

CHAPTER 5.11 Indirect and Cumulative Effects

WSDOT did not identify any significant indirect effects on any resource. The Build Alternative would have a negligible contribution to the cumulative effects of past, present, and future actions.

Please refer to the Indirect and Cumulative Effects Technical Memorandum in Appendix U for additional information about the indirect and cumulative effects analysis.

This chapter describes indirect and cumulative effects expected to be associated with the proposed SR 520, Medina to SR 202: Eastside Transit and HOV Project. Appendix U, Indirect and Cumulative Effects Technical Memorandum, provides more detail, including analytic methods and discussion of past, present, and reasonably foreseeable future actions that could add to or interact with the direct and indirect effects of the project to produce cumulative effects. WSDOT is required to disclose cumulative effects and to suggest practical mitigation options that could be taken by the responsible parties (WSDOT et al. 2008).

What are indirect and cumulative effects?

The other sections of Chapter 5 explain how project construction and operation could directly affect a range of environmental resources. This chapter describes two other kinds of environmental effects: indirect effects and cumulative effects.

Federal regulations (40 CFR 1502.16, 1508.7, 1508.8) implementing the National Environmental Policy Act (NEPA) require that indirect and cumulative effects be considered in NEPA documents because they inform the public and decision-makers about possible unintended consequences of a project that are not always revealed by examining only the direct effects of the individual project under review. This information helps project planners, designers, and builders to mitigate direct effects under their control in ways that can make adverse indirect and cumulative effects less likely and less severe.

Indirect effects (sometimes called secondary impacts or effects) are defined as effects that:

... are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may

include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 Code of Federal Regulations [CFR] 1508.8).

Indirect effects result from one project but, unlike direct effects, typically involve a chain of cause-and-effect relationships that can take time to develop and can occur at a distance from the project site. This makes indirect effects difficult to accurately predict and usually requires a qualitative estimate more general than predictions of direct effects.

Cumulative effects (also called cumulative impacts) are defined as:

... the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

A cumulative effect is the project's direct and indirect effects on a particular resource, combined with the past, present, and future effects of other human activities on that same resource. The result is the expected future condition of the resource when all of the external factors known or likely to affect it are taken into account.

Why are indirect and cumulative effects considered in this EA?

As noted above, indirect effects are tied to the direct effects described in early sections of this EA. The analysts looked at interactions between the project's effects to identify ways in which the project contributed to effects further removed in time or place.

The analysts identified cumulative effects by following the *Guidance on Preparing Cumulative Impact Analyses* (WSDOT et al. 2008) and by reviewing plans and policies developed by the Puget Sound Regional Council (PSRC), including *Vision 2040* (PSRC 2008), the *Transportation 2040 Draft EIS* (PSRC 2009b),

and the 2010 to 2013 Transportation Improvement Program projects. Many land development and transportation projects are under construction or planned for construction in the reasonably foreseeable future, as shown in Exhibit 6. The analysts reviewed trends from past and present actions and then considered the action in light of the trend plus reasonable future actions. This chapter summarizes the conclusions of the analysis; additional detail about the analysis of indirect and cumulative effects may be found in Appendix U, Indirect and Cumulative Effects Technical Memorandum.

What are the potential indirect and cumulative effects of the project?

Air Quality

What indirect effects would the project likely have on air quality?

Construction of the project could produce indirect effects on air quality if emissions or particulates were dispersed to locations distant from the construction zone; these effects would be temporary and limited to the construction period. No permanent indirect effects are expected to occur as a result of the project.

What would the cumulative effect on air quality likely be?

Project construction activities would make a small, short-term contribution to an incremental effect on air quality by emitting exhaust gases and particulates into the atmosphere. Emissions from project construction activities would combine with other emissions from sources within the region. This incremental effect would be temporary and is not expected to cause a change from the baseline condition or a violation of the National Ambient Air Quality Standards (NAAQS).

During project operation, vehicles using the SR 520 corridor would release exhaust emissions into the atmosphere. It should be understood, however, that this happens now, and that the transit expansion and HOV lanes provided by the project would decrease the cumulative exhaust emission below the level expected under the No Build Alternative. The analysis shows that the project will produce an incremental improvement in air quality.

