peak Period		
	Existing	No Build Alternative	Preferred Alternative	Existing	No Build Alternative	Preferred Alternative
I-5 Northbound (main line) from I-90 to NE 45th	9	31	7	11	13	15
I-5 Southbound (main line) from NE 45th to I-90	11	19	17	22	20	29
Seattle to Bellevue (I-5 at University to I-405 at NE 4th/8th)	25	44	11	15	23	19
Bellevue to Seattle (I-405 at NE 4th/8th to I-5 at University)	19	25	13	43	41	28

I-5 Main Line – Evening Peak Period

Under No Build conditions, evening congestion on westbound SR 520 would restrict the amount of traffic that reaches the I-5 corridor. The SR 520 throughput to both northbound and southbound I-5 is expected to be noticeably lower than demand, artificially improving conditions on I-5 southbound and northbound from SR 520. Eastbound congestion on SR 520 from the Lake Washington Boulevard on-ramp backs up the I-5 off-ramp to SR 520, slowing the northbound I-5 main line.

Consolidating the Lake Washington Boulevard access to the Montlake interchange and a continuous 6-lane freeway section with inside HOV lanes would reduce congestion and increase throughput on SR 520 under the Preferred Alternative. As a result of the increased throughput, the duration of evening congestion is shown to last for about an hour longer than the No Build Alternative because more traffic would be able to reach the I-5 corridor. This is an increase in volume throughput, not an increase in demand. The improvements to SR 520 would allow about 200 more cars per hour to reach the already existing southbound I-5 congestion, thus extending the severity and duration of congestion.

Despite the slight increase in travel times during the evening commute, both I-5 and SR 520 would serve more vehicles and more people in these vital segments of the network. Table 5.1-7 summarizes the peak travel times during the evening commute for Existing Conditions and the No Build and Preferred Alternatives.

SDEIS No Build Alternative and Options A, K, and L

Outside of the Montlake interchange area, Options A, K, and L would operate similarly to the Preferred Alternative. The I-5 main line and express lane traffic operations under Options A, K, and L would closely match the operations of the Preferred Alternative. The Final EIS and SDEIS analyses both show similar increases in throughput from westbound SR 520 to I-5, and show a reduction in congestion from SR 520 eastbound spilling back onto I-5.

Option A would operate most similarly to the Preferred Alternative. Under Options K and L, traffic volumes on I-5 between SR 520 and NE 45th/50th Street would be slightly less (up to 220 vph in the evening) than the Preferred Alternative or Option A. Options K and L provide an additional crossing of the Montlake Cut. This would allow traffic traveling westbound from SR 520 to I-5 and NE 45th Street, and the reverse, to exit at the new interchange and travel north across the Montlake Cut via a new bridge (Option L) or tunnel (Option K).

The Preferred Alternative and SDEIS options include an HOV/transit ramp connection between the I-5 express lanes and the SR 520 HOV lanes. Again, the differences between the Preferred Alternative and the SDEIS options are focused around the Montlake interchange area and local connections. These differences would not result in different findings for the I-5 express lane operations or the travel demand on the new ramp. Therefore, the results summarized for the Final EIS Preferred Alternative apply to the SDEIS options.

How would the project affect traffic on local streets and at intersections?

The SDEIS analysis modeled traffic operations at 39 key intersections in the transportation study area. For the Final EIS, intersections in the Seattle interchanges along the I-5 corridor were not studied further because the traffic volume changes at these interchanges were less than 1 percent compared to the FEIS No Build Alternative. Table 5.1-8 identifies traffic volume forecasts for interchange areas along the I-5 corridor for the SDEIS and Final EIS.

Table 5.1-8 Forecast Volumes Reported for the 6-Lane Alternative in the EIS Analysis

Location	SDEIS 6-Lane Alternative (Option A with suboption) compared to No Build Alternative		Final EIS Preferred Alternative compared to No Build Alternative	
	AM	PM	AM	PM
NE 45th/42nd Street	+1%	+1%	-1%	-1%
Harvard/Roanoke	+10%	+2%	-1%	+1%
Mercer Street	0%	0%	+1%	+1%
Stewart Street	0%	0%	+1%	+1%

The I-5 corridor intersections were studied previously because the early definition of the study area was based on the limits of construction for a variety of potential improvements with numerous interchange options. Some of the options would have extended onto the I-5 main line, I-5 express lanes, and the City of Seattle street system as far south as I-90. For that reason, there was a need to study the intersections adjacent to the I-5 ramps from NE 42nd Street south to Stewart Street. This included the Harvard/Roanoke intersection network and the Mercer Street interchange area. This network was evaluated in the Draft EIS even after the determination that no additional construction would occur as part of the SR 520 Bridge Replacement and HOV Project. The same intersections were again studied in the SDEIS because there was a potential change in traffic volumes at the Harvard/Roanoke interchange as a result of changes in the interchange options.

WSDOT developed an analysis methodology that provided that they would perform traffic operations analysis at intersections where the total approaching traffic increased by 5 percent or more compared to the No Build Alternative. In each of the interchange areas shown in Table 5.1-8, the traffic volume growth between the Final EIS Preferred Alternative and the No Build Alternative is clearly below the threshold set for additional analysis per the transportation methodology.

Further analysis of intersections within the interchanges listed in Table 5.1-8 are not included in the Final EIS for the following reasons:

- The SR 520, I-5 to Medina project does not propose any new construction on the I-5 main line between NE 45th Street and Stewart Street.
- The traffic volume forecasts show that the Preferred Alternative has a traffic volume effect less than the threshold set in the transportation analysis methodology.

Also since the SDEIS analysis, there have been changes in regional planning and policies that affect the project's year 2030 No Build and Preferred alternatives. These include the following:

- The travel demand model used for the program has been updated for the Final EIS to be consistent with the current PSRC model for year 2030 conditions.
- The build alternative was assumed to be tolled under both the SDEIS and Final EIS analyses. However, for the SDEIS analysis, the toll was defined as a segmental toll, which meant that trips that used SR 520, but did not cross the lake, would pay a toll. Since the SDEIS was published, legislation has determined that the toll associated with the build alternative would be a single-point toll. This means only trips that cross the lake via SR 520 would pay the toll.

Traffic Levels of Service

Levels of service are a way to rate the quality of traffic operations on a given transportation facility. The LOS rating scale uses the letters A through F. The letter grades are based on the levels of delay that drivers experience at an intersection, with the letter A representing the shortest delays (10 seconds or less) and the letter F representing the longest delays (80 seconds or more at signalized intersections).

For this Final EIS, level of service results are presented in the following terms:

- Low to moderate congestion (LOS A through D)
- Congested (LOS E)
- Severely congested (LOS F)

The complete results of the LOS analysis are presented in the Final Transportation Discipline Report (Attachment 7).

The following describes the Final EIS No Build and Preferred Alternative forecasted traffic operations for the Montlake interchange area. Following the Final EIS findings is a summary of the SDEIS No Build Alternative and 6-Lane Alternative options. In the SDEIS section, exhibits from the SDEIS are included and a description of how the SDEIS options would operate if changes incorporated into the Final EIS analysis were included.

Final EIS No Build Alternative and Preferred Alternative

Further analysis of local street operations was performed for the Preferred Alternative at the Montlake interchange area. Exhibit 5.1-22 shows the predicted traffic congestion at project area intersections in 2030 during both the morning and evening peak hours in the Montlake interchange area. As with the SDEIS, the intersections near the Montlake Boulevard interchange were the places where local traffic volumes would be most affected by the project. Those intersections are discussed further below.

Under the Final EIS No Build Alternative, traffic forecasts for 2030 show an overall growth in traffic of 15 percent and 23 percent over existing conditions during the morning and afternoon peak hours, respectively. Travel patterns in the Montlake interchange area would not be expected to change; existing congestion on SR 520 would continue to affect local traffic operations on Montlake Boulevard, Lake Washington Boulevard, and other intersections approaching the interchange.

Exhibits 5.1-23 and 5.1-24 compare local street operations and traffic volumes between the No Build and the Preferred alternatives. Under the Preferred Alternative, travel patterns on local streets in the area would change due to the direct-access HOV ramp from SR 520 and the removal of the Lake Washington Boulevard ramps. From the north, more trips from the University District to I-5 would travel along Montlake Boulevard southbound and across the Portage Bay Bridge westbound than under the No Build Alternative. This is because there would be a toll implemented for crossing the SR 520 floating bridge, reducing cross-lake trips. With cross-lake trips reduced, more capacity would be open for travel along Montlake Boulevard to and from I-5.

Access to eastbound SR 520 from the south would be provided at the Montlake loop ramp (for general purpose trips) and at 24th Avenue East (for HOV trips). The existing ramp to eastbound SR 520 from Lake Washington Boulevard would be removed. This would result in a reduction in traffic using Lake Washington Boulevard through the Arboretum to access eastbound SR 520 compared to the No Build Alternative. Another lane of capacity added to the Montlake loop ramp would accommodate the new traffic. Improvements would also be made to the intersection of Montlake Boulevard and Lake Washington Boulevard to accommodate changes in traffic.

How do the Final EIS and SDEIS analyses of local roadways compare?

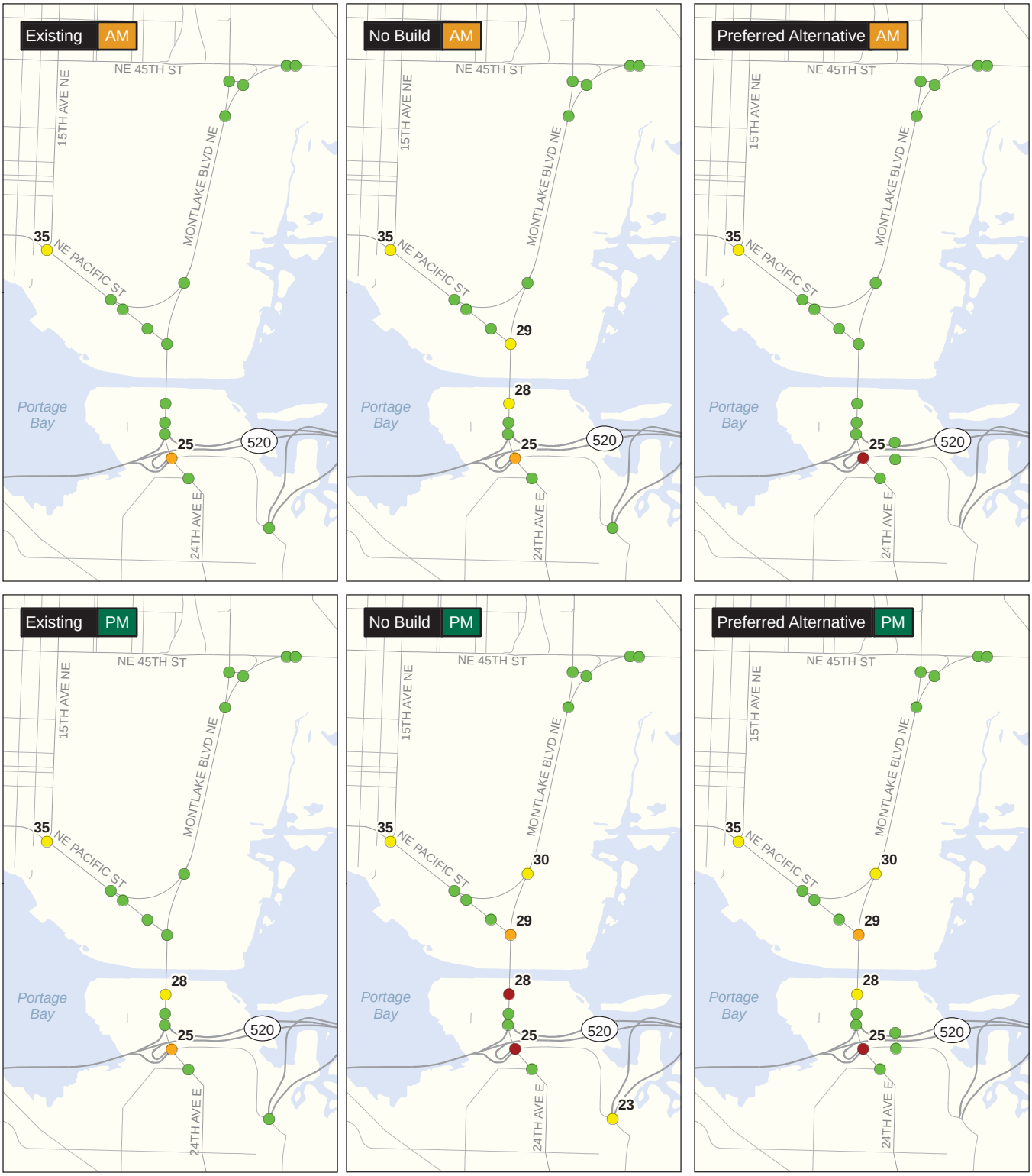
Remember that:

WSDOT reviewed the effects of Options A, K, and L (compared to the No Build Alternative) *relative to* the effects of the Preferred Alternative and the updated No Build Alternative.

So, the SDEIS findings compared to the Final EIS findings are as follows:

- Because Option A would remove the Lake Washington Boulevard ramps, traffic volumes would decrease through the Arboretum and increase at the Montlake Boulevard interchange compared to the No Build Alternative – same as the Final EIS.
- Option A would add capacity across the Montlake Cut with the second bascule bridge, and on the SR 520 eastbound on-ramp with the addition of a second general purpose lane. As a result, local and SR 520 vehicles and buses would benefit over the No Build Alternative by reduced congestion and delay in both directions of Montlake Boulevard between East Roanoke Street and NE Pacific Street – same as the Final EIS.
- Local traffic operations along Montlake Boulevard NE and NE Pacific Street would be better with Option A than without the project – same as the Final EIS.
- Option A traffic patterns would improve operations at four intersections in the Montlake area, and degrade operations at one intersection in the NE 45th Street interchange area and two intersections at the Roanoke/Harvard interchange – similar to the Final EIS.

Exhibit 5.1-22. Traffic Congestion at Seattle Project Area Intersections 2030 AM and PM Peak Hours



- No or little congestion
- Moderate congestion
- Heavy congestion
- Severe congestion/over capacity

Intersection Locations:
23 SR 520 Arboretum Ramps
25 Montlake Blvd/SR 520 EB Ramps/Lake Washington Blvd
28 Montlake Blvd/E Shelby St
29 Montlake Blvd/NE Pacific St
30 Montlake Blvd/NE Pacific Pl
35 NE 45th St/University Village Driveway

N
0 500 1,000 2,000 Feet

Exhibit 5.1-23. **Traffic Volume Changes during the AM Peak Period**

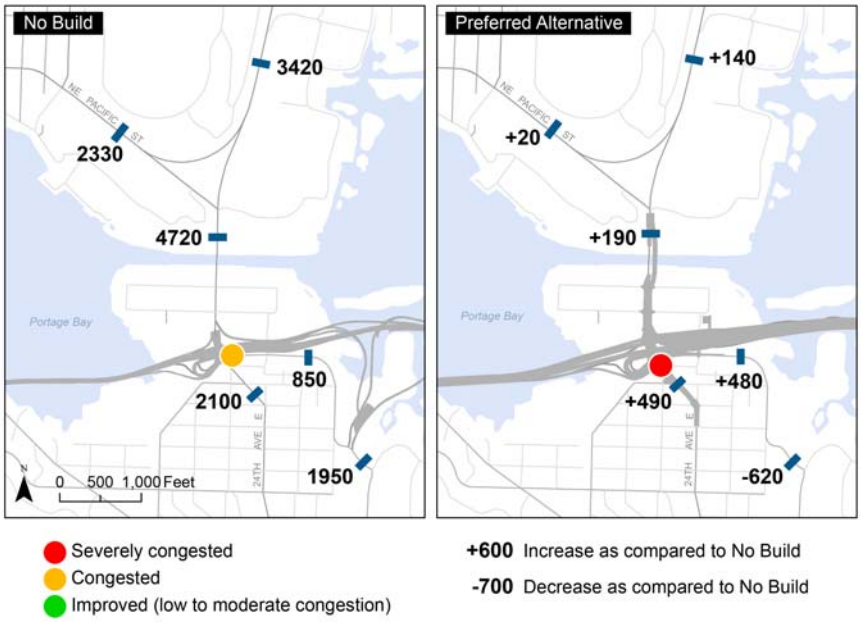
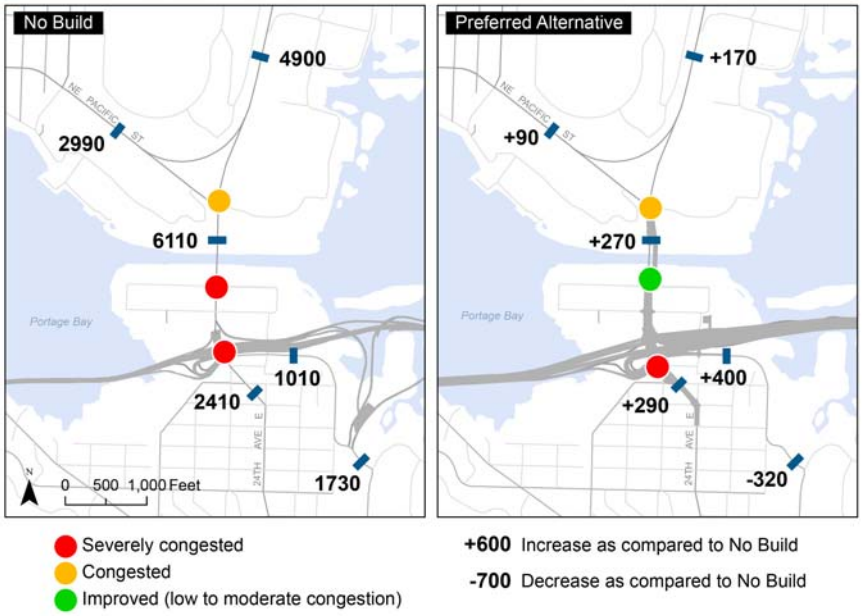


Exhibit 5.1-24. **Traffic Volume Changes during the PM Peak Period**



The following four local roads and intersections in the interchange area are the ones where congestion is expected to continue or worsen under the 2030 No Build Alternative or that have been of specific concern to the community:

- Lake Washington Boulevard/SR 520 ramps and through the Washington Park Arboretum

- Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound Ramps
- Montlake Boulevard/NE Pacific Street
- Montlake Boulevard/East Shelby Street

Specific traffic results for these areas are discussed in greater detail in the following sections.

Lake Washington Boulevard/SR 520 Ramps and Traffic through the Washington Park Arboretum

As occurs today, half of the vehicle trips on Lake Washington Boulevard through the Washington Park Arboretum under the No Build Alternative would be traveling to and from SR 520. Today, those volumes are highest (1,590 vehicle trips per hour) in the morning peak period. Due to population and employment growth, this morning volume would increase by 23 percent to 1,950 vph under the Final EIS No Build Alternative (Exhibit 5.1-23). During the evening peak period, existing volumes of 1,400 vph in this area would increase to 1,730 vph in 2030 (Exhibit 5.1-24). However, even with the growth in traffic on Lake Washington Boulevard, its intersection with the SR 520 ramps would continue to operate at LOS D or better in 2030. The significance of LOS D is described in the text box to the right.

