



In this chapter, we compare the 4-Lane, 6-Lane, and No Build Alternatives in terms of how they would affect the Seattle project area. This chapter provides more detail than Chapter 4. Topics covered include visual quality, local traffic, noise, neighborhood activities, and cultural/historic resources

## Chapter 5: Detailed Comparison of Alternatives – Seattle

This chapter compares the 4-Lane, 6-Lane, and No Build Alternatives in terms of how they are expected to affect the Seattle project area. The effects we cover here are those that would differ substantially among the alternatives; the description of effects is more detailed than the summary version provided in Chapter 4.

First, we look at how the project would physically change the human environment—the things people see and hear and the way they go about their daily activities. Next, we explore how the natural environment, including water quality, wetlands, and fish and wildlife habitat, may change as a result of the project. This chapter also describes effects of the project on cultural and historic resources. To streamline the discussion, topics where project effects would be relatively minor or largely similar among alternatives—including air quality, energy consumption, the regional economy, and the potential for encountering hazardous materials during project construction—are covered only in Chapter 4. The effects of the 6-Lane Alternative options are described only where they differ from the effects of the 6-Lane Alternative.

In some cases, one or both of the build alternatives may affect the project area in a negative way. In these cases, the description of these effects includes a discussion of what measures would be used to avoid, minimize, or mitigate them. Readers interested in seeing a more extensive discussion of the analyses the project team completed can refer to Appendices A through V of this Draft EIS.

### What would the Seattle project area look like if the project were built?

The appearance of SR 520 in the project area would change if the project were built. The bridges and roadway would be wider, shifted to the north, and, in some areas, raised or lowered. Sound walls would run

along both sides of the roadway. Several buildings that are now close to SR 520 would be removed to make way for the new road. The views that would be most affected are in the vicinity of the Portage Bay Bridge, the Montlake area, and the wetlands in Washington Park Arboretum. *Exhibits 5-1 through 5-4* compare how these areas look now with computer-generated simulations of how they could appear if the project were built. Appendix A, Description of Alternatives and Construction Techniques, provides more detailed descriptions of the alternatives.

Most of the effects described below apply to both the 4-Lane and 6-Lane Alternatives. Effects for the 6-Lane Alternative would be more noticeable because of its greater width. However, the 6-Lane Alternative would provide landscaped lids instead of bridges over SR 520 at 10th Avenue East and Delmar Drive, and at Montlake Boulevard. These two lids are expected to improve the appearance of these areas because they would cover the roadway with landscaped open space and vegetation. Of the 6-Lane Alternative options studied in Seattle, two would have noticeably different effects than the 6-Lane Alternative. The Pacific Street Interchange option would differ from the 6-Lane Alternative in the Arboretum and University of Washington areas and in Montlake; the Second Montlake Bridge option would change views in the immediate vicinity of the bridge. Other effects specific to the 4-Lane and 6-Lane Alternatives and options are included in the discussions for each area on the following pages. More detail on the options analysis is available in Appendix V, 6-Lane Alternative Options Report.

For both build alternatives, WSDOT has committed to a number of actions to reduce the project's visual effects. These include:

- Establishing design guidelines that provide standards for visual unity and consistency throughout the corridor
- Revegetating with compatible landscaping in areas where natural habitat and vegetation or neighborhood tree screens are removed
- Constructing aesthetically pleasing sound walls that visually screen the roadway from sensitive viewers, particularly in residential areas
- Landscaping the lids for the 6-Lane Alternative to ensure a unified visual appearance appropriate to the surrounding landscape

Under the No Build Continued Operation Scenario, SR 520 and its bridges would continue to look as they do today. In the Catastrophic Failure Scenario, the appearance of the roadway and bridges would change as a result of damage incurred during the catastrophe, but it is impossible to predict these changes.

### Portage Bay Bridge

The new Portage Bay Bridge would be 10 to 20 feet higher and considerably wider than the existing bridge, with the expansion occurring to the north. The bridge's width would vary from nine lanes under the 6-Lane

#### What is a visualization, and how can it help readers understand project effects?

The computer-enhanced photographs in this section simulate what the project area could look like with the SR 520 project. Using three-dimensional computer visualization techniques, a sophisticated computer program transforms two-dimensional project design drawings into a three-dimensional image that can be viewed from any angle. This image is then integrated with photographs of the project area to provide a realistic simulation of what the finished project would look like.

#### KEY POINTS

##### Visual Quality

At 10th Avenue East and Delmar Drive, and Montlake Boulevard, the 6-Lane Alternative would provide landscaped lids that would cover the roadway with open space and vegetation.

##### Corridor Aesthetics

The SR 520 project team is currently developing a Corridor Aesthetics Handbook. Its purpose is to establish aesthetic guidelines for the SR 520 project that reflect stakeholder preferences, and to serve as a framework to guide subsequent community-focused design efforts for the project corridor. The goal of this process is to help create a new highway facility that take cues from the natural and built environments so that it fits with or enhances the local and regional character of the surroundings. The handbook will also document WSDOT's commitment to design quality.

Alternative to six lanes under the 4-Lane Alternative and Pacific Street Interchange option, but in all cases it would be wider than it is today. Although the new bridge would be similar in construction to the existing bridge, the change in scale would be very apparent to motorists and viewers looking at the bridge from anywhere in the Portage Bay basin (*Exhibit 5-1*). Also very different would be the 8- to 10-foot-high sound walls on the sides of the bridge, which would make it more massive and box-like in appearance, and a much more prominent feature in the landscape.

The new shape and northward placement of the structure would noticeably change the view eastward from homes in the Roanoke Park neighborhood north of the bridge, and would partially block their views to the south. Homes next to the sound walls on North Capitol Hill would have their views limited or blocked by the walls, and the Bagley Viewpoint would be eliminated. To mitigate for these effects, WSDOT would revegetate in Roanoke Park and replace the Bagley Viewpoint, either at a different location (for the 4-Lane Alternative) or on the new 10th Avenue East and Delmar Drive lid (for the 6-Lane Alternative). The new sound walls could be designed with patterns or textures that would help to integrate them with their surroundings.

Motorists traveling on the roadway would find their views change markedly as a result of the sound walls (*Exhibit 5-2*). Varying from 18 to 22 feet high along North Capitol Hill (for the 4-Lane Alternative) to 8 to 10 feet high along the bridge itself, the walls would dramatically and negatively alter the motorist’s experience, blocking views to the sides and partially obstructing long-distance vistas of the Cascades. These effects would alter the qualities that led to Seattle’s designation of SR 520 as a scenic route. The 6-Lane Alternative’s effects would be somewhat less than the effects of the 4-Lane Alternative because the sound walls along North Capitol Hill would be only 12 to 14 feet high, which would minimize the “tunnel effect” on the eastbound approach to the Portage Bay Bridge. This wall would be shorter than the wall under the 4-Lane Alternative because of the 10th and Delmar lid. The interior of the walls, could, like the exterior, be softened with design elements to help make the driving experience more aesthetically pleasing.

### Montlake/University of Washington

Through Montlake, SR 520 would be widened on the north side, removing parking, buildings, shoreline vegetation, and landscaping at the NOAA Northwest Fisheries Science Center. These effects would be greater for the 6-Lane Alternative than for the 4-Lane Alternative, but would be reduced by the Pacific Street Interchange option, which would narrow the roadway in this area. The addition of sound walls (6 to 10 feet high for the 4-Lane Alternative and 8 to 18 feet high for the 6-Lane Alternative) would create additional visual effects along the length of the property between the

#### DEFINITION

##### Viewer Sensitivity

“Viewer sensitivity” is a way of gauging the visual effects of a project on a specific view. It is a combination of the following factors:

How many people have that view?

How long can they see the view?

What is their likely level of concern about the appearance, aesthetics, and quality of the view?

Low viewer sensitivity describes a condition in which few people experience a defined view or they are not particularly concerned about the view. High viewer sensitivity is a condition in which many viewers have a view frequently or for a long duration, and are very aware of and concerned about the view.

#### KEY POINTS

##### Visual Quality

Through Portage Bay the new bridge would be similar in construction to the existing bridge but larger, with sound walls on both sides. The width would vary from nine lanes under the 6-Lane Alternative to six lanes under the 4-Lane Alternative and Pacific Street Interchange option.

**Exhibit 5-1. View of Portage Bay**



Looking east-southeast toward moorage at the Queen City Yacht Club, Portage Bay Bridge, and Montlake from Boyer Avenue



**Existing Views**

- Column spacing 100 feet on center

**4-Lane Alternative**

- Column spacing 250 feet on center
- 10-foot-high sound walls with opening on north side
- Roadway about 60 feet wider and further north
- Southernmost dock (not shown here) at Queen City Yacht Club removed for construction of new bridge

**6-Lane Alternative**

- Roadway about 20 feet wider and to the north compared to 4-Lane Alternative
- Column spacing, sound walls, and removal of southernmost dock (not shown here) same as 4-Lane Alternative

**Exhibit 5-2. View of Portage Bay Bridge**

 Looking east along Portage Bay Bridge toward Montlake from under Delmar Drive bridge over SR 520



**Existing View**



**4-Lane Alternative**

- 10-foot-high sound walls except on north side of bridge
- Roadway about 60 feet wider and to the north
- Monotube style signage
- Street lights not shown



**6-Lane Alternative**

- Roadway wider than 4-Lane Alternative by about 20 feet to north and 10 feet on south
- Sound walls, signs, and lights same as 4-Lane Alternative (observed differences are based on location of camera relative to the wall)

bicycle/pedestrian path and SR 520. Viewers could perceive the sound walls as a positive change because they would block views of the highway from ground level, or as a negative change because of the loss of landscaping and existing views. WSDOT would replace vegetation in accordance with its existing policies and any specific provisions that might be incorporated into the SR 520 corridor aesthetics guidelines.

Both alternatives and all options would replace the MOHAI building and parking lot and the narrow tree screen along the building with roadway and a stormwater treatment wetland. (Refer to the Cultural Resources section of this chapter for further discussion of effects on MOHAI.) Motorists and nearby residents would notice this change, as would users of McCurdy and East Montlake parks where these facilities are located. However, the stormwater treatment wetland could be a positive feature to viewers; it would replace a large asphalt parking lot with a natural-appearing landscape compatible with the adjacent shoreline and park. The MOHAI site and the remaining portions of McCurdy and East Montlake parks would be redesigned in cooperation with the Seattle Parks and Recreation Department, the University of Washington Botanic Gardens, and the Arboretum Foundation.

All of the 6-Lane Alternative options would alter the appearance of the SR 520/Montlake Boulevard interchange. With the Pacific Street Interchange option, the interchange ramps would be removed completely and converted to landscaped open space, improving the appearance of the area. The No Montlake Freeway Transit Stop and Second Montlake Bridge options would both slightly reduce the project's effects by narrowing SR 520 where the current transit stop is located.

Near the Montlake Boulevard/Pacific Street intersection and north along Montlake Boulevard, the Pacific Street Interchange option would create substantial changes that would not occur with the 6-Lane Alternative. The terminus of the Union Bay Bridge just south of Husky Stadium and the lowered roadway at Montlake Boulevard would create a very different visual environment. Bus stops and layover/transit facilities, including the University of Washington Link light rail station, may be more difficult for pedestrians to see as a result. However, the intersection would be bridged to provide pedestrian access across Montlake Boulevard and Pacific Street. Widening by 35 feet on the east side of Montlake Boulevard would remove most or all of the street trees next to the bicycle trail just north of the Montlake Bridge. It would also dramatically change the view of and from the University of Washington Canoe House, which would be nearly beneath the bridge structure as it approached the shoreline. The Pacific Street Interchange option would not block views of Mount Rainier from the Rainier Vista view corridor.

The Second Montlake Bridge option would change the visual surroundings of the existing Montlake Bridge by adding a second bridge immedi-

#### KEY POINTS

##### Visual Quality

Through the Montlake area the freeway would be widened to the north, removing buildings, parking, shoreline vegetation, and landscaping. Effects would be greater with the 6-Lane Alternative than with the 4-Lane Alternative but would be less with the Pacific Street Interchange option. This option would narrow the freeway through Montlake by removing the Montlake interchange ramps completely and converting the area to landscaped open space.



Stormwater treatment wetlands can be positive features to viewers, as shown in this example.

ately to the east, and by removing two houses and a 50- to 80-foot swath of mature trees and shrubs on the east side of Montlake Boulevard. The new bridge and roadway would be more open than the current corridor but the changes would adversely affect the setting of the historic bridge and alter the character of the tree-lined boulevard. Both viewers in the bridge area and those observing the bridge (for example, from the Montlake Cut) would experience a noticeable difference from the existing view.

### Washington Park Arboretum

In the Washington Park Arboretum, views are expected to change very noticeably in both positive and negative ways. The existing roadway is about 15 feet above the water and at ground level on Foster Island. With the 4-Lane and the 6-Lane Alternatives, the new highway would climb steadily from Montlake to a high point of 60 feet above the water just east of Foster Island (*Exhibit 5-3*). From Foster Island and more distant points such as Husky Stadium, the increased height, greater thickness of the structure, and the 8-foot-high sound walls would make the bridge more prominent than it is today. The sound walls would block drivers' views outward toward the wetland and the open water of Lake Washington.

The design of the roadway structure through this area provides for rows of columns that are spaced 250 feet apart compared to 100 feet apart on the existing structure. Wider-spaced columns would improve visibility across the water. The project also would permanently remove the unused R.H. Thomson Expressway Ramps, which would provide more open views for boaters in the waterways south of Marsh and Foster islands and hikers on trails in the Arboretum (*Exhibit 5-4*). Over time, new vegetation planted to mitigate for the effects of project development would help screen Arboretum users from views of the roadway.

The Pacific Street Interchange option would have greater effects than the 6-Lane Alternative on views from the Arboretum and Union Bay. The additional ramps would increase SR 520's width through Foster Island and over the surrounding open-water areas, although the separation between the ramps and the mainline would allow light to shine through. Two sets of support columns for the Union Bay Bridge would encroach upon the existing broad views from Marsh Island, and the structure would shade a portion of the island beneath it. Because of its height, the Union Bay Bridge would be highly visible from most points around Union Bay, and would dominate views from Marsh and Foster islands as well as from East Montlake Park.

#### KEY POINTS

#### Visual Quality

From Foster Island and more distant points such as Husky Stadium, the new bridge would be more prominent than it is today. Effects would be greater with the 6-Lane Alternative than with the 4-Lane Alternative, and greatest with the Pacific Street Interchange option, which would construct the new Union Bay Bridge.

**Exhibit 5-3. View of Arboretum Wetlands**

 Looking east across Union Bay toward west approach and ramps and Marsh Island from just south of pedestrian bridge in East Montlake Park



**Existing View**

- Column spacing 100 feet on center
- Main roadway about 15 feet above water
- Arboretum off-ramp visible center left; Montlake Boulevard off-ramp closest to viewpoint; main roadway visible in background



**4-Lane Alternative**

- Main roadway is long structure in middle of image, 45 to 55 feet above water at distant ramp
- Arboretum off-ramp is partially visible in distance, about 70 feet above water
- Column spacing 250 feet on center
- Unused ramps removed
- Main roadway has 8-foot-high sound walls



**6-Lane Alternative**

- Montlake Boulevard exit ramp visible in center of image, 30 to 40 feet above water
- HOV off-ramp visible at top of image, about 60 feet above water
- Column spacing, removal of unused ramps, and 8-foot-high sound walls on main roadway same as 4-Lane Alternative



**Pacific Street Interchange Option**

- Pacific Street Interchange and Union Bay Bridge visible at top of image, about 80 feet above water
- Main roadway, visible at center of image, 30 to 40 feet above water
- Column spacing, removal of unused ramps, and 8-foot-high sound walls on main roadway same as 4-Lane Alternative

**Exhibit 5-4. View of Arboretum Trail**



Looking northwest along pedestrian path toward tunnel under SR 520 that connects to Foster Island trail



**Existing Views**

- Main roadway 15 to 20 feet above ground level
- Column spacing 100 feet on center

**4-Lane Alternative**

- Roadway shifted about 80 feet to north
- Roadway 50 to 55 feet above ground level
- Column spacing 250 feet on center

**6-Lane Alternative**

- South edge of roadway about 15 feet closer to viewpoint
- Roadway and column spacing same as 4-Lane Alternative

**Pacific Street Interchange Option**

- Roadway in this area is 20 feet wider than 6-Lane Alternative
- Roadway and column spacing same as 4-Lane Alternative

## How would the project affect local streets, intersections, transit, and parking?

### How well will local streets and intersections near SR 520 operate?

Like the regional highway system, local streets and intersections near SR 520 are expected to see changes in traffic conditions by 2030. The transportation team evaluated local traffic effects near a number of key intersections in the project area. Under the No Build Alternative, traffic volumes on Seattle intersections near the I-5 interchanges of Stewart, Mercer, Roanoke, and Northeast 45th Streets would vary from 4 percent less to 11 percent more than existing traffic volumes during the morning peak hour, and would increase by 6 to 9 percent over existing levels during the afternoon peak hour. Traffic volumes at intersections around the SR 520 interchanges of Montlake Boulevard and Lake Washington Boulevard would increase by 3 percent during the morning peak hour and 6 percent during the afternoon peak hour.

