

# General Alternatives Analysis

Applicability  
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Development and Evaluation of Alternatives  
Practicable Alternatives Review  
Avoidance and Minimization Measures Meeting  
Section 4(f) Evaluation  
NEPA Alternatives Analysis

## APPLICABILITY

An Alternatives Analysis assesses project options to address transportation needs while avoiding and minimizing impacts to surrounding resources. All projects involve some Alternatives Analysis consideration. The level of analysis varies depending on the resources potentially impacted by the project. Likewise, documentation for an Alternatives Analysis varies. It may require as little documentation as a small discussion in the project file, or it could require a standalone document that involves the review of multiple agencies.

Consideration of alternatives begins during the Concept Stage, but coordination and documentation of alternatives continues into Preliminary Engineering. Projects involving extensive impacts to Waters of the US, public resources, and cultural resources tend to require detailed Alternatives Analysis development. Other factors, such as level of controversy, project complexity, project length, and funding, also help determine the applicability of an Alternatives Analysis.

## REGULATIONS, GUIDANCE, AND POLICY

Environmental laws, as well as GDOT policies, require the consideration of alternatives that avoid adverse impacts and minimize harm. Depending on the level of a project's potential impacts, an Alternatives Analysis may be conducted and documented in one or more ways. The major laws and policies that govern Alternatives Analysis requirements are summarized below.

### National Environmental Policy Act

The National Environmental Policy Act (NEPA) ensures that federal agencies consider environmental consequences when developing their projects and programs. An analysis of alternatives to avoid and minimize environmental and community impacts is key to the

NEPA process. Projects in GDOT's federal-aid program require some level of Alternatives Analysis through the NEPA process. Depending on the project's NEPA requirements, the Alternatives Analysis may involve coordination with other agencies, and it may need to be discussed in detail as part of the NEPA document.

### Section 404 of the Clean Water Act

Section 404 of the Clean Water Act (CWA) gives the US Army Corps of Engineers (USACE) permitting authority for impacts to Waters of the US. Section 404(b)(1) mandates consideration of practicable alternatives that would not impact aquatic resources or would result in less adverse impacts on the aquatic ecosystem. The GDOT process for complying with 404(b)(1) is known as the Practicable Alternatives Review (PAR) process. It occurs when impacts require either a Section 404 Regional General Permit 35 or a Section 404 Individual Permit. If a PAR is required, details of the PAR Alternatives Analysis are compiled in a report for USACE and resource agency review.

### Section 4(f) of the US Department of Transportation Act

Section 4(f) of the U.S. Department of Transportation Act applies to all GDOT federal-aid projects. Section 4(f) prohibits using property from any of the following if a prudent and feasible avoidance alternative exists:

- > Public parks and recreation areas,
- > Public wildlife and waterfowl refuges,
- > Public or private historic sites on or eligible for inclusion on the National Register of Historic Places (NRHP), and
- > Public or private archaeological sites on or eligible for inclusion on the NRHP that warrant preservation in place.

If the use would have an adverse impact to the property, then it requires a Section 4(f) Evaluation. The evaluation includes an Alternatives Analysis assessment. The assessment analyzes the project to determine if there is a prudent and feasible alternative to the use. If there is no alternative, the evaluation ensures the project includes all possible planning to minimize harm.

### Alternatives Consideration through the Plan Development Process

GDOT projects advance according to the Plan Development Process (PDP). The evaluation of project alternatives is among the interdisciplinary activities that are essential to project advancement. The activities include the analyses and evaluations described above, as well as others. The Value Engineering Study, for example, assesses project alternatives to determine if the purpose of the project could be accomplished at a lower lifecycle cost. This study is conducted for projects costing \$50 million or more. Alternatives considered through the PDP are described in the project's Concept Report and discussed at Concept Team Meetings.

## DEVELOPMENT AND EVALUATION OF ALTERNATIVES

As the project develops, the evaluation of alternatives becomes a part of the project's technical studies and environmental documentation. Depending on the project's potential impacts, the Alternatives Analysis may become a part of more than one study or document. The following activities are important parts of these studies and documentation. They include components of the Alternatives Analysis, and they describe the steps needed to coordinate and document the analysis.

