Chapter 4: The Project Area's Environment

The SR 520, I-5 to Medina: Bridge Replacement and high-occupancy vehicle (HOV) Project area encompasses one of the most diverse and complex human and natural landscapes in the Puget Sound region. It includes areas in Seattle from I-5 to the Lake Washington shore, the waters of Lake Washington, and a portion of the Eastside communities and neighborhoods from the eastern shoreline of the lake to Evergreen Point Road. It also includes densely developed urban and suburban areas and some of the most critical natural areas and sensitive ecosystems that remain in the urban growth area. The project area includes the following:

- *Seattle neighborhoods—Eastlake, Portage Bay/Roanoke, North Capitol Hill, Montlake, University District, Laurelhurst, and Madison Park*
- *The Lake Washington ecosystem and the bays, streams, and wetlands that are associated with it*
- *The Eastside community of Medina*
- *Usual and accustomed fishing areas of the Muckleshoot Indian Tribe, who have historically used the area's fisheries resources and have treaty rights for their protection and use*

This chapter describes what the project area is like today, setting the stage for the project's effects described in Chapters 5 and 6.

Traffic on Evergreen Point Bridge

4.1 Transportation

The configuration of SR 520 today, with its inadequate shoulders and gaps in HOV lanes, makes the corridor especially prone to traffic congestion. And, as commuters on SR 520 know, the corridor is overloaded with traffic on a regular basis.

Population and employment continue to grow both on the Eastside and in Seattle, resulting in new travel patterns and a steady rise in the number of vehicles crossing the Evergreen Point Bridge. Between 2000 and 2010, Eastside population and employment grew by approximately 13 and 7 percent, respectively. Seattle population grew by about 6 percent while employment declined by about 6 percent during that period (PSRC 2010a). Because of the overall growth that has occurred, traffic on the Lake Washington bridges is now heavy in both directions throughout the day and will continue to increase, with population in the Puget Sound area rising by 1 million people and jobs increasing by 640,000 between now and 2030. On SR 520, traffic volumes have been virtually equal in both directions since the late 1980s. In fact, since 1993, peak afternoon traffic volumes have been slightly higher westbound than eastbound.

What is traffic like on SR 520 today?

Traffic congestion occurs regularly in both directions on the freeway. Many factors influence congestion on SR 520, including traffic operations on I-5 and I-405, the interplay of on- and off-ramp traffic with through-traffic along SR 520, and accidents on SR 520. The capacity of the SR 520 corridor is constrained by narrow road shoulders and lanes through the area, including across the floating bridge. Short acceleration lane lengths at the SR 520/Montlake interchange and Lake Washington Boulevard on-ramps contribute to congestion, as do slower speeds related to poor sight distance at roadway curves. The configuration of SR 520 also affects the freeway's ability to provide reliable and safe travel for all vehicles, including buses and carpools. The worst congestion commonly occurs at three points and times along the freeway:

- Westbound approaching the east end of the floating bridge during the morning peak period, where high traffic volumes combine with the end of the HOV lane and buses merging into traffic from the Evergreen Point Freeway Transit Station
- Westbound on the Portage Bay Bridge between I-5 and the SR 520/Montlake interchange during the evening peak period, where traffic merging onto the freeway from Montlake Boulevard and from the Montlake flyer stop meets a short acceleration lane and the uphill slope of the roadway

How does traffic on I-5 and I-405 affect traffic on SR 520?

SR 520 often becomes congested when there are backups on I-5 through downtown Seattle, especially across the Ship Canal Bridge. Congestion on SR 520 also occurs due to backups on I-405 through Bellevue and at the I-405 ramps to and from SR 520 itself.

- Eastbound approaching the west approach span of the SR 520 bridge in the morning peak period, where Lake Washington Boulevard merges onto SR 520, adding traffic along with the narrowing roadway of the bridge

Congestion caused by unpredictable incidents such as traffic accidents or stalled vehicles can last for several hours, both in the morning and the afternoon. Exhibit 4.1-1 shows eastbound and westbound crash rates, including the nature of the accidents, along SR 520, between I-5 and Medina. The highest crash rates in both directions were between I-5 and the SR 520 undercrossing at 24th Avenue East (i.e., between miles .2 and 1 as on Exhibit 4.1-1). 83 percent of the eastbound crashes and 86 percent of the westbound crashes were congestion-related (rear-end and sideswipe crashes) along this section.

Traffic on Montlake Bridge

Exhibit 4.1-1. **Distribution and Type of Eastbound and Westbound Crash Rates Along SR 520**

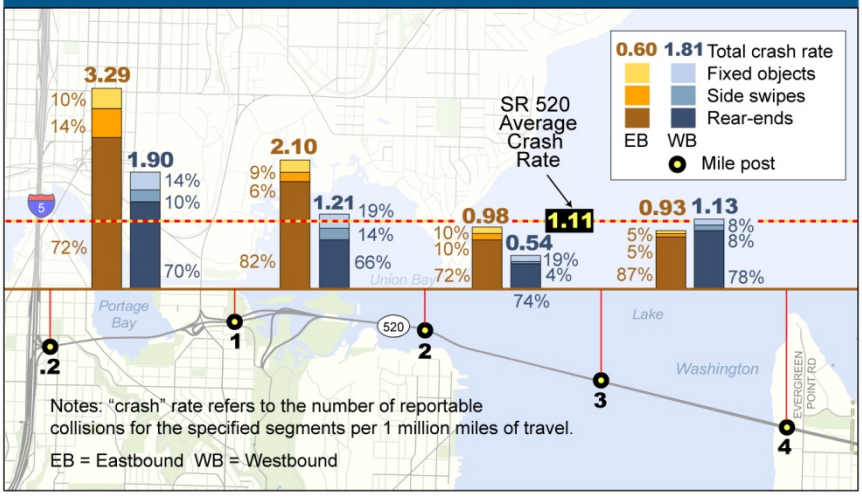


Exhibit 4.1-2. **Montlake Boulevard Existing Areas of Congestion**

Area of congestion

1 - SR 520 eastbound on ramp

2 - U-turn at Hamlin Street

3 - SR 520 westbound off ramp

4 - Montlake Bridge

N 0 200 400 800 Feet

What is traffic like at interchanges in the study area?

The study area interchanges (SR 520/Montlake, SR 520/Roanoke, I-5/NE 45th Street, I-5/Mercer Street, and I-5/Stewart Street) are congested during the morning and evening peak commute hours. During these times, travelers on local streets encounter congestion that is related in part to freeway congestion. However, other factors not related to the freeway affect local traffic operations, including intersection configuration, signal timing, and intersection spacing.

During both the morning and evening peak hours, the SR 520/Montlake Boulevard interchange area experiences some of the worst backups in the study area. The congestion at this location is partially related to traffic flow on SR 520 (which can affect traffic flow on the local street network) and partially to traffic flow on the local street network (which can affect traffic

flow on SR 520). The existing areas of congestion along Montlake Boulevard are shown on Exhibit 4.1-2 and discussed below.

SR 520 Eastbound On-ramp

During the morning peak period, eastbound SR 520 in Seattle is congested, limiting how much traffic can enter from the SR 520 on-ramps. On-ramp traffic can back up beyond the ramp and onto local streets, such as Montlake Boulevard and Lake Washington Boulevard. Traffic congestion on Montlake Boulevard southbound can extend back across the Montlake Bridge. During the evening peak period, congestion on Montlake Boulevard can extend as far north as 25th Avenue NE.

U-Turn at Hamlin Street

Drivers traveling northbound on Montlake Boulevard who want to access SR 520 westbound must make a U-turn at the Montlake Boulevard/East Hamlin Street intersection. These vehicles often spill out of the U-turn pocket and block the inside northbound lane on Montlake Boulevard, constraining through traffic to a single lane. This, in turn, affects traffic exiting the eastbound off-ramp and other intersections to the south.

SR 520 Westbound Off-ramp

Some drivers use the SR 520 westbound off-ramp to travel southbound on Montlake Boulevard. These drivers stop at the end of the westbound off-ramp to wait for a gap in traffic to cross the two northbound through lanes so that they can make a U-turn at Hamlin Street. Accommodating this movement introduces a safety issue and worsens northbound congestion, creating backups on the westbound off-ramp.

Montlake Bridge

Montlake Bridge openings also affect traffic flow in the Montlake interchange area. The bridge does not open during the morning and afternoon peak periods; however, a bridge opening at 3:30 p.m. can affect traffic operations throughout the afternoon commute. The effects of bridge openings compound whatever congestion is present on the local street network and can cause traffic on the SR 520 westbound and eastbound off-ramps to back up onto the SR 520 main line. This same congestion can extend back far enough to affect traffic on I-5.

During a typical summer weekday, the bridge opens 8 to 9 times a day on average. Bridge openings typically last less than 5 minutes, but can extend up to 6 minutes. Longer bridge openings closer to the afternoon commute period can negatively affect traffic flow for a considerable portion of the commute period. In addition to slowing general-purpose traffic, these delays make it difficult for bus drivers to keep to their schedules, affecting transit system reliability.

Montlake Bridge Openings

In 2008, nearly 50 percent of the weekday Montlake Bridge openings occurred between 10:00 a.m. and 3:30 p.m.. Weekday openings represented about 55 percent of the total bridge openings.

The bridge is closed to boat traffic during weekday peak traffic periods of 7:00-10:00 a.m. and 3:30-7:00 p.m. (September 1 – April 30) and 7:00-9:00 a.m. and 3:30-6:30 p.m. (April 30 –September 1) (33 CFR 117.1051).

In 2008, there was an average of 6 openings per weekday, but during the peak months of June, July, and August there was an average of 8 openings per weekday.

The bridge typically remains open for about 5 minutes, which can result in transit (bus) delays. Sixty percent of the affected bus routes are local and 40 percent are routes using SR 520.

How do general-purpose and HOV lanes differ?

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

How does transit operate on SR 520 today?

HOV lanes are provided in a number of locations along SR 520 east of Lake Washington, but they change in their location from inside to outside lanes and are discontinuous. With the gaps in the HOV lanes on SR 520 and the absence of HOV lanes west of Medina, buses are caught in the same congestion as general-purpose vehicles and cannot bypass traffic, making it difficult to remain on schedule. Buses traveling in the same congested lanes as general-purpose traffic leads to less reliability in bus arrival times, requiring transit riders to plan for the worst conditions and expect a relatively long travel time. The variability in bus arrival and departure times also makes transferring between routes difficult.

Bus reliability through the SR 520 corridor is affected by the lack of a continuous HOV lane on SR 520, as demonstrated by the bus travel times between NE 51st Street in Redmond and the Montlake Freeway Transit Station, most notably in the westbound direction during the evening commute. Westbound travel times can range from 10 to 55 minutes during the evening commute (Table 4.1-1). While the average travel time is 22 minutes, approximately 20 percent of bus trips take over 30 minutes (King County Metro 2008), making it difficult for bus passengers to plan their trip. Eastbound transit travel times during the evening commute can range from 10 to 30 minutes, with an average of 16 minutes. During the morning commute, westbound and eastbound travel times are similar, ranging between 10 and 30 minutes. For both directions during the morning peak, most trips average about 16 minutes in either direction, making the travel time fairly reliable.

Table 4.1-1. Existing Bus Travel Times between NE 51st Street (Redmond) and Montlake Freeway Transit Station (Seattle)

	Time of Day			
	Mornings		Evenings	
Direction of Travel	Range (in minutes)	Average (in minutes)	Range (in minutes)	Average (in minutes)
Westbound	10-33	16	10-55	22
Eastbound	10-30	16	10-30	16

Currently, 24 bus routes use the Evergreen Point Bridge—18 King County Metro routes, 5 Sound Transit Regional Express routes, and 1 route operated by Snohomish County Community Transit (King County 2010). As shown in Table 4.1-2, fifteen of these routes connect Eastside communities to downtown Seattle and eight routes connect to the University District and north Seattle. Twenty routes provide peak-period

service only, and all-day service is provided by four of the routes. Only one route provides late-night eastbound service across SR 520.

Table 4.1-2. Existing SR 520 Bus Routes

Bus Routes	Number of Routes[a]	Route Numbers
Downtown Seattle to Eastside (serve Montlake Freeway Transit Station)	15	Peak: 242, 250, 252, 256, 257, 260, 261, 265, 266, 268, 311, 424, 555[b] All day: 255, 545
University District/North Seattle to Eastside	8	Peak: 167, 243, 272, 277, 542, 556 All day: 271, 540

[a]Route 280 provides one late-night eastbound trip between downtown Seattle and Renton and was not included in this table.
[b] Route 555 serves Northgate/University District via I-5 and therefore serves the Montlake Freeway Transit Station.

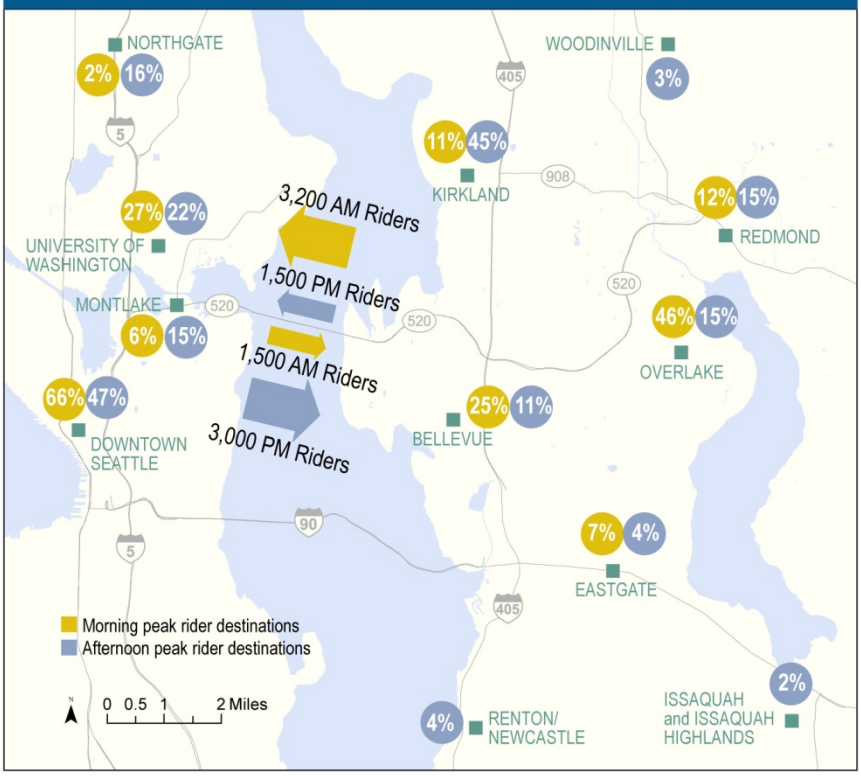
The combined service provided by the 24 routes provides a high level of bus frequency across the SR 520 bridge during peak periods (6:00-9:00 a.m. and 3:30-7:30 p.m.), with a bus crossing the bridge every 2 to 3 minutes during that period. Midday bus service (9:00 a.m. to 3:30 p.m.) has fewer routes than the peak periods, with buses crossing the floating bridge every 4 to 5 minutes

The region's transit agencies currently provide approximately 600 bus trips across the Evergreen Point Bridge on an average weekday, serving almost 16,000 riders. Exhibit 4.1-3 shows existing King County Metro and Sound Transit ridership across the Evergreen Point Bridge and the distribution of those riders at general destinations (as represented by the percentages shown at each location).

