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5.0 PROJECT IMPACT ANALYSES

For all environmental documents, some level of data collection/records review, technical studies, and impact analysis is required. This chapter begins by defining the types of impacts (direct, indirect, and cumulative) that could result from a project. Next, the chapter describes the process for performing a records check, which should be completed early in project planning to help identify important environmental issues that should be considered in the highway location phase. Finally, this chapter discusses the individual technical studies and analyses that are required for the environmental documentation of a project.

The timing for undertaking the analyses and technical studies described in this chapter will differ from project to project. However, the environmental screening process should begin at the earliest phases, once the preliminary purpose and need, and study area are defined and before the EA, EIS, or CE document is initiated. Environmental screening occurs early in the project planning to identify issues that must be considered in establishing the project location. The timing of the tasks discussed in this chapter can also be influenced by any substantial issues or resource areas of concern that are identified early in project planning. Before beginning any project impact analyses, be sure to check with UDOT Environmental Services for the most recent policies and procedures.

For projects prepared pursuant to the terms of the 327 NEPA Assignment MOU or 326 CE MOU, unless otherwise stated, UDOT has assumed the FHWA responsibilities for following all federal laws, regulations, and guidance.

5.1 Types of Impacts

NEPA requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations are given due weight in project decision-making. To understand a project's potential benefit or harm to the environment, different types of impacts and different impact levels must be examined in this evaluation. As discussed in Chapter 3, the level of impact or potential impact is often the determining factor in selecting the appropriate NEPA document for a project. The level of analysis should be commensurate with the project's potential for causing impacts. Many of the technical areas have federal regulations and/or guidance that defines *impact* for that particular resource.

CEQ regulations define the impacts and effects that must be addressed and considered by federal agencies in satisfying the requirements of the NEPA process. There are three types of impacts addressed under NEPA and many other environmental regulations—Direct, Indirect (or secondary), and Cumulative (see Table 5-1). Impacts may be characterized as adverse, not adverse, or beneficial.

Table 5-1. Summary of Direct, Indirect, and Cumulative Effects

Characteristic of Effect	Direct	Indirect	Cumulative
Nature of effect	Typical, inevitable, or predictable	Reasonably foreseeable or probable	Reasonably foreseeable or probable
Cause of effect	Project	Project (if not for the project, this effect would not occur)	Project's effects and other reasonably foreseeable actions' effects
Timing of effect	Project construction and implementation	At some future time after direct effects*	At time of project construction* or in the future
Location of effect	Within project impact area	Generally outside the area of direct project impacts but within the boundaries of systems affected by project	Within boundaries of systems affected by project

Source: *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements*, Final Report, APR 327, Oregon Department of Transportation and FHWA, April 2001

* Indirect and cumulative effects could potentially occur before the project is built (for example, speculators initiating land-use actions in anticipation of project construction).

A. Direct Impacts

As defined in the CEQ regulations (40 CFR 1508.8[a]), *direct effects* are those “which are caused by the action and occur at the same time and place.” Impacts can be a physical impact to a resource, such as a property acquisition or removal of wetlands. Other examples of direct effects can include traffic noise increases, visual impacts, and changes in traffic circulation patterns or access.

1. Direct Impacts Analysis

Direct impacts are evaluated according to individual environmental resources present in the study area and regulations pertaining to those resources. The process for this analysis is explained in detail for each resource in Section 5.3, Resource-Specific Impact Analysis.

B. Indirect and Cumulative Impacts

In compliance with NEPA and CEQ regulations, the indirect and cumulative impacts of a project are determined along with the direct impacts. The degree to which indirect and

cumulative impacts need to be addressed in a NEPA document depends on the potential for the impacts to be adverse and will vary by resource, project type, geographic location, and other factors. This issue should be addressed, particularly when preparing an EIS or an EA, with other agencies and the NEPA participants during early coordination activities or scoping. Indirect and cumulative impacts, which are not as easily recognizable as direct impacts, are described below.

Guidance on assessing indirect and cumulative impacts can be found on FHWA's website. Particularly useful are FHWA's April 1992 position paper [Secondary and Cumulative Impact Assessment in the Highway Development Process](#) and its January 2003 Interim Guidance [Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process](#). Also see CEQ's [Considering Cumulative Effects under the National Environmental Policy Act](#) and AASHTO Practitioner's Handbook 12: Assessing Indirect and Cumulative Impacts under NEPA.

1. Indirect Effects

Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects can include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8). The terms *indirect effects* and *secondary effects* are used interchangeably by FHWA. These induced actions are those that would not or could not occur except for the implementation of a project. These actions are often referred to as "but for" actions and generally occur at a later time or some distance from the original action.

a. Indirect Effects Analysis

[National Cooperative Highway Research Program \(NCHRP\) Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects](#) presents the following eight-step process:

1. **Define the study area boundaries.** Set appropriate study area boundaries for the analysis of indirect effects as well as the timeframe for the analysis.
2. **Identify the study area communities' trends and goals.** Gather information on community trends and goals in the study area, focusing on socioeconomic and land-use issues.
3. **Inventory notable features.** Identify specific valued, vulnerable, or unique elements of the natural environment that will be analyzed in the assessment of indirect effects.
4. **Identify effect-causing activities of the alternatives.** Identify the cause-and-effect relationships between the transportation project and potential effects that

could come into conflict with the goals identified in step 2 or the notable features identified in step 3.

5. **Identify potential effects for analysis.** Compare the effect-causing activities developed in step 4 with the inventory of goals, trends, and notable features that make up the baseline conditions identified in steps 2 and 3.
6. **Analyze effects.** Determine the magnitude and location of the potential effects identified in step 5.
7. **Evaluate analysis results.** Evaluate the uncertainties in the methodology used to evaluate effects in order to better understand the analysis results.
8. **Assess consequences and develop mitigation.** Assess the consequences of the effects and develop strategies to address unacceptable effects, which occur when an effect identified in step 6 conflicts with a goal identified in step 2 or with a notable feature identified in step 3.

2. Cumulative Impacts

Cumulative impacts are impacts on the environment that result 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 Analysis

Cumulative impacts include the direct and indirect impacts of a project together with the reasonably foreseeable future actions of other projects. The spatial and temporal boundaries of a cumulative impacts analysis are uniquely determined for each resource that is studied. These boundaries should be determined by the project team in consultation with the lead agency. The cumulative impact analysis should be narrowed to focus on important issues at a national, regional, or local level. Therefore, not every resource will need a detailed cumulative impact assessment. If a project is not expected to cause a direct impact to a given resource, a cumulative impact analysis for that resource should not be necessary.

CEQ provides guidance for cumulative impact assessment in the report [Considering Cumulative Effects under the National Environmental Policy Act](#). Elements of this guidance include:

1. Identify the issues and resources of concern associated with the proposed project, and define the assessment goals.
2. Establish the geographic limits for the analysis. These might be different for different resources.

3. Establish the timeframe for the analysis.
4. Identify other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified during scoping in terms of their response to change and capacity to withstand stresses.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative impacts.
10. Consider modifying alternatives to avoid, minimize, or mitigate significant cumulative impacts.
11. Monitor the cumulative impacts of the selected alternative.

3. Other Considerations

Separate analyses should be conducted to evaluate the indirect effects of transportation projects and to evaluate project-related cumulative impacts. The NCHRP and CEQ approaches involve overlapping steps that can be conducted concurrently and support both indirect effect and cumulative impact processes. These include establishing the boundary and baseline conditions and trends for the resources of concern. The area of analysis for indirect and cumulative impacts might be different than the project study area.

The determination or estimation of future impacts is essential to both indirect and cumulative impact analysis. Indirect impacts should be related to the proposed project (the impact would not occur in the absence of the project). The cumulative impact analysis includes impacts of past, present, and reasonably foreseeable future actions by everyone. However, the focus must be on reasonably foreseeable actions—those that are likely to occur or probable, rather than those that are merely possible. The project's design year is typically used for the reasonably foreseeable future timeframe. The examination of indirect and cumulative impacts should address the functional relationships of resources within larger systems.

The issue of indirect and cumulative impacts can be discussed on a resource-by-resource basis and/or discussed in a separate section in the impacts chapter. Both processes should include consultation with stakeholders and the public, identification of

important trends and issues, and analysis of the potential for land-use change and related environmental impacts on valued and vulnerable resources.

C. Level of Impact

The determination of impact level considers both the context and the intensity of the impact. Regarding context, it is important to identify how sensitive the affected resource is. For example, is it of national, regional, state, or local significance? Is it a watershed versus a stream channel? Are a few houses affected or is a whole neighborhood affected?

The lead agency determines the level of significance after studying the potential impacts, considering applicable regulations, and consulting with project stakeholders. The level of significance should take into account the ability of the project proponent to mitigate the expected impacts.

Regarding intensity, the analysis determines how minor or severe the impact will be. For example, is public health or public safety involved? Is there a high degree of public controversy? Will the project affect a unique or unusual area? Will federally listed species be adversely affected? Or will the project have beneficial impacts?

It is important to avoid loosely using the terms *significant* or *significantly* to describe impacts in both technical studies and the NEPA document. If an impact is determined to be adverse, the determination must be supported by factual information.

5.2 Records Check in the Early Environmental Study Phase

A desktop records check should be conducted early in the environmental study phase, regardless of which development process is followed for a project. An early records check provides a sound basis for developing or refining alternatives for study in the NEPA document. The records check also provides the background information needed to undertake field surveys and assess project impacts.

A preliminary records check should be done during environmental screening, which occurs early in project planning while alternatives are being developed. It can identify issues of concern or sensitive resource areas early in the process. Environmental Services staff and/or consultants can participate in the early records check. A thorough records check should be conducted once the initial purpose of and need for the project have been identified in the NEPA process.

Initially the screening can be conducted as a desktop records check supplemented by a “windshield” survey or field reconnaissance by knowledgeable technical staff. The screening process helps to identify early important resources that must or should be avoided by the project. By laying out on a constraints map the information gathered in the

screening process, roadway designers and the public can see the environmental factors that must be considered in defining alternatives or options to address the transportation needs.

Different types of records can be accessed in different ways. Some records must be manually checked at agency offices. Other records are accessible online, and still other records are linked to a geographic information system (GIS), which allows data to be linked to geographic points (that is, maps).

GIS is used to access and manage multiple sets of geographically related information. ArcGIS software allows the planner to do virtually any GIS job at any scale of complexity, using tools such as ArcGIS to perform analysis and mapping tasks. These tasks can consist of managing data that include social and economic, land-use, floodplain, traffic and accident, utilities, and geological data and many others. GIS also allows different types of data to be joined by a common feature for data analysis and mapping purposes.

Data for Utah are available through the [Utah Automated Geographic Reference Center \(AGRC\) website](#). The AGRC website provides a number of GIS layers for the state including county boundaries, city limits, watersheds, detailed streams, streets, 7.5-Minute Series USGS Quadrangle maps, aerial imagery, soils, geology, public lands, scenic rivers, and land cover. Several other websites also offer GIS data. State and federal agencies, some cities, and some counties offer various other GIS data layers such as wildlife habitats, grazing allotments, and other resource-specific layers. These different types of data are useful when analysis and mapping are needed on a statewide basis or for specific regions.

UDOT has a [Planning and Environmental Linkage tool \(PEL\)](#) that can be used to perform concept level or broad corridor resource identification. The PEL tool has direct links to UDOT internal data and various external state and federal data sources.

UDOT also has an interactive mapping platform ([UPLAN](#)) to help visualize data, track assets, and aid in transportation planning.

Soils, wetlands, digital raster graphics, and U.S. Census data are all available for each county in Utah. Each of these data sets can be useful for data collection, analysis, and mapping. Downloadable digital wetlands data are available through the [National Wetlands Inventory website](#). Land-use and zoning data can be found in a GIS format in most, but not all, urbanized areas.

The above tools can be used to give a visual sense or “snapshot” of the study area conditions through detailed mapping. The mapping of data either manually or through the use of GIS is especially beneficial for analyzing census and socioeconomic data. In GIS, maps can be produced that spatially locate and compare data for different geographical sets (census blocks, cities, counties, etc.) such as population, density, employment, and housing data, all of which can be useful for environmental studies.

5.3 Resource-Specific Impact Analysis

A. Overview

Data gathering and technical studies are completed for two reasons: 1) to help develop the location and design of a project action alternative or alternatives and 2) to provide a comparison of environmental impacts between the no-action and action alternative(s) and between action alternatives, if more than one is under consideration.

The timing for the study phases can differ depending on the project development process that is being used by UDOT for the individual project. Field or baseline studies are typically completed first as part of the environmental screening process. The comprehensive impact analysis would come later, with full consideration given to the identified environmental factors. If conceptual plans are generated during the pre-NEPA transportation planning process, baseline studies, fieldwork, and the impact analysis can be done at the same time.

The sections below describe the data gathering and technical studies needed for the NEPA analysis. For each resource area, the discussion includes the applicable regulations, the methodology used to identify the affected resource and anticipated impacts to the resource, the agency or public involvement required, and the mandated review times that could affect the project schedule.

The data gathering and technical studies are prepared by technical specialists within UDOT or by consultants. UDOT Environmental Services technical staff or planners will generally oversee and review consultant studies or might request studies to be completed by other UDOT offices. Once the studies are completed, the findings are summarized in the NEPA document.

Sources for guidance on the preparation of the required NEPA analyses are discussed below for each resource. Additional guidance and information on specific environmental topics and other environmental requirements are found on FHWA's [Environmental website](#), [Environmental Review Toolkit](#), and [Environmental Guidebook](#). The FHWA Technical Advisory ([T6640.8A](#)) and publications issued by the [AASHTO Center for Environmental Excellence](#) should also be helpful.

B. Land Use

1. Laws, Regulations, and Guidance

The Utah State Legislature has delegated responsibility for land-use planning and regulation to the Counties and Cities. These local governments develop general or comprehensive plans for land development within their jurisdictional boundaries. The comprehensive, or general, plans often contain a transportation element that lists the

transportation improvements that would be needed to support anticipated land-use patterns. UDOT typically reviews these plans to help understand how the project could change land-use patterns and the relationship of planned land uses and road network needs. In accordance with the 327 NEPA Assignment MOU, UDOT shall ensure and document that for any proposed project the design concept, scope, and funding are consistent with the current Transportation Improvement Plan (TIP), Regional Transportation Plan (RTP), or Metropolitan Transportation Plan (MTP) as applicable. Additional types of plans that may be reviewed include, but are not limited to, local comprehensive plans, local capital improvement programs, agency short-range plans, and the long-range plans of the local metropolitan planning organizations. The project team considers each plan's consistency or lack of consistency with each alternative.

2. Introduction

This section will help the project team determine if any environmental laws and regulations with land-use-related requirements apply to the project and determine if the transportation project or program will be consistent with any applicable land-use plans and implementing regulations.

Land-use plans and zoning data are available from local, state, and federal sources. For the existing conditions, the existing land uses, current zoning, and future zoning or planned land uses within and adjacent to the project are described. Describe existing land use based on city or county maps or by conducting a field survey of the project area. Obtain city zoning information, master plans, and information about planned development and create land-use and zoning figures as necessary. For the environmental consequences, analyze the project's direct and indirect impacts to existing land use, future land-use plans, and zoning. Determine whether the reasonable alternatives are consistent with land-use plans and zoning, and determine mitigation measures.

3. Process

There is no established process that must be followed for evaluating impacts to land use, but the impact assessments must be conducted according to NEPA requirements and FHWA guidelines. The impact assessments consider short- and long-term impacts and construction-period impacts. The project team also identifies and evaluates alternative mitigation measures where impacts are considered adverse.

