Chapter 412 Indirect and Cumulative Impacts

412.01 Introduction

This chapter deals with some of the most challenging sections of an environmental document, namely consideration of:

- Indirect (or secondary) impacts.
- Cumulative impacts.
- Climate change as a cumulative effect.

Part of the confusion around indirect and cumulative effects is due to the different definition of the type of actions considered in the National Environmental Policy Act (NEPA) and Endangered Species Act (ESA).

- NEPA requires consideration of the past, present and reasonably foreseeable future actions, regardless of the agency or person undertaking such actions (40 CFR 1508.7).
- ESA requires consideration of future state or private activities that are reasonably foreseeable, but excludes other federal activities (50 CFR 402.02).
- 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).

This chapter provides guidance for addressing indirect and cumulative impacts to comply with the overarching NEPA analysis and complies with the 2008 Joint Guidance issued by WSDOT, EPA, and FHWA.

412.02 Summary of Requirements

NEPA requires that any agency proposing a major federal action, which may significantly affect the environment, consider the environmental impacts 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)). WSDOT construction projects that are federally funded or require federal approvals must comply with NEPA. SEPA also requires WSDOT, as the state lead agency, 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) (WAC 197-11-060(4)(d-e)).

There are three types or categories of effect (or impact) that must be considered during the NEPA process: direct, indirect, and cumulative (40 CFR 1508.25). Identifying direct effects, which are those effects caused directly by our activities, at the same time, and in the same place, is relatively simple and straightforward. Identifying and analyzing indirect effects, which are effects caused by transportation project activities, that occur later in time, at some distance from the project, and are in the chain of cause-and-effect relationships, can be more complex and generate more confusion. But as complex as indirect effects may be, the cumulative effects analysis is easily the most misunderstood. Table 412-1 provides a summary comparison of direct, indirect and cumulative effects.

Type of Effect	Direct	Indirect	Cumulative
Nature of effect	Typical/inevitable/ predictable	Reasonably foreseeable/ probable	Reasonably foreseeable/ probable
Cause of effect	Project	Project's direct and indirect effects	Project's direct and indirect effects and 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

*Indirect could potentially occur before the project is built (i.e., speculators initiating land use actions in anticipation of project construction).

Source: *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements*, Final Report SPR 327, Oregon DOT and FHWA, April 2001.

Summary of Direct, Indirect, and Cumulative Effects
Table 412-1

1. **When are indirect impacts analyzed?**

   Indirect impacts often relate to changes in land use, such as addition of new impervious surface, filling of wetlands, or modification of habitat. Under the Growth Management Act, land use changes are the direct result of local planning decisions. FHWA and WSDOT do not control this process. However, indirect impacts may be associated with transportation projects if the projects affect 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 project should consider the potential indirect impacts, including whether there is a likelihood that development and economic vitality along the original route may decline. Other examples of indirect impacts include changes in wildlife populations due to direct effects on habitat, changes in use of a recreation development or park due to improved access or visibility; or beneficial effects such as reduced flooding severity downstream due to improved highway runoff flow control.

   In general, projects in a new location or projects in which there is a dramatic change in travel lanes (e.g., from two to six lanes with grade separations) are more likely to contribute to indirect impacts than projects in areas which are already developed, or involve a smaller increase in capacity.

To evaluate the potential for indirect impacts, you should evaluate the likelihood of development in the project area following project construction. 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. Are there plans/plats in the project area approved or currently under review? 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? Does the transportation element of the plan include the proposed transportation project? Would the transportation project support the local decisions contained within adopted plans? Do the city planners expect the project to support or encourage development?

Use your professional judgment and discussions with the city or county in the project area, as well as any other experts in the area to determine whether or not the proposed WSDOT project is consistent with the local plans. Determine if the project is likely to support changes in the type, rate, or timing of planned growth. Document your conclusion and describe the indirect effects associated with the proposed action. It is recommended that the indirect effects be documented along with direct effect because they are causally related to the proposed action.

The process for analyzing indirect effects is further described on the WSDOT Cumulative Effects Analysis web page.

2. **When are cumulative impacts analyzed?**

The CEQ regulations require that all federal agencies consider the cumulative effects of a proposed action. The level of the environmental document being prepared will give you some idea about when and if the analysis should be prepared. In addition, 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 impact a resource, it will not contribute to a cumulative impact on the resource.**

- **Categorical Exclusion (CE): Generally Not Required** – These projects are by definition minor projects without significant environmental impacts, and as such should not require a cumulative impact analysis. There may be unusual circumstances requiring such an analysis, but this should be very rare.
- **Environmental Assessment (EA): Generally 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 decide whether or not an EIS is needed. You will need to conduct an initial environmental assessment. The degree to which resources may be impacted will determine the extent of the cumulative impact analysis needed. Where direct and indirect effects are found to be present, you will need to complete a cumulative impact analysis. When your project is large, complex, and in an environmentally sensitive area, the cumulative impact analysis should mirror what is done for an EIS.

