

6 | Other Considerations



Chapter 6 studies the project's effect on climate change, the potential indirect effects of the project, and the potential cumulative effects of the project in combination with past actions and other current and reasonably foreseeable projects. This chapter also identifies adverse effects that cannot be mitigated, irreversible decisions and irretrievable resources that would be committed to build the project, and the tradeoffs between the short-term impacts to resources and the long-term gains to the community.

How would the project affect climate change?

For additional details, please refer to Appendix H, *Climate Change Memorandum*.

Motor vehicles are a significant source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. Carbon dioxide makes up the bulk of the emissions from transportation. The effects of the No Build and Build alternatives on greenhouse gas emissions were estimated by calculating the level of carbon dioxide emissions from the amount of fuel that would be consumed by vehicles traveling on the project corridor under each alternative.

For the No Build Alternative, the morning peak hour traffic would consume about 770 gallons of fuel and produce an estimated 15,000 pounds of carbon dioxide. The evening peak hour traffic would consume 1,100 gallons of fuel and emit an estimated 21,000 pounds of carbon dioxide.

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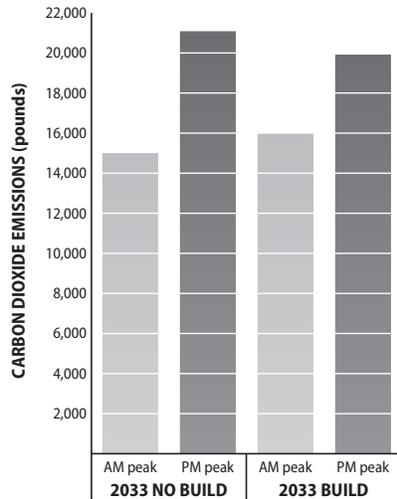


Exhibit 6-1: Projected carbon dioxide emissions in 2033 under the No Build and Build alternatives

For the Build Alternative, morning peak hour traffic would consume about 830 gallons of fuel and release an estimated 16,000 pounds of carbon dioxide. The evening peak hour traffic would consume 1,000 gallons of fuel and produce an estimated 20,000 pounds of carbon dioxide (Exhibit 6-1).

During the morning peak hour, 34 percent more vehicle miles traveled are anticipated under the Build Alternative than under the No Build Alternative; 54 percent more vehicles miles traveled are expected during the evening peak hours. Although more vehicles would use SR 502 under the Build Alternative, these vehicles would be able to travel nearly twice as fast as they could under the No Build Alternative due to reduced congestion and other mobility improvements. Improved speeds equate to a more efficient rate of fuel consumption, and therefore the fuel consumption and the greenhouse gas emissions are approximately the same for the two alternatives despite the difference in the number of vehicles traveling on SR 502.

What are the indirect and cumulative effects, and why are they studied?

For additional details on the indirect and cumulative effects analysis, please refer to Appendix L, *Indirect and Cumulative Effects Analysis*.

DEFINITION

WHAT ARE INDIRECT EFFECTS?

Indirect effects are caused by the proposed action or alternative and are later in time or farther removed in distance, but 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.

DEFINITION

WHAT ARE CUMULATIVE EFFECTS?

A cumulative effect is the effect on the environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects result from individually minor but collectively significant actions taking place over a period of time.

The SR 502 corridor has changed significantly in recent decades as a result of population growth and increased development. The project corridor will continue to grow and urbanize with or without the project. Examination of indirect and cumulative effects considers the project in the context of this ongoing development and in combination with past actions and other current and reasonably foreseeable projects.

Indirect effects are caused by direct effects of the project but occur later in time or farther in distance than direct effects and may include changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems. For example, a property acquisition for a roadway right of way is a direct effect, while stormwater runoff and the downstream effects to fish and fish habitat are the indirect effects of the roadway improvement project.

Cumulative effects are those that would result from the combined direct and indirect effects of the project together with past actions and other current and foreseeable projects near the SR 502 Corridor Widening Project. Cumulative effects can result from individually minor but collectively significant effects of projects over time.