Level of Service D

LOS D is considered to be the threshold for acceptable peak period operations because the intersection is typically still operating under capacity. At this level, operations are still stable, and the intersection is able to accommodate small surges in traffic demand.

Because the Lake Washington Boulevard ramps to and from SR 520 would be removed under the Preferred Alternative, traffic volumes through the Washington Park Arboretum would be lower than under the Final EIS No Build Alternative (and less than today). About half of the Lake Washington Boulevard trips heading toward eastbound SR 520 during the morning peak period are anticipated to shift to Montlake Boulevard. Vehicles exiting westbound SR 520 and heading south would exit at 24th Avenue East and would have the option to use either Lake Washington Boulevard or Montlake Boulevard. About half of these trips from westbound SR 520 are expected to shift to Montlake Boulevard.

Traffic heading south on Lake Washington Boulevard and through the Washington Park Arboretum under the Preferred Alternative would be about 1,330 vph during the morning peak period, which is a reduction of 620 vph compared to Final EIS No Build conditions during the morning peak period (Exhibit 5.1-23). This means that morning traffic volumes through the Arboretum under the Preferred Alternative would be less than they are today. During the afternoon peak period, traffic volumes heading south on Lake Washington Boulevard through the Arboretum would be 1,410 vph, lower than Final EIS No Build conditions (1,730 vph) and similar to volumes today (1,400 vph), as shown in Exhibit 5.1-24. Access to and from the south would be relocated from the Lake Washington Boulevard ramps to 24th Avenue East; this would result in an increase in

trips along Lake Washington Boulevard between Montlake Boulevard and the area of the existing Lake Washington Boulevard ramps.

Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound On-ramp

Under No Build conditions, eastbound SR 520 would continue to be congested for approximately 3 hours during the morning peak period. The intersection of the eastbound SR 520 on-ramp with Montlake Boulevard and Lake Washington Boulevard would continue to operate at LOS E in the morning, with congestion resulting from southbound traffic on Montlake Boulevard attempting to access the freeway. Vehicles lining up attempting to access the ramp would continue to cause congestion on Montlake Boulevard, extending as far back as NE 45th Street. Increasing traffic volumes (15 percent higher in this location) would mean slower access to the ramp for vehicles on Montlake and Lake Washington Boulevards. This same congestion on Montlake Boulevard would delay southbound vehicles on Montlake Boulevard attempting to access the westbound SR 520 on-ramp in the morning. Northbound congestion on Montlake Boulevard would also affect its intersection with East Roanoke Street.

During the morning peak hour, there would be 5,240 vph approaching the Montlake triangle (Exhibit 5.1-23). During the afternoon peak hour, the operation of this intersection would worsen from LOS E today to LOS F in 2030, with 7,000 vph entering the Montlake triangle (Exhibit 5.1-24). The intersection would be 50 percent over capacity at this time of day. Large queues would occur on all approaches to the intersection and would affect adjacent intersections. At its worst, congestion on the eastbound SR 520 off-ramp would extend back onto the eastbound SR 520 main line.

With the closure of the Lake Washington Boulevard ramps, traffic volumes through the Montlake Boulevard/Lake Washington Boulevard/SR 520 eastbound ramps intersection would increase under the Preferred Alternative. The greatest increase would occur in the morning, with up to an additional 640 vph traveling through the intersection. This includes volume changes near the intersection along Montlake Boulevard and Lake Washington Boulevard, shown in Exhibit 5.1-23, and also changes on the Montlake interchange southbound and eastbound ramps. Additional turn lanes (a second northbound left-turn lane and an additional lane on the east- and westbound approaches at this intersection) would be included with the Preferred Alternative to accommodate these additional trips.

With the improvements to the SR 520 main line and the addition of a second general purpose lane on the on-ramp, congestion on the eastbound SR 520 on-ramp would be reduced and traffic would no longer back up onto Montlake Boulevard in the morning peak period, substantially reducing the congestion on Montlake Boulevard southbound.

While the intersection would operate better under the Preferred Alternative than the No Build Alternative during the afternoon peak hour, there would still be congestion on the northbound, southbound, and westbound approaches to the intersection because the intersection would still be over capacity. Northbound congestion would queue through the Montlake Boulevard/East Roanoke Street intersection, and southbound congestion would affect how quickly vehicles could access the westbound SR 520 on-ramp intersection. During the evening peak hour, the intersection would operate at LOS F under the Preferred Alternative, at 15 percent over capacity. Under the Preferred Alternative, an additional 350 vph would travel through this intersection as compared to the Final EIS No Build Alternative. This includes volume changes near the intersection along Montlake Boulevard and Lake Washington Boulevard (shown in Exhibit 5-1-24) and also changes on the Montlake interchange southbound and eastbound ramps. The afternoon peak operations would, however, be significantly better than the Final EIS No Build operations, which would be 50 percent over capacity. This is because the Preferred Alternative would include additional capacity at this intersection to help serve the new trips. The ability to provide capacity improvements in this area is limited by adjacent properties; however, the Preferred Alternative would include an additional northbound left-turn lane and a westbound left-turn lane, and add an eastbound left-turn from the off-ramp.

The intersection would operate at LOS F in the morning peak hour with a volume to capacity ratio of 1.10. This is similar to the operations of the No Build Alternative (LOS E with a volume to capacity ratio of 1.05). Chapter 12 of the Final Transportation Discipline Report (Attachment 7 to this Final EIS) discusses additional coordination with the City of Seattle to manage the operations of this intersection.

Montlake Boulevard/NE Pacific Street

During the morning peak hour, the Montlake Boulevard/NE Pacific Street intersection is projected to operate near capacity, serving 4,840 vehicles per hour and maintaining existing LOS C operations with delays similar to existing conditions. During the afternoon peak hour, the operation of the intersection would worsen from LOS D today to LOS E in the year 2030. This intersection, which is currently at capacity, would be 20 percent over capacity in 2030 without the project, with traffic volumes of 6,300 vph (Exhibit 5.1-24)

Traffic volumes at the intersection of Montlake Boulevard with NE Pacific Street under the Preferred Alternative would be similar to those under the No Build Alternative. There would be 5,030 vph approaching the intersection in the morning and 6,570 vph in the afternoon peak hour, and it would operate at LOS E during the afternoon peak hour. However, under the Preferred Alternative, a southbound HOV receiving lane along Montlake Boulevard would be provided to facilitate the movement from

Montlake Boulevard onto SR 520, and traffic would move through slightly faster with the project in the afternoon peak period than under the No Build.

Montlake Boulevard/East Shelby Street

During the morning peak hour, intersection operations would degrade from LOS B to LOS D under the No Build Alternative. The intersection would operate near capacity, serving 4,780 vph. During the afternoon peak hour, operations would worsen from LOS D today to LOS F in 2030, and traffic from the intersection would create congestion extending into adjacent intersections to the north and south. There would be 6,190 vehicles using the intersection.

The Montlake Boulevard/East Shelby Street intersection would improve to LOS B during the morning peak hour under the Preferred Alternative. Traffic volumes entering the intersection would increase to 4,970 vph, but intersection improvements under the Preferred Alternative would provide additional capacity and reduce delay. During the afternoon peak hour, operations would improve to LOS D, as opposed to LOS F under No Build conditions.

Today, Montlake Boulevard north of its intersection with East Shelby Street is limited to two lanes in each direction. This requires northbound traffic to narrow from three lanes to two through this intersection. The Preferred Alternative would address this bottleneck by adding capacity across the Montlake Cut with a new bascule bridge, resulting in three lanes in each direction. The increased north-south capacity through the Montlake Boulevard/East Shelby Street intersection would result in less delay for the 6,480 vph traffic traveling through this intersection during the evening peak hour.

In a Nutshell

- Higher growth would occur under the No Build Alternative in the morning and less growth in the evening commute periods.
- SDEIS traffic volumes would be slightly higher compared with No Build if they were reforecast using the Final EIS model.
- All options would maintain similar operational findings relative to one another, as described in the SDEIS.
- The Preferred Alternative would be most similar to the suboption to Option A.
- Changes in traffic volume would not be substantial enough to modify any of the SDEIS option definitions

SDEIS No Build Alternative and Options A, K, and L

Traffic growth reported for the Final EIS and the SDEIS differ mainly because there were changes at the regional level. These changes include updates to the travel demand model, assumptions for future projects, and changes in toll definition. The following discussion highlights some of the key changes between the Final EIS and the SDEIS analysis and describes operations of the Montlake interchange area for the morning and evening commute periods.

Table 5.1-9 illustrates that background growth under the No Build Alternative would be higher than what was forecasted for the SDEIS. The increase in growth is about 4 percent. That level of difference is not typically considered to be a substantial change for a 20-year forecast. The Preferred Alternative shows a zero net growth in the Montlake interchange area compared to the No Build.

Table 5.1-9. Montlake Interchange Area Growth, Year 2030

Alternative	AM Peak Hour		PM Peak Hour	
	SDEIS	Final EIS	SDEIS	Final EIS
No Build Alternative	+11% compared to existing	+15% compared to existing	+24% compared to existing	+21% compared to existing
Option A	-14% compared to No Build	-	-7% compared to No Build	-
Option A with Suboptions	-5% compared to No Build	-	-2% compared to No Build	-
Option K, L, and Option K, L with Suboptions	+23% compared to No Build	-	+23% compared to No Build	-
Preferred Alternative	-	0% compared to No Build	-	2% compared to No Build

Note: Traffic forecasts were updated for the Final EIS based on the updated PSRC travel demand model for consistency with regional plans and projects.

Option A would remove the Lake Washington Boulevard ramps that exist today, provide direct transit access from the westbound SR 520 HOV lane, and add a second Montlake bridge. Option A with suboption would add a direct-access ramp from southbound Montlake to eastbound SR 520, and would replace the ramps to Lake Washington Boulevard, located farther northwest from the current ramp location and farther from the arboretum.

Option K would include a new lowered single-point urban interchange that combines the functions of the existing SR 520/Montlake Boulevard and Lake Washington Boulevard ramps to the east. Traffic volumes in the Montlake Boulevard interchange area are forecasted to increase under Option K compared to the No Build Alternative. This is because drivers would take advantage of the capacity associated with the new interchange and crossing of the Montlake Cut. By shifting SR 520 traffic to the single-point urban interchange, drivers would choose to take advantage of the capacity made available on Montlake Boulevard.

Traffic forecasts, travel patterns, and operations are the same under Options K and L, except that Option L would not include the traffic turnaround in the Arboretum. Therefore, vehicles would not be able to access the new interchange from Lake Washington Boulevard southbound. Instead, drivers would go north on Montlake Boulevard to the Montlake Boulevard/NE Pacific Street intersection and would turn right to access the new bridge connection to the new interchange. As a result, Montlake Boulevard traffic volumes under Option L would not decrease as much as under Option K compared to the No Build. However, they would still be substantially less than under the No Build Alternative between Lake Washington Boulevard and NE Pacific Street in the morning and afternoon peak hours.

Lake Washington Boulevard/SR 520 Ramps and Traffic through the Washington Park Arboretum

Under Option A, traffic volumes through the Arboretum were forecasted to decrease compared to the No Build Alternative (Exhibits 5.1-25 and 5.1-26). The Final EIS Preferred Alternative would include westbound off-ramp access to 24th Avenue NE, similar to Option A with suboption, but would provide eastbound on-ramp access only at Montlake, similar to Option A. Traffic volumes through the Arboretum under the Final EIS Preferred Alternative would be greater than Option A, but less than Option A with the suboption.

Exhibit 5.1-25. **SDEIS Analysis – Traffic Volume Changes During the AM Peak Period**

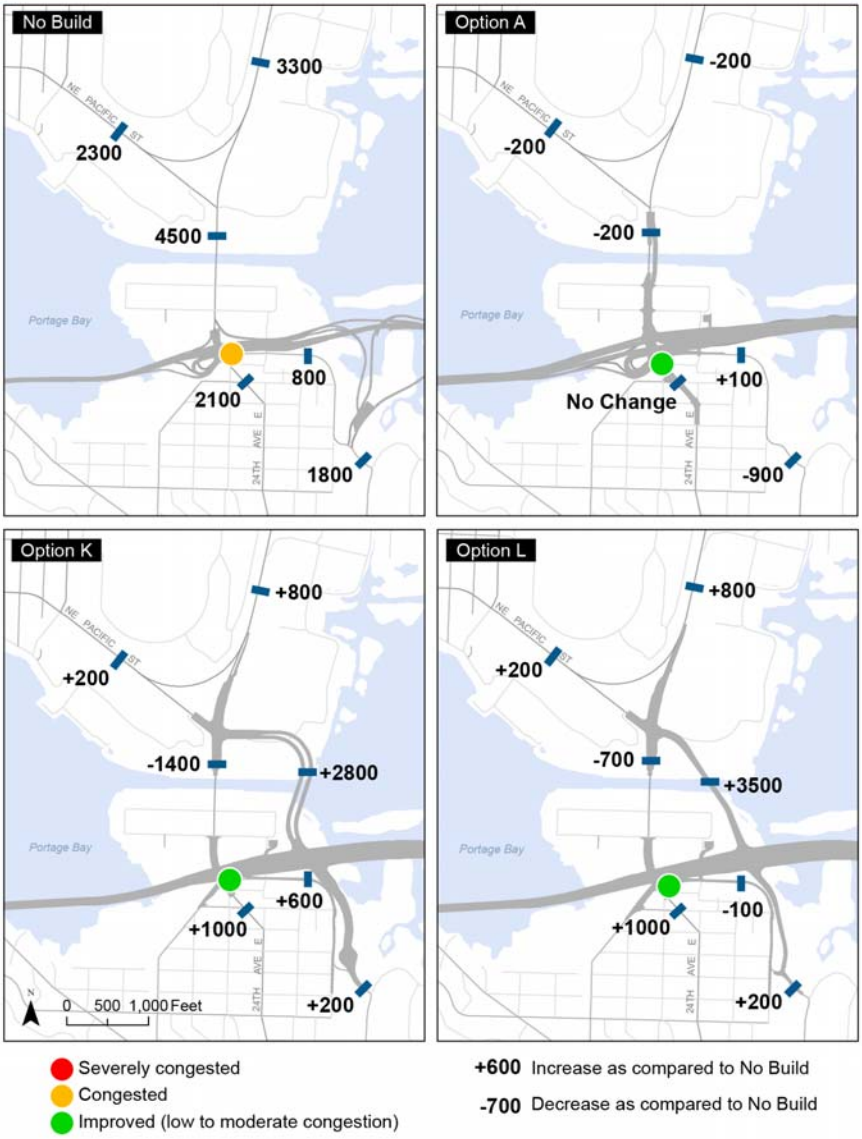
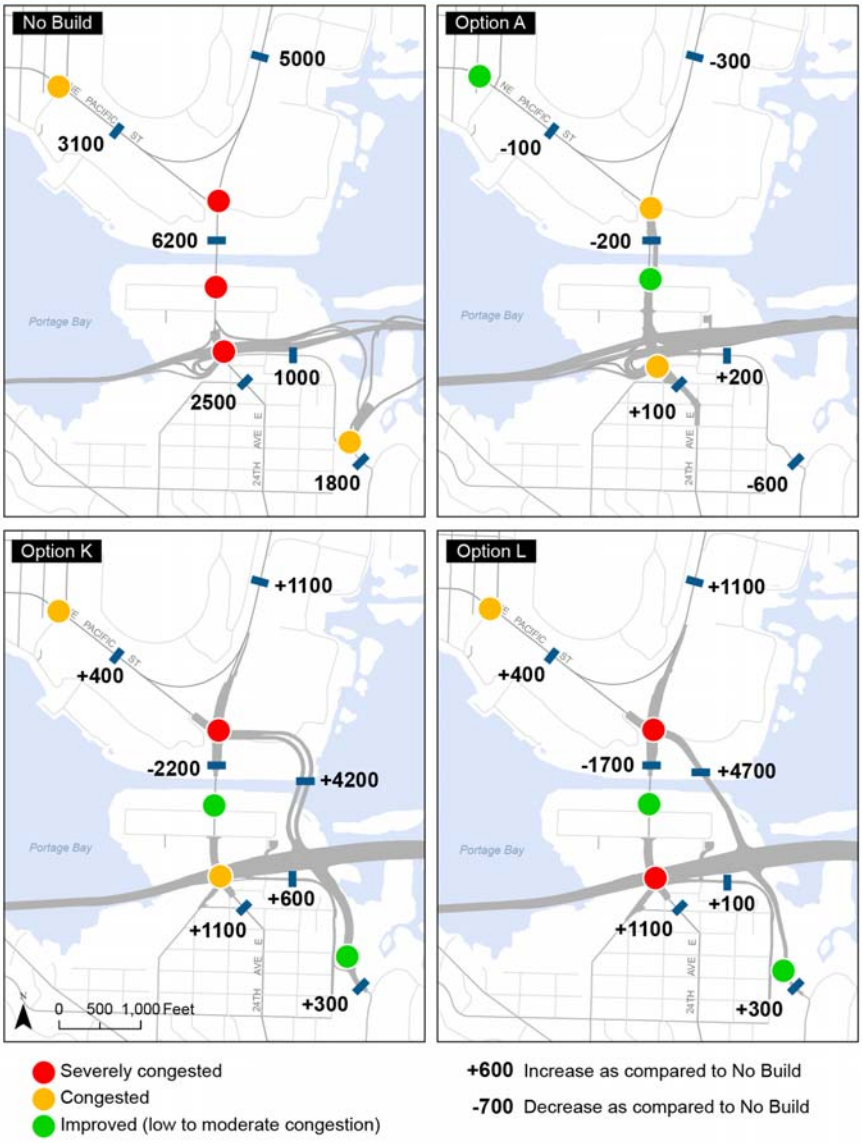


Exhibit 5.1-26. **SDEIS Analysis – Traffic Volume Changes During the PM Peak Period**



Under Options K and L, traffic volumes would shift to the Montlake interchange area to access the new crossing of the Montlake Cut. This would increase in traffic volumes through the Arboretum.

There would be no changes to distribution of traffic volumes through the local roadway networks, and the operations for each of the options would be similar to what was reported in the SDEIS. The relative differences in operations of the SDEIS options compared to each other would be consistent.

Table 5.1-10 summarizes traffic volumes through the Arboretum under each of the Final EIS Preferred Alternative and the SDEIS options.

Table 5.1-10. Traffic Volume through the Arboretum, Year 2030

Alternative	AM Peak Hour		PM Peak Hour	
	SDEIS	Final EIS	SDEIS	Final EIS
No Build Alternative	1,800 vph	1,950 vph	1,800 vph	1,730 vph
Option A	900 vph	-	1,200 vph	-
Option A with Suboptions	1,900 vph	-	1,800 vph	-
Option K and Option K with Suboption	2,000 vph	-	2,100 vph	-
Option L and Option L with Suboptions	2,000 vph	-	2,100 vph	-
Preferred Alternative	-	1,330 vph	-	1,410 vph

Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound On-ramp

The Montlake Boulevard/Lake Washington Boulevard/SR 520 eastbound on-ramp intersection has been identified as having operational issues in the year 2030 conditions with and without the project during the morning and afternoon peak hours.

