

Chapter 412 **Indirect and cumulative effects**

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412.01 Introduction

This chapter provides the policy direction regarding the assessment of indirect and cumulative effects for projects requiring a National Environmental Policy Act (NEPA) Environmental Assessment (EA) or a NEPA/State Environmental Policy Act (SEPA) Environmental Impact Statement (EIS).

NEPA requires that any agency proposing a major federal action that may significantly affect the environment, consider the environmental effects of the proposed action, any unavoidable adverse environmental impacts, and the relationship between local short term uses and long-term productivity of the environment ([42 USC 4332\(c\)](#)). Definitions of major federal actions are found in [40 CFR 1508.1\(w\)](#).

SEPA rules direct state agencies to identify and evaluate probable impacts, alternatives, and mitigation measures, emphasizing important environmental impacts and alternatives (including cumulative, short-term, long-term, direct and indirect impacts).

The Council on Environmental Quality (CEQ) NEPA regulations require federal agencies to evaluate three types of effects in environmental reviews ([40 CFR 1508.1\(i\)](#)): (i) direct effects, which are “caused by the action and occur at the same time and place;” (ii) indirect effects, which are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable;” and (iii) cumulative effects, which result from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions”.

Exhibit 412-1 Highlights the distinctions between direct, indirect and cumulative

Distinctions between direct, indirect, and cumulative effects			
Type of Effect	Direct	Indirect	Cumulative
Nature of effect	Typical, predictable	Reasonably foreseeable, probable	Reasonably foreseeable
Cause of effect	Project	Project's direct effects	Project's direct and indirect effects <i>together with</i> effects of other activities
Timing of effect	Project construction and implementation	At some future time after direct effects	Past, present, or in the future
Location of effect	Within project impact area	Within boundaries of systems affected by project	Within boundaries of systems affected by the project

Adapted from: NCHRP Report 403, *Guidance for Estimating the Indirect Effects of Proposed Transportation Projects* (1998), reprinted in AASHTO Practitioner's Handbook #12 (2016)

412.01(1) Recent changes

In 2024, CEQ revised its NEPA implementing regulations to restore some of the basic elements of its 1978 NEPA regulations that had been eliminated by the 2020 rulemaking. The 2024 rule change:

- Established NEPA Environmental Impact Statements (EISs) must include an environmentally preferred alternative. Environmentally preferable alternative or alternatives will best promote the national environmental policy expressed in section 101 of NEPA by maximizing environmental benefits; protecting, preserving, or enhancing historic, cultural, Tribal, and natural resources; or causing the least damage to the biological and physical environment. CEQ also notes that this can be different from the proposed action ([40 CFR 1502.14\(f\)](#)). See [Chapter 400](#) for more information on environmentally preferred alternative.
- Clarified incomplete and unavailable information and requires an EIS to include an explanation when information is lacking ([40 CFR 1502.21](#)). See [Chapter 400](#) for more information on changes to environmental review and transportation decision making, including to NEPA documentation and processes.
- Established CEQ's NEPA regulations as the floor rather than the ceiling so federal agencies could customize their NEPA procedures consistent with CEQ NEPA regulations, as needed.
- Extended considerations of climate change beyond cumulative effects to occur in multiple points throughout the environmental review process. See [Chapter 415](#) and WSDOT's [Air Quality, Energy and Greenhouse Gas Emissions](#) and [Cumulative Effects and Climate Change](#) webpages for more information on updates relating to considerations of climate change.
- Established for the first time in NEPA, environmental justice is defined ([40 CFR 1508.1](#)). See the environmental justice definition in [Section 412.10](#) and refer to [Chapter 460](#) for more information on updates relating to environmental justice.