The project team conducts a records check, a field review, and a visit to the local planning office to collect the data needed to determine the project's impacts to land use and whether the project is consistent with area plans. In addition, contact with the local planning office can reveal land-development projects in the project area that are under consideration, in the planning stages, or under construction. It is not unusual for such changes to have occurred in the project area after the time the project was flown for

aerial photography or after the time that UDOT coordinated with local officials during the very early project development stage.

The project team then determines the direct and indirect land-use impacts of the project.

- **Direct Impacts.** Determine direct impacts by overlaying the project alternative(s) footprints over the existing land use, existing zoning, or planned land-use/zoning maps and calculating the affected acreage for each alternative.
- **Indirect Impacts.** Ask city and county officials, developers, stakeholders, and property owners how they anticipate the land uses will change as a result of the no-action and action alternatives. Describe these impacts in the indirect impacts section. This input should also be used to determine cumulative land-use impacts (the future land-use/zoning map should also provide this information). However, the focus of the indirect impacts analysis should be on actions that would happen only if the project is implemented. If actions would happen in the absence of the project, they are reasonably foreseeable future actions that should be considered in the cumulative impacts analysis.

The land-use data will form the basis for the land-use impact analysis conducted by the planner. The baseline land-use discussion describes the following elements:

- The general character of land use in the area; for example, areas of agricultural, residential, commercial, or industrial uses and the locations of community services. For a long corridor project, this can be done from one end to the other. (For example: The project begins in an area with small farms. To the north, the study area consists of 1970s subdivisions. The county high school is on the north side of the subdivision development on the west side of the existing road. At the project's northern end, the area has commercial strip development, including a "big-box" retailer.)
- Any planned developments in the area.
- Existing land-use plans and controls, including the growth plan, if one exists.

Examine the following issues in the impact analysis discussion:

- Is the project consistent with the comprehensive development plan of an area, and its transportation element, if one exists?
- Will the project cause changes in land use; for example, will it induce commercial development at an interchange where no development or no commercial development now exists? Will the development that would likely occur require changes to the zoning or subdivision ordinance? Will the project bypass an area lined with highway service businesses, thus eliminating the need for such services at that location? Will the project change a rural area to an area desirable for industrial development?

- How will the project affect the growth of an area?

C. Farmland

1. Laws, Regulations, and Guidance

- Agriculture and Food Act of 1981 (Public Law 97-98) containing the Farmland Protection Policy Act—Subtitle I of Title XV, Sections 1539–1549
- Utah Agricultural Protection Act, Utah Code Title 17, Counties; Chapter 41, Agriculture Protection Area; Part 4, Protection of Land in an Agriculture Protection Area
- Farmland Protection Policy Act Rule, 7 CFR 658
- [Natural Resources Conservation Service \(NRCS\)](#)

2. Introduction

Define the agricultural setting of the project area in terms of prime, unique, and state important farmlands. Describe Century Farms and Agriculture Protection Areas along with the type of farmland activities, and verify this information in the field as appropriate. A Century Farm is a farm that has been continuously owned by a family for 100 years or more. Information on such farms and other types of farmlands can be found through the Utah Department of Agriculture and Food.

In accordance with the federal Farmland Protection Policy Act (FPPA) of 1981, UDOT is required to consider the adverse effects of all federally funded transportation projects on farmland preservation. UDOT is required to consider alternative actions that could lessen those impacts. Utah law does not specifically protect agricultural land from development, but one of the purposes of Utah's zoning law is to support the state's agriculture. Zoning is established by a commission for each county that adopts a plan that assigns zone categories to all land within the county. Utah law also allows the formation of Agriculture Protection Areas (APA), which are geographic areas where agricultural activities are given special protections (see Table 5-2 below).

Table 5-2. Regulations That Apply to Farmland Resources

Farmland Resource	Characteristics and Requirements
Prime and Unique Farmland, State Important Farmland	<ul style="list-style-type: none"> • These are important farmlands as identified under the federal FPPA. • The program is overseen by the Natural Resources Conservation Service (NRCS). • Federal actions that could affect prime and unique farmland must have an FPPA evaluation. The evaluation is initiated by preparing a Farmland Conversion Impact Rating Form. • State and local governments work together to identify farmland of state and local importance.
Farmland of Local Importance (Cropland)	<ul style="list-style-type: none"> • Cropland generally is land under cultivation, but also includes pasture and fallow land. • Cropland can be irrigated or dryland (non-irrigated). • Cropland can be identified through a number of programs or methods. Cropland data are compiled by federal, state, and local governments.
Agriculture Protection Areas (APAs)	<ul style="list-style-type: none"> • These areas are lands devoted to agricultural use and identified as APAs according to Utah's Farmland Assessment Act. • Counties record (enroll), assess, and evaluate lands protected under the Farmland Assessment Act. Taxes on APAs are assessed based on the enrolled lands' productive value. • APAs are protected from regulations that would restrict farm practices, unless the regulations are required for public safety or are required by federal law. • Landowners choose to enroll in and withdraw from the program.

3. Process

The farmland impact assessment is undertaken by the project team during initial coordination and is coordinated with the state office of NRCS.

The purpose of the FPPA is to “minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural usages, and to ensure that federal programs are administered in a manner that, to the extent practicable, will be compatible with state, unit of local government, and private programs and policies to protect farmland.” If farmland, as defined in the FPPA, is converted to non-agricultural use by a project and if there are adverse effects (as defined by NRCS when the impact rating on the Farmland Impact Rating Form [AD-1006] exceeds 160), UDOT must examine alternatives to minimize the impacts. Pursuant to the FPPA, “farmland means prime or unique farmlands.”

In the following four situations, land does not meet the FPPA definition of farmland and no coordination with NRCS is needed:

1. Land is not farmland, either through its soil type as indicated on NRCS soils mapping as not suitable for agriculture or through consultation with NRCS. This situation also applies if land needed for right-of-way is clearly not farmland (for example, rocky or mountainous terrain or sand dunes). Completion of an AD-1006 form is not necessary.
2. Land is urban. Completion of an AD-1006 form is not necessary.
3. For linear development, land has already been converted for industrial, commercial, residential, or recreational activity. Completion of an AD-1006 form is not necessary.
4. If the arrangements for borrow areas or disposal sites are not directed by UDOT, then completion of an AD-1006 form is not necessary.

For projects requiring coordination with NRCS, the project team completes Parts I and III of the AD-1006, [Farmland Conversion Impact Rating](#) form during initial coordination. The planner completing the form uses available plans to calculate the amount of right-of-way that might be needed from land that does not fall under the four exceptions listed above. Analyze potential impacts to prime, unique, and state important farmland. Evaluate impacts to Agriculture Protection Areas. Analyze potential indirect impacts resulting from partial loss of farmland features, including water sources and structures. If the criteria on the FPPA screening sheet are exceeded, the AD-1006 form will need to be completed to determine whether the land to be taken by a federally funded corridor-type project is subject to the FPPA.

UDOT will send the AD-1006 form together with a copy of all maps showing the locations of reasonable project alternatives, to the NRCS state office. NRCS is required to respond within 45 days and will either complete Parts II, IV, or V or mark a “No” in Part II indicating that no farmlands are involved. Part V will contain a value rating between 0 and 100; the higher the rating, the greater the impact. Pursuant to the FPPA, UDOT coordinates an assessment of the potential farmland impacts for its project with the Utah NRCS office through the completion of the AD-1006 form.

If farmland involvement is indicated on the form by NRCS, then UDOT undertakes the assessment needed to complete Part VI. This task requires a review of aerial photographs and quad maps and possibly a field review. In-depth directions for this task are available online. Then, Part VII is completed to determine the level of significance of the farmland involvement. Projects receiving a total score of less than 160 points require only minimal level of consideration for protection, and no alternatives are required to be evaluated. For projects scoring 160 or higher, UDOT must consider alternatives that convert less farmland or that convert farmland of lower value.

Include in the NEPA document a copy of the completed AD-1006 form, if one is required for the project. The NEPA document summarizes the steps taken to comply with the FPPA and the results of the coordination. In addition, discuss any steps taken to reduce the amount of farmland impacts.

APAs are protected from state and local laws that would restrict farm practices, unless the regulations are required for public safety or are required by federal law. The county in which the APA is located cannot change the zoning designation of the APA land within the area unless all landowners give written approval for the change.

APAs cannot be condemned for highway purposes unless (1) the landowner requests the removal of the designation or (2) the applicable legislative body (that is, the legislative body of the county, city, or town in which the agriculture protection zone is located) and the advisory board approve the condemnation, provided that “there is no reasonable and prudent alternative to the use of the land within the Agriculture Protection Area for the project” (Utah Administrative Code, Section 17-41-405 (4)(a)). If protected agricultural areas remain in agricultural use after adjacent development, farm equipment access must be maintained to allow landowners to move farm machinery between parcels.

A landowner can petition the County to have his or her land designated as an APA. Once granted, APA status is typically maintained even after the property is developed and no longer in agricultural use, unless the property owner files a petition to remove the land from the APA. When this occurs, the rest of the APA maintains its status and the boundaries of the APA are redefined. APAs are reviewed every 20 years to determine if the APA status should be maintained, modified, or terminated.

D. Social Environment

1. Laws, Regulations, and Guidance

- Title VI of the Civil Rights Act of 1964 and related statutes
- 23 USC 109(h), Standards
- Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

2. Introduction

No template exists for evaluating social and community impacts. Evaluations will differ based on the scope and type of project and on the local context. For guidance, publications, such as [Community Impact Assessment: A Quick Reference for Transportation](#) (Publication No. FHWA-PD-96-036) will be useful. The community impact analysis ensures that impacts to the social environment are considered with other environmental impacts. There are no standard or uniform impact criteria or thresholds for

a community impact assessment as there are for air quality or noise impacts, for example. The lack of rigorous quantitative methodologies for determining “significance” complicates the analysis of community impacts. The major areas in the community impact assessment in which quantitative techniques can be used are analyses of population and housing characteristics.

3. Process

To prepare this analysis, the project team defines the study area and then completes the following study area tasks to create a community profile:

1. Obtain census data from the [U.S. Census website](#). If available, GIS can help to spatially plot the demographic data. Examine trends in population growth and demographics, ethnicity and race, age distribution, income levels, education levels, and employment status.
2. Obtain population projections. The Governor’s Office of Planning and Budget has developed [population projections for the state of Utah](#). In addition, local MPOs in urbanized areas also have population projection information.
3. Conduct a field review of the project area and locate community facilities (for example, hospitals, emergency services, fire departments, schools, police stations, recreation areas, and libraries), land-use concentrations (for example, residential/neighborhood areas, strip development, central business districts, neighborhood commercial areas, possible minority or low-income concentrations, and historic districts), types of businesses (including planned and approved future development), and parklands.
4. Contact or interview representatives from local governments and local chambers of commerce. Determine if there are any special populations or community issues.
5. Obtain employment (including unemployment) data from the Utah Department of Labor.
6. Conduct community surveys and/or workshops with various community members and groups as well as other outreach strategies.

Once the profile is established, use the baseline data to analyze the impacts of the project on the community. In general, the analysis addresses the following issues:

- How will the project affect interactions among individuals and groups?
- How will the project change social relationships?
- Will certain segments of the community become isolated and/or separated from the community by the project? Will the project reduce community cohesion?
- Is the design of the project compatible with community goals?

- What is the project's perceived impact on the quality of life?
- How will the project affect safety for motorists, non-motorized vehicles, and pedestrians? For school children and school buses?
- Will travel patterns be changed (for example, a change in access to community services or shopping areas)?
- Will residents or community services be displaced?
- Will recreation facilities be affected?
- How will the project affect emergency response times?

Public involvement is integral to the community impact assessment and the development of measures to avoid, minimize, or mitigate impacts. When adverse community impacts are identified, the planner works with the project development team to identify whether design or engineering options would address the impacts, starting with avoidance and then moving to minimization and mitigation techniques. If no options exist, enhancement opportunities that are considered a reasonable expenditure of funds could be included in a project, with UDOT's approval.

Develop neighborhood profiles that include population distribution, workers per household, growth rates, income, race, age, auto availability, commuting patterns, and unemployment using the most recent U.S. Census data as well as information from the local MPOs, the Governor's Office of Planning and Budget, and the planning departments of the cities in the study area. The neighborhood profiles also discuss the involvement of community and neighborhood organizations and the positions that these organizations have taken on past community development issues. Consider traffic, safety, security, accessibility to jobs, social services, recreation, noise, and the future development and zoning plans of the cities in the study area.

Identify impacts on neighborhoods from the neighborhood profiles developed from the alternatives analysis, U.S. Census data, county data, and other sources and from the ongoing public participation and scoping process. Quantify impacts wherever possible, and identify the types of individuals or groups that are most likely to be affected.

Obtain socioeconomic data for the study area that are the most current data available. For population, household, and employment information, use the most current estimates available from the local MPOs by traffic analysis zone (TAZ). For the remaining socioeconomic data, U.S. Census figures should be used.

Describe demographic data, including primary social and economic characteristics, for the study area. This includes characteristics of employment in the study area, current development and growth trends, distribution patterns, and projections for the future. Also, identify community facilities (police, fire, schools, and recreation) in the study area.

Assess the socioeconomic impacts associated with the project, including environmental justice considerations (see Section 6.3[G]). Evaluate any changes in neighborhood or community cohesion for various social groups as a result of the reasonable alternatives. In addition, identify specific social groups that would be specifically benefited, potentially harmed, or disproportionately adversely affected by the reasonable alternatives.

Conduct the impact assessment in accordance with NEPA requirements, FHWA guidance, and Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations. In the assessment, consider short- and long-term impacts and construction-period impacts. Where adverse impacts are expected, identify and evaluate possible mitigation measures.

E. Economic Conditions

1. Laws, Regulations, and Guidance

No regulations guide the evaluation of the economic conditions in a NEPA document, and the range of economic impact issues can vary greatly from project to project.

2. Introduction

Where there are foreseeable economic impacts, the environmental document should discuss the following for each alternative:

- The economic impacts on the regional and/or local economy such as development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales
- Impacts on the economic vitality of existing highway-related businesses (for example, gasoline stations and motels) and the overall local economy
- Impacts of the proposed action on established business districts, and any opportunities to minimize or reduce such impacts by the public and/or private sectors
- Impacts from construction

3. Process

Evaluate the economic impact on the regional and/or local economy as a result of the reasonable alternatives. Assess the economic impact of the reasonable alternatives on the economic vitality of the project area and established businesses. Identify joint development opportunities associated with the project.

Data and information for this analysis can be obtained from the following sources:

- U.S. Census (employment and income)
- Utah Department of Labor (county economic profiles and unemployment data)
- Local Economic Development Office, Chamber of Commerce, Planning Office
- Field review to locate existing and planned businesses
- Local government (tax base data)
- City and county websites (lists of large employers, their locations, and number of employees)
- USDA, National Agricultural Statistics Service, Census of Agriculture

To prepare the impact analysis, the project team should address the questions below, as applicable. These questions will typically be addressed *qualitatively* rather than quantitatively.

- Would the project encourage businesses to move to the area or to relocate within the area, close to the area, or outside the area?
- Would the project increase or diminish visibility for businesses that rely on drive-by traffic?
- Would the project increase or decrease parking for businesses?
- Would access changes help or harm business viability, including operating farms?
- How would the project affect employment (for example, would it facilitate a new industrial park and more jobs)?
- Would the project affect land or property values? For example, changes could improve access to an area, thereby increasing property values, or property values could decline due to a property's proximity to the facility or due to a new undesirable feature.
- Would the project encourage economic development?
- How would the project affect the tax base and property values (for example, would it remove taxable property from the tax base and change property values)?
- What effect would relocated businesses have on sales tax revenue?

