



Cumulative Impacts Analysis Guidelines

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1.0 Introduction

The requirement to assess cumulative impacts of a proposed project is established in the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) for federal actions and in TxDOT's environmental review rules ([43 TAC, Chapter 2](#)).

This guidance document focuses primarily on the assessment of cumulative effects for TxDOT projects. This guidance relies heavily on recognized references on the subject but also seeks to provide a balance between a systematic methodology and scalable application. A consistent theme throughout this guidance is the importance of maintaining **a connected sequence of defensible decisions** in meeting the required consideration of the cumulative effects associated with a project.

2.0 Definition

The CEQ defines cumulative impact 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 impact includes the total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or actions. Cumulative impacts may also include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of an action or influence, including the direct and reasonably foreseeable indirect impacts of the project being evaluated. Accordingly, there may be different cumulative impacts on different environmental resources (FHWA, 2003). A project's incremental impacts are a necessary component of cumulative impacts. This incremental impact will guide the conclusions to be drawn from the analysis in terms of resource sustainability and potential mitigation strategies (NCHRP, 2006).

3.0 Key Principles

The underlying vision of CEQ regulations for evaluating cumulative effects is a desire to maintain a balance between human activities and resource sustainability. As stated by the President's Council on Sustainable Development (CEQ, 1997):

The Council concluded that in order to meet the needs of the present while ensuring that future generations have the same opportunities, the United States must change by ... adopting stewardship and individual responsibility as tenets by which to live...that each generation should fulfill its responsibilities as trustee of the environment for succeeding generations. Analyzing for cumulative effects on the full range of resources, ecosystems and human communities under NEPA provides a mechanism for addressing sustainable development.

The concept of "cumulative effects" considers that development projects can lead to further development. Additionally, every resource has a limited capacity to sustain effects. A resource can only absorb so many additional effects before it fails. Simply stated, analyzing cumulative effects addresses the sustainability of a resource.

4.0 Effects

The CEQ's regulations for implementing the procedural provisions of NEPA require that environmental effects be evaluated for proposed transportation and other federal projects. According to Title 40 Code of Federal Regulations ([40 CFR 1508.8](#)):

Effects includes (sic) 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, whether direct, indirect, or cumulative. 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 effect will be beneficial.

Three types of effects must be considered when evaluating a project:

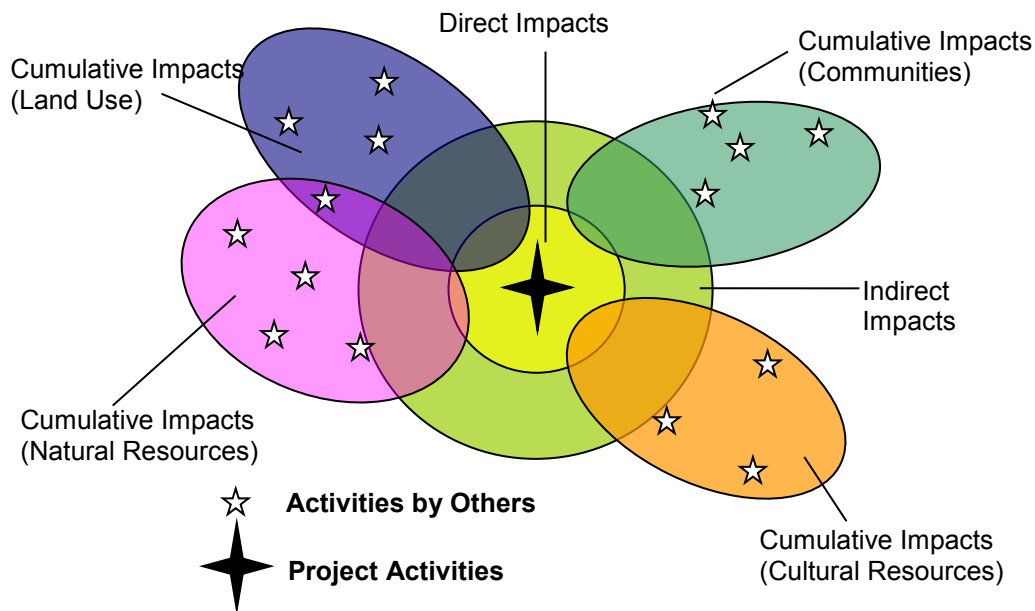
- **Direct Effects** occur as a direct result of an action and occur at the same time and place as the action.
- **Indirect Effects** are reasonably foreseeable effects that occur as a result of an action but occur later in time or are removed from the action location.
- **Cumulative Effects** result 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.