The proposed rule adds direction related to cumulative effects in [40 CFR 1502.15](#), stating: “Agencies shall use high-quality information, including reliable data and resources, models, and Indigenous Knowledge, to describe reasonably foreseeable environmental trends, including anticipated climate-related changes to the environment, and when such information is incomplete or unavailable, provide relevant information consistent with [40 CFR 1502.21](#). This description of the affected environment, including existing environmental conditions, reasonably foreseeable trends, and planned actions in the area, should inform the agency’s analysis of environmental consequences and mitigation measures ([40 CFR 1502.16](#)).”

At the state level, WSDOT has new direction because of the passage of the Healthy Environment for All (HEAL) Act codified in [Chapter 70A.02 RCW](#). This state law directs the consideration of cumulative health impacts, climate-related effects and more. Project teams should follow the direction in Chapters [458](#) and [460](#) regarding the use of the Environmental Health Disparity tool and consider cumulative human health effects. Environmental justice is an important topic that should be considered during the assessment of direct, indirect, and cumulative effects.

412.02 Applicable statutes, regulations, executive orders, and policies

412.02(1) *Federal*

- National Environmental Policy Act (NEPA), [42 U.S.C. 4321](#), 42 U.S.C. 4332(c) re: relationship to long term productivity of the environment.
- CEQ NEPA Implementing Regulations – [40 CFR 1500 - 1508](#) (*Note:* WSDOT refers to the 1978 version).
- FHWA, FRA, and FTA Rules – [23 CFR 771](#).

412.02(2) *State*

- State Environmental Policy Act (SEPA), [Chapter 43.21C RCW](#), and [RCW 43.21C.031](#).
- SEPA implementing regulations are [WAC 197-11-792](#) and [WAC 197-11-060\(4\)](#).
- [Chapter 70A.02 RCW](#) State environmental justice law, also referred to as the HEAL Act.

412.02(3) *Local*

- Local requirements will vary by jurisdiction.

412.03 Considerations during project development

412.03(1) *Planning*

[Chapter 200](#) explains how planning products such as Purpose and Need or a range of reasonable alternatives, can consider environmental issues. Cumulative effects include long-term issues like climate change and land use conversion. These issues can be effectively considered at a planning level to inform the proposed solutions.

412.03(2) Scoping

Chapter 300 explains the importance of public and agency outreach during pre-NEPA and scoping of our environmental documents. Concerns around issues that may seem outside the project are common. These concerns may indicate cumulative effects that should be captured early and considered as important context for the project. For example, a pattern of development in the floodplain, increased flooding, and concerns surrounding future climate change projections.

412.03(3) Design

Project NEPA documents should disclose all the effects and respond to public and agency concerns. The proposed project should highlight ways to address the direct and indirect effects, and ways to be resilient to climate and other hazards.

Where appropriate, the NEPA document should include projections when evaluating reasonably foreseeable effects, including climate change effects (40 CFR 1506.6(d)). See Chapter 415 for more information on documenting climate change effects and WSDOT's [Cumulative Effects and Climate Change](#) webpage for additional guidance.

412.03(4) Construction

- N/A

412.03(5) Maintenance and Operations

- N/A

412.04 Analysis and documentation requirements

412.04(1) Right size to classification (CE, EA, EIS)

Indirect effects

Any project regardless of NEPA classification may have indirect effects. These should be assessed and described alongside direct effects. This is consistent with both the 1978 and the 2020 versions of the CEQ NEPA regulations. WSDOT project teams should follow the AASHTO's guide [Practitioner's Handbook #12: Assessing Indirect and Cumulative Impacts Under NEPA](#).

Cumulative effects

The level of the environmental document being prepared will dictate whether a cumulative effects analysis should be prepared. If so, the scope of the cumulative effects analysis should be limited to those resources that are directly affected by the proposed action. If a project will not directly or indirectly impact a resource, it will not contribute to a cumulative effect on the resource. The one exception to this is climate change impacts. For guidance on climate change-related effects, refer to [Chapter 415](#).

- **Categorical Exclusion (CE): Not Required** – These projects are minor projects without significant environmental impacts, and as such should not require a cumulative effects analysis. There may be unusual circumstances requiring such an analysis, but this should be very rare.

