400 ENVIRONMENTAL CONSIDERATIONS

Highway Design Manual	***Chapter*** EXHIBITS
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HIGHWAY DESIGN	*Chapter* ENVIRONMENTAL CONSIDERATIONS
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HD-401.1 SUMMARY

Environmental considerations are a key component of the project development process. This chapter outlines the following topics related to environmental considerations:

- Integration of environmental stewardship in the project development process
- Description of various environmental issues
- Description of documentation
- Permits and certifications required in project development

HD-401.2 GENERAL

Part of the Cabinet's mission is to develop projects in an environmentally sensitive manner by identifying and evaluating potential impacts to the natural and human environment. Untimely identification of affected areas and environmental issues for the entire reach of the project can jeopardize project goals and schedule. At a minimum, an environmental overview or identification of environmental constraints within the project area is recommended prior to studying alternative alignments.

Projects should be developed in a manner to first avoid any adverse impact. If avoidance is not practical, the impact should be minimized or mitigated. Opportunities to enhance the natural and human environment should always be a consideration when developing a project.

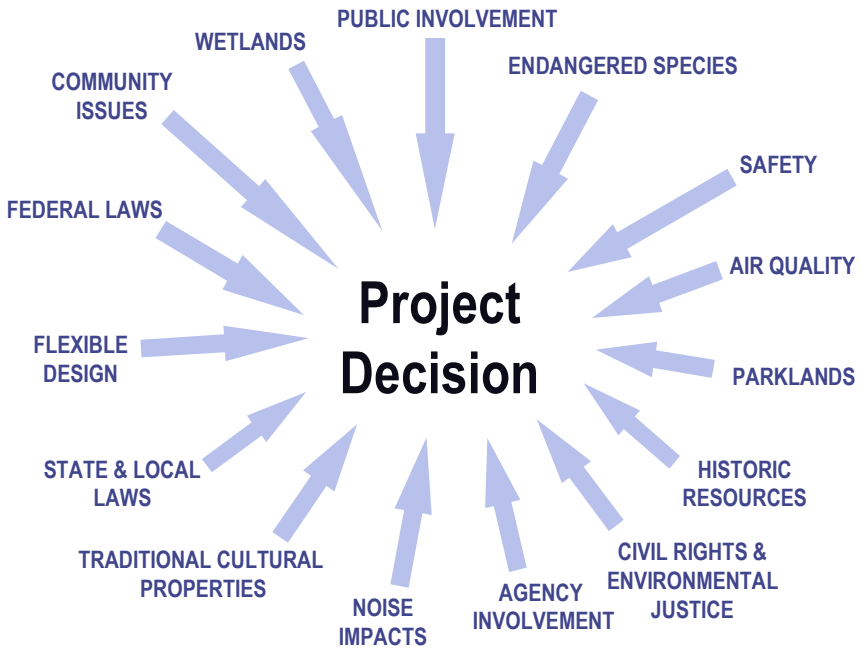
Federal and state laws require the evaluation of a project's potential adverse effects on the natural and human environment, as well as the development of alternatives to minimize such effects. Beyond this, it's also the right thing to do in assuring a project's existence is in harmony with the environment and community. Applying for and obtaining the appropriate environmental clearances, permits, and certifications early in the design phase is essential for

maintaining project schedules.

HIGHWAY DESIGN	*Chapter* ENVIRONMENTAL CONSIDERATIONS
	Subject Environmental Issues

HD-402.1 OVERVIEW

Along with economic and engineering factors, environmental issues require early identification and consideration during the project development process. Project managers and project teams must be knowledgeable of these issues, understand the interrelationship between the environment and the project, and be cognizant of appropriate policies and procedures to contend with these issues.



HD-402.1 OVERVIEW (cont.)

If any of the topics below are identified as an issue of concern during project development, the project manager, or designee, should consult with the district environmental coordinator, Department of Environmental Analysis (DEA) subject matter experts, or the *Environmental Analysis Guidance Manual*.

These issues include, but are not limited to:

- Air Quality
- Aesthetics
- Cemeteries
- Cultural Resources
- Endangered Species
- Federal Lands
- Floodplains
- Ground Water Resources
- Hazardous Materials and Underground Storage Tanks HZM/UST)
- Noise
- Section 4(f) Resources
  - Cultural Resources
  - Recreational Parks
  - Wildlife Refuge
- Section 6(f) Resources
- Socio-Economic Concerns and Environmental Justice
- Streams
- Wetlands

The following sections provide a general overview of specific environmental issues that may be encountered on a project. For detailed policy and procedures, refer to the *Environmental Analysis Guidance Manual*.