How are the indirect and cumulative effects evaluated?

The indirect and cumulative effects were evaluated by first identifying potentially affected resources. For each resource, the timeframe and geographical area for the analysis was defined to capture the potential effects for that specific resource; these parameters varied by resource and are different from the study area boundaries used for examining direct effects.

Indirect effects were identified by examining the direct effects to the resource and then analyzing effects that are likely to occur later in time or farther in distance as a result of the direct effects of the project.

To assess cumulative effects, the direct and indirect effects of the No Build and Build alternatives were evaluated in combination with past actions and other current and reasonably foreseeable projects in the geographic area. Direct and indirect effects of the other current and reasonably foreseeable projects were identified by the best professional judgement of resource specialists. The other current and reasonably foreseeable projects that were considered in this analysis include a total of 170 projects planned, approved, or pending approval by Clark County, the City of Battle Ground, the City of Ridgefield, C-TRAN and Clark Public Utilities. These projects include transportation improvements, utility extensions, annexation applications, new commercial, industrial, and residential development, and park improvements or acquisitions; a list of these projects is included in Appendix L, *Indirect and Cumulative Effects Analysis*. The cumulative effects analysis builds on information derived from the direct effects analyses conducted for each environmental resource (see Chapter 4, *Comparison of the Alternatives – Environmental Effects*) as well as the indirect effects analysis described above.

What are the indirect effects of the project?

Under the Build Alternative, indirect effects are anticipated for the following resources:

- **Fish** – Indirect effects of the Build Alternative on fish would include temporary increases in sedimentation, temporary loss of riparian habitat, and increases in stream temperatures. These indirect effects would result from increased surface runoff from soil disturbed during construction, increased impervious surface, and removal of riparian vegetation and the shading it provides, which would be direct effects of the Build Alternative. Stormwater treatment and detention, meeting Washington State Department of Ecology requirements, is proposed as part of the Build Alternative as

described in Chapter 2, *Developing the Alternatives*. This treatment is expected to improve most water quality indicators in the long-term, which would be beneficial to fish; however, there may be increases in stormwater pollutants, such as zinc and copper, which are not completely removed by treatment facilities and can harm fish.

- **Land use** – Indirect effects on land use would include changes in access for a few local businesses which over time could influence the number of customers; potential minor population increases in certain locations where displaced businesses and residents relocate; parcels of land which may not conform to zoning standards; and changing demands for land use types as fewer acres are used for farming, as access to parcels is limited, and as the population in the area changes in part due to relocations resulting from the project. These indirect effects would be the result of direct effects of the Build Alternative – more specifically, consolidation of access points for rural commercial businesses and residences to no more than one per property, and partial and full acquisitions of parcels for right of way. The access restrictions on property adjacent to SR 502 are expected to deter requests for rezoning, and thereby reduce development pressure along the corridor.
- **Surface water** – Indirect effects of the Build Alternative on surface water would include improved water quality as stormwater treatment facilities would remove roadway pollutants before they enter surface water. More specifically, stormwater treatment would remove approximately 1,895 pounds of total suspended solids annually; however, surface water quality would also be degraded due to an increase in dissolved metals (copper and zinc) that are not removed by the stormwater treatment facilities. The Build Alternative may also result in increases in peak water levels of local streams during major storms. These indirect effects would be the result of construction of stormwater detention and treatment facilities, increased impervious surface, and removal of riparian vegetation, which would be direct effects of the Build Alternative.
- **Vegetation** – Following construction, indirect effects to vegetation resources adjacent to the roadway are expected to be minimal. For example, damage to the root structures of plants, which could be a direct effect of construction activities for the Build Alternative, may later result in plant death.
- **Wetlands** – Indirect effects of the Build Alternative on wetlands would include interruption of natural surface and groundwater flow, which may increase or decrease the length of time wetlands are saturated or covered with water during the year. These indirect effects

would result from clearing vegetation and reducing the function of wetland buffers, which would be a direct effect of the Build Alternative. The potential indirect effects on wetlands have been calculated into the planned wetland mitigation at the same mitigation ratio as direct wetland effects.