#### Changes in Traffic Demand and Capacity

Neither the 4-Lane nor the 6-Lane Alternatives would change traffic demand substantially from No Build levels. Under the 4-Lane Alternative, traffic demand for local intersections near the I-5 interchanges would change by 1 percent or less from No Build levels during the morning and afternoon peak hours. Traffic in the SR 520 interchange areas in Seattle would decrease by 4 percent from No Build levels in the morning peak hour and by 3 percent during the afternoon peak hour, as shown in *Exhibit 5-5*. Under the 6-Lane Alternative, traffic in all interchange areas would change by 1 to 3 percent during the morning peak hour compared to the No Build Alternative. During the afternoon peak hour, traffic would increase by 2 to 5 percent in the I-5 interchange areas and by 1 percent or less in the SR 520 interchange areas. The 4-Lane Alternative would either decrease local traffic volumes or increase them only slightly, and the 6-Lane Alternative and two options would increase traffic volumes (*Exhibit 5-5*).

Two of the 6-Lane Alternative options—Pacific Street Interchange and Second Montlake Bridge—would increase local roadway capacity in the Montlake interchange area. The Pacific Street Interchange option would create new capacity with the construction of the Union Bay Bridge, which would provide a parallel roadway to Montlake Boulevard between Lake Washington Boulevard in the Arboretum and Northeast Pacific Street. This new roadway capacity would attract drivers, causing them to change their routes. The Pacific Street Interchange option would also close the SR 520 ramps on Montlake Boulevard and relocate them to the new interchange, which would substantially decrease the amount of traffic on Montlake Boulevard south of the Montlake Cut. At the same time,

#### Local Traffic Demand and Capacity

- No substantial change in traffic demand for 4-Lane or 6-Lane Alternatives compared to No Build
- Pacific Street Interchange and Second Montlake Bridge options would increase local traffic capacity
- Pacific Street Interchange option would reduce travel times along Montlake Boulevard by up to 20 minutes over No Build

#### KEY POINTS

##### Local Streets

Only modest changes to the traffic volumes on local streets would occur with the 4-Lane and 6-Lane Alternatives. In comparison, however, the added capacity with the Second Montlake Bridge and the Pacific Street Interchange options would increase traffic volumes on local streets, especially on Northeast Pacific Street and 15th Avenue Northeast. This is because both of these options would add lanes along Montlake Boulevard Northeast, and the Pacific Street Interchange option would create capacity on the Union Bay Bridge.

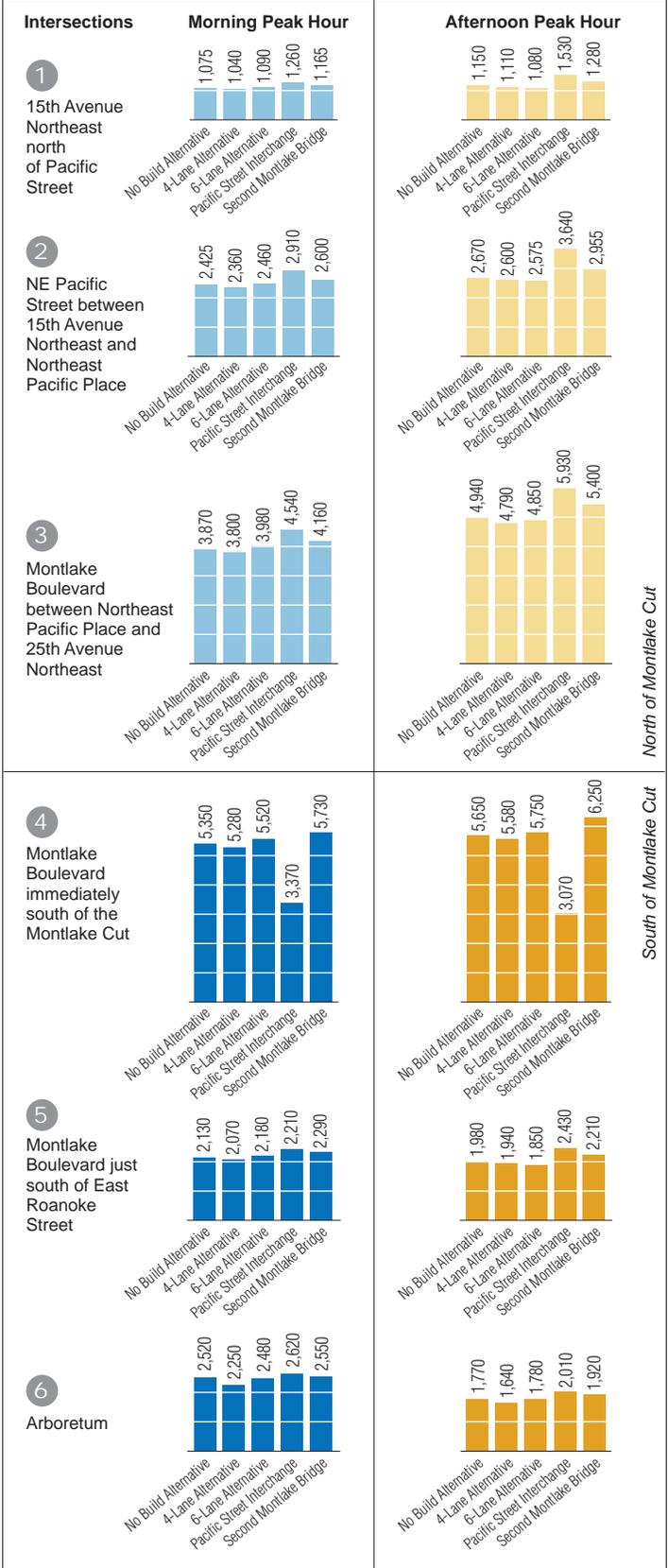


Morning rush hour congestion on the Lake Washington on-ramp to SR 520

Exhibit 5-5. Traffic Volumes on Seattle Streets, Morning and Afternoon Peak Hours



Volumes are for traffic in both directions.



traffic volumes would increase on Northeast Pacific Street, 15th Avenue Northeast, and Montlake Boulevard north of Pacific Street as drivers take advantage of increased capacity on Montlake Boulevard to access the new interchange. Overall, compared to the No Build Alternative, traffic volumes north of the Montlake Cut would increase by 18 percent during the morning commute and by 27 percent during the afternoon commute. South of the Montlake Cut, traffic volumes would decrease by 37 percent during the morning commute and by 46 percent during the evening commute. Traffic that previously used Montlake Boulevard to access SR 520 would use the new Union Bay Bridge.

With the Second Montlake Bridge option, local traffic volumes in the Seattle project area would increase by 6 percent during the morning commute and by 11 percent during the afternoon commute. This additional traffic would result because of the additional capacity (one lane in each direction) provided by the Second Montlake Bridge.

### Changes in Level of Traffic Congestion

As would be expected from the modest changes in traffic levels at local intersections, levels of service would change at some intersections with the build alternatives. Only 2 of the 38 study area intersections in Seattle would be negatively affected by the 4-Lane and 6-Lane Alternatives, while traffic operations would improve from congested or severely congested at six Seattle intersections under one or both alternatives. The most notable improvement would be at the Lake Washington Boulevard/SR 520 Arboretum ramp intersection at the Arboretum, where replacing the existing stop signs with a signal would virtually eliminate severe congestion in both the morning and afternoon peak hours (*Exhibit 5-6*).

The intersections where traffic would improve as a result of the 4-Lane or 6-Lane Alternatives are:

- The NE 45th Street/7th Avenue Northeast intersection under the 4-Lane Alternative during the afternoon peak hour
- The SR 520/Lake Washington Boulevard ramp intersection under both build alternatives during the morning and afternoon peak hours
- The Montlake Boulevard/Lake Washington Boulevard/ SR 520 east-bound ramp intersection under the 6-Lane Alternative during the afternoon peak hour
- The Montlake Boulevard/East Shelby Street intersection under both build alternatives during the morning and afternoon peak hours
- The Montlake Boulevard/Northeast Pacific Street intersection under the 4-Lane Alternative during the afternoon peak hour
- The Montlake Boulevard/Northeast 45th Street intersection under the 6-Lane Alternative during the afternoon peak hour

#### KEY POINTS

##### Local Streets

Overall, the project would improve traffic operations on local streets over the No Build Alternative. With the 4-Lane and the 6-Lane Alternatives, 6 of the 38 study intersections would improve. Two of the intersections would get worse under the 6-Lane Alternative.

Compared to the No Build Alternative, the 6-Lane Alternative would negatively affect the following two intersections, where traffic conditions would decline to congested or low to moderate levels of congestion.

- The Fairview Avenue/Valley Street intersection during the afternoon peak hour
- The intersection of East Roanoke Street, Harvard Avenue East, and the SR 520 westbound off-ramp in the afternoon peak hour

Of these intersections, only the intersection at Fairview Avenue and Valley Street would experience an effect serious enough to need mitigation, because the level of service would drop from E to F during the afternoon peak hour under the 6-Lane Alternative. WSDOT would coordinate with the Seattle Department of Transportation to determine the specific mitigation requirements during project design. No mitigation is proposed for the Harvard Avenue East/East Roanoke Street/SR 520 westbound off-ramp because the change in traffic volume would be very small and would not substantially worsen traffic congestion.

Because of the changes the Pacific Street Interchange and Second Montlake Bridge options would create in traffic patterns, these options would differ in their effects on local intersections. Overall, the added roadway capacity would improve traffic operations at Montlake area intersections that are congested today, especially with the Pacific Street Interchange option. The

DEFINITION	
<b>Traffic Levels of Service</b>	
Level of service (LOS) measurements rate how well traffic operates on a given transportation facility. The rating scale uses the letters A through F, similar to grading scales used in the education system, where A is the best grade and F the worst. The letter grades are assigned based on the levels of delay that drivers experience at an intersection. The letter A represents the least delayed conditions, while the letter F represents the most delayed conditions. For this Draft 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)
Appendix R, Transportation Discipline Report, includes full results of the level of service analysis.	

**Exhibit 5-6. Changes in 2030 Level of Service at Seattle Intersections**

Locations	Morning Peak Hour					Afternoon Peak Hour				
	No Build Alternative	4-Lane Alternative	6-Lane Alternative	Pacific Street Interchange Option	Second Montlake Bridge Option	No Build Alternative	4-Lane Alternative	6-Lane Alternative	Pacific Street Interchange Option	Second Montlake Bridge Option
<b>Seattle</b>										
Fairview Ave./Valley St.	●	●	●	●	●	●	●	●	●	●
E. Roanoke Street/Harvard Ave./SR 520 Westbound Off-Ramp	●	●	●	●	●	●	●	●	●	●
NE 45th St./7th Ave. NE	●	●	●	●	●	●	●	●	●	●
SR 520/Lake Washington Boulevard Ramps	●	●	●	●	●	●	●	●	●	●
Montlake Boulevard NE/Lake Washington Boulevard SR 520 Eastbound Ramp	●	●	●	●	●	●	●	●	●	●
Montlake Boulevard NE/E Shelby St.	●	●	●	●	●	●	●	●	●	●
Montlake Boulevard NE/NE Pacific St.	●	●	●	●	●	●	●	●	●	●
Montlake Boulevard NE/NE Pacific Pl.	●	●	●	●	●	●	●	●	●	●
Montlake Boulevard NE/NE 45th St.	●	●	●	●	●	●	●	●	●	●
NE Pacific St./15th Ave. NE	●	●	●	●	●	●	●	●	●	●

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

new intersections associated with the Pacific Street Interchange option would all operate at acceptable levels of service. Compared to the 6-Lane Alternative, levels of congestion would improve at three additional intersections with the Pacific Street Interchange option.

- The Montlake Boulevard/Lake Washington Boulevard/SR 520 eastbound ramp intersection would improve during both morning and afternoon peak hours under the Pacific Street Interchange option.
- The Montlake Boulevard/Northeast Pacific Place intersection would improve during the afternoon peak hour under the Pacific Street Interchange option.
- The Montlake Boulevard and Northeast 45th Street intersection would improve during the afternoon peak hour under the Pacific Street Interchange and Second Montlake Bridge options.

For the Pacific Street Interchange option, congestion would worsen at one intersection (Northeast Pacific Street/15th Avenue Northeast) during the afternoon peak hour, as compared to the 6-Lane Alternative. Appendix R, Transportation Discipline Report, provides a more in-depth discussion of local street and intersection operations with and without the SR 520 project.

The improved access and levels of service in the Montlake area would translate to travel time benefits under the 6-Lane Alternative and the Pacific Street Interchange option. During the afternoon peak hour, it currently takes about 25 minutes for traffic to make the short journey southbound between 25th Avenue Northeast and the Montlake interchange. The 6-Lane Alternative would reduce this travel time by 10 minutes during the peak hour and the Pacific Street Interchange option would reduce it by 20 minutes. The Pacific Street Interchange option would also offer a 10-minute time savings on this route during the off-peak hours. The Second Montlake Bridge option would not offer any appreciable travel time benefits—and in some cases could increase travel times—because it would draw more traffic to Montlake Boulevard without providing any new capacity. By relocating freeway-related traffic, the Pacific Street Interchange option would essentially allow Montlake Boulevard to function effectively as a local arterial again. This would also be good for transit, as described in the following section.

## How would the project affect transit service?

### Bus Transit

The 6-Lane Alternative would outperform the 4-Lane Alternative in terms of transit circulation, travel time, and access because it would have continuous eastbound and westbound HOV lanes from I-5 to Bellevue Way. HOV facilities would be located in the inside lanes of the roadway, as would transit stops. Transit vehicles would only need to merge with HOV traffic, not traffic in the general-purpose lanes. This would improve transit



Overall, the added local roadway capacity in the 6-Lane Alternative options would improve traffic operations at Montlake area intersections.

operations, circulation, and travel times. The 6-Lane Alternative’s transit stops would have stair and elevator access from the lid above the transit stop; the 4-Lane Alternative would include Americans with Disabilities Act-compliant ramps but no elevators.

Both build alternatives would increase the demand for transit in the project area. Compared to the No Build Alternative, the number of peak period bus trips needed to meet the additional demand would be 30 percent higher for the 4-Lane Alternative and 31 percent higher for the 6-Lane Alternative. The need includes additional buses and service hours. This increased level of transit service is not currently planned or funded. WSDOT will work with Metro Transit and Sound Transit to help ensure that this demand can be met. If the demand for transit is not met, volumes and travel times could change from those described in the traffic analysis.

With all options that close the Montlake Freeway Station, people traveling eastbound across SR 520 would be required to access buses at a different location near the intersection of Montlake Boulevard and Pacific Street. To reach this location, bus riders coming from the south of the Montlake Cut would have to walk or travel farther than today, while riders coming from the north would have a shorter distance to travel to reach the freeway station.

Removing the freeway station and operating transit service on SR 520 between the University District and the Eastside, and downtown Seattle and the Eastside would result in fewer options for riders and divide transit service between the University District and downtown Seattle. As mentioned in Chapter 4, this would reduce the options available to riders. This would require riders to plan their trips more closely according to bus schedules rather than taking advantage of the current frequent service on SR 520 and transferring or getting on and off at the Montlake Freeway Station to reach their destinations. The major effect of the closure would be on Montlake and Capitol Hill residents commuting to jobs in the Overlake area who transfer from Route 43 to Sound Transit’s Route 545 at the Montlake Freeway Station. There is no direct service between the University District and Overlake; closure of the freeway station would require Sound Transit or Metro Transit to establish an entirely new route just to meet these current needs. There would be an operating and capital cost associated with providing this service.

If the Montlake Freeway Station was removed as part of the 6-Lane Alternative, more frequent bus service would be needed to serve the University District and downtown Seattle to and from the Eastside. Similarly, the removal of this station with the Pacific Street Interchange option would require some additional bus service, but those buses would use the Pacific Street interchange to access the University District.

#### KEY POINTS

##### Transit

The 6-Lane Alternative would outperform the 4-Lane Alternative in terms of transit circulation, travel time, and access because it would have continuous eastbound and westbound HOV lanes from I-5 to Bellevue Way.



Several 6-Lane Alternative options would remove the Montlake Freeway Station.

As noted in the sidebar to the right, Montlake Bridge midday openings delay traffic on Montlake Boulevard. Bus routes that serve the University District and areas to the south must cross the Montlake Bridge and are affected by the bridge openings. With the Pacific Street Interchange option, bus travel times to and from eastbound SR 520 would improve by approximately 15 minutes for buses traveling from the 15th Avenue Northeast/Northeast Pacific Street intersection. Buses traveling to and from SR 520 would use the new Union Bay Bridge and would not have to stop for Montlake Bridge openings. With freeway traffic relocated to the new Pacific Street interchange, traffic volumes (and traffic congestion) on Montlake Boulevard south of the Montlake Cut would decrease. Therefore, even though local buses traveling across the Montlake Cut would continue to be delayed by bridge openings, their travel times would also improve over No Build conditions because congestion on Montlake Boulevard would dissipate more quickly with less traffic. With the 4-Lane and 6-Lane Alternatives, buses would still be delayed by Montlake Bridge openings.

In addition, with the Pacific Street Interchange option, there would be a 2-minute time savings on an otherwise 12 minute-long trip for HOV traffic between I-5 and Northeast 124th Street because there would be less traffic across the Portage Bay Bridge.

