17 January 2006

SR 520 Bridge Replacement and HOV Project Draft EIS

6-Lane Alternative Options

Addendum to Noise Discipline Report

Washington State Department of Transportation

SoundTransit

U.S. Department of Transportation
Federal Highway Administration

SR 520 Bridge Replacement and HOV Project EIS

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Prepared for

Washington State Department of Transportation
Federal Highway Administration
Sound Transit

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Acronyms and Abbreviations

dBA	A-weighted decibel
EIS	Environmental Impact Statement
HOV	high-occupancy vehicle
L_{eq}	equivalent sound level
NAC	noise abatement criteria
TNM	Traffic Noise Model
WSDOT	Washington State Department of Transportation

Introduction

This addendum to the *Noise Discipline Report* (CH2M HILL 2005; Appendix M to the Draft Environmental Impact Statement [EIS]) describes the affected environment and environmental consequences of three options to the 6-Lane Alternative. Two of these options are in Seattle and one is on the Eastside. These options are described below.

What are the key points of this report?

Today there are approximately 410 residences in the SR 520 Bridge Replacement and HOV Project study area that meet or exceed the Washington state traffic noise abatement criteria (NAC) of 66 dBA L_{eq} (decibels of equivalent sound pressure level in A-weighted decibels). Of these 410 residences, over 100 already exceed the NAC because of noise sources other than SR 520. These locations have substantial noise from I-5; I-405; and other major and minor arterial roads such as Harvard Avenue East, Roanoke Street, 10th Avenue East, Montlake Boulevard, and Lake Washington Boulevard in Seattle, and Evergreen Point Road, 84th Avenue Northeast, 92nd Avenue Northeast, and Bellevue Way on the Eastside.

Note that for this analysis of the 6-Lane Alternative options, it was necessary to add **11 receivers** in the North Montlake neighborhood and **16 new receivers** near the University of Washington.

Under the No Build Alternative, noise levels are projected to increase in 2030 by only 1 to 2 dBA L_{eq} in most locations, an amount that is not normally noticeable to most humans. However, with this increase, noise levels would exceed the NAC at an additional 34 residences, bringing the total up to 444 from the current estimate of 410.

Compared to today's and the projected 2030 No Build Alternative noise levels, all proposed build alternatives, which include sound walls, would reduce noise levels substantially throughout the SR 520 project corridor. The total number of residences where noise levels would exceed the NAC would be reduced to 129 under the original 6-Lane Alternative, and 153 under the 4-Lane Alternative. The total number of residences exceeding the NAC under the 6-Lane Alternative options considered in this analysis would be as follows:

Number of Residences Where Noise Levels Exceed NAC under Base Alternatives
(Revised to include new modeling locations)

Existing	No Build	4-Lane	6-Lane
410	444	153	129

- 6 Lanes with Pacific Street Interchange: 123 residences
- Second Montlake Bridge: 132 residences

- South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast: 129 residences

What options are being considered in this addendum?

6 Lanes with Pacific Street Interchange Option

This option would remove the Montlake interchange along SR 520 and would construct a new interchange at Pacific Street, just east of the Montlake interchange. Exhibit 1 shows the proposed lane configuration for this option.

The new interchange would be primarily located over the WSDOT-owned peninsula near the Washington Park Arboretum. A new on- and off-ramp to and from the north would extend to Pacific Street at the University of Washington. A column-supported ramp of four general-purpose lanes (two lanes in each direction) extending over Union Bay (referred to as the Union Bay Bridge in this addendum) from the new interchange would touch down at the University of Washington Husky Stadium parking lot before joining the intersection of Pacific Street and Montlake Boulevard. At that intersection, the roadway would be lowered 8 to 10 feet from the existing elevation to provide vehicle-only access. The intersection would be covered to allow pedestrian access above and away from vehicular traffic.

The roadway on Montlake Boulevard north of Pacific Street would be widened to the east until just south of Northeast 45th Street. The navigational channel crossed by the new Union Bay Bridge would be the same width as the existing Union Bay reach (175 feet), with a vertical clearance of either 70 or 110 feet.[1] Columns would be placed just outside the width of the ship canal to not block boat traffic.

Ramps to and from Lake Washington Boulevard would still be included in this option; however, their footprint would be slightly different from the original 6-Lane Alternative. The ramp connections to and from Lake Washington Boulevard and to and from the Union Bay Bridge would

[1] The establishment of a new governing clearance would prevent any vessel with a higher clearance requirement from traveling east from the Montlake Cut to Lake Washington north of the Evergreen Point Bridge. Before establishing a new governing clearance, the Coast Guard will consider whether vessels requiring a higher clearance have an essential use in north Lake Washington. Two vessels with a vertical clearance higher than 70 feet are known to travel this part of the lake. No vessels with a vertical clearance higher than 110 feet travel this part of the lake.

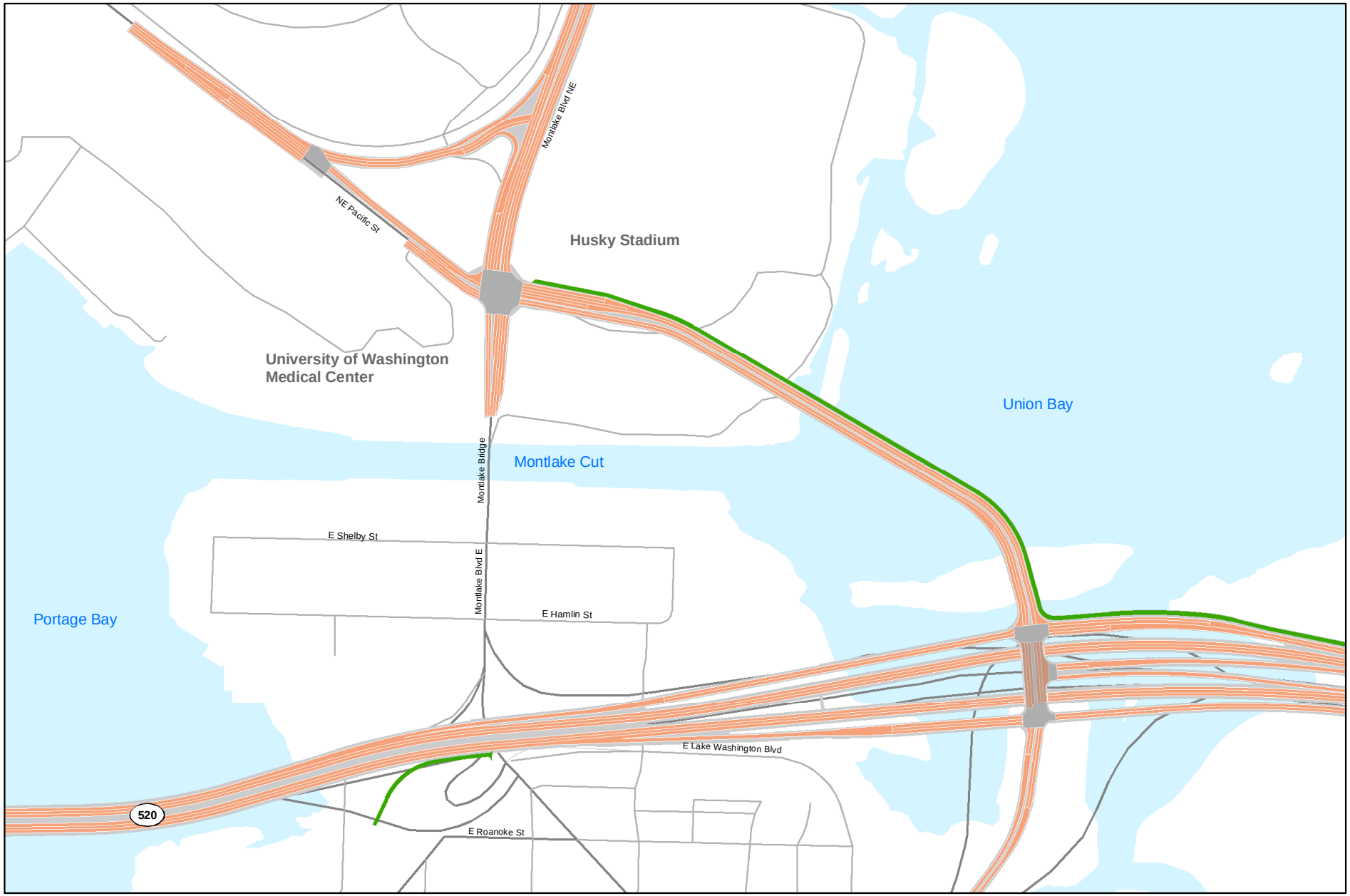

Exhibit 1. **Lane Configuration of the 6 Lanes with Pacific Street Interchange Option**
SR 520 Bridge Replacement and HOV Project

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construct a full diamond interchange, as opposed to a partial diamond interchange under the original 6-Lane Alternative. This full diamond interchange would provide more access to and from Lake Washington Boulevard. No access to or from SR 520 would be provided at Montlake Boulevard.

From Montlake Boulevard to I-5, SR 520 would be six lanes wide (three in either direction). The profile of the Portage Bay Bridge would not differ under this option from the original 6-Lane Alternative. Buses would access SR 520 via the Union Bay Bridge through the University area, providing for a more direct connection between buses and the proposed Sound Transit North Link Station at Husky Stadium. Instead of connecting to the Montlake interchange as in the original 6-Lane Alternative, the bicycle/pedestrian path would follow the Union Bay Bridge from SR 520 and would end at the Pacific Street interchange, close to the Burke-Gilman Trail.

Second Montlake Bridge Option

The intent of the Second Montlake Bridge option is to narrow the SR 520 footprint through the Montlake neighborhood, while providing for transit (bus) access from SR 520 to the University of Washington. Exhibit 2 shows the propose lane configuration for this option, which would be the same as the No Montlake Freeway Transit Stop option, except that it would also include a second Montlake bridge across the Montlake Cut. This bridge would be a parallel bascule (draw) bridge located just east of the existing Montlake Bridge. One bridge would carry northbound traffic, and one would carry southbound traffic.