HD 402.2 AIR QUALITY

The Clean Air Act (CAA) and the National Environmental Policy Act (NEPA) require that air quality be considered for any proposed project. The CAA also requires that all programs, plans, and projects conform to the State Implementation Plan (SIP) and that priority be given to implementing those portions of the plan that are to achieve and maintain the national primary ambient air quality standards. Transportation projects must also be included in the State Transportation Implementation Plan (STIP). The level of detail in an air quality analysis will vary considerably according to the size of the project, the existing level of air quality in the area, and the degree of controversy. Alterations to the project and scope may require a SIP/STIP amendment.

HD 402.3 AESTHETICS

The appearance of highway facilities will have an impact on the scenic and visual quality of an area. During project development, opportunities to enhance aesthetics should be explored and should align with public input, community goals, resource agency input, etc.

HD-402.4 CEMETERIES

Efforts should be made to identify and avoid cemeteries within the project corridor. Local public agencies and residents should be contacted for potential information that may reveal the location of cemeteries that may not be readily visible or delineated. The historical significance of the cemetery will be determined by the appropriate resource agencies. A historic cemetery is potentially subject to Section 4(f) requirements as discussed in **HD-402.1.10. HD-300**, "Surveying," and **HD-1300, "**Right of Way," provide more information concerning surveying and documentation of cemeteries.

HD-402.5 HISTORIC PROPERTIES

Avoiding historic properties, both archeological and above-ground structures, must be considered in the decision-making process of transportation projects. Establishing area(s) of potential effect (APE) and appropriate levels of investigation of historic properties should be accomplished early in the project development process. The investigation should be commensurate with the significance of the historic properties and the magnitude of the project's impacts on the resources. Historic properties must be considered when examining potential alternatives.

Section 106 of the National Historic Preservation Act outlines the requirement to consider the effect of a project with federal involvement (FHWA, ACE, etc.) on historic properties. The Act requires consultation with consulting parties and appropriate resource agencies. Consulting parties must include local government; the State Historic Preservation Officer (SHPO); and may also include local historical groups, preservation groups, recognized Native American Tribe(s), or others who have a demonstrated interest in the resource. Due consideration of these concerns should be given when developing state-funded projects.

Federal regulations require that agencies consider that historic properties of religious and cultural significance to an Indian tribe may be located on ancestral, aboriginal, or ceded lands of that tribe. Accordingly, agencies must make a *reasonable and good faith effort* to identify Indian tribes that attach such significance but that may now live at great distances from the undertaking's area of potential effect. This requires consultation regarding any archeological

investigation involving prehistoric (pre-European contact) resources.

Archaeological sites should not be shown on maps that are included in publicly available documentation unless critical in understanding why an alignment was selected, modified, or dismissed. If archeological sites are depicted on plans, exhibits, etc. that are for public viewing, the location **should not** be precisely shown. A subject matter expert should be consulted to determine how to show these areas for public viewing.

HD-402.6 ENDANGERED SPECIES

The presence of endangered species, both plants and animals, are always to be considered a possibility in the project area. The Endangered Species Act requires consultation with U.S. Fish and Wildlife Service to ensure that actions do not jeopardize threatened or endangered species or their critical habitat. Decisions as to location, construction activities, and letting schedules may be greatly influenced by the presence of these species and should be investigated as early as practical.

HD-402.7 FEDERAL LANDS

Unique uses and aspects of federal lands should be considered before utilizing them in a project and, if practical, avoided. Effects upon federal lands may result in unique permitting requirements and other considerations that may result in lengthy delays. Contact with representatives for these federal lands should be early and often to facilitate development of agreements, permits, and access to the property.

HD-402.8 FLOODPLAINS AND FLOODWAYS

Floodplain encroachments should be avoided when practical. If an encroachment cannot be avoided, the degree of the encroachment should be minimized. Generally, any increase in the 100-year water-surface elevation produced by an encroachment on a National Flood Insurance Program (NFIP) floodplain cannot exceed one foot. Likewise, floodway encroachment should be avoided where feasible. If an encroachment into the floodway cannot be avoided, then either a No Rise Certificate (sometimes referred to as no impact) should be submitted or a map revision with Federal Emergency Management Agency (FEMA) will be required.