In other words, an “effect” is the result or outcome from change caused by an action. It is important, especially in cumulative effects analysis, to consider “effect” as change in the trend of a resource as opposed to impact in static terms.

KEY Points:
In cumulative effects analysis, consider “effect” as change in the trend of a resource as opposed to impact in static terms.

Figure 1 graphically depicts the relationships among the types of impacts, and Figure 2 provides a tabular comparison between the types of impacts.

Figure 1
Relationship of Types of Impacts



**Figure 2
Impact Types**

Impact Types			
	Direct Impacts	Indirect Impacts	Cumulative Impacts
Impact	Caused by the project activities	Caused by the project activities, but occurring later or farther away than direct impacts	Caused by the project activities, plus pre-existing conditions, plus the actions of others
Timeframe	Present	<ul style="list-style-type: none"> • Present • Reasonably foreseeable future 	<ul style="list-style-type: none"> • Past • Present • Reasonably foreseeable future
Focus	Project activities	Project activities	Resource condition
Study Area	Within and closely adjacent to the project limits	<ul style="list-style-type: none"> • Within and near the project limits • Often a larger area than the study area for direct impacts • The geographic area that can be influenced by the project 	<ul style="list-style-type: none"> • Multiple study areas • Each specific resource study area reflects the condition of that resource • Boundaries are not influenced by the project, but by existing boundaries like community boundaries, habitat type, watershed, etc.

5.0 Level of Analysis by Class of Action

CEQ regulations require all federal agencies to consider the cumulative effects of all proposed agency actions. TxDOT’s environmental review rules require that an Environmental Impact Statement or Environmental Assessment prepared for a project include a description of cumulative effects associated with the proposed project. The consideration, documentation, and analysis requirements vary in degree by class of action and should be commensurate with the potential for adverse and significant impacts, whether direct, indirect, or cumulative (FHWA, 2003). It is important to document the consideration of cumulative effects and the rationale for determining the level of analysis. The Class of Action will help determine the level of consideration and documentation:

5.1 Categorical Exclusions (CE)

CE’s are types of actions which, based on prior experience with similar projects, do not individually or cumulatively have significant environmental impacts ([40 CFR 1508.4](#) and [23 CFR 771.117\(a\)](#)). FHWA regulations at 23 CFR 771.117(c) specifically identifies certain types of actions that meet these criteria and normally do not require any further NEPA documentation or approvals. These projects are by definition minor and do not contribute to cumulative effects. The types of projects listed in 23 CFR 771.117(d) require the submittal of appropriate documentation to determine if the CE classification is proper. The level of detail and documentation necessary should be commensurate with the action’s potential for adverse environmental impacts. Since projects approved with CEs are generally minor in nature and have less than significant impacts, indirect and cumulative impacts assessments will generally not be warranted (FHWA, 2003).

5.2 Environmental Assessment (EA)

Projects classified as EA's have environmental impacts, but the significance of the environmental impacts is not clearly established prior to the analysis. The EA should be a concise document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. It should not contain long descriptions, detailed information, or analyses (40 CFR §1508.9 and [FHWA Technical Advisory 6640.8A](#)) but rather focus on relevant information for the public and the decision-maker. The degree to which indirect and cumulative impacts need to be addressed in an EA depends on the potential for the impacts to be significant and will vary by resource, project type and geographic location (FHWA, 2003).

5.3 Environmental Impact Statement (EIS)

Because actions requiring EISs may have significant environmental impacts, the consideration, analysis, and documentation of the appropriate issues must be reasonably detailed and disclosed as required by the CEQ regulations. Actions processed with an EIS need to be carefully evaluated during the scoping process to determine the environmental resources, geographic boundaries, time periods, and methodologies to be used in analyzing indirect and cumulative effects (FHWA, 2003).