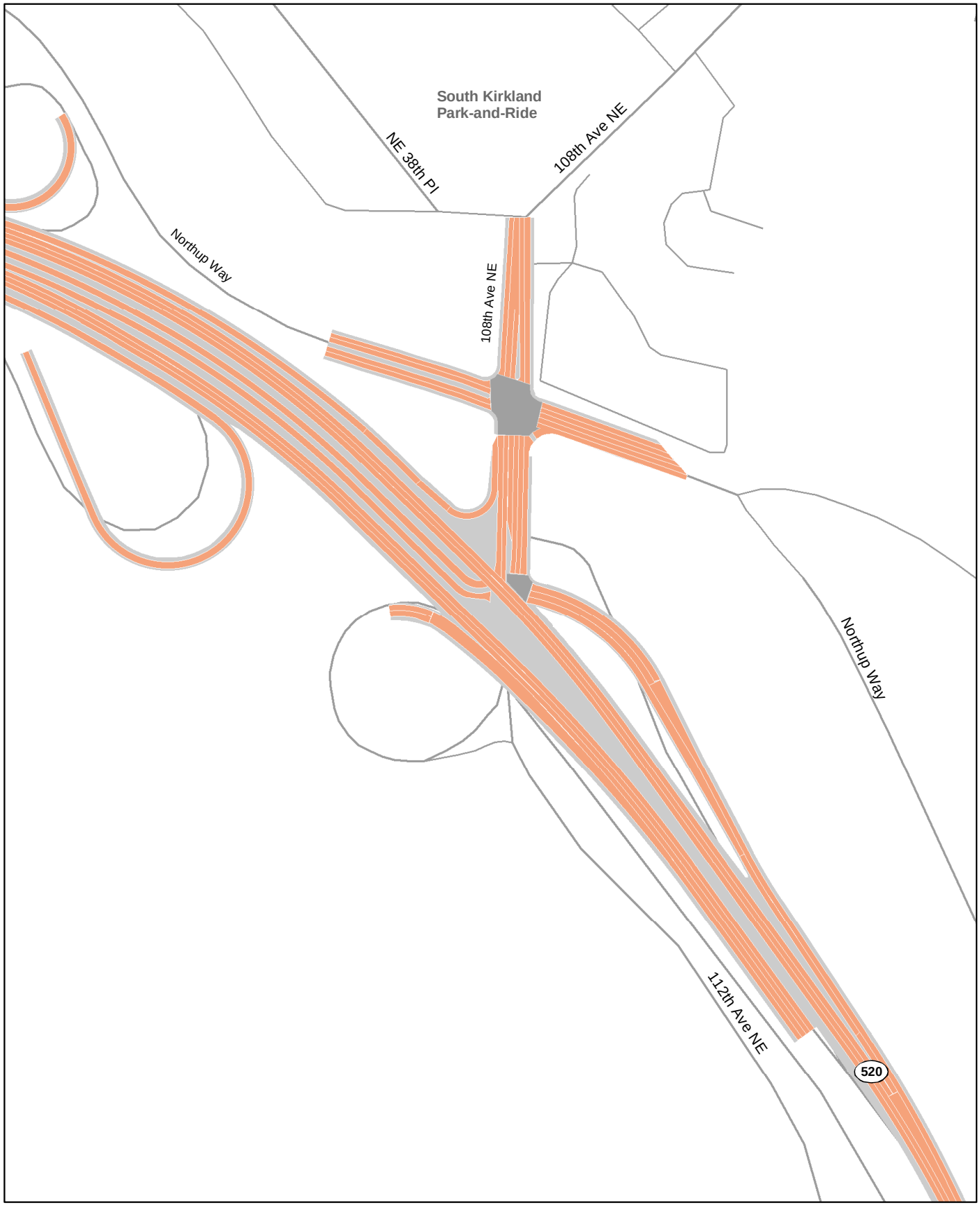
South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast Option

The intent of the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option is to improve access for buses to the South Kirkland Park-and-Ride from eastbound SR 520 and from the South Kirkland Park-and-Ride to westbound SR 520. This option, which is shown in Exhibit 3, would add a new transit/HOV-only westbound on-ramp from 108th Avenue Northeast and a new transit/HOV-only eastbound off-ramp to 108th Avenue Northeast.

The footprint of SR 520 east of Bellevue Way would be widened slightly to accommodate the new ramps. Both 108th Avenue Northeast and Northup Way would be widened and improved under this option. One lane would be added to 108th Avenue Northeast between the

Exhibit 2. **Lane Configuration of the Second Montlake Bridge Option**

SR 520 Bridge Replacement and HOV Project



Option Lane Configuration
Shoulders and Barriers
Intersections

N

0 125 250 500 Feet

Exhibit 3. **Lane Configuration for the South Kirkland Park-and-Ride Transit Access - 108th Avenue Northeast Option**
SR 520 Bridge Replacement and HOV Project

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eastbound on-ramp and 38th Place Northeast. Along with the additional through lane on 108th Avenue Northeast, the northbound leg of the 108th Avenue Northeast/Northup Way intersection would be channelized to include two exclusive left-turn lanes, a through lane, and a shared through/right-turn lane.

There is also a possibility for adding a westbound second left-turn lane at the 108th Avenue Northeast/Northup Way intersection to facilitate clearing the left-turn queue and serving a higher number of westbound left-turn and through trips.

What additional information was collected for this analysis?

This analysis required extending the project study area farther north along Montlake Boulevard and 45th Avenue Northeast. To accommodate this, the noise discipline team reviewed the land use and noise sources in this new corridor and also reviewed residential locations near the existing Montlake Bridge.

The noise discipline team also worked closely with the project design team to obtain updated plan drawings of the alignment for each alternative. In addition, we used supplemental information from the initial analysis, including the measured noise levels in the project corridor and previously modeled noise levels.

Affected Environment

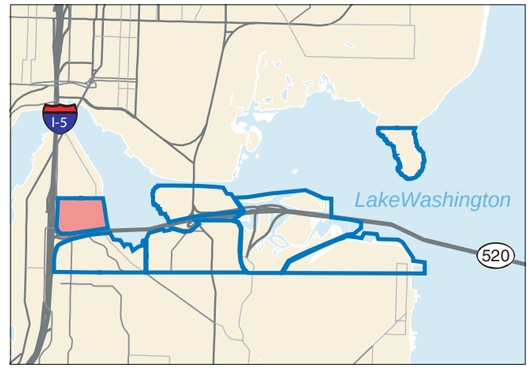
The three options to the 6-Lane Alternative required additional noise modeling to accurately predict locations where the NAC may be exceeded. This included adding new receivers in the Portage Bay/Roanoke neighborhood, the Montlake neighborhood north of SR 520, and in the University of Washington area.

The noise discipline team identified several houseboats in Portage Bay and as a result three new receivers were added into the Portage Bay/Roanoke area to represent noise levels at these locations. Data for these new locations, referred to as HB-1 through HB-3, are presented with the Portage Bay/Roanoke area receivers (HR). Exhibit 4 shows the locations of HB-1 through HB-3, along with the original Portage Bay/Roanoke area receivers (HR).

In the Montlake neighborhood, both the 6 Lanes with Pacific Street Interchange and Second Montlake Bridge options required an additional 11 receiver locations. Denoted MN-25 through MN-35, all of these new receivers are located in the northern section of the Montlake neighborhood. Data for these receivers are presented with the other data for the north Montlake neighborhood. Exhibit 5 shows the locations of MN-25 through MN-35, along with the original Montlake receivers.

Both the Pacific Street Interchange and Second Montlake Bridge options required noise modeling on Montlake Boulevard and 25th Avenue Northeast along the University of Washington campus. To accomplish this, the noise discipline team added 16 receiver locations, including two that represent noise on the Burke Gilman Trail. The other receivers in the University of Washington area were selected to represent the University Hospital and outdoor uses near the Husky Stadium and near Lake Washington. Exhibit 6 shows the 16 new noise modeling locations (UW-1 through UW-16) in an aerial view of Montlake Boulevard and 25th Avenue Northeast along the University of Washington Campus.

On the Eastside, no additional noise modeling locations were necessary to analyze the effects of the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option.



Location map showing noise analysis area

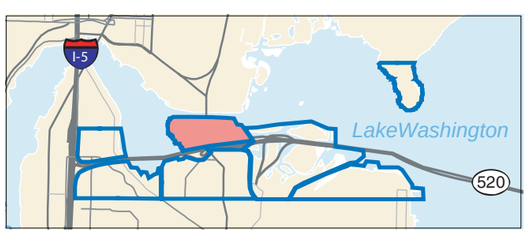
- New modeling location
- Modeling location
- Monitoring and modeling location
- Noise analysis area

N

0 200 400 Feet

Exhibit 4. **Noise Modeling Locations, Portage Bay/Roanoke**

SR 520 Bridge Replacement and HOV Project



Location map showing noise analysis area

- New modeling location
- Modeling location
- Monitoring and modeling location
- Noise analysis area

N

0 100 200 Feet

Exhibit 5. **Noise Modeling Locations, Montlake North of SR 520**

SR 520 Bridge Replacement and HOV Project

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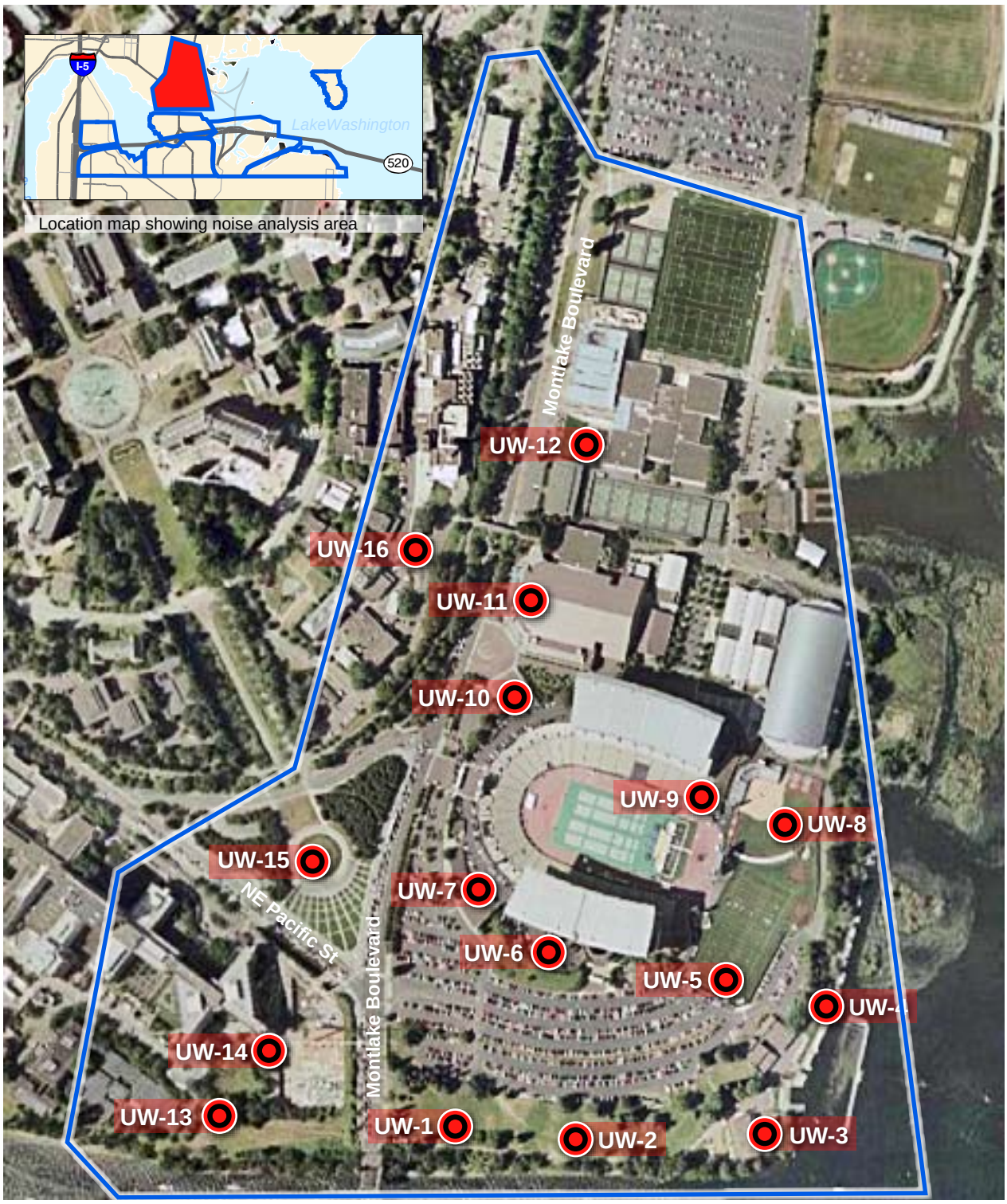

New modeling location

Noise Analysis Area

N

No scale

Exhibit 6. **New Monitoring Locations, University of Washington/Husky Stadium**

SR 520 Bridge Replacement and HOV Project

Potential Effects of the Project

What methods were used to evaluate effects?