- **Environmental Assessment (EA): Required** – These are projects in which the significance of environmental impacts is unknown. As one of the primary purposes of the EA is to help decision makers and the public understand whether an EIS is needed, you need to consider potential cumulative effects. The degree to which resources may be impacted will determine the extent of the cumulative effects analysis needed. Where direct and indirect effects are found to be present, you will need to complete a cumulative effects analysis.
- **Environmental Impact Statement (EIS): Required** – These are projects in which there are anticipated significant environmental impacts, and a cumulative effects analysis may assist decision makers and the public in making informed decisions. The cumulative effects analysis should include substantial information about affected resources, past actions that have contributed to trends, and reasonably foreseeable effects.

412.04(2) Analysis and Methodology

The NEPA project lead determines the approach for documenting cumulative effects. Options are to:

1. Prepare a separate chapter or section on cumulative effects.
2. Integrate the disclosure of cumulative effects within the individual discipline studies and report within those chapters or sections.

In either case, a separate cumulative effects discipline report or technical memo may help to keep the document size to a minimum.

Below is an example from the [SEPA Handbook](#) on the Washington State Department of Ecology [SEPA guidance](#) webpage.

“When describing the environmental impacts of a proposal, the lead agency should consider direct, indirect, and cumulative impacts. For example:

- A new residential development may propose to place fill in a wetland to construct a road (a direct impact).
- The new road may encourage increased development in the area because of the improved access (an indirect impact).

Note: that if the development is already forecast by a locally approved plan, the road project is not inducing the growth, but the relationship can be noted.

- Increased runoff and contaminants from the development would be added to the volumes and levels of contamination from similar developments surrounding the wetland (cumulative impacts).”

Recommended resources

WSDOT follows CEQ NEPA regulations related to indirect and cumulative effects analysis.

WSDOT project teams should use the AASHTO guidance for cumulative effects analysis. AASHTO’s guide [Practitioner’s Handbook #12: Assessing Indirect and Cumulative Impacts under NEPA](#) recommends five general stages, and five analytical steps:

- I. Information gathering
- II. Initial assessment of cumulative effects
- III. Determining the scope and methodology (count what counts)

IV. Conducting the analysis

- 1) Describe resource conditions and trends
- 2) Summarize proposed project's effects on key resources
- 3) Describe other actions and their effects on key resources
- 4) Estimate combined effects
- 5) Consider minimization and mitigation (be sure to reflect the distinction between the proposed action and other actions)

For guidance on climate change-related effects, refer to [Chapter 415](#).

V. Documentation

WSDOT has useful information in GIS on several topics, including climate change and natural hazards. Local agencies maintain land use information as well as emergency management plans that contain valuable information on flooding and other natural hazards. Transportation planners can reach out to locals, tribes, and representatives from traditionally underrepresented, underserved, and overburdened communities to find out what issues are of most concern. The State Department of Health's [Environmental Health Disparities tool](#) is a great resource.

Indirect effects

Any project, regardless of NEPA classification, may have indirect effects. Analysis of indirect effects is needed when effects are reasonably foreseeable and have a reasonably close causal relationship to the proposed action. These should be assessed and described alongside direct effects consistent with CEQ NEPA regulations ([40 CFR 1500 - 1508](#)). A separate indirect effects analysis is not recommended, except in rare cases when a project is likely to cause otherwise unplanned changes in land use patterns.

Most indirect effects are derived from project-related changes in land uses. Under the Growth Management Act, land use changes are controlled by local planning decisions. However, indirect effects may be associated with a transportation project if the project affects the rate and pattern of land use development. For example, if WSDOT constructs a bypass route around a town, the rate of planned growth around the new route may increase. WSDOT's projects should consider the potential indirect effects, including whether there is a likelihood that development and economic vitality along the original route may decline. Other examples of indirect effects include changes in wildlife habitat selection or migration patterns due to direct project-related effects on habitat, for example – increased park use due to improved access.