Because the Build Alternative would be a major transportation project located in a maintenance area for carbon monoxide (CO), it would be subject to transportation conformity requirements. The intent of transportation conformity is to ensure that new projects, programs, and plans do not impede an area from meeting and maintaining air quality standards. Conformity with the State Implementation Plan (SIP) means that transportation activities will not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Because it is not anticipated that the project will create any new violations, nor increase the frequency of an existing violation of the CO standard, it would conform with the purpose of the current SIP and the requirements of the federal Clean Air Act and the Washington Clean Air Act. As a “regionally significant” project, the proposed project is also included in the current Regional Transportation Plan (RTP), *Destination 2030* (PSRC 2007), in the action alternatives evaluated in the *Transportation 2040 DEIS* (PSRC 2009b), and in the 2007–2010 Transportation Improvement Program (TIP), which lists all current transportation projects (PSRC 2009a). The RTP and the TIP meet the conformity requirements identified by federal and state regulations for CO.

Environmental Justice

What indirect effects would the project likely have on low-income, minority, or limited English proficiency populations?

No direct or indirect effects were identified that would contribute to a cumulative effect on low-income, minority, or limited English proficiency (LEP) populations.

What would the cumulative effect on low-income, minority, or LEP populations likely be?

Because no direct or indirect effects were identified, the project would not contribute to a cumulative effect on low-income, minority, or LEP populations for this project.

In reaching this conclusion, the analysts began by defining the study area for cumulative effects on low-income, minority, and LEP residents as the central Puget Sound region as presented in the *Transportation 2040 DEIS* (PSRC 2009b). Next, the analysts reviewed technical memoranda and discipline reports prepared for the following disciplines: air quality;

cultural resources; ecosystems; land use, economics, and relocations; noise; public services and utilities; social elements; transportation; and visual quality and aesthetics to identify potential direct and indirect effects of the Build Alternative that could contribute to a cumulative effect on low-income, minority, or LEP populations.

Analysts then identified other past, present, and reasonably foreseeable future actions that could contribute to a cumulative effect on low-income, minority, or LEP populations through 2030, the project design year. To identify these actions, analysts researched local and regional comprehensive, land use, and transportation plans, and reviewed the present and reasonably foreseeable future actions prepared by WSDOT to support the analyses in the Environmental Justice Technical Memorandum.

Geology and Soils

What indirect effects would the project likely have on geology and soils?

Indirect effects of project construction related to geology and soils would involve aggregate or granular soil use that would preclude their use for other projects and lead to the depletion of this resource in the project vicinity. Aggregate depletion is viewed as a minor indirect effect for this project. No indirect effects were identified for project operation.

What would the cumulative effect on geology and soils likely be?

Construction of the Build Alternative would have a minor contribution to aggregate depletion in the area, in combination with the effects of past, present, and reasonably foreseeable future actions. By design, the project would have a beneficial effect with regard to seismic and soil stability.

Hazardous Materials

What indirect effects would the project likely have on hazardous materials?

Hazardous materials are not in and of themselves a resource that would be evaluated for cumulative effects. Hazardous materials, however, could affect resources including air and water. Hazardous materials could be associated with contaminated soils and groundwater, building materials

encountered through demolition, hazardous materials used at construction sites and released into the environment due to accidental spills, and underground storage tanks. Depending on the contamination, there could be risks to worker safety and public health in addition to the environmental damage.

However, the risk of encountering hazardous materials for this project is low and there are several safeguards in place to minimize temporary effects, including the WSDOT spill prevention control and countermeasures (SPCC) plan for construction projects. See Appendix J, Hazardous Materials Technical Memorandum, for additional information.

What would the cumulative effect on hazardous materials likely be?

Because no direct or indirect effects were identified, no cumulative effects were identified for hazardous materials.

Cultural Resources

What indirect effects would the project likely have on cultural resources?

Traditional cultural properties and archaeological sites relating to Native American cultures have not been identified in the project footprint and are not expected to be directly or indirectly affected by the project. No known historically significant properties would be damaged, removed, or physically altered during project construction or operation. No indirect effects to cultural resources were identified for this project.

What would the cumulative effect on cultural resources likely be?

WSDOT determined that the project would have no direct or indirect effect on any identified cultural resource. For this reason, WSDOT concluded that the project would not contribute to a cumulative effect on cultural resources (WSDOT et al. 2008).

Ecosystems

What indirect effects would the project likely have on ecosystems?

Project construction will directly affect wetlands, streams, and wildlife habitat, but all of these effects will be mitigated as part of the project and design. No indirect effects were identified.

What would the cumulative effect on ecosystems likely be?

As discussed in Appendix L, Ecosystems Discipline Report, WSDOT has worked to avoid and minimize effects to ecosystems during the scoping and design of this project. WSDOT avoided many effects to resources through careful identification of sensitive areas early in the design process.