The noise discipline team performed additional noise modeling to determine what locations in the study area exceed the NAC. Traffic-noise levels were calculated using the same method as the initial analysis, which is described in detail in the *Noise Discipline Report*.

During the initial analysis, noise levels were modeled at 361 locations in the project corridor. For this analysis of the options, noise levels were only modeled at those locations that could experience a change in noise levels when compared to the original 6-Lane Alternative.

To help reduce the large volume of data, the noise team selected Traffic Noise Model (TNM; April 2004) modeling number designations that would correspond to general neighborhood areas. We divided the project study area into 12 neighborhoods—7 in Seattle and 5 on the Eastside. The *Noise Discipline Report* shows how the neighborhoods are grouped into receiver designation areas and also provides complete graphics that show the locations of all noise monitoring and modeling locations. The box to the right shows the modeling receiver notations used for the analysis.

Modeled Receiver Designations

Seattle Project Area

HR	Portage Bay/Roanoke
HB	***Houseboats in Portage Bay***
CH	North Capitol Hill
MN	Montlake north of SR 520
MS	Montlake south of SR 520
UW	***University of Washington***
AB	Washington Park Arboretum
MP	Madison Park
LH	Laurelhurst

Eastside Project Area

PN	Medina and Hunts Point north of SR 520
PS	Medina and Hunts Point south of SR 520
PK	Hunts Point, Clyde Hill, Yarrow Point, and Kirkland north of SR 520
PB	Hunts Point, Clyde Hill, Yarrow Point, and Bellevue south of SR 520
E405	Bellevue east of I-405

Note: Receiver designations in ***Bold Italic typeface*** are new receiver designations added specifically for this analysis

What sound walls were included with the 6-Lane Alternative options?

Sound walls are part of the proposed project design for all alternatives and options. Because of this, the noise discipline team included sound walls in the TNM modeling. The sound walls were designed to meet the following project objectives:

- Reduce overall noise levels in the surrounding communities.

- Reduce future noise levels at all residences to below the WSDOT NAC of 66 dBA L_{eq}.
- Wherever possible, reduce noise levels at front-line residences adjacent to SR 520 by 7 to 10 dBA L_{eq}.

The sound walls included as part of the proposed project would extend along both sides of SR 520 creating a parallel barrier configuration. The potential for these parallel barriers to cause multiple reflections and degrade barrier performance was considered in the analysis. Research has shown that the magnitude of the performance degradation is linked to the ratio of the separation (width) between the barriers and the average height of the barriers. Researchers have concluded that where the average width to average height ratio is 10 to 1 (10:1) or less, a barrier's performance could degrade by 3 dBA or more, and thus a parallel barrier analysis using the TNM is recommended. Based on the proposed footprints of all of the project alternatives and options, the average width to average height ratio would range from about 15:1 to 30:1. Therefore, a detailed parallel barrier analysis is not recommended at this point in the project. Nonetheless, this issue should be revisited during final design to ensure that any potential parallel barrier effect is accounted for in the final sound wall parameters.

Houseboats in Portage Bay

The *Noise Discipline Report* (Appendix M to the Draft EIS) placed the northern sound wall along the Portage Bay Bridge, ending near Portage Bay and resuming near the north Montlake community. Since the original analysis, the noise discipline team identified additional noise sensitive receivers in houseboats along the eastern edge of the Roanoke community. These receivers (HB-1 through HB-3) would benefit from noise reductions of 5 dBA or more with construction of extended sound walls across the northern side of the Portage Bay Bridge. Extended sound walls would meet the project objectives and is recommended for all the build alternatives and the 6-Lane Alternative options.

6 Lanes with Pacific Street Interchange Option

Under the 6 Lanes with Pacific Street Interchange option, the sound walls in Seattle would be similar to the original 6-Lane Alternative. The walls would continue on the both sides of SR 520 from the 10th and Delmar lid to the Montlake lid. The northern wall between the lids would be 10 feet high on the west end, increasing to 12 feet, and continuing at 12 feet to the Montlake lid. The southern wall would be

approximately 14 feet at the 10th and Delmar lid, decreasing to 12 feet near Boyer Avenue, and then continuing at 10 feet to the Montlake lid.

Sound walls would continue east from the Montlake lid along both sides of SR 520 and follow along the ramps to the Pacific Street Interchange. On the north side of SR 520, the wall would be 16 feet near the Montlake lid, reducing to 4 feet at the beginning of the Pacific Street westbound on-ramp to SR 520. On the south side of SR 520, the wall would be 8 feet high from the Montlake lid to the end of the SR 520 eastbound off-ramp to Pacific Street.

East of the Pacific Street interchange, the northern wall would be 4 feet high, uniformly increasing to 8 feet as it continues across Foster Island. The southern wall would be 8 feet, increasing to 10 feet across Foster Island. Both the northern and southern walls would end in the same location as the original 6-Lane Alternative.

Two additional walls would be constructed along both sides of the SR 520 shoulder between the SR 520 travel lanes and the on- and off-ramps. These walls , ranging in height from 8 to 10 feet, would reduce SR 520 traffic noise that would otherwise pass under the column supported on- and off-ramps or through the openings in the walls at the on- and off- ramps.

The only sound walls required along both sides of the Pacific Street interchange connection to the University of Washington would be the standard concrete traffic barriers. With these standard 4-foot barriers, no receivers would exceed the NAC.

Second Montlake Bridge Option

Construction of a second bascule bridge would displace two homes on the northeast side of Montlake Boulevard. This would raise noise levels at homes represented by MN-32 and MN-33. Sound walls have been considered to maintain the existing noise levels in this area and to help meet the project objectives (see *Noise Discipline Report* for more details); however, the walls would not effectively reduce noise levels by more than 3 to 4 dBA. Washington state requires a 7-dBA reduction before a noise wall can be constructed. Noise levels could not be reduced because of the required openings for East Shelby Street, pedestrian access, and the alleyway to the north of the homes.

South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast Option (Eastside)

Under this option, sound walls are proposed for the Eastside from just west of the eastern shoreline of Lake Washington to just west of Bellevue Way. Similar to the original 6-Lane Alternative, the sound walls would be continuous throughout the entire area, except for breaks at Evergreen Point Road, 84th Avenue Northeast, and 92nd Avenue Northeast, where the sound walls would be integrated with lids. Wall heights would vary from 8 feet to 24 feet throughout the corridor. The taller walls would be necessary in areas where residences are located uphill from the project corridor.

What are the effects of the 6 Lanes with Pacific Street Interchange option?

The 6 Lanes with Pacific Street Interchange option would increase noise levels in a few areas and decrease noise levels in others compared to the original 6-Lane Alternative. Under this option, differences would occur in the north and south Montlake neighborhoods, the University of Washington, the Arboretum, and the Laurelhurst neighborhood. Noise levels in the Capitol Hill, Portage Bay/Roanoke, and Madison Park neighborhoods are predicted to remain the same as the original 6-Lane Alternative.

Overall, the number of residences exceeding the NAC in the Montlake neighborhood and along the University of Washington would be reduced from the existing level of 63 to 40. The reduced number would be due to the removal of the existing SR 520 on- and off-ramps at Montlake and the diversion of traffic from Montlake Boulevard to the new Pacific Street interchange. This option also would reduce the number of residences exceeding the NAC by six when compared to the original 6-Lane Alternative. The differences in each of these specific neighborhoods are discussed below.

Montlake North of SR 520

In the Montlake neighborhood north of SR 520, the peak-hour traffic noise levels would decrease by 3 to 6 dBA at the six residences represented by MN-26, MN-27, and MN-32 through MN-35. Other receivers in the north Montlake area also are predicted to have slight noise reductions of 1 to 2 dBA. The lower noise reduction is due to continued background noise from SR 520. Peak-hour traffic noise levels

under this option would be lower than the original 6-Lane Alternative levels because traffic would shift from using Montlake Boulevard to the Pacific Street interchange.

Including the new receiver locations, there are currently 27 residences that exceed the NAC in the north Montlake area. Under the original 6-Lane Alternative, this number would be reduced to 16; with the Pacific Street Interchange option, 10 residences would have peak-hour noise levels exceeding the NAC.

Overall, noise levels with the 6 Lanes with Pacific Street Interchange option would be reduced from 72 to 53 dBA L_{eq} with the original 6-Lane Alternative to 67 to 53 dBA L_{eq}. In addition, all new receiver locations in the Montlake neighborhood would have noise levels that are lower than the original 6-Lane Alternative. The reduction in noise would be due to traffic using the new Pacific Street interchange instead of Montlake Boulevard.

Montlake South of SR 520

In the Montlake neighborhood south of SR 520, the 6 Lanes with Pacific Street Interchange option would slightly decrease (3 to 4 dBA) peak-hour traffic noise levels at the 35 residences along Lake Washington Boulevard represented by MS-1 through MS-5, MS-14, MS-32, and MS-33. The lower traffic noise levels would be due to reduced traffic on Lake Washington Boulevard and the elimination of on- and off-ramps at SR 520.

Peak-hour traffic noise levels would increase noticeably above the original 6-Lane Alternative at the eight second-line residences represented by MS-9, MS-11, MS-12, MS-15, and MS-16. The new source of noise for these receivers would be traffic on the new elevated Pacific Street interchange structure; however, no additional receivers would have peak-hour noise levels above the NAC under this option. The number of receivers exceeding the NAC would remain at 28, which is the same as predicted for the original 6-Lane Alternative.

