

CHAPTER 6 MEASURES TO AVOID, MINIMIZE, OR MITIGATE EFFECTS

This chapter presents the measures that will be used to avoid, minimize, or mitigate any negative effects of the project on the human and natural environments. Avoidance and minimization measures are discussed first, followed by proposed mitigation. The project design will incorporate many best management practices (BMPs) that are standard practices for WSDOT.

What measures will be taken to avoid or minimize effects?

Cultural Resources

Two archaeological sites have been identified in the area of potential effects (APE), but neither is considered to be historically significant. One has been extensively disturbed by prior development of the project area and vicinity, and the other has only limited information potential. No mitigation is considered necessary or proposed at this time.

Because there were some portions of the APE that the project team was not able to investigate, WSDOT is working with the Department of Archaeology and Historic Preservation (DAHP) to develop a programmatic agreement to ensure that cultural resources are assessed on these parcels prior to initiation of construction. If archaeological sites are discovered in the currently inaccessible portions of the APE during future work, the programmatic agreement will ensure that avoidance and minimization are the preferred options, where possible. If unavoidable adverse effects to archaeological sites are going to result from future work, the programmatic agreement provides for the identification, evaluation, and resolution of effects to resources in consultation with DAHP and interested and affected Native American Tribes (see Appendix K, Cultural Resources Technical Memorandum).

WSDOT will follow the Section 106 Programmatic Agreement (see Appendix C) as agreed to by the Tribes and State Historic Preservation Officer (SHPO). The programmatic agreement calls for WSDOT to notify the Tribes and SHPO when ground-

disturbing activities are to take place in areas where previous cultural resource surveys have not occurred. WSDOT will also follow its Unanticipated Discovery Plan in the event that archaeological artifacts or human skeletal remains are found during construction.

The project will not adversely affect any significant historic properties, so no mitigation is necessary or proposed.

Ecosystems

Wildlife and Wildlife Habitat

Measures to avoid or minimize effects on wildlife and habitat include the following:

- Limiting construction to a relatively small area immediately adjacent to the existing roadway to minimize vegetation clearing.
- Following BMPs and other safety measures to minimize erosion and sedimentation and to minimize the risk of spilling contaminants.
- Replanting areas affected by construction with native vegetation.
- Improving culverts relative to existing conditions to increase the likelihood that terrestrial animals will be able to pass under the highway at creek crossings.
- Increasing overall stream lengths by 980 linear feet, creating habitat that might be used by wildlife.

WSDOT will avoid or minimize adverse affects to wildlife using the measures described above. No unavoidable adverse effects are expected.

Wetlands

WSDOT has designed the project to avoid and/or minimize the operational and construction effects of the Build Alternative on wetlands to the greatest extent practicable. Total avoidance is not possible due to the location of the project along the existing road rights of way and the constraints associated with safety and design guidelines. Specific aspects of the design that have been incorporated to avoid and minimize effects on wetlands include the following:

- Retaining walls will be used instead of standard fill slopes to reduce the footprint of the at-grade roadway sections and reduce the amount and extent of wetland fill.
- Noise walls will be installed along the majority of the SR 520 corridor to minimize noise disturbance, which will benefit wildlife using the wetland habitat adjacent to the roadway.
- Stormwater treatment facilities will be constructed to treat roadway runoff before discharging to downstream aquatic habitat. This will improve water quality in riparian wetlands in the study area.
- Existing roadway ramps will be removed to offset some of the effects of new impervious surface and create areas for habitat restoration.
- WSDOT will use BMPs during construction. These practices include implementing temporary erosion and sediment control measures and a stormwater management and pollution prevention plan; operating construction equipment from mats or steel plates to minimize soil compaction when working in or near sensitive areas; and prohibiting servicing and refueling of vehicles within 100 feet of wetlands to reduce potential spills of petroleum and hydraulic fluids in sensitive areas, as appropriate. WSDOT will restore cleared areas to pre-construction grades by replanting the areas with appropriate native herbaceous and woody species.

Fish and Aquatic Habitat

Negative effects from project operation to in-stream habitat, riparian vegetation, fish passage conditions, and stream water quality and water quantity will be avoided to the extent practicable through a design that includes fish passage upgrades, channel realignments and improvements, and inclusion of stormwater treatment facilities (see Chapter 4 for additional detail about these improvements). Overall, these facilities will improve long-term instream habitat and fish passage conditions, and either maintain or reduce current pollutant loading levels to water bodies in the study area.