During the morning peak period, there are 131 westbound and 63 eastbound bus trips carrying approximately 3,300 and 1,400 riders, respectively, across SR 520. Then, during the afternoon peak period, transit travel patterns reverse with more buses traveling eastbound (117) than westbound (52), and with passenger volumes typically spread out over longer periods. During this time, buses carry approximately 1,400 westbound and 3,000 eastbound passengers across SR 520. The minor difference in ridership between the morning and evening commute (3,200 versus 3,000) is most likely due to social activities or work requirements in the evening that affect standard commute plans.

This exhibit shows that the two primary Seattle destinations during the morning commute are downtown Seattle (67 percent) and the University District (28 percent). The two primary Eastside destinations during the morning commute are Overlake (49 percent) and Bellevue (25 percent). During the evening commute, the primary Seattle destinations are the same, while Kirkland and Redmond are the two primary Eastside destinations.

Exhibit 4.1-3. **Transit Ridership across Evergreen Point Bridge**

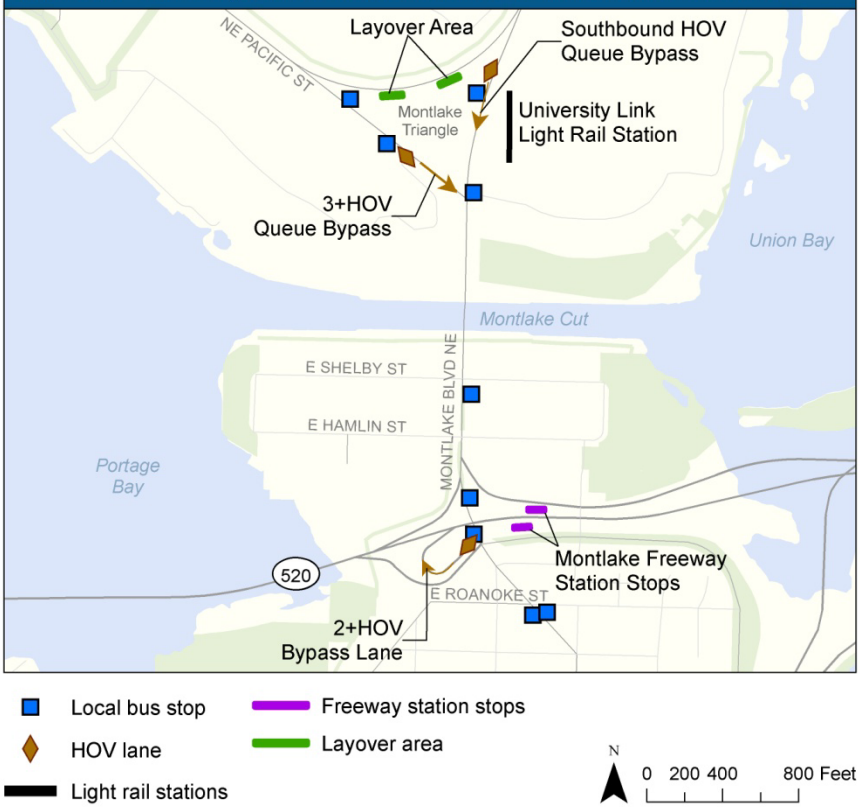


In addition to the King County Metro, Community Transit, and Sound Transit routes, Microsoft uses SR 520 for its Microsoft Connector shuttle service, which provides service for Microsoft employees commuting between Microsoft and Seattle, Bothell, Mill Creek, Issaquah, Woodinville, and Sammamish. The University of Washignton (UW) Medical Center, Children's Hospital, and the Fred Hutchinson Cancer Research Center all operate shuttles that travel through the Montlake neighborhood and University District to other Seattle neighborhoods.

What transit facilities are on or near SR 520 today?

The discussion of transit facilities is focused on the Montlake area, where the project has the potential to affect transit service. Montlake Boulevard and NE Pacific Street have been identified in the City of Seattle's Transit Plan (City of Seattle August 2005) as links in the Urban Village Transit Network (UVTN). The UVTN represents the backbone of the Seattle transit network, carrying the majority of Seattle transit system riders. Exhibit 4.1-4 shows the existing transit facilities within the Montlake area. Although the Evergreen Point station (located east of Evergreen Point Road on the Eastside and not shown on Exhibit 4.1-4) is outside of the project limits, it plays an important role in transit service in the study area and is basically the Eastside analogue to the Montlake station west of the lake.

Exhibit 4.1-4. **Existing Transit and HOV Facilities within the Montlake Area**



The bus stops located within the project study area are:

- Montlake Freeway Transit Station stop - westbound
- Montlake Freeway Transit Station stop - eastbound
- Montlake overpass bus stop - northbound
- Montlake overpass bus stop - southbound
- Montlake Boulevard northbound at East Shelby Street
- UW Medical Center bus stop - westbound
- UW Medical Center bus stop - eastbound

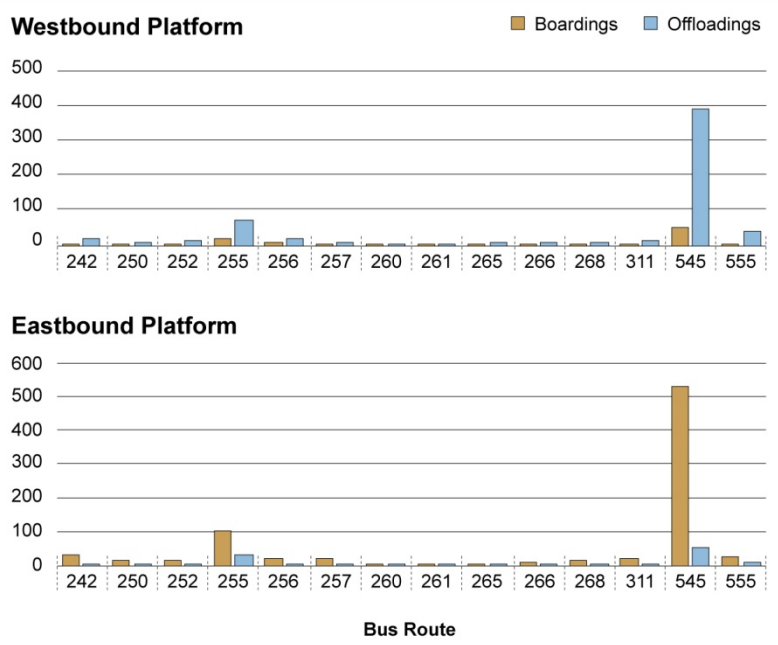
Bus riders transfer between SR 520 and local bus service at these stops. Several of these bus stops include covered passenger waiting areas and other enhancements for pedestrians and transit patrons, including lighting and artwork

Montlake Freeway Transit Station

The Montlake Freeway Transit station consists of one eastbound and one westbound bus platform and shelter on the shoulders of SR 520 near the Montlake interchange. Bus riders access the eastbound platform via stairs on the Montlake overpass, while passengers using the westbound platform use a walkway from Montlake Boulevard.

Of the 16,000 daily transit riders crossing the SR 520 Bridge, approximately 11 percent, or 1,700, use the Montlake Freeway Transit Station on an average weekday. Transit service at the Montlake Freeway Transit Station is provided by King County Metro, Sound Transit, and Community Transit. Exhibit 4.1-5 shows the bus routes that serve the station, and the number of passengers boarding (getting on the bus) and alighting (getting off the bus) by route. Three routes (Sound Transit 545, King County Metro 255, and Sound Transit 540) account for 60 percent (1,000) of the boarding and alighting activity at this station. The exhibits also show that the primary activity at the westbound station is riders getting off of buses, while the primary activity at the eastbound station is riders getting on buses.

Exhibit 4.1-5. **SR 520 Montlake Freeway Station Daily Use (2010)**



Exhibits 4.1-6 and 4.1-7 below show the distribution of bus and passenger activity throughout the day. For the westbound Montlake Freeway Transit Station, passenger activity is greatest in the evening (p.m. and off-peak periods). In the evening peak period, there are approximately 40 passenger boardings and 180 alightings, with most riders using Sound Transit route 545. It is during the off-peak hours that this station has the most alightings (195), with most (160 or 83 percent) occurring between 6:15 and 9:30 p.m. Sound Transit route 545 accounts for 77 percent of these alightings.

Exhibit 4.1-6. **Year 2010 Boardings and Alightings by Time of Day at the Montlake Freeway Transit Station – Westbound**

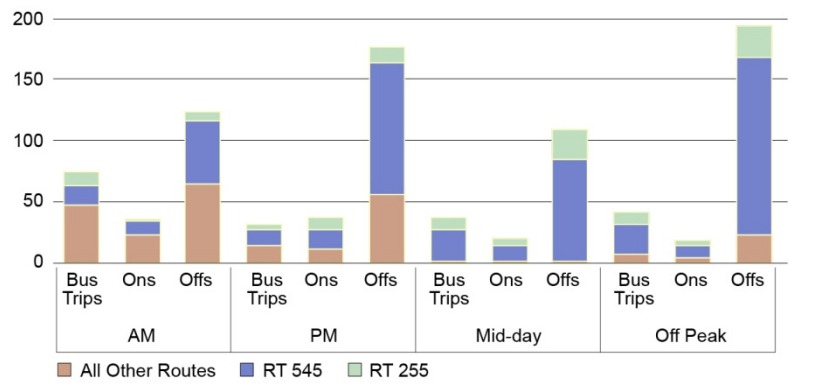
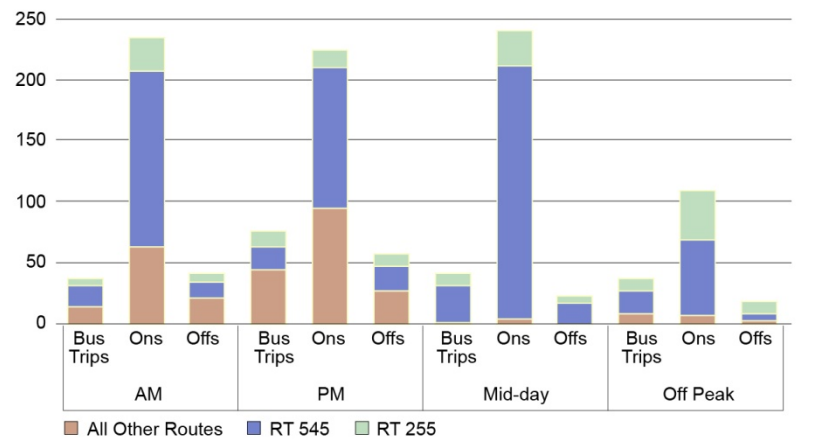


Exhibit 4.1-7. **Year 2010 Boardings and Alightings by Time of Day at the Montlake Freeway Transit Station – Eastbound**



During the morning peak period, there are approximately 40 passenger boardings and 120 passenger alightings over a 3-hour period. The alightings represent Eastside residents traveling to the UW, Montlake, or other nearby neighborhoods by riding downtown-bound SR 520 buses. These riders then transfer to local bus service on Montlake Boulevard NE or walk or bike to their destinations (EnviroIssues and Northwest Research Group Transportation Solutions, Inc. 2005).

In the morning, the eastbound station is the busier of the two stations, with approximately 235 passenger boardings and 40 passenger alightings over a 3-hour period. Approximately 90 percent of the people using the eastbound Montlake Freeway Transit Station in the morning are traveling to work. Approximately 60 percent of these people arrive by bus while another 20 percent arrive by bicycle (EnviroIssues and Northwest Research Group Transportation Solutions, Inc. 2005). At the freeway transit station, they

transfer to SR 520 buses for the trip to the Overlake area (route 545), the Kirkland area (route 255), or other Eastside destinations.

The eastbound stop remains busy during the midday with 240 boardings over a 6-hour period (or 40 per hour). Sound Transit route 545 accounts for 86 percent of these boardings. The westbound station is not as busy as the eastbound station during the mid-day. There are more alightings (110 over a 6-hour period or 18 per hour) than boardings, and Sound Transit route 545 accounts for approximately 75 percent of them.

In the afternoon, 220 people board and 60 people get off buses at the eastbound stop. Approximately 65 percent, or 140 people, arrive from the University of Washington. Approximately 60 percent of these people, or 85 people, arrive by bus while almost the entire remaining 40 percent, or 55 people, walk to the station (EnviroIssues and Northwest Research Group Transportation Solutions, Inc. 2005).

The Montlake Freeway Transit Station is the busiest stop in the entire transit system for loading and unloading of bicycles, with 300 bike rack uses daily. Bicyclists who commute three or more days per week may park their bicycles in one of 54 reserved King County Metro locker spaces at the Montlake Freeway stop on the north side of the bridge.

Montlake Boulevard Bus Stops

The Montlake Boulevard overpass bus stops allow transit riders to transfer between SR 520 and local transit services. The northbound bus stop is located just south of where the SR 520 westbound off-ramp merges onto Montlake Boulevard and the southbound stop is located at the entrance to the SR 520 eastbound on-ramp. The northbound bus stop serves three local bus routes for a total of approximately 190 daily bus trips, 230 daily passenger boardings, and 120 daily passenger alightings per day.

Local buses traveling over SR 520 on the Montlake Boulevard overpass

The southbound bus stop serves three local and seven SR 520 bus routes with 300 daily bus trips, approximately 400 passenger boardings, and 380 passenger alightings per day. On a daily basis, passenger boardings and alightings are highest for the local bus routes (routes 25, 43, 48). Route 271 is the busiest of the SR 520 routes, providing all-day service connecting the University District, downtown Bellevue, Eastgate, and Issaquah.

The bus stop at East Shelby Street serves seven SR 520 bus routes with 100 daily bus trips, approximately 10 passenger boardings, and 100 passenger alightings per day. Route 271 accounts for most of the passenger activity at this stop. This stop is the busiest during the p.m. peak period.

The Montlake Triangle

Bounded by Montlake Boulevard NE, NE Pacific Street, and NE Pacific Place, the "Montlake Triangle" is the southeastern entry to the University of Washington campus. The UW Medical Center stops (one eastbound and

one westbound) are located on NE Pacific Street and are the busiest in the Montlake Triangle area.

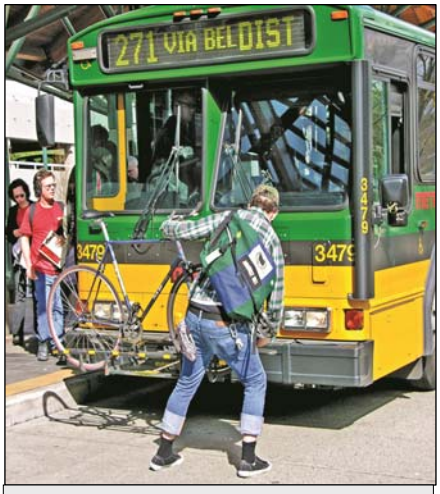
The UW Medical Center stops provide access to the University Medical Center, UW medical and health sciences academic buildings, the main UW campus, Husky Stadium, and associated parking areas. Transit service is provided by King County Metro and Sound Transit and, combined, there are 3,800 boardings/alightings at these stops every weekday. In addition to providing access to the UW, these stops also serve riders transferring between SR 520 and local bus service.