### Need & Purpose

The Need & Purpose (N&P) is central to how project alternatives are evaluated. The Environmental Analyst is responsible for reviewing the N&P for use in the environmental reports and documents. Development of the N&P begins with the Project Justification Statement (PJS). Usually the Office of Planning provides the PJS. It identifies the main issues that the project is intended to address. The PJS is supplemented with traffic and/or crash data, to articulate the N&P. The purpose states the objectives of the project that can be translated into measurable goals, and the need is the transportation problem that must be addressed.

The N&P varies in detail depending on the project and the environmental documentation needed. For smaller projects with minimal documentation requirements, the N&P might be blended with the project description. For larger projects, environmental documentation might devote a chapter of discussion to the N&P. If a project involves a PAR or a Section 4(f) Evaluation, the Environmental Analyst may need to include more details and technical information to support the N&P. More information about N&P development is available in the N&P guidebook.

### Logical Termini

Another requirement that ensures the meaningful evaluation of alternatives is the consideration of logical termini. Logical termini mean that the project limits, or endpoints (termini), are sufficient to address the need for the project (logical). The intent of using logical termini is to look at the proposed project within a context broad enough to adequately consider the traffic characteristics, benefits, and environmental consequences. More information about logical termini is available in the Logical Termini guidebook.

Federal Highway Administration (FHWA) regulations [23 CFR 771.111(f)] for the development of logical termini include three specific components to determine whether logical termini have been established for a proposed project:

- > The project should have rational endpoints that are of sufficient length to address broad environmental concerns;
- > The project should have independent utility, i.e., be usable and a reasonable expenditure even if no additional transportation improvements in the area are made and should not force additional improvements elsewhere; and

- > The project should not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements, either connecting or nearby.

For a project requiring an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), OES policy requires that a Need, Effectiveness and Logical Termini (NELT) Form be provided to FHWA for their review. For Categorical Exclusion (CE) projects where logical termini are in doubt, the Environmental Analyst should meet with the project team to discuss concerns and decide the best course of action. The project team may decide to schedule a meeting with the FHWA and/or to submit a NELT Form to FHWA for review. This should be resolved early in project development.

Independent Utility Discussion in Section 404 Permits

All USACE Section 404 permit applications must include a N&P discussion that demonstrates that the project has independent utility.

### PRACTICABLE ALTERNATIVES REVIEW

During the Concept Stage and prior to the Concept Report approval, the Ecologist coordinates with design to determine if a Section 404 permit is anticipated. The Ecologist may need to initiate interagency consultation on alternatives for major widening and new location projects. This forms the basis of the PAR for projects requiring a Section 404 Regional General Permit 35 or a Section 404 Individual Permit.

The PAR process is prepared collaboratively by the Ecologist and design. It provides an analysis of alternatives that avoid or minimize impacts to jurisdictional waters. The review process typically includes the Project Manager, Environmental SMEs and design giving a presentation of the alternatives to the USACE and other agencies. The alternatives are evaluated based on their ability to meet the project's N&P. Avoidance alternatives that do not meet the N&P do not advance for further consideration. The PAR process culminates with the identification of the preliminary Least Damaging Practicable Alternative (LEDPA). The LEDPA, which becomes the selected/preferred alternative, is ultimately included in the Concept Report. The PAR process is detailed in a series of Environmental Procedures guidebooks.

### AVOIDANCE AND MINIMIZATION MEASURES MEETING

One activity that affects project alternatives—primarily the preferred alternative—is the Avoidance and Minimization Measures Meeting (A3M). It occurs early in Preliminary Design, after environmental resources have been identified and design has developed preliminary cross sections for the preferred alternative. The A3M helps document all avoidance and minimization measures incorporated into the plans. While the A3M is typically conducted between the environmental project team, design, and the Project Manager (PM), it may include other GDOT offices (e.g., bridge design, construction, utilities) if needed. The A3M process typically involves one meeting to evaluate engineering avoidance and minimization options, including constructability. Results of the A3M are incorporated into the preliminary

plans that are used by Environmental SMEs to complete technical studies and environmental documentation.

## SECTION 4(F) EVALUATION

For projects taking land from Section 4(f) properties and determined to have an adverse impact, a Section 4(f) Evaluation must be prepared and approved by FHWA. This evaluation must demonstrate that no feasible and prudent alternative exists that avoids greater than *de minimis* uses of Section 4(f) properties.