F. Right-of-Way and Relocations

1. Laws, Regulations, and Guidance

- 42 USC 61, Uniform Relocation Assistance and Real Property Acquisition Policies for Federal and Federally Assisted Programs

2. Introduction

If displacement of residences, businesses, public facilities, or farms is required within the impact analysis area, UDOT must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC §4601 *et seq.*, as amended 1989). The Uniform Act ensures the fair and equitable treatment of persons whose real property is acquired or who are displaced as a result of a federal or federally assisted project. Government-wide regulations provide procedural and other requirements (appraisals, payment of fair market value, notice to owners, etc.) in the acquisition of real property and provide for relocation payments and advisory assistance in the relocation of persons and businesses.

The UDOT Right-of-Way Division handles relocations subsequent to the NEPA process. The guidelines used by UDOT for carrying out the provisions of this Act are contained in its [Relocation Assistance Brochure](#).

3. Process

The project team identifies and describes the real property proposed to be acquired, through purchase, easement, or other means, as a result of a project. This information is developed during the preliminary engineering phase of the project. The project team identifies property to be acquired based on the applicable County Assessor's information on properties in the corridor. The information identifies property boundaries, ownership, and encumbrances such as easements and structures. Describe the land to be acquired in terms of its acreage, location, use, number and condition of structures, and occupancy status. This information should be stored in a database along with a record of any conversations or coordination with the property owner. The database should be turned over to the UDOT Right-of-Way Division at the conclusion of the NEPA process.

If a proposed acquisition would result in displacement, prepare a summary of households or businesses that would be displaced. This information is based on a visual inspection of the property and available public records. A relocation occurs when constructing the project would require purchasing an occupied structure, such as a home or business. In such instances, affected residents or business owners would receive relocation assistance in addition to compensation for the fair market value of the property itself. The impacts of any acquisitions and displacements are identified and described in the NEPA document. During the final design phase of the project (at the time of actual property acquisition), UDOT's Right-of-Way Division assesses acquisition and relocation costs and determines impacts to those who are displaced as well as whether adequate, decent, safe, and sanitary housing and business locations are available. Relocation procedures for programs sponsored by UDOT are guided by the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970. The project team provides acquisition and displacement information to UDOT so that it can evaluate the

availability of adequate, decent, safe, and sanitary housing and business locations that are affordable by those who are displaced.

The project team also examines the secondary impact of the acquisition and displacement on the adjacent properties and surrounding area (including neighborhood disruption). Where adverse impacts are identified, the project team works to identify alternatives and other possible mitigation measures.

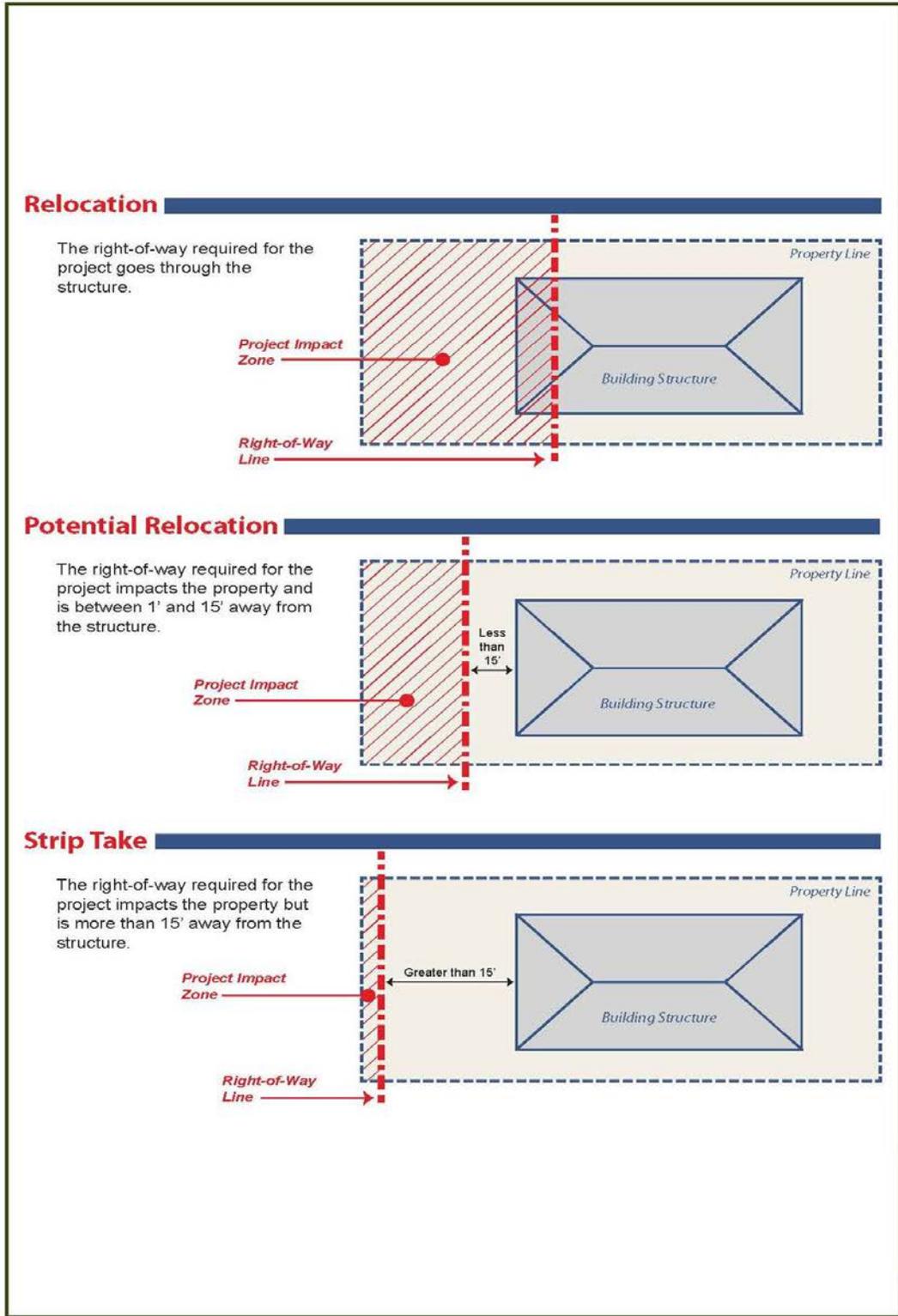
For residential relocations, the ability of residents to relocate in a given area depends partially on the housing market conditions in the area, so an overview of the current housing and rental market in the project region should be given. The purpose of this information is to help project decision-makers understand the available housing market so that they can manage any housing impacts associated with the project.

For UDOT NEPA documents, the following definitions are used to analyze the impacts of relocations:

- A *relocation* occurs when an existing structure would be within the right-of-way of a proposed alternative, the entire property needs to be acquired, and the residents or business would need to relocate.
- A *potential relocation* is a situation in which a property would be directly affected by the project and an existing structure (excluding porches and garages) would be within 15 feet of the proposed right-of-way, but it is not clear whether the entire property needs to be acquired (the value of 15 feet is only a “rule of thumb” to assess which properties might need to be relocated as a result of the project)¹. See Figure 5-1 below for an illustration of how potential relocations are considered. By the end of the right-of-way acquisition phase, UDOT will determine whether each potential relocation is a full relocation or a strip take (see below). This determination depends on an independent valuation of the property that includes any project-related damage to buildings.
- A partial acquisition (colloquially referred to as a *strip take*) generally occurs when a property is located within the proposed right-of-way, but the right-of-way is more than 15 feet from an existing structure¹ (see Figure 5-1 below). For this type of impact, only a strip of land would need to be acquired. As with potential relocations, UDOT could refine strip takes during the right-of-way acquisition phase.

¹ It may be appropriate to use different distances in an evaluation. The reason(s) for using a selected right-of-way distance in an evaluation should be documented in the project file.

Figure 5-1. Property Impact Descriptions



G. Environmental Justice Populations

1. Laws, Regulations, and Guidance

- [Title VI of the Civil Rights Act of 1964](#)
- [UDOT Title VI Program](#)
- [Civil Rights Restoration Act of 1987](#)
- USDOT EJ Order 6640.23A and [Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations \(Executive Order 12898\)](#)
- [U.S. Department of Transportation \(USDOT\) EJ Order 5610.2 \(a\)](#)
- [Federal Highway Administration Environmental Justice Reference Guide](#)
- [23 USC 109\(h\)](#)
- [49 CFR Part 21.9\(b\)](#)
- [Uniform Relocation Assistance and Real Property Acquisition Act of 1970](#)
- [Council on Environmental Quality's Guidance for Environmental Justice \(December 10, 1997\)](#)

2. Introduction

Environmental justice (EJ) has its origins in Title VI of the Civil Rights Act of 1964. In 1994, Executive Order 12898 was issued and gave a renewed emphasis to Title VI and added low-income populations to those protected by the principles of environmental justice.

There are three fundamental principles at the core of environmental justice as expressed in [FHWA's Transportation and Environmental Justice Case Studies publication](#) and the [FHWA Environmental Justice website](#):

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction in, or substantial delay in the receipt of benefits by minority and low-income populations

Minority and low-income populations as they apply to environmental justice are defined as:

- **Black** – a person having origins in any of the black racial groups of Africa.
- **Hispanic** – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- **Asian American** – a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.
- **American Indian or Alaskan Native** – a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
- **Low-Income** – a person whose household income (or, in the case a community or group, whose median household income) is at or below the [U.S. Department of Health and Human Services poverty guidelines](#).

a. Identification of Regulations

1) [Title VI of the Civil Rights Act of 1964](#)

Title VI of the 1964 Civil Rights Act provides one of the principal legal underpinnings for environmental justice. It states that “No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” Title VI prohibits recipients of federal funds from actions that reflect “intentional discrimination” or that exhibit “adverse disparate impact discrimination” on the basis of race, ethnicity, or national origin.

2) [Civil Rights Restoration Act of 1987](#)

The Civil Rights Restoration Act of 1987 amended Title VI so that recipients of federal aid must comply with the non-discriminatory requirements in all their activities, not just the programs and activities that directly receive federal support. That is, government agencies that receive any federal funds must avoid discriminatory impacts not only when setting policy for federally funded programs, but also for programs that are entirely state-funded or locally funded.

3) [Executive Order 12898](#)

Environmental justice was first identified as a national policy in 1994 when President Bill Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order requires that each federal agency, to the greatest extent allowed by law, administer and implement its programs, policies, and activities that affect human health or the environment so as to identify and avoid “disproportionately high and adverse” effects on minority and low-

income populations. Executive Order 12898 applies to a wider population than Title VI, which does not cover low-income non-minority populations.

4) [USDOT Order on Environmental Justice](#)

In April 1997, the U.S. Department of Transportation issued the *Order To Address Environmental Justice in Minority Populations and Low-Income Populations*. As USDOT's response to Executive Order 12898, this order generally describes the process for incorporating environmental justice principles into USDOT programs, policies, and activities. The objective of the order is to ensure that the interests and well-being of minority populations and low-income populations are considered and addressed during transportation decision-making and to achieve this by working within the existing statutory and regulatory requirements. Like Executive Order 12898, the USDOT order does not create a new set of requirements for state and local agencies but is intended to reinforce considerations already embodied in existing law, such as NEPA and Title VI. The order states that USDOT will not carry out any programs, policies, or activities that will have a disproportionately high and adverse effect on minority populations or low-income populations unless "further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effect are not practicable."

This order was updated in May 2012. On June 14, 2012, FHWA issued Order 6640.23a, which established FHWA's policies and procedures for complying with its obligations under the executive order. FHWA's Order 6640.23a provides specific language to use in NEPA documents when environmental justice populations are not found within the impact analysis area or when populations are present but will not experience disproportionately high or adverse impacts as a result of the project. In Order 6640.23a, FHWA defines low-income and minority populations as shown in Table 5-3 below.

b. Definitions

The definitions presented in Table 5-3 are taken from the USDOT Order 6640.23a on Environmental Justice.

Table 5-3. Environmental Justice Definitions

Term	Definition
Low-income	A person whose median household income is at or below the Department of Health and Human Services poverty guidelines .
Minority	Any person belonging to any of the following five groups: <ul style="list-style-type: none"> • Black (a person having origins in any of the black racial groups of Africa); • Hispanic or Latino (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); • Native Hawaiian and other Pacific Islander (a person having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands); • Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or • American Indian or Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).
Low-income population	Any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed USDOT program, policy, or activity.
Minority population	Any readily identifiable groups of minority persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed USDOT program, policy, or activity.
Adverse effects	The totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to, bodily impairment, infirmity, illness, or death; air, noise, and water pollution and soil contamination; destruction or disruption of human-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of benefits of USDOT programs, policies, or activities.
Disproportionately high and adverse effects on minority and low-income populations	An adverse effect that: <ul style="list-style-type: none"> • Is predominantly borne by a minority population and/or a low-income population, or • Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

In April 2015, FHWA issued the [Federal Highway Administration Environmental Justice Reference Guide](#) for addressing environmental justice under NEPA. The document does not establish any new requirements or replace any existing guidance, but is instead a

resource for DOT and FHWA staff to help them ensure compliance with EJ requirements. EJ at FHWA means identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority¹ populations and low-income populations to achieve an equitable distribution of benefits and burdens. This also includes the full and fair participation by all potentially affected communities in the transportation decision making process.

3. Process

There is no established process that must be followed for evaluating impacts to environmental justice populations. As project teams evaluate and understand specific project contexts, they develop project-specific processes. This guidance offers suggestions for project teams to consider, but it is not intended to be prescriptive or all-inclusive. Two suggested processes are included as flowcharts. Both flowcharts are essentially the same, but the suggested steps are in a different order.

- In one process (see Figure 5-2), the presence and locations of environmental justice populations are determined first, and then project-level impacts are analyzed to determine if disproportionate impacts would occur. This approach might be appropriate when preliminary investigations reveal a high likelihood of environmental justice populations within the project study area.
- The second process (see Figure 5-3) first focuses on the nature of the project impacts and then, if necessary, identifies the potential for environmental justice populations. This approach might be warranted when preliminary investigations reveal a lower likelihood of environmental justice populations in the project study area or where there is a low likelihood of project-related adverse impacts.

Since project impacts vary, project teams should carefully consider the project context when determining which process to select.

This guidance also includes a list of techniques that can be used to identify environmental justice populations (see Table 5-4). These techniques have been gathered through training exercises and project-related experience. Project teams select the activities that will be most effective in determining the presence of environmental justice populations. Also included is a list of potential environmental justice impacts and a series of suggested questions to ask to help project teams determine if the project will have disproportionately high and adverse impacts (see Table 5-5). These lists are not intended to be prescriptive or all-inclusive.

The list below includes several of the questions asked in each of the flowcharts. In addition, the list provides some guidance and suggestions about how project teams can select appropriate activities to answer the questions.

- **Are EJ populations likely in the project area?** USDOT/FHWA guidelines describes an EJ population as a “readily identifiable group of minority and/or low-

income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons.” Often projects use threshold levels for the percentage of minority or low-income populations. Thresholds can be developed by using state, county, or city-level census data or other appropriate measures. Those census blocks or block groups in the project area that exceed thresholds can be determined as areas of concern where EJ populations are more likely. Other methods can also be used.