Traffic volumes decreased at this intersection under the SDEIS options compared to the No Build Alternative, with the exception of Option A (Table 5.1-10). Under Option A, all access to and from SR 520 would occur from the Montlake Boulevard interchange, resulting in higher traffic volumes than the other options. In addition, Option A would provide additional capacity through the interchange area. The result is that all SDEIS options would operate better than the No Build Alternative.

The updates to the travel demand model and toll scenario resulted in an increase in traffic demand through this intersection in the Final EIS on SR 520 during the morning peak hour. Because operations in the morning peak are at LOS E under the No Build Alternative, the SDEIS options would operate at LOS E or F, similar to the Preferred Alternative. Traffic forecasts and operations are summarized in Table 5.1-11.

The SDEIS analysis indicated that under Options A and K, the intersection would operate better than the No Build Alternative, but still at LOS E in the evening peak hour. This intersection would operate at LOS F with Option L. Options A and K would operate similar to the Preferred Alternative if updated with the same assumptions (toll definition and travel demand model version). Option L would likely continue to operate worse

than the No Build Alternative at this location. Traffic forecasts and operations are summarized in Table 5.1-12. A volume to capacity ratio was also provided where the LOS is F, to better explain the magnitude of failing operations.

Table 5.1-11. Volume Entering Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound Ramps Intersection, Year 2030

	AM Peak		PM Peak	
Alternative	**SDEIS**	**Final EIS**	**SDEIS**	**Final EIS**
No Build Alternative	4,440 vph	4,550 vph	5,510 vph	5,410 vph
Option A	4,640 vph	-	5,810 vph	-
Option A with Suboptions	4,260 vph	-	5,400 vph	-
Option K	4,090 vph	-	4,800 vph	-
Option K with Suboption	4,050 vph	-	4,750 vph	-
Option L	4,090 vph	-	4,800 vph	-
Option L with Suboptions	4,090 vph	-	4,800 vph	-
Preferred Alternative	-	5,190 vph	-	5,760 vph

Table 5.1-12. LOS and V/C Ratio of Montlake Boulevard/Lake Washington Boulevard/SR 520 Eastbound Ramps, Year 2030

	AM Peak		PM Peak	
Alternative	**SDEIS**	**Final EIS**	**SDEIS**	**Final EIS**
No Build Alternative	LOS E	LOS E/1.05	LOS F/1.26	LOS F/1.50
Option A	LOS D	-	LOS E	-
Option A with Suboptions	LOS C	-	LOS E	-
Option K	LOS D	-	LOS E	-
Option K with Suboption	LOS C	-	LOS C	-
Option L	LOS D	-	LOS F/1.32	-
Option L with Suboptions	LOS C	-	LOS E	-
Preferred Alternative	-	LOS F/1.10		LOS F/1.20

Montlake Boulevard/NE Pacific Street

The Final EIS analysis assumed that there would be a single-point toll and that drivers would not pay a toll to cross the Portage Bay Bridge. So under the Preferred Alternative, there would be more trips made across the Portage Bay Bridge between I-5 and Montlake compared to the SDEIS analysis, which assumed a segmental toll. This means if the toll scenario for the Options A, K, and L analyses were updated, there would be an increase in trips across the Portage Bay Bridge between I-5 and Montlake to the north. This would result in more traffic entering the Montlake triangle area than was reported in the SDEIS for Options A, K, and L (Table 5.1-13). Traffic volumes entering the Montlake triangle under Options K and L would be expected to be over 9,000 vph during the afternoon peak hour using the Final EIS travel demand model and toll definition.
Option A with the suboption would be similar to the Preferred Alternative. Option A would be similar to the Final EIS No Build Alternative.

Table 5.1-13. Volume Entering Montlake Triangle, Year 2030

	AM Peak Hour		PM Peak Hour	
Alternative	**SDEIS**	**Final EIS**	**SDEIS**	**Final EIS**
No Build Alternative	5,050 vph	5,240 vph	7,150 vph	7,000 vph
Option A	4,750 vph	-	6,850 vph	-
Option A with Suboptions	4,750 vph	-	7,050 vph	-
Option K with suboption	6,250 vph	-	8,900 vph	-
Option L	6,950 vph	-	9,400 vph	-
Option L with Suboptions	6,250 vph	-	8,900 vph	-
Preferred Alternative	-	5,410 vph	-	7,270 vph

Table 5.1-14 shows the LOS for the Montlake Boulevard/Pacific Street intersection. During the morning peak hour, the intersection would operate at LOS D or better under the No Build Alternative and SDEIS options, which is considered acceptable. During the afternoon peak hour, Options K and L would operate with a LOS F grade and worse than the No Build Alternative (Table 5.1-14). For the LOS F conditions where the intersection would be over capacity, we have also provided a v/c ratio to better explain the magnitude of failing operations.

The SDEIS analysis identified significant operational issues with Options K and L and their suboptions at the Montlake Boulevard/Pacific Street intersection during the afternoon peak hour. Traffic volumes in this area were substantially greater than the capacity of the intersection. With an

anticipated increase in traffic with the single-point toll and the updated travel demand model used in the Final EIS, the operations of the Montlake Boulevard/Pacific Street intersection would be expected to be similar or worse than was reported in the SDEIS for Options K and L and their suboptions.

Table 5.1-14. LOS of Montlake Boulevard/Pacific Street Intersection, Year 2030

Alternative	AM Peak Hour		PM Peak Hour	
	SDEIS	Final EIS	SDEIS	Final EIS
No Build Alternative	LOS C	LOS C	LOS F/1.26	LOS E
Option A	LOS C	-	LOS E	-
Option A with Suboptions	LOS C	-	LOS E	-
Option K and Option K with Suboption	LOS C	-	LOS F/1.38	-
Option L	LOS D	-	LOS F/1.32	-
Option L with Suboptions	LOS C	-	LOS F	-
Preferred Alternative	-	LOS C	-	LOS E

How would the project affect bus facilities and service?

The Preferred Alternative and the SDEIS options would all provide improved access for HOV and transit in the Montlake interchange area, but design details would vary. As shown in Exhibit 5.1-27, the Preferred Alternative and the SDEIS options would all affect bus operations with the following changes:

- Add HOV lanes in both directions across SR 520 from Evergreen Point Road to I-5.
- Add an HOV direct connection to the I-5 express lanes that would operate westbound-to-southbound in the morning and northbound-to-eastbound in the afternoon.
- Add HOV direct-access ramps to the Montlake interchange area, connecting with SR 520 to and from the east. Option A is the only exception because it did not provide direct access from Montlake to the east.
- Remove the Montlake Freeway Transit Station.
- The Preferred Alternative, which was developed by refining SDEIS Option A, would also include (see Exhibit 5.1-28):
  - Providing bus stops on the new Montlake lid to help replace the function of the Montlake Freeway Transit Station.

How was bus service evaluated for the project?

For all alternatives, WSDOT evaluated the demand for buses and determined the bus capacity that would be available based on information from King County Metro, Sound Transit, Community Transit, and Microsoft Corporation (as a private shuttle operator).

The information about demand and capacity for the transit system was considered for each alternative, and WSDOT evaluated how each alternative would affect the transit infrastructure and operations.

WSDOT considered not only what the demand for buses would be, but also what effect the project itself would have on demand.

- Adding HOV lanes to Montlake Boulevard NE from SR 520 (southbound between NE Pacific Street and East Shelby Street and northbound between SR 520 to the Montlake Cut).
- Providing for the addition of signal priority at the interchange area.

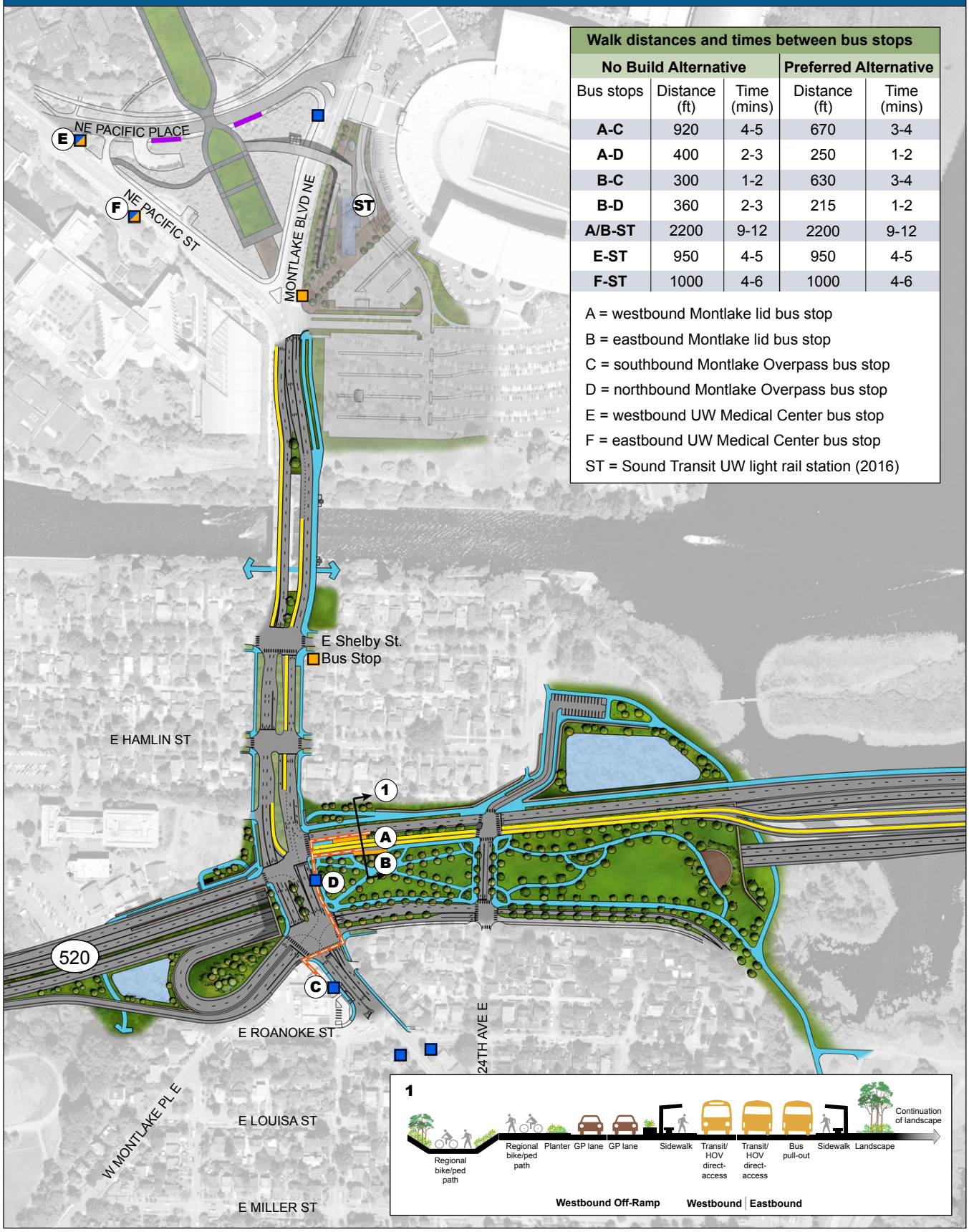
Exhibit 5.1-27. HOV and Transit Improvements Along SR 520 with the Preferred Alternative

Option A would include a westbound transit-only off-ramp to northbound Montlake Boulevard, while the Preferred Alternative and Options K and L would include 3+carpools and transit direct-access ramps to and from the east at the new interchange east of Montlake Boulevard.

Would bus capacity on SR 520 meet demand in 2030?

The Final EIS analysis assumed that expanded light rail service would be in place in 2030 with the implementation of ST 2, and used the corresponding changes to bus routes and ridership on SR 520 as provided by King County Metro and Sound Transit. The East Link light rail line across I-90, which would serve downtown Seattle, Mercer Island, Bellevue, and Overlake (Redmond), would be operating by this time. Exhibit 5.1-28 shows the current and forecasted daily and peak-period person demand by bus in 2030.

Exhibit 5.1-28. **Preferred Alternative Transit and HOV Facilities within the Montlake Area**



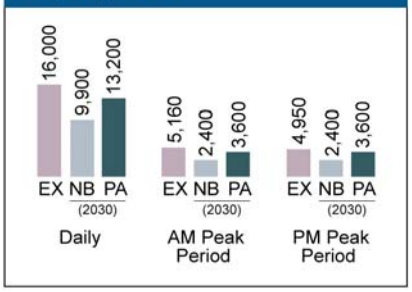
Walk distances and times between bus stops				
	No Build Alternative		Preferred Alternative	
Bus stops	Distance (ft)	Time (mins)	Distance (ft)	Time (mins)
A-C	920	4-5	670	3-4
A-D	400	2-3	250	1-2
B-C	300	1-2	630	3-4
B-D	360	2-3	215	1-2
A/B-ST	2200	9-12	2200	9-12
E-ST	950	4-5	950	4-5
F-ST	1000	4-6	1000	4-6

A = westbound Montlake lid bus stop
B = eastbound Montlake lid bus stop
C = southbound Montlake Overpass bus stop
D = northbound Montlake Overpass bus stop
E = westbound UW Medical Center bus stop
F = eastbound UW Medical Center bus stop
ST = Sound Transit UW light rail station (2016)

Bus Stop (Local Route)
Bus Stop (SR 520 Route)
Bus Stop (Local and SR 520 Route)
Layover Area
HOV Lanes
Bicycle/Pedestrian Path

Under the Final EIS No Build Alternative, which includes East Link and associated changes in SR 520 bus service, daily person demand for buses on SR 520 would decrease by 38 percent between now and 2030, as seen in Exhibit 5.1-29. Transit ridership demand would decrease by about 50 percent during the morning and evening commute periods, compared to today. Much of this decrease would be due to a switch of ridership from SR 520 buses to East Link light rail on I-90.

Exhibit 5.1-29. **Daily Person Trips by Bus**



The Preferred Alternative, similar to the SDEIS options, would increase person demand for buses over the No Build Alternative. Daily transit ridership would increase by approximately 33 percent with the Preferred Alternative than without the project. This increase reflects the effect on mode choice of tolling, completing the HOV lanes in both directions across the bridge, adding a reversible connection to the I-5 express lanes, and adding direct-access ramps at the Montlake Boulevard interchange. Transit ridership demand with the project would increase by about 50 percent during both morning and evening commute periods compared to the No Build Alternative.

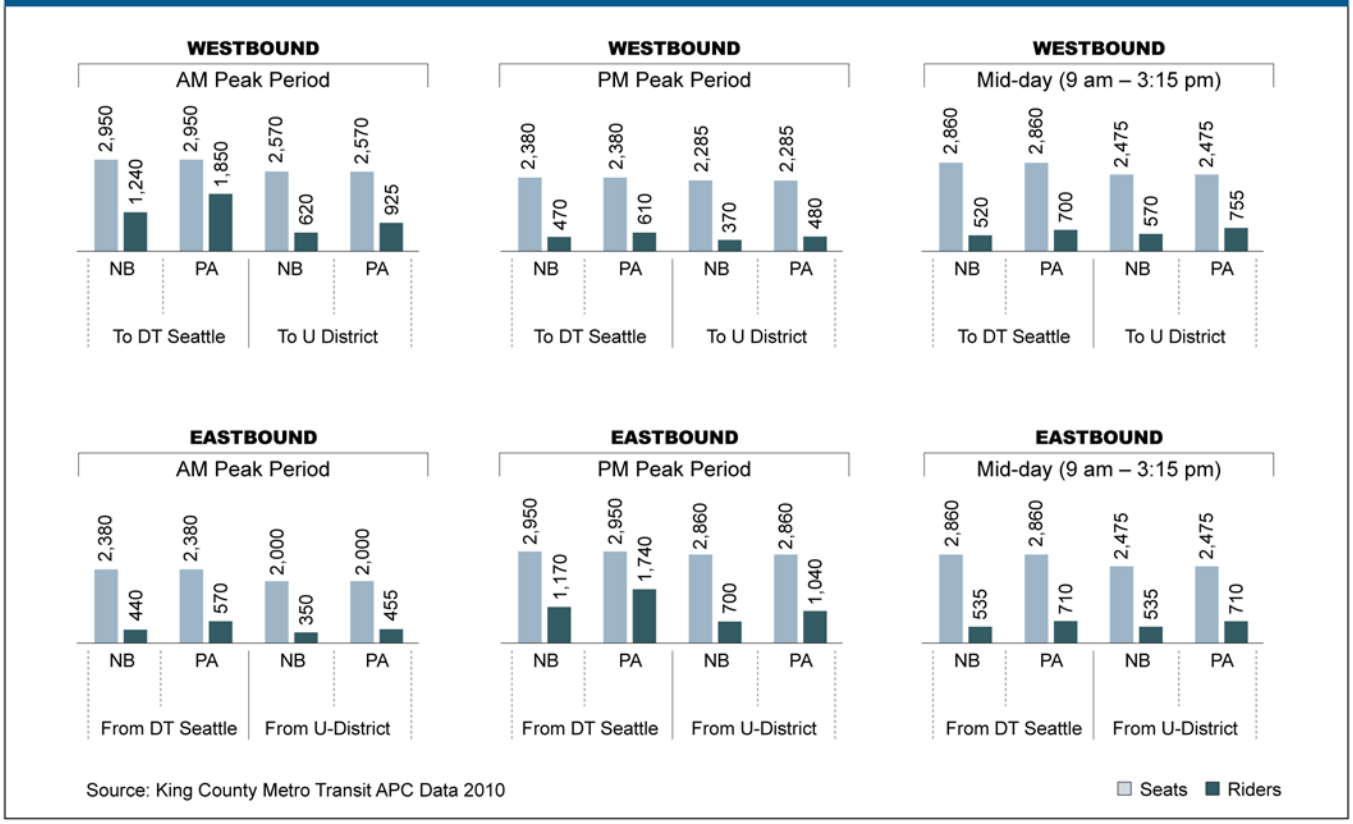
East Link and the corresponding bus service changes were not included in the SDEIS direct effects transit analysis because ST 2 had not yet been approved by voters. However, East Link was included in the SDEIS cumulative effects analysis and the results were similar to the Final EIS in that there was a net decrease in transit ridership on the SR 520 corridor. Transit ridership on SR 520 under the SDEIS cumulative effects scenario was about 85 percent lower than it was under the SDEIS No Build Alternative (without East Link) and about 55 percent lower than it was under the SDEIS options. The fact that there was less of a decrease under the build options (55 versus 85 percent) demonstrates the benefit of the HOV lane improvements included in the SDEIS options.

As shown in Exhibit 5.1-30, there were similar changes in daily transit trips in the Final EIS analysis with the Preferred Alternative, resulting in an increase in transit trips compared to the No Build Alternative, but a net decrease compared to today. It was estimated that SR 520 bus routes would provide approximately 6,800 westbound seats during the morning commute period (6:00 a.m. to 9:00 a.m.), with an actual demand for approximately 5,700 seats. This means that during its busiest time, the SR 520 corridor bus transit system would be operating at 84 percent capacity.