It is very important to determine if the project is likely to support planned land use. Ask whether the project will alter the type, rate, or timing of planned growth. Consider whether there is potential for indirect effects on either the natural or the human environments (including environmental justice communities). See [Chapter 460](#) for environmental justice guidance.

To evaluate the potential for indirect effects, consider the likelihood of development in the project area following project construction. Carefully examine the land use discipline study for your project (See [Chapter 455](#) for land use analysis). Consider the following:

- Look at population and land use trends in the project area and region or subarea. How has the area developed? How fast is it planned to develop? Will the project affect the rate of development? Are people building in the area? Look at the pattern of zoning. Has it recently changed or is it about to change?
- Review the local comprehensive plans. Is the project area within the urban growth boundary or outside it? Is the local jurisdiction considering changes in the urban growth boundary to allow for growth or are they concentrating on infill? Confirm that the proposed project is aligned with the transportation element of the plan. Would the transportation project support other modal decisions contained within adopted plans? Do the city planners expect the project to support or encourage development?

Document your conclusion and describe the indirect effects associated with the proposed action. If your project is likely to induce growth that is not planned, refer to AASHTO's guide [Practitioner's Handbook #12: Assessing Indirect and Cumulative Impacts under NEPA](#) for direction and national best practices.

Cumulative effects

For EAs and EISs, potential cumulative effects should be considered as early as possible in the NEPA process. Use information from existing environmental documents and other relevant information such as natural resource plans, local comprehensive plans, existing zoning, recent building permits, and interviews with local government. These may also be good sources for information on past actions.

Quantifying cumulative effects may be difficult, since a large part of the analysis requires projections about what may happen in a project area. The analyst must develop a list of reasonably foreseeable future actions taken by governmental and private entities. We recommend coordinating with the authors of the social, environmental justice, and land use and transportation studies to capture the information they have on future actions. Coordinate your outreach to other agencies and the public so that you understand the likely future context for the project and the surrounding area.

A cumulative effect analysis builds upon information derived from direct and indirect effect. This makes it tempting to postpone the identification of cumulative effects until the direct and indirect effect analyses are well under way. However, early consideration of cumulative effects may facilitate the design of alternatives to avoid or minimize impacts. Do not defer the consideration of cumulative effects. Instead, as you begin to consider a project's potential direct and indirect effects, start outlining the potential cumulative effects as well. As more information about direct and indirect effects becomes available, use it to further refine the cumulative effects analysis. If you determine that cumulative effects are not an issue, document that decision along with the reasons for the decision.

The cumulative effects analysis includes cumulative climate change-related effects of the proposed action. For more information on climate change-related effects, see [Chapter 415](#).

Reasonably Foreseeable Determination

When determining and analyzing reasonably foreseeable actions, it can be helpful to review language from court decisions in formulating questions and criteria as practitioners proceed with analysis to determine which actions may be reasonably foreseeable. Courts have recognized that “An environmental impact is considered ‘too speculative’ for inclusion in an EIS (Environmental Impact Statement) if it cannot be described at the time the EIS is drafted with sufficient specificity to make its consideration useful to a reasonable decision maker.” *Dubois v. US. Dept. of Agriculture*, 102 F.3d 1273,1286 (1st Cir. 1996).

Factors that indicate whether an action or project is “reasonably foreseeable” for the purposes of cumulative effects analysis include: whether the project has been federally approved; whether there is funding pending before any agency for the project; and whether there is evidence of active preparation to make a decision on alternatives to the project. *Clairton Sportmen’s Club v. Pennsylvania Turnpike Commission*, 882 F. Supp 455 (W.D. Pa 1995). EPA’s [Consideration of Cumulative Impacts in EPA Review of NEPA Documents](#) (May 1999) states:

“Court decisions . . . have generally concluded that reasonably foreseeable future actions need to be considered even if they are not specific proposals. The criterion for excluding future actions is whether they are “speculative.” The NEPA document should include discussion of future actions to be taken by the action agency. The analysis should also incorporate information based on the planning documents of other federal agencies, and state and local governments. For example, projects included in a 5-year budget cycle might be considered likely to occur while those only occurring in 10–25-year strategic planning would be less likely and perhaps even speculative.”