- **Identify EJ populations.** The presence or absence of EJ populations can be confirmed in a variety of ways. See Table 5-4 below as a starting point.
- **Are there adverse project impacts?** Use existing methodology to determine if adverse project impacts occur (see Table 5-5 below).
- **Are the impacts disproportionately high and adverse?** The USDOT/FHWA guidelines define a *disproportionately high and adverse* effect as an effect that:
 - Is predominantly borne by a minority and/or low-income population, or
 - Will be suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

a. Thresholds

Thresholds are often a component of data-driven evaluation techniques and serve as a way to define the level of environmental justice concern based on demographics. The source of the demographic data is often census data but can also include subsidized and low-income housing data and school data. Thresholds can be established to categorize and prioritize areas based on level of concern but are arbitrary. If project teams elect to use thresholds as part of their environmental justice process, careful consideration should be used in selecting the geographic limits of the area used for comparison. For many projects, use of state-level census data might be too broad for a useful comparison. Likewise, county-level census data, while convenient, might also be too broad for an effective comparison. [NCHRP Report 532, Effective Methods for Environmental Justice Assessment](#), has some useful suggestions for conducting a threshold analysis.

b. Report Content

No technical reports are mandated by state or federal law. However, it might be appropriate to prepare a more detailed report or analysis if preliminary research shows high concentrations of minority or low-income populations in the project area, or if environmental justice concerns are voiced by the affected community or can be reasonably anticipated by the project team.

Since project characteristics vary, reporting of environmental justice identification and impact evaluation will also vary. Project teams should consider including the following information in their report:

- Summary of related laws, regulations, and guidance
- Definition of adverse and disproportionate impacts (from the USDOT order)
- Document data sources and methods for determination
- Description of the study area and its demographics using narrative and maps
- Summary of public interaction strategy
- Description and maps of impacts and benefits to affected populations
- Description of specific interactions with the affected communities and results
- Environmental justice determination(s)
- Discussion of mitigation options, if applicable

At a minimum, the environmental justice process and results are documented in the environmental document. The discussion includes a description of the process used and the rationale behind the decision. The discussion also includes what methods and tools were selected to identify environmental justice populations and why they were selected. Finally, the discussion includes the outcomes of the selected activities and the conclusions drawn from those results.

Table 5-4. Tools To Identify Environmental Justice Populations

Tool	Information It provides	Suggested Uses	Limitations
U.S.Census data	<ul style="list-style-type: none"> • Demographic information at the state, county, census tract, block group, and block levels • Data include race, ethnicity, and income levels 	<ul style="list-style-type: none"> • Appropriate for most projects • Can be used to establish thresholds • Statistical analysis could be helpful • Provides indication of population in the project study area 	<ul style="list-style-type: none"> • Data can be old • Requires some confirmation because populations are not distributed uniformly
USDHUD Section 8 Housing and Federal Empowerment Zone/Renewal Communities Locator	<ul style="list-style-type: none"> • Location of subsidized housing 	<ul style="list-style-type: none"> • Use to identify low-income housing, which could indicate a low-income population • Use to confirm assumptions from census data 	<ul style="list-style-type: none"> • There might be other low-income families besides those in subsidized housing
USDOE National Center for Education Statistics	<ul style="list-style-type: none"> • Race and ethnicity of students • Students eligible for free and reduced-price meals • Migrant students 	<ul style="list-style-type: none"> • Use to confirm census data 	<ul style="list-style-type: none"> • Data are typically not for current school year • School boundaries might not coincide with other data sources
Field surveys	<ul style="list-style-type: none"> • Presence and location of sensitive receptors, public spaces, and residential and business characteristics 	<ul style="list-style-type: none"> • Use to confirm census data • Understand more of what is in the community 	<ul style="list-style-type: none"> • Visual cues are not always reliable
Public involvement	<ul style="list-style-type: none"> • Helps public to understand the nature of the project and allows public opportunity to provide input on the project and impacts 	<ul style="list-style-type: none"> • Gain refined understanding of project population makeup and also population areas of concern 	<ul style="list-style-type: none"> • Need to understand the community in order to tailor the public involvement effort (for example, if community members are employed in different shifts, the team might need to hold meetings at non-traditional times and might need to provide food, transportation, or child care)

Table 5-5. Assessing Project-Level Impacts

Potential Impact	Questions To Ask	Follow-up
Air quality	<ul style="list-style-type: none"> • Are there intersections in violation of air quality standards? • Are there other non-regional air quality concerns? • Are there concerns about mobile-source air toxics? 	<ul style="list-style-type: none"> • Determine the locations of intersections in violation of air quality standards.
Hazardous materials	<ul style="list-style-type: none"> • Will the project create or alter hazardous material transfer routes? 	
Water quality	<ul style="list-style-type: none"> • Will the project reduce water quality? • Are there populations who use or need water differently? What will the impacts be to those populations? 	
Pedestrians/bicyclists/transit	<ul style="list-style-type: none"> • During construction, will existing sidewalks, bicycle paths, and transit stops remain available? • Will the project place sidewalks or bicycle paths in some areas but not in others? • Will access to sidewalks and bicycle paths be equal? 	
Community cohesion/social impacts/isolation	<ul style="list-style-type: none"> • Will the project remove or relocate community services or other places of importance? • Will travel time and access to community services be adversely affected? • Are community members interdependent? How will the project affect that interdependence? • Will human-made dividers (such as bridges or four-lane or wider roads) segment existing communities? • Is the proposed project perceived to significantly benefit one portion of an existing neighborhood and significantly harm another portion of the same neighborhood? • Will access roads into and out of the project area be dead-ended or cut off? • Will roads, bridges, and other traffic improvements be constructed to surround the project area and create the feeling of an isolated "island"? 	

Table 5-5. Assessing Project-Level Impacts

Potential Impact	Questions To Ask	Follow-up
Business/community economic vitality	<ul style="list-style-type: none"> • Does the project area contain businesses that are owned by or cater to minority and/or low-income populations? • How will these types of businesses be affected by construction? • Will property owners' land values change? • Will the number and types of jobs available in the area change? • Will travel time to jobs change? • Will the project area become a more attractive place for employers to locate their facilities? 	<ul style="list-style-type: none"> • Determine if any businesses will require relocation. • Work with business owners on relocation specifics (new location, etc.).
Bodily impairment, infirmity, illness, or death	<ul style="list-style-type: none"> • Will safe and easy access to community or regional resources (shopping, transit stops, schools, etc.) be changed? • Will traffic speed or volume change? • Will the project change traffic volumes or traffic patterns on local streets? 	
Right-of-Way/relocations/displacement of persons, businesses, farms, or nonprofit organizations	<ul style="list-style-type: none"> • Will the project require acquisition of right-of-way or relocations? • How many will be displaced? 	
Transportation accessibility/mobility/congestion	<ul style="list-style-type: none"> • Will the project increase travel times, reduce mobility, or reduce the accessibility of the transportation network? • Will traffic congestion levels change? 	
Noise/vibration	<ul style="list-style-type: none"> • Will the project result in noise impacts to adjacent receptors? • Will vibration levels caused by increased traffic or transit improvements change? 	
Aesthetic values	<ul style="list-style-type: none"> • Will the view or vista change? • Will the amount of open space change? 	

Table 5-5. Assessing Project-Level Impacts

Potential Impact	Questions To Ask	Follow-up
Human-made or natural resources	<ul style="list-style-type: none"> • Will the number of trees and other plants change? • Will the number or size of parks, parkland, or outdoor recreation opportunities change? • Will the project affect a food source (for example, vegetation or wildlife) important to low-income or minority populations? 	
Availability of public and private facilities and services	<ul style="list-style-type: none"> • Will the travel time to public and private facilities and services (schools, medical facilities, shopping, etc.) change? • Will there be a change in the number and type of impediments to access public and private facilities (for example, more or wider roadway crossings, additional bus transfers, or increased walking distance between bus stops)? 	
Exclusion or separation of minority or low-income individuals within a given community or from the broader community	<ul style="list-style-type: none"> • Will the project increase the feeling of exclusion or alienation between the EJ population and the broader region? 	
Denial of, reduction in, or significant delay in the receipt of benefits	<ul style="list-style-type: none"> • Will access to or use of the transportation improvements be denied to any low-income or minority population or groups (for reasons such as cost, ability to access, etc.)? • Will the overall benefits and improvements being proposed by the plan or project be available at the same level and within the same basic timeframe to the target population as it will to the broader community? 	

Figure 5-2. Proposed Environmental Justice Process #1 – Population First

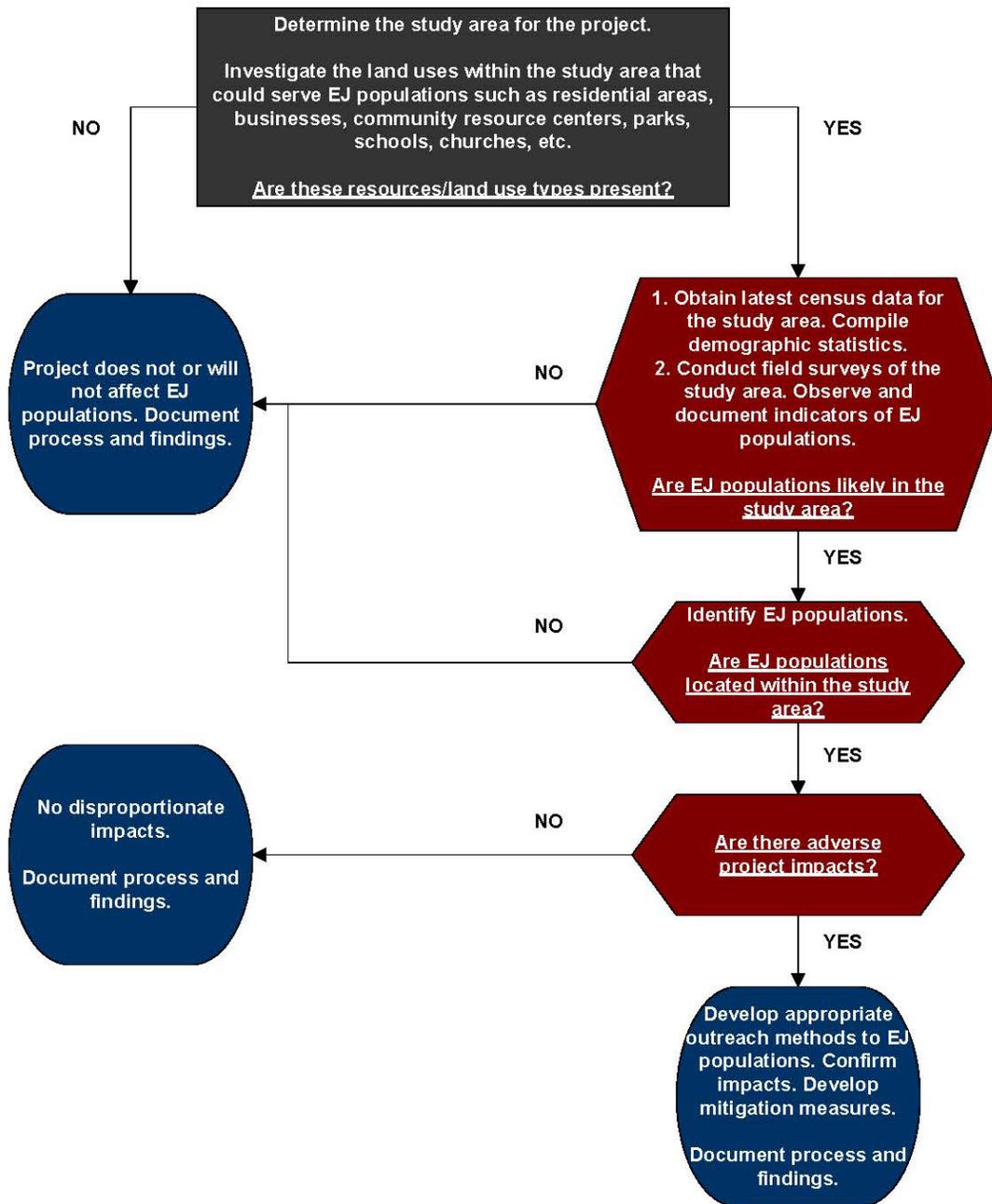


Figure 5-3. Proposed Environmental Justice Process #2 – Impacts First

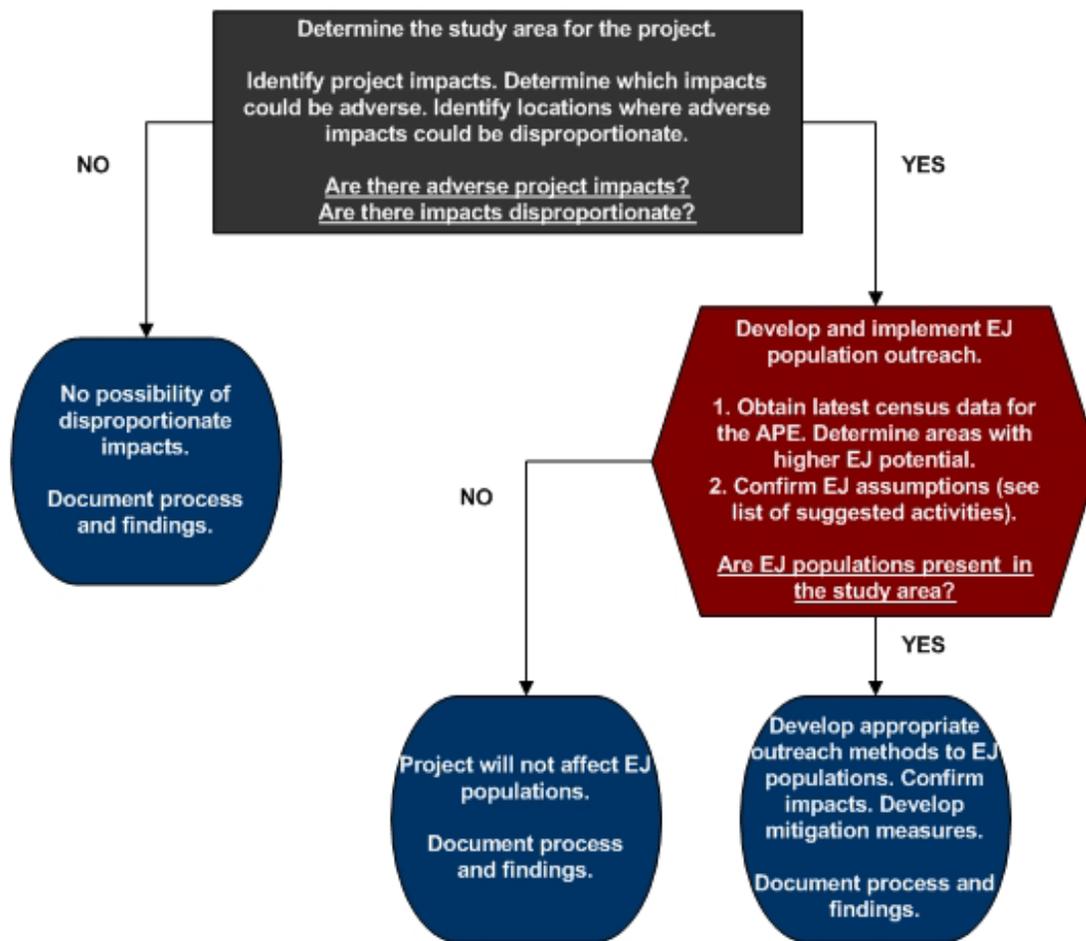
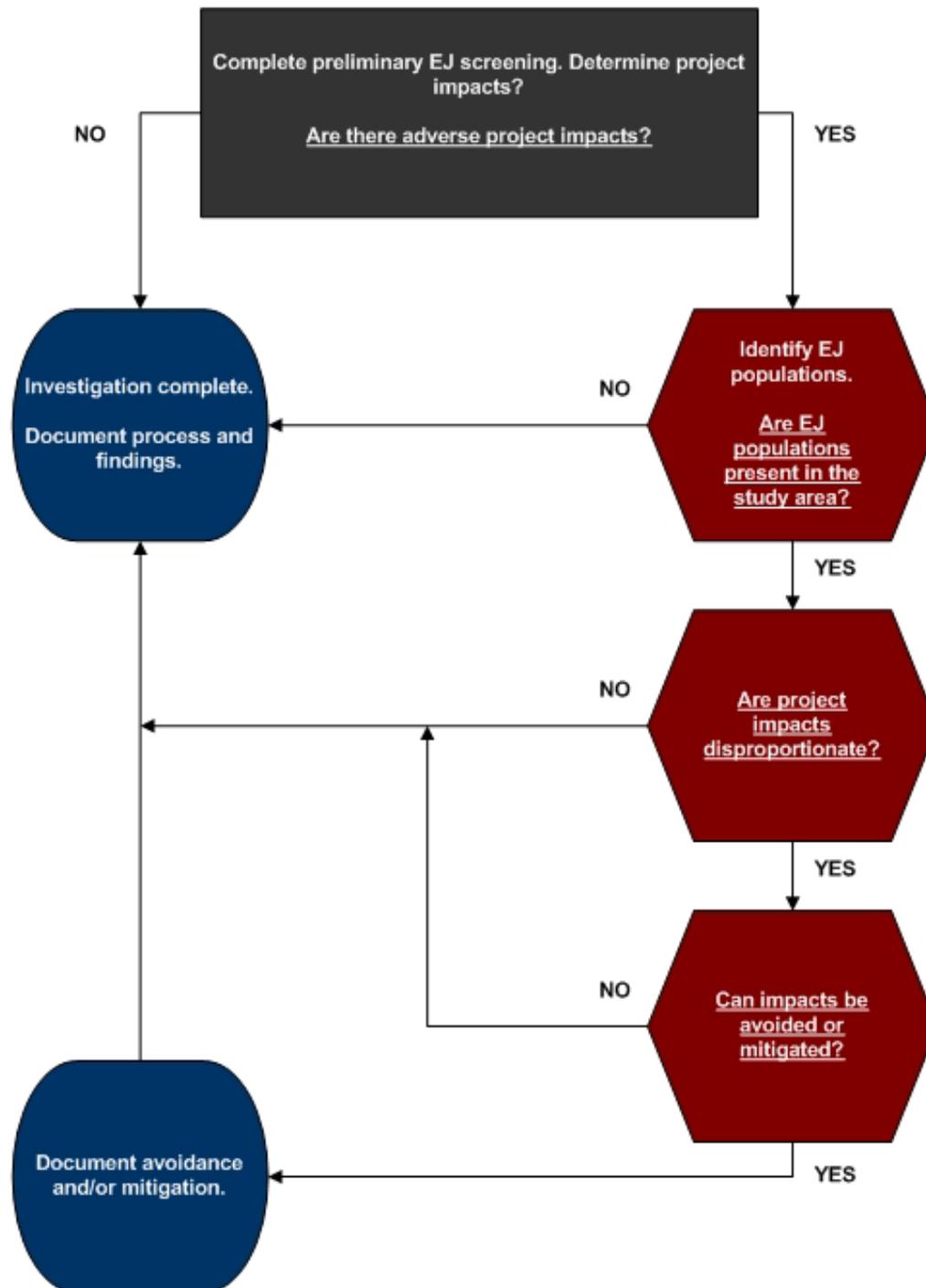