6.0 Scoping

Scoping is the early and open process for determining the scope of issues, actions, alternatives, and potential impacts to be addressed in the NEPA study ([40 CFR § 1501.7](#)). NEPA studies are intended to be meaningful and focused on decision-making, which means the project scope should not be too broadly or too narrowly defined. The scoping process is intended to focus attention on the real issues and de-emphasize consideration of minor issues. This will appropriately narrow the scope of the environmental analysis on the issues that will have an influence on the decision or deserve attention from an environmental stewardship perspective. If a topic doesn't add value to the project decision, the related decisions of other agencies, or promote full disclosure, then it should only be briefly discussed or in some cases not included at all (FHWA, 2003). CEQ recommends focusing on key resource issues of national, regional or local significance (i.e. "count what counts") (CEQ, 1997). To identify potential issues, consider whether the resource is:

- Protected by legislation or resource management plans
- Ecologically important
- Culturally important
- Economically important
- Important to the well-being of a human community

Consider whether the project might involve issues that could affect long-term quality of life or resource sustainability. Also, consider concerns of agencies managing and regulating those resources, the regional history of resource degradation, and the presence of other proposals that would produce future degradation (CEQ, 1997). The approach to the cumulative impacts analysis also is based on the sensitivity or vulnerability of resources that could be affected by the project. For example, if a project is located in the vicinity of important habitat for an endangered species, and the population of that species is declining, that factor may justify a more extensive assessment of cumulative impacts on that species, even if the project itself is expected to have modest effects on that species (AASHTO, 2011).

KEY Points:

If a project will not cause direct or indirect impacts on a resource, it will not contribute to a cumulative impact on that resource (AASHTO, 2011).

The final consideration in identifying resources of concern is to determine if this or other activities will substantially affect the priority resources. Consider resources most likely to be substantially affected. If the project effects are minor, look for other activities (government or private) in the region that may affect the resource. The key factor is whether there are substantial impacts on the resource, not whose actions are causing the impacts.

If the project does not directly or indirectly affect a resource, it will not contribute to the cumulative effects (AASHTO, 2011). Therefore, the resource does not need to be studied in the cumulative effects analysis. If a protected resource is not studied for this reason, a determination that the project will not have direct or indirect effects on this resource should be indicated in the analysis.

KEY Points:

In evaluating effects, the key factor is whether there are substantial impacts on the resource, not whose actions are causing the impacts.

7.0 Cumulative Effects Analysis Methodology

No single formula is applicable for determining the appropriate scope and extent of a cumulative effects analysis. 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.

The cumulative impact analysis builds upon information derived from the direct and indirect impacts analyses. Consequently, the practitioner may tend to postpone the cumulative effects analysis until the direct and indirect impact analyses are well under way. However, CEQ recommends that potential cumulative impacts be considered as early as possible, preferably during scoping, to identify potential direct and indirect effects. Such early consideration of cumulative impacts may also facilitate the design of alternatives to avoid or minimize impacts. It is advisable, particularly on EIS-level projects, to coordinate with ENV about potential cumulative impacts while considering the appropriate level of effort and methodology. Each project is different and the methodology described here is flexible so that a tailored approach might be appropriate for each project.

In its simplest form, the cumulative effect is the summation of direct and indirect effects of past actions, present actions, reasonable project alternatives, and other future actions. However, a cumulative effect is sometimes greater or less than the sum of the individual effects (CEQ, 1997). For example, there may be special designations or ongoing regulations protecting the affected resources that would limit the effects. On the other hand, some resources may be more sensitive to change and experience greater adverse effects when faced with multiple stresses. Consider these interactions by examining the cause-and-effect relationships between the stresses and the resources. Use the baseline, trends, and potential effects to consider how a particular resource responds to change, and estimate the combined effects on each resource of concern. Evaluate each project alternative separately. Then, draw conclusions about the cumulative effects. Base these conclusions on facts, not speculation (AASHTO, 2011).

A cumulative effects analysis includes a series of analyses, focused on each of the resources selected for detailed consideration. Where cumulative impacts are concerned, The Fifth Circuit in *Fritiofson v. Alexander*, 772 F.2d 1225 (5th Cir. 1985) has explained that “a meaningful cumulative-effects study” under NEPA must include:

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.