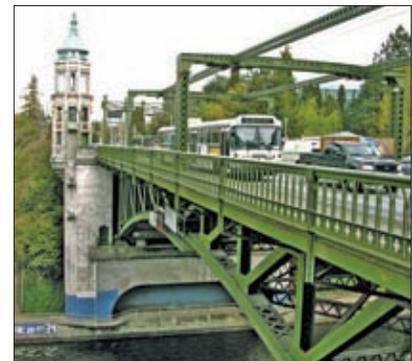
### Rail Transit

Based on Sound Transit's current construction schedule for the University Link, WSDOT anticipates that the University of Washington Link light rail station will be in place close to the same time the Pacific Street interchange would be completed. This light rail service will provide improved access between downtown Seattle, Capitol Hill, and the University District; bus riders on SR 520 would be able to transfer via the Pacific Street transfer point near the light rail station to catch connecting service to these and other areas.

Improving traffic conditions for freeway and local buses to and from the Montlake Boulevard/Pacific Street intersection and surrounding area would benefit rail transit riders through more reliable connections with the area bus service. The 4-Lane Alternative would provide some reliability benefits for transit; the 6-Lane Alternative would provide even greater reliability benefits for transit because the HOV system would be completed in both directions between I-5 and I-405, thereby allowing buses to bypass congestion. The Pacific Street Interchange option would provide the greatest reliability benefits for freeway bus service because not only would buses be able to bypass congestion on SR 520, but they would also be able to bypass the Montlake Bridge. Additionally, the Pacific Street Interchange option would also improve traffic operations on the local street network, which would benefit local bus service.

### Montlake Bridge Openings and Local Traffic

The Montlake Bridge opens for boat traffic during the early morning, middle of the day, and evening. The bridge does not open during the peak commute periods between 7 a.m. and 10 a.m. and between 3:30 p.m. and 7 p.m. on weekdays from September through April. From May through August, the bridge does not open between 7 a.m. and 9 a.m. and between 3:30 p.m. and 6 p.m. on weekdays. Bridge openings last an average of 5 minutes and delay traffic up to 10 minutes along Montlake Boulevard both northbound and southbound during the middle of the day.



Montlake Bridge openings substantially delay traffic on Montlake Boulevard.

Because the Union Bay Bridge and the new Montlake Boulevard/Pacific Street intersection would be very close to the University Link station, conflicts could occur between the two project’s design features. Potential areas of design conflict include the rail station’s north vent, tunnel facilities, station plaza, and entrance structures. There could also be a need to relocate bus stops and layover/transit facilities as a result of lowering the Montlake Boulevard/Pacific Street intersection. The bus-rail transfer locations and walking distances would not be otherwise affected by the build alternatives. Although the intersection would be bridged to provide pedestrian access across both streets, the facilities could be more difficult to see with the Pacific Street Interchange option. WSDOT will work with Sound Transit to avoid design conflicts and to ensure that the changes to the intersection do not conflict with wayfinding for Link patrons.

Although more people would use transit under No Build than do now, the benefits would be limited because buses would experience the same delays as single-occupant vehicles. The Catastrophic Failure Scenario would create substantial disruption in transit service because all buses using the affected portion of the facility would need to be rerouted.

### How would the project affect parking?

The No Build Alternative would not affect parking supply because the highway would not be expanded. However, the 4-Lane Alternative would result in an overall loss of 200 parking spaces, and the 6-Lane Alternative in an overall loss of 220 parking spaces. Of the losses, five would be on-street parking stalls located on the west side of 24th Avenue East, just south of East Hamlin Street.

The Pacific Street Interchange option would remove an additional 250 parking spaces in the University of Washington’s E-11/E-12 parking lot and along the east side of Montlake Boulevard between the Hec Edmundson Pavilion and Northeast 45th Street and an additional 250 to 300 stalls in the University of Washington’s E1 parking lot. *Exhibit 5-7* shows the loss of parking spaces for each alternative by area, and *Exhibit 5-8* shows these areas on a map.

WSDOT is currently developing mitigation strategies for the loss of parking. Potential mitigation areas include the following locations:

- NOAA Northwest Fisheries Science Center—The 4-Lane Alternative would affect 8 to 16 parking spaces at this facility; the 6-Lane Alternative would affect 20 to 40 parking spaces. One potential mitigation strategy would be to build an onsite parking structure.



It is possible that a new parking structure could be built in this location south of Husky Stadium.

**Exhibit 5-7. Number of Parking Spaces Displaced**

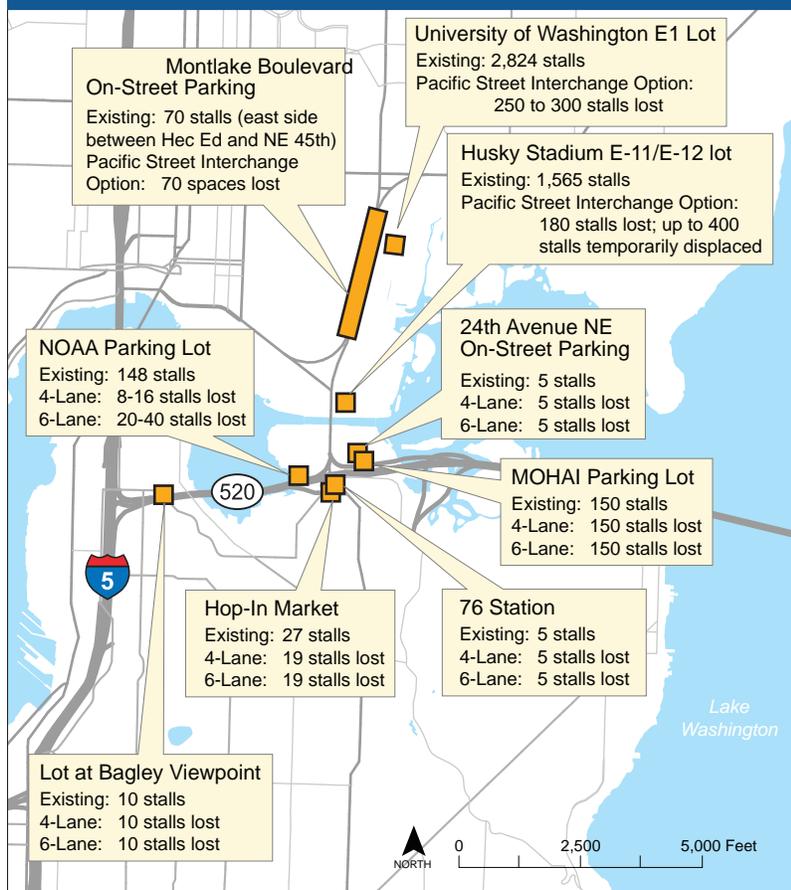
2030 Alternative/Option	I-5 Area <sup>a</sup>	Montlake/ University of Washington Area	Total
No Build	0	0	0
4-Lane	10	190	200
6-Lane	10	210	220
Pacific Street Interchange Option	10	710-760	470

<sup>a</sup>In Bagley Viewpoint parking lot.

- The Hop-In Market—Approximately 19 out of 27 parking spaces on the east and west sides of the Hop-In Market would be affected. Since the adjacent 76 service station would be acquired for the project, excess space on the service station lot could be used to replace enough of the lost parking spaces to meet the demand.
- University of Washington E-11/E-12 parking lot—It is possible that a new parking structure could be built in this location.

Refer to Appendix R, Transportation Discipline Report, for more detailed information on how the project would affect parking.

**Exhibit 5-8. Potentially Affected Parking Areas in Seattle**



Introduction to the Project  
 The Project Area: Then and Now  
 Developing the Alternatives  
 Comparison of the Alternatives  
 Detailed Comparison of Alternatives – Seattle  
 Detailed Comparison of Alternatives – Eastside  
 Construction Effects  
 Other Considerations

PART 1: WHAT THE PROJECT IS AND HOW IT CAME TO BE

PART 2: EVALUATING ALTERNATIVES

## How noisy would the Seattle project area be if the project were built?

As described in Chapter 2, traffic noise is a dominant part of life in many neighborhoods in the Seattle project area. This noise results from the neighborhoods’ proximity to SR 520 and/or I-5, which currently have few or no noise-reduction features, and from traffic on local streets. This situation would improve substantially if either of the build alternatives were built. More than half the residences that now experience noise levels approaching or exceeding FHWA’s noise abatement criteria would have their noise levels drop below the criteria because of the proposed sound walls that are part of the project design. The noise reductions would be even greater compared to No Build noise levels, which would generally be higher than existing levels. *Exhibit 5-9* summarizes the results from noise modeling used to predict future noise levels for the Seattle project area.

Of the 274 residences in Seattle where noise levels are now at or above the noise abatement criteria, 127 would continue to approach or exceed the criteria under the 4-Lane Alternative and 109 would under the 6-Lane Alternative. The 6-Lane Alternative would reduce noise more than the 4-Lane Alternative because of the two lids over SR 520 in Seattle. Noise levels for two of the 6-Lane Alternative options would differ slightly from those of the 4-Lane Alternative; 103 residences would approach or exceed the noise criteria under the Pacific Street Interchange option, and 112 would approach or exceed the criteria under the Second Montlake Bridge option.

In general, the western portion of the Seattle project area would experience the least noise reduction, mainly because I-5 and busy local streets are the dominant noise sources in that area. However, the SR 520 sound walls still would provide some benefit. *Exhibits 5-10* and *5-11* show noise conditions in Roanoke/Portage Bay, North Capitol Hill, and Montlake north and south of SR 520 with and without the project.

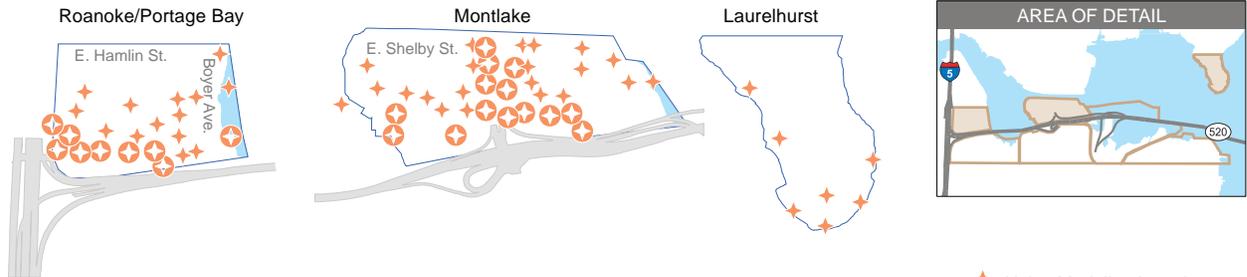
KEY POINTS	
<b>Noise</b>	
The noise situation would improve substantially if either of the build alternatives were built. At more than half of the residences where noise levels are now at or above federal noise abatement criteria, noise levels would drop to below the criteria due to sound walls, which are incorporated into the project design.	

**Exhibit 5-9. Noise Modeling Results, Seattle Project Area**

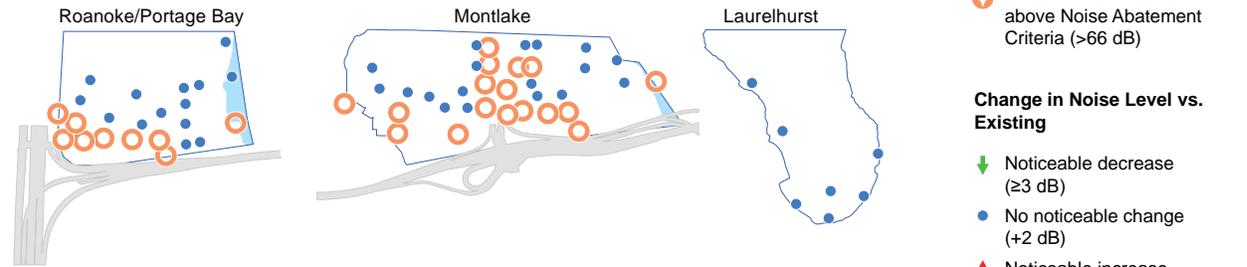
Neighborhood	Number of Residences Approaching or Exceeding FHWA Noise Abatement Criteria					
	Existing	No Build Alternative 2030	4-Lane Alternative 2030	6-Lane Alternative 2030	Pacific Street Interchange Option 2030	Second Montlake Bridge Option 2030
Roanoke/Portage Bay	24	24	19	16	16	16
North Capitol Hill	99	109	60	49	49	49
Montlake	62	66	48	44	38	47
Madison Park	89	89	0	0	0	0
Laurelhurst	0	0	0	0	0	0
<b>Total</b>	<b>274</b>	<b>288</b>	<b>127</b>	<b>109</b>	<b>103</b>	<b>112</b>

Exhibit 5-10. Noise Levels in Seattle North of SR 520

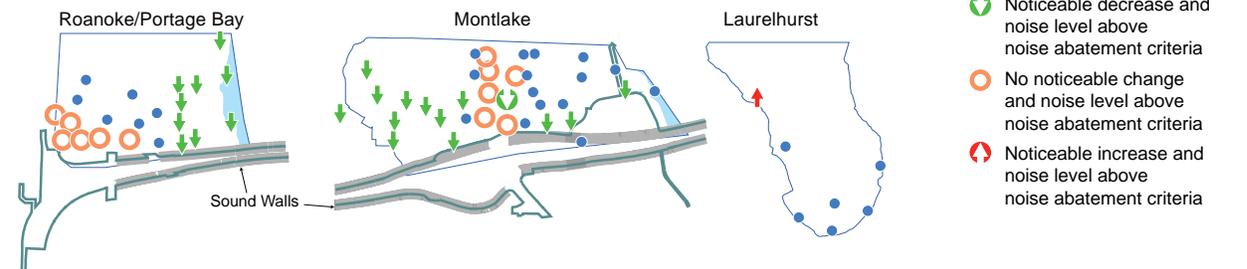
Existing



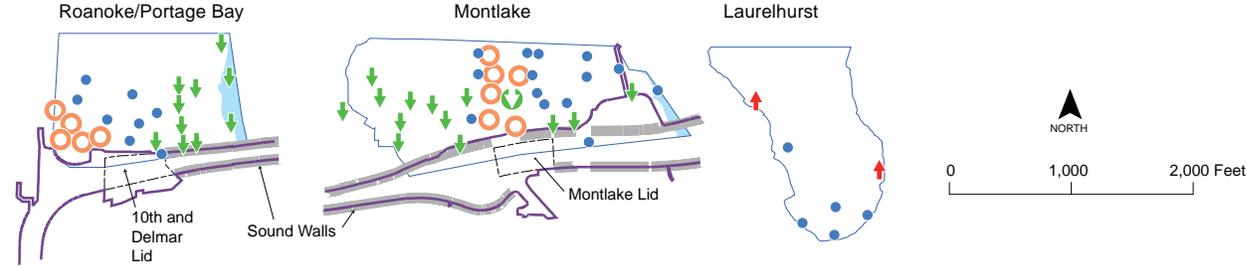
No Build Alternative



4-Lane Alternative

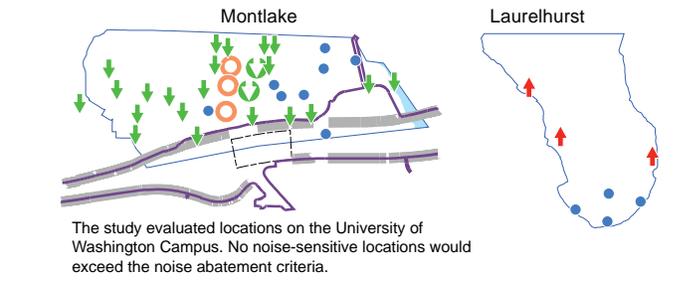


6-Lane Alternative

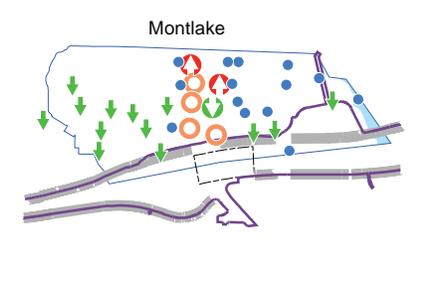


- ★ Noise Modeling Location
  - ⊕ Modeled Noise Level above Noise Abatement Criteria (>66 dB)
- Change in Noise Level vs. Existing**
- ↓ Noticeable decrease (≥3 dB)
  - No noticeable change (+2 dB)
  - ↑ Noticeable increase (≥3 dB)
  - ↻ Noticeable decrease and noise level above noise abatement criteria
  - ⊕ Noticeable increase and noise level above noise abatement criteria

Pacific Street Interchange Option



Second Montlake Bridge Option



1 Introduction to the Project  
 2 The Project Area: Then and Now  
 3 Developing the Alternatives  
 4 Comparison of the Alternatives  
 5 Detailed Comparison of Alternatives – Seattle  
 6 Detailed Comparison of Alternatives – Lake Washington  
 7 Detailed Comparison of Alternatives – Eastside  
 8 Construction Effects  
 9 Other Considerations