The eight Montlake residences represented by receivers MS-24 through MS-26 would have lower peak-hour noise levels under this option due to the elimination of the Montlake off-ramp and the fact that the sound wall would be moved closer to the SR 520 travel lanes. Noise levels for the original 6-Lane Alternative would range from 56 to 73 dBA L_{eq}; with the 6 Lanes with Pacific Street Interchange option, noise levels in this same area are predicted to range from 52 to 72 dBA L_{eq}.

University of Washington

The noise discipline team modeled an additional 16 receivers within the University of Washington campus for the original 6-Lane Alternative and the 6 Lanes with Pacific Street Interchange option. The primary purpose of the evaluation was to determine what effects traffic at the Pacific Street interchange would have on noise levels in and around the University of Washington. With sound walls along the Pacific Street interchange structure, no noise-sensitive locations on the campus would exceed the NAC.

Noise levels are predicted to decrease at locations near Lake Washington (receivers UW-1 through UW-3) due to reduced traffic on the Montlake Bridge. The parking lots on the east side of Montlake Boulevard are not noise-sensitive receivers.

Arboretum

Under the 6 Lanes with Pacific Street Interchange option, peak-hour traffic noise levels would increase slightly compared to the original 6-Lane Alternative. The Arboretum areas represented by receivers AB-17 through AB-20 would experience slight but noticeable increases of 3 to 5 dBA in peak-hour traffic noise levels due to the new Pacific Street interchange structure. Noise levels throughout the Arboretum would change because of the new location of the ramps to Lake Washington Boulevard and added traffic using the new interchange. Overall, peak-hour traffic noise levels within the Arboretum would range from 57 to 65 dBA L_{eq}; these noise levels are all under the NAC.

Laurelhurst

In general, under the 6 Lanes with Pacific Street Interchange option, peak-hour traffic noise levels in the Laurelhurst neighborhood would not differ noticeably compared to the original 6-Lane Alternative. Overall noise levels are predicted to range from 56 to 63 dBA L_{eq} during peak traffic noise periods. The residences represented by receiver LH-7 would experience a slight increase (1 to 2 dBA) in peak-hour noise levels due to traffic on the elevated Pacific Street interchange. Noise levels at all other receivers would be within 1 dBA of the original 6-Lane Alternative noise levels. No residences in Laurelhurst are predicted to exceed the NAC.

Madison Park

The 6 Lanes with Pacific Street Interchange option noise levels and number of residences exceeding the NAC would be the same as the original 6-Lane Alternative.

Noise levels for the original 6-Lane Alternative are available in the *Noise Discipline Report*, Appendix M to the Draft EIS.

What are the effects of the Second Montlake Bridge Option?

The Second Montlake Bridge option would noticeably increase noise levels in some areas of the Montlake neighborhood north of SR 520 and within the University of Washington campus. Other neighborhoods in Seattle would experience the same noise levels as calculated for the original 6-Lane Alternative.

Eleven additional receivers were added in Montlake neighborhood north of SR 520 near the Montlake Bridge, and 16 additional receivers were added along Montlake Boulevard to represent receivers at the University of Washington. Each of those areas is discussed below.

Montlake North of SR 520

In the Montlake neighborhood north of SR 520, slight but noticeable increases of 3 dBA in the peak-hour traffic noise levels at two residences (represented by receivers MN-19 and MN-33) would be expected due to the extra travel lanes and increased speeds from the construction of the second Montlake Bridge. The removal of two residential structures on the east side of Montlake Boulevard at East Shelby Street also would result in increased noise at the previously shielded residences. A noise wall was considered for receivers MN-32 and MN-33; however, the noise wall was not effective at reducing levels by more than 3 to 4 dBA; the State requires a 7-dBA reduction for a noise wall to be considered for construction.

Under the Second Montlake Bridge option, the number of residences in the Montlake neighborhood north of SR 520 exceeding the NAC would be 19, which is an increase of 3 residences above the 16 originally projected with the original 6-Lane Alternative. Currently, there are an estimated 27 residences exceeding the NAC.

University of Washington

The noise discipline team modeled additional receivers within the University of Washington campus for the original 6-Lane Alternative and the Second Montlake Bridge option. The primary purpose of the evaluation was to determine what effects traffic on the second Montlake Bridge would have on noise levels in and around the University of Washington. Noise levels are projected to increase by only 2 dBA along Montlake Boulevard due to the added bridge and other roadway improvements.

What are the effects of the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast Option?

Overall, Eastside noise levels with the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would differ slightly (3 dBA or less) from the original 6-Lane Alternative. This change in noise levels would result from the shift in the alignment to accommodate the relocated bicycle/pedestrian path.

Noise levels at one receiver, PB-13, would increase by 3 dBA compared to the original 6-Lane Alternative. At all other Eastside receivers, the increase in noise levels would not differ noticeably (2 dBA or less) from the original 6-Lane Alternative. Overall, there would be no change to the location or number of Eastside receivers that would exceed the NAC. Each Eastside neighborhood area is discussed below.

Medina and Hunts Point North of SR 520

Peak-hour traffic noise levels under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would differ by 1 dBA L_{eq} or less in Medina and Hunts Point west of 84th Avenue Northeast and north of SR 520. Under the original 6-Lane Alternative, noise levels ranged from 51 to 65 dBA L_{eq}. Under this option. noise levels are predicted to range from 52 to 65 dBA L_{eq}.

Under this option with sound walls, all noise-sensitive residential receivers would be below the NAC. There would be no change in the number of residences predicted to exceed the NAC when compared to the original 6-Lane Alternative. Currently, there are an estimated 29 residences that exceed the NAC in this portion of the study area.

Medina and Hunts Point South of SR 520

In Medina and Hunts Point west of 84th Avenue Northeast and south of SR 520, peak-hour traffic noise levels under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would range from 52 to 64 dBA L_{eq} and differ by no more than 1 dBA L_{eq} compared to the original 6-Lane Alternative (51 to 65 dBA L_{eq}).

Under this option with sound walls, all noise-sensitive residential receivers would be below the NAC. There would be no change in the number of residences predicted to exceed the NAC compared to the original 6 Lane Alternative. Currently, an estimated 37 residences exceed the NAC in this portion of the study area.

Hunts Point, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

In Hunts Point, Clyde Hill, Yarrow Point, and Kirkland north of SR 520, peak-hour traffic noise levels under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would differ by no more than 1 dBA L_{eq} at residential locations and by no more than 2 dBA along the entire corridor. Overall future noise levels under this option would range from 49 dBA to 65 dBA L_{eq}.

Under this option with sound walls, all noise-sensitive residential receivers would be below the NAC. There would be no change in the number of residences predicted to exceed the NAC compared to the original 6-Lane Alternative. Currently, an estimated 16 residences exceed the NAC in this portion of the study area.

Hunts Point, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

On the south side of SR 520 in Hunts Point, Clyde Hill, Yarrow Point, and Bellevue, peak-hour traffic noise levels under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would decrease by no more than 1 dBA L_{eq}. Noise wall heights were raised slightly (1 to 2 feet) to offset the effect of shifting the alignment to the south. After an adjustment of noise wall heights, most residences would experience reduced noise levels (1 to 3 dBA L_{eq}). Overall noise levels were predicted to range from 47 to 66 dBA L_{eq} under this option, which is a reduction of less than 1 dBA compared to 48 to 66 dBA L_{eq} under the original 6-Lane Alternative.

Under this option with sound walls, six noise-sensitive residential receivers would exceed the NAC. There would be no change in the number of residences predicted to exceed the NAC when compared to the original 6-Lane Alternative. Currently, an estimated 47 residences exceed the NAC in this portion of the study area.

Bellevue East of I-405

In the areas east of I-405, peak-hour traffic noise levels under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option would remain the same as the original 6-Lane Alternative. Overall noise levels were predicted to range from 62 to 72 dBA L_{eq} under this option, which is the same as predicted under the original 6-Lane Alternative.

Mitigation

Early in the development of this project, WSDOT committed to installing sound walls wherever needed to reduce noise levels caused by the proposed project to below the NAC. These sound walls are included as part of the project design; in other words, they are integral to and inseparable from the project, not just mitigation added to the project. In addition, several other design elements would also help reduce noise levels caused by the current roadway.

WSDOT requires that every reasonable effort should be made to attain a 10 dBA (or greater) noise reduction at the first row of receivers (e.g., front-line receivers). For a noise barrier to be considered a feasible form of mitigation by WSDOT, the majority of the first row, ground floor receivers must achieve a 5 dBA noise reduction and at least one receiver must have a 7 dBA reduction. For most projects, noise barrier construction is considered feasible if a 7 dBA noise reduction can be achieved for ground floor residences. There is no mitigation for upper floors, such as second floors of single-family residences.

WSDOT has established cost-effectiveness criteria to ensure that if a noise barrier is recommended, the cost of the noise barrier is consistent with the level of reduction and is not excessive.

For more detailed information about how sound walls and other noise abatement measures work, see the *Noise Discipline Report* (Appendix M to the Draft EIS) and the *Noise Mitigation and Design Options Report*.

What other noise-reducing design elements are included with this project?

The proposed project includes a number of design elements that reduce noise levels. These include shifting the roadway alignment away from residences, depressing (lowering) sections of the roadway, and/or placing a lid over portions of the highway.

All proposed build alternatives would remove the curve in the west approach to the Evergreen Point Bridge and shift the highway away from Madison Park residences. As the highway touches down on the Eastside, the roadway would be north of the current roadway, which

would shift traffic noise away from residences to the south but move it closer to residences to the north.

A depressed roadway can provide substantial noise reduction, depending on the amount of depression. The original 6-Lane Alternative, the 6 Lanes with the Pacific Street Interchange option, and all Eastside options would have depressed sections of roadway at several locations, including the approach to the I-5 interchange; the Montlake interchange; and to a lesser extent, at Evergreen Point Road, 84th Avenue Northeast, and 92nd Avenue Northeast.

Another noise-reducing design element of the original 6-Lane Alternative is the landscaped lids over depressed sections of the roadway. Each lid would be approximately 500 feet in length over the highway, which is short enough to not require ventilation, but long enough to help reconnect the communities along SR 520. The locations of the five lids are:

- 10th Avenue East and East Delmar Drive
- Montlake Boulevard
- Evergreen Point Drive
- 84th Avenue Northeast
- 92nd Avenue Northeast

Although these lids were included in the original 6-Lane Alternative as community enhancements, they are also very effective at preventing sound from reaching noise-sensitive receiver locations near the lidded areas. For a comparison of the overall effectiveness of the lids at reducing noise see *How do the 4-Lane and 6-Lane Alternatives Compare?* in the *Noise Discipline Report* (Appendix M to the Draft EIS).

How could the project mitigate for noise levels above the noise abatement criteria?