The combination of a decrease in bus ridership over today along with improved headways (shorter time between bus arrivals on a given route) suggests that there would be available seat capacity on buses in the SR 520 corridor. A comparison of bus seat capacity and bus ridership demand for the No Build and Preferred Alternatives was prepared using ridership information for the two busiest SR 520 transit markets (Eastside-downtown Seattle buses and Eastside-University District) and the assumed route headways. The purpose of this comparison was to determine the

effects of the Preferred Alternative and the removal of the Montlake Freeway Transit Station, which is anticipated to increase ridership on Eastside-University District routes. Exhibit 5.1-30 shows the anticipated ridership and bus capacities.

Exhibit 5.1-30. **Year 2030 Bus Capacity vs Ridership across SR 520 Bridge**



As shown in Exhibit 5.1-30, it was estimated that SR 520 bus routes would provide approximately 5,500 westbound seats during the morning commute period (6:00 a.m. to 9:00 a.m.), with a demand for approximately 2,780 seats (Eastside- downtown Seattle buses and Eastside-University District combined). This means that during its busiest time, the SR 520 corridor bus transit system would be operating at 50 percent capacity, which is better than under the SDEIS options. These data appear to illustrate that there would be adequate capacity available to meet the anticipated 33 percent increase in ridership demand along the corridor throughout the day.

What would bus travel times be on the SR 520 corridor?

Under the Final EIS No Build Alternative, HOV travel times in either direction on SR 520 would be the same or slightly longer than today in the morning peak period, and faster than today in the evening peak period. During the morning peak period, HOV travel times westbound between

SR 202 and I-5 would be a maximum of 18 minutes (2 minutes more than today); eastbound, the maximum HOV trip time would be 26 minutes from I-5 to SR 202 compared to 25 minutes today. The increase in HOV travel times would be due to additional congestion resulting from the growth in demand between today and 2030. In the evening, the maximum HOV travel time westbound between SR 202 and I-5 would improve by 9 minutes (28 minutes today compared to 19 minutes in 2030); eastbound, the maximum HOV travel time from I-5 to SR 202 would improve by 2 minutes (20 minutes today compared to 18 minutes in 2030). The improvement in the evening commute would occur because of the other planned improvements to the corridor. These changes are similar to those under the SDEIS No Build Alternative, except for eastbound HOV travel times under SDEIS Option K during the evening commute. This difference is discussed in Section 5.1.3 under *Evening Peak Eastbound*.

The Preferred Alternative would further improve bus reliability and travel times on SR 520 over the No Build Alternative, as well as the connections between bus service and other travel modes in the Montlake interchange area. The project would keep westbound and eastbound HOV lane speeds consistently at or near free-flow conditions throughout the peak periods (even during the peak hour of the peak period). As a result, westbound and eastbound HOV travel times would reliably be an average of 14 to 16 minutes between I-5 and SR 202, helping buses to stay on schedule.

Westbound, the maximum HOV travel times between SR 202 and I-5 would improve by up to 3 to 4 minutes for HOV traffic during both morning and evening peak periods, compared to No Build conditions. Eastbound, HOV maximum travel times would improve by up to 12 minutes compared to No Build conditions during the morning peak period, and up to 3 minutes during the evening peak period. The improvement would be due to completion of the new Montlake interchange, which would improve local traffic operations as well as travel times and reliability for SR 520 buses compared to the Final EIS No Build Alternative. The Preferred Alternative would maintain the HOV priority treatments on NE Pacific Street eastbound and Montlake Boulevard NE southbound; it would also add HOV lanes to Montlake Boulevard NE from SR 520 to across the Montlake bascule bridges. These HOV facilities would allow buses to bypass traffic congestion associated with off-peak openings of the Montlake Bridge. These changes are similar to those for the SDEIS options. For more information about freeway travel times, see Section 5.1.3.

How would the Montlake Freeway Transit Station be affected?

Under the Final EIS No Build Alternative, King County Metro and Sound Transit would restructure SR 520 bus service to downtown Seattle to support East Link and University Link light rail and King County Metro

How would bus service change with I-90 East Link light rail in place?

With new light rail service in place, King County Metro and Sound Transit would revise bus service to facilitate bus-light rail connections and create transit service efficiencies

The number of downtown Seattle-Eastside routes would be reduced from 15 to 7 and the number of U-District/North Seattle – Eastside routes would be reduced from 8 to 6. All-day service across the floating bridge would continue to be provided by the same four all-day routes that operate today.

While the overall number of routes would be reduced, route headways would be improved to provide more frequent bus service than today across the SR 520 bridge.

transit service changes. These changes would result in seven fewer bus routes across SR 520 and, therefore, fewer bus routes serving the Montlake Freeway Transit Station. As a result of these service changes, a forecasted 1,100 riders would use the station compared to 1,700 today. The implementation of Sound Transit route 542 between Redmond and the University District in October 2010 is anticipated to further decrease use of the Montlake Freeway Transit Station during the peak periods. Route 542 provides direct service to the University District, and is an option to using route 545. Using route 542 allows bus riders to avoid walking or busing from the Montlake Freeway Transit Station.

Like all of the SDEIS options, the Preferred Alternative would remove the Montlake Freeway Transit Station. SR 520 transit travel patterns would not be substantially affected by this change. Under the Preferred Alternative, new westbound and eastbound bus stops would be provided on the new Montlake lid. These stops would continue to be accessible to pedestrians, bicyclists, and other transit riders. Eastside-University District/North Seattle bus routes would continue to exit at the Montlake interchange and serve this stop.

Adding the westbound and eastbound stops to the Montlake lid would allow transit agencies to maintain SR 520 bus service to the Montlake interchange area via Eastside-downtown Seattle bus routes during off-peak periods. Westbound buses would be able to exit via the new HOV direct-access ramps, serve the stop on the Montlake lid, and then continue on westbound SR 520 to downtown Seattle or other destinations via I-5. Eastbound buses would be able to exit SR 520 at the Montlake off-ramp, turn left onto Montlake Boulevard, and then turn right onto the direct-access ramps to pick up or drop off passengers. As result, riders would have access to both downtown Seattle-Eastside and University District-Eastside bus routes during midday, evenings, and weekends.

During the morning and evening peak periods, downtown Seattle-Eastside bus routes would have one less stop on their route, resulting in travel time savings. Because downtown Seattle-Eastside bus routes would not serve the Montlake lid bus stops during the a.m. and p.m. peak periods, riders would lose access to approximately 220 bus trips between Montlake Boulevard and the Evergreen Point or Yarrow Point freeway transit stations compared to the No Build Alternative.

Transit riders who would normally use one of these routes would need to use one of the University District-Eastside bus routes instead. They would have access to an additional 55 bus trips between Eastside-University District as well as East Link, which would serve the University of Washington (UW) at the station near Husky Stadium. Some riders using SR 520 bus service might need to transfer at the Evergreen Point Freeway Transit Station to reach their destination. Transfer time between westbound downtown Seattle and University District buses at the Evergreen Point

station would be between 3 to 4 minutes during both peaks. This estimate is based on the combined bus frequency for the Eastside-University District routes as it is assumed that most riders destined for the University District would be able to catch any University District route. Riders traveling eastbound who need to catch a downtown Seattle bus to their final destination would be able to catch any eastbound University District route, which would also have a combined frequency of every 3 to 4 minutes during the peak periods, to the Evergreen Point freeway station. Once there, some riders might have to wait up to 45 minutes if they do not consult bus schedules. During the off-peak and weekends, riders would be able to use Eastside-downtown Seattle routes to access the Montlake area. For many riders, the addition of 3 to 4 minutes to transit trip time would be offset by time saved through replacing walk time from the Montlake Freeway Transit Station with direct service to the Montlake Multimodal Center (about a 5 minute savings).

What would be the effects on local bus service on Montlake Boulevard NE?

Under the Final EIS No Build Alternative, transit agencies plan that routes 272 (an express bus route between the University District and Bellevue) and route 556 (an express bus route between Northgate and Issaquah) would be discontinued and would no longer be available at the East Shelby Street and Montlake Boulevard southbound bus stops. This would have a minimal effect because total boardings and alightings are expected to decrease by less than 1 percent at each of those stops on a daily basis as a result of the change in service.

Based on the travel demand modeling that assumed light rail ridership in 2030, it is also anticipated that ridership would decrease on some of the local King County Metro routes traveling through the Montlake area as transit riders switch to light rail. For example, transit riders traveling between Capitol Hill and the University District on route 43 might choose to take light rail via the John Street, UW, and Brooklyn stations. Transit riders who are traveling between Capitol Hill and Overlake might also choose to take East Link.

Under the Preferred Alternative, two bus stops would be relocated due to the reconstruction of the Montlake interchange area (see Exhibit 5.1-28 for details of the transit facilities that would exist with the project). The Montlake Boulevard southbound bus stop, currently on a traffic island at the SR 520 eastbound on-ramp, would be permanently relocated 270 feet to the south to near East Roanoke Street (as requested by the City of Seattle through the ESSB 6392 process described in Chapter 1). The Montlake Boulevard northbound bus stop at the SR 520 westbound off-ramp would be permanently relocated 100 feet to the south on the Montlake overpass.

The new bus stop would be designed as a pull-out lane to allow buses to stop without affecting local traffic operations.

Southbound Travel Times

Travel time for local buses traveling eastbound along NE Pacific Street and southbound along Montlake Boulevard NE would be approximately 16 minutes under the Final EIS No Build Alternative (between 15th Avenue NE and East Roanoke Street). Under the Preferred Alternative, travel time for southbound local buses would improve to approximately 11 minutes because of capacity improvements to the local street system, including HOV lanes and an HOV direct-access ramp at the Montlake interchange. For a detailed description of the changes in the local street capacity and LOS improvements associated with the Final EIS No Build Alternative and the Preferred Alternative, please refer to the section in this chapter titled *How would the project affect traffic on local streets and at intersections?*

Southbound travel times under the Final EIS No Build Alternative and the Preferred Alternative would be slightly longer than the SDEIS No Build Alternative (9 minutes) and options (all were 3 to 5 minutes). This is due to different analysis limits, which were expanded to account for more of the congestion in the study area. With the same analysis limits, the SDEIS results would be similar because of the options all having similar travel times to each other and all being better than No Build.

Northbound Travel Times

Travel times for local buses traveling northbound along Montlake Boulevard NE and westbound along NE Pacific Street would be approximately 19 minutes under the Final EIS No Build Alternative (between 15th Avenue NE and East Roanoke Street). Under the Preferred Alternative, travel times for northbound local buses would improve to approximately 14 minutes because of capacity and HOV improvements to the local street system and at the Montlake interchange.

The Preferred Alternative travel times fell between Option A (18 minutes) and Option A with the suboption (10 minutes), reflecting the effect of combining the revised design characteristics of each. The Preferred Alternative travel times were also better than Options K and L (26 and 28 minutes, respectively). Northbound travel times under the Final EIS No Build Alternative are less than the SDEIS No Build Alternative (45 minutes). This is due to differences in background traffic growth in the Montlake interchange area, which were slightly less under the Final EIS No Build Alternative (21 percent in Final EIS compared to 24 percent in the SDEIS). Background traffic growth was updated to reflect updates from the PSRC travel demand model. Updated simulation modeling also provided improved U-turn simulation, which could have added to the improved operations. This decrease in traffic volumes and improved simulation

resulted in better traffic operations through the Montlake interchange area, particularly at the Montlake Boulevard NE/East Hamlin Street intersection.

Comparable traffic volumes would decrease travel times under the SDEIS No Build Alternative. The changes in volume would also apply to the SDEIS options; however, none of the options include the U-turn function, so that would not affect their results. Operational results would still be relatively similar between the options. Option A and Option A with the suboption would still have better travel times than Options K and L. This is because travel times under Options K and L are constrained by operational issues at the Montlake Boulevard/NE Pacific Street intersection, which was operating 40 percent over capacity. Reduced background growth in traffic volumes would not eliminate this constraint. For more detailed information on how the alternatives affect intersection operations, please refer to the section in this chapter titled *How would the project affect traffic on local streets and at intersections?*

How would the project interact with proposed improvements in the "Montlake Triangle" area?

At the time of the SDEIS, the City of Seattle, King County Metro, Sound Transit, UW, and WSDOT were considering several options to improve traffic circulation in the Montlake Triangle vicinity. The construction of the University Link light rail station at Husky Stadium, an increased concentration of bus and pedestrian traffic around the Montlake Triangle, and increased pedestrian and bicycle traffic from the new regional pedestrian and bicycle path across SR 520 would make this already busy area function as a multimodal center. The Montlake Multimodal Center would function as a primary commuter entry onto the University of Washington campus. The University of Washington has also been planning a project to improve the Rainier Vista, whose southern terminus is at NE Pacific Place across from the Montlake Multimodal Center. As part of the ESSB 6392 process, WSDOT coordinated with these agencies to ensure that the SR 520 project options would be compatible with other improvements at this location.

The SDEIS evaluated potential improvements at the Montlake Multimodal Center under Options K and L, which would have added a new leg to the intersection of Montlake Boulevard NE and NE Pacific Street. These options included a full or partial lid at the intersection to allow pedestrians to cross over Montlake Boulevard to access other portions of the campus. Option A did not require any changes to this intersection, and, therefore, did not propose a lid or other changes to pedestrian and bicycle facilities. Sound Transit's EIS for the University Link light rail station had evaluated a pedestrian bridge across Montlake Boulevard and Pacific Place, and the UW was conducting its own environmental review of the Rainier Vista project;

Option A assumed that these projects would proceed independently of the SR 520, I-5 to Medina project.

Like Option A, the Preferred Alternative does not propose any changes at the Montlake Boulevard/Pacific Street interchange. However, as noted above, the improvements to traffic circulation, transit, and bicycle/pedestrian access provided by the SR 520, I-5 to Medina project made it important for WSDOT to coordinate closely with the agencies planning projects in this area. As part of the ESSB 6392 work group process following the SDEIS, WSDOT continued to work with the Seattle Department of Transportation, the Seattle Design Commission, the UW, King County Metro, and Sound Transit on ways to improve circulation at the Montlake Multimodal Center. The intent of the coordination effort was to ensure that SR 520 project options would be compatible with other projects and improvements at this location. (A copy of ESSB 6392 is provided in Attachment 16 to this Final EIS.)

Together, the agencies identified conceptual design options that would provide safe, efficient transfers for bicyclists, pedestrians, and bus users to connect to the University Link light rail station near Husky Stadium. Exhibit 5.1-31 shows the likely configuration for the Montlake Triangle after completion of all planned projects there, as envisioned through the

Exhibit 5.1-31. **Rendering of Sound Transit's University of Washington Station Entrance with Pedestrian Bridge, (opening in 2016)**

coordination effort. Although WSDOT would not be responsible for implementing improvements in this area, it is providing part of the funding for the improvements in recognition of the need to serve additional nonmotorized traffic in this area.

Neither the Preferred Alternative nor SDEIS Option A would change or negatively affect other projects in the Montlake Triangle area proposed by others. The Preferred Alternative includes the same assumptions about operation of this area, including pedestrian connections, as Option A, although future pedestrian volumes were updated for the Final EIS analysis to be consistent with the North Link final environmental documentation (Federal Transit Administration and Sound Transit 2009). However, if Options K or L were ultimately chosen to move forward, the concept discussed above would need to be revisited, as it would not be compatible with the planned improvements.

University District and Montlake Multimodal Center Bus Service

Under the Final EIS No Build Alternative, the addition of Sound Transit's University Link light rail station would change the need for and usage of existing bus stops in the Montlake Triangle. After opening of the light rail line and station, the Montlake Triangle area would serve multiple transportation modes—buses, light rail, bicycles, and pedestrians—making it the Montlake Multimodal Center.

Sound Transit initiated construction of the new segment of light rail between downtown Seattle and the UW and the UW Station in 2009; the facilities are expected to open in 2016. The UW Station shown in Exhibit 5.1-31 would provide access to the UW campus, the UW Medical Center, nearby sports venues, and surrounding neighborhoods. Sound Transit forecasts that there would be approximately 23,000 total boardings and alightings per day at this station in 2030. This is compared to the 3,000 total boardings and alightings today at the UW Medical Center bus stops on NE Pacific Street. The new Sound Transit pedestrian bridge over Montlake Boulevard (also shown in Exhibit 5.1-31) would help to accommodate the additional pedestrian traffic, as would the new grade-separated pedestrian crossing between the Montlake Multimodal Center and the Rainier Vista walkway planned by the University of Washington. Specifically, this pedestrian crossing would cover NE Pacific Place, which would be lowered to below-grade.

Similar to the SDEIS options, the Preferred Alternative would be designed to be compatible with the planned UW Station. Coordination among WSDOT, King County Metro, Sound Transit, and the UW regarding the interaction of SR 520 with light rail and bus transit would continue throughout the design phase of the project. WSDOT, Sound Transit, King County Metro, and the UW have also developed a High-Capacity Transit

The SR 520 High-Capacity Transit Plan

The 2008 SR 520 High-Capacity Transit (HCT) Plan—developed by King County Metro, Sound Transit, the UW, and WSDOT—identified a planning vision for bus rapid transit (BRT) in the SR 520 corridor. The vision is for a network of up to five bus rapid-transit lines selected based on transit market demand. The routes would provide frequent (10-minute) all-day service in both directions, connecting downtown Seattle, the University District, and Eastside activity centers.

As discussed in Chapter 2 of this Final EIS, BRT has been identified as the preferred near-term form of HCT in the corridor, with light rail transit as a potential future enhancement if regional planning supports it.

The plan also includes options for developing the Montlake Triangle into a multimodal center to serve bus, pedestrian, bicycle, and light rail circulation and connections.

Implementation of the HCT plan is contingent on replacing the Evergreen Point Bridge, adding HOV lanes, and constructing critical transit facilities, including the new Evergreen Point Freeway Transit Station and transit/HOV direct-access facilities near the Montlake interchange. Additional funding would also be needed to provide the higher levels of bus service recommended in the plan.

Plan (WSDOT 2008), which provides a strategy for implementing bus rapid transit service on the SR 520 corridor (see text box at right).

With the opening of the UW Station, some existing transfer activity would relocate from the Montlake Freeway Transit Station to the Montlake Multimodal Center. For riders transferring between SR 520 buses and light rail, pedestrian walk times between the NE Pacific Street bus stops and the University Link light rail station entrance would be less than 5 minutes.

With relocation of the HOV lanes and freeway transit stations to the inside of SR 520, King County Metro has indicated that an important route now serving the Montlake Triangle area, route 271, could be re-routed to the 108th Avenue NE HOV direct-access ramp in Bellevue that would be constructed as a part of the SR 520, Medina to SR 202 project. This would allow route route 271 to serve the 92nd Avenue and Evergreen Point Freeway Transit stations and provide midday and off-peak service to the Montlake and University District neighborhoods.

Would there be effects on bicycle/bus connections?

In 2030 without the project, conditions would generally not improve from today, when bicycle riders are often delayed because of full bicycle racks, sometimes waiting up to 30 to 40 minutes for a bus with bicycle rack space (King County Metro 2002). The transit services' proposed improved headways could ease bicycle-bus coordination, but traffic congestion across SR 520 would still delay trips and lead to long wait times.