PART 1: WHAT THE PROJECT IS AND HOW IT CAME TO BE

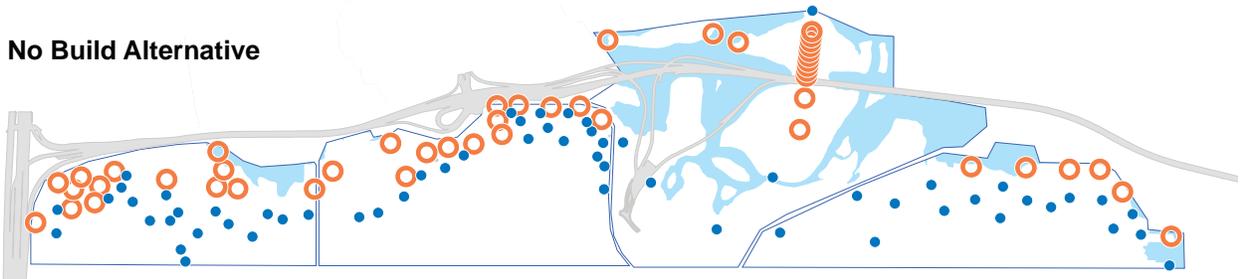
PART 2: EVALUATING ALTERNATIVES

Exhibit 5-11. Noise Levels in Seattle South of SR 520

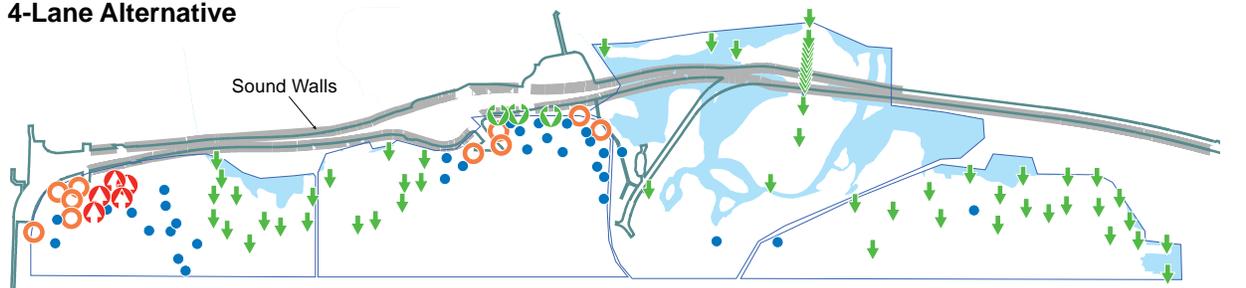
**Existing**



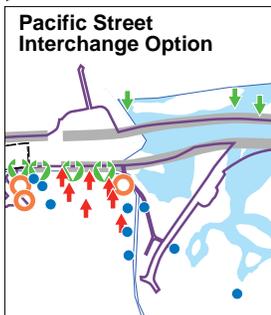
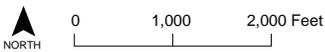
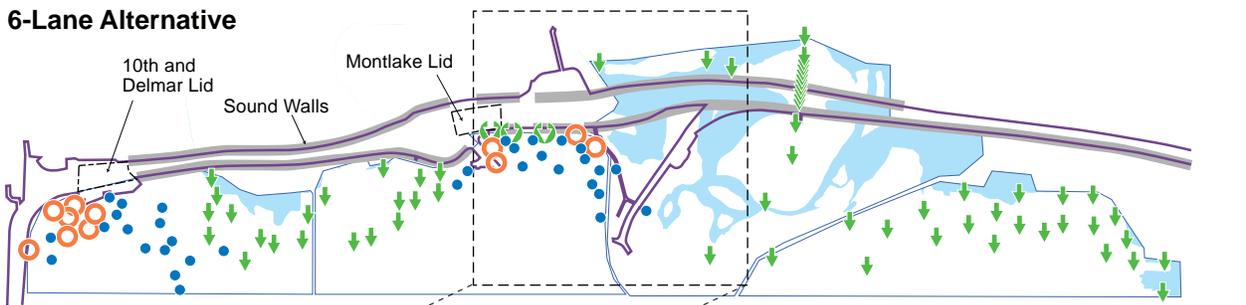
**No Build Alternative**



**4-Lane Alternative**



**6-Lane Alternative**



- ★ Noise Modeling Location
  - ★ Modeled Noise Level above noise abatement criteria (>66 dB)
- Change in Noise Level vs. Existing**
- ↓ Noticeable decrease (≥3 dB)
  - No noticeable change (+2 dB)
  - ↑ Noticeable increase (≥3 dB)
  - ↻ Noticeable decrease and noise level above noise abatement criteria
  - No noticeable change and noise level above noise abatement criteria
  - ↻ Noticeable increase and noise level above noise abatement criteria

In **Roanoke/Portage Bay**, a number of residents would experience very noticeable decreases in noise levels. It would be considerably quieter east of 10th Avenue East and north of East Roanoke. Reductions in noise levels would range from 3 to 13 decibels (note that the term “decibels” in this Draft EIS refers to decibels on the A-weighted scale), which means that the differences in noise level would vary from barely audible to very noticeable. The number of residences where noise levels approach or exceed the noise abatement criteria would drop from 24 under existing conditions to 19 under the 4-Lane Alternative and 16 under the 6-Lane Alternative. Locations where noise levels would remain at or above the criteria either are dominated by traffic noise from I-5, Harvard Avenue East, East Roanoke, and 10th Avenue East, or are too high in elevation for the walls to provide effective noise reduction.

In **North Capitol Hill**, some residents south of SR 520 and east of 10th Avenue East would hear a noticeable increase in noise levels under the 4-Lane Alternative. For most residences, it would be much quieter, particularly for residents east of Delmar Drive. Compared to existing conditions, where noise levels approach or exceed the noise abatement criteria at 99 residences, there would be only 60 above the criteria under the 4-Lane Alternative and 49 under the 6-Lane Alternative. Noise levels would approach or exceed the criteria at fewer residences under the 6-Lane Alternative because the 10th and Delmar lid would reduce noise levels east of 10th Avenue East. Those residences where levels are at or above the noise abatement criteria are affected by noise from I-5 and 10th Avenue East.

In **Montlake**, there would be no noticeable increases in noise levels, and for many residents, it would be noticeably quieter. In Montlake north of SR 520, noise levels would continue to exceed the noise abatement criteria at 16 residences under both the 4-Lane and 6-Lane Alternatives, compared to 24 today. All 16 residences are located along Montlake Boulevard, which is the primary source of the noise. The Pacific Street Interchange option would reduce the affected residences from 16 to 10 by decreasing traffic on Montlake Boulevard; the Second Montlake Bridge option would increase the number to 19 because of additional traffic that would be closer to these residences. South of SR 520, noise levels at 32 residences would approach or exceed the noise abatement criteria under the 4-Lane Alternative and noise levels at 28 residences would under the 6-Lane Alternative and options, compared to 35 residences that approach or exceed the criteria today. The residences still approaching or exceeding the criteria are located along two major arterial streets, East Montlake Place East and East Lake Washington Boulevard, which are major contributors to noise levels.

Traffic using the Pacific Street interchange would result in a slight increase of 2 to 3 decibels at some receivers south of SR 520, which under the 6-Lane Alternative would experience a 1- to 2-decibel increase. The noise levels would still be below the noise abatement criteria.



The project team modeled noise effects on the University of Washington campus, including the University of Washington Medical Center and along the Burke-Gilman Trail. None of these areas would approach or exceed the noise abatement criteria under the build alternatives.

The project team also modeled noise effects on the **University of Washington campus** at the University of Washington Medical Center, along Rainier Vista, in the Husky Stadium area, along the Burke-Gilman Trail, and along Montlake Boulevard to determine the noise effects of the Pacific Street Interchange and Second Montlake Bridge options. The analysis concluded that neither option would cause a noticeable change in noise levels at noise-sensitive locations in these areas or cause them to approach or exceed the noise abatement criteria.

As shown in *Exhibit 5-11*, **Washington Park Arboretum** and the **Madison Park** neighborhood would enjoy substantial noise reduction benefits from the project under most conditions because of the new sound walls. With the 4-Lane and 6-Lane Alternatives, people using the Arboretum Loop Trail across Marsh and Foster islands would find the park experience much quieter, with noise levels reduced by 3 to 18 decibels from No Build levels. In the Arboretum, where many areas frequented by the public now approach or exceed the noise abatement criteria, none would approach or exceed the criteria under either build alternative or any of the options. However, with the Pacific Street Interchange option, noise levels near Marsh Island would remain at or just slightly less than No Build levels because of the Union Bay Bridge overhead.

In **Madison Park**, where 89 residences now have noise levels over the noise abatement criteria, none would approach or exceed the criteria under either build alternative or the 6-Lane Alternative options. Noise levels would decrease by as much as 6 decibels under the 4-Lane Alternative and as much as 8 decibels under the 6-Lane Alternative. These reductions would be very noticeable to virtually all residents in north Madison Park.

In **Laurelhurst**, current noise levels do not approach or exceed the noise abatement criteria at any residences, and none would exceed the criteria under either the 4-Lane or the 6-Lane Alternatives. Noise levels under the 4-Lane Alternative would increase by 1 to 5 decibels over existing levels. Under the 6-Lane Alternative, noise levels would increase by 1 to 4 decibels. The 4- to 5-decibels change would be perceptible, but the noise levels would remain well below the noise abatement criteria. Because of the distance between the Union Bay Bridge and the Laurelhurst neighborhood, noise levels with the Pacific Street Interchange option would not differ noticeably from the 6-Lane Alternative.

With the No Build Alternative, people in the project area would continue to hear high levels of noise from SR 520. With the Continued Operation Scenario, noise levels would be similar to or higher than what they are today. The Catastrophic Failure Scenario would change traffic patterns, and therefore would redistribute traffic noise in the study area. Some areas that are now predominantly affected by SR 520 noise would be much quieter, while other parts of the study area would become noisier. The actual noise



The Washington Park Arboretum would enjoy substantial noise reduction benefits from the project because of the new sound walls.

levels would depend on where the failure occurred and how it affected traffic patterns.

For more detailed information on project-related noise issues, see Appendix M, Noise Discipline Report.

## What neighborhoods may be affected, and how might their characteristics change?

The project could affect Seattle neighborhoods in a number of different ways, including:

- *Community cohesion*—the ability of people to interact with each other in ways that lead to a sense of community. The evaluation of effects on community cohesion looks at the project’s potential to change neighborhood population characteristics and connections with churches, schools, and other community facilities.
- *Recreation*—the project’s effects on parks, trails, and other recreational facilities.
- *Land use*—the effects the project could have on how land is used in the project area, including how much land would be converted to new highway right-of-way and whether the project would be consistent with local and regional land use plans.
- *Regional and community growth*—the ways the project might cause the rate or nature of development to change in the project area and the region overall by opening access and/or increasing mobility.
- *Services*—how the project might change the provision of public services such as police and fire response, and utilities like water supply, wastewater treatment, and electrical service.
- *Bicycle, pedestrian, and transit facilities*—the project’s effects on how people move around the area by means other than private automobiles.
- *Environmental justice*—the extent to which the project could disproportionately affect minority, limited English proficient, and/or low-income populations.

The following sections describe how the alternatives would affect each of these characteristics in the Seattle project area. Appendices G, K, N, O, and P provide more detailed information on these topics.

### Community Cohesion

As described in Chapter 2, the construction of SR 520 in the 1960s divided neighborhoods in the Seattle project area. North Capitol Hill lost its connection with the Roanoke/Portage Bay neighborhood, and Montlake became a bisected community with one part north and one part south of the highway. The build alternatives would not further isolate nor physically separate the project area’s neighborhoods, and the 6-Lane Alternative would partially reconnect the neighborhoods severed over 40 years ago by



The build alternatives would not further isolate nor physically separate the project area’s neighborhoods.

#### KEY POINTS

#### Community Cohesion

The 6-Lane Alternative would partially reconnect the neighborhoods severed over 40 years ago by SR 520’s construction. By providing lids where bridges over SR 520 now exist at 10th Avenue East, Delmar Drive, and Montlake Boulevard (two lids total), the project would enhance links across the highway, especially for bicyclists and pedestrians.

SR 520's construction. By providing lids where bridges over SR 520 now exist at 10th Avenue East and Delmar Drive, and Montlake Boulevard, the project would enhance connections across the highway, especially for bicyclists and pedestrians. In addition to carrying local streets over SR 520, these lids would be landscaped open space areas that would provide paths across the highway and create places for people to sit and enjoy the view. The Montlake Boulevard lid would only partially realize this benefit, as a ramp at the south end of the lid would prevent pedestrians and bicyclists from connecting directly to the Montlake Playfield.

All three of the 6-Lane Alternative options in Seattle would provide additional benefit to community cohesion by reducing the footprint of the 6-Lane Alternative through Montlake. In the case of the Pacific Street Interchange option, the existing interchange at Montlake would close permanently. This option also would allow a more complete reconnection of Montlake over SR 520 than the 6-Lane Alternative because it would fully bridge the existing interchange area and allow pedestrians and cyclists direct access to the Montlake Playfield.

The alternatives and options would not displace affordable housing or community facilities, nor would they create physical impediments that would make it more difficult for people to reach community facilities or affordable housing. Both build alternatives and the options would remove the MOHAI building; however, the museum is currently planning to move before SR 520 construction would begin.

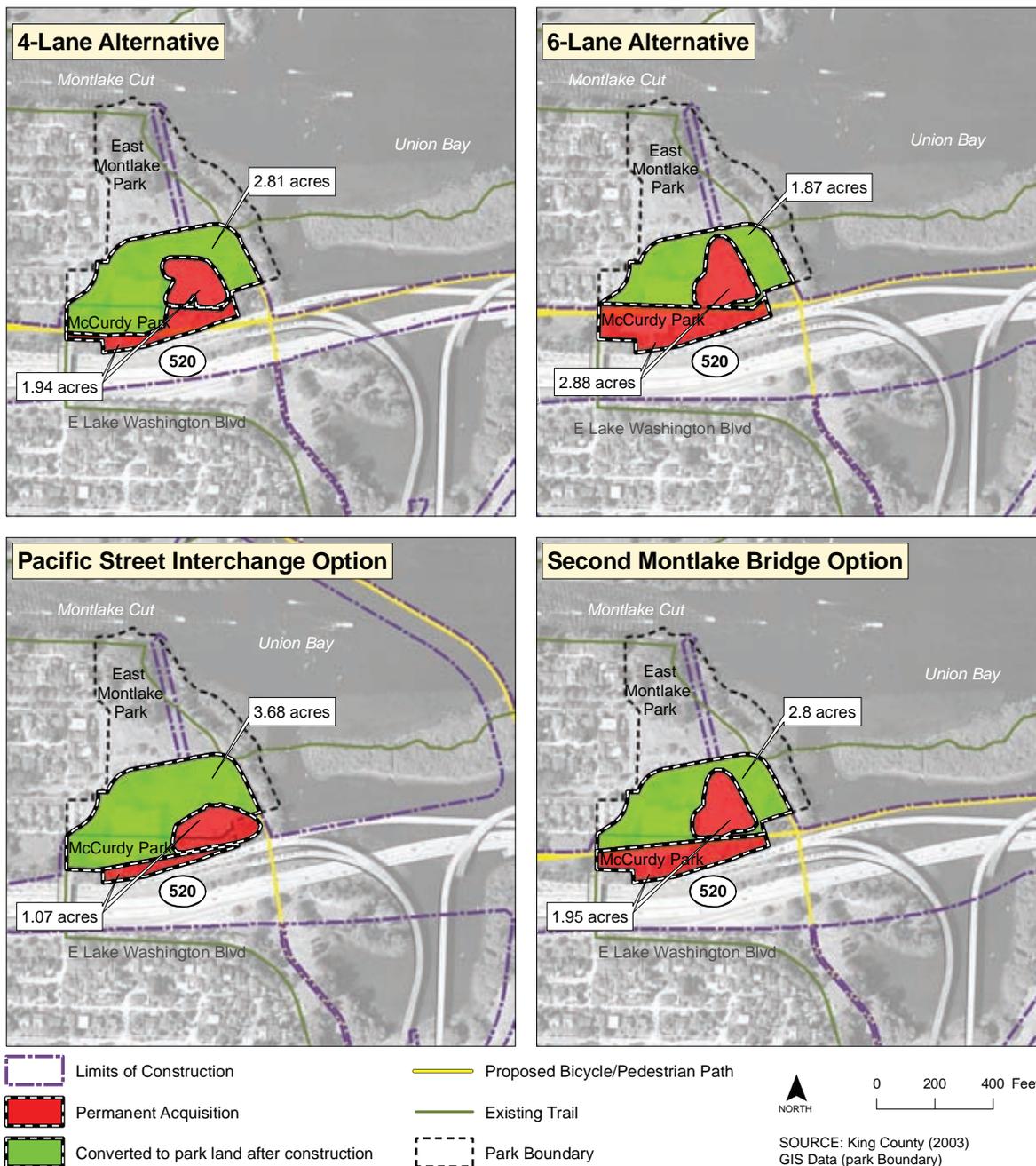
The alternatives would not directly affect neighborhood population distribution. The 4-Lane Alternative would not displace any residences; the 6-Lane Alternative with the Pacific Street Interchange or No Montlake Freeway Transit Stop options would displace only one; and the Second Montlake Bridge option would displace three residences. Furthermore, both build alternatives would improve air quality, noise levels, and traffic congestion in Seattle communities. Such improvements would not provide an impetus for residents to move elsewhere. Over time, the project could have a slight effect on regional population distribution by changing large-scale patterns of mobility within the project area (see Chapter 9).