HD-402.9 GROUND WATER RESOURCES

Aquifers and springs may provide drinking water to individuals or communities via recharge areas receiving surface drainage from sinkholes or other

groundwater supplies (water tables, etc.) The trend for many large communities nationwide is to obtain their drinking water from ground water resources because they are safer and require less chemical purification than surface water. The Safe Drinking Water Act and Underground Injection Control Program are the laws and regulations that pertain to this issue. Designated well-head protection areas may also have state or local regulations that must be considered.

HD-402.10 HAZARDOUS MATERIALS AND UNDERGROUND STORAGE TANKS

The potential impacts of hazardous material (HazMat) and underground storage tanks (UST) should be considered when developing projects. If it becomes necessary to acquire contaminated property, the Cabinet may assume liability and responsibility for cleanup which may lead to exorbitant costs and/or project delays. It is imperative that the project team takes adequate measures to identify and avoid, when possible, HazMat and UST sites before the initiation of final design and plan preparation. All known HazMat and UST sites should be shown prominently on the roadway plans. The Division of Environmental Analysis (DEA) has a list of property uses that may potentially include UST/HAZMAT conditions.

HD-402.11 NOISE

Baseline studies are used to determine the potential need for mitigation of adverse noise impacts to the community. This determination shall include a weighing of the benefits achieved; the overall adverse social, economic, and environmental effects; and the costs of the abatement measures. The FHWA regulations for mitigation of highway traffic noise in the planning and design of federally aided highways require the following during the planning and design of a highway project:

- Identification of traffic noise impacts
- Examination of potential mitigation measures
- The incorporation of reasonable and feasible noise mitigation measures into the highway project
- Coordination with local officials to provide information on compatible land use planning and control

The regulations contain noise abatement criteria which represent the upper limit of acceptable highway traffic noise for different types of land uses and human activities. The regulations do not require that the abatement criteria be met in every instance. Rather, they require a reasonable and feasible effort be made to provide noise mitigation when the criteria are approached or exceeded. Designers should look for ways to minimize noise intrusion into highway surroundings by utilizing noise barriers, earthen berms, vegetation, manipulating

geometrics, and other context-sensitive methods.

The designer should also keep in mind that noise impacts during construction may be mitigated by using alternative construction practices, and should include them, when practical, by notes on the plans or in the proposal.

KYTC's *Noise Analysis and Abatement Policy* can be viewed at:

http://transportation.ky.gov/Environmental-Analysis/Pages/Noise.aspx

HD-402.12 SECTION 4(F) RESOURCES

Federal Department of Transportation (US DOT) regulations afford protection to any publicly owned park, recreation area, wildlife or waterfowl refuge, or significant historic properties. These protections are defined as what is commonly referenced as Section 4(f). This protection is only afforded under federal DOT regulations and does not apply to actions taken by other federal agencies (USACE, US Coast Guard, etc.) or state and local agencies.

FHWA may only approve the use of land from any of these properties if it is determined that:

- There is no feasible and prudent alternative to the use of land from the property; and

- The action includes all possible planning to minimize harm to the property resulting from such use.

Information supporting such determination must demonstrate there are unique problems or unusual factors involved in the selection of avoidance alternatives or the cost, social, economic and environmental impacts or community disruption resulting from such alternatives reach extraordinary magnitudes.

Minor impacts that do not adversely affect the qualities that make the resource significant (such as strip takings) may be addressed through a programmatic Section 4(f) consultation or as a *de minimis* impact.

All federal-aid projects or projects requiring FHWA approval should be closely examined early in the project development process for potential Section 4(f) impacts. All reasonable measures should be taken to avoid such resources regardless of funding source.

HD-402.13 SECTION 6(F) RESOURCES

Section 6(f) resources are public parks or recreational lands that have used money provided by the National Park Service Land and Water Conservation Fund. No property acquired and/or developed under this section shall, without approval from the National Park Service, be converted to other than public outdoor recreation uses. Approval of such a conversion is granted only if it is in accord with the existing comprehensive statewide outdoor recreation plan and only upon such conditions as deemed necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

HD-402.14 SOCIO-ECONOMIC CONCERNS AND ENVIRONMENTAL JUSTICE

By executive order federal agencies are required to avoid, minimize and, if unavoidable, mitigate disproportionately high adverse effects on minority and low-income populations. Additional consideration may be appropriate for low-income family clusters. Effects would include impacts upon human health, environmental resources, and social and economic conditions. Efforts should be made to encourage the full and fair participation by all potentially affected communities in the transportation decision-making process.