- **Wildlife** – The potential indirect effect to wildlife resources associated with the Build Alternative may be a slight increase in incidental deaths over time caused by the direct effects of increased traffic, a wider roadway for wildlife to cross, and a median treatment for wildlife to navigate. Wildlife that use wetlands for habitat would also experience indirect effects of increased light and glare, increased noise levels, habitat fragmentation, loss of biodiversity, and an increased presence of invasive plant species due to the direct effects to wetlands.

For the No Build Alternative, the indirect effects would be continued degradation of water quality as a result of the pollutant laden stormwater reaching sensitive water resources. No other indirect effects are expected to occur under the No Build Alternative.

What are the cumulative effects of the project?

Cumulative effects – those direct and indirect effects from the Build Alternative combined with effects from past actions and other nearby current and reasonably foreseeable projects independent of the Build Alternative – would be minimized to the extent possible through mitigation of the direct and indirect effects of the Build Alternative as described in Chapter 7, *Environmental Commitments*. Other current and reasonably foreseeable projects would also be required to comply with applicable environmental regulations and any mitigation measures required by those regulations.

The following cumulative effects of the Build Alternative are anticipated:

- **Fish** – The Build Alternative is expected to result in cumulative effects to water quality associated with the creation of new impervious surface and adverse direct effects to in-stream habitat in both fish-bearing and non-fish-bearing streams, which would directly affect fish habitat. Other projects in the study area could further degrade fish resources by increasing impervious surfaces, increasing stormwater pollutants, removing riparian vegetation, converting fish habitat, and increasing streambed sedimentation. However, the project and other actions potentially affecting fish would comply with regulations that may require culvert replacement, riparian restoration, planting of native trees and shrubs, installation

of woody debris, removal of concrete bank armoring, stream channel realignment, and stormwater treatment, which could have a beneficial cumulative effect on fish.

Mitigation for direct and indirect effects of the Build Alternative would include fish habitat enhancements such as restoration of stream channels, re-establishment of floodplain connectivity, and replanting of native riparian plant communities.

- **Farmlands** – The cumulative effect on agriculture and farmlands would be a loss of approximately 7,100 acres of prime farmlands in Clark County between now and 2024. This acreage includes 75–79 acres from the project and 7,023 acres planned for conversion to commercial, industrial, residential, and public improvements under the County’s comprehensive plan. This continuing loss of farmland has been occurring since the 1950s as population has grown and urbanized areas have expanded throughout Clark County. The direct effect of the Build Alternative, the loss of approximately 75–79 acres of prime farmland, is relatively minor in the context of the overall pattern of farmland conversion, representing less than 0.1 percent of county land. By comparison the 7,023 acres of prime farmland expected to be converted as a result of the 2007 update to Clark County’s *Comprehensive Growth Management Plan*, represents 1.7 percent of land in Clark County. There are no indirect effects of the Build Alternative that contribute to cumulative effects on agriculture and farmlands.
- **Land use** – The cumulative effect on land uses in Clark County is the expected conversion of approximately 11,800 acres of land formerly reserved for farming, forestry, or low density rural residences to more urban uses by 2024 as the population in Clark County grows. The 2007 update to the Clark County *Comprehensive Growth Management Plan* expanded urban growth boundaries by 11,698 acres to accommodate the anticipated population growth through 2024, which would occur with or without construction of the Build Alternative. By comparison, the direct effect of the Build Alternative to convert 40–60 acres of land to right of way and 68 acres for mitigation, represents only about one percent of the land conversion anticipated. The updated comprehensive plan did not change the land use designations within the study area, and the Build Alternative is not anticipated to cause changes in existing land uses beyond some minor commercial redevelopment near Dollars Corner.
- **Noise** – Current and reasonably foreseeable residential, commercial and industrial developments near the study area are likely to cause

increases in traffic which could result in increased noise. However, it is unlikely that a noticeable increase in noise levels would occur as a direct result of the Build Alternative; even in combination with other current and reasonably foreseeable actions, no substantial cumulative effect is anticipated.