The No Build Alternative would maintain the physical separation of North Capitol Hill from Roanoke/Portage Bay and of the northern and southern sections of Montlake. Over time, increased traffic congestion on and around SR 520, along with the resulting noise and air pollution, would lower the quality of life in these neighborhoods. Under the Catastrophic Failure scenario, it is possible that damage to SR 520 could hinder access within or between project area neighborhoods, or access to community facilities.

## Recreation

In the Seattle project area, both the 4-Lane and 6-Lane Alternatives and all options would require the acquisition of portions of Bagley Viewpoint, McCurdy Park, East Montlake Park, and the Washington Park Arboretum. Exhibits 5-12 and 5-13 depict the park lands that would be acquired to build the alternatives and options, and Exhibit 5-14 quantifies these effects. The build alternatives would have positive as well as negative effects on parks, as described below.

**Exhibit 5-12. Project Effects on McCurdy and East Montlake Parks**



1 Introduction to the Project  
 2 The Project Area: Then and Now  
 3 Developing the Alternatives  
 4 Comparison of the Alternatives  
 5 Detailed Comparison of Alternatives – Seattle  
 6 Detailed Comparison of Alternatives – Lake Washington  
 7 Detailed Comparison of Alternatives – Eastside  
 8 Construction Effects  
 9 Other Considerations

PART 1: WHAT THE PROJECT IS AND HOW IT CAME TO BE

PART 2: EVALUATING ALTERNATIVES

The affected areas of the Arboretum, East Montlake Park, and McCurdy Park are used for different purposes. The portion of the Arboretum in the project area is primarily used for activities like walking, kayaking, canoeing, and bird watching. McCurdy and East Montlake parks contain the Museum of History and Industry (MOHAI); much of McCurdy Park supports the museum with parking and landscaped areas. East Montlake Park combines open fields with wooded shoreline areas and provides access to the Ship Canal Waterside Trail and the Arboretum Waterfront Trail. All three parks would be affected under all build alternatives by the visual

**Exhibit 5-13. Project Effects on Washington Park Arboretum**

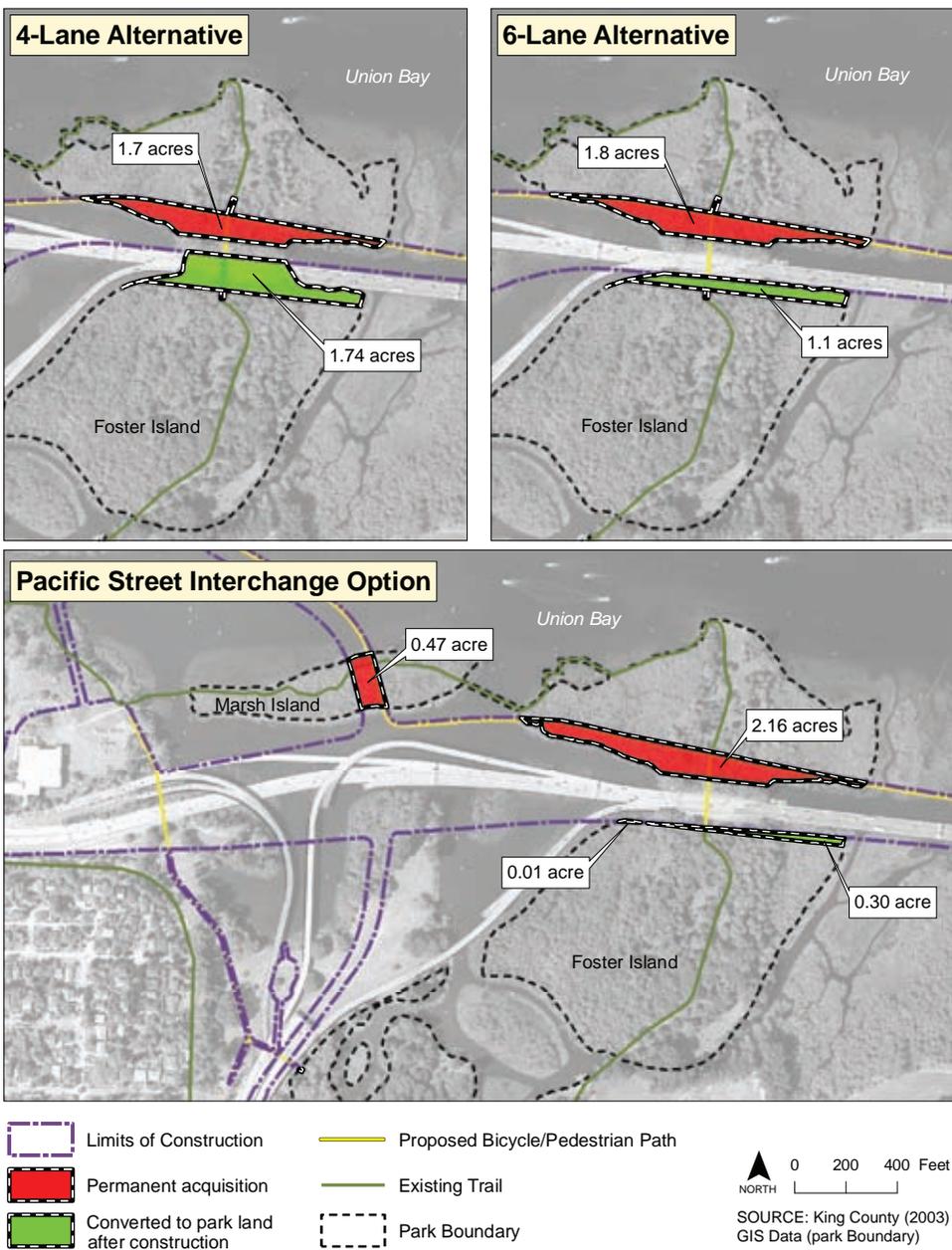


Exhibit 5-14. Park and Recreation Effects in the Seattle Project Area				
Park and Recreational Facility	4-Lane Alternative	6-Lane Alternative	Pacific Street Interchange Option	Second Montlake Bridge Option
Bagley Viewpoint	Negative effects: 0.06 acre would be acquired, viewpoint would become unusable	Negative effects: 0.09 acre would be acquired, viewpoint would become unusable	Negative effects: 0.09 acre would be acquired, viewpoint would become unusable	Negative effects: 0.09 acre would be acquired, viewpoint would become unusable
McCurdy Park	Negative effects: 0.88 acre acquired, visual intrusion  Positive effect: Noise reduction	Negative effects: 1.5 acres acquired (whole park), visual intrusion  Positive effect: Noise reduction	Negative effects: 0.62 acre acquired, visual intrusion  Positive effect: Noise reduction	Negative effects: 1.18 acres acquired, visual intrusion  Positive effect: Noise reduction
East Montlake Park	Negative effects: 1.06 acres acquired, visual intrusion  Positive effects: Noise reduction, trail improvements	Negative effects: 1.38 acres acquired, visual intrusion  Positive effects: Noise reduction, trail improvements	Negative effects: 0.45 acre acquired, visual intrusion  Positive effects: Noise reduction, trail improvements, opportunity to connect park to Montlake lid	Negative effects: 0.77 acre acquired, visual intrusion  Positive effects: Noise reduction, trail improvements
Washington Park Arboretum	Negative effects: visual intrusion to some views  Positive effects: Could return 0.04 acre to park, improvement to some views, noise reduction, trail improvements	Negative effects: 0.7 acre acquired, visual intrusion to some views  Positive effects: Improvement to some views, noise reduction, trail improvements	Negative effects: 2.34 acres acquired, visual intrusion to some views  Positive effects: Improvement to some views, noise reduction, trail improvements	Negative effects: 0.7 acre acquired, visual intrusion to some views  Positive effects: Improvement to some views, noise reduction, trail improvements
Burke-Gilman Trail	No acquisition	No acquisition	Negative effects: 0.08 acre acquired, visual intrusion	No acquisition
University of Washington Open Space <sup>a</sup>	None	None	Negative effects: 0.1 acre acquired, visual intrusion	Negative effects: 0.2 acre acquired
University of Washington Waterfront Activity Center	None	None	Negative effects: 0.18 acre acquired, visual intrusion	None
East Campus Bicycle Route	None	None	None	Negative effects: westernmost 100 feet of trail acquired, visual intrusion

<sup>a</sup>Not considered a Section 4(f) resource because its primary use is not for recreation.

presence of the highway, which would be larger and closer to some park users.

The 6-Lane Alternative with the Pacific Street Interchange option and the 6-Lane Alternative would require the most permanent park land acquisition (a net loss of 3.86 acres and 3.67 acres, respectively, versus 2.94 acres for the Second Montlake Bridge option and 1.96 acres for the 4-Lane Alternative). Of the affected parks, only Bagley Viewpoint and McCurdy Park (with the 6-Lane Alternative) would have the potential to

## SR 520 Parks Workshops

On the west side of the project corridor, SR 520 passes through or near some of our region's most important natural resources and public open spaces, including Lake Washington's Portage and Union Bays, the Washington Park Arboretum, historic Lake Washington Boulevard, and one of Lake Washington's few remaining wetland systems. In spring 2005, members of the project team met with a group of stakeholders that included representatives of the University of Washington, the Arboretum Foundation, and Seattle's Departments of Transportation and Parks and Recreation. In two workshops, this group discussed ways to minimize the project's effects on natural areas and open spaces, enhance these resources where possible, and incorporate existing planning for these resources into the project design.

Topics of discussion included:

- Restoring Lake Washington shoreline that has been affected by past land uses
- Expanding the Arboretum's plant collection into the WSDOT-owned peninsula
- Expanding bicycle and pedestrian routes that would enhance Seattle's nonmotorized transportation and provide access within the Arboretum.
- Exploring potential for a new building at the MOHAI site with offices and meeting space
- Replacing the MOHAI parking lot with a pond that would create wetland habitat and improve the quality of water running off SR 520
- Creating a trail to provide a direct route under SR 520 between the Arboretum and East Montlake Park
- Providing shoreline access for canoes and kayaks
- Adding "landscape-scale" art such as earthworks beneath stretches of elevated roadway where plants may have a difficult time establishing due to lack of light and water
- Incorporating the Arboretum's master plan into SR 520 planning and design
- Minimizing cut-through traffic on Arboretum Drive East
- Replacing failing street trees on Lake Washington Boulevard East
- Creating new formal gateways into the Arboretum using structures and/or plantings

Ideas generated during the workshops will serve as the basis for future discussions, planning, and design.

become completely unusable as a result of project construction; WSDOT would replace the viewpoint at a new location for the 4-Lane Alternative; the viewpoint could be relocated onto the landscaped lid at 10th Avenue East and Delmar Drive as part of the 6-Lane Alternative. The Washington Park Arboretum could actually see a slight gain in area under the 4-Lane Alternative because the northward shift of the roadway would free up land on Foster Island currently being used as right-of-way. WSDOT is working with Seattle Parks and Recreation to minimize and mitigate potential effects; mitigation measures could include developing additional parklands in compensation for those acquired.

Neither build alternative would make it more difficult to reach recreational facilities in the project area. Improved access within the Arboretum would be a benefit of the project. Today, SR 520 limits passage between the northern and southern areas of Foster Island to a tunnel under the roadway. Both of the build alternatives and the options would elevate the bridge over the island, allowing free access for both wildlife and people (see *Exhibit 5-4*). Noise, air quality, and water quality in the Seattle project area parks would improve under the 4-Lane and 6-Lane Alternatives.

As described earlier in this chapter, the build alternatives would have both positive and negative effects on views in Washington Park Arboretum.

### KEY POINTS

#### Recreation

Both alternatives and all options would require the acquisition of portions of Bagley Viewpoint, McCurdy Park, East Montlake Park, and the Washington Park Arboretum. WSDOT is working with Seattle Parks and Recreation Department to minimize and mitigate potential effects; mitigation measures could include developing additional parklands in compensation for those acquired.



Today, SR 520 limits passage between the northern and southern areas of Foster Island to a tunnel under the roadway.

The build alternatives would create higher, wider bridge structures with high sound walls, but would open up views at the water level and remove the visual clutter of unused freeway ramps. The Pacific Street Interchange and Second Montlake Bridge options could slightly increase the flow of traffic flow during the evening peak hour (see *Exhibit 5-5*) because of the location of the new interchange and ramps over the Arboretum, while the 4-Lane and 6-Lane Alternatives would result in little change compared to No Build.

Effects in the Arboretum would be greatest with the Pacific Street Interchange option, as the Union Bay Bridge would pass directly over Marsh Island and its support columns would be prominent features on the island’s north and south sides. However, because this option would remove the existing Montlake interchange ramps, it would provide the opportunity to connect the proposed Montlake Boulevard lid to East Montlake Park and to connect Montlake Playfield to Montlake Boulevard. The land added by the lid (approximately 1.9 acres) could be used to provide a contiguous recreational area, helping to mitigate the effects of park acquisition elsewhere. WSDOT is working with Seattle Parks and Recreation to avoid, minimize, and mitigate potential effects; mitigation measures could include developing additional park lands in compensation for those acquired as well as implementing recommendations from the SR 520 Park Workshops (described above).

The No Build Alternative would not require the acquisition of any park lands, but neither would it provide the enhanced views and access and reduced noise levels in the Washington Park Arboretum that the build alternatives would. The Catastrophic Failure Scenario could damage or impair access to the parks near SR 520, especially the Arboretum, depending on where the failure occurred.

### Land Use

Some land now used for other purposes in the Seattle project area would be converted to right-of-way for the widened SR 520. *Exhibit 5-15* pres-

**Parks and Section 4(f)**

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As described in Chapter 4, parks and historic properties are protected by Section 4(f) of the Department of Transportation Act. We discuss Section 4(f) effects in a separate section later in this chapter and provide a full Section 4(f) evaluation in Appendix P, Draft Section 4(f) Evaluation.

**KEY POINTS**

**Land Use**

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Under the 4-Lane and the 6-Lane Alternatives, most of the land acquisitions would come from the affected parks. For the Pacific Street Interchange option, the total land acquisition would be much greater, and nearly half of the affected land would be in the southeast portion of the University of Washington campus where the new Union Bay Bridge would be located. 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.

Exhibit 5-15. Land Use Effects in Seattle Project Area			
Alternative/Option	Acres and Parcels Affected	Residential Structures Displaced	Non-Residential Structures Displaced
4-Lane Alternative	12.6 acres 21 parcels	1	12
6-Lane Alternative	14.1 acres 23 parcels	1	13
Pacific Street Interchange option	26.8 acres 19 parcels	1	8
Second Montlake Bridge option	13.5 acres 26 parcels	3	12

Introduction to the Project  
 1  
 The Project Area: Then and Now  
 2  
 Developing the Alternatives  
 3  
 Comparison of the Alternatives  
 4  
 Detailed Comparison of Alternatives – Seattle  
 5  
 Detailed Comparison of Alternatives – Lake Washington  
 6  
 Detailed Comparison of Alternatives – Eastside  
 7  
 Construction Effects  
 8  
 Other Considerations  
 9

PART 1: WHAT THE PROJECT IS AND HOW IT CAME TO BE

PART 2: EVALUATING ALTERNATIVES

ents the effects of both build alternatives and the two 6-Lane Alternative options, whose effects would be appreciably different. *Exhibit 5-16a and b* shows the areas where new right-of-way would be acquired and where buildings would be displaced.