Environmental justice, when properly implemented, affects all levels of transportation decision-making. This approach will:

- Make better transportation decisions that meet the needs of all people
- Design transportation facilities that fit more harmoniously into communities
- Enhance the public-involvement process, strengthen community-based partnerships, and provide minority and low-income populations with opportunities to improve their quality of life
- Minimize and/or mitigate unavoidable impacts by identifying concerns early in the process and provide offsetting initiatives and enhancement measures to benefit affected communities and neighborhoods

The total project should be reviewed to ensure actions resulting from transportation decisions do not result in a disproportionately high adverse effect on minority and low-income populations. For example, no decisions should be made as to location of transportation facilities simply because it's “cheaper” to affect lower cost housing as opposed to more expensive areas.

HD-402.15 STREAMS

When developing projects, the project team should consider and document the avoidance of stream impacts and stream channelization. Streams are generally

defined as:

- Perennial (flow year around)
- Intermittent (flows during certain times of the year, when groundwater provides water for stream flow)
- Ephemeral (flows only during and for a short time after rainfall events)

Placement of culverts or channelization resulting in stream loss can create long- and short-term impacts on water quality, as well as aquatic and riparian ecosystems, and may adversely affect domestic, municipal, and agricultural water supplies. Additionally, stream mitigation for these impacted waters is costly and time consuming. Avoiding or minimizing stream impacts can benefit the aquatic environment and minimize project costs and effects to project schedule.

Stream losses exceeding 300 feet or channelization exceeding 100 feet require a Section 401 Water Quality Certification from the Kentucky Energy and Environment Cabinet (KEEC), Division of Water, and General (Nationwide) or Individual Section 404 Permits from the U.S. Army Corps of Engineers (USACE). (further detailed in **HD-503**, "Types of Permits & Certifications").

The information required for the development of permit applications should be provided early in the project development process, but no later than right-of-way plan submittal in order to obtain approval from the necessary resource agencies. Plans depicting mitigation of impacted streams should be developed and included with the project, as advised by the subject matter experts. This mitigation plan development should be initiated during the development of right-of-way plans.

HD-402.16 WETLANDS

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (EPA, 40 CFR 230.3 and COE, 33 CFR 328.3). The basic premise is that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. When applying for a permit, the following must be shown:

- Steps are taken to avoid wetland impacts where practicable
- An attempt has been made to minimize potential impacts to wetlands

- Mitigation is provided for any remaining, unavoidable impacts through activities to restore or create wetlands

HIGHWAY DESIGN	*Chapter* ENVIRONMENTAL CONSIDERATIONS
	Subject Environmental Documents

HD-403.1 OVERVIEW

The environmental document records the project decision-making process. It documents the evaluation and selection of project alternatives, including consideration of engineering, environmental, and economic factors.

Per the National Environmental Policy Act (NEPA), federal regulations identify three means of documenting a project and analyzing the effects. The most appropriate type of document to use is dependent on project scope, scale of impacts, project complexity, and potential for controversy. The forms of NEPA documentation include:

- Categorical Exclusion (CE)
- Environmental Assessment (EA) and Finding of No Significant Impact (FONSI)
- Draft and Final Environmental Impact Statement (DEIS and FEIS) and Record of Decision (ROD)

For state-funded projects, environmental resources are typically documented in an Environmental Overview. The *Environmental Analysis Guidance Manual* provides a comprehensive description of these documents.

Development of federally funded projects must adhere to the "Federal Highway Environmental Decision Tree" shown in **Exhibit 400-01**. A federally funded project is defined as a project in which any phase or part thereof includes federal funding. Projects requiring federal land transfers/easements and federal permits (ACE, Coast Guard, etc.) can also qualify as federal undertakings and must comply with the NEPA process.

HD-403.2 CATEGORICAL EXCLUSION (CE)

CEs are defined as actions that do **not** result in the following:

- Significant impacts to planned growth or land use
- Relocation of significant numbers of people
- Significant impacts on natural, cultural, recreational, or historic features.
- Significant impacts to air, noise, or water quality

CEs, individually or cumulatively, do not have any significant environmental impacts and are excluded from the requirements typically necessary to prepare an EA or EIS.

Through a programmatic agreement with FHWA-Kentucky Division, CEs are processed as one of four types or levels. The appropriate type or level is dependent upon the context of the project and intensity of the impacts. Projects with little to no impact are processed using either a Categorical Exclusion for Minor Projects (CEMP) or a CE Level 1, which is typically prepared in the district office and approved by the environmental coordinator and project manager. A specific list of CEs that do not require any approval from FHWA is found at 23 CFR 771.117(c) and in the KYTC *Categorical Exclusion Evaluations Users Manual*. Additional project types requiring more comprehensive documentation may also be processed without FHWA approval as either a CE Level 1 (prepared in the district) or as a CE Level 2 (prepared by the DEA). Projects having greater impact to the environment may be processed using a CE Level 3 if the projects meet the criteria established in 23 CFR 771.117(d) and have FHWA approval.