Although all build alternatives would include sound walls, noise levels at some residences would continue to exceed the NAC. In accordance with the Federal Highway Administration and WSDOT requirements, noise mitigation measures are considered at locations along the alignments where traffic noise levels are predicted to exceed the NAC as a result of the proposed project. There are several locations where the NAC exceedances would not be due entirely to the proposed project,

and there are no reasonable or feasible methods of reducing noise. The following sections summarize the locations expected to exceed the NAC even with the proposed noise abatement measures, and why no additional noise abatement measures are recommended.

Seattle

In Seattle, noise levels at several residential locations would continue to exceed the NAC, even with the proposed noise-reducing design options and noise abatement measures. Receivers HR-1 through HR-3 and HR-14 and HR-15 in the Portage Bay/Roanoke neighborhood would exceed the NAC under all alternatives and options. All of these receiver locations are close to I-5 and adjacent to Harvard Avenue East or East Roanoke Street, or both. The combined noise from I-5 and these local major arterials are the main reason for noise levels above the NAC. No additional noise abatement is being recommended because the proposed project would not modify any of these roadways. Furthermore, there is no reasonable or feasible method of providing additional noise abatement in the area that would be within the scope of this project. Overall, noise levels and number of receivers exceeding the NAC in the Portage Bay/Roanoke neighborhood are similar to those of the original 6-Lane Alternative.

Several receiver locations in the North Capitol Hill neighborhood would continue to exceed the NAC under the 6 Lanes with Pacific Street Interchange and the Second Montlake Bridge options (CH-1, CH-2 and CH-13 through CH-16 and CH-28). Major noise sources for all receivers in this area include I-5 and 10th Avenue East. As with the Portage Bay/Roanoke neighborhood, no additional noise abatement is being recommended on North Capitol Hill because the proposed project is not modifying any of these roadways.

In the Montlake neighborhood, several receiver locations would continue to exceed the NAC because of traffic on Montlake Boulevard and Lake Washington Boulevard. No additional noise abatement is recommended because the proposed project would not modify any of these roadways. Compared to the original 6-Lane Alternative, the 6 Lanes with Pacific Street Interchange option would lower noise levels for many receivers located on Montlake Boulevard and Lake Washington Boulevard. The total number of residences exceeding the NAC would be reduced by 6, from 44 to 38. The Second Montlake Bridge option would increase the number of residences exceeding the NAC to 47 compared to 44 for the original 6-Lane Alternative.

Eastside

Under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option, noise levels on the Eastside would increase by no more than 3 dBA compared to the original 6-Lane Alternative. There would be no change to the location or number of receivers that would exceed the NAC. The same six receiver locations PB-19, PB-24, E405-3, E405-4, E405-5, and E405-7 (representing 18 residences) that would exceed the criteria under the original 6-Lane Alternative would continue to exceed the criteria under the South Kirkland Park-and-Ride Transit Access – 108th Avenue Northeast option.

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Attachment 1

Summary of Residential Locations Exceeding the WSDOT NAC

Exhibit 1-1. Summary of Residential Locations Exceeding the WSDOT NAC

	Existing and Base Alternatives				Design Options		
Area	**Existing**	**No-Build**	**4-Lane Base**	**6-Lane Base**	**Pacific Street Interchange**	**Montlake Bridge**	**Bike Path to North**
Portage Bay	24	24	19	16	16	16	16
Capitol Hill	99	109	60	49	49	49	49
Montlake North	27	24	16	16	10	19	16
Montlake South	35	42	32	28	28	28	28
University Wash	1	2	2	2	2	2	2
Arboretum	0	0	0	0	0	0	0
Madison Park	89	89	0	0	0	0	0
Laurelhurst	0	0	0	0	0	0	0
Points North	29	29	4	0	0	0	0
Points South	37	41	5	0	0	0	0
Points Kirkland	16	18	0	0	0	0	0
Points Bellevue	47	60	9	6	6	6	6
East-405 Impacts	6	6	6	12	12	12	12
Seattle	275	290	129	111	105	114	111
Eastside	135	154	24	18	18	18	18
Total	410	444	153	129	123	132	129

Notes:

Shaded cell under the design options columns indicates that the noise levels NAC exceedances are identical to those for the original 6-Lane Alternative.

Attachment 2

Noise Levels in the Seattle Project Area

2A: Montlake Neighborhood North of SR 520

Exhibit 2A-1. 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Interchange Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
MN-1	0	66	**69**	**67**	59	-8
MN-2	0	66	**66**	**72**	63	-9
MN-3	0	66	**75**	**75**	64	-11
MN-4	2	66	**67**	63	59	-4
MN-5	3	66	**67**	62	59	-3
MN-6	3	66	**66**	64	62	-2
MN-7	2	66	**69**	**68**	**67**	-1
MN-8	3	66	**68**	**67**	**66**	-1
MN-9	3	66	64	65	62	-3
MN-10	4	66	64	64	59	-5
MN-11	0	66	**66**	65	58	-7
MN-12	0	66	65	60	55	-5
MN-13	4	66	64	61	55	-6
MN-14	3	66	64	63	56	-7
MN-15	4	66	64	62	57	-5
MN-16	4	66	63	62	59	-3
MN-17	4	66	**68**	65	65	0
MN-18	3	66	**72**	**67**	**67**	0
MN-19	5	66	62	60	59	-1
MN-20	3	66	60	59	58	-1
MN-21	3	66	61	60	58	-2
MN-22	0	66	63	62	58	-4
MN-23	4	66	**68**	65	65	0
MN-24	3	66	62	58	53	-5
MN-25	2	66	63	60	59	-1
MN-26	2	66	72	**66**	**66**	0
MN-27	3	66	65	61	61	0
MN-28	6	66	60	60	59	-1
MN-29	0	66	65	65	62	-3
MN-30	0	66	60	61	59	-2

Exhibit 2A-1. 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Interchange Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
MN-31	4	66	59	60	59	-1
MN-32	2	66	62	60	59	-1
MN-33	1	66	64	61	61	0
MN-34	1	66	66	63	62	-1
MN-35	2	66	63	60	60	0

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 2A-2. 6-Lane Alternative with Second Montlake Bridge Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Residential Structures	NAC		6-Lane Alternative w/Second Montlake Bridge Option		Sound Wall Reduction[a]
			Existing[a,b]	No Wall[a]	w/ Wall[a]	
MN-1	0	66	**69**	64	60	-4
MN-2	0	66	**66**	**66**	62	-4
MN-3	0	66	**75**	0	0	0
MN-4	2	66	**67**	**72**	64	-8
MN-5	3	66	**67**	**71**	63	-8
MN-6	3	66	**66**	**68**	65	-3
MN-7	2	66	**69**	**70**	**69**	-1
MN-8	3	66	**68**	**70**	**70**	0
MN-9	3	66	64	65	64	-1
MN-10	4	66	64	63	61	-2
MN-11	0	66	**66**	63	60	-3
MN-12	0	66	65	57	56	-1
MN-13	4	66	64	59	57	-2
MN-14	3	66	64	62	59	-3
MN-15	4	66	64	62	59	-3
MN-16	4	66	63	64	63	-1
MN-17	4	66	**68**	**70**	**70**	0
MN-18	3	66	**72**	**73**	**73**	0
MN-19	5	66	62	63	63	0
MN-20	3	66	60	62	62	0
MN-21	3	66	61	63	61	-2
MN-22	0	66	63	62	60	-2
MN-23	4	66	**68**	**71**	**71**	0
MN-24	3	66	62	57	55	-2
MN-25	2	66	63	65	65	0
MN-26	2	66	72	**75**	**75**	0
MN-27	3	66	65	**67**	65	-2
MN-28	6	66	60	61	61	0

Exhibit 2A-2. 6-Lane Alternative with Second Montlake Bridge Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Residential Structures	NAC		6-Lane Alternative w/Second Montlake Bridge Option		Sound Wall Reduction[a]
			Existing[a,b]	No Wall[a]	w/ Wall[a]	
MN-29	0	66	65	64	63	-1
MN-30	0	66	60	59	58	-1
MN-31	4	66	59	59	59	0
MN-32	2	66	62	63	62	-1
MN-33	1	66	64	**66**	65	-1
MN-34	1	66	66	**69**	**69**	0
MN-35	2	66	63	**66**	65	-1

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 2A-3. Summary of Future Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
MN-1	**69**	**69**	57	60	59	60
MN-2	**66**	**67**	61	61	63	62
MN-3	**75**	**75**	--	--	64	0
MN-4	**67**	**68**	63	64	59	64
MN-5	**67**	**68**	63	63	59	63
MN-6	**66**	**66**	64	64	62	65
MN-7	**69**	**70**	**69**	**69**	**67**	**69**
MN-8	**68**	**68**	**67**	**67**	**66**	**70**
MN-9	64	65	62	62	62	64
MN-10	64	65	59	59	59	61
MN-11	**66**	**67**	56	59	58	60
MN-12	65	**66**	55	55	55	56
MN-13	64	65	54	55	55	57
MN-14	64	65	55	57	56	59
MN-15	64	64	56	57	57	59
MN-16	63	64	60	60	59	63
MN-17	**68**	**68**	**66**	**66**	65	**70**
MN-18	**72**	**72**	**69**	**69**	**67**	**73**
MN-19	62	62	60	60	59	63
MN-20	60	61	60	60	58	62
MN-21	61	61	60	60	58	61
MN-22	63	64	60	59	58	60
MN-23	**68**	**68**	**66**	**66**	65	**71**
MN-24	62	63	52	53	53	55
MN-25	63	64	62	62	59	65
MN-26	**72**	**72**	**72**	**72**	**66**	**75**
MN-27	65	**66**	64	64	61	65
MN-28	60	61	59	59	59	61
MN-29	65	**66**	63	63	62	63

Exhibit 2A-3. Summary of Future Peak-Hour Traffic Noise Levels for Montlake Neighborhood North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
MN-30	60	60	58	58	59	58
MN-31	59	59	57	57	59	59
MN-32	62	62	62	62	59	62
MN-33	64	65	65	65	61	65
MN-34	**66**	**67**	**67**	**67**	62	**69**
MN-35	63	63	63	63	60	65

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

2B: Montlake Neighborhood South of SR 520

Exhibit 2B-1. 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood South of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Street Interchange Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
MS-1	4	66	**74**	**72**	**71**	-1
MS-2	4	66	**74**	**72**	**70**	-2
MS-3	6	66	**74**	**71**	**69**	-2
MS-4	3	66	**72**	**70**	**68**	-2
MS-5	5	66	**70**	**70**	**68**	-2
MS-6	4	66	59	65	63	-2
MS-7	4	66	59	63	62	-1
MS-8	3	66	61	**66**	64	-2
MS-9	2	66	62	**67**	63	-4
MS-10	4	66	**67**	**69**	**66**	-3
MS-11	2	66	60	**66**	61	-5
MS-12	4	66	56	64	60	-4
MS-13	4	66	58	63	61	-2
MS-14	4	66	60	62	61	-1
MS-15	6	66	56	64	61	-3
MS-16	4	66	62	**66**	64	-2
MS-17	2	66	**73**	**73**	**72**	-1
MS-18	4	66	65	**69**	65	-4
MS-19	4	66	**66**	**69**	64	-5
MS-20	3	66	**66**	**69**	61	-8
MS-21	0	66	**70**	**69**	59	-10
MS-22	0	66	**69**	**68**	58	-10
MS-23	0	66	**66**	**66**	57	-9
MS-24	2	66	63	64	57	-7
MS-25	2	66	63	64	58	-6
MS-26	4	66	63	65	59	-6
MS-27	3	66	65	**68**	61	-7
MS-28	4	66	64	**67**	61	-6
MS-29	4	66	63	**67**	63	-4
MS-30	4	66	64	**68**	64	-4

Exhibit 2B-1. 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Montlake Neighborhood South of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Street Interchange Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
MS-31	6	66	58	62	61	-1
MS-32	4	66	61	62	61	-1
MS-33	5	66	64	64	64	0

[a] Leq noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA Leq.

