13.0 Environmental Review

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13.1 What Is Included?

This stage of greenhouse gas (GHG) assessment includes consideration of GHG emissions in any environmental review, analysis, and documentation that is conducted for a transportation project, plan, or program. This section describes ways to include GHG effects as part of the documentation of environmental effects. The environmental documentation will include any analysis conducted as part of project development and design (Section 12.0). It also may reference relevant GHG analyses conducted in the development of transportation plans and/or programs that include the project (see Sections 10.0 and 11.0). In some States, environmental review is required for an entire transportation plan or program, and GHG would be considered as part of this review and associated documentation.

GHG emissions for the various project or plan alternatives can be considered in environmental documentation from either a qualitative or quantitative perspective for major projects. Minor projects, such as simple repaving, would typically be addressed on a programmatic basis.

13.2 Why Address GHGs in Environmental Review?

Environmental review of transportation projects is required under the National Environmental Policy Act (NEPA) for Federally funded projects. The goal of environmental documentation is to provide a mechanism for the integration of environmental considerations into project decision-making; inform the public about foreseeable effects from a project, plan, or program; and document how the analysis of those effects was done.

In 2016, the Council on Environmental Quality issued guidance on considering climate change (including GHG emissions) in NEPA analysis, which was being updated in 2021. Guidance on considering climate change and GHG emissions in NEPA is likely to continue to evolve. There is, however, no Federal prohibition on including a GHG analysis or addressing climate change under NEPA.

Some States' environmental laws and regulations, such as those of California, Massachusetts, New York, and Washington, also require consideration of GHG emissions and/or climate change impacts in State-level environmental reviews.

13.3 Level of Effort

The level of effort to add GHG considerations to environmental documentation should be modest; most of the effort will be in the analysis itself if a quantitative analysis is conducted. For a qualitative assessment, the level of effort will include a few hours of time to describe the various GHG sources and how they may be impacted. Some States, including Virginia and Texas, have developed sample language that can be customized or inserted directly in project-level documentation to address GHGs from a qualitative standpoint (Texas DOT, 2018).

13.4 Complementarity/Consistency with Other Transportation Goals

Environmental documentation typically addresses air quality and energy use associated with project or plan alternatives. Including discussion of GHG effects, either qualitative or quantitative, is generally relatively straightforward as these effects are often closely related and analyzed using the same methods and data sources.

NEPA also includes requirements to address a project's "energy requirements and conservation potential of various alternatives and mitigation measures" (40 Code of Federal Regulations Sec 1502.16(e)). Assessment of energy requirements will rely on many of the same data sources as assessment of GHG emissions, and energy reduction measures may have considerable overlap with GHG reduction strategies.

13.5 Who—Roles and Responsibilities

Executive	Admin	Planning	Programming	**Environmental**
Design	Construction	Maintenance	Operations	Regions/Districts

Potential roles in GHG consideration in this functional area include

- **Executives—**Set policy regarding how, and under what circumstances, GHGs should be addressed in environmental documentation.
- **Project Manager—**Ensure that the analysis is done and documented as part of the environmental documentation.
- **Environmental Staff—**Determine that all the required data are available. Use available tools to perform analysis in a technically sound manner. Prepare documentation of methods, assumptions, and findings.

13.6 Goal and Target Setting

The environmental documentation should identify any relevant GHG reduction goals and/or targets that have been set by the agency or the State, and it should discuss how the preferred project or plan alternative supports those goals and/or targets.

13.7 Strategy Identification, Evaluation, and Implementation

The environmental documentation should include analysis that is meaningful and informative to decision-makers and the public, particularly in evaluating differences—if any—in GHG emissions between alternatives. At the project level, such analysis may address differences in GHG emissions

between a No-Build alternative and various Build alternatives. Similarly, planning-level analysis conducted at the corridor, subarea, and regional planning levels may include analysis of a "no-action" alternative and various plan alternatives. The documentation should discuss any mitigation strategies included as part of the project and should describe the methods and assumptions for any evaluation that was conducted. Specific strategies that might be considered are discussed in Section 10.0 and Section 12.0.

As State DOTs evaluate the GHG emissions associated with projects or plans, they may wish to develop an analysis approach that is commensurate with anticipated GHG emissions impacts and addresses differences across alternatives. One consideration is whether to assess GHG emissions qualitatively or quantitatively. Other considerations include the analysis timeframe to be covered; the categories of GHG emissions to be included; and specific methods, data, and tools to support analysis.

13.7.1 Qualitative Assessment

A qualitative project-level assessment for a major project, program, or plan may consist of

- A brief description of the various Build alternatives compared to the No-Build alternative.
- A discussion of the effect of the Build alternatives' effect on various traffic variables such as volumes, speeds, congestion, transit ridership, and vehicle fleet mix and how the resulting changes in these parameters will affect GHG emissions.
- A summary of whether the completion of the project or plan will result in less or more GHG emissions from vehicles operating on the facility or network.
- A discussion of GHG emissions from the construction of the project (or the set of projects included in the plan). This could include a description of the equipment and fuels that will be used, the embodied emissions of the major materials, the duration of the construction and how it may be staged, and the duration and location of any detours resulting from the construction of the project(s).
- A discussion of GHG emissions from maintaining the facility once the project is completed. This could include a general description of what the change in maintenance activities could be; how far into the future they may occur; and the equipment, materials, and fuels that may be used, etc.