The westbound stop is served by 11 routes (3 local and 8 SR 520 bus routes) and the eastbound stop is served by 13 routes (4 local and 9 SR 520 bus routes). Local buses (routes 43, 44, and 48) account for 70 percent of passenger activity. SR 520 bus routes, especially all-day routes 271 and 540, account for approximately 30 percent of daily on/off activity at the westbound stop. At the eastbound stop, SR 520 bus routes account for slightly more with approximately 36 percent of daily on/off activity.

There are also transit layover spaces on the southeast curb of NE Pacific Place and a driver comfort station in the Montlake Triangle Garage that facilitate use of these bus stops. HOV lanes are provided on NE Pacific Street eastbound and Montlake Boulevard southbound lanes to facilitate bus and carpool travel. These lanes help to reduce the delays for carpools, local buses, and eastbound SR 520 bus routes. Sound Transit is also scheduled to begin operating light rail in this area in 2016 and construction of a University Link light rail station is already underway. This station will be located on the east side of Montlake Boulevard near Husky Stadium.

Trolley Wires

Overhead electric bus wires (trolley wires) are located along NE Pacific Street, the eastbound lane of NE Pacific Place, and the southbound outside lane of Montlake Boulevard (between NE Pacific Place and NE Pacific Street). There are also trolley wires on Montlake Boulevard NE south of NE Pacific Street, across the Montlake Bridge, 24th Avenue, and 10th Avenue East (in the North Capitol Hill and Portage Bay/Roanoke neighborhoods). Trolley wire power substations are located in these areas.



Bus with a Bike Rack

Bicyclists wishing to cross the lake via SR 520 must board a bus equipped with a bicycle rack.

Evergreen Point Freeway Station

The Evergreen Point Freeway Station is located west of I-405 near the east end of the Evergreen Point Bridge. Both eastbound and westbound bus platforms and shelters are located on the shoulders of SR 520. On the south side of SR 520, the Evergreen Point Park-and-Ride provides 51 parking stalls just southwest of the eastbound bus platform. Approximately 20 routes serve this freeway station. Over 80 percent of the activity at the westbound station is transfer activity, primarily to University District-bound buses (EnviroIssues and Northwest Research Group

Transportation Solutions, Inc. 2005). At the eastbound station, transfers account for 95 percent of the activity.

The majority of riders using the Evergreen Point Freeway Station transfer to and from bus routes serving the University of Washington (over 50 percent) or downtown Seattle (over 30 percent) (EnviroIssues and Northwest Research Group Transportation Solutions, Inc. 2005). Many of the connecting Eastside routes originate in Redmond, Kirkland, or Bellevue. Some Medina residents and students busing to private schools in Seattle also use this freeway station.

Approximately 1,100 bus riders per day currently use this station (King County Metro, Spring 2010b APC Data). Many bicyclists use this stop because it is the last opportunity to put bikes on buses before crossing the SR 520 floating bridge.

What is nonmotorized travel like today?

Today, the Evergreen Point Bridge poses a considerable challenge for bicyclists and pedestrians traveling between Seattle and the Eastside communities. Because of the limited shoulder widths, no pedestrian or bicycle traffic is allowed on the bridge. Bicyclists wishing to cross the lake via SR 520 must board a bus equipped with a bike rack.

Bicyclists and pedestrians can reach the SR 520 corridor in Seattle using a combination of trails and on-street bicycle lanes. The Montlake Bridge over the Montlake Cut is an important crossroads serving several transportation modes that link the Montlake and University District neighborhoods.

As shown in Exhibit 4.1-8, there is currently substantial pedestrian and bicycle activity around the Montlake interchange as people travel to, from, or through the University District and the UW.

This interchange area provides the key stop and transfer point for local and regional bus service to and from the University District, including access for the UW Medical Center, the Triangle Parking Garage, UW main campus, and the UW parking areas. The area also provides a link between the Burke-Gilman Trail and Seattle destinations, especially those to the south.

Pedestrians use a traffic island at the corner of the Montlake Triangle to travel between the UW E-11 parking lot east of Montlake Boulevard and the UW Medical Center. Pedestrians also cross the Triangle to travel between the UW central campus and the UW Medical Center and Husky Stadium facilities.

Exhibit 4.1-8. **SR 520/Montlake Interchange Area Pedestrian Volumes and Bicycle/Pedestrian Routes**

Peak Total AM and PM Pedestrian Volumes

- < 400
- 400 - 600
- 600 - 800
- Bus stop
- Bicycle/pedestrian route
- Park

N

0 250 500 Feet

There are five pedestrian bridges located north of the Montlake Triangle:

- Two across NE Pacific Street between Montlake Boulevard NE and 15th Avenue NE
- Three across Montlake Boulevard connecting the UW main campus to the athletic facilities and parking lot located east of Montlake Boulevard

Bicyclists cross the Montlake Triangle as they travel between areas south of the Montlake Bridge and the UW Medical Center or the main campus and the Burke-Gilman Trail. The sidewalks, crosswalks, and asphalt path across the Triangle are designated regional trail connections in the Seattle nonmotorized plan. Approximately 6 percent of students and staff bicycle to campus, many of whom come from the south and cross Montlake

Boulevard NE, NE Pacific Street, and NE Pacific Place (University of Washington 2001).

There are currently no dedicated bicycle facilities connecting the Burke-Gilman Trail and the portion of the Lake Washington Bike Loop south of SR 520. However, cyclists use sidewalks and arterial streets in the project area to travel to the Montlake Freeway Transit Station and other destinations.

4.2 Land Use and Economic Activity

The land uses of a community indicate where people live, work, shop, and participate in community activities. Local governments plan for land uses according to the community's long-range vision and goals. In the Puget Sound region these goals are identified within the framework of the Washington State Growth Management Act, which requires communities to plan for future growth and the infrastructure required to serve it. SR 520 is a regionally important transportation corridor, one of only two bridges that cross Lake Washington connecting major employment and population centers. Successful implementation of state, regional, and local land use plans requires the ability to efficiently and reliably move an increasing volume of people and goods across the lake. Regional plans have identified the addition of HOV lanes in the SR 520 corridor as a key component of the area's future infrastructure needs.

What are the land uses within the project area?

The project area encompasses neighborhoods in Seattle from I-5 to the Lake Washington shore, the waters of Lake Washington, and the city of Medina on the Eastside. Within Seattle, it includes seven Seattle neighborhoods: Eastlake, Portage Bay/Roanoke, North Capitol Hill, Montlake, University District, Laurelhurst, and Madison Park. Land use along the SR 520 corridor is primarily residential, with parks, playfields, and open space interwoven into the development pattern. Businesses are located near the I-5 and Montlake interchanges. Recreational, civic, and commercial establishments are located along the shorelines of Portage Bay and Lake Union and in the neighborhoods surrounding the Montlake interchange.

The UW campus lies north of the freeway and the Montlake Cut, with Husky Stadium and the UW Medical Center prominently located at its southern end. The NOAA Northwest Fisheries Science Center and MOHAI are immediately north of SR 520 on either side of the Montlake interchange. The corridor extends through the north end of the Washington Park Arboretum before crossing Lake Washington. On the Eastside, Medina occupies a peninsula that extends into Lake Washington; this neighborhood is characterized by large homes on semi-wooded properties with few commercial businesses. Exhibits 4.2-1 and 4.2-2 show the land use pattern through the Seattle and Eastside portions of the project area. Neighborhoods are described in more detail in Section 4.3, Social Elements.

Washington State Transportation Plan and Highway System Plan

The 2007-2026 Washington Transportation Plan (WTP) (WSDOT 2006) guides transportation policy and investment decisions at all levels throughout the state and meets federal and state planning requirements. The WTP addresses the state's transportation challenges by making targeted, prioritized investments to achieve the greatest benefit with limited funding.

The WTP assigns 4 of the 5 prioritized investment guidelines to the SR 520 Evergreen Point Bridge. These are:

- Preservation—Preserve and extend prior investments in existing transportation facilities and the services they provide to people and commerce.
- Safety—Target construction projects, enforcement, and education to save lives, reduce injuries, and protect property
- Economic Vitality—Improve freight movement and support economic sectors that rely on the transportation system, such as agriculture, tourism, and manufacturing.
- Mobility—Facilitate movement of people and goods to contribute to a strong economy and a better quality of life for citizens.

Aerial view of Lake Washington

Exhibit 4.2-1. **Existing Land Use in Seattle**

Existing Land Use			
Single family	Park/open space	Industrial	Unknown
Multifamily	Civic and quasi-public	Parking	Right-of-way
	Commercial	Vacant	

N 0 500 1,000 2,000 Feet

What are the current economic conditions in the project area?

On both sides of the lake, there are major employers that require efficient transportation systems for the movement of goods, services, and employees to and from their places of business. Seattle is the largest city in Washington and the biggest employment center in the Pacific Northwest. Between 2000 and 2030, employment in Seattle is expected to increase 31 percent from approximately 540,000 to over 708,000 jobs (PSRC 2006).

Bellevue is the financial, retail, and office center of the Eastside. The greater Eastside is expected to grow considerably in the coming decades. This is especially true for Bellevue, the second largest employment center in the Puget Sound region. Total jobs on the Eastside are expected to increase 56 percent, from approximately 240,000 in 2000 to 375,000 in 2030 (PSRC 2006). The Eastside includes many "new economy" jobs in high-tech industries, as well as retail and service jobs including financial, real estate, medical, and professional.

In recent years, the regional economy has diversified, resulting in an economy less affected by downturns in a single industry. One of the primary industries responsible for this diversification is the high-tech industry. Business growth will continue to depend on the region's transportation system to provide reliable movement of goods and services,

Exhibit 4.2-2. **Existing Land Use on the Eastside**

Existing Land Use	
Single family	Commercial
Park/open space	Vacant
Civic and quasi-public	Right-of-way

N 0 500 1,000 2,000 Feet

customers, and employees to and from their business locations. SR 520 is a critical component of the region's transportation system.

What are the land use plans and implementing regulations for the project area?

Several key state and regional planning documents establish the framework for local land use plans and programs. These planning documents are the Washington State Growth Management Act (GMA); Puget Sound Regional Council's *Vision 2040* (PSRC 2008) and *Destination 2030* (PSRC 2007); and King County's Countywide Planning Policies (King County 2008a). In addition, Sound Transit's 2030 *Sound Move* plan, adopted in 1996, and the *ST2* plan, adopted in 2008, provide a multi-year regional transit planning framework.

Washington State's GMA (Chapter 36.70A Revised Code of Washington [RCW]) provides a comprehensive framework for managing growth and coordinating land use planning with infrastructure. The GMA's planning goals guide development of local comprehensive plans and development regulations, such as directing growth to urban areas, reducing sprawl, and encouraging efficient transportation systems. Local, county, and regional plans are required to be consistent with the GMA.

Regional Plans

Vision 2040 (PSRC 2008) is PSRC's long-range growth management, economic, and transportation strategy for the central Puget Sound region, which encompasses King, Kitsap, Pierce, and Snohomish counties. *Vision 2040* contains numerous land use and transportation related policies that emphasize concentrating growth in urban centers and connecting those centers with an efficient, transit-oriented, multimodal transportation system. The plan supports transportation investments in major facilities and services that maximize transportation system continuity and are phased to support regional economic development and growth management options.

In particular, *Vision 2040* supports developing a transportation system that connects urban centers with frequent service, convenient connections, and easy transfers between modes. *Transportation 2040* (PSRC 2010a) translates the policies of *Vision 2040* into implementation strategies, providing a guide for large regional projects and important local solutions for a 30-year period. The PSRC models and assesses the impacts of this land use pattern on travel forecasts, to estimate the effect on the transportation system of the region over time. This information provides the basis for which the investments in *Transportation 2040* are identified. The plan is the regional transportation planning document that serves as the basis for state and federal transportation expenditures within the region.

Transportation 2040 identifies the SR 520 floating bridge as a project necessary to support development of the centers identified in *Vision 2040*

Transportation 2040

The Transportation 2040 plan improves mobility through a combination of effective land use planning, demand management, efficiency enhancements, and strategic capacity investments. To improve system efficiency, the plan creates "smart corridors" with advanced technology. Capacity improvements strategically expand roadway, transit, and nonmotorized facilities, with new roadways limited to key missing links and enhancing existing facilities. Over time the region will transition to a new funding structure based on user fees, which could include high-occupancy toll (HOT) lanes, facility and bridge tolls, highway system tolls, vehicle miles traveled (VMT) charges, and other pricing approaches that replace the gas tax and further fund and manage the transportation system.

and to keep freight moving to support a strong economy. It also supports relying directly on users of the new highway capacity to pay for improvements through systemwide tolling, which would also have positive effects by reducing congestion and emissions. This means that a 6-lane SR 520 is assumed in PSRC's regional traffic model as a key facility needed to serve planned land uses under *Vision 2040* and local land use plans.

Countywide Planning Policies

Consistent with the provisions of the GMA and *Vision 2040*, the *King County Countywide Planning Policies* (King County 2008a) provide the regional vision and framework for the comprehensive plans of King County and its cities. These policies establish an urban growth area in the western one-third of King County where most growth and development is projected to occur. Policies that support the urban growth area call for a balanced transportation system that includes both high-capacity transit and an extensive HOV system.

Local Plans

Seattle and Medina have comprehensive plans consistent with the GMA. These plans provide the overall policy guidance for future development at a local level and address topics such as land use, housing, parks and open space, transportation, and the environment. Each city also has a shoreline master program that is consistent with the requirements of the Washington State Shoreline Management Act (Chapter 90.58 RCW). In addition, Seattle has transportation and neighborhood plans that pertain to the SR 520 project area. These are described below.

Comprehensive Plans

Seattle's Comprehensive Plan: Toward a Sustainable Seattle (City of Seattle 2007) sets forth land use policies geared toward creating urban centers that concentrate residential development and employment centers while maintaining the density and character of the neighborhoods. No substantial changes in land use patterns are planned for the Seattle neighborhoods along SR 520. Policies within the Comprehensive Plan state Seattle's support for completion of the HOV lane system in the Puget Sound region, and that freeway expansion should focus primarily on accommodating non-single-occupant-vehicle users.

The land uses identified in the Medina comprehensive plan do not differ from existing uses, and no substantial changes in land use patterns are planned for this community.