Exhibit 2B-2. Summary of Future Peak-Hour Traffic Noise Levels for Montlake Neighborhood South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
MS-1	**74**	**75**	**71**	**71**	**71**	**71**
MS-2	**74**	**74**	**71**	**71**	**70**	**71**
MS-3	**74**	**74**	**71**	**71**	**69**	**71**
MS-4	**72**	**73**	**72**	**71**	**68**	**71**
MS-5	**70**	**71**	**70**	**70**	**68**	**70**
MS-6	59	59	60	60	63	60
MS-7	59	60	60	60	62	60
MS-8	61	62	63	62	64	62
MS-9	62	63	62	62	63	62
MS-10	**67**	**67**	**67**	**66**	**66**	**66**
MS-11	60	60	61	60	61	60
MS-12	56	57	58	58	60	58
MS-13	58	58	58	59	61	59
MS-14	60	61	60	61	61	61
MS-15	56	56	57	57	61	57
MS-16	62	62	62	62	64	62
MS-17	**73**	**73**	**73**	**73**	**72**	**73**
MS-18	65	**66**	**66**	64	65	64
MS-19	**66**	**66**	65	63	64	63
MS-20	**66**	**66**	61	60	61	60
MS-21	**70**	**71**	59	58	59	58
MS-22	**69**	**70**	61	59	58	59
MS-23	**66**	**67**	61	58	57	58
MS-24	63	64	58	56	57	56
MS-25	63	64	57	56	58	56
MS-26	63	64	57	56	59	56
MS-27	65	**66**	59	58	61	58
MS-28	64	65	60	59	61	59
MS-29	63	64	62	60	63	60
MS-30	64	64	64	62	64	62

Exhibit 2B-2. Summary of Future Peak-Hour Traffic Noise Levels for Montlake Neighborhood South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
MS-31	58	58	58	59	61	59
MS-32	61	61	61	61	61	61
MS-33	64	65	64	65	64	65

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

2C: Washington Park Arboretum

Exhibit 2C-1. Future 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Washington Park Arboretum

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Street Interchange		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
AB-1	0	66	**66**	**66**	62	-4
AB-2	0	66	**67**	**68**	63	-5
AB-3	0	66	**68**	**67**	62	-5
AB-4	0	66	**80**	64	60	-4
AB-5	0	66	**76**	**66**	60	-6
AB-6	0	66	**72**	**66**	60	-6
AB-7	0	66	**70**	**67**	60	-7
AB-8	0	66	**69**	**66**	60	-6
AB-9	0	66	**68**	**66**	60	-6
AB-10	0	66	**67**	**66**	60	-6
AB-11	0	66	**67**	**66**	60	-6
AB-12	0	66	**66**	**66**	59	-7
AB-13	0	66	65	**66**	59	-7
AB-14	0	66	63	65	59	-6
AB-15	0	66	**71**	**66**	60	-6
AB-16	0	66	65	**66**	59	-7
AB-17	0	66	60	63	58	-5
AB-18	0	66	56	59	57	-2
AB-19	0	66	64	65	65	0
AB-20	0	66	63	**67**	63	-4

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 2C-2. Summary of Future Peak-Hour Traffic Noise Levels for Washington Park Arboretum

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6- Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
AB-1	**66**	**67**	61	60	62	60
AB-2	**67**	**68**	60	59	63	59
AB-3	**68**	**69**	62	60	62	60
AB-4	**80**	**80**	56	62	60	62
AB-5	**76**	**77**	57	61	60	61
AB-6	**72**	**73**	58	61	60	61
AB-7	**70**	**71**	58	61	60	61
AB-8	**69**	**70**	57	60	60	60
AB-9	**68**	**69**	58	59	60	59
AB-10	**67**	**68**	58	59	60	59
AB-11	**67**	**67**	58	59	60	59
AB-12	**66**	**67**	58	58	59	58
AB-13	65	**66**	58	58	59	58
AB-14	63	63	57	57	59	57
AB-15	**71**	**72**	63	59	60	59
AB-16	65	**66**	61	58	59	58
AB-17	60	60	56	54	58	54
AB-18	56	57	52	52	57	52
AB-19	64	65	61	62	65	62
AB-20	63	64	61	61	63	61

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

2D: University of Washington

Exhibit 2D-1. Existing Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	NAC[a]	Existing Noise Level[b,c]	Residences Exceeding NAC[d]
UW-1	66	65	--
UW-2	66	58	--
UW-3	66	55	--
UW-4	66	54	--
UW-5	66	54	--
UW-6	66	58	--
UW-7	66	62	--
UW-8	66	52	--
UW-9	66	53	--
UW-10	66	62	--
UW-11	66	66	Athletic Building Entrance
UW-12	66	64	--
UW-13	66	59	--
UW-14	66	61	--
UW-15	66	64	--
UW-16	66	62	--

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] NAC is the WSDOT Noise Abatement Criteria level.

[b] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[c] Bold numbers indicate noise levels exceeding the NAC.

[d] There are no residences in the University of Washington study area.

Exhibit 2D-2. No Build Alternative Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	NAC[a]	Existing Noise Level[b,c]	2030 No Build Noise Level	Change in Noise Level	No Build Alternative Residences Exceeding NAC[d]
UW-1	66	65	66	1	Open space near bridge
UW-2	66	58	59	1	0
UW-3	66	55	55	0	0
UW-4	66	54	54	0	0
UW-5	66	54	54	0	0
UW-6	66	58	58	0	0
UW-7	66	62	63	1	0
UW-8	66	52	53	1	0
UW-9	66	53	54	1	0
UW-10	66	62	63	1	0
UW-11	66	66	66	0	Athletic Building Entrance
UW-12	66	64	64	0	0
UW-13	66	59	59	0	0
UW-14	66	61	62	1	0
UW-15	66	64	64	0	0
UW-16	66	62	62	0	0

[a] NAC is the WSDOT Noise Abatement Criteria level.

[b] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[c] Bold numbers indicate noise levels exceeding the NAC.

[d] Estimated number of residences with noise levels exceeding the NAC.

Exhibit 2D-3. Future 4-Lane Alternative Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	Residential Structures	NAC	Existing[a,b]	4-Lane Alternative		Sound Wall Reduction[a,b,c]
				No Wall[a,b]	w/ Wall[a,b]	
UW-1	0	66	65	66	N/A	N/A
UW-2	0	66	58	59	N/A	N/A
UW-3	0	66	55	55	N/A	N/A
UW-4	0	66	54	54	N/A	N/A
UW-5	0	66	54	54	N/A	N/A
UW-6	0	66	58	58	N/A	N/A
UW-7	0	66	62	63	N/A	N/A
UW-8	0	66	52	53	N/A	N/A
UW-9	0	66	53	54	N/A	N/A
UW-10	0	66	62	63	N/A	N/A
UW-11	0	66	66	66	N/A	N/A
UW-12	0	66	64	64	N/A	N/A
UW-13	0	66	59	59	N/A	N/A
UW-14	0	66	61	62	N/A	N/A
UW-15	0	66	64	64	N/A	N/A
UW-16	0	66	62	62	N/A	N/A

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}

[c] There are no sound walls in the University of Washington area under this alternative.

Exhibit 2D-4. Future 6-Lane Alternative Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	Residential Structures	NAC	6-Lane Alternative			Sound Wall Reduction[a,b,c]
			Existing[a,b]	No Wall[a,b]	w/ Wall[a,b]	
UW-1	0	66	65	66	N/A	N/A
UW-2	0	66	58	59	N/A	N/A
UW-3	0	66	55	55	N/A	N/A
UW-4	0	66	54	54	N/A	N/A
UW-5	0	66	54	54	N/A	N/A
UW-6	0	66	58	58	N/A	N/A
UW-7	0	66	62	63	N/A	N/A
UW-8	0	66	52	53	N/A	N/A
UW-9	0	66	53	54	N/A	N/A
UW-10	0	66	62	63	N/A	N/A
UW-11	0	66	66	66	N/A	N/A
UW-12	0	66	64	64	N/A	N/A
UW-13	0	66	59	59	N/A	N/A
UW-14	0	66	61	62	N/A	N/A
UW-15	0	66	64	64	N/A	N/A
UW-16	0	66	62	62	N/A	N/A

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}

[c] There are no sound walls in the University of Washington area under this alternative.

Exhibit 2D-5. Future 6-Lane Alternative with Pacific Street Interchange Design Option Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Interchange		Sound Wall Reduction[a,b]
				No Wall[a,b]	w/ Wall[a,b]	
UW-1	0	66	65	66	65	-1
UW-2	0	66	58	64	62	-2
UW-3	0	66	55	58	55	-3
UW-4	0	66	54	60	57	-3
UW-5	0	66	54	62	59	-3
UW-6	0	66	58	62	60	-2
UW-7	0	66	62	64	64	0
UW-8	0	66	52	58	56	-2
UW-9	0	66	53	58	56	-2
UW-10	0	66	62	65	65	0
UW-11	0	66	66	68	68	0
UW-12	0	66	64	66	66	0
UW-13	0	66	59	58	58	0
UW-14	0	66	61	61	61	0
UW-15	0	66	64	65	64	-1
UW-16	0	66	62	63	63	0

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 2D-6. Future 6-Lane Alternative with Second Montlake Bridge Option Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative		Sound Wall Reduction[a,b,c]
				No Wall[a,b]	w/ Wall[a,b]	
UW-1	0	66	65	68	N/A	N/A
UW-2	0	66	58	59	N/A	N/A
UW-3	0	66	55	55	N/A	N/A
UW-4	0	66	54	53	N/A	N/A
UW-5	0	66	54	54	N/A	N/A
UW-6	0	66	58	59	N/A	N/A
UW-7	0	66	62	63	N/A	N/A
UW-8	0	66	52	53	N/A	N/A
UW-9	0	66	53	54	N/A	N/A
UW-10	0	66	62	63	N/A	N/A
UW-11	0	66	66	66	N/A	N/A
UW-12	0	66	64	64	N/A	N/A
UW-13	0	66	59	60	N/A	N/A
UW-14	0	66	61	62	N/A	N/A
UW-15	0	66	64	65	N/A	N/A
UW-16	0	66	62	62	N/A	N/A

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}

[c] There are no sound walls in the University of Washington area under this alternative.