Negative effects on streams and fish during construction will be avoided or minimized by restricting all in-water work to

authorized construction periods. These “work windows” will exclude periods when juvenile salmon are likely to be present in substantial numbers. Adherence to designated work windows, as identified by the appropriate agencies (WDFW, NOAA Fisheries, and USFWS), will also eliminate or reduce in-water interference during periods when returning adult salmon are present. WSDOT will restore temporarily cleared areas to pre-construction grades by replanting the areas with appropriate native vegetation.

Potential effects on streams, including sedimentation during construction, will be minimized as follows:

- Avoidance – WSDOT will use permanent retaining walls to minimize effects to streams and riparian buffers by reducing the project footprint. Except where absolutely necessary, construction equipment will not enter below the ordinary high water mark of streams. Staging areas and stockpiling areas will be located well away from aquatic areas.
- Prevention – WSDOT will use appropriate BMPs to reduce the risk of erosion and reduce or minimize the chance of sediments entering project water bodies. Erosion and sediment control measures could include mulching, matting, and netting; filter fabric fencing; quarry rock entrance mats; sediment traps and ponds; surface water interceptor swales and ditches; and the placement of construction material stockpiles away from streams. In addition, a temporary erosion control plan for clearing or removing vegetation, grading, ditching, filling, excavating, and conducting embankment compaction will be prepared and implemented to minimize and control pollution and erosion from all vegetation or ground-disturbing activities. Erosion and sediment control BMPs will be properly implemented, monitored, and maintained during construction. No long-term water quality effects are expected, although even with BMPs, some short-term water quality effects for sediment (such as increases in stream turbidity) is possible, particularly during large storm events. However, the magnitude of these effects is expected to be small and not likely to adversely affect stream water quality.

Energy

Building the proposed project will consume large amounts of energy that will no longer be available for other purposes. To avoid or minimize adverse energy effects related to project construction, WSDOT may implement where practicable the following potential measures to mitigate the unintended negative effects of energy consumption:

- Adhere to construction practices that encourage efficient energy use, such as limiting idling equipment, encouraging carpooling of construction workers, and locating staging areas near work sites.
- Purchase construction materials from local suppliers to limit transportation fuel consumption.

Based on the precision of the methodology used to estimate emissions during operation of the project once complete, its contribution to greenhouse gas emissions would be similar to what could be expected if the project were not built. As a result, no operational mitigation measures are anticipated.

Land Use, Economics, and Relocation

Land Use

Measures to avoid or minimize effects on land uses during construction and operation, such as traffic congestion, noise, visual and aesthetic, and recreation access, are described elsewhere in this chapter.

Economics

To avoid or minimize adverse economic effects related to construction, WSDOT will work with business owners to provide detours and maintain access for customers.

It is anticipated that the net economic effects of operation will be positive; therefore, no mitigation related to operation of the project economics is proposed.

Measures to reduce traffic congestion, noise, visual and aesthetic, and dust effects during construction, which could deter patrons from local businesses, are described elsewhere in this chapter.

Relocation

The acquisition and relocation for the project will be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Displaced residents are eligible to receive relocation advisory services and certain monetary payments for moving and replacement housing costs. Displaced businesses are eligible for advisory services and monetary payments for moving and re-establishment costs. Resources will be available to all relocated residential and business owners without discrimination. If WSDOT determines that insufficient housing exists, it will commit to Housing of Last Resort (Washington Administrative Code 468-100-404), which provides necessary housing in a number of ways and in a manner feasible for the individual displacement situations.

Relocations will occur prior to construction. Thus, there will be no adverse relocation effects from operation of the project.

Noise

To limit construction noise at nearby receptors, WSDOT would incorporate the following activities, where practicable:

- Require all engine-powered equipment to have mufflers that were installed according to the manufacturer's specifications.
- Require all equipment to comply with pertinent U.S. Environmental Protection Agency (USEPA) equipment noise standards.
- Limit noisiest construction activities, such as jackhammers, concrete breakers, saws, and other forms of demolition to daytime hours of 8:00 am to 5:00 pm on weekdays.
- Minimize noise by regular inspection and replacement of defective mufflers and parts that do not meet the manufacturer's specifications.
- Install temporary or portable acoustic barriers around stationary construction noise sources, where feasible.
- Locate stationary construction equipment as far from nearby noise-sensitive properties as possible.
- Shut off idling equipment.

- Schedule construction operations to avoid periods of noise annoyance identified in complaints.