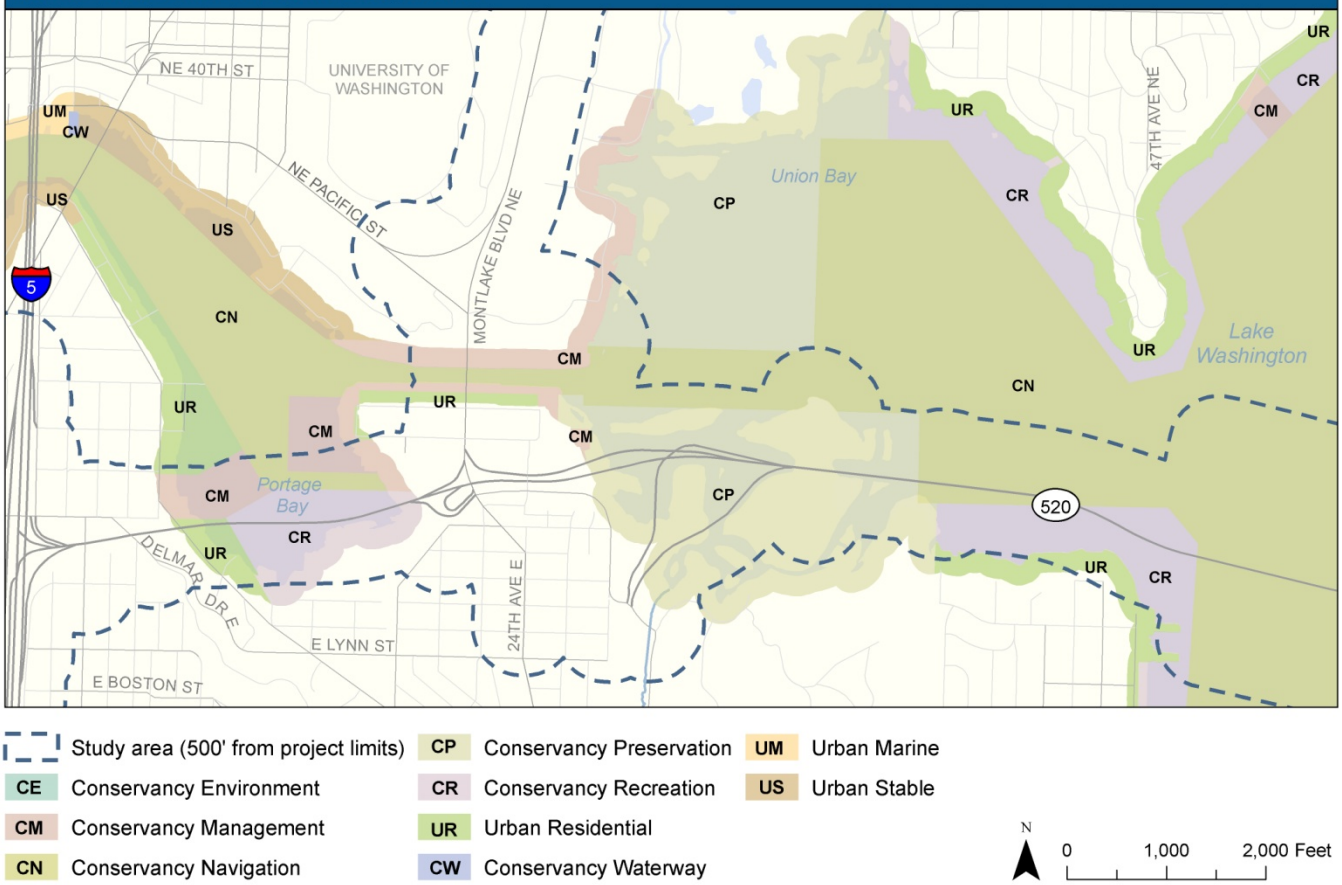
Shoreline Master Programs

Shorelines generally refer to lands next to rivers, larger lakes, and marine water bodies, including associated shorelands, wetlands, and floodplains.

The state's Shoreline Management Act (SMA) provides the vision, goals, and policy context for each city and county in Washington to adopt a shoreline master program at a regional and local level. The shoreline master programs regulate local shoreline use and development.

Exhibit 4.2-3 depicts the shoreline designations within the Seattle land use study area.

Exhibit 4.2-3. **Seattle Shoreline Designations**



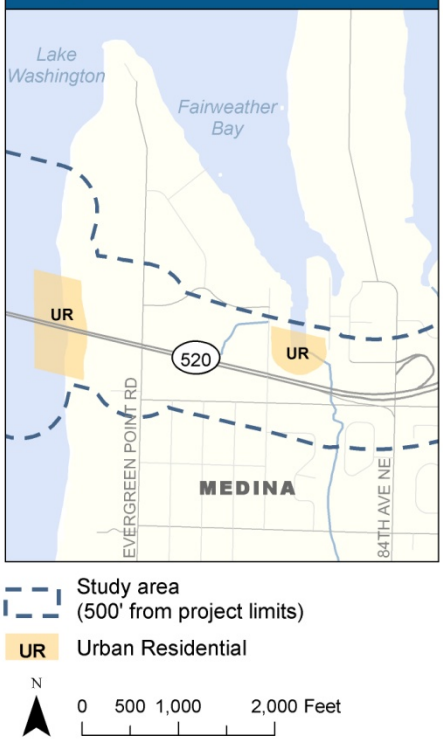
The City of Seattle's Shoreline Master Program (SMP) is currently in the process of being comprehensively updated as required by the state. The SMP constitutes the policies and regulations governing development and uses on and adjacent to marine and freshwater shorelines. These include the shorelines of Puget Sound, Lake Washington, Lake Union/Ship Canal, Duwamish River, and Green Lake, as well as associated wetlands and floodplains. These policies and regulations affect land uses, structure bulk and setbacks, public access requirements, bulkheads, docks, piers, and construction practices. The updated SMP is expected to be adopted in late 2011 or early 2012.

The major categories of shoreline designation within the Seattle project area are Conservancy and Urban. Each has several sub-categories. The

Conservancy designation is intended to protect and manage shorelines for public, ecological, and/or navigational use, and typically is more restrictive in terms of permitted uses. The urban designation is usually applied to shorelines that are more densely developed or designated for future development. The project is anticipated to be permitted in all shoreline designations as an Essential Public Facility, pursuant to Seattle Municipal Code (SMC) 25.60 and 23.80. Special or conditional use under Conservancy shoreline designations; bridges and streets are permitted outright in areas designated Urban Residential (UR).

The shoreline designation within the city of Medina is urban (Exhibit 4.2-4). Utilities and government facilities are allowed within this shoreline designation.

Exhibit 4.2-4. **Eastside Shoreline Designations**



Seattle Neighborhood Plans

In 1999, the Seattle City Council finished the approval process for 38 neighborhood plans created by nearly 20,000 community members. The plans identify over 4,200 actions recommended by these neighborhoods to ensure that they will continue to thrive and improve as Seattle grows over the next 20 years, and that the growth meets the City's commitments under the State's Growth Management Act. Two of the 38 neighborhoods are within the study area, Eastlake and the University Community Urban Center. No other neighborhood plans have been approved within the study area. See http://www.seattle.gov/neighborhoods/npi/plans.htm for more information regarding neighborhood planning.

Eastlake Neighborhood Plan

The Eastlake community, adjacent to I-5 in Seattle, has adopted the *Eastlake Neighborhood Plan* (City of Seattle 1998a). The plan's policies call for reducing freeway-related noise, air, and water pollution and supporting the neighborhood's visibility and identity from I-5 through such means as landscaping and signage.

University Community Urban Center Neighborhood Plan

The University District is adjacent to Montlake Boulevard NE and the UW. Policies in its adopted *University Community Urban Center Neighborhood Plan* (City of Seattle 1998b) call for an efficient transportation system that balances different modes (including public transit, pedestrians, bicycles, and automobiles) and minimizes effects on the community. A goal of the neighborhood plan is to focus on improving circulation within existing roadway capacity.

Seattle Area Community Organizations

The Seattle project area includes many active neighborhood groups that have been involved in the project since its inception. Information on these groups can be found at the following websites:

www.eastlakeseattle.org (Eastlake)

www.nchna.com (North Capitol Hill)

www.montlake.net (Montlake)

www.udistrictchamber.org (University District)

www.laurelhurstcc.com (Laurelhurst)

www.madisonparkcouncil.org (Madison Park)

Institutional Master Plans

University of Washington Master Plan – Seattle Campus

The University of Washington's Seattle campus master plan (University of Washington 2003) guides proposed campus development. The campus plan

anticipates adding approximately 3 million square feet of new building space to support long-term growth needs. The plan identifies 68 potential sites for future development and areas of the campus that are to be preserved as open space. In addition, the plan establishes campus circulation patterns, including internal streets, transit circulation, pedestrian and bicycle pathways, and parking areas; identifies how the UW will manage its transportation needs and mitigate traffic effects; and determines how UW-related development will integrate with the University District's neighborhood plan and Sound Transit's University Link light rail system.

The campus master plan identifies major pedestrian pathways along Montlake Boulevard NE and the Union Bay shoreline within the south campus area, where project improvements would occur. The plan also identifies areas of development and where increased parking capacity may be possible in and around the Husky Stadium. Objectives in the plan include increasing access for pedestrians and bicycles to and within campus and improving transit access to minimize vehicle trips. The plan also includes a policy to work in partnership with Seattle and regional partners to provide a high level of transit service to the campus and the adjacent community.

Washington Park Arboretum Master Plan

The Seattle City Council approved the *Washington Park Arboretum Master Plan* in 2001 (Seattle Parks and Recreation et al. 2001). The plan calls for the continued use of the Arboretum for education, conservation, and recreation and visitor services. It includes new trails and exhibits, revised roadways and parking, new and replacement buildings, and expanded maintenance and education programs. New structures include a south gateway education and visitor center, education and curation buildings near the Graham Visitors Center at the north end of the Arboretum, a pavilion and entry building for the Japanese garden, expanded maintenance facilities, greenhouse and bathhouse replacement, and use of part of the present MOHAI building as administrative space.

What role does the UW play in the project area?

As the state's major institution of higher learning, the UW is a dominant presence in the Seattle project area, affecting such aspects of the built environment as land use, views, and travel patterns. Founded in 1861 as the Territorial University of Washington, the university moved to its present campus on Union Bay in 1895. The 640-acre campus now serves a population of over 65,000 students, faculty, and staff in 16 million square feet of space.

UW Campus in the spring

Arboretum Graham Visitors Center

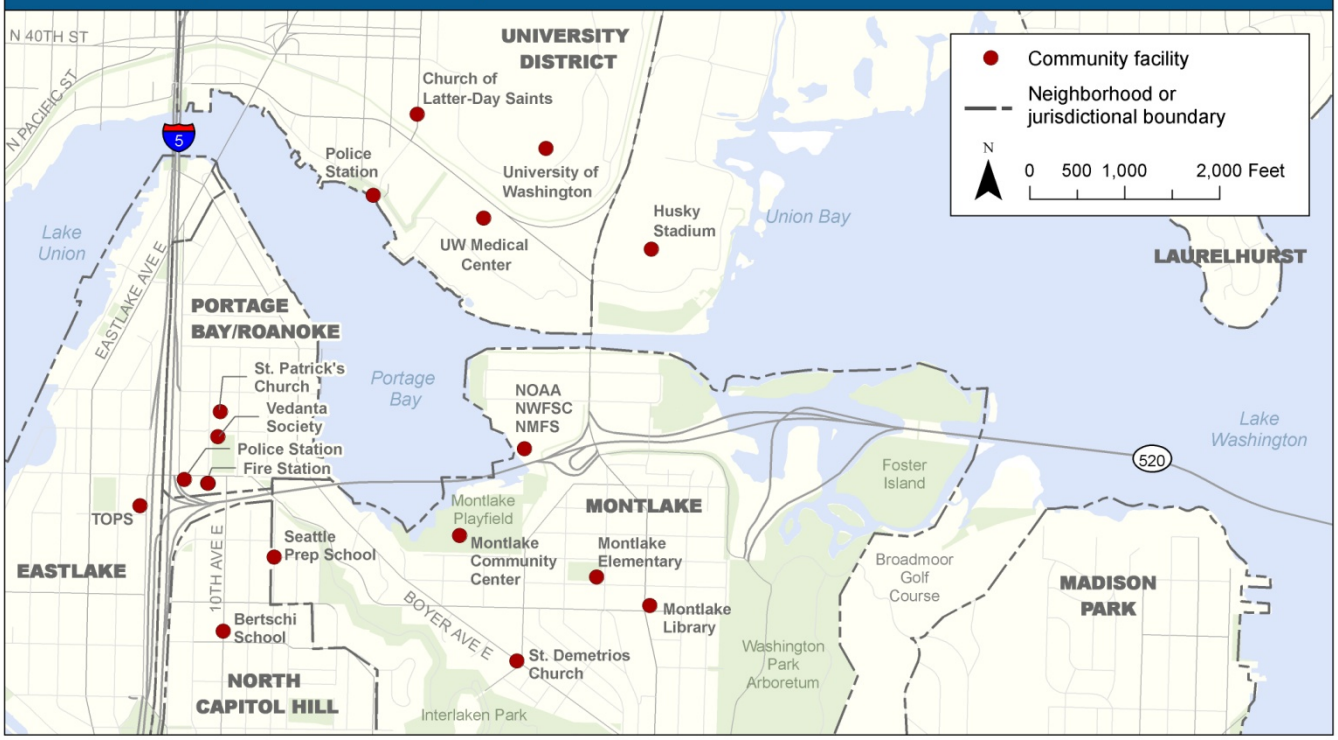
4.3 Social Elements

Transportation infrastructure influences neighborhoods and communities in many ways. Highways connect people with their homes and daily destinations, while local streets and paths provide circulation for commuters, bicyclists, and pedestrians within their neighborhoods.

What neighborhoods are in the project area?

As described in Section 4.2, Land Use and Economic Activity, the project area includes portions of seven Seattle neighborhoods–Eastlake, Portage Bay/Roanoke, North Capitol Hill, Montlake, University District, Laurelhurst, and Madison Park–and a portion of Medina on the Eastside. Exhibit 4.3-1 identifies the neighborhoods and community facilities within the project area. (Parks are depicted in Exhibit 4.4-1 in Section 4.4.) The following paragraphs describe key features of each neighborhood.

Exhibit 4.3-1. **Neighborhoods and Community Facilities**



Eastlake

The Eastlake neighborhood is located west of I-5 and east of Lake Union and consists of single-family residences, small-scale apartment and condominium complexes, and commercial businesses. Commercial businesses consist mainly of retail stores and restaurants interspersed with office space.

Eastlake Avenue bisects the neighborhood from north to south and connects the UW to the north with downtown Seattle to the south. The Option Program at Seward—a kindergarten through 8th grade alternative school in the Seattle Public School District—is located along Boylston Avenue East, just west of the I-5/SR 520 interchange. This program, known as TOPS, is a public magnet school that serves diverse populations, including many low-income and minority students.

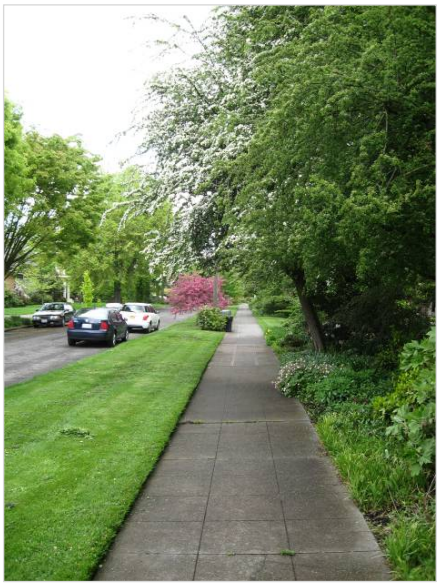
North Capitol Hill

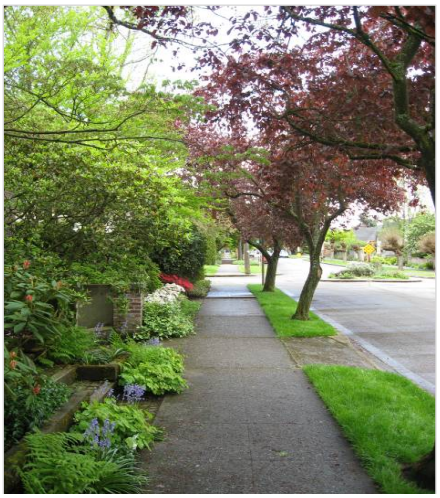
North Capitol Hill, located east of I-5 and south of SR 520, is a densely populated urban neighborhood made up of single-family and multifamily residential areas and commercial businesses along the main arterials. 10th Avenue East is the major north-south arterial, providing access to I-5 and SR 520. The Bertschi School, a private elementary school, is located in the North Capitol Hill neighborhood, south of East Lynn Street. Seattle Preparatory School, a private high school, is located on 11th Avenue East, south of Delmar Drive East.