- **Surface water** – The Build Alternative would be expected to result in direct effects to surface water resources. In combination with other current and reasonably foreseeable transportation, commercial and residential development projects, the Build Alternative would be expected to contribute to the degradation of surface water resources by the incremental conversion of land to impervious surfaces and the possible increase in pollutants discharged to water bodies. However, stormwater treatment measures that would be part of federal, state, and local permitting would help offset direct and indirect effects of the Build Alternative, and thereby also help offset the cumulative effects to surface water, particularly in critical areas such as wetlands and streams.
- **Vegetation** – The Build Alternative would require removal of vegetation that provides habitat, and with other transportation, commercial, and residential projects, would degrade vegetation resources by their incremental loss. These losses include potential effects to listed plant species, loss of wildlife habitat, and the long-lasting loss of mature vegetation such as forest and scrub-shrub habitats. Portions of the landscape are already degraded by past vegetation removal, altered habitat, and conversion to urban uses. The cumulative effect of the Build Alternative in combination with other actions could degrade vegetation resources further. However, mitigation measures, as described in Chapter 7, *Environmental Commitments*, would help offset the negative direct and indirect effects of the Build Alternative to vegetation.
- **Wetlands** – Transportation improvements (including the Build Alternative), residential development, and commercial development in the vicinity of SR 502 are likely to result in conversion of wetlands and wetland buffers to other types of uses. The Build Alternative, in combination with other current and reasonably foreseeable projects and past actions would result in an incremental loss of wetland acreage, function, and connectivity to other wetlands, stream networks, and natural areas. Wetland mitigation measures proposed for the Build Alternative at the Sunset Oaks wetland mitigation site and the Mill Creek North potential mitigation site would mitigate for the project's direct and indirect effects to wetlands.

- Wildlife** – Current and reasonably foreseeable residential and commercial development and transportation improvements are likely to result in the fragmentation or removal of vegetation that wildlife species depend on for habitat, feeding, and breeding. The Build Alternative would result in direct effects to 29 acres of upland grassland, 5 acres of upland scrub-shrub, 11 acres of upland forest, and 6 acres of upland/wetland riparian habitat used by wildlife. These direct effects in combination with habitat loss from past actions and other current and reasonably foreseeable projects contribute to the cumulative loss of wildlife habitat. Other projects would be required to adhere to applicable regulations which may require mitigation in the form of planting disturbed areas with native vegetation, creation and enhancement of wetland habitat, enhancement and restoration of riparian habitat, and/or preservation of high quality habitat through conservation easements. Mitigation for direct and indirect effects of the Build Alternative would include stream channel improvements and establishment of vegetation that could be used as wildlife habitat.

For the No Build Alternative, the direct effects on surface water resources include the current pollutant load generated from the roadway which does not receive any sort of stormwater treatment presently and would not experience the decrease in total suspended solids that would result from the Build Alternative. Cumulatively, the loss of pervious surface from other projects and the lack of stormwater treatment under the No Build would continue to degrade water quality. Other than these effects on surface water, the No Build Alternative is not expected to result in any cumulative effects.

Are there any adverse effects that cannot be avoided through mitigation measures?

Many infrastructure projects – even projects that provide substantial beneficial effects for the public – have some negative effects on the community and environment. Washington State Department of Transportation is committed to avoiding, minimizing, and mitigating such effects whenever possible. Nevertheless, the SR 502 Corridor Widening Project would have some adverse effects that cannot be mitigated. These include:

- Fish** – Approximately 0.1 acres of designated critical fish habitat would be lost under the Build Alternative. Because Washington State Department of Transportation does not have the authority to redesignate land as critical fish habitat, an in-kind replacement is not possible. However, Washington State Department of Transportation will implement reasonable and prudent measures as identified in the

Biological Opinion issued by the National Marine Fisheries Service during the Endangered Species Act consultation process to avoid or minimize the impact to critical fish habitat resulting from the Build Alternative.