Social Elements

The project will include a number of measures to avoid or minimize any negative effects in the study area including continuing to work with the Eastside community design collaboration to develop specific measures and meet with these groups to inform them about any construction activities and ensure that avoidance and minimization measures are effective.

Construction will not affect regional and community growth; therefore, no mitigation is proposed. Additional measures to reduce traffic congestion, noise, dust, and visual effects during construction are identified elsewhere in this chapter.

WSDOT may implement the following measures to avoid or minimize construction effects:

Community Cohesion

- Continue to use the project Web site and send out newsletters providing information about the project. Newsletters will be sent out in the appropriate languages to ensure effective communication with study area residents.
- Schedule neighborhood meetings, as often as needed, to keep residents informed of any construction activities before and during construction.
- Develop a traffic management plan to help minimize the effect on transit schedules and arterial movements during construction.
- Ensure that temporary road and lane closures are minimized and detour routes are well signed.

Community Services

- Coordinate with public service providers before construction, including proposed detour routes, and work with them to establish alternative detour routes, if necessary.
- Coordinate with school officials during construction.

- Notify residents of any disruptions or changes to services well in advance.
- Prepare a consolidated utility plan that lists existing locations of potential temporary locations, potential relocated locations, schedule for utility work, and detailed information on any service disruptions.

Recreational Facilities

- Identify and sign detour routes for the temporary closures and rerouting of Points Loop Trail.
- Restore landscape to pre-construction conditions to those park properties that will be temporarily affected during construction.

Pedestrian, Bicycle, and Transit

- Identify and sign detour routes on bicycle/pedestrian pathways.
- If temporary transit stops are required, clearly mark the stops and provide additional signage indicating location.
- If there are any alternative routes and/or temporary transit stops, ensure that stops are accessible for those with disabilities.

During operation, no adverse effects are anticipated on any of the social elements; therefore, no mitigation measures are proposed.

Transportation

Construction effects to traffic on SR 520 during the weekday peak commute times will be minimal. WSDOT will develop a Transportation Management Plan (TMP) prior to construction. The TMP may contain strategies for managing traffic operation, traffic control and public information for the project.

Strategies for managing traffic flow during construction may include the following measures:

- Timing of necessary lane closures outside of the peak commute times would be designed to minimize the effects to traffic.
 - Nighttime lane and ramp closures would be restricted to designated hours.

- Full closures of the freeway, if necessary, would be employed over the weekend to minimize effects during peak commute periods.
- Traffic on the Evergreen Point Road NE, 84th Avenue NE, and 92nd Avenue NE bridges will be maintained at all times during the construction of the proposed lids since no alternative detour routes exist on the north side of the freeway. The Bellevue Way NE bridge structure will be completed incrementally with reduced capacity to maintain traffic operations on that road during construction.
- The primary detour route for an SR 520 closure is the I-90 Bridge. However, traffic conditions on I-90, I-5, I-405 and SR 522, as well as on local arterials surrounding Lake Washington, will also be affected.
- The southbound Bellevue Way NE to westbound on-ramp may be closed for 2 to 3 months and the 108th Avenue NE westbound on-ramp could be closed for 6 to 9 months during construction. Construction restrictions would be in place to prevent closures of both ramps at the same time. A detour route between the two ramps via Northup Way will be in place during the ramp closures.
- Construction effects to the freeway transit stations at Evergreen Point Road and 92nd Avenue NE would be minimized.
 - Construction methods may require the closure of the stations for short durations, but construction restrictions will be in place to prevent closure of both the stations at the same time.
 - The stations would remain on the outside shoulders of SR 520 during Stages 1 through 4 of construction and will not shift to the inside of the freeway until Stage 5 when all supporting infrastructure is in place. This staging would minimize disruption to current commuters and ensure that full and safe access is available to the new facilities.

Visual Quality and Aesthetics

Several best practices would be applied to minimize or avoid negative visual effects that could arise from construction and

operation of the project. Approaches for minimizing construction effects may include the following:

- Shield construction site lighting to reduce the amount of light spilling onto nearby residences and businesses.
- Minimize visual obtrusiveness by locating construction equipment and stockpiled materials in areas that are less visually apparent and less visible from the road or to residents and businesses.

Approaches for minimizing operation effects may include the following:

- Design permanent facilities to fit with the surroundings by choosing forms and colors that do not contrast or stand out and by minimizing structural bulk, where possible.
- Continue to engage the Eastside communities in discussions about the visual quality and aesthetics of the roadway and corridor and apply the results to the design.
- Replant or enhance vegetation, street trees, and landscaping for screening or community identity and aesthetics.
- Minimize visual effects on cultural resources, public parks, and open spaces.
- Shield permanent facility lighting to reduce the amount of light spilling onto nearby residences and businesses.