Portage Bay/Roanoke

The Portage Bay/Roanoke neighborhood, located east of I-5 and north of SR 520, is generally bordered by Portage Bay on the north and east. This neighborhood is almost completely residential with tree-lined streets. Mixed land uses along Boyer Avenue East include houseboats on Portage Bay, the Queen City Yacht Club, and the Portage Bayshore Condominiums. Roanoke Park is located just north of SR 520 on East Roanoke Street and is part of the Roanoke Park Historic District.

There are two churches in the neighborhood: Saint Patrick's Catholic Church at 2702 Broadway East and the Vedanta Society of Western Washington at 2716 Broadway East. Seattle Fire Department Station #22





Neighborhood streets in the Portage Bay/Roanoke and Montlake neighborhoods

and the Seattle North Detachment of the Washington State Patrol are located on East Roanoke Street.

Small commercial areas consisting of retail stores and restaurants are located at the north end of the neighborhood around the intersection of Eastlake Avenue East and Fuhrman Avenue. Fuhrman Avenue East and Boyer Avenue East provide access around Portage Bay on the east and connect this neighborhood to the Montlake neighborhood and SR 520.

Montlake

The Montlake neighborhood lies between the waters of Portage Bay and the Washington Park Arboretum and is generally bounded by the Lake Washington Ship Canal (Montlake Cut) on the north, the Arboretum on the south and east, and the Portage Bay/ Roanoke neighborhood on the west. Montlake Boulevard/24th Avenue East is the main north-south arterial, connecting the Montlake neighborhood to the UW, SR 520, and other neighborhoods further south in Seattle.

Seattle Yacht Club

The neighborhood is predominantly residential and characterized by homes that were built in the first two decades of the 20th century. The construction of SR 520 in the 1960s separated the neighborhood into two areas. The area north of SR 520 (often referred to as the Shelby-Hamlin neighborhood) includes the Seattle Yacht Club, MOHAI and the U.S. Department of Commerce's NOAA Northwest Fisheries Science Center. The neighborhood area south of SR 520 includes the Montlake Community Center, Montlake Elementary School, and several community services.

Interlaken Park, Montlake Playfield, McCurdy Park, East Montlake Park, and the Washington Park Arboretum encircle the neighborhood, providing a substantial amount of public open space and offering a variety of active and passive recreational opportunities. Park and recreational facilities are described in more detail in Section 4.4.

Montlake Community Center

Community services within the Montlake neighborhood include the Saint Demetrios Greek Orthodox Church at 2100 Boyer Avenue East, the Montlake Community Center (1618 East Calhoun Street) at the south end of Montlake Park, and the Seattle Public Library Montlake Branch (2401 24th Avenue East). The Seattle Parks and Recreation Department operates the Montlake Community Center, which offers an array of programs and special events for all ages, including martial arts, dancing, and senior programs.

University District

The University District and the UW are located north of Portage Bay and the Montlake Cut and west of Union Bay. This neighborhood is densely developed with campus buildings, housing, and commercial businesses to support a large student population, employees, and residents.

Montlake Boulevard NE and NE Pacific Street are main roadways linking the Montlake neighborhood via the Montlake Bridge to the UW campus and Husky Stadium, the UW Medical Center, and the business district and residential areas north of the campus. The Burke-Gilman Trail, a regional bike and pedestrian path, also runs along Montlake Boulevard and NE Pacific Street.

University of Washington – Husky Stadium

Laurelhurst

Laurelhurst is a predominantly residential neighborhood located north of SR 520 on a peninsula that is bounded by Lake Washington on the south and east and by Union Bay on the west. Single-family homes are located along a south-facing hillside on the peninsula, and residents enjoy views of the lake, the Evergreen Point Bridge, and Mount Rainier.

Madison Park

Madison Park is a residential neighborhood located between the Arboretum and Broadmoor Golf Course on the west, and Union Bay and Lake Washington on the north and east. East Madison Street connects downtown Seattle with the lakeshore neighborhood, which is characterized by small retail shops, restaurants, and single-family and multifamily residential development. Madison Park is located along the Lake Washington shoreline south of the Evergreen Point Bridge. At the southern end of the neighborhood, East Madison Street intersects with Lake Washington Boulevard East, which runs east through the Washington Park Arboretum to provide access to SR 520.

Medina (Eastside)

The Eastside portion of the project area that would be affected by construction of the project is within the city of Medina, a predominantly residential area on the east shore of Lake Washington. Medina is characterized by large single-family homes. SR 520 separates the north and south portions of Medina, and Evergreen Point Road provides access between these two areas. Fairweather Park borders SR 520 from Evergreen Point Road east to 80th Avenue NE. The Points Loop Trail, a bicycle and pedestrian path, also crosses SR 520 at Evergreen Point Road.

What are the existing social and demographic characteristics of the project area?

Community Cohesion

Construction of I-5 in the 1950s and SR 520 in the 1960s bisected the Seattle and Eastside neighborhoods described above, which affected community cohesion in those neighborhoods. Despite the presence of the highway, however, all the neighborhoods in the project area have a strong community identity and are well established, with many older homes,

DEFINITION

Community Cohesion

Community cohesion is the ability of people to communicate and interact with each other in ways that lead to a sense of community, as reflected in the neighborhood's ability to function and be recognized as a singular unit.

mature landscaping, and limited land for any new development. A variety of parks, open spaces, and trails are found within these neighborhoods, ranging from small street triangles and lookout points (such as Bagley Viewpoint in the Portage Bay/Roanoke neighborhood) to the woodlands at Interlaken Park, to the Washington Park Arboretum with large open spaces, pedestrian trails, and botanical gardens. Most of the neighborhoods feature walkable streets with sidewalks and crosswalks and some have traffic calming devices at intersections.

Community cohesion is further maintained by neighborhood commercial areas, which include businesses such as food markets, coffee shops, restaurants, and hair salons that cater to neighborhood residents and provide the residents opportunities to engage socially with one another. Religious institutions, community centers, and local libraries also provide services that knit these communities together.

The neighborhoods in Seattle are characterized by a variety of pedestrian and bicycle facilities and extensive transit service. This transportation network supports linkages within the neighborhoods and offers many ways to travel to other neighborhoods and districts in Seattle and the Eastside. Bicycle/pedestrian paths, including the Bill Dawson Trail (also known as the Montlake Bike Path) and the Burke-Gilman Trail, also provide opportunities for bicyclists in the study area to travel broadly through the Seattle area. To cross the Evergreen Point Bridge to the Eastside, pedestrians and bicyclists must use transit.

DEFINITION

Low-Income

A low-income person is an individual whose household income falls below the federal poverty guidelines, as defined by the U.S. Department of Health and Human Services.

For 2011, the federal poverty guideline for a household of four in one of the 48 contiguous states and Washington DC is $22,350.

Demographic Characteristics

Overall, the Seattle neighborhoods are more ethnically diverse and have a higher proportion of renters than the Eastside. Median home values and household incomes are generally lower than in Eastside communities. Of the Seattle neighborhoods, the University District has the highest proportion of renter-occupied housing and lowest median household income. It is more ethnically diverse than other Seattle neighborhoods in the project area, reflecting the large number of students that reside there. Median household incomes (based on the 2000 U.S. census) range from $31,000 to $80,000 in the University District, Eastlake, Portage Bay/Roanoke, and North Capitol Hill neighborhoods, and from $75,000 to $101,000 in the Madison Park, Montlake, and Laurelhurst neighborhoods. The median household income in Medina is $158,239 based on the 2000 census.

DEFINITION

Minority

A minority person is an individual who identifies himself or herself as:

- Black (a person having origins in any of the black racial groups of Africa);
- Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
- Asian (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);
- American Indian/Alaskan Native (a person having origins in any of the original peoples of North American and who maintains cultural identification through tribal affiliation or community recognition); or
- Some other race.

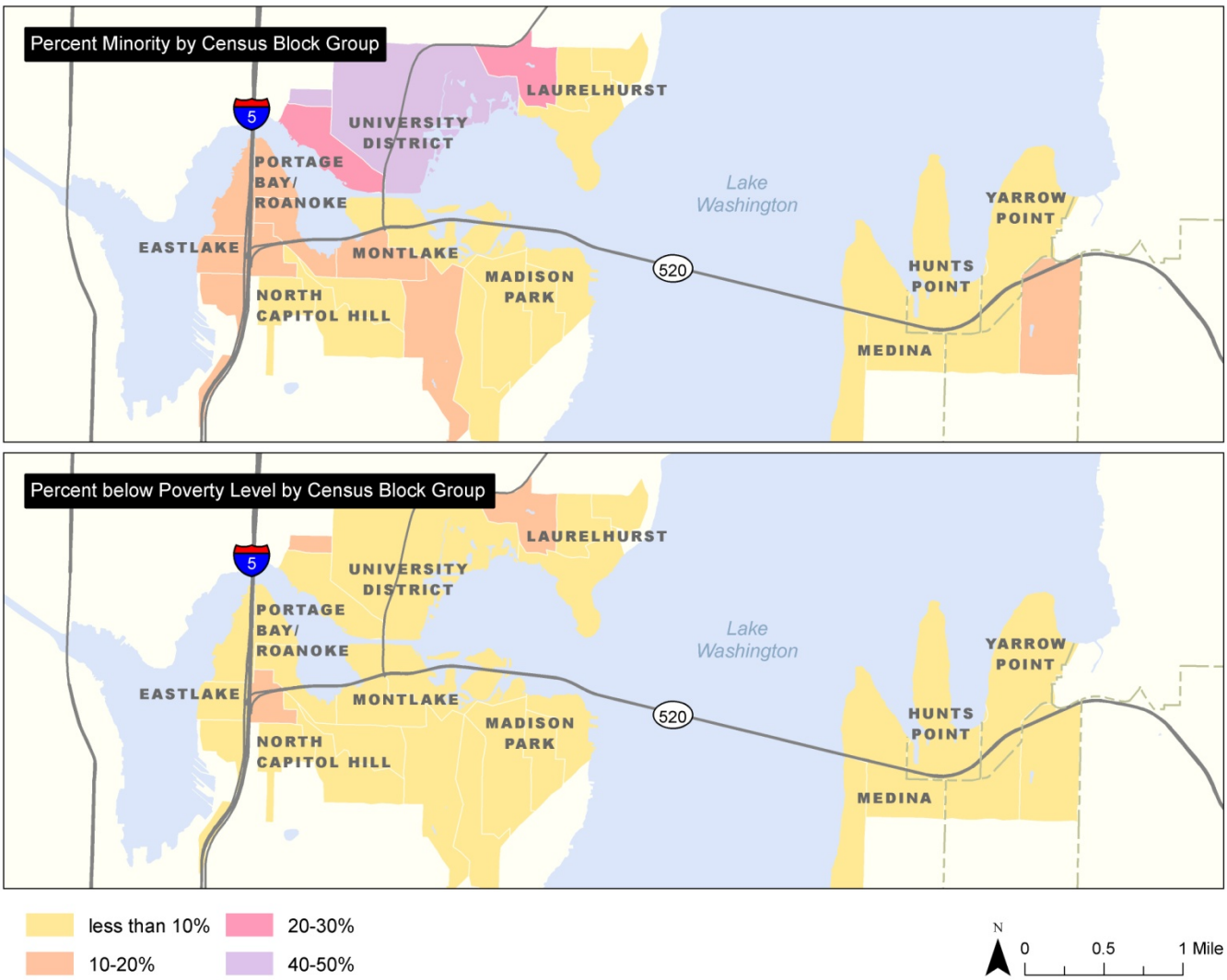
Low-Income, Minority, and Limited English Proficiency Populations

According to the 2000 U.S. Census, just over 5 percent of the population in the project study area has household incomes at or below the federal poverty level. Parts of the University District, Portage Bay/Roanoke, North

Capitol Hill, and Laurelhurst neighborhoods have concentrations of low-income residents (Exhibit 4.3-2).

Nearly 16 percent of residents in the project study area are identified as part of a minority population. The University District has the highest concentration of minority populations. Less than 1 percent of residents in

Exhibit 4.3-2. **Distribution of Low Income and Minority Populations in the Study Area**



the project study area have limited English proficiency (LEP).

Although the project area has a small resident Native American population, Foster Island and Lake Washington are important places to people of Lakes Duwamish descent. The Lakes Duwamish were the Native Americans most closely associated with the Seattle portion of the project area. Many members of the Muckleshoot Indian Tribe, Snoqualmie Tribe, Suquamish Tribe, and Confederated Tribes and Bands of the Yakama Nation are descended from families who lived near Lake Washington, and Foster

Island was used by the Lakes Duwamish as a resting place for their dead. In addition, the Muckleshoot Tribe currently uses Lake Washington for fishing as provided by treaty rights (see Section 4.11).

The effects of federal projects on low-income and minority populations are addressed by Executive Order 12898, which established the concept of "environmental justice" and required environmental documents to disclose whether a project would have disproportionately high and adverse effects on these populations. Since the Executive Order went into effect in 1994, federal agencies, including FHWA, have developed guidance on how to evaluate environmental justice effects. Chapter 5 includes information on how this analysis was done for the SR 520 project.

What fire, emergency medical, and police services are in the project area?

Fire and Emergency Medical

Seattle Fire Department Station 22 is located within the Portage Bay/Roanoke neighborhood at 901 East Roanoke Street (see Exhibit 4.3-1). The Seattle Fire Department plans to reconstruct Fire Station 22 because of its inadequate size and outdated building. Other fire stations that respond to calls in the project area include Station 17 in the University District (1050 NE 50th Street) and Station 34 in Madison Park (633 32nd Avenue East). Average response time for the Seattle Fire Department is 4.32 minutes (Seattle Fire Department 2009).

The fireboats E1, E2, and E3 are stationed at Fishermen's Terminal in Ballard. Through mutual aid agreements with jurisdictions around Lake Washington, the fireboats can respond to boat or marina fires anywhere on the lake.

The City of Medina contracts with Bellevue Fire and Emergency Medical Services for fire and emergency response services.

The UW Medical Center (1959 NE Pacific Street) is located in the University District neighborhood. Harborview Medical Center, located on Capitol Hill (325 9th Avenue) is the Level I trauma facility for Washington and is also the headquarters for the Seattle Fire Department's Medic One Program. Other hospitals serving the project area include Swedish Medical Center (Providence and First Hill campus), Virginia Mason Medical Center, Children's Hospital and Regional Medical Center, and Overlake Hospital Medical Center (Bellevue).

Fire Station 22

Seattle Fire Department Station 22 is located in the Portage Bay/Roanoke neighborhood at 901 East Roanoke Street.