Under the Preferred Alternative, as with the SDEIS options, HOV travel times between I-5 and SR 202 would improve from today, as discussed above. This would lead to improved connections between transit services and other travel modes compared to existing conditions and the No Build Alternative. With the project, bicycle commuters would have the option of riding across the SR 520 bridge on their bicycles instead of waiting for a bus, which is likely to reduce their total commute travel time. Whether or not they choose to bicycle or use bus racks to transport bicycles along SR 520, the project would make their trip more reliable.

How would the project affect nonmotorized transportation?

For the Final EIS, WSDOT completed additional evaluation of nonmotorized transportation routes and features, using a higher level of planning detail than was available when the SDEIS was being prepared. The additional detail came from the efforts of the ESSB 6392 workgroup (described in Chapter 1). The workgroup, which included WSDOT, discussed and agreed on the network of primary nonmotorized routes that would connect to major destinations, such as the UW, and to other transportation components, such as the Burke-Gilman Trail. Although this analysis was refined in the context of the Preferred Alternative, many of the

general concepts developed for nonmotorized transportation are also applicable to the SDEIS design options.

The Preferred Alternative and the SDEIS options would meet the project goals of providing mobility benefits in the SR 520 corridor and to the region as a whole. Nonmotorized systems offer options for mobility that cannot be realized by highway systems; they may, if carefully designed, help to reconnect communities that were isolated by construction of the highway. The nonmotorized features of the SR 520, I-5 to Medina project are part of a larger, comprehensive transportation system, including connections to routes identified in the Seattle Bicycle Master Plan (City of Seattle 2007).

The following project features are common to the Preferred Alternative and Options A, K, and L:

- **Evergreen Point Bridge.** The regional bicycle/pedestrian path across the bridge is the most substantial improvement in nonmotorized connections provided by the project. Bicyclists and pedestrians would have the ability to travel directly east and west across Lake Washington along the SR 520 corridor, which is an option they do not have today.
- **10th Avenue East and Delmar Drive East Lid.** On the 10th Avenue East and Delmar Drive East lid, intersection connections would be improved to provide enhanced safety for bicyclists and pedestrians. The lid surface would offer a more aesthetic connection between neighborhoods adjacent to SR 520 and would include a meandering pathway from east to west between 10th Avenue East and Delmar Drive East.

While the Preferred Alternative and design options meet the basic project goals, they contain slight differences in their effects on nonmotorized transportation in the I-5 and Montlake interchange areas. These differences are primarily associated with the variations in design features in the following areas:

- **I-5/Roanoke Crossing.** The Preferred Alternative would add a path on the south side of the Roanoke Street bridge over I-5 and new crosswalks at the Harvard Avenue East/Roanoke Street intersection. This would improve safety in an area where bicyclists typically share the roads with vehicle traffic. These improvements would be provided via an enhanced bicycle/pedestrian overcrossing parallel to the existing East Roanoke Street Bridge.

  Under Options A, K, and L, a lid over I-5 would be provided at the existing East Roanoke Street crossing over I-5, extending to the north and south. Pedestrians, bicyclists, and emergency vehicles would be able to access the top of the lid for cross connections. The existing East Roanoke Street Bridge would be rebuilt under these design options.

- **Montlake Boulevard and 24th Avenue East Lid.** The Preferred Alternative and SDEIS options A, K, and L would allow pedestrians and bicycles to connect via the Montlake Boulevard and 24th Avenue East lid to the Evergreen Point Bridge path to the east, the Burke-Gilman Trail to the northeast and west, the Bill Dawson Trail to the southwest, and Lake Washington Boulevard/Arboretum trails to the southeast.

  The Preferred Alternative and Option A offer the most direct access on paths from the SR 520 bridge to Lake Washington Boulevard, the Arboretum, and the Bill Dawson Trail. Options K and L would require users to cross streets to access the same facilities.

  Under Option L, the elevation differences at the single-point urban interchange limit the area of the lid, which may require users to travel along streets instead of using pathways on the lid to reach their destinations.
- **Montlake Boulevard and NE Pacific Street Intersection.** The Preferred Alternative and Option A would improve connectivity for bicyclists and pedestrians with other modes of transportation via the Montlake Multimodal Center and University Link light rail station by expanding the pedestrian facilities across the Montlake Cut. A roadside bicycle/pedestrian path would be provided along the new Montlake bascule bridge, replacing the existing narrow sidewalk. Compared to the No Build Alternative, bicyclists would experience fewer conflicts with traffic by using the roadside path. This bicycle/pedestrian path would provide a direct connection with the Sound Transit pedestrian bridge that would cross over Montlake Boulevard and tie seamlessly with the UW Rainier Vista project, allowing cyclists and pedestrians access to the Burke-Gilman trail and the UW main campus.

  Under Options K and L, there would be a lid over the NE Pacific Street/Montlake Boulevard intersection that would provide more direct nonmotorized connections between local bus services and regional bus services, including SR 520 routes to the Eastside and the University Link light rail station. Bicyclists traveling south of NE Pacific Street on Montlake Boulevard would still be required to use either the narrow sidewalk on the existing Montlake drawbridge or the street. Because of the new crossing of the cut for vehicles, there would be less traffic on Montlake Boulevard and cyclists would experience fewer conflicts with vehicles as a result of the reduced traffic.
- **Arboretum/Lake Washington Boulevard.** The Preferred Alternative and Option A would reduce vehicular traffic in the Arboretum compared to the No Build Alternative, resulting in improved conditions for bicycle and pedestrian travel.

  Option K would provide a lid for bicyclists and pedestrians to connect from the SR 520 bridge exit to the Arboretum pathways via two overpass connections.

Under Option L, a bicycle/pedestrian path would briefly cross under Lake Washington Boulevard, both at the SR 520 ramp and farther south as Lake Washington Boulevard leads through the Arboretum area.

Options A, K, and L could include an optional land bridge at Foster Island that would provide additional connections from the SR 520 bridge to the existing arboretum trails.

The Preferred Alternative and SDEIS options A, K, and L would result in the loss of 54 bicycle locker spaces and 53 bicycle rack spaces near the existing Montlake Freeway Transit Station due to construction of the SR 520 westbound off-ramp. WSDOT, King County Metro, and Sound Transit are working together to determine the best way to replace these bicycle parking facilities.

Effect on Key Nonmotorized Routes

In response to public and agency comments and legislative direction, seven nonmotorized routes in the transportation study area were evaluated in more detail for the Final EIS (Exhibit 5.1-32). These routes, and the project's effects on them, are described below.

Route 1: Regional Connection - SR 520 Regional Path to Burke-Gilman Trail, the University of Washington, and Sound Transit's University Link Station

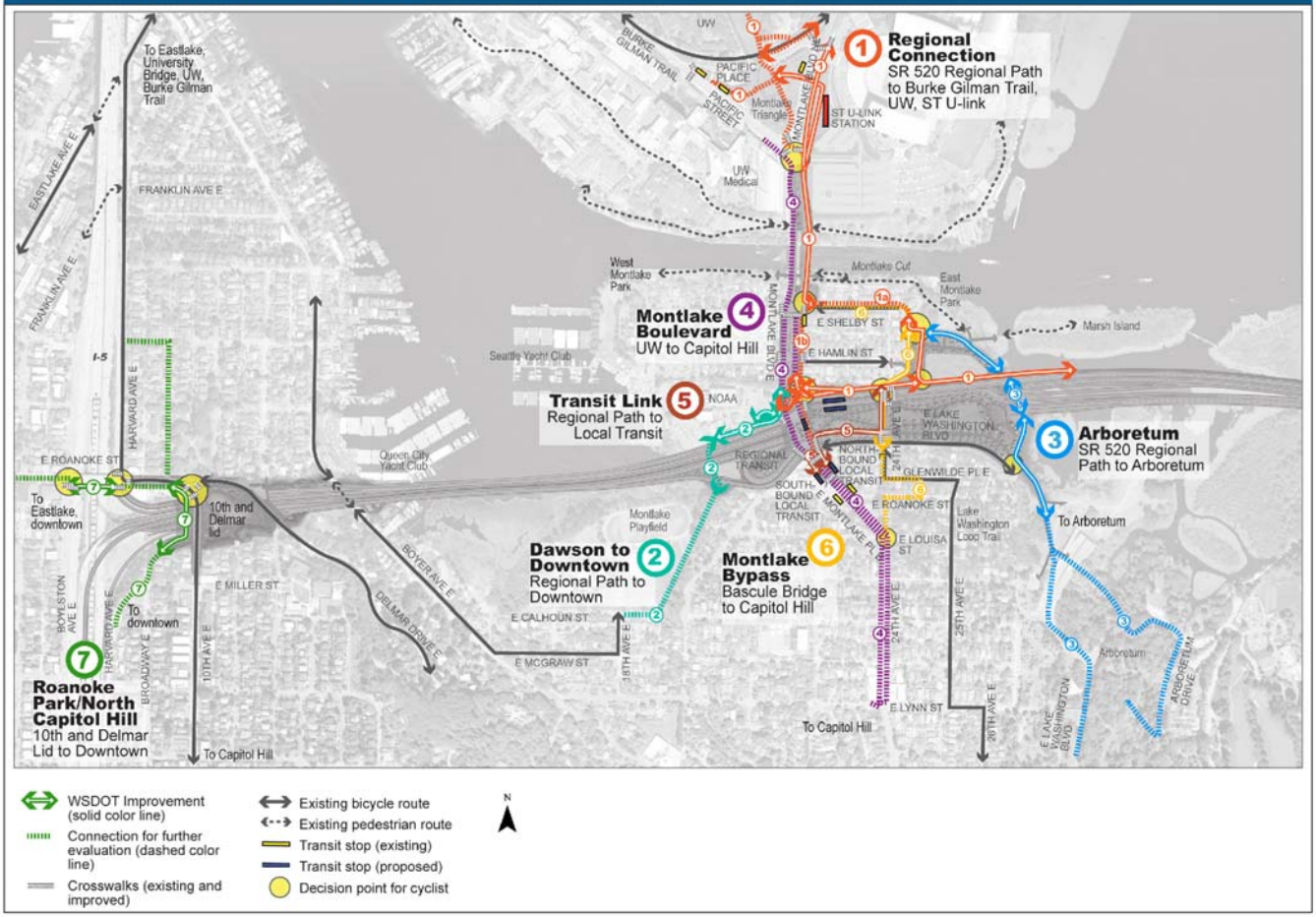
This route forms a vital connection between the UW in Seattle and the communities east of Lake Washington. Under the No Build Alternative as today, cyclists and pedestrians would board a bus to cross SR 520 or detour to the north or south to use their bicycles.

The Preferred Alternative and SDEIS options A, K, and L would build a new section of the SR 520 regional trail across the Evergreen Point Bridge from Montlake Boulevard to Medina, improving the capacity and efficiency of the nonmotorized network.

Under the Preferred Alternative and Option A, an off-street nonmotorized path that would be completed as part of a new bascule bridge across the Montlake Cut would help to safely connect the SR 520 regional trail to the Burke-Gilman Trail, existing transit stops, and the future University Station in and around the Montlake Triangle. The portion of this route on city streets between the bascule bridge and regional trail will be developed by the City of Seattle as agreed through ESSB 6392 coordination.

Under Options K and L, bicyclists would still be required to use Montlake Boulevard, but would experience fewer conflicts with vehicles as a result of reduced traffic. In the Montlake Triangle area, the NE Pacific Street lid would provide seamless nonmotorized connections between local and regional bus services, the University Link light rail station, and the Burke-Gilman Trail.

Exhibit 5.1-32. **Nonmotorized Routes**



The bicycle and pedestrian paths proposed for construction by the project are shown in orange on Exhibit 5.1-33. There are portions of the seven common routes that would be built by the SR 520, I-5 to Medina project.

Route 2: Bill Dawson Trail to Downtown Seattle – SR 520 Regional Path to Downtown Seattle

Under the No Build Alternative, the Bill Dawson trail would operate as it does today, connecting Montlake Boulevard to East Calhoun Street near Montlake Playground, and also providing connections to Capitol Hill and downtown Seattle. The trail currently passes underneath SR 520 on the east side of Portage Bay, and this crossing would remain substantially the same under the Preferred Alternative.

The Preferred Alternative and Options A, K, and L would add an undercrossing for the trail beneath Montlake Boulevard just north of the proposed eastbound SR 520 off-ramp intersection, improving system connectivity by providing a direct connection to the new SR 520 regional trail. The crossing underneath SR 520 would be widened and relocated slightly west of its current location to accommodate new bridge structures. Short connector trails would maintain trail connections to Montlake Boulevard at both ends of the new undercrossing alignment.

Exhibit 5.1-33. **Future Trail Connectivity**

Route 3: Arboretum - SR 520 Regional Path to Arboretum

Under the No Build scenario, the route from the Arboretum to the Montlake Boulevard interchange would follow Lake Washington Boulevard to Montlake Boulevard.

Under the Preferred Alternative and Option A, a new trail would be constructed that would cross under SR 520 and connect to 24th Avenue between East Shelby Street and East Hamlin Street. Parking for the trail would be available at a new parking lot to be established in East Montlake Park. The new trail would separate pedestrians and cyclists from the flow of motorized traffic and increase the number of connection options across SR 520, enhancing safety, adding capacity, and improving efficiency for pedestrians and bicyclists. Bicyclists would also have the option to travel between Lake Washington Boulevard and the SR 520 regional path via 24th Avenue East.

Under Option K, two short lids would be built over the ramps between Lake Washington Boulevard and SR 520 to provide pedestrian and bicyclist connections between the neighborhoods and the Arboretum. This design would also provide a separate roadway parallel to the ramps that would be designated for local residents, cyclists, and pedestrians. This design feature would reduce the potential for pedestrian and bicycle conflicts with motorized vehicles.

Option L would provide a bicycle/pedestrian path that crosses briefly under Lake Washington Boulevard, both at the SR 520 ramp and farther south as Lake Washington Boulevard leads through the Arboretum area. This design would also maintain a connection between the neighborhoods and the Arboretum, and reduce the potential for pedestrian and bicycle conflicts with motorized vehicles.

Option K includes a land bridge at Foster Island to increase/maintain connectivity of regional trails to the Washington Park Arboretum. The SR 520 roadway would be lowered at the land bridge, and pedestrian/bicyclist access from the south side of Foster Island would be possible along a new path that follows the surface of the new land bridge. Short retaining walls would be constructed around the new land bridge north of SR 520.

Route 4: Montlake Boulevard – University of Washington to Capitol Hill

As under existing conditions, the No Build scenario would require bicyclists to use the sidewalk or board a bus to cross the historic bascule bridge because the steel-grated road surface is not safe for bicycles. Elsewhere, cyclists may choose to use the sidewalk for the majority of this route, both northbound and southbound, rather than riding in-lane with motorized traffic, although the City may provide "sharrows."

Under the Preferred Alternative and Option A, the new bascule bridge would provide a separate nonmotorized path to cross the bridge on

Sharrows

Sharrows (or sharing-arrows) are white pavement markings typically on the right side of a curbside travel lane that indicate the shared use of the lane with vehicles and bicycles on an established bicycle route. Sharrows typically consist of two or more chevron arrows pointing in the direction of travel and a small cyclist symbol.

Montlake Boulevard. In addition, safety for pedestrians traveling on Montlake Boulevard would be improved because crossing locations would be signal-protected and would not expose pedestrians to higher-speed, free-flow right-turn movements.

Under Options K and L, bicyclists would still need to use Montlake Boulevard, but would experience fewer conflicts with vehicles as a result of reduced traffic.

Route 5: Transit Link – Regional Path to Local Transit

This route represents the connections from the SR 520 regional path to local and regional transit routes. Under No Build conditions, the SR 520 regional path would not be built. Bicyclists and pedestrians would need to use transit to cross Lake Washington and then transfer in the Montlake area as they do today. The local transit stops would continue to be located on Montlake Boulevard near the eastbound and westbound SR 520 ramps.

As defined in the ESSB 6392 workgroup process, the Preferred Alternative would keep the existing northbound stop near its current location, construct a new stop on the Montlake lid between the east- and westbound ramps, and relocate the southbound stop about 250 feet south of its current location. The Preferred Alternative would include crossing improvements at the Montlake Boulevard and Lake Washington Boulevard intersection by removing the free right-turn movements for vehicles, as developed in coordination with the City of Seattle. Options A, K, and L could provide similar connections between the regional path and local transit service.

Route 6: Montlake Bypass - Bascule Bridge to Capitol Hill

Under the No Build Alternative, 24th Avenue East would provide a safer alternative to the high traffic volumes of Montlake Boulevard for bicycles and pedestrians. Crossing the freeway at 24th Avenue East maintains close and convenient connections to transit stops at the interchange.

Traffic volumes would increase on 24th Avenue East under the Preferred Alternative, reducing the level of safety for bicyclists sharing the street. The Preferred Alternative would add one more intersection crossing (signal-protected) to negotiate at the westbound off-ramp/direct-access ramp intersection with 24th Avenue East. It would also provide additional paths across the Montlake lid, accommodating more pedestrians and bicycles and facilitating north-south travel through the Montlake neighborhoods. In addition, it would create more convenient transit connections and would protect pedestrians with two signals at the intersections with 24th Avenue East.

Similar to the Preferred Alternative, Option A, K, and L would connect with the Seattle bicycle/pedestrian connection along 24th Avenue East and additional paths across the Montlake lid. Traffic volumes along 24th Avenue East would be lower than under the Preferred Alternative, which

could result in a slightly safer nonmotorized environment than under the Preferred Alternative.

Route 7: Roanoke Park/North Capitol Hill – 10th and Delmar Lid to Downtown Seattle

Today and under the No Build Alternative, the crossings of I-5 and SR 520 on these routes serve high traffic volumes and form important connections in the city grid. The area is also the crossroads of several bicycle routes in the city of Seattle.

The Preferred Alternative would improve safety and enhance connectivity for all nonmotorized users by providing a separate crossing of I-5 south of East Roanoke Street, of SR 520 west of 10th Avenue East, and multiple pathways on the SR 520 lid between 10th Avenue East and Delmar Drive East.

Options A, K, and L would provide improved connections over I-5 via a new lid and improvements over SR 520 between 10th Avenue East and Delmar Drive East, similar to the Preferred Alternative.

How would the project affect parking?

The Preferred Alternative would have fewer parking effects than SDEIS options A, K, and L. Option L would have the greatest overall effect on parking due to construction of the northern interchange ramps across the Montlake Cut, which would pass through the Husky Stadium's south parking lot. Exhibit 5.1-34 shows the locations of affected parking.

Table 5.1-15 lists the existing parking supply, average number of spaces in use, estimated utilization rate, and the number of spaces the Preferred Alternative and Options A, K, and L would affect.

The Preferred Alternative and Options A, K, and L would require removal of the existing lot at Bagley Viewpoint Park due to construction of the 10th and Delmar lid. WSDOT is considering replacement of part or all of this parking.

At the NOAA property, only the portion of the facility parking lot located on WSDOT right-of-way under the Portage Bay Bridge structure (38 spaces) would be removed under the Preferred Alternative. Under Option A, roughly 12 spaces could be removed from the portion of the parking lot that is not under the existing structure due to column placement. Options K and L would not affect parking at this location.

How was parking evaluated?

The analysis considered existing parking supply, conceptual project design, and field observations to estimate the number of affected parking spaces and new parking provided for the Preferred Alternative. WSDOT collected supply and demand field data for each parking area that would be affected. Parking demand was determined based on a field survey that measured parking utilization several times at each location during 2 consecutive days in October 2010.