- A description of any regional or statewide GHG analyses that may exist, either from climate action plans or stand-alone analyses, and how the project aligns with those analyses.
- A description of any regional or statewide climate action plans, policies and/or goals and objectives, and how the project is consistent with these policies or goals.
- An overall conclusion regarding the project or plan, the preferred alternative, and the impact on GHG emissions considering all the factors that have a significant bearing on the project as described above.

13.7.2 Quantitative Assessment

A quantitative project-level assessment for a major project may consist of

- A brief description of the various Build alternatives compared to the No-Build alternative.
- A discussion of the effect of the Build alternatives' effect on various traffic variables such as volumes, speeds, congestion, transit ridership, and vehicle fleet mix. A table or other graphics could be useful to highlight differences among the alternatives.
- The results of the Motor Vehicle Emission Simulator (MOVES) or Emission Factor (EMFAC) runs summarized by alternative.
- A summary of whether completion of the project or plan will result in less or more GHG emissions from vehicles operating on the facility or network.
- A discussion of GHG emissions from the construction of the project or set of projects. This could include a description of the equipment and fuels that will be used, the major materials selected, the duration of the construction and how it may be staged, and the duration and location of any detours resulting from the construction of the project. The results of emissions from construction can be displayed by alternative.
- A discussion of GHG emissions from maintaining the facility once the project is completed. This could include a general description of what the change in maintenance activities could be; how far into the future they may occur; and the equipment, materials, and fuels that may be used, etc. The emissions results from maintenance of the facility can be displayed.
- A description of any regional or statewide GHG analyses that may exist, either from climate action plans or stand-alone analyses, and how the project aligns with those analyses. Quantitative emissions from the regional and/or statewide emissions analysis can be displayed.

- A description of any regional or statewide climate action plans, policies and/or goals and objectives, and how the project is consistent with these policies or goals.
- A description of any GHG mitigation measures that were considered and/or will be implemented to reduce emissions associated with the project or plan.
- An overall conclusion regarding the project or plan, the preferred alternative, and the GHG emissions considering all the factors that have a significant bearing on the project as described above.

Examples of GHG Consideration in Environmental Documentation

A wide variety of practices and triggers determine the need for a GHG analysis at the project level among State DOTs that consider GHG emissions at this level. In general, however, two triggers commonly determine a GHG assessment at the project level. One is the environmental classification of the project. Higher classification projects, such as Environmental Impact Statements (EISs) or Environmental Assessments (EAs), typically would have a GHG assessment at the project level (whether qualitative or quantitative), while lower classifications, such as Categorical Exclusions (CEs), would not. The other common trigger for a project-level GHG assessment is the scale and scope of the project. Larger projects that would affect traffic or operation of the facility over distances of several miles (mesoscale or macroscale) may have a project-level GHG assessment (whether qualitative or quantitative), while small-scale projects that may only have localized effects (microscale or "Hot-Spot") would not.

The definition of a non-exempt project under the transportation conformity regulation may be one way of determining whether the scale and scope of the project is sufficient for a project-level GHG assessment. Some State DOTs combine these considerations by performing a GHG assessment for EISs, not performing them for CEs, and considering the scale and scope of a project for determining whether to perform a project-level GHG assessment for EAs.

Whether to assess projects qualitatively or quantitatively is often a policy decision made by the State DOT. For example:

- California—Generally, projects that increase roadway capacity require a quantitative GHG analysis, whereas projects that do not increase roadway capacity require a qualitative GHG analysis. Projects must also address consistency with regional transportation plans/sustainable communities strategies in metropolitan planning

organization (MPO) areas and plans (e.g., climate action plans) that may have GHG-related goals in non-MPO areas (CalTrans, undated).

- District of Columbia—The District requires qualitative discussion of direct and indirect effects of the project on GHGs (DDOT, 2012).
- Massachusetts—Projects subject to the Massachusetts Environmental Policy Act that require an EIS must quantify emissions and reduce GHG emissions to the maximum amount feasible. Also, projects must adhere to a Complete Streets design approach to accommodate pedestrians, bicyclists, and transit riders (Commonwealth of Massachusetts, 2010).
- Minnesota—Generally, a quantitative analysis is required for construction and maintenance emissions for all projects, and it is required for operational emissions for projects that affect volumes and speeds. Some exceptions apply, such as a total construction cost less than $1,000,000 or if the project is not a project type included in the Minnesota Infrastructure Carbon Estimator tool (MnDOT, undated).
- Oregon—Oregon requires a quantitative assessment of GHG emissions for EISs and a qualitative or quantitative assessment for EAs, depending on the project (Oregon DOT, 2018a).
- Pennsylvania—Projects that meet the definition of "regionally significant" under the Federal transportation regulation require a qualitative or quantitative GHG analysis. If the project affects vehicle miles traveled or speeds and has not been assessed under a planning-level GHG assessment, then a quantitative analysis is performed; otherwise, a qualitative analysis is performed (PennDOT, 2017).
- Texas—Texas has prepared an inventory of statewide transportation GHG emissions and identified strategies to reduce GHG emissions from the transportation sector. At the project level, the environmental document discusses the consistency and context of the project in relation to the inventory and identified strategies (Texas DOT, 2018).
- Washington—Washington State requires a project-level quantitative GHG analysis for all projects that are processed as EAs and EISs and a qualitative evaluation for some smaller-scale projects (WSDOT, 2018).

13.8 Self-Assessment: Environmental Review

A self-assessment worksheet is provided to assist State DOT staff involved in environmental review to determine their level of engagement in GHG assessment and additional steps they could take to estimate and reduce GHG emissions. The worksheet is meant to be used as a guide and completed with any markings and notes that are helpful.

Click to download – Self-Assessment: 13.0 Environmental Review

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