412.04(3) Required documentation for cumulative effects

WSDOT projects that are preparing a NEPA EA or EIS should document the analysis of cumulative effects in the same way they did under the 1978 CEQ NEPA regulations. WSDOT project teams should follow the documentation requirements described in:

- AASHTO’s guide [Practitioner’s Handbook #12: Assessing Indirect and Cumulative Impacts under NEPA](#). That direction is consistent with WSDOT policy and SEPA rules.
- WSDOT’s procedures for climate change-related effects discussed in [Chapter 415](#).

Cumulative effects can either be discussed in individual sections on each element of the environment or included in a separate section. A separate section is most appropriate when there are a lot of cumulative effects that are interrelated across disciplines. Most project teams find it useful to have a separate discipline report or technical memo to document the details of methodology and findings. In some cases where there are few cumulative effects, a project team can write cumulative effects entirely within the EA or EIS.

Whatever approach you take, be sure that the reader can find your discussion of cumulative effects.

412.05 External engagement

Public involvement and inclusive engagement are central to NEPA and SEPA. It is part of how you successfully identify direct, indirect, and cumulative effects of a proposed project. We must reach out to others. Work with your project team, communications, tribal liaison, and the other subject matter experts to find out what they've heard about cumulative effects. Tribal leaders and staff have very deep knowledge of the trends that have adversely impacted tribal resources. This information is very useful in preparing the cumulative effects analysis and in identifying potential mitigation. Environmental justice community members and local government staff have very valuable insights as well.

412.06 Internal Roles and responsibilities

The following offices have a key role in indirect and cumulative effects analysis. See the [NEPA Roles Table](#) on the [NEPA and SEPA](#) webpage for more information about general NEPA documentation roles.

412.06(1) *Region/Modal Planning Office*

Conduct environmental screening to locate WSDOT assets that are vulnerable to climate threats. Consult with local planning partners to determine availability of additional area-specific climate data. Use this information to document how climate change and extreme weather vulnerability are considered and to propose practical long-term solutions that improve resilience. Provide documentation and recommendations to environmental staff. See [Chapter 415](#) for information on additional climate change considerations.

412.06(2) *Region/Modal Environmental Office*

Identify resource areas that require a cumulative effects analysis under NEPA. Prepare analysis or review analysis prepared by environmental technical experts.

412.06(3) *Environmental technical experts*

Perform technical analysis to determine effects, including cumulative effects, for the range of environmental disciplines evaluated under NEPA. Consultants may also fulfill this role. WSDOT environmental technical experts can help develop consultant scopes of work. WSDOT environmental technical experts review consultant work to ensure requirements are met and the analysis is technically sound.

412.06(4) *Headquarters Environmental Services Office*

The Environmental Services Office (ESO) keeps the indirect and cumulative effects guidance current and consistent with rules and regulations. The ESO NEPA Specialist provides support and technical assistance with EA and EIS projects. The [NEPA/SEPA Program](#) is available to consult on cumulative effects. See [Chapter 415](#) for contacts on consideration of climate change.

412.07 Mitigation

It is the project team's responsibility to define mitigation for direct and indirect effects. Mitigation requirements are discussed within the other discipline chapters. With regard to cumulative effects and potential mitigation, refer to the [AASHTO practitioners guide](#).

412.08 Applicable permits and approval process

There are no permits or approvals associated with indirect or cumulative effects.

412.09 Abbreviations and acronyms

AASHTO	American Association of State Highway and Transportation Officials
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
NEPA	National Environmental Policy Act
SEPA	State Environmental Policy Act

412.10 Glossary

Communities with environmental justice concerns – means those communities that may not experience environmental justice ([40 CFR 1508.1](#)).