AASHTO's Practitioner's Handbook, *Assessing Indirect Effects and Cumulative Impacts under NEPA*, suggests the cumulative effects analysis include these five basic steps:

1. Describe resource conditions and trends;
2. Summarize the direct and indirect impacts of the proposed action on that resource;
3. Describe other actions and their effects on the resource;
4. Estimate the combined effects of the proposed action and other actions on the resource; and
5. Consider minimization and mitigation for those effects.

Combining the recommended steps from the references mentioned above, the requirements of a cumulative effects analysis for a TxDOT project should include the five steps to adequately consider the cumulative effects of proposed project. The five steps are:

1. Resource Study Area, Conditions and Trends
2. Direct and Indirect Effects on each Resource from the Proposed Project
3. Other Actions – Past, Present and Reasonably Foreseeable – and their Effect on each Resource
4. The Overall Effects of the Proposed Project Combined with other Actions
5. Mitigation of Cumulative Effects

As discussed earlier, the consideration, documentation, and analysis requirements will vary in degree by class of action and should be commensurate with the potential for adverse and significant impacts.

Step 1 – Resource Study Area, Conditions and Trends

This step begins with the scoping performed for the project and goes on to include identification of the resources to consider in the cumulative effects analysis, definition of the study area for each affected resource, and establishment of the timeframe for the analysis. The practitioner should narrow the focus of the cumulative effects analysis to effects of significance to the proposal for agency action and its alternatives, based on thorough scoping (CEQ, 2005). As a summary of the scoping process, a table indicating resources not carried through to the cumulative effects analysis is recommended. If the project will have no direct or indirect effects on that resource, then a cumulative impacts analysis generally is not performed for that resource. (AASHTO, 2011) Resources carried forward should be discussed in more detail in this step. As presented in the AAASHTO Practitioner's Handbook (AASHTO, 2011), the discussion of each resource carried forward should include the following:

Current Conditions – The discussion of current conditions is a snapshot of the health of the resource. It may include quantitative data as well as qualitative assessment. For example, if an assessment is addressing water resources, the description of current conditions might give the number of acres of various categories of wetlands, a description of the important functions of those wetlands, and a description of the overall quality of those wetlands; it might also include similar types of information regarding streams, lakes, or other water bodies. The intent of this description is to help the reader understand the overall health of the resource.

Trends – The discussion of trends provides a picture of the changes in the resource over time. This picture can include historical trends as well as forecasts of future changes. A discussion of historical trends generally does not need to address individual actions that affected the resource; rather, it provides an overview of developments that have resulted in the current condition of the resource. For example, if water bodies are impaired, the discussion might explain the role of certain land uses (agriculture, mining, residential development, etc.) in causing the impaired conditions. Similarly, the future projections would provide a baseline for understanding the direction of the resource—i.e., is its condition improving or declining, and is there any reason to believe that the resource is approaching a “tipping point” that could lead to irreversible declines?

The goal of the discussion is to provide a context for the potential impacts. This information may be contained in another part of the EA or EIS or may be in technical report. If so, it can be summarized or cross-referenced as appropriate.

Cumulative effects are considered within a spatial geographic area labeled as the Resource Study Area (RSA). The RSA should be determined based on the environmental resources that are selected for analysis. There may be a single RSA that is used for all of the resources, or a separate study area for each resource. The challenge is defining the area large enough to understand the trends affecting the health of the resource and yet small enough to provide practical consideration of the project’s contribution to the cumulative effects. The basic requirement is that the analysis clearly defines the boundaries and explains the reasons why those boundaries were selected.

Many approaches are available to define a study area for a cumulative impact analysis. CEQ’s *Considering Cumulative Effects under the National Environmental Policy Act* provides additional information and examples related to determining RSA’s.

The timeframe selected should reflect the unique conditions of the study area and the resources to be analyzed. Choose timeframes based on what has changed and trends in the area. The timeframe should go back far enough to provide a context for the present condition and project into the future to include reasonably foreseeable development. It is not necessary to set a specific time period for considering past actions, as long as the effects of past actions are discussed (AASHTO, 2011). The future year should have a logical basis, such as the time horizon for the local transportation plan.