Police

The Seattle Police Department provides law enforcement and responds to calls in Seattle. Seattle is divided into five precinct areas, with the East Precinct patrolling and responding to calls in the project area

neighborhoods south of the Montlake Cut and the North Precinct patrolling and responding to calls in the University District and Laurelhurst neighborhoods.

Police services in Medina are provided by Medina Police Department.

There are two additional law enforcement agencies that patrol and respond to calls in the study area. The Washington State Patrol responds to accidents on project area highways and highway on-ramps, off-ramps, and interchanges. The Seattle North Detachment of the Washington State Patrol is located at 811 East Roanoke in the Portage Bay/Roanoke neighborhood. The UW Police Department serves and protects the people and property within the main campus of the university. The station is located at 1117 NE Boat Street (see Exhibit 4.3-1).

Utility Providers

Utility providers in the project area include but are not limited to:

- Puget Sound Energy
- Seattle City Light
- Seattle Public Utilities
- City of Seattle Department of Information Technology
- King County Wastewater Treatment Division
- Qwest Communications
- Various wireless communications service providers
- King County Metro Transit (trolley lines)

What utility providers serve the project area?

A number of utility providers serve the project area. Major utility crossings of SR 520 and I-5 within the project area are identified on Exhibit 4.3-3.

Exhibit 4.3-3. **Major Utilities in Seattle Project Area**

Electricity

The City of Seattle-owned electric utility, Seattle City Light, provides electric power to the neighborhoods in Seattle. A number of overhead and underground distribution lines are located adjacent to SR 520 and I-5 within the project area; however, no major overhead or underground transmission

lines cross SR 520 within the project area. Puget Sound Energy provides electric power on the Eastside. King County Metro Transit Division operates and maintains a separate electricity grid and substation for the local bus trolley service within the project area. These trolley lines only cross SR 520 at the existing 10th Avenue East, Delmar Drive East, and Montlake Boulevard NE undercrossings.

Natural Gas

Puget Sound Energy provides natural gas service to the study area. There are buried gas distribution lines throughout the project area; however, no high-pressure gas mains are located near SR 520 in the project area.

Telecommunications

Qwest Communications is a principal provider of local telephone services in the study area. Qwest also provides internet service to the study area. Telephone lines are typically located within street rights-of-way, aboveground on utility poles in most areas, and underground in some areas. Main feeder telephone lines cross SR 520 at Boyer Avenue East and cross I-5 at approximately East Roanoke Street and East Miller Street.

Various companies provide wireless communication services to the area, including AT&T, Verizon, Sprint Nextel, and T-Mobile. Two registered cellular towers are located within the study area, one at the Montlake interchange and one in Medina.

Cable

Comcast provides cable television and cable internet service to neighborhoods in the study area. Qwest provides cable internet service and has cable and fiber optic lines located along the Burke Gilman Trail.

Water, Wastewater, and Stormwater

Seattle Public Utilities (SPU) provides water service to the neighborhoods in Seattle. Major water mains (no smaller than 42 inches in diameter) in the study area include a 42-inch main that crosses SR 520 between 10th Avenue East and Delmar Drive East and a 54-inch main that crosses SR 520 at Montlake Boulevard NE (see Exhibit 4.3-3). The City of Bellevue Utilities Department provides water and sewer services to Medina.

SPU also manages Seattle's drainage, surface water runoff, and sewer systems. In some areas sewage and stormwater are combined and conveyed through the King County interceptor system to the West Point Treatment Plant. In other areas separate drainage-only systems convey stormwater directly to water bodies such as Lake Union, Elliott Bay, and Lake Washington.

The King County Wastewater Treatment Division provides sewage treatment services in Seattle. Wastewater from the Seattle study area flows

to the West Point Treatment Plant, located on Puget Sound. Major sewer trunk lines include 108-inch and 42-inch sewers that cross SR 520 at Montlake Boulevard NE, travel south, and connect into a 90-inch main along East Montlake Place East and a 66-inch main along West Montlake Place East.

Stormwater and drainage are discussed in more detail in Section 4.10 and the Water Resources Discipline Report Addendum and Errata (Attachment 7).

Garbage and Recycling Service

SPU currently has contracts with two private firms for garbage and recycling service in Seattle: Waste Management and CleanScapes. Waste Management provides service outside the study area in south and northwest Seattle. CleanScapes began contracting with the city in March 2009 and serves central and northeast Seattle, including the study area. There are no recycling or transfer/disposal stations located in the study area. Allied Waste Services (Rabanco) provides garbage, recycling, and yard debris collection services in Medina.

4.4 Recreation

Parks and recreation facilities are important resources, highly valued by community members. The recreational resources within the project vicinity include public parks, major waterways, popular multi-use trails, and busy UW recreational and athletic facilities. Most of the recreation facilities are owned or maintained by the parks and recreation department of Seattle, or by the UW. The City of Seattle Parks and Recreation Department manages over 6,200 acres encompassing more than 400 parks and open spaces. The UW's 630-acre campus is located north of the Montlake Cut and west and north of Union Bay and includes Husky Stadium, Hec Edmundson Pavilion, the Waterfront Activities Center (WAC), and many acres of open space used for recreational purposes.

Which Seattle recreational facilities are in the project area?

Seventeen parks and recreational facilities are located in the Seattle portion of the project corridor. These include eight City of Seattle parks (including the Washington Park Arboretum and Bagley Viewpoint), four designated trails, one historic boulevard, two private yacht clubs, and UW recreational facilities. These facilities (in addition to one park and one trail on the Eastside) are shown on Exhibit 4.4-1 and listed with supplemental information in Table 4.4-1. Some of these parks—in particular the Washington Park Arboretum—are of regional and even national significance.

Rogers Playground

Rogers Playground is a 1.9-acre City of Seattle neighborhood park. Access is available on all sides of the playground from Eastlake Avenue, Franklin Avenue, Roanoke Street, and Louisa Street. The playground has baseball and soccer fields, restroom facilities, a children's play area, walking trails, and off-street parking.

Roanoke Park

Roanoke Park is a 2.2-acre Seattle neighborhood park. It lies within the Roanoke Park Historic District and is surrounded by stately homes (see Section 4.6, Cultural Resources, for more information). The park has many mature fruit trees as well as picnic sites, a children's play area, walking trails, and a half-basketball court. Access is available on all sides of the park from 10th Avenue East, Broadway Avenue East, East Roanoke Street, and East Edgar Street.

Exhibit 4.4-1. Parks and Recreational Facilities in Seattle Project Area

Bagley Viewpoint

Bagley Viewpoint is located adjacent to the north boundary of the Roanoke Street off-ramp from westbound SR 520. Bagley Viewpoint is a small (0.1-acre) park owned by the City of Seattle. It offers views of Portage Bay, Lake Washington, and the Cascade Mountains, although invasive vegetation has limited the extent of these views. Bagley Viewpoint is identified in the draft *Vegetation Management for Seattle Parks Viewpoints* (City of Seattle 2005), which proposes procedures for controlling erosion and removing weeds in the area. Bagley Viewpoint is also protected under the City of Seattle's SEPA ordinance as a "SEPA viewpoint." Proposed alterations to these viewpoints are subject to visual guidelines set forth in *Seattle Views: An Inventory of 86 Public View Sites Protected under SEPA* (City of Seattle 2002).

Bagley Viewpoint

Interlaken Park

Interlaken Park is a 51.7-acre, densely wooded Seattle park on Delmar Drive East on the north end of Capitol Hill. Bikers, hikers, and joggers frequent the paths and trails throughout the park. In the 1890s, Interlaken Boulevard was the principal bike and buggy path linking Capitol Hill with the boulevards on Lake Washington.

Table 4.4-1. Summary Information about Recreation Resources in the Project Vicinity

Park ID No.[a]	Name/Location	Size or length	Facility Type and/or Function[b]	Ownership and Management	Site Features and Characteristics
1	Rogers Playground	1.9 acres	Neighborhood park	City of Seattle Department of Parks and Recreation	Tennis courts, ball field, restrooms
2	Roanoke Park	2.2 acres	Neighborhood park	City of Seattle Department of Parks and Recreation	Basketball court, play area, picnic tables, trails
3	Bagley Viewpoint	0.1 acre	Viewpoint park	City of Seattle Department of Parks and Recreation	View of Portage Bay, off-street parking
4	Interlaken Park	51.7 acres	Regional park	City of Seattle Department of Parks and Recreation	Woods, trails
5	Montlake Playfield	26 acres	Neighborhood waterfront park	City of Seattle Department of Parks and Recreation	Play areas, trails, picnic tables, tennis courts, community center, hand-carry boat launch, boating, wildlife viewing
6	Queen City Yacht Club	9.2 acres	Privately operated marina, members only	Private	Moorage, clubhouse
7	Seattle Yacht Club	1.3 acres	Privately operated marina, members only	Private	Moorage, clubhouse
8	Bill Dawson Trail	1,750 feet	Bicycle and pedestrian trail	WSDOT right-of-way, City of Seattle Department of Parks and Recreation, NOAA	Multi-use pathway
9	McCurdy Park	1.4 acres	Neighborhood park	City of Seattle Department of Parks and Recreation	Southern half of MOHAI building, open space
10	East Montlake Park	8.8 acres	Neighborhood waterfront park	City of Seattle Department of Parks and Recreation, Washington State Department of Natural Resources	Northern half of MOHAI building, parking, benches, waterfront trails, , hand-carry boat launch, boating, wildlife viewing
11	University of Washington Open Space, Northeast shore of the Montlake Cut and Union Bay	3 acres	Open space, picnic facilities, climbing wall, a portion of the East Campus Bicycle Route	UW	As noted in Facility Type and/or Function plus WAC with docks, UW Canoe House

Table 4.4-1. Summary Information about Recreation Resources in the Project Vicinity

Park ID No.[a]	Name/Location	Size or length	Facility Type and/or Function[b]	Ownership and Management	Site Features and Characteristics
12	Burke-Gilman Trail	12.5 miles	Bicycle and pedestrian trail	City of Seattle and UW	Multi-use pathway
13	Husky Stadium	18 acres	Intercollegiate facility	UW	Stadium and associated parking
14	Olmsted Boulevard - Lake Washington Boulevard from NE Madison Street to NE Pacific Street	2 miles	Park boulevard/ Collector arterial	City of Seattle/Seattle Department of Transportation	Mature trees and landscaping, on-street bike path
15	Washington Park Arboretum	230 acres	Regional park also encompassing Foster and Marsh Islands	City of Seattle Department of Parks and Recreation, UW	Arboretum collection, Japanese garden, visitor center, waterfront trail and access, views
16	Arboretum Waterfront Trail	0.5 mile	Trail	City of Seattle Department of Parks and Recreation, UW	Observation platforms and views
17	Ship Canal Waterside Trail	1,200 feet	Trail	City of Seattle Department of Parks and Recreation	Trail, benches, viewpoints
18	Points Loop Trail	5.6 miles	Trail	Communities of Medina, Hunts Point, and Yarrow Point	Includes off-street trails, streets, and sidewalks
19	Fairweather Park	11 acres	Neighborhood nature park	City of Medina	Forested open space, tennis courts, trail

[a] ID numbers correlate with Exhibits 4.4-1 and 4.4-2.
[b] Facility designation determined by jurisdiction or use.
[c] While the entire campus is open to the public, not all areas provide publicly accessible recreational resources.

In 1903, the Olmsted Brothers designed today's Interlaken Boulevard along that route. Access to Interlaken Park from the north is available from Delmar Drive, through Interlaken Boulevard, but many access points are available from local roadways. A striped and designated bike path is located either on-street or adjacent to Delmar Drive for pedestrian and bicycle access.

Montlake Playfield

Located on the shore of Portage Bay (along with some of the aquatic area of Portage Bay), the Montlake Playfield is a 26-acre Seattle regional park. The playfield is used for many recreational events, including football, baseball, soccer, and track. The community center hosts many

neighborhood meetings and events. Currently, the draft *Vegetation Management Plan for Seattle Parks Viewpoints* (City of Seattle 2005) identifies restoring intended views at Montlake Playfield as "high priority" because invasive species and overgrown vegetation obscure much of the views. Access to Montlake Playfield and community center is available from Calhoun Street, with off-street parking. Pedestrian access from the north is available from the Bill Dawson Trail. The shoreline of the park is used for put-in and take out of hand-carry boats, and the aquatic features of the park are used for recreational boating and wildlife viewing. The southern shoreline of Portage Bay, on which Montlake Playfield is located, contains a 12.7-acre wetland, which is discussed in Section 4.11 (Ecosystems) of this chapter and shown on Exhibit 4.11-1.

Queen City Yacht Club

Established in the early 1900s and moved to its current location in 1934, Queen City Yacht Club is a members-only club with paved parking and moorage space for 229 powerboats and sailboats extending east into Portage Bay. The facility is located at 2608 Boyer Avenue East, just north of the Portage Bay Bridge and a portion of the facility's dock space is underneath the aerial right-of-way of the Portage Bay Bridge. The facility offers organized cruises, dinners, sailing classes, and other special events for members. Some of the special events relate to and occur during the weeks surrounding Opening Day of boating season.

Seattle Yacht Club

The Seattle Yacht Club was established in 1892. The club has been located since 1920 at 1807 East Hamlin Street and includes a clubhouse with paved parking and moorage for 271 boats extending to the west into Portage Bay. The Seattle Yacht Club is a recreational and cultural institution that supports and enhances the residential quality of the neighborhood. The club sponsors organized events such as powerboat cruises, sailing and marine safety classes, and sailboat races (regattas). As with the Queen City Yacht Club, there are also special events occurring during the weeks surrounding Opening Day of boating season. The Seattle Yacht Club, is associated with the social and maritime history of Seattle, and traditionally holds Opening Day ceremonies through the Montlake Cut and on Portage Bay at the beginning of May each year.

Bill Dawson Trail (Montlake Bike Path)

The Bill Dawson Trail is a designated multi-use pathway that extends under SR 520 between the northeast corner of the Montlake Playfield and the southern edge of the NOAA Northwest Fisheries Science Center. The trail lies both on NOAA property (on a permanent easement) and within the existing WSDOT SR 520 right-of-way. The trail receives considerable use because it connects to Montlake Boulevard and the larger citywide trail

Annual Boating Events

The study area hosts a number of annual boating events that have citywide and regional importance.

- Opening Day of boating season is held in early May. The Montlake Bridge is raised to allow larger watercraft through the Montlake Cut. Spectators line the banks of the cut and also watch from boats moored in Union Bay.
- The Windermere Cup, a rowing competition, is held in the Montlake Cut on the Opening Day of boating season. Viewing is generally from the UW Canoe House, the trails and open space along the Montlake Cut, and the Montlake Bridge, which is closed to traffic during the event.
- The Nordstrom Beat the Bridge fundraising run uses the Husky Stadium parking lot and crosses the Montlake Bridge.

Bill Dawson Trail (Montlake Bike Path)

system. Access from the north is at Montlake Boulevard, and access from the south is at Montlake Playfield at Calhoun Street.

East Montlake Park and McCurdy Park

East Montlake Park and McCurdy Park are located on the shore of Union Bay adjacent to the Shelby-Hamlin portion of the Montlake neighborhood.