A Section 4(f) Evaluation may be prepared as part of a NEPA document, or it may be developed as a stand-alone document. Either way it must include the project's N&P. A central component to the Section 4(f) Evaluation is the Alternatives Analysis discussion. The project team must fully evaluate alternatives that avoid greater than *de minimis* uses of Section 4(f) properties. An alternative with a *de minimis* use of a Section 4(f) property is considered an avoidance alternative, and no additional evaluation is necessary for alternatives that involve *de minimis* uses. If an alternative, which avoids greater than *de minimis* uses of Section 4(f) properties, is found to be prudent and feasible, it must be selected.

Where use of Section 4(f) property cannot be avoided, FHWA may approve only the alternative that causes the least overall harm including weighing impacts to other resources not protected under Section 4(f). *De minimis* impacts do not need to be considered in the avoidance discussion. The Alternatives Analysis must be completed and documented to the extent that it demonstrates whether an alternative is prudent and feasible.

## NEPA ALTERNATIVES ANALYSIS

For federal-aid projects, the NEPA process requires consideration of alternatives that avoid adverse impacts and minimize harm to all environmental resources. Once resources have been identified, the project team must collaborate to identify and develop the alternatives that satisfy the project's N&P and minimize environmental impacts. Collaboration may occur in a formal meeting, or it may happen through regular project coordination.

Given the resource types considered, impacts must be weighed and balanced in comparison to one another. The Environmental Analyst must document this consideration in the NEPA document. FHWA published a toolkit to outline its policy toward the development and evaluation of alternatives.

NEPA Transportation Decisionmaking, Environmental Review Toolkit  
Federal Highway Administration

The alternatives documented in the NEPA analysis must include alternatives developed through other activities, such as the PAR, the A3M, and the Section 4(f) Evaluation. The alternatives no longer under consideration may be described as having been eliminated and

the reason provided, or they may be described in detail among the range of alternatives in the NEPA document.

### Alternatives Screening

The Alternatives Analysis should clearly indicate why and how the range of project alternatives was developed. As part of this, the analysis should explain why and how alternatives were screened from consideration. The screening must:

- > Indicate at what point in the process the alternatives were removed;
- > List who was involved in reviewing the criteria for assessing alternatives;
- > Detail the measures for assessing the alternative's effectiveness;
- > Include the public and agency input used in the screening; and
- > Clearly state the criteria used to eliminate alternatives.

As an example, consider a bypass alternative developed and eliminated from consideration through the PAR process. The NEPA document should:

- > Briefly describe the alternative;
- > Indicate that it was screened from consideration during the PAR;
- > List the PAR agencies that established the assessment criteria, USACE and GDOT at a minimum;
- > Detail the pros and cons of the bypass alternative as considered during the PAR;
- > Include the input used during the screening, such as the opinion of the USACE; and
- > State why the alternative was eliminated, such as not meeting the N&P due to a low traffic.

When preparing NEPA documents, the Environmental Analyst should be candid about the rationale for generating, evaluating, and eliminating alternatives. The document must be specific. If an alternative is eliminated from further consideration because it does not meet the N&P, for example, the environmental document must explain how or why it doesn't meet the N&P. This information could be documented through a paragraph or with a table or other graphic. The screening discussion is typically found under the "Alternatives No Longer Under Consideration" heading.

### Range of Alternatives

To conduct an Alternatives Analysis, the project team is responsible for developing the full range of alternatives. The range should outline to agencies and the public the options that are available to address the problem identified by the N&P. Project alternatives must also

connect logical termini, have independent utility, and not restrict the consideration of future transportation alternatives. Major projects must include substantial coordination between FHWA (the lead federal agency) and participating agencies to review the range of alternatives.

### No-build Alternative

Discussion of the no-build alternative is required to address Council on Environmental Quality (CEQ) guidelines. The no-build alternative is typically the only alternative among the range of alternatives that does not meet the N&P. The document usually identifies the disadvantages of this alternative. The discussion should acknowledge the impacts and costs that would be avoided by the no-build alternative. These advantages are weighed against the disadvantages from failing to meet the project's N&P. The no-build alternative acts as the benchmark against which the impacts of other alternatives can be compared.

### Preferred Alternative

This is sometimes called the build alternative. When only one alternative is recommended, the document should clearly describe the alternative in terms of length, proportion of widening/improvement versus new location, cross streets in the project area, and type of traffic control proposed. The existing and proposed typical sections need to be described, including number and width of lanes, type of median, sidewalks, shoulders, and ROW.

The preferred alternative can be developed at a higher level of detail than other alternatives. This allows the project team to develop mitigation measures and/or concurrent compliance with other applicable environmental laws.