The project includes new structures, roadway widening, and vegetation removal, which will have visual effects. In addition to the measures mentioned above, the following practices could be applied to minimize effects:

- Adhere to the agreed-upon project aesthetic design guidelines to ensure visual unity and consistency throughout the SR 520 corridor. These include defining the appearance and style of built elements, such as lighting, railings, sign bridges, structures, and walls.
- Follow the guidelines of the Roadside Classification Plan to blend the project into the adjacent land uses, while creating a unified experience for the highway user. Restore vegetation to areas where vegetation had been removed, in particular those areas that are visible from residences.

- Establish landscaping that is compatible with the character of the existing vegetation and that meets community goals.
- Apply a pattern to noise and retaining walls to create a unified visual appearance as viewed from within the highway corridor. Noise walls that face communities may also include a more detailed texture to align with a slower viewing speed and increased ability to observe more detail.
- Landscape the lids with input from the neighborhoods so the landscape fits with the community and provides enhanced connectivity between neighborhoods and greenbelts.

Water Resources

Surface Water

Permanent negative effects of the Build Alternative will be avoided by including stormwater treatment facilities as part of the project. Overall, these facilities will either maintain or reduce current pollutant loading levels to water bodies in the study area.

Negative effects on surface water bodies during construction will be avoided or minimized by implementing water quality pollution control measures outlined in the required TESC and SPCC plans and by following permit conditions.

Potential sedimentation effects on Eastside streams during construction will be minimized in the following ways:

- Avoidance – Use of retaining walls to minimize effects to streams, wetlands, and other critical areas. Except where absolutely necessary, and where permits allow, construction equipment will not enter below the ordinary high water mark of Eastside streams. Staging areas and stockpiling areas will be located well away from water bodies.
- Prevention – Use of appropriate BMPs to reduce the risk of erosion and reduce or minimize the chance of sediments entering project water bodies. Erosion and sediment control measures could include mulching, matting, and netting; filter fabric fencing; quarry rock entrance mats; sediment traps and ponds; surface water interceptor swales and ditches; and placing construction material

stockpiles away from streams. Sedimentation will be minimized by limiting ground-disturbing work to the dry season and conducting all in-water work within the approved work window, as specified in the project Hydraulic Project Approval. New or replacement culverts and stream reaches will be aligned adjacent to the existing structures so they could be constructed in dry conditions, thereby minimizing the amount of in-water work and associated water quality effects. In addition, a TESC plan will be prepared and implemented to minimize and control pollution and erosion from stormwater. Erosion and sediment control BMPs will be properly implemented, monitored, and maintained during construction. No long-term water quality effects are expected, although even with BMPs, some temporary short-term water quality effects from sediment (such as increases in stream turbidity) could occur, particularly during large storm events. However, the magnitude of these effects will be small, and not likely to adversely affect stream water quality.

No mitigation will be required because negative effects will be avoided or minimized through provision of stormwater treatment facilities as part of the project design. Discharges from the Build Alternative will meet or exceed *Highway Runoff Manual* (WSDOT 2008a) requirements and water quality regulations.

As described in Chapter 4 of this EA, it is not possible to provide full detention for stormwater within the project right of way and project limits due to the limited availability of suitable locations for detention ponds and treatment facilities. WSDOT will follow the provisions of the WSDOT Stormwater Management Program Plan (February 2009) developed under the NPDES General Permit. This Plan establishes a process for evaluating potential locations for off-site stormwater detention. WSDOT has currently identified over 200 candidate sites for evaluation within State right of way. WSDOT will provide site investigation, design, and construction of a facility in advance of or by the time the Yarrow Creek drainage facilities for the Eastside project are completed.

WSDOT will obtain all necessary local, state, and federal permits. WSDOT will also conduct any required environmental re-evaluations as needed for the new facility. WSDOT will also conduct cultural resources investigations on the selected site and coordinate with DAHP and the Tribes to confirm no significant cultural resources will be affected by development of the facility as described in the Section 106 Programmatic Agreement (see Appendix C).

Groundwater

The Build Alternative will increase the amount of land covered by PGIS in the study area; however, this increase will not cause a detectable change to groundwater recharge. Pollutant loading to stormwater discharges will be maintained or reduced; therefore, potential groundwater contamination will not be a concern and no mitigation will be required. Because permanent effects on groundwater will be negligible, and human use of groundwater in the study area is limited, no additional compensation will be required.