Depending upon the potential for project impacts and the necessity to consult with outside resource agencies, CEMP development may require a few days or two to three months. CE Level 1 documentation typically requires two to six months depending upon the resources affected, especially historic properties including archaeological resources. CE Level 2 or 3 documentation typically requires 6 to 24 months depending upon the complexity of the project, resources affected, securing resource agency agreements for mitigation, etc.

CE approvals expire after two years but may require reevaluation during that period if the project scope changes.

HD-403.3 ENVIRONMENTAL ASSESSMENT (EA)

The primary purpose of an EA is to help the Transportation Cabinet and FHWA decide if an EIS is needed. Baseline environmental studies are typically developed to assess the potential environmental impact of proposed project alternatives. The decision-making process is documented by inclusion of the

results of the baseline studies, as well as engineering and economic considerations. This process concludes with the determination of the final documentation as a CE, FONSI, or EIS. The document oftentimes, but not always, identifies the preferred alternative.

The project team, in consultation with FHWA, should determine the level of effort needed for determining the range of alternatives and EA documentation. EAs typically require 18-36 months to complete. Completion is dependent upon project complexity, range of alternatives analyzed, resources impacted, resource agency agreements required, and other factors.

HD-403.4 FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Following a public hearing, the FONSI serves as FHWA's approval of the EA's finding that the project will not result in any significant impacts. This document is preceded by an EA. The FONSI approval expires after two years but may require reevaluation during that period if the project scope changes. The development of a FONSI may require 6-15 months to complete. Completion is dependent upon necessary archaeological work, scope of the public comments received, and additional alternatives or studies required as a result thereof.

HD-403.5 ENVIRONMENTAL IMPACT STATEMENT (EIS)

Under the National Environmental Policy Act (NEPA), an EIS must be prepared when it is determined that a proposed action may significantly affect the quality of the human environment. An EIS is not merely a disclosure document, but is used in conjunction with other relevant information to plan actions and make decisions.

Following the publication of a Notice of Intent in the Federal Register, the EIS process results in three documents: the Draft EIS (DEIS), the Final EIS (FEIS), and the Record of Decision (ROD). Designers should consult with DEA and the project team regarding the time frame necessary to complete this process. A minimum of three years for this process should be anticipated with as many as two additional years, depending upon the complexity of the project and scale of the impacts.

The DEIS and FEIS approvals expire after three years but may require reevaluation during that period if the project scope changes. Reevaluation of an FEIS is required prior to any major project action (right of way, utilities, or construction).

HD-403.6 ENVIRONMENTAL REEVALUATIONS

Before advancing a project into any major phase, FHWA regulation 23 CFR 771.129 requires a reevaluation of environmental documents. The intent is to assess the project's current conditions and identify any changes that may affect previous project decisions. Changes to any of the following should be considered during reevaluations:

- Project Scope
- Project Area
- Regulation

Project changes that occur after approval of an environmental document must be clearly communicated among all project team members to assure project decision documents are properly updated.

HD-403.7 STATE-FUNDED PROJECTS

An Environmental Overview is typically adequate to address environmental issues for state-funded projects. The project team should consider project impacts and determine avoidance and mitigation measures protective of resources as required by the involved federal agencies or to the extent deemed appropriate.

State-funded projects do not require the approval of FHWA but may require an approval or permit from another federal agency subject to NEPA requirements. Examples of such actions include:

- US ACE permits
- Coast Guard permits
- Easements on purchase of federally-owned property or from within federally designated lands such as the Daniel Boone National Forest

These agencies must prepare their own NEPA document based upon project information provided by KYTC.

For state-funded projects where there is federal agency involvement, the project must be developed in a manner consistent with all NEPA requirements. NEPA requirements include:

- Analysis of alternatives
- Compliance with the National Historic Preservation Act (Section 106)
- Compliance with the Endangered Species Act, etc.

The project is not required to comply with FHWA-specific regulations or provisions, especially Section 4(f). Regardless of funding source, other environmental factors such as underground storage tanks, relocations, hazardous waste or cleanup sites, noise, etc. must be considered.

FEDERAL HIGHWAY ENVIRONMENTAL DECISION TREE