- **Environmental Impact Statement (EIS): Required** – These are projects in which there are anticipated significant environmental impacts, and a cumulative impact analysis may assist decision makers in making decisions on project scope, design, and location. In general, the cumulative impact analysis should include substantial information about resources, past actions that have contributed to trends and reasonably foreseeable effects. See page 45 in CEQ guidance, *Considering Cumulative Effects Under NEPA*.

3. **Where should cumulative impacts be discussed in the environmental document?**

   Cumulative impacts 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 impacts that are interrelated across disciplines.

412.03 Type of Impacts Included in the Cumulative Impacts Analysis

Cumulative impacts include direct and indirect impacts resulting from governmental and private actions. The relationships are illustrated in Figure 412-1.

- **Direct and indirect impacts** of the project are included in a cumulative impact analysis. This information should be gathered from the sections of the environmental document where the direct impacts of the project are discussed. Impacts may include impacts to wetlands, changes in land use (conversion to transportation use), effects on endangered species, as well as other relevant impacts.
- **Non-project related impacts** are included in a cumulative impact analysis. These include past, present and reasonably foreseeable future impacts on the affected resources. Keep in mind that impacts can be positive as well as negative, for example hazardous material clean up over the years may have improved conditions in an area.

412.04 Analyzing Cumulative Impacts

WSDOT, EPA-Region 10, and FHWA-Washington Division have agreed that there is no single formula available for determining the appropriate scope and extent of a cumulative impact analysis based on input received during scoping. Ultimately, the practitioner must determine the methods and extent of the analysis based on the size and type of the project proposed, its location, potential to affect environmental resources, and the health of any potentially affected resource. We endorse the eight-step process described on the Joint Guidance and WSDOT Cumulative Effects Analysis web page.

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

Unlike direct impacts, quantifying cumulative impacts may be difficult, since a large part of the analysis requires projections about what may happen in a project area. Actions taken by governmental and private entities other than WSDOT need to be considered for a cumulative impact analysis. Outreach to other agencies will make it easier to identify additional information that might be needed.

For the analysis, 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.

412.05 Climate Change and Greenhouse Gases

WSDOT developed the nation's first DOT project-level guidance for GHG analysis and climate change in 2009. WSDOT's published NEPA Environmental Impact Statements and Environmental Assessments must disclose project-level Green House Gases (GHG) emissions and describe potential climate threats (policy direction is included in Results WSDOT, the agency's strategic plan.

1. **Greenhouse Gases** – The emission of greenhouse gases (such as carbon dioxide) and issues related to global climate change should be discussed in environmental assessments and environmental impact statements as a cumulative impact. The discussion should include efforts currently underway in Washington State to reduce GHG emissions and the effects of current projects on GHG emissions (see the WSDOT Energy web page, or contact WSDOT's Air Quality, Acoustics, and Energy Program.
2. **Climate Change** – Project teams are expected to examine available information about climate trends and to use the results of WSDOT's assessment of vulnerable infrastructure. By doing this, project teams will satisfy WSDOT's directive to consider ways to make their proposed projects more resilient to future climate impacts and severe storm events. Past trends for a specific resource (water, habitat, air) may not be accurate predictions for the future; instead, we need to look at scientifically-based projections of the changing climate as part of our analysis of cumulative effects. WSDOT advises project teams to use the current climate projections available from the University of Washington's Climate Impacts Group in combination with the WSDOT Climate Impacts Vulnerability Assessment (completed November 2011) and *WSDOT's Guidance for Project-Level Climate Change Evaluations* on the WSDOT Adapting to Climate Change web page, or contact WSDOT's *Environmental Policy Branch Manager*.

412.06 Case Law and Cumulative Impacts Analysis

Case law provides some guidance on the standards that must be met with regard to cumulative impacts. NEPA analyses must include useful evaluation of the cumulative impacts of past, present, and future projects. In Carmel-by-the-Sea v. U.S. Department of Transportation, 123 F.3d 1142, 1160 (9th Cir.1997), the Ninth Circuit found that this means the environmental analysis must evaluate the combined effects of past, present and future projects in sufficient detail to be "useful to the decision maker in deciding whether, or how, to alter the program to lessen cumulative impacts." See also Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1379-80 (9th Cir.1998) ("To 'consider' cumulative effects, some quantified or detailed information is required. . . . General statements about

'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided.").