Displacements under the 4-Lane Alternative would include one business (the 76 service station at the Montlake interchange), one dock at Queen City Yacht Club, nine buildings at the NOAA Northwest Fisheries Science

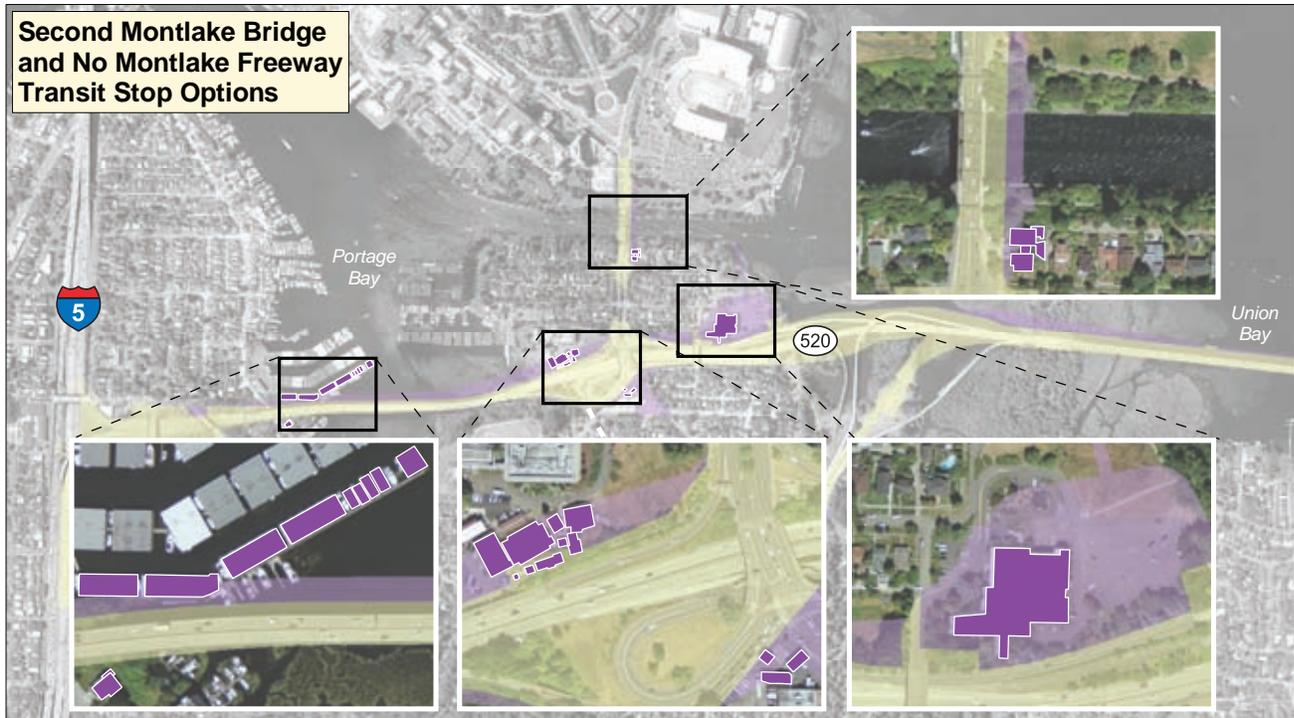
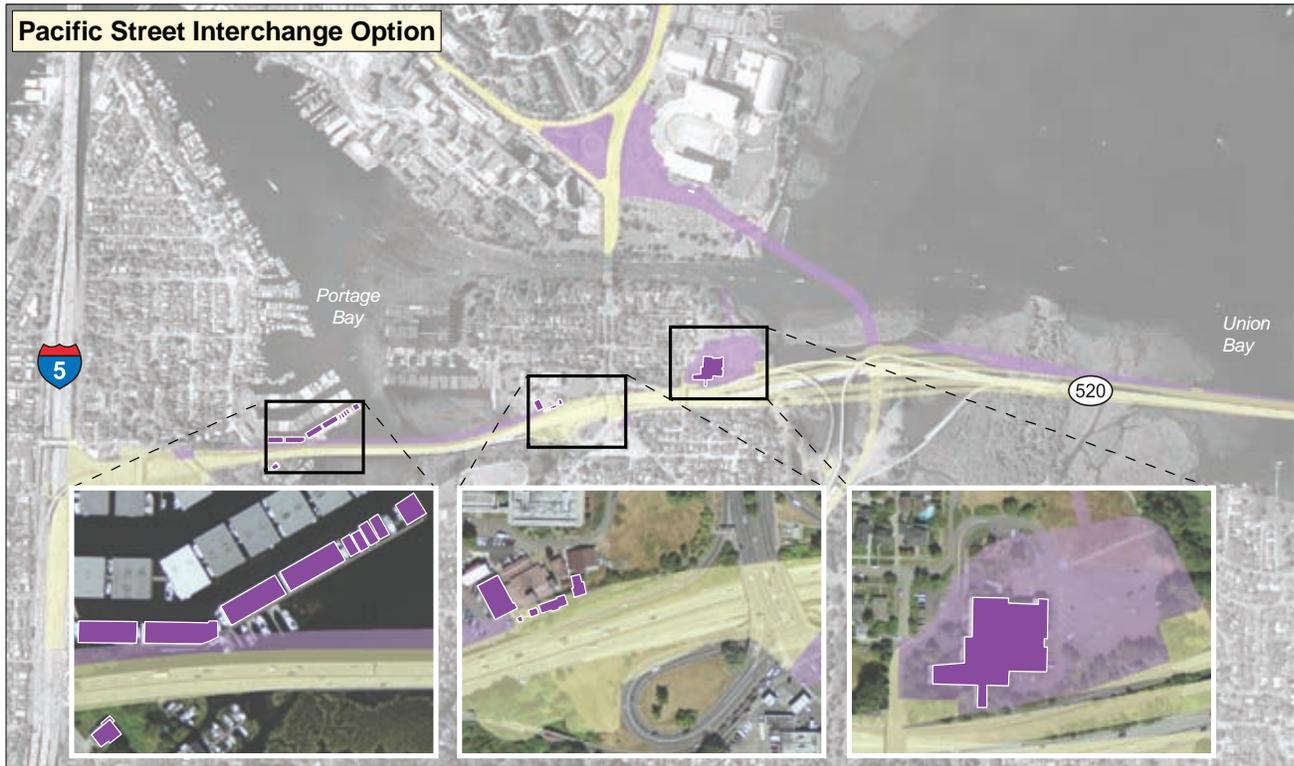
**Exhibit 5-16a. 4-Lane and 6-Lane Alternative Effects on Properties and Structures in the Seattle Project Area**



Proposed Project Footprint inside Existing Right-of-Way/ Affected Property
  Affected Structure

SOURCE: City of Seattle (2003) GIS Data (Building Footprints)
 
 NORTH   
 0 500 1,000 Feet

Exhibit 5-16b. 6-Lane Alternative Options Effects on Properties and Structures in the Seattle Project Area



Proposed Project Footprint inside Existing Right-of-Way/ Affected Property

Affected Structure

SOURCE: City of Seattle (2003) GIS Data (Building Footprints)

0 500 1,000 Feet

Center, and MOHAI. A portion of the dock farthest from shore could potentially be saved if it could be reconnected to the dock directly north. The 6-Lane Alternative would displace the same buildings as the 4-Lane Alternative, plus an additional structure at the NOAA Northwest Fisheries Science Center. Both the 4-Lane and 6-Lane Alternatives would displace one residence just south of SR 520 and east of Boyer Avenue East. Under the 4-Lane and 6-Lane Alternatives and the Second Montlake Bridge option, most of the land would come from the affected parks. Under the Pacific Street Interchange option, the total land acquisition would be greater, and nearly half of the affected land would be in the southeast portion of the University of Washington campus. This option would avoid displacing the service station at the Montlake interchange and displace four fewer buildings than the 6-Lane Alternative at the NOAA Northwest Fisheries Science Center.

Both the 4-Lane and the 6-Lane Alternatives and options would support regional land use planning, including the Puget Sound Regional Council's Vision 2020 and King County's Countywide Planning Policies regarding transportation system continuity. The project would be consistent with regional policies on the use of alternative transportation modes and the concentration of growth in urban centers. The 6-Lane Alternative would go further toward meeting these goals because it would provide a continuous HOV system from I-5 to I-405, and because it would be more effective in improving the movement of people between the urban centers in the study area.

Both alternatives also would be generally consistent with policies of the Seattle Comprehensive Plan by protecting the Roanoke/Portage Bay, North Capitol Hill, and Montlake neighborhoods from noise and traffic congestion and improving transit connections. The 6-Lane Alternative, with its HOV lanes, would do more than the 4-Lane Alternative to promote a transit and ridesharing system that provides viable alternatives to people driving alone, a goal of Seattle's Comprehensive Plan. The 6-Lane Alternative would also be more consistent with policies stating that Seattle supports completion of the HOV system in the Puget Sound region and that expansion of freeway capacity should be primarily to accommodate non-SOV users. All build alternatives and options (except for the 4-Lane Alternative without expanded pontoons) would provide the ability to accommodate future high-capacity transit, which is consistent with planning policies that encourage the development and use of transit.

WSDOT would mitigate 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. Some houses and businesses—in particular, the



The 76 service station located near the Montlake interchange would be displaced by the 4-Lane and 6-Lane Alternatives, but not by the Pacific Street Interchange option.



The Queen City Yacht Club is located on the north side of the Portage Bay bridge. The southernmost dock would be displaced by the project.

Seattle waterfront residence displaced under the 6-Lane Alternative, the 76 service station, the Queen City Yacht Club dock, and MOHAI—could be difficult to replace in kind or relocate because of their unique characteristics or location. (As described above, MOHAI is currently planning to move out of its existing building, which would resolve the issue of its relocation.) WSDOT would work closely with all displaced residents and businesses to find suitable properties to accommodate their needs.

The No Build Alternative would not use any additional land or displace any buildings. However, it would not support local land use plans as well as the build alternatives 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 avoiding noise and traffic congestion in neighborhoods and improving transit connections.

### Regional and Community Growth

Neither build alternative, nor any of the options, would cause any noticeable change in the number or the characteristics of people living in the project area neighborhoods as compared to the No Build Alternative. The minor displacements that the project would cause are not enough to change the community or neighborhood populations. The alternatives would not negatively affect the quality of life within the neighborhoods, and in fact would improve noise levels, air quality, and traffic over existing conditions. Overall, the project area contains owner-occupied, high-value housing, as evidenced by the high median home values. Given the lack of displacements and the improvements in quality of life, the composition of the project area’s communities and neighborhoods would not change.

### Public Services

The build alternatives and options would not change the delivery of public services within the project area, except to improve emergency response times. The project would not displace any public services and would not create any impediments to reaching those services. None of the alternatives except for the Pacific Street Interchange option would change the routes of public services provided. The Pacific Street Interchange option would close the SR 520 ramps on Montlake Boulevard and relocate them to the new interchange, causing drivers to change their routes. This may increase travel distance to the Montlake neighborhood. The No Build Alternative could compromise service delivery over time as congestion in the project area increased, while the Catastrophic Failure Scenario could interrupt access for users and providers of services.

#### Regional Bicycle/Pedestrian Connections

The SR 520 corridor spans Lake Washington and seven towns and cities: Seattle, Medina, Hunts Point, Yarrow Bay, Clyde Hill, Kirkland, and Bellevue. A bicycle/pedestrian path along SR 520 and on the new Evergreen Point Bridge has the potential to connect the region’s longest and most popular trails and routes: the Burke-Gilman Trail, the Washington Park Arboretum Waterfront Trail, the Lake Washington Loop Route, the Sammamish River Trail, and the East Lake Sammamish Trail, as well as many on-street bicycle routes.

## Bicyclist, Pedestrian, and Transit Facilities

Both the 4-Lane and the 6-Lane Alternatives and the options would improve capacity, circulation, and travel times for bicyclists and pedestrians by providing a continuous bicycle/pedestrian path from west of the Boulevard interchange to Northeast Points Drive in Kirkland. *Exhibit 3-9* shows the path, along with other key existing and proposed bicycle and pedestrian facilities in the Seattle project area. This path would add a key element to the regional nonmotorized transportation system by providing another link across Lake Washington. Bicyclists in the SR 520 corridor would no longer have to wait for a bus to cross the lake. The 6-Lane Alternative would provide additional pedestrian/bicyclist facilities by creating new access across the lid at 10th Avenue East/Delmar Drive, under Montlake Boulevard, and under SR 520 in the vicinity of East Montlake Park and the Washington Park Arboretum.

The No Build Alternative would not provide any improvements for pedestrians and bicyclists, who would face the same challenges in crossing Lake Washington as they do today. The Catastrophic Failure Scenario would have only limited effects on nonmotorized traffic because SR 520 does not currently have provisions for pedestrians or bicyclists.

The No Build and 4-Lane Alternatives include a partial HOV lane (westbound on the Eastside). Because the lanes would not extend continuously throughout the corridor, transit vehicles would operate in the general-purpose lanes with other vehicles in the Seattle project area.

The 6-Lane Alternative's continuous HOV lanes would allow transit vehicles to bypass traffic congestion through much of the corridor. As a result, the 6-Lane Alternative would move people more efficiently than either the No Build or 4-Lane Alternatives.

In addition, the benefits of an HOV lane could potentially change community life in adjacent neighborhoods by providing an incentive to use transit and increasing pedestrian activity.

With all options that close the Montlake Freeway Station, people traveling eastbound across SR 520 would be required to access buses at a different location near the intersection of Montlake Boulevard and Pacific Street. To reach this location, riders coming from the south of the Montlake Cut would have to walk or travel farther than today, while riders coming from the north would have a shorter distance to travel to reach the transit stop.

## Environmental Justice

The project team used data from the 2000 U.S. Census to see how the project area's concentrations of minority, limited English proficiency, and low-income residents compared to the region as a whole. Of the Seattle neighborhoods that the project would directly affect, only the University District and South Lake Union were found to contain relatively high

percentages of low-income residents. These two neighborhoods also have relatively high percentages of minority populations. The analysis did not identify any disproportionate effects on these low-income residents.

Chapter 4 summarizes the conclusions drawn from the environmental justice analysis on a regional basis, including work that was done to study the effects of tolling on minority and low-income users of the Evergreen Point Bridge. Appendix G, Environmental Justice Analysis, explains how the project team conducted the environmental justice analysis.

## How would effects on cultural and/or historic resources compare between the alternatives?

Development of new projects can affect cultural and historic resources if a known resource (for example, a historic structure) must be physically altered or removed because of the project. Effects can also occur if project development changes the setting of the resource by removing parts of its historic context (for example, landscaping or other buildings that are closely associated with it). Historians and archaeologists may also consider a setting changed if the physical nearness of the new development intrudes upon it with new, incompatible visual elements or a large increase in noise. On the other hand, a project can have beneficial effects by reducing noise or removing features that have previously altered the historic setting. As described in Chapter 4, the Section 106 and Section 4(f) regulatory processes provides a framework for evaluating and mitigating effects on National Register of Historic Places (NRHP)-eligible and listed properties.

In the Seattle project area, the build alternatives would have both positive and negative effects on historic properties on (or eligible for listing on) the NRHP and/or as Seattle Landmark properties. (Note that for many of these properties, WSDOT and FHWA will be seeking concurrence from the State Historic Preservation Officer [SHPO] as to their NRHP eligibility). *Exhibit 5-17* shows the effects of the alternatives and options on identified historic properties in the Seattle project area; *Exhibit 5-18* summarizes these effects. Appendix D, Cultural Resources Discipline Report, provides additional information on historic properties and the Section 106 process, while Appendix P, Draft Section 4(f) Evaluation, contains the Section 4(f) evaluation.

Positive effects would result from substantially decreased noise in the vicinity of historic properties as a result of sound walls that are part of the project design. In some instances, the roadway would also shift away from the historic properties, partially restoring their settings. Negative effects would result either from removal of land or buildings within a historic setting, or from visual intrusion caused by more prominent roadway and bridge structures. WSDOT would mitigate removal of land or buildings on a site-specific basis, as described below, and would offset visual intrusion by creating landscaped buffers wherever possible. Section 4(f) effects are described later in this chapter. WSDOT and FHWA would coordinate

### KEY POINTS

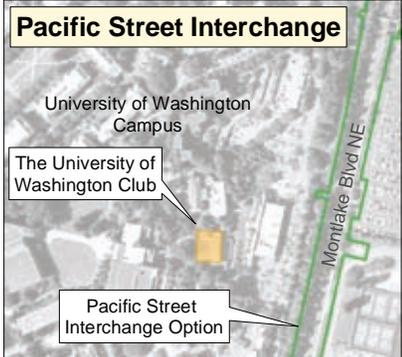
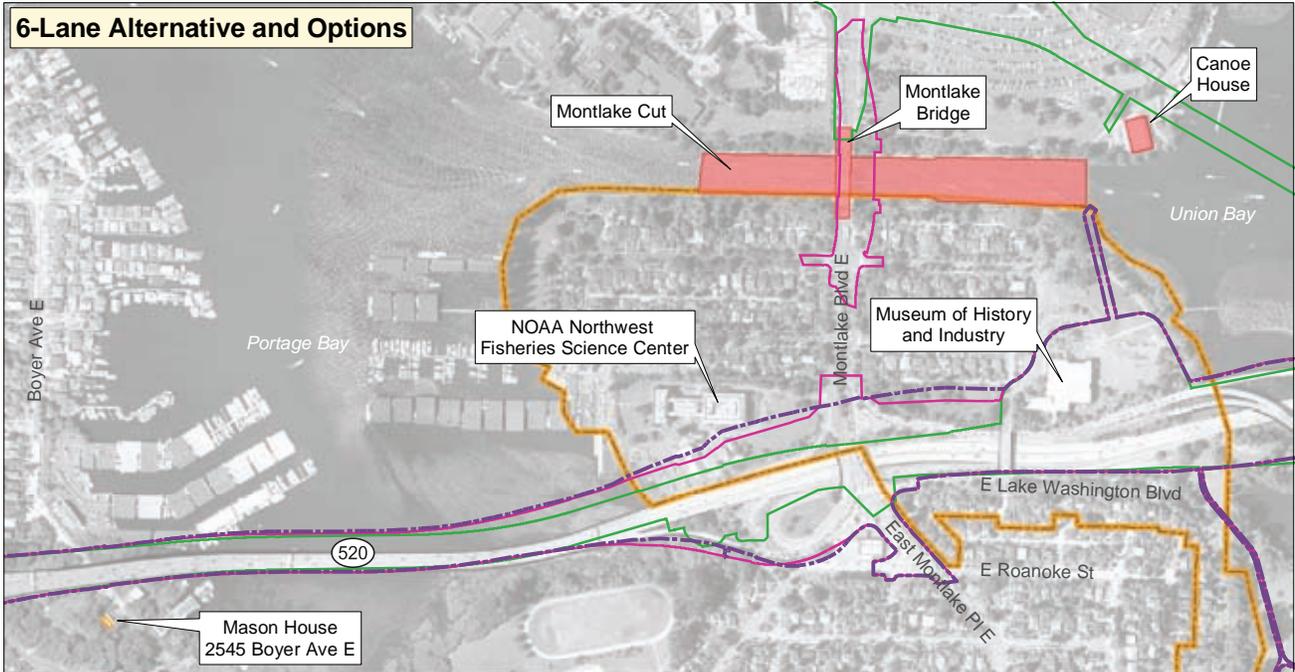
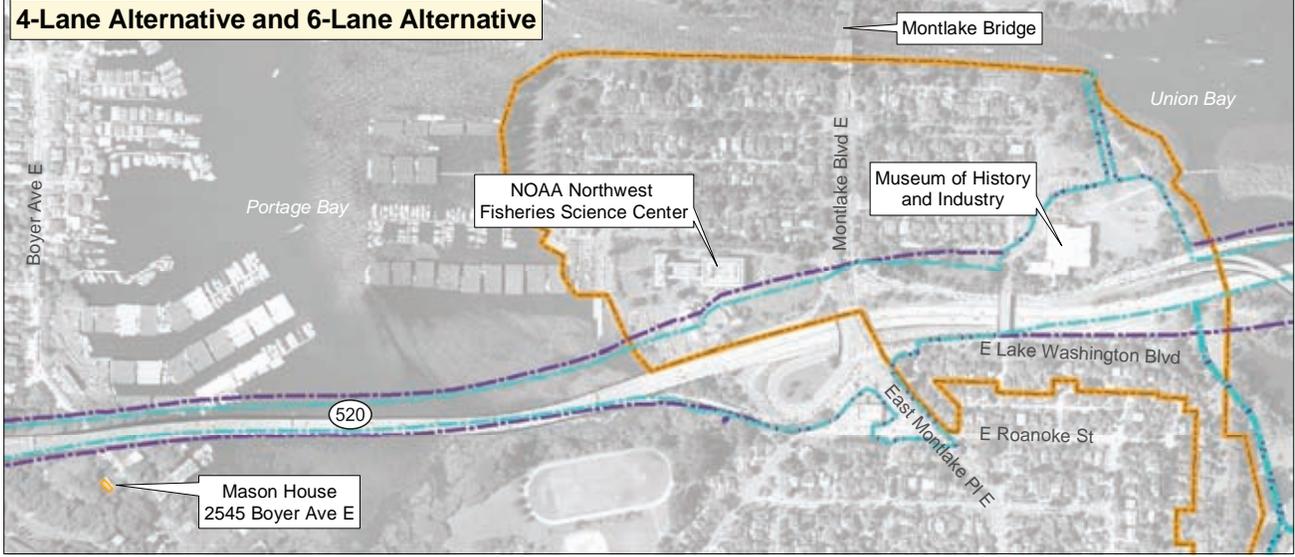
#### Historic Resources