The SDEIS parking results were based on data collected in 2004 and did not include field verification, although some supply and utilization rates were verified from other sources or estimated using aerial photography. For the Final EIS, the utilization rates and supply were verified during October 2010 field surveys and were comparable to the SDEIS utilization rates.

Exhibit 5.1-34. **Potentially Affected Parking**

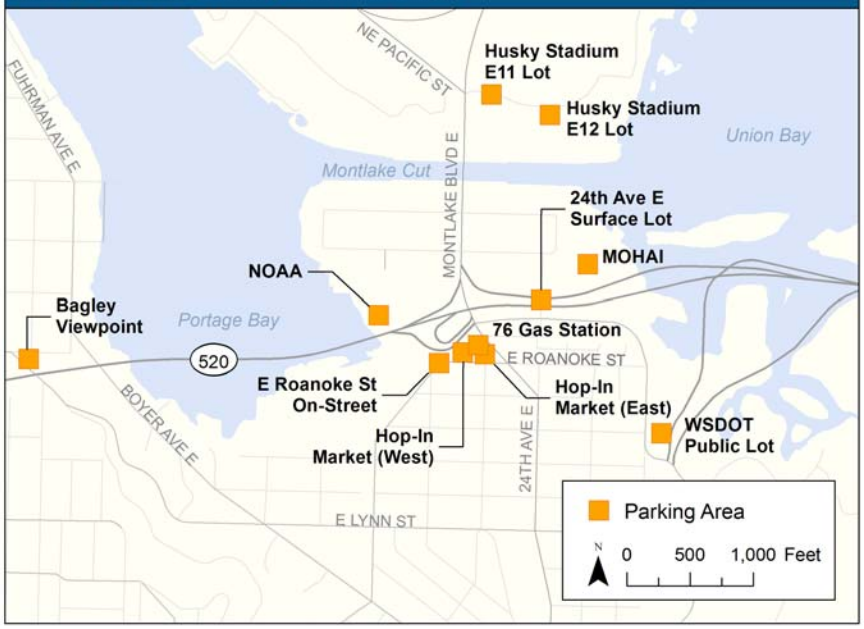


Table 5.1-15. Potentially Affected Parking Areas

Location	Existing Parking Supply	Utilization Rate	Spaces Removed by Build Alternative			
			Preferred Alternative	Option A	Option K	Option L
Lot at Bagley Viewpoint	10	10% [a]	10	10	10	10
NOAA NW Fisheries Science Center	132	90% [a]	38	12	0	0
East Roanoke Street (on-street)	6	50% [a]	0	0	6	6
76 Gas Station	5	100% [a]	0	5	0	0
Montlake Boulevard Market (west)	17	82% [a]	0	9	0	0
Montlake Boulevard Market (east)	10	50% [a]	0	10	0	0
24th Avenue East (on-street)	5	20% [a]	0	0	1	0
MOHAI	150	39% [b]	124 [e]	150 [e]	150 [e]	150 [e]
Husky Stadium E11 Lot	429	100% [c]	0	0	20	114
Husky Stadium E12 Lot	746	100% [c]	0	0	0	57
WSDOT Public Lot	24	100% [d]	0	0	24	0
Total Affected Spaces			**172**	**196**	**211**	**337**

[a] Utilization rate obtained by hourly field surveys in 2010.
[b] Utilization rate obtained by hourly field surveys in 2004.
[c] Utilization rate provided by the UW; updated to reflect post-Sound Transit build condition.
[d] Utilization rate estimated from multiple aerial photographs.
[e] Includes removal of the facility that requires the parking spaces; therefore, there would be no net loss at these locations. Under the Preferred Alternative, 26 spaces would be replaced for park users.
Note: Adding the suboptions to Options A, K, or L would not change the parking conditions listed in this table.

Under the Preferred Alternative and Options A, K, and L, most of the affected parking spaces are located at the MOHAI site, which would be relocated under the Preferred Alternative. Approximately 26 parking spaces at the existing MOHAI site would be replaced under the Preferred Alternative, supporting access to East Montlake Park. Off-site, Option K would also remove one on-street parking space west of MOHAI on the west side of 24th Avenue East, just south of East Hamlin Street.

In addition to these locations, Option A would require removal of the 76 Gas Station and its associated five parking spaces. Option A would also eliminate a total of 19 spaces from the front and back parking lots of the Montlake Boulevard Market.

Options K and L would extend West Montlake Place East to the intersection of Montlake Place East and East Lake Washington Boulevard, eliminating six on-street parking spaces on East Roanoke Street. Both options would also provide access to SR 520 near Husky Stadium, affecting the E11 and/or E12 Husky Stadium parking lots: Option K would result in a loss of approximately 20 parking spaces in lot E11, and Option L would result in a loss of approximately 114 parking spaces in lot E11 and 57 spaces in lot E12. Option K would also remove a WSDOT parking lot located east of Lake Washington Boulevard East at East Miller Street, eliminating 24 spaces.

Adding the suboptions to Option A, K, or L would result in no measurable change to the parking effects described above.

What are the indirect effects of the project on transportation?

The travel demand model was used to estimate the project's potential indirect effects on transportation. Indirect effects would include changes in cross-lake travel patterns and regional travel patterns in Seattle and Eastside areas outside the project limits resulting from the project. For trips across Lake Washington, while daily vehicle demand on SR 520 would be about 5 percent lower under the Preferred Alternative, daily vehicle demand on other parallel facilities (that is, SR 522 and I-90) would be approximately 1 to 2 percent higher under the Preferred Alternative when compared to the No Build Alternative. This difference would be lessened during peak commute periods when cross-lake travel routes are typically more congested. During these periods, fewer drivers are expected to use SR 522 and I-90 to avoid a toll on SR 520. For both the Eastside and Seattle areas, the model predicts that vehicle and person trips for the Preferred Alternative and No Build Alternative would be similar (that is, the differences were slight). (See Chapters 5 and 11 of the Final Transportation Discipline Report [Attachment 7]). No additional, quantifiable, indirect effects were identified for the transportation analysis.

What has been done to avoid or minimize negative transportation effects?

Growth over the past two decades has resulted in worsening traffic levels and congestion on the SR 520 corridor. While growth will likely continue in the region, the level of growth is expected to be somewhat lower than historical trends; therefore, without the project, traffic levels and congestion on the SR 520 corridor would continue to degrade. One of the purposes of the SR 520, I-5 to Medina project is to improve mobility for people and goods on the SR 520 corridor. The project has also been designed to avoid negative effects on local roadways.

As part of ESSB 6392 coordination work and the general design refinement process, WSDOT has identified locations where the project would affect traffic and proposed design modifications to reduce those effects, including the number of lanes needed for on- and off-ramps and intersection configurations and stop controls adjacent to the corridor. Some examples of design modifications incorporated into the Preferred Alternative to minimize negative effects on transportation are as follows.

- Allow SR 520 buses to serve the Montlake lid stops during off-peak periods so that the transit agencies could incorporate that area into service.
- Remove the existing Lake Washington Boulevard ramps, reducing traffic volumes traveling through the Washington Park Arboretum compared to the No Build Alternative.
- Provide an improved bicycle/pedestrian pathway along the east side of the new Montlake Bridge to improve bicycle and pedestrian safety.
- Relocate transit stops from previous locations on Montlake Boulevard to minimize the walking distance to new bus connections on the Montlake lid.
- Provide an alternative safe route for pedestrians and bicycles to address the increase in traffic on 24th Avenue East under the Preferred Alternative.

Although these design refinements were specifically developed for the Preferred Alternative, similar modifications could also be considered for Options A, K, and L to address community concerns. Potential design refinements to Options A, K, and L that were identified in the SDEIS and have not been incorporated into the design options for this Final EIS are described in the following section.

What would be done to mitigate negative effects that could not be avoided or minimized?

Traffic Operations

In addition to reviewing project effects for the overall interchange area, WSDOT reviewed individual intersection operations to identify where additional design changes could be considered based on its LOS guidelines. During the morning peak hour, the Montlake Boulevard and Lake Washington Boulevard/SR 520 eastbound ramps intersection would operate at LOS F under the Preferred Alternative, which would be worse than the No Build Alternative. WSDOT reviewed project effects for the overall interchange area as well as specific intersection operations, and identified design changes that could be considered to address the morning LOS issue. Under the Preferred Alternative, the approach to the intersection on Lake Washington Boulevard would be striped for three lanes (a left-turn lane, a shared through left-turn lane, and a right-turn lane). Restriping the approach to a left-turn lane, a through lane, and a right-turn lane would improve intersection operations to LOS E, similar to the No Build Alternative.

Beyond the measures that have already been integrated into Options A, K, and L, several local intersections could be signalized to improve traffic flow. These improvements would be consistent with WSDOT design standards. The intersections are as follows:

- Lakeview Boulevard East/I-5 northbound on-ramp
- Harvard Avenue East/I-5 northbound on-ramp
- Boylston Avenue East/East Lynn Street

WSDOT would continue to work with the Seattle Department of Transportation to determine the effectiveness of these improvements in reducing project effects.

Design Standards

WSDOT design standards and Seattle concurrency thresholds for local traffic operations and parking policies were reviewed to establish project standards and thresholds for traffic and parking improvements. These standards and thresholds are described in the Transportation Discipline Report (Attachment 7).

Nonmotorized Facilities

The Preferred Alternative and Options A, K, and L would result in the loss of 54 bicycle locker spaces and 53 bicycle rack spaces near the existing Montlake Freeway Transit Station. WSDOT, Metro, and Sound Transit are working together to determine the best way to replace these bicycle parking facilities.

Parking

Parking in some areas might not be replaced in-kind because of the shortage of space available for replacement. Coordination among WSDOT, the City of Seattle, and affected land owners would be necessary to determine the actual parking measures that might be implemented as part of the project. For instance, WSDOT is coordinating with the City of Seattle

to further develop design details for the lids, which could include replacement parking for the loss of 10 parking spaces at Bagley Viewpoint. WSDOT is also coordinating with NOAA Northwest Fisheries Science Center to further minimize or mitigate parking effects on that facility.

5.2 Land Use and Economic Activity

Washington State's Growth Management Act integrates transportation and land use planning in order to encourage economic and community development around designated urban centers and transportation corridors. SR 520 is one of the two primary east-west traffic corridors between Seattle and the Eastside. This section compares potential effects of the Preferred Alternative with those of Options A, K, and L on land uses adjacent to the corridor; describes the project's consistency with transportation and land use planning goals; and includes a discussion of how proposed corridor improvements may influence future economic activity. Information in this section is based on the Land Use, Economics, and Relocations Discipline Report Addendum and Errata (Attachment 7).

KEY POINT

Right-of-way Requirements

The Preferred Alternative would require less new right-of-way (10.6 acres) than the SDEIS design options. Like all the SDEIS design options, it would remove the MOHAI building, a single-family and duplex residence south of the Portage Bay Bridge, and two vacant single-family residences in Medina. Similar to SDEIS Option A, it would also remove two single-family residences in Montlake.

How would the project affect land use?

WSDOT would acquire land adjacent to the existing corridor for new permanent right-of-way in order to accommodate alignment and interchange improvements. Table 5.2-1 summarizes the number of acres that would be converted to right-of-way and the number of structures affected by the Preferred Alternative and Options A, K, and L. The exhibits in this section show right-of-way acquisitions by geographic area from I-5 to Medina. Land use along the corridor is a mix of residential and park use, interspersed with civic, quasi-public, and commercial uses. Buildings, businesses, and other uses that are on affected properties would be removed or relocated.

How would WSDOT work with property owners whose land is acquired for right-of-way?

Property acquisition and relocations would occur in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Property owners would receive compensation for their properties at fair market value, and relocation resources would be available to all displaced residents and business owners without discrimination and WSDOT would work closely with all displaced residents and businesses to find suitable properties to accommodate their needs.

Table 5.2-1. Land Use Effects Summary

Option	Acres Converted to Right-of-Way	Residential Structures Removed	Non-Residential Structures Removed
Preferred Alternative	10.6 acres	6	1
Option A	11.5 acres	6	11
Option K	15.5 acres	4	2
Option L[a]	12.4 acres	4	1

Note: Since the SDEIS was published, refinement of the project's construction staging requirements has identified the need for two additional property acquisitions south of the existing Portage Bay Bridge. The totals in this table have been updated to reflect this change.
[a] Adding northbound capacity on Montlake Boulevard to Option L would result in an additional 1.4 acres of right-of-way acquisition along Montlake Boulevard north of the Montlake Cut.

The amount of property that the Preferred Alternative would convert into right-of-way would be similar to Options A and L (10.6 acres for Preferred alternative, 11.5 acres for Option A, and 12.4 acres for Option L).

Option K would convert the most total acreage to right-of-way (15.5 acres) because of construction of the tunnel across the Montlake Cut and the need for additional right-of-way in McCurdy and East Montlake Parks south of the cut (Table 5.2-2). Option K would also convert additional acreage associated with the land bridge on Foster Island. Right-of-way requirements on the Eastside would be the same for the Preferred Alternative as for Options A, K, and L.

Table 5.2-2. Right-of-way Requirements by Geographic Area

Area[a]	Preferred Alternative (acres)	Option A (acres)	Option K (acres)	Option L[b] (acres)
I-5 Area	0	0.1	0.1	0.1
Portage Bay Area	1.9	2.6	1.4	1.4
Montlake Area	6.6	6.7	11.4	9.1
West Approach Area	0.9	0.9	1.4	0.6
Evergreen Point Bridge and East Approach Area	1.2	1.2	1.2	1.2
Total	10.6	11.5	15.5	12.4

Note: Since the SDEIS was published, refinement of the project's construction staging requirements has identified the need for two additional property acquisitions south of the existing Portage Bay Bridge. The totals in this table have been updated to reflect this change.

[a] These areas correlate with Exhibits 5.2-2 through 5.2-8.

[b] Adding northbound capacity on Montlake Boulevard to Option L would result in an additional 1.4 acres of right-of-way acquisition along Montlake Boulevard north of the Montlake Cut.

Table 5.2-3 identifies the acreages by existing land use types that would be converted to transportation land use. Park lands are subject to special protection under federal law; right-of-way effects on parks are discussed further in Section 5.4.

Table 5.2-3. Right-of-way Requirements by Land Use Type

Land Use Type	Preferred Alternative (acres)	Option A (acres)	Option K (acres)	Option L[a] (acres)
Park/open space/other	8.6	9.3	13.8	10.7
Single-family residential	2.0	2.0	1.7	1.7
Commercial	0	0.2	0.0	0.0
Total	10.6	11.5	15.5	12.4

Note: Since the SDEIS was published, refinement of the project's construction staging requirements has identified the need for two additional property acquisitions south of the existing Portage Bay Bridge. The totals in this table have been updated to reflect this change.

[a] Adding northbound capacity on Montlake Boulevard to Option L would result in an additional 1.4 acres of right-of-way acquisition along Montlake Boulevard north of the Montlake Cut. None of the other SDEIS suboptions required additional right-of-way.

KEY POINT

The NOAA Northwest Fisheries Science Center and SR 520

Immediately north of SR 520, just east of the Portage Bay Bridge, is the campus of the National Oceanic and Atmospheric Administration (NOAA) Northwest Fisheries Science Center (NWFSC). Founded in 1931, this historic campus is now a major national fisheries research facility that employs approximately 400 people. The NWFSC is one of the leading research institutions for salmon recovery, and has a key role in the protection and rebuilding of Puget Sound's threatened and endangered fish and mammal species, including the killer whale.

NWFSC's south campus—the portion closest to SR 520—is home to laboratories that conduct state-of-the-art experiments in fish rearing and culture. When NOAA expressed concern regarding the effects of SDEIS Option A—which would have required removal of up to 11 south campus buildings—WSDOT engineers shifted the Preferred Alternative's alignment so that the buildings could be preserved. While this solved a major problem, the agencies also agreed that the effects of construction on the ongoing research must be considered and mitigated for. Accordingly, WSDOT and NOAA began a series of in-depth workshops in early 2011 to evaluate construction impacts and identify appropriate mitigation. These workshops are expected to culminate in a mitigation agreement in mid-2011, which will be documented in the Record of Decision.

Overall, these changes in land use represent small percentages of these types of land uses within the city of Seattle and are spread along the entire length of the corridor between I-5 and Lake Washington. No substantial change to the overall urbanized land use pattern in Seattle would occur. Effects on park areas would be mitigated consistent with federal, state, and local regulations (see Chapter 9, Section 4(f) Evaluation).

Structure Removal or Relocation

Structures that would be permanently removed or relocated under the Preferred Alternative or Options A, K, and L are described below and are shown on Exhibit 5.2-1. Long-term relocations (that is, for multiple years) of docks or moorage slips are also identified.

I-5 Area

Exhibit 5.2-2 shows right-of-way acquisitions in the I-5 area. No relocations would occur in this area.

Portage Bay/Roanoke Area

Exhibit 5.2-3 shows right-of-way acquisitions in the Portage Bay/Roanoke area. Relocations would include:

- **Portage Bay residence(s).** The Preferred Alternative and Options A, K, and L would remove one single-family residence and a duplex residence in the Portage Bay/Roanoke neighborhood (Exhibits 5.2-1 and 5.2-3). These residences are located just south of the Portage Bay Bridge and would be removed to accommodate the construction work bridge south of the existing Portage Bay Bridge, which would be in place for several years. The need to acquire the duplex was identified after the SDEIS was published; the property would support staging for construction of the bridge as well as stormwater treatment facilities. This relocation is the result of a design refinement based on more recent construction planning.
- **Moorage slips at Queen City Yacht Club and Bayshore Condominiums.** Approximately 10 moorage slips on the south side of the Queen City Yacht Club and 10 moorage slips associated with the Bayshore Condominiums south of Portage Bay Bridge would be relocated during construction of the bridge, which would occur over a 64-month construction period. WSDOT would provide equivalent moorage to boat owners during this period. WSDOT will work with affected property owners to identify specific moorage locations when construction staging information is further refined for each area prior to construction. It is anticipated that most of these moorage slips could be restored at their current locations after the Portage Bay Bridge is completed. After construction is complete, support columns for the new Portage Bay Bridge would be located very close to the docks at Queen City Yacht Club and the Bayshore Condominiums.