The Carmel-by-the-Sea court acknowledged that the EIS considered the impacts in the individual resource discussions and in a separate section, but noted that the analyses were "not lengthy, and taken either separately or together" they failed to satisfy NEPA, 123 F.3d at 1160. The critical component missing from the analysis was how the past and future projects interact with the present project to cumulatively impact the area resources.

A cumulative impacts analysis should identify the area in which the effects of the proposed project will be felt; the impacts that are expected in that area from the proposed project; other actions—past, present, and proposed, and reasonably foreseeable—that have or are expected to have impacts in the same area; the impacts or expected impacts from these other actions; and the overall impact that can be expected if the individual impacts are allowed to accumulate. Grand Canyon Trust v. Federal Aviation Administration, 290 F.3d 339 (D.C. Cir 2002); Fritiofson v. Alexander, 772 F.2d 1225 (5th Cir. 1985).

In Fritiofson, the court stated that "the CEQ regulations [indicate] that a meaningful cumulative-effects study must identify: (1) the area in which effects of the proposed project will 'be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate. Fritiofson v. Alexander, 772 F.2d at 1245.

412.07 Additional Resources of Indirect and Cumulative Effects

An excellent reference for analyzing indirect effects is *NCHRP Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*. This 2002 reference handbook includes the results of research, guidance, and a framework to help estimate effects.

The most current information and additional resources can be found in the American Association State Highway and Transportation Officials *Practitioner's Handbook: Assessing Indirect Effects and Cumulative Impacts under NEPA*.

See also:

- *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements,* Final Report SPR 327, Oregon Department of Transportation and FHWA, April 2001 and Appendices.
- Executive Order 13274 (on Environmental Stewardship and Transportation Infrastructure Project Reviews) and Indirect and Cumulative Impacts Work Group, Draft Baseline Report, March 15, 2005.
- Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process, FHWA Interim Guidance 2003.
- Considering Cumulative Effects Under the National Environmental Policy Act, Council on Environmental Quality, 1997.

412.08 Applicable Statutes and Regulations

- National Environmental Policy Act (NEPA), 42 USC Section 4321.
- State Environmental Policy Act (SEPA), RCW 43.21C, and RCW 43.21C.031. SEPA implementing regulations are WAC 197-11-792 and WAC 197-11-060(4).
- CEQ Rules – 40 CFR 1508
- FHWA Rules – 23 CFR 771

412.09 Glossary

Effect – See Impact.

Context – "This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant." (40 CFR 1508.27(a))

Cumulative Impact/Effect (NEPA) – 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 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).

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).

Direct Impact/Effect – Effect caused by the proposed action and occurring at the same time and place.

Impact – Synonymous with "Effect." Includes ecological impacts (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health impacts, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes the effect will be beneficial.

Indirect Impacts/Effects (NEPA) – Effects which are caused by the action that 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 CFR 1508.8).

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.

Intensity – This refers to the severity of a proposed action's impact on the environment. CEQ NEPA Regulations (40 CFR 1508.27(b)) list several factors to consider. Context and intensity are considered together in determining the significance of an impact (the more sensitive the environmental context, the less intense an impact needs to be to have a potentially significant effect).

Mitigation – According to 40 CFR 1508.20, includes: (a) Avoiding the impact; (b) Minimizing impacts by limiting the degree or magnitude; (c) Rectifying the impact by repairing, rehabilitating, or restoring; (d) Reducing or eliminating the impact 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." EPA's Consideration of Cumulative Impacts in EPA Review of NEPA Documents (May, 1999) states that "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."

Language from court decisions can be helpful in formulating questions and criteria as practitioners proceed with analysis to determine which actions may be reasonably foreseeable. For example, one court case defined "reasonably foreseeable" as an action that is "sufficiently likely to occur, that a person of ordinary prudence would take it into account in making a decision." Sierra Club v. Marsh, 976 F.2d 763, 767 (1st Cir. 1992) (Sierra Club IV). Courts have also 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).