KEY Points:

Describe the current health and status of each resource of concern.

- Identify stress indicators and factors that have typically caused the resource to decline.
- Describe governmental regulations, plans and standards that may constrain the cumulative effects.
- Define a baseline condition for the resource using historical trends.

KEY Points:

The RSA should be large enough to understand the trends affecting the health of the resource and yet small enough to provide practical consideration of the project’s contribution to the cumulative effects.

Step 2 – Direct and Indirect Effects on Each Resource from the Proposed Project

The direct and indirect impacts of the proposed project are a component of cumulative impacts. The analysis must look at the impacts of a proposed project in combination with the impacts of other past, present, and reasonably foreseeable projects identified within an RSA. This step helps to identify the direct and indirect impacts for each of the proposed project alternatives on the resources identified in Step 1. It is important to differentiate each alternative’s potential to contribute to cumulative impacts.

The cumulative impacts analysis should just summarize the direct and indirect effects of the proposed action on each resource. This discussion should be supported by cross-references to more detailed discussion elsewhere in the EA or EIS or in a summary table as part of this step.

Step 3 – Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource

Past actions should be listed to the extent they contribute to the trend and current context of the resource. Agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined. Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions (CEQ, 2005).

The cumulative effects analysis should identify other reasonably foreseeable future actions. Typically, the analysis includes a list (often in table format) of other actions that are identified specifically, such as planned highway or transit projects. The analysis should include the full range of other actions, not just transportation projects. Focus on activities “that are likely or probable, rather than merely possible” (FHWA, 2003). Types of projects to look for include:

- Major Transportation Projects – the assessment does not need to include minor projects, but should focus on projects with a potential to impact the environment (for example new roadways and added capacity projects).
- Other Major Developments – consider future developments such as residential subdivisions, industrial facilities and commercial development.

Potential sources of future actions may include:

- Projects included in the MPO’s transportation plan
- Projects included within local government capital improvements plans
- Permits for public and private projects
- Local government future land use plans
- Interviews of local planning officials, real estate professional and developers
- Transportation projects included in TxDOT’s UTP.

The analysis should consider the impacts of the other actions on the resources that have been selected for analysis. CEQ has provided useful guidance on the extent to which agencies are required to analyze the environmental effects of past actions under NEPA when they describe the cumulative environmental effect of a proposed action (2005). It is not necessary to describe the other actions in the same level of detail as the proposed action. However, where there is a basis for doing so, the cumulative impacts analysis should express potential impacts in quantitative terms – for example, by estimating the total acreage of wildlife habitat that could be converted to residential development based on existing trends. Quantitative information is preferable to broad generalities.

It is not sufficient to merely list the reasonably foreseeable future actions. The assessment also needs to discuss the potential impacts of these actions, or explain why there is not enough information available to do so. Environmental effects from other reasonably foreseeable actions may be estimated; exact calculations of impacted areas are not necessary (NCHRP, 2008).

Step 4 – The Overall Effects of the Proposed Project Combined with other Actions

This step combines the information from Step 2 and Step 3 to address potential cumulative effects on each of the resources of concern.

The project's cumulative impacts can be assessed using a variety of methods and tools that are suited to different levels of analysis. Chapter 5 of CEQ's *Considering Cumulative Effects under the National Environmental Policy Act* describes a variety of methods or tools – both qualitative and quantitative – for evaluating cumulative impacts. The method(s) used may vary depending on the resource considered, the type of available information, and the scale of the proposed project. More than one method can be used to

KEY Points:

Cumulative impacts can be simply explained as a math equation.

Past impacts + Present impacts +
Reasonably Foreseeable impacts =
Cumulative impacts

assess cumulative impacts on a single resource. The emphasis of the conclusion should be on the cumulative effects on each resource, not a restatement of the project's impacts.

The analysis should provide a reasonably thorough assessment of important and probable environmental effects sufficient for informed agency decision making and public participation (NCHRP, 2008). Examples of activities that support the "Hard Look" standard include: obtaining opinions from experts outside the agency, giving careful scientific

scrutiny to the issues, and responding to legitimate concerns raised (NCHRP, 2008).