### Other Alternatives

The range of alternatives should broadly explore valid means of meeting the project's N&P. The presentation should not demonstrate bias towards one alternative over another. For example, Transportation System Management alternatives may be evaluated as potential alternatives. These may include high-occupancy vehicle lanes, ridesharing, signal synchronization, and other actions. Also, if appropriate, mass transit options may be considered even though mass transit is outside FHWA and GDOT's funding authority.

Generally, only alternatives that meet the N&P should be included in the range of alternatives. However, under certain circumstances, the range may include a project that does not meet the N&P. This may be when a lead or participating agency requests the alternative be included due to public expectation. In such cases, the document should clearly explain why the alternative does not meet the N&P (or is otherwise unreasonable, imprudent, or not practicable), why it is being analyzed in detail, and why it will not be selected.

### Efforts to Minimize Harm

The NEPA document should describe efforts to minimize harm to environmental resources. Because of the higher level of detail, this is primarily described only for the preferred

alternative. The efforts may result from project development activities such as the PAR, the A3M, and the Section 4(f) Evaluation.

In the NEPA document, efforts to minimize harm are discussed in the sections relevant to the type of environmental resource. For example, measures to minimize harm to wetlands are listed in the Waters of the US section. Minimization measures may also be included on the Environmental Commitments Table. Minimization measures to be carried out by the contractor also should be included in the Environmental Resource Impact Table.

### Documentation

There is no guidance that specifies the exact contents of the Alternatives Analysis documentation. In general, the NEPA document should be tailored to the type of project, the range of alternatives, the evaluation of project impacts, and the level of interest from agencies and the public.

NEPA documents divide the discussion of different types of environmental resources into sections, e.g., community resources, ecology resources, cultural resources, etc. If an adverse impact is anticipated for an environmental resource, the corresponding section of the NEPA document will include a discussion of avoidance alternatives and other efforts to avoid and minimize impacts to that resource. Corresponding technical studies and agency consultations also include this discussion.

### Categorical Exclusion

Most NEPA documents developed through GDOT are CEs and Programmatic Categorical Exclusions (PCEs). Because of the nature of their projects, these documents do not include Alternatives Analysis discussions. If relevant, CEs may indirectly refer to the Alternatives Analysis process by summarizing the PAR, discussing efforts to minimize harm, and/or referencing the Section 4(f) Evaluation. CEs may include an Alternatives Analysis section if requested by the lead federal agency due to specific project conditions.

### Environmental Assessment

The EA must include a section to describe the alternatives analyzed through the NEPA process. The purpose of the section is to provide agencies and the public a clear discussion of the options available to address the problem identified by the N&P. This section of the EA should detail the following:

- > An introduction that summarizes the process used to develop the alternatives, including resource identification, avoidance, and minimization;
- > A discussion or a table detailing the alternatives no longer under consideration; and
- > A description of the range of alternatives, including the no-build alternative, the preferred alternative, and other alternatives.



### Environmental Impact Statement

For projects requiring an EIS, a more detailed Alternatives Analysis is required. The analysis begins with early activities between GDOT, the lead federal agency (usually FHWA), and cooperating and participating agencies. This collaboration includes developing the methodologies used to establish the range of alternatives, the criteria used to evaluate the alternatives, and the level of detail in the Alternatives Analysis. It can be completed during the scoping stage of the EIS, which includes coordination and public involvement over the N&P. Agencies and the public must be given meaningful input to develop the Alternative Analysis methodologies, criteria, and level of detail. The alternatives should be considered and discussed at a comparable level of detail to avoid any indication of a bias towards a particular alternative.

The Alternatives Analysis may be prepared as a standalone document and summarized in the Draft EIS and Final EIS. A standalone document may allow early agreement between the agencies on the range of alternatives considered through the EIS process. Alternatively, the analysis may be detailed as part of the EIS. In either case, the analysis documentation should detail the following:

- > A summary of the agency coordination and public involvement that developed the analysis methodologies, criteria, and level of detail;
- > A summary of the process used to develop the alternatives, including resource identification, avoidance, and minimization;
- > A discussion or a table detailing the alternatives no longer under consideration;
- > A description of the range of alternatives, including the no-build alternative, the preferred alternative, and other alternatives; and
- > An evaluation of the performance of these alternatives based on the established analysis methodology, criteria, and comparable level of detail.

*Guidebook Revision History*

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