East Montlake Park was created from land deeded to Seattle for park purposes in the 1909 plat of the Montlake neighborhood. The 8.8-acre park is jointly owned by the Seattle Parks and Recreation Department (western one-third of the park) and the Washington State Department of National Resources (eastern two-thirds of the park including the in-water areas). While the split in ownership of the site is still in effect, the entire area is signed and recognized by the City and the public as East Montlake Park. Today, East Montlake Park provides trail connections to the Washington Park Arboretum and the Montlake neighborhood and contains trailheads for both the Arboretum Waterfront Trail and the Ship Canal Waterside Trail. The shoreline of the park consists of wetlands that are associated with other nearby wetland areas (Marsh Island, Foster Island, and other portions of the Washington Park Arboretum). The aquatic portion of the park is used for recreational boating and wildlife viewing. The site's wetlands and the wildlife in this area are discussed in Section 4.11 (Ecosystems).

McCurdy Park is situated between the north side of SR 520 and the southern boundary of East Montlake Park. Seattle has designated the park as a SEPA viewpoint because of its views of Marsh Island and Foster Island and limited views of Lake Washington. Vehicular access to these parks and MOHAI is available from the 24th Avenue overpass, with off-street parking. Pedestrian traffic can access these parks from the Montlake neighborhood, the Arboretum Waterfront Trail, and the Ship Canal Waterside Trail.

Washington Park Arboretum

Seattle Parks and Recreation and the University of Washington cooperatively manage the Washington Park Arboretum. Seattle Parks and Recreation maintains its park functions and the University of Washington owns, maintains, and manages the plant collections and associated programs. The Arboretum Foundation manages fund raising, membership, and volunteer services. Although the City of Seattle owns most of the Washington Park Arboretum, the University of Washington owns portions of the park, and the Washington Department of Natural Resources owns most of Marsh Island and the northern half of Foster Island.

Existing park facilities include the Japanese Garden, Graham Visitor's Center, several canoe and kayak launches to Union Bay, paved and unpaved walking paths (including the Arboretum Waterfront Trail), islands, picnic tables, parking lots, natural areas, and manicured lawns. The Washington

McCurdy Park. Vegetation in the park separates SR 520 and MOHAI.

East Montlake Park and the Ship Canal Waterside Trail, looking toward Union Bay

Arboretum Waterfront Trail under SR 520 on Foster Island

Park Arboretum, which has a nationally and internationally recognized woody plant collection, is a significant educational resource as well as a recreation resource.

Future development of the Washington Park Arboretum is guided by the 2001 *Washington Park Arboretum Master Plan* (City of Seattle et al. 2001); see Section 4.2 and the Recreation Discipline Report Addendum and Errata (Attachment 7) for more information. Planned improvements in the project area include the addition of a 300-square-foot outdoor education building on Foster Island and a viewing platform on Marsh Island.

Foster and Marsh Islands

Foster and Marsh islands are peat and marsh landscapes that lie near the southern shore of Union Bay. They are wetland and waterway landscape features of the Washington Park Arboretum located at the north end of the park (City of Seattle et al. 2001). The waterways surrounding these islands consist of marshes and open-water channels that contain native and non-native vegetation not found in other portions of the park. The park provides four designated non-motorized watercraft landings in the waterways with access to the waterfront trail system.

Foster Island was purchased in 1917 to be included as a part of Washington Park. The island grew considerably when the opening of the Ship Canal and the Hiram M. Chittenden Locks (also known as the Ballard Locks) lowered the water level of Lake Washington by 9 feet. The original SR 520 project in 1963 divided the island and dredged through its central portion to create the isthmus over which the highway passes. SR 520 provides a pedestrian underpass for trail connection; the underpass is approximately 8 feet high by 12 feet wide and 92 feet long. Marsh Island is located west of Foster Island and is considerably smaller. The UW manages the plant collections. The two islands are connected by the Arboretum Waterfront Trail (described below).

Arboretum Waterfront Trail and Foster Island

Arboretum Waterfront Trail

In 1967, the Arboretum Waterfront Trail was established by the UW, the Interagency Committee for Outdoor Recreation (now the Recreation and Conservation Office), the U.S. Department of Interior, and the City of Seattle. Land and Water Conservation Act grant funds were used for the original development of the trail.

The Arboretum Waterfront Trail is a 0.5-mile trail that meanders on a series of floating piers and structures through the marsh land that connects Marsh and Foster islands to the main features of the Washington Park Arboretum. Raised observation platforms provide views of the various wetlands around the islands and of Union Bay and Husky Stadium. The western trailhead is located in East Montlake Park and connects to the Ship Canal Waterside Trail and on to the UW.

Ship Canal Waterside Trail

The Ship Canal Waterside Trail was constructed in 1970 and designated a National Recreation Trail in 1971. It is located east of Montlake Boulevard along the south side of the Montlake Cut. The 1,200-foot-long trail connects the Arboretum Waterfront Trail with West Montlake Park on Portage Bay. The trail was originally developed with funds from a Land and Water Conservation Act grant and is maintained by the Seattle Parks Department. Popular year-round activities along the trail include sightseeing, picnicking, fishing, and jogging. Each May, thousands of Seattle residents line the shores of the Montlake Cut to watch the parade of boats that marks the opening day of boating season. The trail can be accessed from Montlake Boulevard as well as from East Montlake Park at East Shelby Street.

Burke-Gilman Trail

Burke-Gilman Trail

The Burke-Gilman Trail is a popular recreational trail for walkers, runners, cyclists, and skaters; it is also used by non-motorized commuters. This 14-mile paved trail is located in the cities of Seattle, Lake Forest Park, and Kenmore and provides views of the city, waterways, and Lake Washington. In the project vicinity, the trail is jointly maintained by Seattle Department of Transportation and Seattle Parks and Recreation Department.

The Burke-Gilman Trail is a regional facility built on an old railway bed, with the southern trailhead located west of the project area at 8th Avenue NW and Leary Way on the Fremont-Ballard border. The trail passes through the UW, paralleling the west side of Montlake Boulevard. The trail has become a major transportation corridor that serves thousands of commuters and recreational users.

Olmsted Boulevards

Montlake and Lake Washington boulevards were designed as part of the Olmsted plan for Seattle parks, boulevards, and playgrounds (see sidebar). The boulevards are distinguished by planting strips that contain mature trees and landscaping. The Montlake Boulevard planting strip is approximately 550 feet long and is located between the SR 520 interchange and East Shelby Street. The Lake Washington Boulevard planting strip is located between the Montlake Boulevard interchange and the western boundary of the Washington Park Arboretum. Both planting strips are located in the National Register of Historic Places (NRHP) eligible Montlake Historic District and are maintained for aesthetic value and traffic operations by the City of Seattle. (For more information, refer to Section 4.6 and the Final Cultural Resources Assessment and Discipline Report [Attachment 7].)

The Olmsted Plan

In 1903, the Seattle City Council contracted with the Olmsted Brothers to prepare a comprehensive plan that would guide the future development of a Seattle park system.

John C. Olmsted spent several weeks in the summer of 1903 studying the topography of Seattle and its parks. The centerpiece of his plan was a 20-mile landscaped boulevard linking most of the existing and planned parks and greenbelts within the city limits. Roanoke Park, Interlaken Park, Volunteer Park, Lake Washington Boulevard, Washington Park Boulevard, and Montlake Boulevard are all part of this Olmsted system.

Washington Park was one of Seattle's first parks and was included in the overall Olmsted plan.

University of Washington Campus Recreational Facilities

The UW provides several recreational sites and facilities for intercollegiate and intramural activities and for passive recreation. The intercollegiate athletic program provides organized spectator sports such as football, basketball, baseball, and track. Facilities include the Bank of America Arena at Hec Edmundson Pavilion and Husky Stadium, both located in the south campus area near the SR 520 Montlake Boulevard interchange. Montlake Boulevard provides the main arterial access to these facilities from the south campus, but many access points to the campus are possible. Other recreational areas include the Ship Canal and Union Bay waterfront, Burke-Gilman Trail, and other natural areas of the southeast campus. All recreational areas are open to the public as well as to UW students and staff.

Aerial view of the University of Washington's Husky Stadium and southeast campus facilities

Intercollegiate Facilities

Husky Stadium is located immediately north of the Montlake Cut and the UW Open Space. Its south parking lot has approximately 1,200 parking spaces (E-11 and E-12). Parking is at capacity and is primarily used by UW Medical Center employees and visitors. East of Husky Stadium are the Husky Softball Stadium and the Husky Soccer Field. Although these facilities are not open to the public during athletic seasons, they are also used for community events.

Husky Stadium is a resource for the community, as it is used for more than just UW athletic contests. More than 50 other events involving more than 70,000 individuals are held annually at Husky Stadium. These events include, among others, annual commencement exercises, the American Cancer Society Relay for Life, the Multiple Sclerosis Society Walk, community youth soccer practices, Washington State Patrol training, the Seattle Public School Board Walk, and high school football (University of Washington 2008). Youth sports participation is also an important activity, with thousands of young people attending sports and band camps each year.

UW Waterfront Activities Center dock and Canoe House. Canoe rentals are available at the Waterfront Activities Center.

University of Washington Open Space

The UW Open Space is a large grassy area, approximately 3 acres in size, located between the Husky Stadium parking lot and the Montlake Cut. The Open Space is vegetated and includes a climbing wall and facilities for picnicking that are open for public use and other recreational activities. The Open Space also contains the Waterfront Activities Center, the Canoe House, and the connecting East Campus Bicycle Route.

Canoes exploring the Arboretum

Waterfront Activities Center

Water-related recreational facilities are available at the Waterfront Activities Center, which is located south of Husky Stadium on Union Bay and the Montlake Cut. The Washington Yacht Club, Sailing Team, Kayak Club (flat

and white water), and Union Bay Rowing Club organize their activities at the WAC. The WAC is open 337 days a year including holiday and weekends. More than 220,000 people visit the facility each year (35 percent are the general public). The WAC also rents canoes and rowboats to the general public with discount rates for students, staff, and alumni. This facility provides a unique recreational opportunity for the general public to view the aquatic areas in and around Marsh and Foster islands. The WAC rents 15,000 to 20,000 boats each year. Storage for private non-motorized boats is also available to students, faculty, staff, and alumni association members. Most often, boaters cross the Montlake Cut, and then proceed through Union Bay and under SR 520 in order to dock, hike, or picnic in the Washington Park Arboretum.

University of Washington Canoe House

The Canoe House on the UW campus is listed in the NRHP. It is located adjacent to the WAC at the entrance to the Lake Washington Ship Canal from Union Bay. The Canoe House was built in 1928 by the U.S. Navy to serve as a hangar for the Aviation Training Corps. It was donated to the university and used as the shellhouse for the rowing team until 1949. It is currently used by the UW crew team.

East Campus Bicycle Route

The East Campus Bicycle Route is a gravel trail located in the southeast campus along Lake Washington and the Montlake Cut between the WAC and Montlake Boulevard. A vegetated slope provides a buffer between the trail and the cut.

How is Lake Washington used for recreation?

Recreational activities such as fishing and non-motorized boating occur in and on Lake Washington throughout the year, with peak use of the lake during the summer months. There are multiple launch points for both motorized and non-motorized watercraft in the project vicinity. The Washington Park Arboretum has several boat landings for non-motorized watercraft and the WAC rents canoes and kayaks.

Which Eastside recreational facilities are in the project area?

Points Loop Trail

The Points Loop Trail lies within the jurisdictions of Medina, Hunts Point, Clyde Hill, and Yarrow Point (Exhibit 4.4-2). In the project area, the trail is located in the WSDOT right-of-way and along the south side of Fairweather Park, Hunts Point Park, and Wetherill Nature Preserve.

Fairweather Park

Fairweather Park

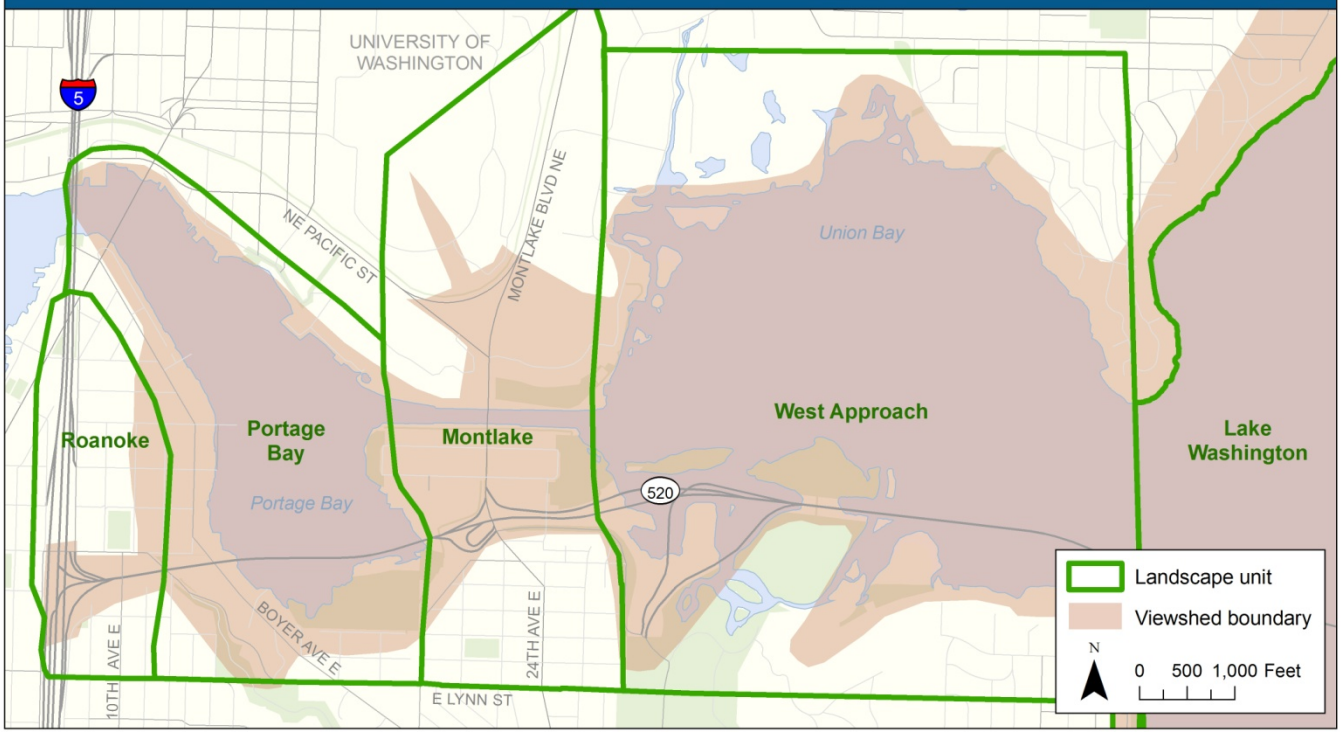
Fairweather Park is north of SR 520 (Exhibit 4.4-2). It is managed by the City of Medina and includes tennis courts, open space, 11 acres of woods, streams, and wetlands. The park has considerable ecological diversity, with more than 53 species of plants, 6 species of mammals, and 20 species of birds. The terrain ranges from upland forest to wetland, and the park is bisected by a spring-fed stream. The park is maintained through volunteer efforts and contributions. The Points Loop Trail is located immediately adjacent to the south side of the park, within the WSDOT right-of-way.