The build alternatives would have both positive and negative effects on historic resources eligible for listing on the National Register of Historic Places (NRHP) and/or as Seattle Landmarks. Positive effects would generally result from decreased noise near historic properties as a result of sound walls that are part of the project design. Negative effects would result either from removal of land or buildings within a historic setting, or from visual intrusion caused by more prominent roadway and bridge structures.



Architectural detail from a home along Shelby Avenue.

Exhibit 5-17. Effects on Historic Resources in the Seattle Project Area



- 4-Lane Footprint
- 6-Lane Footprint
- 2nd Montlake Bridge Footprint/ No Montlake Freeway Transit Stop
- Pacific Street Interchange Footprint
- Montlake Historic District (Potential Boundary)

- National Register of Historic Places - Listed Resource
- National Register of Historic Places - Eligible Resource

0 200 400 Feet  
 NORTH

NOTE: Concurrence not yet received from SHPO on eligibility determinations



Exhibit 5-18. Project Effects on Historic Resources in the Seattle Project Area		
Historic Property	4-Lane Alternative	6-Lane Alternative and Options
Mason House (2545 Boyer Avenue East)	Reduced noise and visual intrusion	Similar to 4-Lane Alternative
NRHP-eligible Roanoke Park Historic District	Increased visual intrusion, but lower noise levels would improve setting	Similar to 4-Lane Alternative, but greater benefits with new 10th Avenue East/Delmar Drive lid
NRHP-eligible Montlake Historic District	Acquisition of NOAA Northwest Fisheries Science Center property and demolition of MOHAI; lowering of highway would reduce visual effects and lower noise levels by up to 10 decibels	Would acquire land from the same properties and have same positive effects as 4-Lane Alternative; 6-Lane Alternative lids would enhance connections within and among communities; Pacific Street Interchange option would increase visual intrusion but reduce noise and improve connectivity of Montlake Boulevard lid; Second Montlake Bridge option would increase visual intrusion and noise, and also remove two contributing houses
Montlake Cut	No effect	Pacific Street Interchange and Second Montlake Bridge options would increase visual intrusion
Montlake Bridge	No effect	Under Second Montlake Bridge option, land within right-of-way would be used for construction of adjacent bridge, with resulting negative effect on historic setting; Pacific Street Interchange would increase visual intrusion on views of bridge
University of Washington Canoe House	No effect	Pacific Street Interchange option would negatively affect historic setting; Second Montlake Bridge would have a lesser visual effect
University of Washington Club	No effect	Pacific Street Interchange option would affect views from the property

these measures with the SHPO to address adverse effects on historic resources protected by Section 106.

With the No Build Alternative, historic and cultural resources would remain more or less in their current condition. This would avoid the visual intrusion caused in some locations by the new roadway and bridges, as well as the effects on the NOAA Northwest Fisheries Science Center and MOHAI. On the other hand, the benefits of the sound walls would be lost, and high levels of noise would continue to affect the settings of the project area’s historic buildings and districts.

**How would the project affect historic properties in the Roanoke Park Historic District?**

Both build alternatives would visually intrude upon the Roanoke Park Historic District, which WSDOT has identified is potentially eligible for listing on the NRHP, because new sound walls and the reconstructed 10th Avenue East and Delmar Drive bridges over SR 520 would be visible from Roanoke Park and some of the buildings within the district. However, the

sound walls would improve the district’s setting by lowering noise levels in the area, as described earlier in this chapter.

In addition, the NRHP-eligible Mason House at 2545 Boyer Avenue East would benefit from the northward shift of the Portage Bay Bridge, which would reduce visual intrusion, and installation of the SR 520 sound walls, which would decrease noise levels substantially.

Under the 6-Lane Alternative, the two existing bridges at 10th Avenue East and Delmar Drive would be replaced by a single landscaped lid. The lid would accommodate both streets and include Olmsted-style landscaping to link it visually with Roanoke Park. This would benefit the potentially NRHP-eligible historic district by increasing landscaped green space, further reducing noise levels, and providing a pedestrian passageway between the North Capitol Hill and Roanoke/Portage Bay neighborhoods.

### How would the project affect historic properties in the Montlake Historic District and at the University of Washington?

As shown in *Exhibit 5-16*, all build alternatives would acquire property from the NOAA Northwest Fisheries Science Center, which would lose some of its parking, landscaping, and outlying buildings to the widened SR 520 right-of-way. This would occur under both build alternatives and all of the 6-Lane Alternative options, although the 6-Lane Alternative would require the most land from the property and the Pacific Street Interchange option would acquire the least. The Portage Bay Bridge would be larger and closer, and the sound walls along the roadway would have a minor visual intrusion on the building’s setting. On the positive side, noise levels would decrease by up to 8 decibels and the sound walls would provide some visual screening from the roadway. In addition to the mitigation provided by the sound wall, WSDOT would work with NOAA and the SHPO to develop appropriate measures to improve the setting of the historic structure. These could include landscaping improvements, relocating or rebuilding of accessory buildings, and creating smaller landscaped parking lots or a parking structure to replace the existing large lot.

The Montlake Historic District, which WSDOT has determined is potentially eligible for listing on the NRHP, would experience a similar pattern of positive and negative effects (*Exhibit 5-18*). The highway would be lowered by up to 4 feet, reducing its noise and visual effects. Overall noise levels within the district would decrease by up to 10 decibels. In addition, the new Lake Washington Boulevard ramps to the Evergreen Point Bridge would be farther away from the historic residences, and removal of the unused R.H. Thomson Expressway Ramps would allow this area to be redeveloped with trails and other recreational facilities. In addition, the lid over Montlake Boulevard would benefit the district by improving the visual environment and providing open space for recreation or other community activities. However, visual effects would result from the partial



The Museum of History and Industry (top) and NOAA Northwest Fisheries Science Center (bottom) are located on the north side of SR 520 in the potentially NRHP-eligible Montlake Historic District.

loss of the landscaped area behind the properties on the south side of East Hamlin Street, the increased height of the new 24th Avenue East bridge over SR 520, and widening of East Montlake Place East and its intersection with Lake Washington Boulevard East. The 6-Lane Alternative would offset these effects with the landscaped lid at Montlake Boulevard. The lid would reduce noise and visual intrusion, increase green space, and partially reconnect the two sides of the potentially NRHP-eligible Montlake Historic District. The ultimate effect is not expected to be adverse because it would not diminish the integrity of the district's historic values.

The Pacific Street Interchange and Second Montlake Bridge options would affect more historic properties, and affect them differently, than the 6-Lane Alternative. The Pacific Street Interchange option would result in much greater visual intrusion than the 6-Lane Alternative on the potentially NRHP-eligible Montlake Historic District because of the high visibility of the Union Bay Bridge. The Second Montlake Bridge option would remove two of the historic district's contributing houses southeast of the existing bridge, and would increase noise because the roadway would be closer to homes on the east. Both options would also adversely affect the NRHP-listed Montlake Bridge itself.

The Pacific Street Interchange option's Union Bay Bridge would have a negative effect on views of the Montlake Bridge, while the Second Montlake Bridge option would adversely affect the bridge's historic setting by occupying its right-of-way and changing the view. WSDOT would work with the SHPO to minimize this effect by designing and constructing the new facilities to be as complementary as possible to the historic Montlake Bridge.

Both these options would also adversely affect the Montlake Cut and the University of Washington Canoe House, neither of which would be affected by the 6-Lane Alternative. The Pacific Street Interchange option would benefit these properties near the Montlake Cut by reducing noise levels but would visually detract from their settings. At the Canoe House, this option's effect on the historic setting would be adverse because the Union Bay Bridge and two 25-by-25-foot columns would be immediately adjacent to the structure and its dock. The second Montlake bridge would also be visible from both properties and would thereby alter their settings, but is not expected to detract from the integrity of these properties' significant historical features. In addition, the University of Washington Club would have its open vista of Lake Washington interrupted by the new bridge. This effect would not be so severe as to compromise the property's historical integrity.

As noted earlier, both build alternatives and the options would require the demolition of MOHAI (*Exhibit 5-16a*). Although the museum is not NRHP-eligible because of the alterations made to it over the years, it is potentially eligible as a Seattle Landmark and is a contributing element to



The Canoe House was built in 1918 as a seaplane hangar. It was given to the University of Washington in 1922 and used as a shell house for crew activities. It is currently well-maintained and is still used for canoe and sailboat storage and rental activities.

the potentially NRHP-eligible Montlake Historic District, which would be affected by its removal. WSDOT would consult with the SHPO, Seattle Parks and Recreation, and MOHAI to identify appropriate mitigation measures. These measures could include documenting the museum’s artifacts (if the museum were still operating at this location when construction took place), funding an exhibit on the history of MOHAI and its original structure, and/or contributing to redevelopment of the site. WSDOT would also consult with the SHPO and Seattle Parks and Recreation to ensure that appropriate landscaping and screening are provided and that the use of any remaining property is compatible with the potentially NRHP-eligible Montlake Historic District. Please see pages 98 to 116 of the Cultural Resources Discipline Report and pages 34 to 40 of the Addendum to the Cultural Resources Discipline Report (Appendix D) for additional information.

### How would the project affect archaeological and ethnographic sites?

Neither the 4-Lane nor the 6-Lane Alternative would permanently affect any known archaeological or ethnographic sites. However, because Native Americans are known to have used the shoreline areas of Union Bay, Portage Bay, and Lake Washington for seasonal encampments and some permanent villages, it is possible that previously undiscovered sites could be discovered in these areas during construction. WSDOT is currently conducting subsurface testing in archaeological high-probability areas within the project boundary to determine whether buried archaeological deposits are present, and if so, whether they are associated with historically significant resources. This testing will be completed prior to selection of the preferred alternative, and results will be included in the Final EIS.

WSDOT will also develop an inadvertent discovery plan to address late discovery of any cultural resources found during construction. In accordance with the provisions of this plan, WSDOT would work with the affected tribes and the SHPO to identify measures to mitigate the project’s effects if avoidance of the discovered cultural resource is not possible. These measures could include data recovery programs to collect and document materials found at the site, and potentially other offsite mitigation measures that would be negotiated between FHWA, the Tribes, the SHPO, and WSDOT.

### How would the project affect Section 4(f) resources?

The Seattle project area includes up to 14 properties that are protected under Section 4(f) regulations. These include seven parks and recreational facilities, two NRHP-eligible historic districts, and five NRHP-listed or eligible historic properties. As described in the subsections above on parks and cultural resource effects (*see Exhibits 5-14 and 5-18*), each of the build alternatives and options would affect some of these properties as a

#### Constructive Use under Section 4(f) (from 23 CFR 771.135)

(2) Constructive use occurs when the transportation project does not incorporate land from a Section 4(f) resource, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished.

(3) The Administration is not required to determine that there is no constructive use. However, such a determination could be made at the discretion of the Administration.

(4) The Administration has reviewed the following situations and determined that a constructive use occurs when:

(i) The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f), such as hearing the performances at an outdoor amphitheater, sleeping in the sleeping area of a campground, enjoyment of a historic site where a quiet setting is a generally recognized feature or attribute of the site’s significance, or enjoyment of an urban park where serenity and quiet are significant attributes;

(ii) The proximity of the proposed project substantially impairs esthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. Examples of substantial impairment to visual or esthetic qualities would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a park or historic site which derives its value in substantial part due to its settings.

result of land acquisition. Permanent property acquisition is considered a “use” under Section 4(f) regulations; based on the current project designs, the 4-Lane Alternative would require less total acreage from Section 4(f) properties than the 6-Lane Alternatives and options. A project can also use a Section 4(f) property without acquiring any land. This is considered a “constructive use.” (See the sidebar on the previous page for a definition of constructive use according to Section 4(f) regulations.)

Both the build alternatives would have varying degrees of other positive and negative proximity effects, as described earlier in this chapter. For example, these include both positive and negative effects on views in the Arboretum. Both the build alternatives would cover a wider area on higher structures that would be visible from more areas; these higher structures would also improve views under SR 520. WSDOT would also improve these ground-level and water-level views by removing the unused freeway ramps adjacent to the Arboretum. Both the build alternatives would reconstruct and enhance the Arboretum Waterfront Trail where it crosses under SR 520 and would substantially reduce noise levels. Most of the other Section 4(f) resources affected by the project would also have changed views and reduced noise levels. These effects may in some cases constitute a constructive use; WSDOT is currently working with the appropriate agencies to reduce the effects by design modifications as appropriate.

Measures to minimize harm to Section 4(f) resources have been included in the build alternatives and options. Mitigation measures were discussed in the preceding sections on park effects and cultural and historic resource effects. The full Draft Section 4(f) Evaluation is provided in Appendix P.

Congress recently revised the existing Section 4(f) legislation to simplify the 4(f) process for some transportation projects. Under this new legislation, an analysis of alternatives that would avoid Section 4(f) properties is not required and the Section 4(f) evaluation process is complete for a property if FHWA determines that the project results in *de minimis* (i.e., minor) impacts to the property. For historic resources, this determination is made in compliance with the consultation process outlined in Section 106 of the National Historic Preservation Act (16 USC 470(f)). For parks, recreation areas, and wildlife refuges, the determination is made after public notice and opportunity for public review and comment and concurrence from the officials with jurisdiction over the property. A *de minimis* impact finding is made on a property by property basis. FHWA can rely on mitigation in making a *de minimis* impact finding.

FHWA and WSDOT plan to consider the applicability of the *de minimis* provision on all of the Section 4(f) properties within the project area. The properties in Seattle most likely to qualify include Bagley Viewpoint, East Montlake Park, the Burke-Gilman Trail, the East Campus Bicycle Trail, and the NRHP-eligible Montlake Historic District. If appropriate, the FHWA Division Administrator will make a *de minimis* finding

## Recent Changes to Section 4(f) Regulations

### *De Minimis Impacts on Section 4(f) Resources*

Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Pub. L. 109-59, amended existing Section 4(f) legislation at Section 138 of Title 23 and Section 303 of Title 49, United States Code, to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f). This revision provides that once the U.S. Department of Transportation (USDOT) determines that a transportation use of Section 4(f) property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a *de minimis* impact on that property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

### *Section 4(f) Evaluation and Approval for Transportation Projects That Have a Net Benefit to a Section 4(f) Property*

In 2005, FHWA developed a nationwide programmatic Section 4(f) evaluation for certain federally assisted transportation improvement projects on existing or new alignments that will use property of a Section 4(f) park, recreation area, wildlife or waterfowl refuge, or historic property, which in the view of the Administration and officials(s) with jurisdiction over the Section 4(f) property, the use of the Section 4(f) property will result in a net benefit to the Section 4(f) property.

See also [www.environment.fhwa.dot.gov/projdev/4fnetbenefits.asp](http://www.environment.fhwa.dot.gov/projdev/4fnetbenefits.asp)

based upon impact avoidance, minimization, and mitigation or enhancement measures that are included in the project to address the impacts and adverse effects on the Section 4(f) resource. This finding would be made with the concurrence of the officials responsible for the protection of the property, such as officials from Seattle Department of Parks and Recreation.