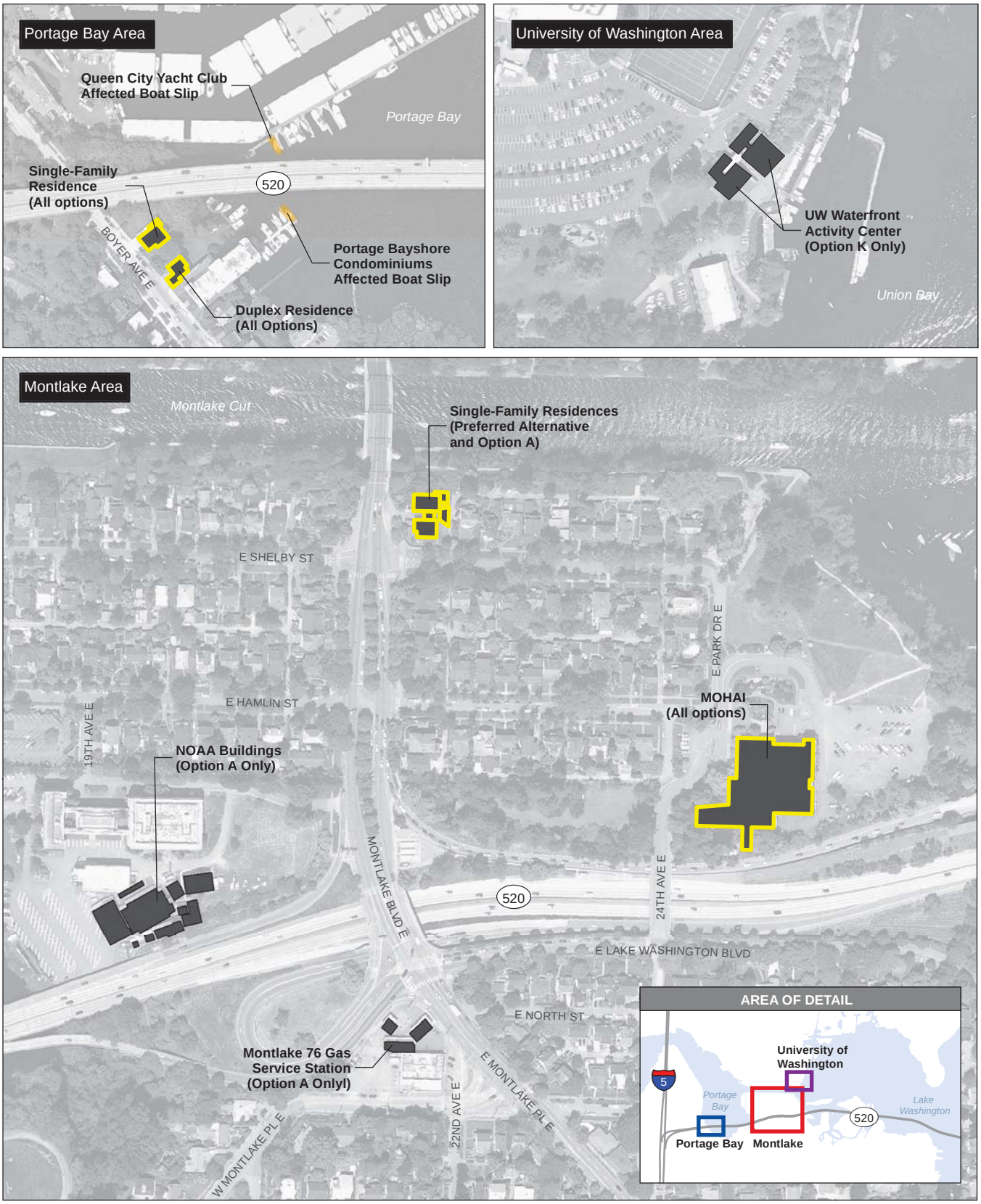
Property Ownership and WSDOT Right-of-Way in the Canal Reserve Area

Property ownership along SR 520 between Portage Bay and Union Bay is very complex. In this area, SR 520 generally follows a route set aside in the early 1900s for the eastern portion of the Lake Washington Ship Canal. After the Montlake Cut was ultimately sited farther north, these "Canal Reserve" lands were deeded to a variety of new owners. To further complicate matters, "new" land along the shoreline was created when the level of Lake Washington and Portage Bay dropped after the opening of the Ballard Locks.

WSDOT is working with land owners and conducting title searches to establish accurate property ownership records in this area. Ongoing research indicates that part of the existing SR 520 right-of-way east of Portage Bay may occupy an easement granted by NOAA, rather than being owned in fee by WSDOT. Similarly, existing SR 520 right-of-way south of the Portage Bay Bridge in the vicinity of the Montlake Playfield appears to be authorized under an easement from the City of Seattle, rather than being under WSDOT ownership.

Because of the complexity and age of the records, ownership information may take some time to confirm. However, the right-of-way lines shown in this Final EIS are accurate, regardless of whether or not the underlying property is owned in fee by WSDOT. When we discuss right-of-way acquisition, it means either (1) purchasing new right-of-way in fee, or (2) expanding the boundaries of an existing easement. Therefore, the estimates of new right-of-way quantities for the Land Use discussion remain the same irrespective of who owns the property.

Exhibit 5.2-1 Affected Structures



Permanently affected structure - Preferred Alternative

Permanently affected structure - SDEIS options

N

0 200 400 Feet

Exhibit 5.2-2. **Right-of-way Acquisitions in the I-5 Area**

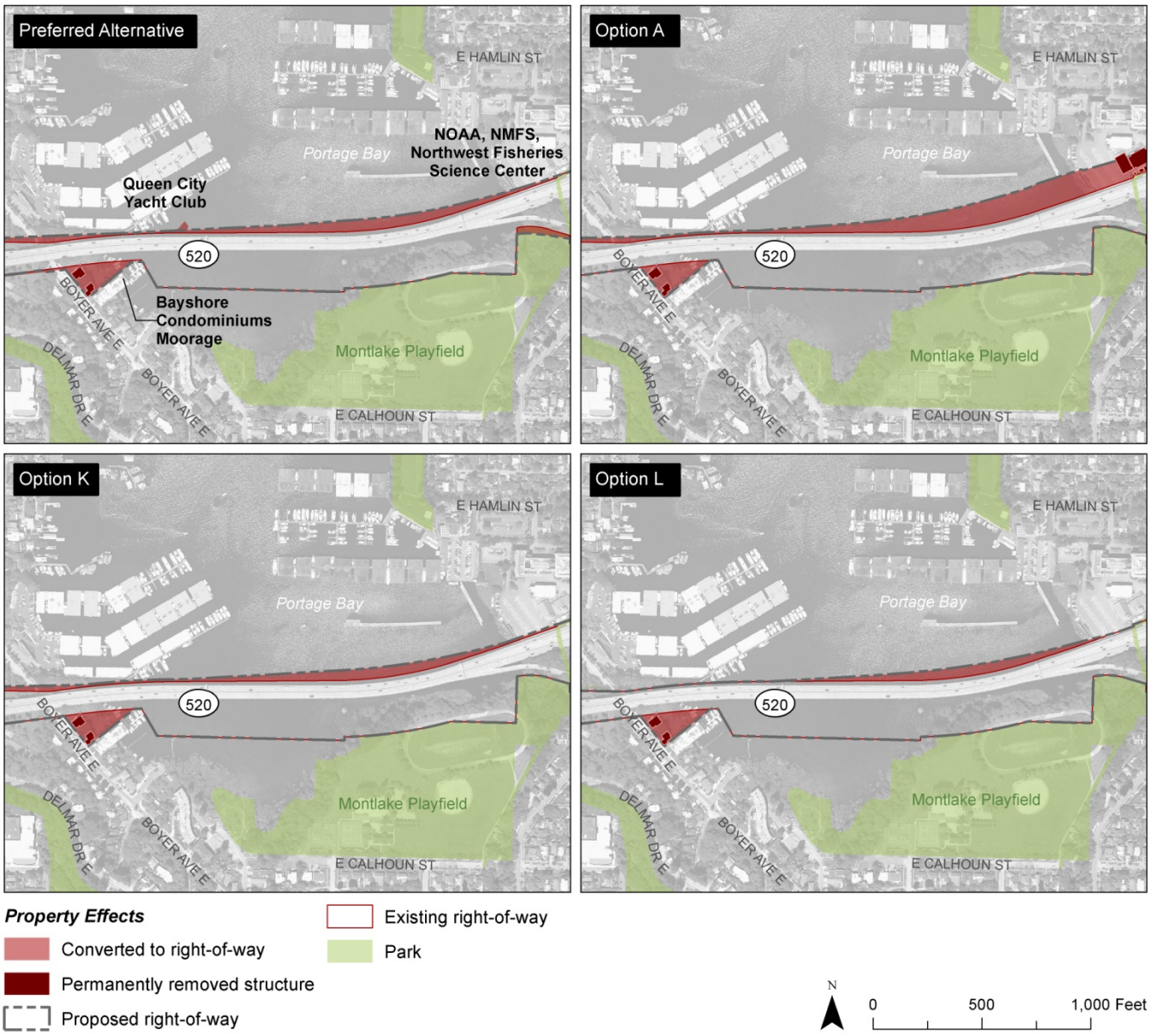
WSDOT anticipates the loss of one full boat slip at Queen City Yacht Club. Access to the finger piers on the north side of the Bayshore Condominium dock would require passage between bridge support columns with approximately 17 feet of clearance. The column located near the last finger pier slip on the north side of the condominium dock would limit the size and type of boat that could be moored in that slip. Vessels moored on the outer end of the dock may need to be positioned so that they do not extend beyond the north end of the finger pier.

Montlake Area

Exhibit 5.2-4 shows right-of-way acquisitions in the Montlake area. Relocations would include:

- **Museum of History and Industry (MOHAI) Building.** The Preferred Alternative, like Options A, K, and L, would remove the MOHAI building and its parking lot for construction of a permanent stormwater treatment wetland that would treat runoff from the west approach and Montlake interchange (Exhibits 5.2-1 and 5.2-4). MOHAI is planning to relocate to a new site.
- **Montlake Residences.** The Preferred Alternative, similar to Option A, would remove two single-family residences in the Montlake neighborhood (Exhibits 5.2-1 and 5.2-4). These residences are located

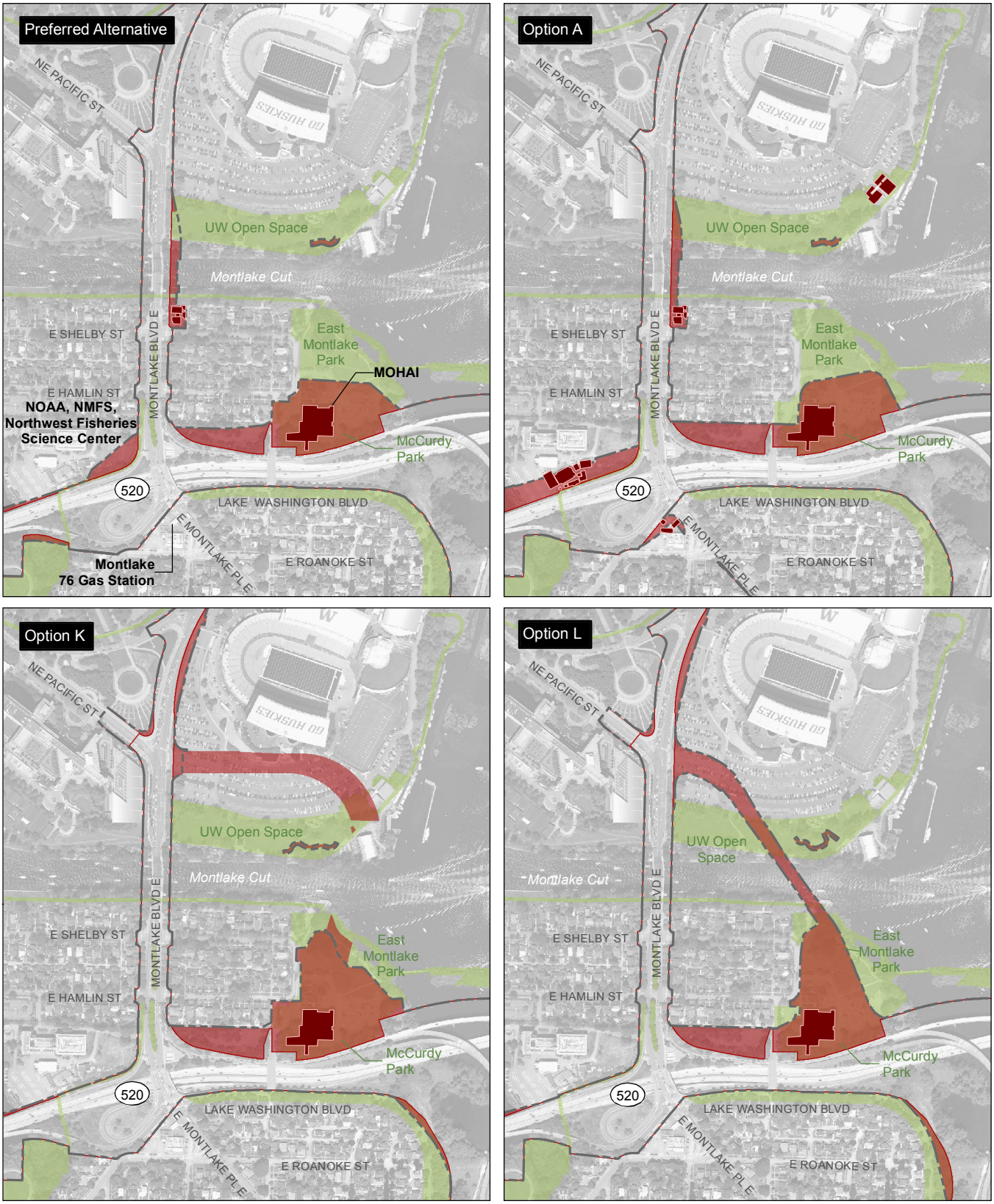
Exhibit 5.2-3. **Right-of-way Acquisitions in the Portage Bay Area**



on the east side of Montlake Boulevard East immediately south of the Montlake Cut. These effects would occur to accommodate the new bascule bridge across the Montlake Cut on Montlake Boulevard East.

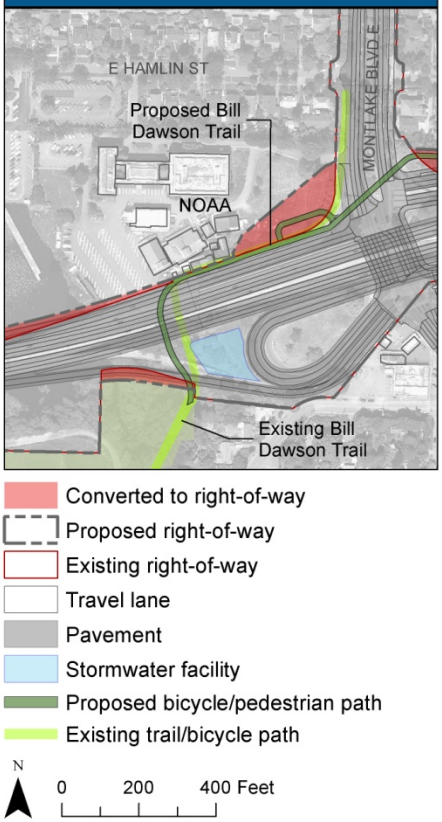
- **Montlake Business.** Option A would remove the Montlake 76 station located at the Montlake Boulevard East/Lake Washington Boulevard intersection, just south of the SR 520 on- and off-ramps, to allow for improvements to the existing Montlake interchange (Exhibits 5.2-1 and 5.2-4). The Preferred Alternative would not have this effect.

Exhibit 5.2-4. **Right-of-way Acquistions in the Montlake Area**



- **NOAA Northwest Fisheries Science Center**. Option A would remove 11 buildings that make up the south campus of the NOAA facility (Exhibit 5.2-4), which is used for fisheries-related research and experiments. Nine of these buildings would be removed to accommodate the westbound on-ramp and the auxiliary lane across the Portage Bay Bridge. Option A would not affect the two northernmost buildings on the south campus or any buildings on the north campus, which consists of offices, laboratories, a library, and a 150-seat auditorium. The Preferred Alternative changed the project design in this area to avoid removal of any NOAA campus buildings (Exhibit 5.2-5).
- **Waterfront Activities Center.** Option K would temporarily relocate the University of Washington Waterfront Activities Center buildings that are southeast of Husky Stadium on Union Bay and the Montlake Cut (Exhibit 5.2-1) to accommodate construction of the tunnel under the Montlake Cut.

Exhibit 5.2-5. **Preferred Alternative – Effects on NOAA, NMFS, Northwest Fisheries Science Center**



West Approach and Lake Washington Areas

Exhibit 5.2-6 shows right-of-way acquisitions in the west approach area. No relocations would occur in this area.

Lake Washington

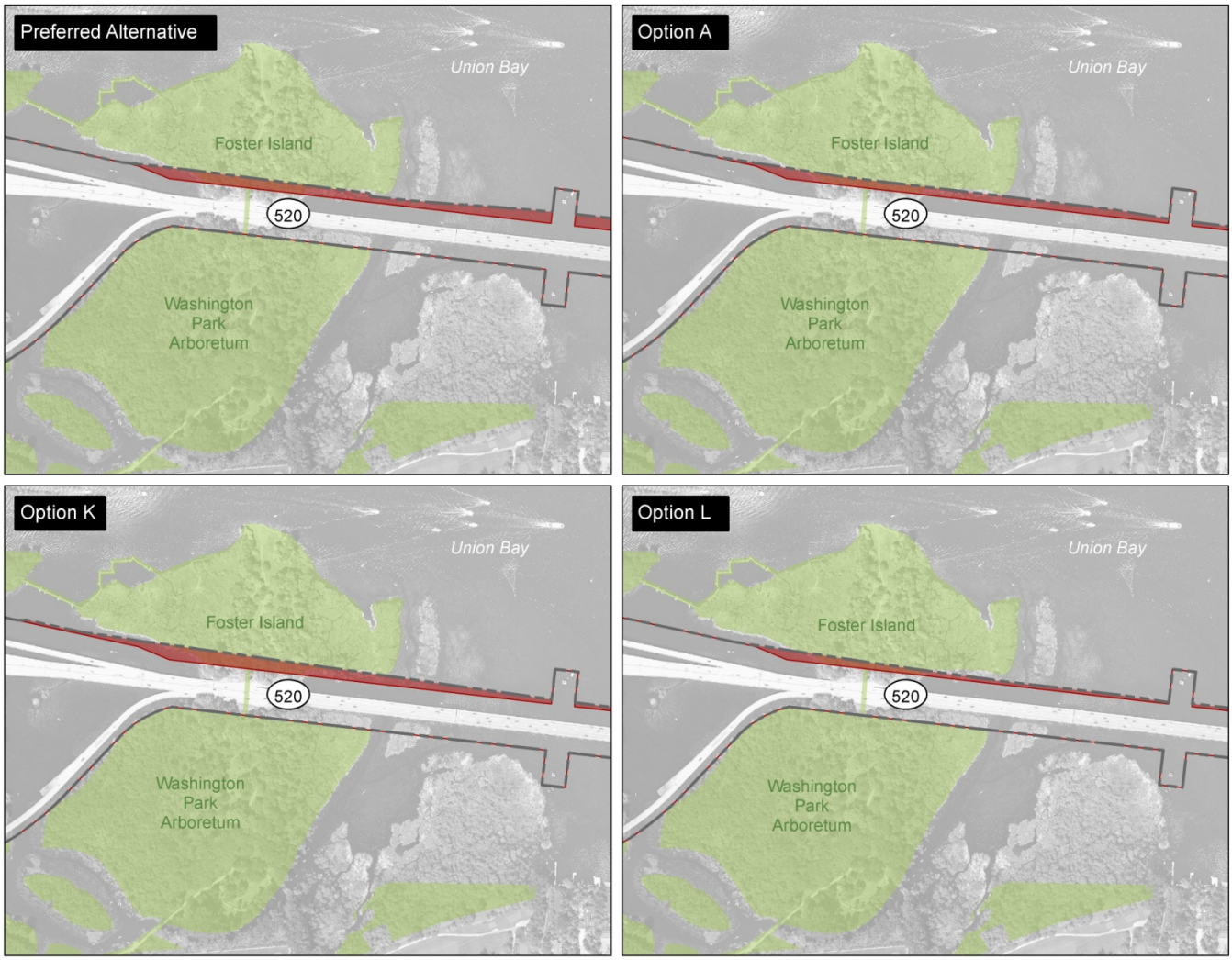
WSDOT would obtain an aquatic land easement from the Washington State Department of Natural Resources for construction and right-of-way for the new Evergreen Point Bridge and new anchors placed in Lake Washington. The easement would be needed for both the west and east approaches, and the new floating bridge. WSDOT currently has approximately 254 acres of right of way for the existing bridge, and is working with DNR to obtain another 137 acres of aquatic easement for the new SR 520 alignment through the lake, as shown in Exhibit 5.2-7. No relocations would occur in the Lake Washington area.