Exhibit 4.4-2. **Parks and Recreational Facilities on the Eastside**

4.5 Visual Quality

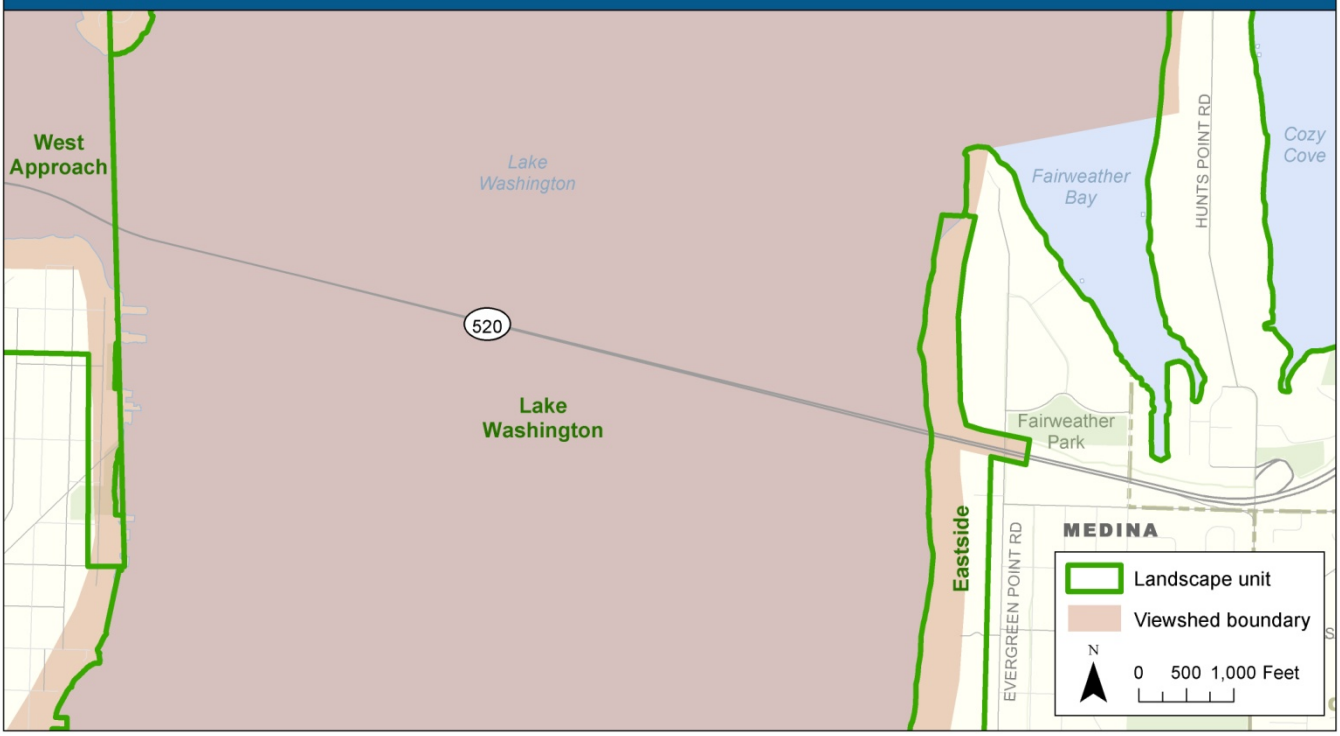
Study areas for this visual quality assessment are the project viewshed, which is defined as the area that can be seen from the roadway, and landscape units, which are smaller subareas within the viewshed (Exhibits 4.5-1 and 4.5-2). The viewshed is divided into subareas called landscape units, which allow a closer look at the details and character of neighborhoods or other small districts. The criteria for determining the limits of a landscape unit are that each unit has a distinctive landscape pattern or use and specific, finite geographic boundaries. The project team defined a total of six landscape units based on this criteria and field visits: Roanoke, Portage Bay, Montlake, west approach, Lake Washington, and Eastside.

Exhibit 4.5-1. **Seattle Viewshed and Landscape Units**



The Roanoke landscape unit consists of a high plateau, with steep hillsides, between Lake Union and Portage Bay. The Portage Bay landscape unit comprises the hillsides and shorelines around the Portage Bay basin including the waters of the basin. The Montlake landscape unit consists of the Montlake Boulevard corridor and neighborhoods along the corridor. The west approach segment consists of Union Bay and all of Union Bay's islands, marshes, hillsides, and shorelines. Lake Washington landscape unit includes the lake and its shorelines. The Eastside landscape unit comprises the area between Evergreen Point Road and 92nd Avenue NE in Yarrow Point.

Exhibit 4.5-2. **Eastside Viewshed and Landscape Unit**



Roanoke Landscape Unit

Panoramic views are available to the public from the 10th Avenue East and Delmar Drive East overpasses. In general, however, this is a vehicle-oriented environment, and the aesthetic experience of pedestrians in most of this landscape unit is diminished by traffic. The pleasant landscape at Roanoke Park and streetscapes between 10th Avenue East and Delmar Drive East help to improve the experience. Transportation signage and signalization, street lighting, and overhead utilities create a moderate degree of visual clutter.

The visual character of the Roanoke landscape unit is defined by the highly diverse development and highways within it. SR 520 is recessed below the neighborhoods, so the experience of traveling on the highway through this area is that of traveling in a concrete channel passing under small bridges or on elevated ramps. Few homes along SR 520 in this unit have views of the highway because of topography and dense tree screens. I-5 is generally not visible from homes north of East Roanoke Street because of recently installed noise walls.

Viewer groups are commuters traveling through the area on SR 520 and I-5, workers and visitors to businesses or activity centers in North Capitol Hill, and residents traveling between work and home or their local park. Commuters, particularly drivers, are likely to be less sensitive to visual quality because they are traveling on the roadways at high speeds and focused on traffic movements. Their passengers may be somewhat more

DEFINITIONS

A **viewshed** is the aggregate area that can be seen from the project and that has views of the study area from the surrounding area.

Landscape units are subareas of a viewshed that make evaluation of the study area more manageable. They are defined by visual traits and visual continuity within the unit. The "landscape units" can also be thought of as a way to organize the project by "rooms" that a viewer passes through while traveling along SR 520.

Simulations are computer-generated or hand-drawn images that illustrate probable visual changes and relative scales of the existing and proposed features as seen from a pedestrian's or commuter's viewpoint.

Roanoke landscape unit, looking northeast

sensitive to views and visual quality because they can look around. Workers and visitors in North Capitol Hill and Roanoke are likely to be moderately sensitive to visual quality in this area because they are familiar with the place or are engaged in social or recreation activities. Residents are likely to be very sensitive to visual quality because this is their neighborhood and they are attentive and attached to certain familiar qualities and views.

View of Portage Bay

Portage Bay Landscape Unit

The visual character of the Portage Bay landscape unit is defined by the bay itself and by the density and diversity of development around and in Portage Bay. Development is continuous around the shoreline except for the more natural area of shoreline and wetland vegetation at the edge of the Montlake Playfield.

Portage Bay landscape unit, looking southwest toward Roanoke and Queen Anne

The view east and southward from the Roanoke plateau hillsides is characterized by covered docks and boat slips near the Portage Bay Bridge. Most views of the bridge from the Montlake Playfield and neighborhoods are screened in summer and fall by trees along the shoreline. SR 520 is clearly visible from the north part of Portage Bay. The bridge dominates the views from the Queen City Yacht Club and homes along Boyer Avenue, while still allowing for views to north Portage Bay because of its height.

The largest viewer group is commuters traveling on the SR 520 Portage Bay Bridge. Boaters, workers, and visitors who travel to a business or activity center in the UW area and residents who travel between work and home constitute smaller groups.

Montlake landscape unit, looking north toward Husky Stadium

Although in general commuters tend to become less sensitive over time to views of their surroundings, commuters as a whole (both drivers and passengers) on the Portage Bay Bridge are likely to appreciate the visual quality of the panoramic and memorable views in both the eastbound and westbound directions. Viewers in taller vehicles such as trucks and buses are able to see over the traffic barriers and have better lateral views of Portage Bay, the marinas to the north, and marshes to the south. Workers and visitors in the University of Washington (UW)area are likely to be moderately sensitive to visual quality because they are familiar with the place or are engaged in social or recreation activities. Residents are likely to be very sensitive to visual quality because this is their neighborhood and they are attentive and attached to certain familiar qualities and views.

View of Montlake Cut and Montlake Bridge

Montlake Landscape Unit

The Montlake landscape unit is a mixed-use area that includes the Montlake residential neighborhood on either side of Montlake Boulevard, the NOAA Northwest Fisheries Science Center, the Museum of History and Industry (MOHAI) area, the Montlake Cut, and UW's southeast campus. The visual character of this landscape unit is defined by the diversity of development.

View from Lake Washington Boulevard toward MOHAI and McCurdy Park

The Montlake neighborhood includes residential-scale buildings and commercial establishments in a variety of architectural styles and ages. There are large, multi-story buildings at NOAA, medium-scale club facilities at the Seattle Yacht Club, and the medium-scale MOHAI building. Across the Montlake Cut, the UW area has multi-story, large-footprint buildings and structures to house the hospital, sports, and research facilities, also in a variety of styles and ages. Husky Stadium is the dominant and iconic structure and a memorable part of most views inside and outside of the area.

Panoramic, highly memorable views are available year-round from the north stands in Husky Stadium. These views contain important visual resources: Union Bay, Lake Washington, Mount Rainier, and the Cascade and Olympic mountains. The Montlake Bridge is a historic and picturesque structure when seen from other viewpoints, but also offers scenic views along the Montlake Cut, across Union and Portage bays and Lake Washington, and of the Cascade Mountains. In addition, Rainier Vista on the UW Campus offers views toward Lake Washington and Mt. Rainier.

The Montlake landscape unit is a very active area both as an important crossroads and as an urban-educational destination zone with numerous activity centers. Viewer groups are commuters traveling by bus or car through the area on SR 520 and Montlake Boulevard; employees of and visitors to the business or activity centers; and residents traveling between work and home. Commuters on SR 520 are likely to be less sensitive to visual quality because they are traveling in a concrete-lined channel at high speeds and focused on traffic movements.

West Approach Landscape Unit

The west approach landscape unit includes the bay and its diverse and complex shorelines, islands, marshes, and wetlands. The Evergreen Point Bridge and Lake Washington Boulevard ramps rise through the Arboretum wetlands and the tree canopy at Foster Island, and pass over open water north of Broadmoor Golf Course and north Madison Park. The broad oval shape of the bay connecting to the expanse of Lake Washington creates a scenic and open character.

The visual character of this landscape unit is defined primarily by the bay itself and secondarily by the open spaces that ring the bay. These open spaces include the islands, marshes, and wetlands along the shorelines; the Washington Park Arboretum; and the private Broadmoor Golf Course.

The western highrise east of the Arboretum is visible from most viewpoints because of its height and the fact that it is not screened by vegetation. The western highrise is a part of the view from north-facing Madison Park residences. The structure's lines are simple and narrow, but the height of the road deck is such that from parts of Madison Park it blocks northward

West approach landscape unit at Arboretum looking north

View of west highrise from Madison Park

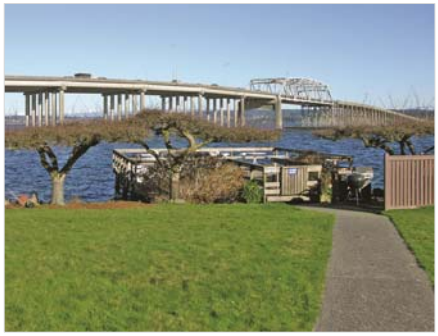
View from Lake Washington Boulevard off-ramp

View of Foster Island north shoreline

views of Union Bay from north Madison Park and views of Madison Park from Laurelhurst. However, Mount Rainier and the Cascade Mountains are still visible from Laurelhurst in the distance above the bridge.

Evergreen Point Bridge
(floating span in center)

Panoramic, highly memorable views are available year-round from south-facing residences in Laurelhurst, the Union Bay Bridge, and the highrise connecting to the east end of the west approach. The vista from these viewpoints includes the Cascade Mountains, Union Bay, the Arboretum, Lake Washington, the Eastside hills, and Mount Rainier. West-facing views include the Olympic Mountains and the Seattle hillsides and skyline. Picturesque and scenic views are available from most places on or around the bay.



Bridge profile near Madison Park

The west approach landscape unit is a very scenic area with a high level of recreational activity. As with the other Seattle landscape units, Union Bay is important both for its connector routes and as a destination point with a number of recreational activity centers. Viewer groups are commuters traveling through the area on SR 520; boaters heading to or from Lake Washington; visitors to recreation sites; and residents traveling between work and home.

Commuters and boaters are likely to be sensitive to visual quality because of the beauty of the landscapes and stretches of open water through which they travel. Visitors engaging in recreational activities are likely to be very sensitive to visual quality in this area because they have come specifically to enjoy the natural and scenic surroundings. Residents are a small viewer group compared to the other groups discussed above, but are also likely to be very sensitive to visual quality because they are attentive and attached to certain familiar qualities and views.

Lake Washington Landscape Unit

The Evergreen Point Bridge is the only built structure in the Lake Washington landscape unit (docks are considered to be part of the Seattle or Eastside areas). A three-story control house is located midspan, with equipment for the retractable drawspan and two overhead walkways. The east and west highrises have steel-framed truss superstructures that add to the apparent height. Overhead roadway facilities include freeway light standards and sign structures.

View from Edgewater Apartments

The road deck of the floating bridge is approximately 7 feet above water level, giving commuters the sense of being at water level. Because of the openness of the lake, especially to the north and south, Evergreen Point Bridge offers expansive, highly memorable views of the Cascade and Olympic mountains, Mount Rainier, the wooded hillside communities around the lake, and Husky Stadium.

The floating span and east and west highrises are visible from almost anywhere on Lake Washington, but these structures become less visible

with distance. The dark gray of the pontoons and road deck helps to soften the visual presence of the structure when seen from distant locations.

The bridge appears as an 8-foot-tall concrete wall when seen from the lake and near the bridge; however, this is a transitory view for most people boating on the lake. The tall columns and cross-bracing of the east approach and highrise dominate views from the homes in Medina near the east approach and from boats traveling in the boat channel.

Boaters, water skiers, and people fishing on Lake Washington are the largest group with the opportunity to have close-up views of the bridge. Residents who live on Medina's shoreline and west-facing slope near the floating bridge and east approach have a scenic view that includes them as dominant features. Boaters and residents for whom the bridge is a distant feature are also viewer groups.

Commuters are the only viewer group with views from the bridge and also represent a large group because of the high daily traffic volumes. Sensitivity is likely to be high for all viewer groups given the panoramic and memorable views from both the lake and the floating bridge.

Eastside Landscape Unit

Urban development in the Eastside study area consists primarily of single-family residences on large lots, waterfront residences with private docks in small bays and on Lake Washington, a few small commercial establishments, and the Bellevue Christian School/Three Points Elementary school complex. The Points Loop Trail that parallels SR 520 on the north is an important neighborhood recreation path for strolling and accessing other neighborhoods. The trail is screened from the freeway in many places by a dense buffer of mature trees and shrubs.

Residents with views across Lake Washington are likely to be very sensitive to the views in this area. All of these views include the Evergreen Point Bridge and are affected by the bridge to varying degrees, depending on how close the viewpoint is to the bridge.