Where avoidance was not possible, effects were minimized by treating stormwater, providing wildlife habitat, and improving wetland functions. The project would make a beneficial contribution to ecosystem health along the SR 520 corridor, helping to reduce the cumulative effect of development on wetlands and aquatic habitat. Through best management practices, conservation measures, and the application of specific construction sequencing and timing (such as minimizing in-water work), WSDOT would ensure that short-term construction effects on wetlands, fisheries resources, and wildlife would be small and would not lead to substantial fish mortality, changes to fish populations or subpopulations, habitat loss or degradation, or decreased wetland function.

Considered with the effects of past, present, and reasonably foreseeable future actions, the project would have a negligible contribution to cumulative effects on wetlands, streams, and wildlife.

Energy

What indirect effects would the project likely have on energy?

The energy analysis did not identify indirect effects on energy or greenhouse gas (GHG) emissions from project construction or operation. Energy supplies are sufficient to build and operate the project without placing abnormal demands on energy sources outside the region.

What would the cumulative effect on energy likely be?

The construction and operation of the project would consume energy and emit GHGs into the atmosphere. Operation of the project would not be measurably different from the No Build Alternative and thus would not contribute to a cumulative effect. Construction of the project would have temporary release of emissions. WSDOT has taken steps to minimize fuel use during construction to reduce GHG emissions by construction equipment by setting up construction areas, staging areas, and material transfer sites in ways that reduce equipment and vehicle idling.

Considered with the effects of past, present, and reasonably foreseeable future actions, the project would have a negligible contribution to cumulative effects on energy and climate change.

Global climate change is being addressed at local, regional, national, and international levels. In Washington state, the Legislature has set in law state GHG and vehicle miles travelled (VMT) reduction goals. Governor Christine Gregoire, by Executive Order 09-05, Washington's Leadership on Climate Change, created partnerships aimed at reducing transportation-related GHG emissions. WSDOT is active in the state-wide and regional efforts to reduce VMT and GHG emissions. These efforts will build on the many programs WSDOT has in place that reduce GHG and VMT including the following: Commute Trip Reduction Program, Growth and Transportation Efficiency Center Program, and Vanpool Investment Program (the largest program in the country – eliminated 203 million drive-alone miles statewide in 2008). The region's transportation plan prepared by PSRC contains a series of recommendations that address energy and GHGs.

Land Use, Economics, and Relocation

What indirect effects would the project likely have on land use, economics, and relocation?

The Build Alternative would not result in indirect land use effects after construction. The existing land uses in the project area are well established and generally consistent with the applicable comprehensive plan and zoning designations. In addition, regional land use planning decisions are established in adopted regional and local land use plans, and these plans considered transportation planning decisions and future transportation improvements.

The project would not result in any adverse indirect effects on the regional economy. Temporary, beneficial indirect economic effects would accrue from the hiring of vendors and purchasing of materials and supplies required for project construction, leading to increased employment throughout the relevant parts of the supply chain in the short-term.

What would the cumulative effect on land use, economics, and relocation likely be?

The proposed project is part of the desired future as outlined in the PSRC's *Vision 2040* (PSRC 2008). The Build Alternative's contribution to the cumulative effect on land use would not be adverse or substantial in combination with other past, present, and reasonably foreseeable future actions. The Build Alternative's relative contribution (approximately 12 acres converted from existing land use to transportation right of way) would not be measurable compared to the total cumulative effect.

Regional land use decisions are determined at the regional level and are implemented in local comprehensive plans that must be consistent with *Vision 2040* (PSRC 2008). The *Transportation 2040 DEIS* (PSRC 2009b) land use analysis incorporates reasonably foreseeable changes in the Puget Sound's future land use, population, employment, and travel behavior, including the SR 520, Medina to SR 202: Eastside Transit and HOV Project, and subsequent development would be planned according to the development regulations of the local jurisdiction.

The project would not contribute to a cumulative effect on economic activity. This is because there is little expected

difference between the Build Alternative and No Build Alternatives in the 4-County area (King, Pierce, Snohomish, and Kitsap Counties) as measured to the end of the design life of the project in 2030.

Because the Build Alternative is not proposing tolling, it would have no contribution to the cumulative effects from tolling associated with reasonably foreseeable future actions.

Noise

What indirect effects would the project likely have on noise?

No indirect effects related to noise were identified. Once project construction is complete, most if not all of the direct effects would be reduced or eliminated. Because the traffic noise study uses future predicted traffic that includes other planned projects and commuting projections, the direct effects of the project, along with traffic noise from other area roadways, would likely be the dominant noise source in the corridor.