If FHWA determines that the impacts to any of the Section 4(f) properties are not de minimis and an analysis of avoidance alternatives is required, a new Section 4(f) evaluation called the “net benefit” programmatic Section 4(f) evaluation may apply. For the net benefit programmatic evaluation, a key consideration is the condition of the property if it is avoided. If the property already suffers from some degree of impairment, such as damaged features or facilities, poor access, bad location, or drainage problems, avoiding the property would leave those conditions in place, whereas use of the property with careful attention to mitigation measures could result in a net benefit. As the programmatic evaluation states, a net benefit is achieved when the transportation use, the measures to minimize harm, and the mitigation incorporated into the project result in an overall enhancement of the Section 4(f) property when compared to both the future No Build or avoidance alternatives and the present condition of the Section 4(f) property. FHWA would make this determination after considering the activities, features, and attributes that qualify the property for Section 4(f) protection. A project does not achieve a net benefit if it will substantially diminish the functions or values that made the property eligible for Section 4(f) protection.

To complete the Section 4(f) process, FHWA will ensure that the preferred alternative is a feasible and prudent alternative with the least harm to the Section 4(f) properties after considering mitigation to the properties. As part of its evaluation, FHWA will consult with the jurisdictions that own the affected parks about park effects and with the State Historic Preservation Officer about effects to historic properties. This analysis will be included in the Final Section 4(f) Evaluation that will be circulated with the Final EIS.

## What effects would the alternatives have on ecosystems in Seattle?

The 4-Lane and 6-Lane Alternatives and the 6-Lane Alternative Pacific Street Interchange and Second Montlake Bridge options would affect ecosystem conditions and functions. Some beneficial effects would include removing unused highway ramps, providing stormwater treatment facilities where none now exist, and adding sound walls. Negative effects would include filling or shading wetlands and habitat. Effects would be fully mitigated to comply with applicable laws and with WSDOT’s policy of causing no net loss in wetland functions and values. Compared to the

### KEY POINTS

#### Ecosystems

The project’s effects on Seattle ecosystems would be:

- Better water quality resulting from new stormwater facilities
- Fewer columns in Portage Bay and Union Bay
- Filling of 0.2 acre of wetlands with any of the build alternatives
- Filling of between 2.0 acres and 5.3 acres of wetland buffer, depending on the alternative
- Shading of between 4.5 and 7.8 acres of wetland, depending on the alternative.

4-Lane Alternative, the 6-Lane Alternative would have slightly more negative effects because of its larger footprint.

Construction of the new roadway and bridges would fill or shade some areas of wetland and wetland buffer. It also would eliminate vegetation that provides wildlife habitat. The project would improve habitat conditions by constructing stormwater treatment facilities that would reduce the pollutant loads in runoff; this would improve water quality in wetland habitats and in the areas where fish spawn, forage, and rear. Higher bridges in the Arboretum area would also allow indirect light to reach the surface, which would help vegetation grow.

WSDOT would compensate for adverse effects using methods approved by the regulatory agencies with jurisdiction over wetlands, water quality, wildlife, and fisheries. These agencies, and their relevant areas of jurisdiction, include:

- U.S. Army Corps of Engineers (for effects on wetlands and navigable waters)
- U.S. Fish and Wildlife Service (effects on federally listed threatened and endangered species and compliance with the Fish and Wildlife Conservation Act, Migratory Bird Treaty Act, and Golden Eagle Protection Act)
- NOAA Fisheries (effects on federally listed threatened and endangered species)
- Washington State Department of Ecology (effects on shorelines, wetlands, water quality, and stormwater discharge)
- Washington Department of Fish and Wildlife (changes to water bodies and effects on state-listed species and habitat)
- Cities and towns within the project area (effects on critical areas, including wetlands, shorelines, and habitat areas)

An overall mitigation strategy would be developed with these agencies after a preferred alternative is identified. The specific details of how the project would avoid or offset adverse effects would be developed when WSDOT consults with, or submits permit applications to, these agencies during later phases of project design. General approaches to mitigation include:

- Water quality—The project would benefit water quality by treating and controlling stormwater runoff from the roadway. The treatment provided would meet or exceed the current requirements of state and federal water quality regulations.
- Wetlands—The project has been designed to avoid or minimize wetland effects wherever possible. Where damage cannot be avoided, WSDOT would create new wetlands and/or restore or enhance degraded wetlands, as well as enhance and preserve wetland buffers.
- Fish habitat—The project already includes many measures that would improve fish habitat. Higher bridges would reduce the intensity of

### The Importance of Wetlands and Buffers

**Wetlands** are transitional zones between aquatic environments and dry land. Their physical, chemical, biological, and social functions provide economic and ecological benefits. For example, the capacity of wetlands to store water and trap sediments can reduce downstream flooding and improve overall water quality. Wetland vegetation slows the movement of water, reducing streambank and shoreline erosion. Many wetlands support diverse vegetation types, which provide food and habitat for wildlife. Wetlands also provide educational and recreational opportunities for humans.

**Wetland buffers**—the natural, undeveloped areas surrounding a wetland—are a crucial part of the wetland system and must be protected along with the wetland. Buffers filter sediments and other pollutants from stormwater runoff. They slow and direct runoff water, maintaining water levels in the wetland. In addition, they serve as a “habitat connector,” providing a protective pathway for wildlife species moving from wetland to upland habitats. Buffers are vital to the survival of many species that rely on upland areas near wetlands to complete their habitat needs. And they provide a visual and noise barrier between the inner core of the wetland and adjacent human activities.

shading of the water below, which could affect fish behavior. The new bridges would have fewer columns in the water and would treat stormwater before discharging it. Structures that currently shade and fill open water, such as the unused R.H. Thomson Expressway Ramps, would be removed as well. In addition, WSDOT would restore affected habitat by enhancing wetlands and shorelines after construction.

- Wildlife habitat—Measures to offset project effects on wetlands and fish habitat—for example, creating new wetlands or restoring degraded wetlands or planting diverse vegetation in stream corridors and shoreline areas—would improve habitat and benefit project area wildlife. Habitat affected by construction would be replanted where possible.

The No Build Alternative would not fill any wetlands or affect additional wildlife habitat in Seattle. However, the existing bridge shades wetlands and wetland buffers in the Arboretum, and these effects would continue. The No Build Alternative would forego an important benefit of the build alternatives—the control and treatment of stormwater runoff from the highway. In addition to improving water quality over what it is today, the proposed improvements would enhance habitat for fish and other aquatic life. This benefit would not be realized if SR 520 were not rebuilt.

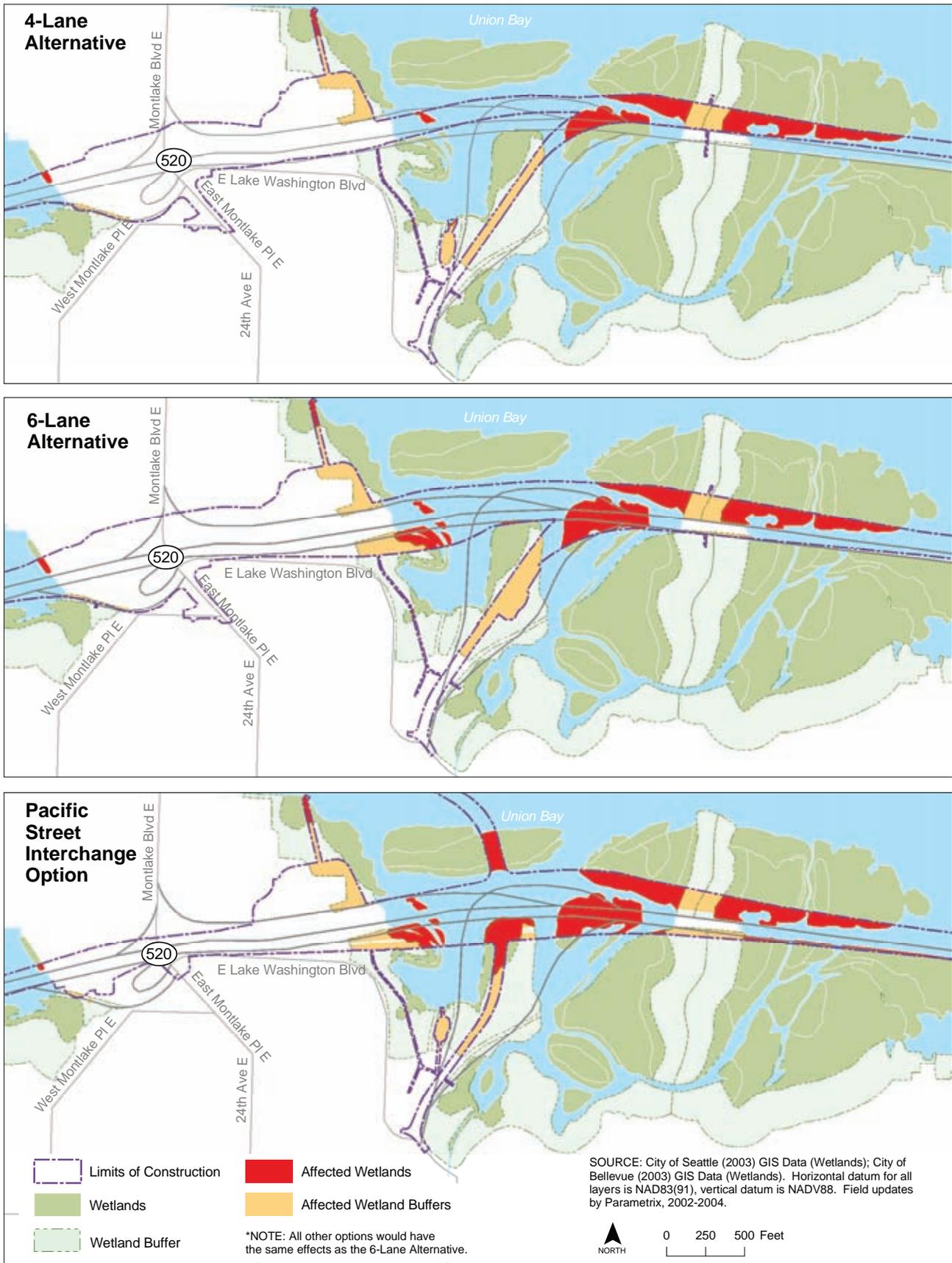
The following sections summarize specific effects of the project on the basins described in Chapter 2. Additional information on analytical methods and results is available in Appendices E and T, Ecosystems Discipline Report and Water Resources Discipline Report.

### Lake Union and Portage Bay Basins

The project would shade less than 0.1 acre of wetland in this basin under the 4-Lane Alternative and 0.1 acre under the 6-Lane Alternative. The shaded area would be located beneath the new Portage Bay Bridge (see *Exhibit 5-19*). The Pacific Street Interchange option would have the smallest shading effect because of its narrower width in this area. Seventy-six columns would be removed with the existing bridge. For the new bridge, the 4-Lane and 6-Lane Alternatives would replace these 76 columns with 54 columns, which would fill approximately 4,240 square feet of open-water areas. The narrower Pacific Street Interchange option would require only 36 columns and would fill 3,600 square feet. In all cases, the result would be fewer but larger bridge columns in Portage Bay than exist today.

The quality of water discharging to Lake Union and Portage Bay during storms would generally be better than the quality of water today because stormwater facilities would treat runoff from the road surface, which is currently untreated. The wider roadway would increase impervious surface in the basin, but the change would be relatively small compared to the size of the basin and would not substantially affect wetlands or habitat.

**Exhibit 5-19. Effects on Wetlands in the Seattle Project Area**



## Union Bay Basin

The project would fill wetlands and wetland buffers in the Union Bay Basin. It would also shade wetlands and buffers beneath the highway and bridges. All of the affected wetlands are high quality and are given a “Category II” rating by the Department of Ecology and the City of Seattle. *Exhibit 5-19* shows where the affected wetlands and buffers are located, and *Exhibit 5-20* provides a summary of effects. All of the fill in wetlands and buffers would result from new bridge columns, although there would be far fewer of these columns in Union Bay than there are today.

Compared to the existing bridge approach structures, which have 454 columns, the 4-Lane Alternative approach structures would have 120 columns, the 6-Lane Alternative would have 162, and the Pacific Street Interchange option would have 124. The Pacific Street Interchange option would also require four large columns (625 square feet each) to support the Union Bay Bridge. The project would also remove the three existing ramps near the Arboretum to expose about 0.2 acre of previously shaded wetlands.

As shown in *Exhibit 5-20*, the project would also shade varying amounts of wetlands and buffers. However, the new bridges would cause less intense shade than the existing structures in the Union Bay area. The west approach to the Evergreen Point Bridge would be between 10 and 41 feet higher than it is now, allowing more light to penetrate to the surface of the ground or water. The area under the center of the bridge would still be relatively shaded, but areas near the edges would probably support well-developed plant communities, including shrubs and small trees. WSDOT would mitigate shading effects on wetland plant communities by revegetating low-quality wetlands in the vicinity of the project.

The 4-Lane Alternative and the 6-Lane Alternative would not directly affect fish passage, since no structures would be placed in the main migration pathway through the Montlake Cut (which all salmonids that migrate in and out of Lake Washington pass through) and the open-water area of Union Bay. However, the Pacific Street Interchange and Second



Some beneficial effects to project area ecosystems would be removing unused highway ramps, providing stormwater treatment facilities where none now exist, and adding sound walls.

**Exhibit 5-20. Wetland and Buffer Effects in Seattle Project Area**

Alternative/Option	Fill		Shading <sup>a</sup>	
	Wetland	Buffer	Wetland	Buffer
4-Lane Alternative	0.2	2.0	4.5	2.3
6-Lane Alternative	0.2	3.8	6.7	2.2
Pacific Street Interchange Option <sup>b</sup>	0.2	5.3	7.8	1.3

<sup>a</sup>Number represents the maximum area shaded; actual shading may be substantially less.

<sup>b</sup>Other Seattle options would not differ from the 6-Lane Alternative.

Montlake Bridge options would each include a new structure over the salmon migration route.

The Pacific Street Interchange option’s Union Bay Bridge would span the bay at a height of 110 feet, supported by two 25-foot-square columns in the water on either side of the navigation channel. The staggered locations of these columns on the north and south sides of the navigation channel would reduce the width of the salmon migration corridor by up to 10 percent. This could potentially concentrate juvenile salmon into a narrower area of the migration corridor as they approach the Montlake Cut; the greater concentration of young salmon could attract predators such as northern pikeminnows to the area, which could increase predation on the salmon. The columns would also reduce the amount of habitat for invertebrates on which fish prey. Designing the bridge columns with smooth vertical surfaces would not likely provide attractive habitat for predator species such as smallmouth or largemouth bass. Because of its height, the Union Bay Bridge would cast a diffuse shadow that would probably not have a detectable effect on fish migration patterns.

The Second Montlake Bridge option would place a parallel, 58-foot-wide bridge deck 32 to 48 feet above the water of the Montlake Cut. The bridge would have its foundation on land, so that no structures would be required within the water. Because the existing bridge deck is thick, its grate allows only a small amount of reflected light to pass. The new bridge would have a solid deck casting a slightly darker shadow. Since all fish reaching this location would have passed under numerous other bridges—many lower and casting darker shadows—this bridge is not expected to affect fish migration patterns.

The project would improve Union Bay’s water quality by channeling runoff through stormwater treatment wetlands near the Lake Washington Boulevard on-ramp and at East Montlake Park. Treatment wetlands (described in Chapter 3) would surround the bridge columns from Union Bay to just beyond the east edge of Foster Island. These wetlands would use natural processes to remove pollutants from the bridge runoff. The improved water quality would benefit aquatic habitat and help offset the loss of water quality treatment functions from the affected wetlands. The Pacific Street Interchange option would include fewer of the bridge column treatment wetlands, but all runoff from the roadway surface would be treated at other types of stormwater facilities to comply with water quality standards.

The project would reduce the availability and quantity of wetland habitat for invertebrates, amphibians, birds, and mammals and would displace a beaver lodge near Foster Island. However, the area affected is small, and mitigation measures (as described above) would help offset the losses. The lower levels of noise resulting from the presence of the sound walls would

improve habitat value in areas that are currently affected by high noise levels.

WSDOT would meet compensatory mitigation requirements with a combination of wetland creation/restoration and wetland and buffer enhancement and preservation at a ratio of 3 to 1 for the highest quality wetlands. The ratio for shading effects is proposed to be a 1:1 ratio, but a final determination is yet to be made. The category of affected wetlands will determine the amount and type of wetland creation and/or enhancement to be done as mitigation. WSDOT would select mitigation sites based on watershed characteristics, size of the site, the ability of the site to mitigate for project effects, and other factors. Some potential mitigation opportunities in Seattle include:

- Revegetating low-quality wetlands in and around Lake Washington to compensate for shading effects on wetlands. This could include planting native trees and shrubs near or adjacent to the lakeshore to provide habitat for birds, wetland-dependent mammals, and amphibians.
- Creating approximately 0.6 acre of wetlands on a portion of the WSDOT-owned peninsula near the Arboretum by removing existing highway ramps, excavating fill material, and replanting with native vegetation.
- Replanting wetlands and buffers within the footprint of the existing SR 520 roadway with native species when the roadway and columns are removed.

Any of these Seattle project area mitigation options could provide educational opportunities for local residents, especially if interpretive trails and signs were provided. Appendix E, Ecosystems Discipline Report, provides more detailed information on potential mitigation measures.