Exhibit 2D-7. Summary of Future Peak-Hour Traffic Noise Levels for the University of Washington

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
UW-1	65	66	66	66	68	68
UW-2	58	59	59	59	59	59
UW-3	55	55	55	55	55	55
UW-4	54	54	54	54	53	54
UW-5	54	54	54	54	54	54
UW-6	58	58	58	58	59	58
UW-7	62	63	63	63	63	63
UW-8	52	53	53	53	53	53
UW-9	53	54	54	54	54	54
UW-10	62	63	63	63	63	63
UW-11	66	66	66	66	66	66
UW-12	64	64	64	64	64	64
UW-13	59	59	59	59	60	60
UW-14	61	62	62	62	62	62
UW-15	64	64	64	64	65	65
UW-16	62	62	62	62	62	62

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

2E: Laurelhurst Neighborhood

Exhibit 2E-1. 6-Lane Alternative with Pacific Street Interchange Option Peak-Hour Traffic Noise Levels for Laurelhurst Neighborhood

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative w/Pacific Interchange		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
LH-1	2	66	61	63	63	0
LH-2	2	66	61	63	63	0
LH-3	2	66	59	61	61	0
LH-4	2	66	60	62	62	0
LH-5	2	66	53	56	56	0
LH-6	3	66	57	60	60	0
LH-7	2	66	51	57	57	0

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 2E-2. Summary of Future Peak-Hour Traffic Noise Levels for Laurelhurst Neighborhood

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Options	
		No Build	4-Lane	6-Lane	Pacific Street Interchange	Second Montlake Bridge
LH-1	61	61	62	63	63	63
LH-2	61	61	62	62	63	62
LH-3	59	60	61	61	61	61
LH-4	60	60	61	62	62	62
LH-5	53	54	55	56	56	56
LH-6	57	58	59	59	60	59
LH-7	51	51	56	55	57	55

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Attachment 3

Noise Levels in the Eastside Project Area

3A: Medina and Hunts Point North of SR 520

Exhibit 3A-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Medina and Hunts Point North of SR 520

Receiver Number	Residential Structures	NAC		6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
			Existing[a,b]	No Wall[a]	w/ Wall[a]	
PN-1	3	66	**67**	62	56	-6
PN-2	3	66	**69**	**73**	61	-12
PN-3	4	66	**75**	--	--	--
PN-4	0	66	**70**	**66**	62	-4
PN-5	3	66	**66**	**66**	62	-4
PN-6	2	66	64	64	60	-4
PN-7	6	66	61	60	58	-2
PN-8	4	66	60	59	57	-2
PN-9	3	66	60	59	58	-1
PN-10	4	66	59	58	55	-3
PN-11	0	66	63	61	56	-5
PN-12	4	66	57	56	53	-3
PN-13	3	66	57	58	53	-5
PN-14	4	66	56	57	52	-5
PN-15	0	66	**80**	**75**	62	-13
PN-16	0	66	**74**	**72**	61	-11
PN-17	0	66	**72**	**67**	59	-8
PN-18	0	66	**66**	**66**	58	-8
PN-19	0	66	65	64	57	-7
PN-20	0	66	64	63	56	-7
PN-21	0	66	63	62	55	-7
PN-22	0	66	61	61	55	-6
PN-23	0	66	61	61	54	-7
PN-24	0	66	60	60	54	-6
PN-25	3	66	**67**	**69**	59	-10
PN-26	2	66	**71**	**73**	61	-12
PN-27	1	66	**69**	**71**	60	-11
PN-28	6	66	**71**	**74**	62	-12
PN-29	4	66	**67**	**66**	65	-1

Exhibit 3A-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Medina and Hunts Point North of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PN-30	6	66	60	60	59	-1
PN-31	4	66	63	63	58	-5
PN-32	3	66	63	64	58	-6
PN-33	4	66	64	65	57	-8
PN-34	4	66	62	64	55	-9
PN-35	3	66	62	63	55	-8
PN-36	4	66	61	62	55	-7
PN-37	6	66	60	60	56	-4
PN-38	4	66	58	59	56	-3
PN-39	6	66	57	57	56	-1
PN-40	4	66	60	61	54	-7
PN-41	4	66	57	58	52	-6
PN-42	4	66	57	58	53	-5
PN-43	3	66	52	54	52	-2

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 3A-2. Summary of Future Peak-Hour Traffic Noise Levels for Medina and Hunts Point North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PN-1	**67**	**68**	56	57	56
PN-2	**69**	**70**	60	61	61
PN-3	**75**	**75**	65	--	--
PN-4	**70**	**71**	64	61	62
PN-5	**66**	**67**	60	61	62
PN-6	64	65	58	59	60
PN-7	61	62	55	57	58
PN-8	60	60	55	56	57
PN-9	60	61	57	58	58
PN-10	59	60	54	54	55
PN-11	63	64	56	55	56
PN-12	57	58	52	52	53
PN-13	57	58	52	53	53
PN-14	56	57	51	52	52
PN-15	**80**	**80**	61	63	62
PN-16	**74**	**75**	59	61	61
PN-17	**72**	**72**	58	59	59
PN-18	**66**	**67**	57	58	58
PN-19	65	**66**	56	57	57
PN-20	64	64	55	56	56
PN-21	63	63	54	55	55
PN-22	61	62	54	54	55
PN-23	61	62	53	54	54
PN-24	60	61	53	54	54
PN-25	**67**	**67**	58	59	59
PN-26	**71**	**71**	60	62	61
PN-27	**69**	**69**	59	61	60
PN-28	**71**	**72**	63	63	62
PN-29	**67**	**68**	**66**	65	65
PN-30	60	61	58	58	59

Exhibit 3A-2. Summary of Future Peak-Hour Traffic Noise Levels for Medina and Hunts Point North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PN-31	63	64	58	58	58
PN-32	63	64	56	58	58
PN-33	64	65	56	58	57
PN-34	62	63	55	56	55
PN-35	62	63	54	55	55
PN-36	61	62	55	55	55
PN-37	60	61	55	56	56
PN-38	58	59	55	55	56
PN-39	57	57	55	55	56
PN-40	60	61	53	54	54
PN-41	57	57	52	52	52
PN-42	57	57	52	53	53
PN-43	52	53	51	51	52

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

3B: Medina and Hunts Point South of SR 520

Existing 3B-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Medina and Hunts Point South of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PS-1	3	66	**68**	63	55	-8
PS-2	3	66	**67**	65	55	-10
PS-3	2	66	**71**	**66**	59	-7
PS-4	4	66	**73**	**67**	63	-4
PS-5	2	66	**73**	**67**	62	-5
PS-6	0	66	**71**	**71**	60	-11
PS-7	1	66	**70**	**71**	62	-9
PS-8	1	66	**71**	**72**	64	-8
PS-9	4	66	**66**	**66**	60	-6
PS-10	4	66	**68**	**68**	61	-7
PS-11	3	66	64	65	59	-6
PS-12	2	66	**67**	**66**	62	-4
PS-13	3	66	**72**	**66**	64	-2
PS-14	4	66	**66**	62	62	0
PS-15	4	66	60	59	56	-3
PS-16	3	66	63	62	57	-5
PS-17	4	66	64	63	59	-4
PS-18	4	66	**66**	**66**	60	-6
PS-19	3	66	64	64	57	-7
PS-20	0	66	**66**	**66**	57	-9
PS-21	2	66	63	62	56	-6
PS-22	3	66	62	59	55	-4
PS-23	4	66	65	59	54	-5
PS-24	4	66	62	57	52	-5
PS-25	3	66	61	59	55	-4
PS-26	4	66	57	56	52	-4
PS-27	4	66	59	59	53	-6
PS-28	6	66	57	57	52	-5
PS-29	6	66	59	60	55	-5

Existing 3B-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Medina and Hunts Point South of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PS-30	4	66	61	61	56	-5
PS-31	5	66	59	60	54	-6
PS-32	6	66	56	56	53	-3
PS-33	4	66	63	65	60	-5

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Existing 3B-2. Summary of Future Peak-Hour Traffic Noise Levels for Medina and Hunts Point South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PS-1	**68**	**69**	57	55	55
PS-2	**67**	**68**	58	55	55
PS-3	**71**	**71**	60	58	59
PS-4	**73**	**74**	63	63	63
PS-5	**73**	**73**	**67**	62	62
PS-6	**71**	**72**	61	60	60
PS-7	**70**	**71**	62	62	62
PS-8	**71**	**71**	63	65	64
PS-9	**66**	**67**	60	60	60
PS-10	**68**	**69**	61	61	61
PS-11	64	65	60	59	59
PS-12	**67**	**68**	65	62	62
PS-13	**72**	**73**	**68**	64	64
PS-14	**66**	**68**	63	62	62
PS-15	60	61	57	56	56
PS-16	63	63	58	57	57
PS-17	64	65	59	58	59
PS-18	**66**	**66**	61	61	60
PS-19	64	64	57	57	57
PS-20	**66**	**67**	59	58	57
PS-21	63	64	58	56	56
PS-22	62	62	56	54	55
PS-23	65	**66**	56	54	54
PS-24	62	63	55	52	52
PS-25	61	61	56	54	55
PS-26	57	58	53	51	52
PS-27	59	59	54	53	53
PS-28	57	57	53	52	52
PS-29	59	59	55	55	55
PS-30	61	62	56	56	56

Existing 3B-2. Summary of Future Peak-Hour Traffic Noise Levels for Medina and Hunts Point South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PS-31	59	59	54	54	54
PS-32	56	57	53	53	53
PS-33	63	65	60	60	60

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

3C: Hunts Point, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

Exhibit 3C-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Hunts Point, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PK-1	2	66	65	**67**	60	-7
PK-2	0	66	64	65	59	-6
PK-3	3	66	**68**	**69**	61	-8
PK-4	3	66	61	62	57	-5
PK-5	4	66	58	59	56	-3
PK-6	5	66	54	54	51	-3
PK-7	0	66	**59**	58	59	1
PK-8	0	66	58	61	58	-3
PK-9	0	66	56	59	57	-2
PK-10	0	66	55	57	57	0
PK-11	0	66	54	55	56	1
PK-12	0	66	53	54	55	1
PK-13	0	66	52	53	55	2
PK-14	0	66	51	52	54	2
PK-15	0	66	50	52	54	2
PK-16	0	66	49	51	53	2
PK-17	3	66	**70**	**68**	63	-5
PK-18	4	66	**68**	**74**	65	-9
PK-19	2	66	60	**66**	59	-7
PK-20	3	66	58	62	59	-3
PK-21	3	66	60	64	58	-6
PK-22	2	66	**67**	**68**	62	-6
PK-23	3	66	62	63	58	-5
PK-24	4	66	**66**	**66**	60	-6
PK-25	3	66	55	57	54	-3
PK-26	4	66	57	56	54	-2
PK-27	4	66	57	57	55	-2
PK-28	3	66	61	62	56	-6
PK-29	3	66	61	63	62	-1
PK-30	4	66	54	55	52	-3

