



FDM 3-4-1 NEPA Design Process - Preliminary Design

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This chapter provides policy and guidance for developing and documenting the National Environmental Policy Act (NEPA) Design Process of the Design-Bid-Build project development process. Information on how to perform basic design procedures and fundamental steps for performing the design work are within various WisDOT and National references including but not limited to the Facilities Development Manual, Bridge Manual, Highway Capacity Manual, Roadside Design Manual, Program Management Manual, MUTCD, AASHTO's Policy on Geometric Design for Highway and Streets, and State and Federal Transportation and Environmental Laws, Policies, Regulations and Agreements.

NEPA Design Process, commonly referred to as Preliminary Design, is the environmental scoping, evaluation and documentation along with the engineering and design activities necessary to select a project's preferred design alternative. The selected design alternative is recorded in the final approved environmental class action document.

Selection of a project's preferred alternative requires various levels of engineering and design activities in order to make sound engineering decisions and to document a project's environmental affects.

Environmental scoping, evaluation and documentation are the decision making phases that evaluates project alternatives and identifies the impacts the project will have on the environment and communities. In accordance with NEPA, this environmental evaluation and documentation is required for all projects and must be completed before final project decisions are made and final design can begin.

The environmental class action document identifies the preferred design alternative once the environmental impacts of the proposed engineering alternative(s) are evaluated and documented. The selected action is recorded in the final approved environmental class action document (e.g. Categorical Exclusion (CE), Finding of no significant impact (FONSI), Record of Decision (ROD)). Assuming the project's selected action is a build alternative it will be carried forward into final design. The NEPA Design Process concludes with the final approved environmental class action document. Final Design follows the NEPA design Process.

Performed in conjunction and concurrently with the Environmental evaluation and documentation are Engineering and Design activities. These activities includes developing and documenting the engineering design in collaboration with various function areas including surveying and mapping, right-of-way, traffic, highway design, pavements, utilities, railroad, hydraulics, geotechnical, structural design, maintenance and construction to support the identification of a preferred alternative and the decision making process in Environmental documentation.

[Attachment 1.1](#) provides WisDOT NEPAs engineering and design activities.

FHWA's policy on Permissible Project Related Activities During the NEPA Process can be found in the U.S Department of Transportation Federal Highway Administration Directive Order 6640.1A dated October 1, 2010:

<http://www.fhwa.dot.gov/legsregs/directives/orders/66401a.cfm>

Environmental evaluation and documentation of project alternatives should include some level of engineering design to verify the alternatives are consistent with the project's purpose and need, and to identify and compare the impacts of each alternative. Engineering may include developing multiple geometric alignments, roadway templates, roadside features or other alternatives for evaluation. The engineering design is typically developed to approximately 30 percent level of design detail, but may vary depending on the information needs for environmental impact evaluation. This typically includes identification of a detailed project scope, evaluation and documentation of engineering and design activities, estimated costs, and a project delivery plan for implementing the proposed project and achieving the project objectives on schedule and within budget.

For small-scale improvements such as preventive maintenance, resurfacing, restoration and rehabilitation (3R) type projects, isolated bridge replacements and other projects constrained by a limited or well defined scope, environmental evaluation and documentation is often readily identifiable without the need to fully perform many of the engineering and design activities listed in [Attachment 1.1](#). For these projects the environmental document should be completed very early in the project development process.

In unique circumstances a high level of design detail such as earthwork quantities, material source and waste investigation plans, drainage designs, soil borings, pavement and soils report, hazardous material investigation,

intersection design, interchange design, structure type/size/ location studies, right-of-way exhibits (property lines, title deed searches, preliminary Right of Way requirements), utility engineering, preliminary traffic control, preliminary construction staging project schedules and cost estimates, maybe required to define the significance of environmental impacts and mitigation. Prior to selection of a preferred alternative, comparison of each alternative shall be done in a fair and balanced manner. The level of design work that is needed to analyze a projects environmental impacts should be done to an equal level of detail for each of the alternatives that are included in the Environmental document.

NEPA engineering and design activities shall not affect the objective consideration of the alternatives and shall not cause adverse environmental impacts. The list of engineering and design activities found in [Attachment 1.1](#) and FHWA Directive Order 64401a is not exclusive. An approval process is required to allow for additional activities and for advancement of activities that do not constitute final design. A letter of request to approve additional engineering activities or advancement of activities along with reasons and justification shall be prepared by the Region's Environmental Liaison and forwarded for approval to the regions environmental oversight contact in DSTD Environmental Service. Environmental Service will request and secure FHWA final approval.

The objectives and deliverables of the NEPA Design Process are:

- To fully clarify and quantify the transportation needs and deficiencies identified during the planning and programming phase.
- Develop a general course of proposed action and formally define project's purpose and need.
- Identify and evaluate, with an appropriate level of engineering analyses, the feasible and reasonable alternatives consistent with the purpose and need.
- Identify and evaluate environmental impacts of the feasible and reasonable alternatives.
- Select a preferred alternative in accordance with the NEPA.
- Secure a final approved Environmental Class Action Document.

LIST OF ATTACHMENTS

[Attachment 1.1](#) NEPA Design Engineering and Design Activities