- **Noise** – A variety of noise abatement measures to mitigate long-term noise effects were evaluated. The following techniques were considered but rejected as potential noise mitigation for the project:
 - Implementing traffic management measures was deemed not reasonable, as they would tend to lower speeds and increase congestion, counter to the purpose of the project to improve mobility. For these reasons, these measures are also often inappropriate to apply on National Highway System routes such as SR 502.
 - Acquiring land as buffers zones was deemed not reasonable due to high costs and land use effects.
 - Realigning the roadway was deemed not reasonable due to high costs, environmental effects, land use effects and public input.
 - Sound insulating public use or nonprofit institutional structures was deemed not reasonable, as predicted interior noise levels would not be high enough to warrant abatement per the Federal Highway Administration Noise Abatement Criteria.
 - Construction of noise barriers or berms were deemed not reasonable due to high costs and not feasible since noise levels would not be substantially reduced.

Each of these techniques was evaluated to determine if it was feasible and reasonable to reduce noise levels. However, none of the potential mitigation measures were found to meet both of these criteria.

Therefore, noise mitigation measures are not proposed as part of the Build Alternative.

- **Wetlands** – Although, through mitigation, Washington State Department of Transportation will ensure that there is no net loss of wetlands, by definition, Category I wetlands have characteristics that make them difficult or impossible to replace at a 1 to 1 ratio. The Build Alternative would permanently affect 2–3 acres of Category I wetlands. To meet the wetland mitigation requirements, Washington State Department of Transportation would select sites that provide the greatest beneficial ecological effect on the affected watersheds and would construct new wetlands designed to replace lost wetlands functions. In addition, the surface area of new wetlands created would total approximately three times the surface area of wetlands filled.



DEFINITION

WHAT IS REASONABLE?

Reasonable refers to the maximum cost per residence benefiting from the noise abatement.



DEFINITION

WHAT IS FEASIBLE?

Feasible refers to whether the barrier can provide a substantial (at least seven decibels) reduction in noise and other constructability issues.

What irreversible and irretrievable commitments of resources would occur to build the project?

Some resources committed to construct the project would be irretrievable after completion of the project, including the physical materials used to build the project. These materials, such as aggregate used to make concrete or fill material, are finite resources. These resources are not currently in short supply. The energy used to build the project and keep it operating also would be irretrievable. Energy that would be consumed includes gasoline, oil and electricity needed for construction. Project construction is not expected to have a substantial effect on energy sources or fuel available in the region or the state.

Approximately 12–16 acres of land with prime farmland soils in the study area would be converted to a transportation use due to the acquisition of strips of land from the properties along SR 502. An additional 63 acres of land with prime farmland soils at the Mill Creek North potential mitigation site would be converted from an agricultural use to a public use as a wetland mitigation site. This conversion of prime farmland represents less than 0.1 percent of the total prime farmland soils in Clark County (approximately 157,000 acres). Similarly, the conversion of 95–114 acres of land currently or recently used for farming represents about 0.1 percent of the total agricultural lands in Clark County (70,684 acres in 2002). The decision to convert farmland to transportation facilities and wetland mitigation facilities would be an irreversible commitment of this resource.

Are there tradeoffs between short-term use of environmental resources and long-term gains?

The long-term safety and mobility improvements that the Build Alternative offers outweigh the short-term inconveniences and use of resources that would occur during construction, such as noise, dust, traffic congestion, and energy use. The Build Alternative would reduce congestion on SR 502 and include improvements that enhance the safety conditions of the roadway. As described in Chapter 7, *Environmental Commitments*, this alternative includes a variety of mitigation measures designed to minimize the disruptions that occur during construction.