Potential effects on groundwater during construction will be negligible. These potential effects will be minimized by implementing TESC and SPCC plans. The project's stormwater treatment facilities will protect groundwater quality.

Section 4(f) Resources

Section 4(f) resources within the study area include four parks, a pedestrian/bicycle trail, and three NRHP-eligible historic properties. The information in Chapter 5.10 of this EA demonstrates that the construction and operational activities of the proposed project will not constitute a "use" of three of the Section 4(f) parks, and will meet the *de minimis* effect criteria for the one remaining park, the pedestrian/bicycle trail, and the three historic properties.

Points Loop Trail

During construction, access will be maintained with detour routes using local streets, ensuring that the continued use and continuity of the trail will not be impaired.

Fairweather Park

The new Evergreen Point Road lid will have beneficial visual effects on the park. This landscaped lid will increase green

space adjacent to the park and will provide a new entrance to the park from the reconstructed Evergreen Point Road crossing of SR 520. The proposed noise walls will reduce noise levels in 2030 by 5 to 15 A-weighted decibels (dBA) compared with existing conditions and by 6 to 16 dBA compared with the No Build Alternative. After construction, the area will be regraded and revegetated.

Indirect and Cumulative Effects

No additional measures beyond those already listed in this chapter will be necessary during construction and operation of the project to avoid or minimize adverse indirect or cumulative effects.

What measures will be taken to mitigate effects?

Ecosystems

As part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project, WSDOT has developed a Conceptual Wetland Mitigation Plan and a Conceptual Stream Habitat Mitigation Plan (plans). These plans detail the proposed mitigation that WSDOT will commit to in order to mitigate all adverse effects on these resources as a result of the project. Both plans are under review state and federal regulatory agencies. Final mitigation details and provisions of the plans will be written into one or more environmental permits for the project that are anticipated for issuance in early 2010. Summary features of the plans are provided below.

Wildlife and Wildlife Habitat

While not proposed as specific mitigation for wildlife and wildlife habitat, the rehabilitation of degraded wetlands at an offsite location (as proposed in the Wetland Mitigation Plan) will also provide areas that could be used as wildlife habitat.

Wetlands

WSDOT will provide mitigation to compensate for loss of wetlands and their functions including adverse effects on water quality, hydrologic, and habitat functions as a result of construction and operation of the project. Mitigation will result in no net loss of wetland habitat or functions.

The project will permanently fill approximately 7.0 acres of wetland in the study area. Approximately 1.6 acres of wetland will be temporarily affected by construction of the project.

Twenty-two wetlands will be completely filled as a result of roadway widening. These wetlands are generally small and are associated with the SR 520 right of way. Eight wetlands will be partially filled by the project.

The SR 520, Medina to SR 202: Eastside Transit and HOV Project will provide compensatory mitigation at the Keller Mitigation Site located in the Bear Creek basin, including the following:

- Rehabilitation of 28.17 acres of formerly agricultural wetlands; and
- Rehabilitation of approximately 3.41 acres of wetland/buffer from pasture to a mixture of wetland and upland forest and shrub communities.

The proposed mitigation considers both the quantity and quality of wetlands rehabilitated in order to achieve a no net loss of wetland functions.

The final mitigation proposal will include wetland rehabilitation and wetland/buffer enhancement activities at the Keller Mitigation Site sufficient to meet federal, state, and local regulatory requirements. The proposed mitigation site will be monitored for 10 years. Monitoring, contingency, and site management plans are provided and will be used to adaptively manage the mitigation site.

Fish and Aquatic Habitat

WSDOT will provide mitigation to compensate for direct effects on fisheries resources and aquatic/riparian habitats. Overall, approximately 980 feet of new open channel aquatic habitat and associated riparian buffers will be developed.

In addition, WSDOT is committing to restoring a major reach of the Yarrow Creek system, restoring connectivity within Yarrow Creek and several tributaries.

Details of these plans are included in the Conceptual Stream Habitat Mitigation Plan, currently under review by regulatory agencies.

Noise Walls

Early in the development of this project, WSDOT committed to installing noise walls associated with the Eastside project as mitigation to reduce noise levels caused by the proposed project to below the Noise Abatement Criteria (NAC). These noise walls have been developed as part of the project design. The project team conducted a detailed analysis to determine the appropriate location and extent of noise walls to be incorporated into the project. See Appendix O, Noise Technical Memorandum for additional detail about the analysis and design of noise walls for the project.