After analyzing the effects and verifying the results, explain what the results of the analysis mean (NCHRP, 2008). First, indicate whether or not the alternative contributes to cumulative effects. Then, describe the consequences of these effects on the resource.

The CEQ Guidance (1997) discusses using the concepts of context and intensity in making impact conclusions. Consider the context and intensity of the proposed project's cumulative impacts. This will help to make conclusions about the severity of these impacts. Chapter 4 of the CEQ Guidance provides additional information on assessing the magnitude and significance of cumulative impacts.

Step 5 – Mitigation of Cumulative Effects

The project sponsor may be required to mitigate for the direct or indirect effects caused by the proposed project, in coordination with the resource regulators or agencies with jurisdiction. However, the sponsoring agency is not required to implement mitigation measures for effects caused by others (NCHRP, 2006). Nonetheless, all relevant, reasonable mitigation measures must be identified, even if they are outside the jurisdiction of the agency, or unlikely to be implemented (FHWA, 2003).

Mitigation measures identified to address the proposed project's direct and indirect effects will also minimize, rectify, or compensate for negative cumulative effects. These measures are typically considered in the evaluation of direct and indirect effects and included in those sections of the EA or EIS. It would be appropriate to cross-reference these measures to meet the requirements in this step.

For impacts of other actions, identify potential mitigation measures that could be adopted by the sponsors of these actions, whether private or public. Indicate the entity that would carry out the mitigation measures as well as the probability of the mitigation measures being implemented (NCHRP, 2006). Consider potential actions by agencies that:

- Implement other state or federal laws
- Implement city, county and regional planning decisions
- Obtain state and local government legislative approvals

- Modify future development density at the city, county or regional level

8.0 Review of the Cumulative Effects Analysis

The following steps are adapted from the 2008 NCHRP report, NCHRP 25-24(43), and are recommend as review criteria for a cumulative effects analysis.

Step 1 Does the analysis identify specific elements of the natural and human environment that are the focus of the analysis and explain how they were selected?

Does the analysis describe the current health of each resource carried forward in the cumulative effects analysis, how it got to its current state, and major trends affecting the health of the resource?

Does the analysis identify the study area boundaries and timeframe, and explain the reason by which they were selected?

Step 2 Does the analysis summarize the direct and indirect impacts of the proposed action on the resources of concern so that the reader can understand the incremental effects of the project?

Step 3 Does the analysis identify other reasonably foreseeable actions that will impact the resources of concern and describe the impacts of those other actions?

Step 4 Does the analysis draw conclusions about the aggregate or total impact on each resource as a result of all the “other actions,” combined with the direct and indirect impacts of the proposed action?

Are the conclusions supported by logical analysis and plausible reasoning, and consistent with other sections of the document?

Step 5 Does the analysis discuss minimization and mitigation measures at the appropriate level, such as land use and resource protection policies? These should be discussed for information purposes, even if they are not in the control of the lead agencies.

9.0 Scalable Cumulative Effects Analysis

As previously mentioned, the consideration, documentation, and analysis requirements for the cumulative effects analysis will vary in degree by class of action and scope of work, and should be commensurate with the potential for adverse and significant impacts. Using past experience, it is reasonable to anticipate that a particular action may have little potential for adverse or significant impacts. Some projects warrant a brief discussion that is largely qualitative in nature and relies largely on existing data sources (AASHTO, 2011). Proposed actions that are typically finalized with a finding of no significant impact usually involve only a limited cumulative impact assessment to confirm that the effects of the proposed action do not reach a point of significant environmental impacts (CEQ, 2005). An abbreviated analysis using the five steps discussed above might be appropriate in some cases.

Keep in mind that a resource in poor or declining health may factor into the level of analysis. Consultation with ENV during the scoping process will assist in identifying projects suitable for a simplified cumulative effect analysis.

10.0 Other Federal Environmental Requirements that Include Consideration and Analysis of Cumulative Impacts

There are several environmental regulations, legislations, and authorities, in addition to NEPA that include cumulative impact requirements or general policies applicable to specific resource considerations. The following list from *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process* (FHWA, 2003) is for illustration purposes and is not intended to be all-inclusive.