What would the cumulative effect on noise likely be?

The Build Alternative will reduce noise adjacent to the roadway by constructing noise barriers and lids at several locations. While the Build Alternative is not expected to have a cumulative effect on the regional noise levels, the project will have measurable reductions of noise in the study area (500 feet to either side of the roadway). The total number of residences experiencing high noise levels (exceeding the NAC) would be reduced from 128 (under no action) to 20 under the proposed Build Alternative. Most of the remaining properties exceeding the NAC do so because of traffic noise radiating from arterial roads, such as Bellevue Way and Lake Washington Boulevard, 84th Avenue NE, 92nd Avenue NE and NE 28th Street.

Social Elements

What indirect effects would the project likely to have on social elements?

There are few social resources (that is, parks, libraries, churches, community centers, and schools) located in the study area. Operation of the project would have no direct effects on any of the social elements that would result in indirect effects. The project does have the potential to result in positive indirect benefits related to air quality because of the

reduced number of single-occupancy vehicles and the anticipated increases in transit, carpools, and vanpools. Additionally, the lids are intended to provide improved pedestrian and non-motorized access to both sides of SR 520, which could increase social cohesion in the neighborhoods bisected by the original roadway construction.

What would the cumulative effect on social elements likely be?

No direct or indirect effects were identified that would contribute to cumulative effects for social elements. Several temporary adverse direct effects were identified related to construction. However, these do not contribute to a long-term cumulative effect. The analyst did identify beneficial effects, such as improved transit and HOV services, improved response time for emergency vehicles, and community connections via lids.

Because the Build Alternative is not proposing tolling, it would have no contribution to the cumulative effects from tolling associated with reasonably foreseeable future actions.

Transportation

What indirect effects would the project likely have on transportation?

No indirect effects related to transportation were identified. This project produces direct beneficial effects on transportation; no adverse indirect effects are anticipated.

What would the cumulative effect on transportation likely be?

Construction activities would have a minor, short-term contribution to cumulative effects by causing travel delays and congestion due to lane and road closures and detours.

The project would have a beneficial effect, implementing regional planned transportation improvements and maintain or improve traffic conditions within the SR 520 corridor. Under the Build Alternative, in conjunction with other regional transportation projects, traffic conditions within the project corridor are expected to be similar to or better than those estimated for the project if other planned actions did not occur.

Increases in carpool and transit demand are projected under both the Build Alternative and No Build Alternative. This is

largely due to improvements to the HOV lane system between Redmond and Seattle. However, the increase in HOV demand associated with the No Build Alternative would not be as large as with the Build Alternative.

Because the Build Alternative is not proposing tolling, it would have no contribution to the cumulative effects from tolling associated with reasonably foreseeable future actions.

Visual Quality and Aesthetics

What indirect effects would the project likely have on visual quality and aesthetics?

No indirect effects associated with visual quality were identified.

What would the cumulative effect on visual quality and aesthetics likely be?

The Build Alternative will have a minor contribution to the visual effects of past, present, and reasonably foreseeable future actions. Construction and operation of SR 520 would change the visual character and reduce the visual quality rating of the SR 520 corridor from Medina to approximately I-405 because mature vegetation would be replaced with noise walls and the highway would likely be noticeably wider. These changes would result in the SR 520 corridor becoming more suburban in character and generally continuing the urbanization trend. WSDOT would establish architectural standards for noise walls and bridges, add landscaping, and revegetate disturbed areas.

Water Resources

What indirect effects would the project likely have on water resources?

There are no identified indirect effects to stormwater or surface water. There are no identified direct or indirect effects to groundwater in the study area. There would be no direct or indirect effects to water resources in the restriping portion of the project.

What would the cumulative effect on water resources likely be?

The Build Alternative will contribute incremental benefits to water quality in relation to the effects of past, present, and

future actions. Operation of the new SR 520 stormwater treatment facilities would reduce the amounts of pollutants (pounds per year) discharged to study area receiving waters as well as a reduction in the concentrations of pollutants discharged at any one time to the same receiving environments. An additional benefit would be habitat improvement associated with reductions in peak flows to streams. These are all beneficial cumulative effects that will be measurable within local streams but not likely to be measurable within the adjacent bays and Lake Washington.

SR 520, MEDINA TO SR 202: EASTSIDE TRANSIT AND HOV PROJECT
ENVIRONMENTAL ASSESSMENT