Eastside Area

Exhibit 5.2-8 shows right-of-way acquisitions in the Eastside area. Relocations would include:

- **Medina Residences and Shoreline Docks**. Exhibit 5.2-8 shows the two affected parcels in Medina. They are located west of Evergreen Point Road. WSDOT has already acquired the two properties and plans to remove the two houses (currently vacant) that occupy them. One of the two parcels has a dock that would be permanently removed. An additional private dock to the north may not be usable during the 36-month construction period of the east approach.

Exhibit 5.2-6. **Right-of-way Acquisitions in the West Approach Area**

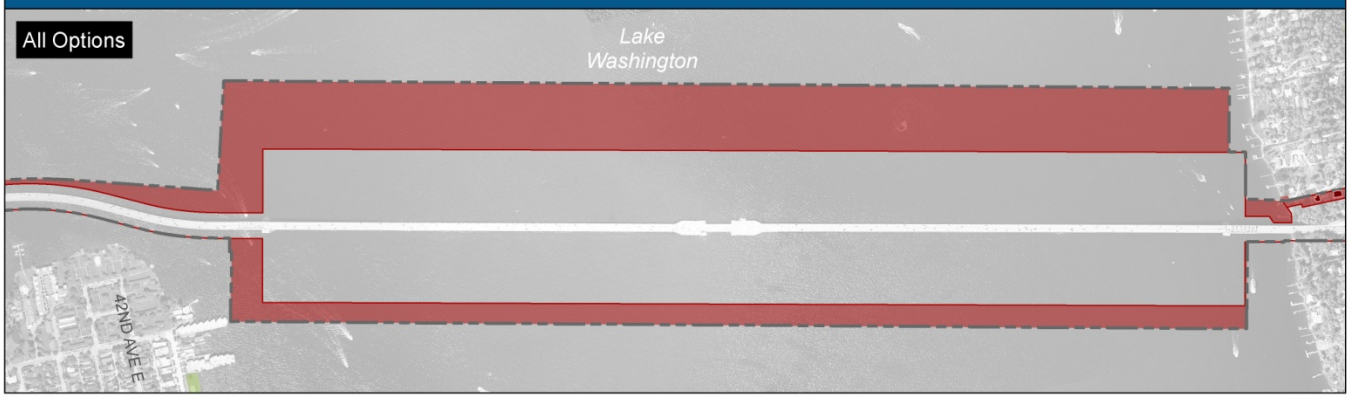


Property Effects

- Converted to right-of-way
- Permanently removed structure
- Proposed right-of-way
- Existing right-of-way
- Park

N 0 500 1,000 Feet

Exhibit 5.2-7. **Right-of-way Acquisitions in the Lake Washington and Eastside Transition Areas**



Property Effects

- Converted to right-of-way
- Permanently affected structure
- Proposed right-of-way
- Existing right-of-way

N 0 500 1,000 2,000 Feet

How would the project affect economic activity?

Investment in transportation infrastructure can be beneficial to businesses and consumers because of improved accessibility (the ease with which specific locations or activities can be reached). Factors that influence accessibility include travel times, safety, and the transportation choices available to users. Transportation investments that result in improved mobility can also contribute to economic development through inflow of labor and businesses from other regions, and increased efficiency for existing labor and capital resources (Transportation Research Board 2001).

Tolling of SR 520 was assumed under the Preferred Alternative and Options A, K, and L as a source of revenue to finance the project (see Chapter 1).

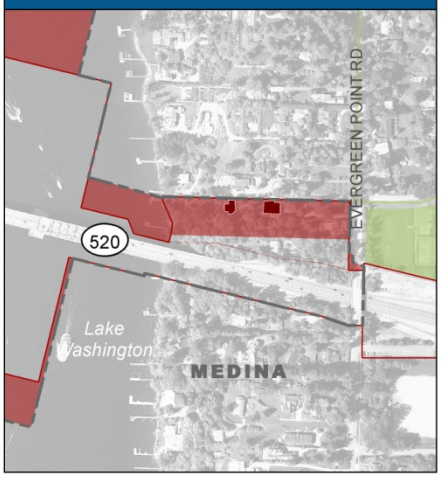
Tolling scenarios evaluated in the transportation model assumed variable tolling (different toll rates are charged depending on the time of day and whether the trip is during peak or off-peak traffic hours). For example, a trip during peak traffic hours would be more expensive than at other times of day. Results from the transportation model indicate that the new lanes, combined with the toll, would provide an incentive to use transit and high-occupancy vehicles (HOV). As discussed in Section 5.1, Transportation, congestion and travel times for both general-purpose and HOV trips would be reduced, particularly during the westbound afternoon and eastbound morning peak periods. Businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit from this improved mobility.

As described earlier, WSDOT would acquire additional right-of-way to construct the Preferred Alternative and Options A, K, and L. As a result, taxable property would be removed from the local jurisdictions' tax bases, which would decrease property tax revenues. However, the project would result in only a minor decrease to Seattle's tax base because a considerable amount of the land that would be required is already publicly owned and not subject to property tax. Table 5.2-4 shows the initial property tax decrease for the Preferred Alternative and Options A, K, and L.

The total assessed value of the property acquired for right-of-way under the Preferred Alternative and Options A, K, and L would be between $9 million and $15 million. Of this additional right-of-way acquired, approximately $2.7 million to $4.4 million would be taxable. Using the 2008 tax levy rate for the City's portion of the taxable right-of-way, it is estimated that the loss of property tax revenue for the City of Seattle would be under $12,500. This represents less than 0.01 percent of the City's 2008 budgeted property tax revenues.

WSDOT has purchased two parcels in the city of Medina for replacement of the Evergreen Point Bridge. The City of Medina's loss of annual

Exhibit 5.2-8. **Right-of-way Acquisitions on the Eastside**



Property Effects

- Converted to right-of-way
- Permanently affected structure
- Proposed right-of-way
- Existing right-of-way
- Park

N 0 250 500 Feet

KEY POINT

Local and Regional Economy

Businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit from the Preferred Alternative and Options A, K, and L.

Table 5.2-4. Estimated Annual Property Tax Effects within Seattle

6-Lane Alternative	Estimated Assessed Value of Right-of-Way	Estimated Taxable Value of Right-of-Way	Initial Property Tax Decrease[a]	Budgeted 2008 Property Tax Revenues (percent)
Preferred Alternative	$11,800,000	$3,100,000	$8,600	Less than 0.01
Option A	$14,700,000	$4,400,000	$12,100	Less than 0.01
Option K	$9,092,000	$2,692,000	$7,600	Less than 0.01
Option L[b]	$10,992,000	$2,692,000	$7,600	Less than 0.01

[a] The total initial property tax effect includes partial encroachments. The tax effect of the partial encroachments was calculated by multiplying the actual 2008 property tax collected for the entire parcel by an estimate of the percentage of the parcel that would be acquired.
[b] Adding northbound capacity on Montlake Boulevard to Option L would require an additional 1.4 acres of right-of-way; however, this area is currently in public ownership and its acquisition as right-of-way would not result in measurable changes to tax effects.
Source: King County Assessor (2009).

property tax revenue would be approximately $920. The losses of property tax revenue in Seattle and Medina would not represent a substantial effect on the cities' overall tax revenues.

Parking Removal

As discussed in Section 5.1, Transportation, some permanent loss of parking may occur as a result of the project. Most of the parking displacements, except under Option L, are not expected to result in adverse economic effects on the local economy because the lots are either rarely used or the amount of lost parking would be less than the amount of remaining spaces after the lot maximizes its average number of spaces in use. Those losses that could affect the businesses are discussed below.

The Preferred Alternative would displace fewer parking stalls than Options A, K, and L. Although the Preferred Alternative would not affect parking at the Hop-In-Market, it would result in permanent changes in access. The existing unconsolidated access into the Hop-In-Market from Montlake Boulevard, 22nd Avenue East and East Roanoke, would be consolidated into a single location on East Roanoke Street.

Option A would affect parking at the Hop-In Market, which would make it difficult for patrons to frequent the store, especially during the noon hour. During other hours of operation, potential customers could be deterred from shopping at the market because parking spaces could be difficult to find.

Options K and L would affect parking at Husky Stadium lots E-11 and E-12. Option K would permanently acquire 20 stalls and Option L would permanently acquire 171 parking stalls. The Husky Stadium lots are almost

fully used; visitors and employees at the UW Medical Center might be required to find alternative parking around the stadium.

Effect of Suboptions

- Adding the suboptions to Option A, K, or L resulted in no measurable difference in the economic activity effects described above.

Would the project be consistent with regional and local land use plans and policies?

The project's addition of new HOV lanes and a regional bicycle and pedestrian path is consistent with the Puget Sound Regional Council's (PSRC's) *Vision 2040* (PSRC 2008) and *Transportation 2040* (PSRC 2010a) plans as well as King County's Countywide Planning Policies. These documents emphasize the need to provide transportation system continuity and the use of alternative transportation modes, and to improve linkages between urban centers. As noted in Chapter 4, *Transportation 2040* and the PSRC regional travel demand model assume a 6-lane SR 520 by 2040 to support planned population and employment growth in the region. *Transportation 2040* identifies the SR 520 floating bridge as a project necessary to support development of the centers identified in *Vision 2040* and to keep freight moving to support a strong economy. It also recommends relying directly on highway users to pay for improvements through tolling. The strategy starts with developing high-occupancy traffic (HOT) lanes and tolling individual highway and bridge projects in their entirety as they are implemented. The plan calls for full highway system tolls by approximately 2030, which would also have positive effects on reducing congestion and emissions of pollutants and greenhouse gases. Although planning for how to implement full regional tolling is still in its early stages, the SR 520, I-5 to Medina project is consistent with future regional tolling strategies.

The Preferred Alternative and Options A, K, and L would also be consistent with policies of the Seattle Comprehensive Plan related to completing and promoting use of a regional HOV system, limiting freeway capacity expansions to those accommodating "non-single-occupancy vehicle users," protecting the Seattle neighborhoods from noise and traffic congestion, and improving transit connections.

The Preferred Alternative and Options A, K, and L would be consistent with policies in the City of Medina Comprehensive Plan related to enhancing pedestrian and bicycle access and minimizing the effects of the regional transportation system on adjacent residential uses in the city.

Options K and L would cross the Montlake Cut and connected to the Pacific Street intersection through the Husky Stadium parking lot located in the southeast portion of the University of Washington campus. The change in land use from parking to transportation right-of-way would be

inconsistent with the goals for this area identified in the *University of Washington Master Plan – Seattle Campus* (University of Washington 2003). Options K and L also conflicted with the area designated in the plan as a potential development site near the University of Washington's Waterfront Activities Center (WAC).

The *Washington Park Arboretum Master Plan* (City of Seattle et al. 2001) calls for the continued use of the Arboretum for education, conservation, and recreation and visitor services. One of its policies calls for the unused R.H. Thomson Expressway ramps to be converted to a multiuse path to MOHAI. The Preferred Alternative and Options A, K, and L would remove these ramps and would relocate MOHAI; thus, they would be inconsistent with this policy. Another policy in the master plan calls for retaining the WSDOT parking lot on Lake Washington Boulevard west of the SR 520 ramps. Option K would remove this parking lot, and thus would be inconsistent with this policy. The project would be consistent with all other policies of the *Washington Park Arboretum Master Plan*. As discussed further in Section 5.4, WSDOT has worked extensively with Arboretum representatives since issuance of the SDEIS to develop mitigation for effects on the Arboretum in order to implement key recommendations of the master plan.

Shoreline regulations apply to improvements located within 200 feet of shorelines, including water bodies such as lakes and associated wetlands. As such, the Portage Bay, west approach, and Evergreen Point bridges would all be located within the shoreline environment. Within Seattle, the project is anticipated to be permitted as an Essential Public Facility under the Conservancy Navigation (CN), Conservancy Recreation (CR), Conservancy Management (CM), and Conservancy Preservation (CP) designation. Bridges and streets are permitted outright in areas designated Urban Residential (UR).

The City of Seattle is in the process of updating its shoreline master program (SMP). The updated SMP is expected to be adopted in late 2011 or early 2012. Since the updated SMP has not yet been adopted, it is not possible to assess the consistency of the Preferred Alternative and Options A, K, and L with the new regulations. However, it is possible to generally use the current SMP as guidance on the relative degree of consistency. Based on this approach, the Preferred Alternative and Option A would be more consistent with the SMP than Option K and L, because the latter two options would have greater effects on the shoreline area and public recreation opportunities in the Arboretum.

Since the Preferred Alternative was identified, WSDOT has worked with the agencies with jurisdiction over shoreline resources—the City of Seattle, the City of Medina, and Ecology—to develop best management practices and other site-specific mitigation measures to protect shoreline areas and ensure compliance with the City of Seattle's Environmental Critical Areas

Ordinance (Seattle Municipal Code 25.09). This coordination has occurred through multiple individual pre-application meetings with local jurisdictions over the last 2 years, as well as through the Natural Resources Technical Working Group meeting with relevant regulatory agencies. WSDOT will continue to coordinate with these agencies to ensure that all required shoreline master program permits and approvals are obtained.

The No Build Alternative would be less consistent with local land use plans than the Preferred Alternative because the portion of SR 520 in the project area would remain a nonstandard roadway that does not allow bicycle or pedestrian travel and offers few advantages for transit. The No Build Alternative would not be consistent with the Seattle Comprehensive Plan's policies about completing the regional HOV system, avoiding noise and traffic congestion in neighborhoods, and improving transit connections.

What are the indirect effects of the project on land use and economic activity?

Land Use

Transportation projects can have indirect effects on land use if the projects bring about changes in the rate and pattern of development. Anticipating and guiding growth patterns are the objective of Washington State's Growth Management Act, which is described briefly below. In cases where transportation projects facilitate growth—for example, if a new highway brings development to a rural area—this "induced growth" is considered an indirect effect of the transportation project. Induced growth is generally not a major concern in situations where the transportation facilities being improved are located in densely populated urban areas and are already over capacity.

The SR 520, I-5 to Medina project is not expected to have indirect effects on land use, including induced growth effects. As indicated by *Vision 2040*, the central Puget Sound region population is expected to increase by about 1 million people over the next 30 years (PSRC 2010c, WSDOT 2010g). To identify how the project could affect future land use, WSDOT requested that PSRC run their integrated transportation and land use model (called the DRAM-EMPAL model—see text box at right) to assess changes in growth patterns under the Preferred Alternative and No Build. This analysis was updated between the SDEIS and the Final EIS because the PSRC released updated population and employment estimates. The DRAM-EMPAL model results from PSRC show that the SR 520, I-5 to Medina project would have little to no impact on regional population and employment distribution (WSDOT 2010g). Additionally, the DRAM-EMPAL model showed that the project would not induce any changes in employment within the forecast analysis zones around Lake Washington. The maximum change in population as a result of the project was 2 percent, and that occurred in the Points Communities (near the eastside transition

PSRC's DRAM-EMPAL Model

The PSRC forecasts economic and demographic changes for the central Puget Sound area using DRAM-EMPAL Models. The forecasts show how many people will live and work in the region and accounts for shifts in jobs and population within a region or county by using Forecast Analysis Zones (FAZs).

WSDOT used the DRAM-EMPAL models to identify project level changes to the project area demographics.

area of the project). Instead, this and other regional transportation projects would improve efficiency and support a shift in travel from single occupancy vehicles towards transit and HOV options. Tolling will help facilitate this shift. The result is more people being moved by fewer vehicles on a transportation network that will accommodate planned increases in population growth but will not change the growth pattern or lead to unintended growth patterns. PSRC's integrated transportation and land use model indicates that "approximately 97% of growth occurs within designated urban growth areas, in a manner consistent with the Regional Growth Strategy" (Chapter 1, Page 10 of PSRC 2010a). Since *Vision 2040* assumes a 6-lane SR 520, the project supports containment of growth within the urban growth area.

Economic Activity

Operation of the Preferred Alternative would not affect the regional economy, except through beneficial effects of improved transportation efficiency along the SR 520 corridor. As noted above, because the proposed project would replace part of an existing transportation corridor through an urban area that has already been developed, it would not change land use or development patterns as demonstrated by the PSRC DRAM-EMPAL model. For more information on the long-term effects of the project on transportation efficiency, see the Final Transportation Discipline Report (Attachment 7). For more information on the direct effects of the project on land use and growth patterns, see the Land Use, Economics, and Relocations Discipline Report Addendum and Errata (Attachment 7).

How will WSDOT work with property owners whose land is acquired for right-of-way?

WSDOT would conduct property acquisition and relocations in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Property owners would receive compensation for their properties at fair market value, and relocation resources would be available to all displaced residents and business owners without discrimination and WSDOT would work closely with all displaced residents and businesses to find suitable properties to accommodate their needs. As noted above, some park properties would be subject to special mitigation requirements; these are discussed in Section 5.4.

Residential Relocations

- WSDOT will work with owners and/or residents of relocated properties required by the Preferred Alternative. Residents displaced by the Preferred Alternative would be provided with relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

- Relocated residents are eligible to receive relocation advisory services and certain monetary payments for moving and replacement housing costs. WSDOT would work with the affected property owners to identify specific needs and available replacement property in the vicinity. Relocation resources would be made available without discrimination. If WSDOT determined that insufficient housing existed, it would commit to Housing of Last Resort (WAC 468-100-404), which provides necessary housing in a number of ways and in a manner feasible for the individual situations.

Other Relocations

- WSDOT has acquired the MOHAI building from the City of Seattle, the Historical Society of Seattle, and King County. WSDOT is working with MOHAI to relocate the museum operation to a replacement facility. Relocation activities are anticipated to be complete by the end of 2012.

What has been done to avoid or minimize negative effects?

Throughout the design process, WSDOT has taken care to avoid and minimize any adverse land use, economic, and relocation effects. The Preferred Alternative has minimized potential relocations and land use effects as described below:

- The width of the new Portage Bay Bridge has been reduced and its alignment has been shifted. This change has resulted in the avoidance of the NOAA Northwest Fisheries Science Center buildings that would have been displaced by Option A.
- The Montlake interchange has been reconfigured and the lid extended east to beyond 24th Avenue East. This change has resulted in the avoidance of the Montlake 76 station that would have been displaced by Option A.