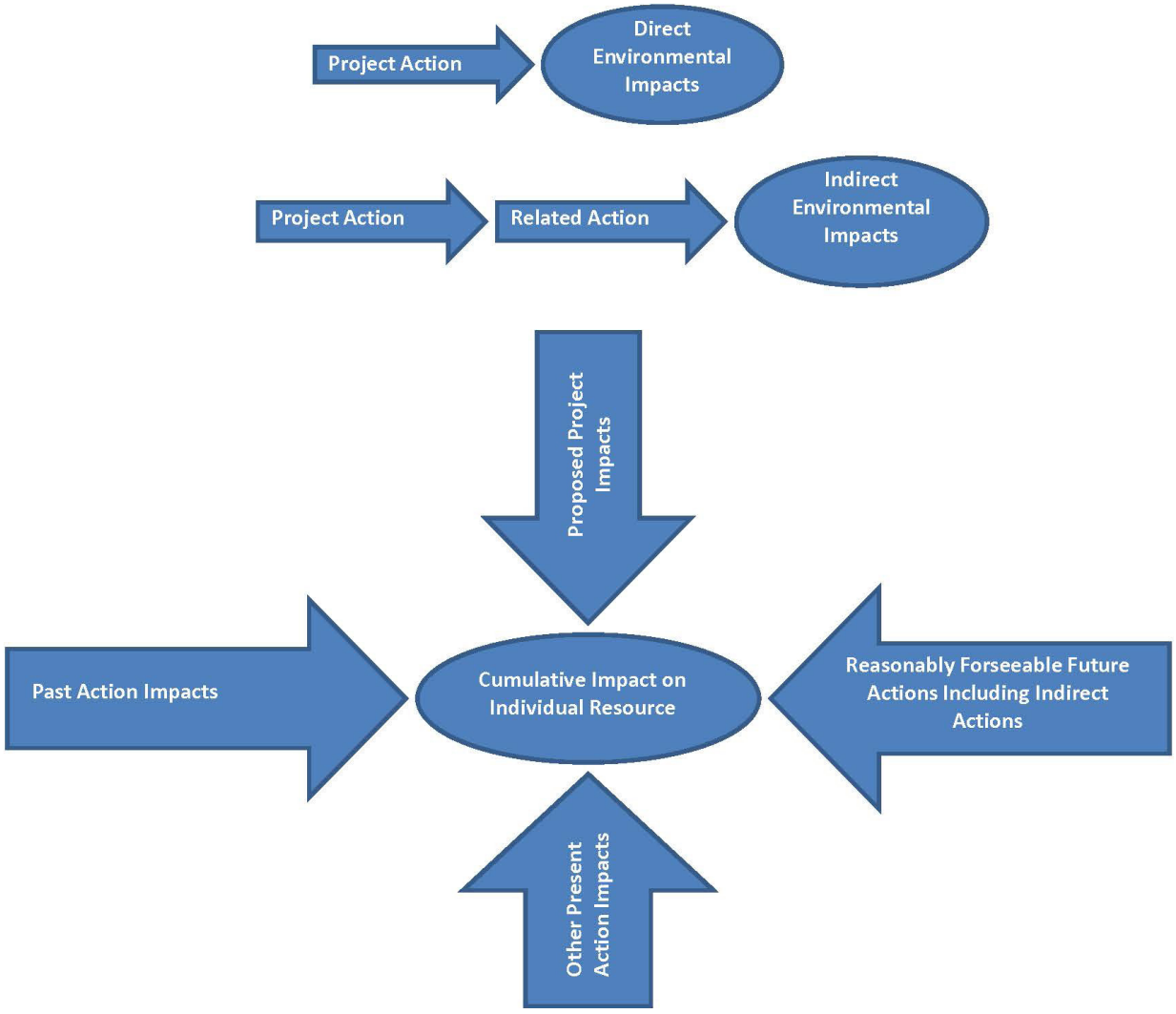
Factors that indicate whether an action or project is "reasonably foreseeable" for the purposes of cumulative impacts analysis include: whether the project has been federally approved; whether there is funding pending before any agency for the project; and whether there is evidence of active preparation 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).

Resource – Referred to in NEPA and SEPA implementing regulations as "natural or depletable" resources (CEQ 1502.16, WAC 197-11-440(6)) and renewable or nonrenewable resources (WAC 197-11-444). FHWA Technical Advisory T 6640.8A (October 30, 1987) refers to "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, setting, likelihood of occurrence, and severity, intensity, 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 adverse impact on the environment.

Review and consideration of case law can help clarify interpretations of the term "significance." In deciding whether a project will significantly impact the environment, case law suggests that agencies should review the proposed action in light of the extent to which the action will cause adverse environmental effects in excess of those created by existing uses in the affected area and the absolute quantitative adverse environmental effects of the action itself, including the cumulative harm. In any proposed major federal action, the public must have an opportunity to submit factual information on this issue which might bear on the department's threshold decision of significance. Hanley V. Kleindienst, 471 F.2d 823 (2nd Cir. 1972, cert. denied, 412 U.S. 908 (1973). If you are concerned about the role that the level of significance and controversy may have, you should consult your Attorney General's office or other legal counsel.



Source: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process, FHWA, 2003

Relationship Between Direct, Indirect, and Cumulative Effects
Figure 412-1

This page intentionally left blank.