Figure 5-4. Proposed Environmental Justice Process #3 – Hybrid Approach



H. Transportation

1. Laws, Regulations, and Guidance

- General Bridge Act of 1946; 33 USC 52
- 23 CFR 652 (bicycle and pedestrian traffic)
- Americans with Disabilities Act (ADA)
- FHWA regulations, including 23 CFR 771
- FAA regulations

a. General Bridge Act

Under the General Bridge Act of 1946 (33 USC 525, formerly Section 9 of the Rivers and Harbors Act) and implementing regulations, the approval of the U.S. Coast Guard is required to construct a new bridge or reconstruct or modify an existing bridge over navigable waters of the United States. The purpose of the act is to preserve the public right of navigation and prevent interference with interstate and foreign commerce.

b. Americans with Disabilities Act (ADA)

The Americans with Disabilities Act, Public Law 101-336, enacted July 26, 1990, prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation. The ADA requires public transit agencies to provide any person with disabilities living within 0.75 mile of a bus route a ride from their home to the bus stop. Public transportation services are not covered by regulations for Title II, subtitle A, which prohibits discrimination on the basis of disability in all services, programs, and activities provided to the public by state and local governments (*Federal Register*, July 26, 1991). Regulations for Title III, 28 CFR 36, revised July 1, 1994, which prohibits discrimination on the basis of disability in public places, includes standards for accessible design, including minimum standards for ensuring accessibility when designing and constructing a new facility or altering an existing facility (Appendix A to 28 CFR 36).

c. FHWA Regulations

FHWA regulations covering federally aided projects include the following policy (in 23 CFR 652) on accommodation of bicyclists and pedestrians:

The safe accommodation of pedestrians and bicyclists should be given full consideration during the development of federal-aid highway projects and during the construction of such projects. The special needs of the elderly and the handicapped shall be considered in all federal-aid projects that include pedestrian facilities. Where current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort shall be made to minimize the detrimental

effects on all highway users who share the facility. On highways without full control of access where a bridge deck is being replaced or rehabilitated, and where bicycles are permitted to operate at each end, the bridge shall be reconstructed so that bicycles can be safely accommodated when it can be done at a reasonable cost. Consultation with local groups of organized bicyclists is to be encouraged in the development of bicycle projects.

d. Federal Aviation Administration (FAA) Regulations

FAA Regulations, Part 77 (January 1975), include guidance relevant to design of road projects that would affect navigable airspace.

2. Introduction

The transportation analysis addresses the expected impacts of UDOT projects on transportation. The analysis documents the existing and future conditions of the road and transit network in the study area, identifies areas of need, and assesses the impacts of the reasonable alternatives based on a comparison with the no-action alternative. This element of the built environment includes the movement or circulation of people and goods, specifically transportation systems; vehicle traffic, traffic hazards, and parking; and waterborne, rail, and air traffic. In addition, FHWA guidance highlights bicycle and pedestrian travel considerations.

Presumably UDOT projects are designed to improve transportation systems, including multiple modes of travel, so adverse transportation impacts are atypical. However, transportation impacts need to be considered and, if necessary, mitigated for, especially those that can occur during construction. Highway projects can affect transportation in many ways, including conflicts between local traffic and added regional or subregional traffic at new or revised access points, increased volumes in single-occupancy vehicle and high-occupancy vehicle lanes, increased safety hazards for bicyclists and pedestrians, and increased congestion or interrupted access during construction. This section covers the impacts of highway projects. Ferry, rail, and aviation projects could have similar impacts, such as traffic congestion and safety hazards, especially during construction.

3. Process

a. Baseline Data

Using existing traffic and transit counts, evaluate existing traffic and transit patterns in the study area. In the analysis, emphasize transportation facilities, since the performance of the road network is important to understand and document. Include a summary of road congestion and variability in travel time. Also, evaluate existing transit conditions and

include a summary of transit boardings, means of access to transit, and transit level of service for bus and light rail.

Include a description of the existing highway/roadway network, average daily traffic volumes, and congestion levels on key roads that intersect the reasonable alternatives. Also include a description of and information regarding the existing transit services, transit-related parking and park-and-ride lots, pedestrian/bicycle facilities, and highway-rail grade crossings in the study area. Use baseline data to describe existing travel demand and level of service in the study area and connecting arterials.

Review the most recent traffic and transit projections available from UDOT, the local transit authority, and the local MPO and incorporate them into the study or adjust them as necessary. Use the regional travel model from the MPO to understand how well the reasonable alternatives would meet the travel demand in the study area. The model should provide an estimate of travel demand and transportation level of service in the future with important outputs including travel times, transit ridership and market share, and new transit riders. Discuss the general impacts of the project on the road networks. Use transportation demand modeling to determine any changes in demand that would affect the other transportation systems and to determine the best approach to mitigate any adverse impacts. In addition, model the changes in operations of any transportation systems in a simulation tool using the changes in travel demand to determine any detrimental effects of the operations and how those operations can be improved for the benefit of all modes of travel.

The traffic data from the MPO will include existing, or baseline, traffic and projected traffic, with or without the project. Traffic is assigned to the local road network and is shown on a map. This information can be used for both a level of service analysis and for conducting air and noise analyses.

For the traffic impact analysis, show how the project would reduce traffic congestion, particularly if this is one of the purposes of the project. For example, in order to show this for a new road, a level of service (LOS) analysis is done for existing local roads that are currently being used, such as parallel routes. This analysis would show how these roads operate under existing conditions and how they will be improved under future conditions with the proposed improvements. In other words, if one of the purposes of the project is to “relieve traffic congestion,” as is often the case, the document must objectively document that the improvements would accomplish this result.

Review the impacts of the project on adjacent surface streets to make sure the system can adequately and safely collect and distribute any new traffic loads resulting from new or revised access. Identify and document any expected impacts on the following conditions, along with mitigation for adverse impacts:

- Any new congestion points, as well as congestion points that would be eliminated or reduced
- Corridor efficiencies through improved integration and maximized opportunities for public transportation
- Traffic detours or diversions
- Safety hazards (accident frequency related to trip volume)
- Transit routes
- Surface street conditions that would affect traffic entering or exiting traffic (interstate highways)

b. Parking

Parking issues can include impacts to public or private parking adjacent to the right-of-way and interim impacts such as construction parking, staging, and access. Local jurisdictions take the issue of parking seriously. Consult them early in project development to identify possible impacts, particularly if significant parking would be eliminated by a highway project and there is not enough space for replacement parking. If parking impacts would affect local businesses and/or low-income or minority populations, address these as social, economic, and environmental justice impacts.

I. Pedestrian and Bicyclist Issues

4. Laws, Regulations, and Guidance

- Intermodal Surface Transportation Efficiency Act (ISTEA)
- Transportation Equity Act for the 21st Century (TEA-21)
- USDOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure
- 23 USC 109(m), Protection of Non-motorized Transportation Traffic
- UDOT Policy 07-117 Inclusion of Active Transportation

The [USDOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure](#) was drafted in response to Section 1202(b) of the [Transportation Equity Act for the 21st Century \(TEA-21\)](#):

Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right-of-way or within the same transportation corridor.
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. *Excessively disproportionate* is defined as exceeding 20% of the cost of the larger transportation project.
- Where scarcity of population or other factors indicate an absence of need.

In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day.

There are growing efforts throughout the United States to improve conditions for bicycling and walking. Congress recognized this need in 1991 when it passed the [Intermodal Surface Transportation Efficiency Act](#) (ISTEA). ISTEA included a spending package that increased the responsibilities of local and state governments to plan and implement bicycle and pedestrian facilities. The funding infusion provided by ISTEA and continued by TEA-21 in turn fueled even stronger efforts to build trails and to renovate streets and roads for bicycling and walking. Section 1202(a) of TEA-21 states that “bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation facilities, except where bicycle and pedestrian use[s] are not permitted.” That section of TEA-21 also states that “transportation plans and projects shall provide due consideration for safety and contiguous routes for bicycles and pedestrians.”

In addition, 23 USC 109(m) states that the USDOT Secretary “shall not approve any project or take any regulatory action under this title that will result in the severance of an existing major route or have significant adverse impact on the safety for non-motorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists.”

5. Introduction

Existing and proposed pedestrian and bicycle facilities are typically defined in the long-range transportation plans for the MPO in the study area. The bicycle and pedestrian portions of these long-range plans provide a comprehensive view of the regional pedestrian and bicyclist system. These plans have been compiled with input from the cities and counties and identify which pedestrian and bicyclist accommodations should be included in the regional system.

City and county governments also maintain plans that describe each community's vision for local bicycle and trail facilities. These local pedestrian and bicyclist systems are

documented in general plans, recreation plans, and/or transportation master plans for the communities.

When possible in the analysis, pedestrian and bicyclist facilities should be defined as Class 1, 2, or 3. A Class 1 facility is typically considered a “trail” and is separated from a roadway facility (for example, the Jordan River Parkway Trail). Class 2 or 3 facilities are typically considered bicycle “routes” and are included as part of an existing or proposed roadway, either as a dedicated bicycle lane or by sharing a travel lane with vehicles.

6. Process

UDOT is committed to working in a team environment to address the infrastructure needs of pedestrians and bicyclists throughout the state as much as is technically, environmentally, and financially feasible. UDOT promotes active transportation, referring to human-powered travel, and is focused on optimizing mobility as one of their four strategic goals. This includes developing facilities for the use of pedestrians and bicyclists and providing public educational, promotional, and safety programs. Additional information on active transportation can be found on [UDOT's website](#).

If non-motorized transportation is already a feature of a facility, the project team should consider preserving that function. In addition, changes in traffic or traffic patterns could transform a pedestrian-friendly environment into one in which walking or biking residents could be injured. Include a discussion of the results of this consideration in the NEPA document. If routes are cut off or removed, develop replacement routes and discuss this in the NEPA document. UDOT published [Guidelines for Bicycle and Pedestrian Accommodations](#) and the [Pedestrian & Bicycle Guide](#) and are available on UDOT's website.

J. Joint Development

1. Laws, Regulations, and Guidance

- FHWA Technical Advisory T6640.8A

Under the Technical Advisory, an agency developing a project that uses federal money should identify and discuss those joint-development measures that will preserve or enhance an affected community's social, economic, environmental, and visual values.

2. Introduction

Joint development is a term used by FHWA which, in this context, encompasses opportunities and expected impacts that are also addressed elsewhere in the NEPA document (for example, opportunities to construct pedestrian and bicycle trails). Often, joint development is described as an effort by a public agency and a private developer to

undertake a construction project. Joint developments are usually a voluntary joining of government entities with private for-profit organizations to undertake mutually beneficial development in connection with public infrastructure. A joint-development agreement generally contains formal legally binding language between a public entity and a private individual.

Projects can also be initiated through a co-development. A co-development is an informal working arrangement in which the public agency and the private developer work together to complete their individual projects in a mutually beneficial way. The co-developers usually attempt to site and coordinate their projects based on a non-binding legal agreement.

3. Process

The joint-development impact analysis area typically includes those current and proposed facilities, such as trails and parks that can be developed or planned along with the project. These facilities would be within the right-of-way of the project or immediately adjacent to the project. Successful joint development requires proper planning and supportive zoning.

K. Air Quality

1. Laws, Regulations, and Guidance

- [Clean Air Act \(CAA\) of 1970, as amended](#)
- [EPA Transportation and Air Quality Resources](#)
- [40 CFR Part 93](#)

The Clean Air Act (CAA) requires that project sponsors analyze the air quality impacts of proposed projects. Passed by Congress in 1970, the CAA is the most comprehensive legislation related to air quality. The CAA was amended in 1977 and most recently in 1990 under the Clean Air Act Amendments (CAAA). The CAA of 1970 established six criteria pollutants and required the U.S. Environmental Protection Agency (EPA) to set [National Ambient Air Quality Standards \(NAAQS\)](#) for these pollutants (see Table 5-6 below). The six criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. According to EPA, transportation sources contribute to four of the six criteria pollutants: carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), ozone (O₃), and nitrogen dioxide (NO₂). The CAAA require a qualitative discussion of the air quality impacts of a transportation project and any transportation control measure that is used to mitigate the air quality impacts attributable to the project.