Cumulative Effect – Effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time ([40 CFR 1508.1](#)).

Cumulative Effects (ESA) – Effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation ([50 CFR 402.02](#)). **Note:** NEPA and ESA share a common threshold for determining whether to consider the potential for the action to change the rate of growth thereby increasing the indirect effects of an action. Therefore, the same causal relationship should be used for writing the NEPA document as for writing the biological opinion for ESA compliance (see [Section 436.05](#)).

Direct Effect – Direct effects are caused by the proposed action and occur at the same time and place that may occur during construction or operation of the project. Effects may be ecological, aesthetic, historic, cultural, economic, social, or health related ([40 CFR 1508.1](#)).

Effects (or Impacts) – Changes to the human environment that are from the proposed action or alternatives that are reasonably foreseeable, including direct effects, indirect effects, and cumulative effects. Effects include:

- Ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, such as disproportionate and adverse effects on communities with environmental justice concerns, whether direct, indirect, or cumulative.
- Effects also include effects on Tribal resources and climate change-related effects, including the contribution of a proposed action and its alternatives to climate change, and the reasonably foreseeable effects of climate change on the proposed action and its alternatives.
- Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effects will be beneficial (40 CFR 1508.1).

Environmental justice – means the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision making and other Federal activities that affect human health and the environment so that people: (1) Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and (2) Have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices (40 CFR 1508.1).

Environmentally preferable alternative means the alternative or alternatives that will best promote the national environmental policy as expressed in section 101 of NEPA (40 CFR 1508.1).

Indirect Effect (NEPA) – Indirect effects are caused by the proposed action or alternative and occur later in time or are farther removed in distance but are still reasonably foreseeable. Indirect effects may include effects related to 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 CFR 1508.1).

Induced Growth or Growth Inducing Effect – Terms used as examples of an indirect effect related to changes in the pattern of land use, population density, or growth rate. (WSDOT discourages the use of these terms because they are vague and confuse the local decisions regarding planned growth under the Washington State Growth Management Act with project-specific effects).

Irretrievable – Impossible to retrieve or recover.

Irreversible – Impossible to reverse.

Mitigation – According to 40 CFR 1508.1(y), includes: (a) avoiding the adverse effect; (b) Minimizing adverse effects by limiting the degree or magnitude; (c) rectifying the adverse effect by repairing, rehabilitating, or restoring; (d) reducing or eliminating the adverse effect over time; and (e) compensating by replacing or providing substitute resources.

Reasonably Foreseeable – An action is reasonably foreseeable if it is considered likely to occur and isn't too speculative. Reasonably foreseeable impacts are predictable and probable. They are not impacts that are just merely possible.

Resource – Resources are defined by NEPA and SEPA implementing regulations as “natural or depletable” resources ([40 CFR 1502.16](#), [WAC 197-11-440\(6\)](#)) and renewable or nonrenewable resources ([WAC 197-11-444](#)). Resources are defined by FHWA [Technical Advisory T 6640.8A](#) as “natural, physical, human, and fiscal resources” in guidance on irreversible and irretrievable commitments of resources.

Resource Study Area – A Resource Study Area is specific for each resource and focused on the area where cumulative effects on the resource are expected to occur. It may be the same or larger than the study area for direct and indirect effects.

Significance – The significance of a potential impact on the natural or built environment depends upon context and intensity. In considering whether an adverse effect of the proposed action is significant, agencies shall examine both the context of the action and the intensity of the effect. In assessing context and intensity, agencies should consider the duration of the effect. Other considerations include: setting, likelihood of occurrence, and severity, magnitude, or duration of the impact. Almost every transportation project that would be recognized as major federal action, no matter how limited in scope, has some effect on the environment. Additional information and examples for determining significance is found in [40 CFR 1508.1](#).