Exhibit 3C-1. 6-Lane Alternative with Bicycle/Pedestrian Path to the North Option Peak-Hour Traffic Noise Levels for Hunts Point, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PK-31	4	66	53	55	52	-3
PK-32	3	66	49	51	50	-1
PK-33	3	66	53	53	51	-2
PK-34	3	66	51	52	49	-3
PK-35	5	66	53	56	53	-3
PK-36	0	66	**73**	**78**	63	-15
PK-37	0	66	**67**	**67**	58	-9
PK-38	0	66	65	65	58	-7
PK-39	0	66	63	63	56	-7
PK-40	0	66	62	61	54	-7
PK-41	0	66	60	60	54	-6
PK-42	0	66	59	59	53	-6
PK-43	0	66	58	59	53	-6
PK-44	0	66	58	58	52	-6
PK-45	0	66	57	58	52	-6
PK-46	4	66	62	62	56	-6
PK-47	2	66	62	62	56	-6
PK-48	4	66	60	60	56	-4
PK-49	20	66	59	59	55	-4
PK-50	6	66	59	60	54	-6

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 3C-2. Summary of Future Peak-Hour Traffic Noise Levels for Hunts Points, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PK-1	65	**66**	60	60	60
PK-2	64	65	58	58	59
PK-3	**68**	**69**	60	61	61
PK-4	61	62	56	57	57
PK-5	58	58	53	56	56
PK-6	54	54	51	52	51
PK-7	59	60	56	58	59
PK-8	58	59	54	56	58
PK-9	56	57	53	54	57
PK-10	55	56	51	53	57
PK-11	54	55	50	51	56
PK-12	53	54	49	50	55
PK-13	52	53	48	49	55
PK-14	51	52	48	49	54
PK-15	50	51	47	48	54
PK-16	49	50	47	47	53
PK-17	**70**	**71**	64	62	63
PK-18	**68**	**69**	63	65	65
PK-19	60	61	63	59	59
PK-20	58	59	61	58	59
PK-21	60	61	59	58	58
PK-22	**67**	**68**	61	62	62
PK-23	62	63	58	58	58
PK-24	**66**	**67**	57	59	60
PK-25	55	56	51	54	54
PK-26	57	57	54	54	54
PK-27	57	58	56	55	55
PK-28	61	61	56	56	56
PK-29	61	62	62	62	62
PK-30	54	55	52	52	52

Exhibit 3C-2. Summary of Future Peak-Hour Traffic Noise Levels for Hunts Points, Clyde Hill, Yarrow Point, and Kirkland North of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PK-31	53	54	50	51	52
PK-32	49	50	47	50	50
PK-33	53	53	50	51	51
PK-34	51	52	50	49	49
PK-35	53	54	53	53	53
PK-36	**73**	**74**	65	65	63
PK-37	**67**	**68**	59	59	58
PK-38	65	**66**	58	58	58
PK-39	63	64	56	56	56
PK-40	62	62	54	55	54
PK-41	60	61	54	54	54
PK-42	59	60	53	53	53
PK-43	58	59	53	53	53
PK-44	58	59	52	53	52
PK-45	57	58	52	52	52
PK-46	62	63	57	56	56
PK-47	62	63	56	56	56
PK-48	60	61	56	56	56
PK-49	59	59	55	55	55
PK-50	59	60	55	54	54

-- = Receiver location in new highway right-of-way; therefore, no noise levels were calculated.

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

3D: Hunts Point, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Exhibit 3D-1. 6-Lane Alternative Peak-Hour Traffic Noise Levels for Hunts Point, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Residential Structures	NAC		6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
			Existing[a,b]	No Wall[a]	w/ Wall[a]	
PB-1	2	66	**72**	**73**	64	-9
PB-2	2	66	**69**	**75**	61	-14
PB-3	2	66	**68**	**72**	60	-12
PB-4	3	66	**69**	**71**	59	-12
PB-5	3	66	**73**	**76**	61	-15
PB-6	4	66	62	64	58	-6
PB-7	2	66	62	64	58	-6
PB-8	3	66	64	65	59	-6
PB-9	3	66	**70**	**75**	63	-12
PB-10	4	66	**66**	**70**	61	-9
PB-11	3	66	**68**	**68**	63	-5
PB-12	2	66	**68**	**66**	59	-7
PB-13	3	66	60	**67**	63	-4
PB-14	4	66	61	64	60	-4
PB-15	4	66	65	**67**	61	-6
PB-16	4	66	**66**	**67**	57	-10
PB-17	4	66	65	**66**	56	-10
PB-18	2	66	**71**	**73**	62	-11
PB-19	2	66	**71**	**73**	**66**	-7
PB-20	3	66	**69**	**72**	64	-8
PB-21	0	66	**68**	**72**	61	-11
PB-22	4	66	**67**	**69**	63	-6
PB-23	4	66	**69**	**72**	65	-7
PB-24	4	66	**67**	**70**	**66**	-4
PB-25	15	66	62	62	62	0
PB-26	15	66	60	60	60	0
PB-27	15	66	58	59	59	0
PB-28	4	66	61	63	61	-2
PB-29	2	66	65	**67**	59	-8

Exhibit 3D-1. 6-Lane Alternative Peak-Hour Traffic Noise Levels for Hunts Point, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Residential Structures	NAC		6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
			Existing[a,b]	No Wall[a]	w/ Wall[a]	
PB-30	3	66	62	63	58	-5
PB-31	4	66	62	64	59	-5
PB-32	3	66	64	65	60	-5
PB-33	3	66	62	63	58	-5
PB-34	3	66	65	**67**	61	-6
PB-35	3	66	64	65	58	-7
PB-36	4	66	59	60	54	-6
PB-37	3	66	60	60	54	-6
PB-38	3	66	58	59	54	-5
PB-39	4	66	59	61	56	-5
PB-40	4	66	53	57	53	-4
PB-41	4	66	54	58	55	-3
PB-42	3	66	56	59	56	-3
PB-43	3	66	64	67	64	-3
PB-44	4	66	59	61	59	-2
PB-45	3	66	60	61	59	-2
PB-46	4	66	62	62	58	-4
PB-47	3	66	62	63	58	-5
PB-48	3	66	64	65	59	-6
PB-49	3	66	62	64	61	-3
PB-50	4	66	64	64	61	-3
PB-51	4	66	60	60	59	-1
PB-52	4	66	55	55	54	-1
PB-53	4	66	54	55	53	-2
PB-54	2	66	58	59	56	-3
PB-55	2	66	62	63	61	-2
PB-56	3	66	59	60	58	-2
PB-57	3	66	64	64	63	-1
PB-58	2	66	61	62	59	-3

Exhibit 3D-1. 6-Lane Alternative Peak-Hour Traffic Noise Levels for Hunts Point, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Residential Structures	NAC	Existing[a,b]	6-Lane Alternative with Bicycle/Pedestrian Path to the North Option		Sound Wall Reduction[a]
				No Wall[a]	w/ Wall[a]	
PB-59	4	66	58	59	57	-2
PB-60	4	66	59	60	58	-2
PB-61	6	66	59	60	58	-2
PB-62	4	66	51	52	50	-2
PB-63	4	66	50	51	49	-2
PB-64	4	66	48	48	47	-1

[a] L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.

Exhibit 3D-2. Comparison of Future Peak-Hour Traffic Noise Levels for Hunts Points, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PB-1	64	64	64	64	64
PB-2	61	61	61	61	61
PB-3	60	60	60	60	60
PB-4	59	59	59	59	59
PB-5	61	61	61	61	61
PB-6	58	58	58	58	58
PB-7	58	58	58	58	58
PB-8	59	59	59	59	59
PB-9	63	63	63	63	63
PB-10	61	61	61	61	61
PB-11	63	63	63	63	63
PB-12	59	59	59	59	59
PB-13	63	63	63	63	63
PB-14	60	60	60	60	60
PB-15	61	61	61	61	61
PB-16	57	57	57	57	57
PB-17	56	56	56	56	56
PB-18	62	62	62	62	62
PB-19	**66**	**66**	**66**	**66**	**66**
PB-20	64	64	64	64	64
PB-21	61	61	61	61	61
PB-22	63	63	63	63	63
PB-23	65	65	65	65	65
PB-24	**66**	**66**	**66**	**66**	**66**
PB-25	62	62	62	62	62
PB-26	60	60	60	60	60
PB-27	59	59	59	59	59
PB-28	61	61	61	61	61

Exhibit 3D-2. Comparison of Future Peak-Hour Traffic Noise Levels for Hunts Points, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PB-29	59	59	59	59	59
PB-30	58	58	58	58	58
PB-31	59	59	59	59	59
PB-32	60	60	60	60	60
PB-33	58	58	58	58	58
PB-34	61	61	61	61	61
PB-35	58	58	58	58	58
PB-36	54	54	54	54	54
PB-37	54	54	54	54	54
PB-38	54	54	54	54	54
PB-39	56	56	56	56	56
PB-40	53	53	53	53	53
PB-41	55	55	55	55	55
PB-42	56	56	56	56	56
PB-43	64	64	64	64	64
PB-44	59	59	59	59	59
PB-45	59	59	59	59	59
PB-46	58	58	58	58	58
PB-47	58	58	58	58	58
PB-48	59	59	59	59	59
PB-49	61	61	61	61	61
PB-50	61	61	61	61	61
PB-51	59	59	59	59	59
PB-52	54	54	54	54	54
PB-53	53	53	53	53	53
PB-54	56	56	56	56	56
PB-55	61	61	61	61	61
PB-56	58	58	58	58	58

Exhibit 3D-2. Comparison of Future Peak-Hour Traffic Noise Levels for Hunts Points, Clyde Hill, Yarrow Point, and Bellevue South of SR 520

Receiver Number	Existing[a,b]	Future 2030 Noise Levels[a,b]			6-Lane Alternative Option
		No Build	4-Lane	6-Lane	Bicycle/Pedestrian Path to the North
PB-57	63	63	63	63	63
PB-58	59	59	59	59	59
PB-59	57	57	57	57	57
PB-60	58	58	58	58	58
PB-61	58	58	58	58	58
PB-62	50	50	50	50	50
PB-63	49	49	49	49	49
PB-64	47	47	47	47	47

[a] Modeled L_{eq} noise levels in decibels with A-weighting (dBA).

[b] Bold numbers indicate noise levels exceeding the NAC, 66 dBA L_{eq}.