The EPA Conformity Rule, 40 CFR Part 93, requires state DOTs and MPOs to develop Long-Range Transportation Plans (LRTPs) and Transportation Improvement Programs (TIPs) that conform to the emissions budget and the implemented schedule of

Transportation Control Measures established in the State Implementation Plan (SIP). TIPS and LRTPs are lists of transportation projects that are to be undertaken in the short term and long term. Individual projects conform to the SIP if they:

- Do not result in new violations of the NAAQS,
- Do not increase the frequency or severity of current violations of the NAAQS, and
- Do not delay timely attainment of the NAAQS or any required interim emissions reductions or other milestones.

It is important to note that for projects processed pursuant to the 327 NEPA Assignment MOU or 326 CE MOU, FHWA still has responsibility to make project-level conformity determinations. If a project processed pursuant to one of these MOUs requires a project-level determination, UDOT must consult and involve FHWA with the conformity determination.

Table 5-6. Transportation Related National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon monoxide (CO)	9 ppm (10 mg/m ³)	8-hour ^a	None	
	35 ppm (40 mg/m ³)	1-hour ^a		
Nitrogen dioxide (NO ₂)	100 ppb ^c	1-hour average	53 ppb	Annual Mean
	53 ppb ^c	Annual Mean		
Particulate matter (PM ₁₀)	150 µg/m ³	24-hour ^d	Same as primary	
Particulate matter (PM _{2.5})	12.0 µg/m ³	Annual ^e (arithmetic mean)	15.0 µg/m ³	Annual Mean
	35 µg/m ³	24-hour ^f		
Ozone (O ₃)	0.07 ppm (2015 std)	8-hour ^g	Same as primary	
	0.075 ppm (2008 std)	8-hour ^g	Same as primary	

Source: [EPA](#), October 2011

ppm = parts per million

µg/m³ = micrograms per cubic meter

^a Not to be exceeded more than once per year.

^{b c} Primary standard of 100 ppb is 98th percentile, averaged over 3 years. The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

^d Not to be exceeded more than once per year on average over 3 years.

^e To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 12.0 µg/m³.

^f To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

^g To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008).

^h To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

ⁱ The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤1.

As of June 15, 2005, EPA revoked the [1-hour ozone standard](#) in all areas except the 8-hour ozone non-attainment [Early Action Compact \(EAC\) Areas](#).

^j Final rule signed June 2, 2010. The 1971 annual and 24-hour SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated non-attainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

2. Introduction

The criteria pollutants commonly associated with transportation projects, air toxics, and the greenhouse gases associated with climate change are described below (information provided from [EPA](#)).

a. Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats from CO are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks.

A large majority (77%) of the nationwide CO emissions are from transportation sources. The largest emission contribution comes from highway motor vehicles. Other major sources of CO are wood-burning stoves, incinerators, and industrial sources.

b. Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter (PM) includes dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as sulfur dioxide (SO₂) and volatile organic compounds (VOCs) are also considered particulate matter. PM_{2.5} consists of particles less than 2.5 micrometers in diameter, and PM₁₀ consists of particles between 2.5 and 10 micrometers in diameter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO₂) and laboratory studies of animals and humans, there are major adverse effects on human health from PM. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death. The major subgroups of the population that appear to be most sensitive to the effects of PM include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children. PM is also a major cause of visibility impairment in the United States.

c. Ozone (O₃)

Ozone (O₃) is a photochemical oxidant and the major component of smog. While O₃ in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O₃ at ground level are a major health and

environmental concern. O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of VOCs and oxides of nitrogen (NO_x) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O_3 levels occur typically during the warmer times of the year. Both VOCs and NO_x are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops, and other sources that use solvents.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 affect not only people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. O_3 is a regional pollutant and is not typically analyzed at the project level.

d. Nitrogen Dioxide (NO_2)

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban atmospheres. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are a precursor both to O_3 and acid rain and can affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO). NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3 . NO_x forms when fuel is burned at high temperatures. The two major emissions sources of NO_2 are transportation and stationary fuel combustion sources such as electric utility and industrial boilers. NO_2 is a regional pollutant and is not typically analyzed at the project level.

e. Mobile-Source Air Toxics (MSATs)

The CAAA of 1990 listed 188 hazardous air pollutants (HAPs) and addressed the need to control toxic emissions from transportation. In 2001, EPA issued its first Mobile-Source Air Toxics Rule, which identified 21 mobile-source air toxic compounds (or MSATs) as being HAPs that required regulation. A subset of six of these MSAT compounds were identified as having the greatest influence on health: benzene, 1,3-butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. EPA issued a second MSAT Rule in February 2007 that generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented. Unlike the criteria pollutants, MSATs do not have NAAQS associated with them, which makes evaluation of their impacts more subjective.

In October 2016, FHWA released an update to the [MSAT Interim Guidance](#). The update reflects changes in methodology for conducting emissions analysis and updates of research in the MSAT arena.

f. Climate Change and Greenhouse Gases

Gases that trap heat in the atmosphere are often called *greenhouse gases*. Some greenhouse gases occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (for example, fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

- [Carbon Dioxide \(CO₂\)](#). Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, and trees and wood products and also as a result of other chemical reactions (for example, manufacture of cement). Carbon dioxide is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- [Methane \(CH₄\)](#). Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions are also produced by livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- [Nitrous Oxide \(N₂O\)](#). Nitrous oxide is emitted during agricultural and industrial activities as well as during combustion of fossil fuels and solid waste.
- [Fluorinated Gases](#). Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for [ozone-depleting substances](#) (that is, chlorofluorocarbons [CFCs], hydrochlorofluorocarbons [HCFCs], and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases.

g. Utah Non-attainment and Maintenance Areas

The purpose of air quality conformity is to reduce the severity and number of violations of the NAAQS, to achieve the NAAQS as expeditiously as possible for non-attainment areas, to ensure compliance with an air quality maintenance plan, and to support the intent of the 1990 CAAA to integrate transportation, land use, and air quality planning. The CAAA establish three designations for areas based on ambient air quality conditions observed for NAAQS pollutants:

- **Non-attainment areas:** Areas that currently exceed the NAAQS for transportation-related criteria pollutants.
- **Maintenance areas:** Areas that at one time were designated as non-attainment areas but have since met the NAAQS for transportation-related criteria pollutants.

Areas are designated maintenance areas for 20 years from the date when EPA approves the State's request for redesignation as a maintenance area.

- **Attainment areas:** Attainment areas include all other areas that meet the NAAQS.
- Current information about non-attainment and maintenance areas can be found at the [EPA's](#) website (Status of Utah Designated Areas).

3. Process

Air quality analyses performed during the environmental study phase will vary considerably in content and in the level of detail based on the project scope, size, and geographic location. For an individual project, there are two levels of conformity analysis: regional and project level.

The U.S. Environmental Protection Agency (EPA) released the latest emission model, the Motor Vehicle Emissions Simulator (MOVES) in 2014, and started a two-year grace period before MOVES 2014 and 2014a are required to be used in new regional emissions analyses for transportation conformity determinations and for NEPA purposes (previous version was MOVES 2010). As of October 7, 2016, project sponsors began using MOVES 2014 to conduct emissions analysis for NEPA purposes. On October 8, 2016, EPA issued guidance on [MSAT Analysis in NEPA Documents](#) using MOVES. Based on FHWA's analysis using the latest version of MOVES (MOVES2014a), diesel particulate matter (diesel PM) remains the dominant MSAT of concern.

a. Regional (Mesoscale) Analysis

A regional or mesoscale air quality analysis of a project determines the project's overall impact on regional air quality levels. A transportation project is analyzed as part of a regional transportation network developed by an MPO or the State. Projects in this network are listed in the long-range transportation plan (LRTP) and the TIP. The LRTP includes a regional analysis that uses vehicle-miles traveled (VMT) and vehicle-hours of travel (VHT) within the region to determine daily pollutant burden levels. The results are used to determine if an area is in conformity with the regulations in the Final Conformity Rule.

The first step for the project team is to confirm that the project is listed in a conforming long-range transportation plan. The second step is to obtain data on the air quality attainment designation of the study area, monitored air quality levels for NAAQS pollutants (if available), and anticipated future traffic volumes expected for the action alternatives. Typically, the regional air quality conformity analysis determines whether the project's projected emission levels will exceed the NAAQS when combined with background emission levels (the existing or expected emission levels if this project is not implemented). The conformity analysis takes into account other planned projects that would be implemented.

Conformity applies to the following transportation-related criteria pollutants: O₃, CO, NO₂, PM₁₀, PM_{2.5}. Conformity also applies to the precursor pollutants for O₃, which are VOCs and NO_x. The analysis is conducted using EPA emission models to estimate the pollutant burden of the project. Emission models require traffic data (vehicle-miles traveled, vehicle-hours of travel, and traffic speed) to estimate pollutant levels.

Detailed information about [conformity analysis and modeling](#) is available on the FHWA website.

b. Project-Level (Microscale) Analysis

A project-level microscale analysis is conducted for specific locations in non-attainment or maintenance areas. These areas are referred to as *hot spots*. The process to conduct a microscale analysis for each pollutant is discussed briefly below.

c. Carbon Monoxide (CO)

1) Exempt Projects – CO Hot-Spot Analysis Is Not Required

Projects consistent with 40 CFR 93.126 or 40 CFR 93.128 are exempt from transportation conformity requirements and thus are not subject to CO hot-spot requirements. Exempt projects include safety projects such as railroad crossings, guard rails, and bridge reconstruction (with no additional travel lanes); mass transit projects such as rehabilitation of transit vehicles; air quality projects such as pedestrian and bicycle facilities; and other projects such as noise attenuation.

2) Projects of Air Quality Concern – CO Hot-Spot Analysis Is Required

The EPA Conformity Rule established requirements for project-specific analysis of CO impacts from transportation projects. Local areas of concern, such as intersections, are referred to as *hot spots*. As stated in 40 CFR 93.123, the need for a quantitative CO hot-spot analysis is determined as follows*:

- If a project affects a location identified in the applicable implementation plan as a site of violation or possible violation.
- If a location is currently in a non-attainment or maintenance area and is experiencing a LOS D or worse, or will change to a LOS of D or worse in the design year because of increased traffic volumes related to the project.
- If a project affects one or more of the top three intersections in the nonattainment or maintenance area with the highest traffic volumes.
- If a project affects one or more of the top three intersections in the nonattainment or maintenance area with the worst level of service.

**Occasionally a project not meeting these criteria will still require a qualitative hotspot analysis.*

A Hotspot Analysis for CO is conducted to determine if the pollutant concentrations (project contribution plus background levels) are above or below the 1-hour and 8-hour NAAQS. This analysis is conducted using the most recent version of the EPA mobile-source emission factor model and the CAL3QHC air dispersion model. In 2010, EPA approved the use of MOVES as a motor vehicle emission model for use in PM and CO hot-spot analyses for transportation conformity purposes. MOVES generates project-specific emission rates that are post-processed for use as input for CAL3QHC.

Dispersion modeling is the most commonly used method for assessing local air quality impacts; it estimates pollutant concentration levels based on project-specific design data, traffic data, and meteorological data. The concentrations are combined with background concentration levels (based on available monitoring data or estimates) to determine total pollutant concentrations. The results are then compared to the 1-hour and 8-hour NAAQS. For those projects where a Hotspot Analysis is performed, each alternative studied in detail and the no-action alternative should be analyzed for the opening year and the design year. A brief summary of the methodologies and assumptions used should be included in the environmental document.

Total CO concentrations (project contribution plus estimated background) at identified reasonable receptors for each alternative should be reported. If the total concentration is less than either the 1-hour or the 8-hour NAAQS, the project is considered to have a minor environmental impact and does not require consideration of mitigation for long-term air quality impacts. If the selected alternative would result in a violation of EPA's 1-hour or 8-hour CO standards, the No Action alternative should be modeled. If the selected alternative has lower concentrations than No Action, the conformity criteria are satisfied. If not, efforts should be made to develop reasonable mitigation measures through early coordination between UDOT and the Utah Division of Air Quality. Mitigation measures can include changes in design scope and concept, changes in intersection design to improve traffic flow and level of service, and development and implementation of transportation demand measures (for example, park-and-ride lots, improved transit service, and high-occupancy vehicle lanes) at the regional and study area levels. The mitigated selected alternative must be remodeled and must either meet the NAAQS or have concentrations lower than the No Action alternative in order to proceed.

d. Particulate Matter (PM_{2.5} and PM₁₀)

On March 10, 2006, EPA issued a Final Conformity Rule regarding the local or "hot-spot" analysis of PM_{2.5} and PM₁₀ (40 CFR 93). For transportation projects located in PM_{2.5} and PM₁₀ non-attainment areas, a hot-spot analysis is required. The objective of a PM hot-spot analysis is to determine if a project would cause or contribute to any new local PM₁₀ and/or PM_{2.5} violations or increase the frequency or severity of any existing violations in non-attainment and maintenance areas.

1) Exempt Projects – PM Hot-Spot Analysis Is Not Required

Projects consistent with 40 CFR 93.126 or 40 CFR 93.128 are exempt from transportation conformity requirements and thus are not subject to PM_{2.5} hot-spot requirements. Exempt projects include safety projects such as railroad crossings, guard rails, and bridge reconstruction (with no additional travel lanes); mass transit projects such as rehabilitation of transit vehicles; air quality projects such as pedestrian and bicycle facilities; and other projects such as noise attenuation.

2) Projects of Air Quality Concern – PM Hot-Spot Analysis Is Required

A hot-spot analysis must be completed for “projects of air quality concern” located in PM₁₀ or PM_{2.5} non-attainment and maintenance areas. Such projects are one of the following types (see 40 CFR 93.123(b)(1)):

- New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles.
- Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or projects affecting intersections that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.
- Projects in or affecting locations, areas, or categories of sites that are identified in the PM₁₀ or PM_{2.5} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

3) Non-exempt Projects – PM Hot-Spot Analysis Is Not Required

The remaining non-exempt projects that do not fall into the category of “projects of air quality concern” do not require a hot-spot analysis in order to meet the conformity requirements because EPA has determined that these remaining projects would not have an adverse impact on air quality and meet the requirements of the CAA without further local analysis.

4) PM_{2.5} and PM₁₀ Hot-Spot Analyses

In 2015, EPA updated the [*Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Non-attainment and Maintenance Areas*](#). This guidance is used to conduct quantitative PM hot-spot analyses for certain highway and transit

projects that involve significant diesel emissions. The guidance describes how to estimate project emissions using EPA's MOVES 2014 model, and how to apply air quality models such as CAL3QHCR for PM hot-spot analyses.

e. Mobile-Source Air Toxics (MSATs)

FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances.

- **Tier 1.** No analysis is required for projects with no potential for meaningful MSAT effects. Such projects include:
 - Projects that qualify as a CE under 23 CFR 771.117
 - Projects exempt under the CAA conformity rule in 40 CFR 93.126
 - Projects with no meaningful impacts on traffic volumes or vehicle mix

- **Tier 2.** Qualitative analysis is required for projects with low potential MSAT effects. Project types that do not meet the criteria of Tier 1 or Tier 3 are included in this category. Examples include minor widening and new interchanges where design-year traffic is expected to be less than 140,000 to 150,000 AADT.

For Tier 2 projects, a qualitative analysis should compare the expected effect of the project on traffic volumes, vehicle-miles traveled, vehicle mix, or routing of traffic and the associated changes in MSATs for the project alternatives studied in detail, including the no-build, based on VMT, vehicle mix, and speed. The analysis should also discuss national trends that project substantial reductions in MSAT emissions due to stricter engine and fuel regulations issued by EPA and should include the latest uncertainty language developed by FHWA and information regarding the health impacts of MSATs.