The regulations implementing **Section 106 of the National Historic Preservation Act (NHPA)** require the consideration of indirect and cumulative impacts when applying the criteria of adverse effect on historic properties (36 CFR §800.5(a)(1)) and delineating the area of potential effects (APE) (36 CFR § 800.16(d)).

Section 404 of the Clean Water Act (CWA) establishes a permitting program to regulate the discharge of dredged and filled material into waters of the United States, including wetlands. The Section 404 (b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR § 230 subpart B) requires the CWA Section 404 permitting authority to determine the potential short- or long-term effects by determining the nature and degree of effect the proposed discharge will have, individually and cumulatively. Cumulative and secondary effects on the aquatic ecosystem must be considered as part of the Section 404(b)(1) analysis.

50 CFR Part 402 Interagency Cooperation-Endangered Species Act of 1973, as Amended requires the evaluation of direct, indirect, and cumulative effects on listed species and designated critical habitat of proposed federal actions (402.12, 402.14). Cumulative effects are defined (402.2) as "those 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" Note that cumulative effects under ESA do not include past or future Federal actions. Indirect effects are included in the definitions (402.02) of Action, Destruction or adverse modification, Effects of the action, and Jeopardize the continued existence of.

Section 3-301(b) of Executive Order 12898 on Environmental Justice states that whenever practicable and appropriate, Federal agency human health analyses must identify multiple and cumulative exposures to substantial environmental hazards.

11.0 Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effects
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulation
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENV	Environmental Affairs Division
ESA	Endangered Species Act
FHWA	Federal Highway Administration
ICI	Indirect and Cumulative Impacts
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
TAC	Texas Administrative Code
TxDOT	Texas Department of Transportation

12.0 Recommended Cumulative Effects Analysis Resources

AASHTO Practitioner's Handbook – Assessing Indirect Effects and Cumulative Impacts Under NEPA (AASHTO, 2011)

A primary source for TxDOT's guidance document, this document provides a concise overview of legal requirements for both indirect and cumulative effects evaluations.

Considering Cumulative Effects under the National Environmental Policy Act: Council on Environmental Quality (CEQ, 1997)

Includes step-by-step guidance by CEQ for evaluating cumulative effects. Appendix A provides detailed descriptions of selected methodologies.

FHWA Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process (FHWA, 2003)

In this paper, FHWA answers some common questions about the agency's regulations for considering cumulative effects.

NCHRP Project 25-25, Task 43, Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents. (NCHRP, 2008)

One of the primary sources for TxDOT's guidance document, this research project reviewed case law related to indirect and cumulative effects evaluations and recommends considerations for legal sufficiency.

References

AASHTO, 2011: Practitioner's Handbook – [Assessing Indirect Effects and Cumulative Impacts Under NEPA: Center for Environmental Excellence by AASHTO](#)

CEQ, 1981: [NEPA's Forty Most Asked Questions](#)

CEQ, 199: [Considering cumulative effects under the National Environmental Policy Act: Council on Environmental Quality, Executive Office of the President](#)

CEQ, June 24, 2005: [Guidance on the Consideration of Past Actions in Cumulative Effects Analysis](#)

ICI Work Group, 2005: [Executive Order 13274](#) – Indirect and Cumulative Impacts (ICI) Work Group, Draft Baseline Report

FHWA, 1992: [Memorandum on the Position Paper](#): Secondary and Cumulative Impact Assessment in the Highway Project Development Process: Dated May 1, 1992.

FHWA, 2003: [Interim Guidance](#): Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process.

NCHRP, 2006: [NCHRP Project 25-25, Task 11](#), Indirect and Cumulative Impact Analysis: A review and synthesis of the requirements for indirect and cumulative impact analysis and mitigation under major environmental laws and regulations, Transportation Research Board.

NCHRP, 2008: [NCHRP Project 25-25, Task 43](#), Legal Sufficiency Criteria for Adequate Indirect Effects and Cumulative Impacts Analysis as Related to NEPA Documents, Transportation Research Board.

Appendix A

The following table shows the revision history for this guidance document.

Revision History	
Effective Date Month, Year	Reason for and Description of Change
July 2016	Version 2 was released. Added additional general information about various impact types (direct, indirect, and cumulative). References to the Indirect and Cumulative Impacts Handbook have been deleted.
May 2014	Version 1 was released