- **Tier 3.** Quantitative analysis is required for projects with higher potential MSAT effects. Projects in this category would:
 - Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects; **or**
 - Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000² or greater by the design year; **and**
 - Be located in proximity to populated areas

For Tier 3 projects, a more rigorous assessment of impacts is required. This approach would include a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative, to use as a basis of comparison. This analysis also may address the potential for cumulative impacts, where appropriate, based on local conditions. How and when cumulative impacts should be considered would be addressed as part of the assistance outlined above. The NEPA document for this project should also include relevant language on unavailable information.

Detailed guidance on performing [Tier 2 and Tier 3 MSAT analyses](#) can be found on the FHWA website.

f. Documentation

The environmental document should summarize the findings of the air quality analysis or explain why an analysis was not needed for the project. An overall summary statement should be provided that states whether the project would likely result in adverse impacts (that is, the NAAQS would be exceeded).

g. Mitigation Measures

Projects could require mitigation measures to address short-term air quality impacts, (that is, construction impacts). Such impacts can be mitigated through best management practices such as dust-suppression strategies.

L. Noise

1. Laws, Regulations, and Guidance

- 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise
- Utah Administrative Code R930-3
- [UDOT Noise Abatement Policy](#)

a. Federal Guidance

Studies have shown that some of the most pervasive sources of noise in our environment today are those associated with transportation (FHWA, *Highway Traffic Noise: Analysis and Abatement Guidance, 2011*). Traffic noise tends to be a dominant noise source in our urban and rural areas. FHWA has established noise standards for its programs, policies, and actions, which are contained in 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise.

NEPA provides broad authority and responsibility for evaluating and mitigating adverse environmental effects, including highway traffic noise. NEPA directs the federal government to use all practical means and measures to promote the general welfare and foster a healthy environment. Another federal law, which specifically involves abatement of highway traffic noise, is the Federal-Aid Highway Act of 1970. This legislation mandated FHWA to develop noise standards for mitigating highway traffic noise.

FHWA regulations contained in 23 CFR 772 require the following actions during the planning and design of a transportation project:

1. Identification of traffic noise impacts
2. Examination of potential mitigation measures
3. Incorporation of reasonable and feasible noise-mitigation measures into the project
4. Coordination with local officials to provide helpful information on compatible land use planning and control

FHWA's regulations recognize two types of projects. Type I projects involve the construction of a new highway on a new location or the alteration of an existing highway resulting in additional through-traffic lanes, auxiliary lanes, or interchange ramps; or a substantial change in vertical or horizontal alignment. Type II projects are those whose sole purpose is to provide noise-abatement measures on existing highways. UDOT does not currently have a Type II noise-abatement program. A Type III project does not meet the classifications for Type I or Type II. Type III projects do not require noise analysis.

b. UDOT Noise Abatement Policy

UDOT's Noise Abatement Policy is consistent with FHWA's regulations regarding highway traffic noise (23 CFR 772). This policy requires that every reasonable and feasible effort be made to provide noise mitigation when the noise-abatement criteria are approached or exceeded. The UDOT Noise Abatement Policy, established in 1987 and updated in 2014, has been approved by FHWA and outlines procedures for analyzing impacts, conducting noise studies, and determining if potential noise-abatement measures are feasible and reasonable.

Table 5-7. UDOT Noise-Abatement Criteria (NAC)

Activity Category	Description of Activity Category	Criteria $L_{eq}(h)$
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where preservation of those qualities is essential if the area is to continue to serve its intended purpose	56 dBA (exterior)

Table 5-7. UDOT Noise-Abatement Criteria (NAC)

Activity Category	Description of Activity Category	Criteria $L_{eq}(h)$
B	Residential	66 dBA (exterior)
C	Active sports areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, schools, trails and trail crossings	66 dBA (exterior)
D	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios	51 dBA (interior)
E	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F	71 dBA (exterior)
*F	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing	--
*G	Undeveloped lands that are not permitted	--

Source: UDOT Noise Abatement Policy

$L_{eq}(h)$ = equivalent hourly noise level

* Note that Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types and therefore, an analysis of noise impacts is not required.

2. Introduction

This section focuses primarily on environmental noise procedures for roads. The level of noise (defined as unwanted sound) near roads depends on six things:

- Traffic volume
- Speed of the traffic
- Percentage of trucks in the flow of traffic
- Distance to the highway
- Intervening topography
- Atmospheric conditions

Generally, traffic noise is increased by heavier traffic volumes, higher speeds, and a greater percentage of trucks.

a. Noise Characteristics

Noise levels are measured in units called decibels (dB). Since the human ear does not respond equally to all frequencies, measured sound levels are often adjusted or weighted to correspond to the frequency response of human hearing and the human perception of loudness. Weighted sound levels are expressed in numbers called A-weighted decibels (dBA) and are measured with a calibrated noise meter.

Traffic noise impacts occur when one of the following situations is expected at a sensitive land use:

1. The future worst-case noise level is equal to or greater than the UDOT Noise Abatement Criteria (NAC) in Table 5-8 for each corresponding land use category.
2. The future worst-case noise level is greater than or equal to an increase of 10 dBA over the existing noise level. This impact criterion takes effect regardless of existing noise levels.

b. Noise Abatement

The goal of noise abatement is to substantially reduce noise, which may or may not result in noise levels below the NAC levels. The two relevant criteria to consider when identifying and evaluating noise-abatement measures to be incorporated in a project are *feasibility* and *reasonableness*. UDOT will provide noise abatement for impacts from Type I projects if the abatement is determined to be both feasible and reasonable.

The *feasibility* factors outlined below must collectively be achieved for a noise abatement measure to be considered “feasible.” Failure to meet any factor would result in the noise abatement measure being deemed not feasible and therefore not included in the proposed project. It is important to note that even if all feasibility factors are achieved, noise abatement must still meet all reasonableness factors in order to be included in the project:

1. Engineering Considerations – Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, barrier height, topography, drainage, utilities, maintenance access, and maintenance of the abatement measure must be taken into account as part of establishing feasibility. Noise abatement measures are not intended to serve as privacy fences or safety barriers. Abatement measures will be consistent with general AASHTO design principles.
2. Safety on Urban Non-Access Controlled Roadways – To avoid a damaged wall from becoming a safety hazard in the event of a failure, wall height shall be no greater than the distance from the back of curb to the face of the proposed wall.
3. Acoustic Feasibility – A proposed noise barrier must reduce noise by at least 5 dBA for at least 75% of front-row (adjacent) receptors.

The *reasonableness* factors outlined below must collectively be achieved for a noise abatement measure to be considered “reasonable.” Failure to meet any factor would result in the noise abatement measure being deemed not feasible and therefore not included in the proposed project.

1. Noise Abatement Design Goal – Proposed abatement measures should reduce noise by 8 dBA or greater for at least 75% of front-row (adjacent) receptors.
 2. Cost-Effectiveness – The cost of noise abatement measures must be deemed reasonable to be included in the project. Noise abatement costs are determined by multiplying a fixed unit cost per square foot by the height and length of the barrier. The fixed unit cost is based on historical average costs of noise barriers installed on UDOT projects and is reviewed at regular intervals. Fixed unit costs and allowable costs can be found in the Procedures section of the UDOT Noise Policy. Cost of abatement is determined by analyzing the cost of barrier that would satisfy the noise reduction goal for at least 75% of front-row receptors.
 3. Viewpoints of Property Owners and Residents – Viewpoints of property owners and residents (non-owners) must be solicited to determine if noise abatement is desired. A multiplier factor of 5 is applied to ballots of property owners compared to a factor of 1 to ballots of non-owners.
 - During final design, property owners at benefited receptors (those that would receive a reduction of 8 dBA as a result of noise abatement) and receptors that border and are directly adjacent to the end of a proposed noise wall (those that are not, by definition, benefited) are balloted so they can indicate their preference for or against noise abatement measures.
 - Methodology for assessing the ballots is described in the UDOT Noise Abatement Policy. Noise abatement will only be recommended if 75% of votes counted favor noise abatement. In addition, at least 50% of the ballots must be returned after balloting efforts are completed.
 - Noise receptor locations are normally restricted to exterior areas of frequent human use. Typically, noise receptor locations are chosen at areas between the right-of-way line and buildings where frequent human activity occurs.
3. Process

When conducting scoping for a project, meet with UDOT to determine if the project qualifies as a Type I project. Get concurrence before the contract is signed.

a. Conduct Noise Analyses

Use the following steps to conduct noise analyses for UDOT projects.

- 1) Review the Current UDOT Noise Abatement Policy and Procedures
 - Meet with Environmental Services staff to review the analysis approach for the project and get concurrence on:
 - Study area boundaries.
 - Locations of representative receivers and noise monitoring sites. The number and location of receivers should be representative of the environment being analyzed.
- 2) Determine types and numbers of sensitive land use activities (receptors) that might be affected. Noise impact and abatement analyses will include lands within Land Use Activity Categories A, B, C, D and E (Table 5-7) only when development exists or has been “permitted.” UDOT will consider a development as being “permitted” when a formal building permit has been issued prior to the date the final environmental decision document is approved. If none are identified, disclose this in the environmental document, ending the process.
- 3) Determine Existing and Future Worst Case Noise Levels
 - Identify and classify noise-sensitive receivers that could be affected.
 - Measure noise levels at monitoring sites during the noisiest time of day and count traffic volumes (where applicable). It is not necessary to measure existing noise levels for land use categories F and G.
 - Use the traffic noise model (TNM) to estimate existing noise levels at measurement locations and other areas as needed.
 - Compare modeled results with actual measurements to calibrate the TNM.
- 4) Perform Noise Analysis Using TNM
 - Perform noise analyses for all developed lands containing noise-sensitive land uses. Analyses should include development that has been designed, planned, and programmed (when a formal building permit has been issued) before the date of the environmental document approval (CE, FONSI, or ROD).
 - Use the latest version of TNM to model future worst-case noise levels.
 - Use LOS C traffic volumes and the posted (or planned) speed limit as inputs into TNM.
 - Model all build alternatives carried forward for detailed study.

5) Determine Noise Impacts

- Compare the results of the noise analysis to the UDOT NAC. A noise impact occurs when the worst-case noise level:
 - Meets or exceeds the NAC, or
 - Is 10 or more dBA greater than the existing noise level.
- Show affected receivers on a plan-view map. This can be done by placing a red dot on each affected receiver or by shading or coloring the affected parcels.
- Provide a table showing representative receivers, existing noise levels, and projected future noise levels. Clearly indicate the noise levels that are considered to be an impact according to the UDOT NAC.

b. Consider Noise-Abatement Measures

- Consider noise abatement for all Type I projects where impacts are identified. To be included in a project, noise abatement must be feasible and reasonable according to UDOT's Noise Abatement Policy. These factors include:
 - *Noise Reduction from Abatement Measures.* Noise must be reduced by at least 8 dBA for at least 75% of front-row receivers.
 - *Local Issues.* Noise barriers on non-limited-access roads in urban areas will not exceed 8 feet in height.
 - *Land Use and Zoning.* Noise-abatement measures are usually not consistent with commercial or industrial land uses. Coordinate with business owners to determine if they are in favor of noise-abatement measures.
 - *Engineering, Safety, and Maintenance.* These issues must be considered to determine if noise-abatement measures are feasible.
 - *Cost-Effectiveness.* The cost of abatement when divided by the number of affected and benefited receivers must meet the criteria in the Procedures section of the current Noise Abatement Policy.

c. Solicit Public Involvement

- Incorporate public involvement strategies to ensure that the concerns of affected communities are known. In addition, if noise-abatement measures are found to be reasonable and feasible, UDOT needs to know if the public is in favor of noise-abatement measures. Refer to UDOT's current Noise Abatement Policy for balloting procedures.

d. Document Noise Study Findings

- Describe the following elements of the noise analysis and include them in the environmental document:
 - The basic concepts of noise
 - UDOT's Noise Abatement Policy and its consistency with 23 CFR 772
 - Existing noise levels in the project area
 - The concepts of noise analysis and abatement
 - The results of the detailed noise analysis performed for the project alternatives
 - Likely noise impacts, if any
 - Mitigation measures, if applicable
 - If noise abatement is recommended, provide likely locations, heights, and lengths of abatement measures.
 - If noise abatement is not recommended, explain why and include the appropriate criteria from UDOT's Noise Abatement Policy.
- Conclusions
 - Discuss whether noise mitigation (noise abatement) appears feasible and reasonable for affected properties. Describe the likely locations and heights of noise-abatement features. Clarify that the actual locations and heights of noise-abatement features will be determined during final design.

e. Evaluate Construction Noise

- Sensitive receptors can also experience short-term noise impacts as a result of construction activities.
- Construction impacts can be minimized by the implementation of best management practices during construction.
- In the environmental document, identify measures to be incorporated in the project to mitigate construction noise impacts.

M. Cultural (Archaeological and Architectural) Resources**1. Laws, Regulations, and Guidance**

- [Section 106 of the National Historic Preservation Act \(NHPA\)](#)

- [Utah Antiquities Act: UCA 9-8-404](#)
- [36 CFR 800](#)
- [UDOT Architectural and archaeological/paleontological guidance](#)
- [Utah Professional Archaeological Council \(UPAC\) Linear Sites Guidance](#)
- [National Register Bulletins](#)

2. Introduction

Cultural resources include prehistoric and historic archaeological sites, structures, buildings, objects, and districts. Investigations for UDOT are generally divided into two groups: archaeological and architectural. Archaeological sites include linear features such as railroads, canals, and roads as well as sites whose material remains are primarily artifacts and features, and can be prehistoric or historic. Architectural resources include buildings, structures, bridges, culverts, and structures.

a. National Register Criteria

The purpose of cultural resource investigations under Section 106 and UCA 9-8-404 is to consider the effects of undertakings on cultural resources that are listed or eligible for listing on the National Register of Historic Places (NRHP) (historic properties) (36 CFR 800.16(l)). As a general rule, properties that have achieved significance within the past 50 years are not eligible for the NRHP. They may, however, be eligible if they are of exceptional importance as described in [National Register Bulletin 22](#). The evaluation of site significance and eligibility for the NRHP involves measuring a particular site's qualities against the criteria for the NRHP given in [36 CFR 60.4](#). These criteria apply to both Section 106 and UCA 9-8-404 and are summarized below.

The quality of *significance* in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- (A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) That are associated with the lives of persons significant in our past; or
- (C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) That have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Integrity is the ability of a property to convey its significance. In other words, has the property undergone alterations that render its appearance unrecognizable? Stated formally, to retain historic integrity, a property will always possess several, and usually most, of the aspects that make it significant under one or more of the NRHP eligibility criteria. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is (or was) significant. The aspects of integrity can be used in various combinations. The National Park Service bulletin *How To Apply the National Register Criteria for Evaluation* ([National Register Bulletin 15](#)) provides a lengthy explanation of how to evaluate the integrity of a property. UDOT and the staff at the Utah Division of State History (UDSH) encourage consultants to refer frequently to the bulletin.

b. Utah Division of State History – Historic Preservation Section Criteria

In addition to the NRHP requirements (age, integrity, and significance), the UDSH – Historic Preservation Section has developed a rating system to evaluate integrity of buildings. These criteria emphasize architectural quality and the evidence of features that define a particular building type or style, not historical associations or the potential of the properties to yield information, unless the property could be listed on its own merits under any of the NRHP criteria. In almost all circumstances, UDOT staff and UDSH – Historic Preservation Section staff should use the following four rating options primarily as a guide to physical integrity:

1. **(ES) Eligible/Significant:** Built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations or additions; potentially eligible as an individual listing on the National Register under criterion “C”; also buildings of known *historical* significance.
2. **(EC) Eligible:** Built within the historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as “A” buildings; more substantial alterations or additions than “A” buildings, though overall integrity is retained; eligible for the National Register as part of a potential historic district or primarily for historical, rather than architectural, reasons, which cannot be determined at this point.
3. **(NC) Not eligible:** Built during the historic period but has had major alterations or additions; no longer retains integrity.
4. **(OP) Out-of-Period:** Constructed outside the historic period.

c. Effect Findings

The “criteria of adverse effect” is the standard by which effects to historic properties are measured.

- An **adverse effect** is found when “an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association” (36 CFR 800.5(a)(1)).
- A finding of **no adverse effect** is made “when the undertaking’s effects do not meet the criteria of [adverse effect] or the undertaking is modified or conditions are imposed...” (36 CFR 800.5(b)). In other words, a finding of “no adverse effect” is used when an undertaking affects a property that is eligible for or listed on the National Register but does not impair the integrity of the property.
- A finding of **no historic properties affected** is made when “either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them as defined in [36 CFR] 800.16(i)...” (36 CFR 800.4(d)). A finding of “no historic properties affected” is used in three instances: (1) No cultural resources are present in the APE, eligible or not eligible; (2) cultural resources are present in the APE, but no eligible properties are present; and (3) eligible properties are present in the APE, but the undertaking will have no effect on them.

If historic properties are adversely affected, the agency consults with the State Historic Preservation Officer (SHPO) and other interested parties to develop and evaluate alternatives or modifications to the project that could avoid, minimize, or mitigate the adverse effects (36 CFR 800.6). A MOA is executed that describes how the adverse effects will be resolved (36 CFR 800.6(b)).

d. Roles of FHWA, UDOT, and the Consultant

UDOT is authorized to conduct the cultural resource investigations in compliance with Section 106 on behalf of FHWA (per the [Section 106 PA](#) executed among FHWA, USACE, SHPO, ACHP, and UDOT and per the terms of the 327 NEPA Assignment MOU). In the Section 106 PA, FHWA authorizes UDOT to initiate and, in most cases, conclude consultation with the SHPO and other consulting parties. FHWA retains the responsibility to consult with Native American tribes if the tribes request formal consultation. Attachment 4 of the PA describes the tasks for which the signatories are responsible. Field work and report preparation can be conducted by either the UDOT Region Archaeologist/Architectural Historian or by a professionally qualified consultant. However, certain documents must be prepared by UDOT including Tier 1 screening forms, clearance memos, and determination of eligibility and finding of effects (DOEFOEs). Consultants may provide assistance or supporting documentation.

For projects processed under the 326 CE MOU and 327 NEPA Assignment MOU (see Chapter 3), UDOT has also assumed the responsibilities of FHWA for complying with

Section 106 and 36 CFR 800 (except for tribal consultation). Under this agreement, Memorandums of Agreements do not have to be signed by FHWA.

For state-funded or state-permitted projects, UDOT conducts the investigations in compliance with UCA 9-8-404, following the process identified in the [404 PA](#) between UDOT and the SHPO. All provisions of the 106 PA are included in the 404 PA except that FHWA and ACHP are not involved. Tribal consultation is initiated by UDOT and is done at the discretion of the UDOT Region Archaeologist, depending on the nature and scope of the undertaking. In general, projects of a type for which tribal consultation would be initiated under the 106 PA would also be initiated under the 404 PA.

e. Qualifications

The oversight of the archaeological and architectural studies needed to comply with Section 106 and UCA 9-8-404 is the responsibility of the Region Archaeologists and the UDOT Architectural Historian. UDOT requires all work performed by UDOT staff or consultants meet certain qualifications. All archaeological consultants who conduct archaeological field surveys must either be permitted by the Public Lands Policy Coordinating Office as a principal investigator or be working under the direction of a principal investigator who holds a valid permit. Because much of UDOT right-of-way is by easement over federal land, federal permits and/or project authorizations could be required as well. Architectural historians do not need to meet permitting requirements but must meet the National Park Service professional qualification standards for architectural historians (refer to 36 CFR 61, Appendix A). Project managers and consultants who want to hire either an archaeologist or an architectural historian can refer to environmental categories of the UDOT Consultant Services General Engineering Pool.

3. Process

The goal of cultural resource investigations for UDOT is to identify archaeological and architectural resources, evaluate them for eligibility for listing on the NRHP, identify the effects of the project on such resources, and seek ways to avoid, minimize, or mitigate those effects.

a. Tier 1 and Tier 2 Projects

The Section 106 and 404 PAs establish two tiers of project review based on the type of impacts to historic properties.

- **Tier 1 projects** result in a finding of **no historic properties affected** and will not require case-by-case review by the SHPO.
- **Tier 2 projects** result in a finding of **no adverse effect** or **adverse effect** and require case-by-case review by the SHPO.

The Region Archaeologist and the Architectural Historian screen projects to determine if a project is exempt from further review or consultation based on one of the following findings of no historic properties affected: (1) there are no cultural resources present; (2) there are cultural resources present but no eligible sites; or (3) there are eligible sites present, but sites are completely avoided by the undertaking, and the potential for substantial indirect effects is very low. Determining whether a project is Tier 1 or Tier 2 is based on the effects from the project as a whole (on both architectural and archaeological resources, not on just one resource type).

Tier 1 projects require completion of the Tier 1 Screening Form, which serves as the clearance memo for the project and should be included in the environmental document along with any consultation letters. UDOT Environmental Services submits all Tier 1 Screening Forms to the SHPO on a quarterly basis, along with accompanying cultural resource inventory reports.

The Tier 1 Screening Form should follow the standard format//template and contain the following information:

- Description of the project and the limits of disturbance (for example, roadway prism, toe-of-slope to toe-of-slope, existing UDOT right-of-way, etc.). Be very clear on exactly what has been cleared. Provide a map of the cleared area if necessary so the contractor has no doubt about what has been cleared.
- Statement of applicable laws (Section 106, UCA 9-8-404, UCA 63-73-19) and Section 106 and 404 PAs.
- Brief description of the APE, records search, survey (if one was conducted), and results. The records search should include databases in both the Antiquities and the Historic Preservation sections of UDSH.
- Eligibility and effect determinations.
- Information regarding consultation with Native American tribes, certified local governments (CLGs), other agencies, and any other interested parties.
- Information regarding any project commitments such as avoidance measures, environmental fencing, or monitoring.

Tier 2 projects require that a determination of eligibility and finding of effect (DOEFOE) is submitted to the SHPO with accompanying cultural resource inventory reports for a 30-day review period. The DOEFOE serves as the clearance memo for the project and should be included in the environmental document along with any consultation letters. There is a standard format/template for the DOEFOE which should contain specific project and resource information. For more information on this process, see Sections 5.3(M)(3f) and (3g).

b. Scope and Level of Identification Efforts

The cultural resource investigations should begin as early in the project as possible. The first step is to determine the scope and level of identification efforts (36 CFR 800.4(a) and (b)). The Region Archaeologist and/or the Architectural Historian first determine the APE in consultation with the SHPO, as appropriate. In accordance with the Section 106 and 404 PAs, SHPO consultation on the APE is not required on routine projects (defined as those projects classified as a CE in the NEPA process). For projects that are non-routine (EAs or EISs) or those with the potential for substantial indirect and/or cumulative effects, the UDOT staff should consult the SHPO. Consultation with the SHPO should be by letter in order for the SHPO to assign a case number and begin the project file.

The APE is defined as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking” (36 CFR 800.16(d)).

When determining the APE, the following factors should be considered:

- All alternatives being considered for the undertaking
- All locations proposed for ground disturbance
- All locations from which the undertaking may be visible or audible
- All locations where the undertaking may result in changes in traffic patterns, land use, public access, etc.
- All areas where there may be indirect as well as direct effects

The APE often equates to the study area in the NEPA document, and the survey area might or might not be the same as the APE. The APE encompasses both archaeological resources and architectural resources and can be different for each resource. The level of the identification effort required within the APE can vary depending on the scope and nature of the undertaking, the nature and extent of potential effects on historic properties (including indirect and cumulative effects), and the likely nature and location of historic properties within the APE. For example, the area of the undertaking subject to direct effects might require a Class III archaeological inventory and a reconnaissance-level building survey, while the area of the undertaking subject to indirect effects might require only a literature search and a windshield survey.

If a consultant is conducting the investigations, it is recommended that the consultant contact the Region Archaeologist and the Architectural Historian before bidding on a project to discuss the APE and the level of identification required. Before beginning field inventories (for *both* archaeology and architecture), the consultant must obtain written authorization to proceed using the [UDOT Fieldwork Authorization Form](#). The consultant is required to contact the Region Archaeologist before submitting the field work authorization form. The Region Archaeologist will review and sign the submitted form,

and return it to the consultant. For projects involving architectural resources, the Architectural Historian will also review and sign the form (the Region Archaeologist will coordinate with the Architectural Historian when this is needed).

If appropriate and relevant to the project, notification letters to potential consulting parties (including Native American tribes) can be sent at this time. For more information on stakeholder consultation, see Section 5.3(M)(3k).

c. Architectural Process

Before undertaking field work or even bidding on the project, the surveyor should check the National Register and survey files at the UDSH – Historic Preservation Section. [National Register nominations in Utah](#) have been digitized and are also available online. Surveyors should also check the online database Preservation Pro to see what buildings have been previously surveyed (check both the Literature Search and Properties functions). In addition to reviewing data of previously recorded architectural resources in the survey area, consultants and UDOT staff should check the address files and CLG surveys in the Historic Preservation Section for overviews of neighborhoods and communities and information about individual properties that might already have been recorded in the survey area.

Consultants should also review historic [Sanborn maps](#), if pertinent to the project, and be familiar with the research or archival resources available in individual cities and counties. Aerial photographic maps from the late 1930s through the 1960s are available at the Utah County Surveyor's office and are invaluable for surveying properties in Utah County. Photographs and tax assessment cards with a construction date for most buildings in Salt Lake County are available at the Salt Lake County Archives. Cache, Davis, and Utah Counties have similar resources, although they are more often found through the Assessor's Office.

In addition, consultants should plan to use county histories and planning documents, such as subdivision plats and master plans, during the course of the survey to understand the history of the community associated with the survey area and what economic and social forces shaped the architecture of the survey area. Bibliographies from National Register nominations completed after the early 1980s often provide useful community history sources.

Two primary levels of survey can be undertaken for architectural resources: reconnaissance-level survey (RLS) and intensive-level survey (ILS). RLSs can be undertaken as windshield surveys, standard surveys, or selective surveys. ILSs are usually undertaken for mitigation purposes or to assist with the evaluation of eligibility once an RLS has been submitted to SHPO. Table 5-8 describes the different type of surveys.

Table 5-8. When To Use Different Levels of Surveys

Type of Survey	When To Use
Windshield	<ul style="list-style-type: none"> • When a casual, quick look at an area is needed. • When all work will occur within the existing right-of-way. • When the surveyor has a general idea of the boundaries of a potential or defined project, but the boundaries have not been firmly established. • When there is no expectation of a report, photographs, or anything to submit to the SHPO. • A windshield survey is completed solely for use by a consultant or UDOT employee. It is not submitted to the SHPO.
Standard Reconnaissance-Level Survey	<ul style="list-style-type: none"> • When all buildings in a defined area need documentation. • When the survey area contains a high concentration of buildings.
Selective Reconnaissance-Level Survey	<ul style="list-style-type: none"> • When documentation of only older buildings (greater than 50 years) in areas heavily infiltrated with new buildings (less than 50 years) is needed. <ul style="list-style-type: none"> ○ Most surveys for UDOT projects are selective because the survey area is linear. <p>NOTE: In some instances, surveys for UDOT projects can be prepared at both the selective and standard levels. For example, a surveyor might document buildings using both the selective and standard methods if a proposed corridor passes through an established neighborhood and an industrial park that was recently constructed with few older buildings.</p>
Standard and Selective Surveys of Fewer than 20 Properties	<ul style="list-style-type: none"> • When recording fewer than 20 properties: <ul style="list-style-type: none"> ○ Properties are recorded individually on the SHPO form "Historic Site from Utah SHPO for Section 106 Review Only." ○ Does not require more information than an RLS of 20+ properties.
Intensive-Level Survey	<ul style="list-style-type: none"> • When an undertaking results in an adverse effect. Section 110 (b) of the NHPA requires that buildings or sites must be recorded prior to demolition as part of mitigation. • To assist with the evaluation of eligibility once an RLS has been submitted to the SHPO.

Standard or selective reconnaissance surveys consisting of a large number of buildings for UDOT projects generally consist of long, linear patterns, thus making for cumbersome mapping in reports. For this reason, survey areas are often recorded on several maps. A variety of formats can be used, including aerial photographs. The maps do not have to be to scale, but the scale must be large enough to clearly indicate every primary building, structure, or site included in the survey and an address number. The maps and the recorded sites must be clear enough that copies can be made. Names of individual streets on which properties are recorded should be indicated, and, if the survey includes

Table 5-9. Digital Photograph Requirements for Surveys

Level of Survey	Required Format of Photographs
Standard or selective RLS of 20 or more properties	<ul style="list-style-type: none"> • Contact print mockup page in Microsoft Word document printed in color or black and white on photographic paper. Color photographs are preferred. • Color photos burned onto regular CD for UDOT review, with addresses indicated and organized into different files for cities, if applicable. • Color photos burned onto gold CD after SHPO review.
Standard or selective RLS of fewer than 20 properties	<ul style="list-style-type: none"> • Printed color or black-and-white photos on photographic paper, no smaller than 4 x 6 inches. Color photographs are preferred. • Color photos of each property burned onto gold CD.
ILS forms for mitigation	<ul style="list-style-type: none"> • Printed color photos on photographic paper, no smaller than 4 x 6 inches. • Color photos of each property burned onto individual gold CD.

d. Archaeological Process

The examination of archaeological records and literature is critical for identifying previously recorded resources and developing contexts that can be important to understanding the area's resources. For archaeological resources, the records search includes examination of the project and site file maps and accompanying site survey forms at the UDSH – Antiquities Section, the National Register of Historic Places, and the General Land Office (GLO) records. Record searches should be conducted at other agency offices (School and Institutional Trust Land Administration [SITLA], BLM, U.S. Forest Service, etc.) as appropriate. The search should include the APE and an appropriate buffer (generally 0.5 mile on each side of the APE).

Archaeological investigations often involve a field inventory and may involve different survey strategies (e.g., intensive-level pedestrian, reconnaissance, or windshield survey). This determination will be made by the Region Archaeologist on a project-by-project basis evaluating such factors as previously conducted surveys, amount of previous disturbance or development in the project area, potential for native ground disturbance, dense vegetation, and topography conditions. Project maps included in reports must depict the APE as well as the surveyed area, and the areas of different survey intensities. These must be described in the report as well.

Everyone, including consultants, who works in the highway right-of-way is required to wear American National Standards Institute (ANSI) 107-2004 Class II clothing (or greater) in accordance with [UDOT Policy 06E-02](#). An encroachment permit must also be

obtained from the Region Permits Office. If other land jurisdictions are involved, permits or authorizations might be required from other agencies.

All archaeological sites identified in the course of the inventory will be recorded and encoded on the standard Intermountain Antiquities Computer System ([IMACS](#)) form. Each site form will be accompanied by a sketch map that has a scale and north arrow and is clearly labeled. It will also include a 7.5-minute USGS topographical map at 1:24000 scale that includes a scale and north arrow and is clearly labeled. Photographs should include site overviews, features, artifacts, and at least one photo showing the horizon for relocation purposes.

Isolates (isolated finds or occurrences) are archaeological resources not recorded as sites. How they are recorded will be determined in consultation with the Region Archaeologist.

Subsurface testing conducted during archaeological surveys is rare and should only be done in consultation with the Region Archaeologist and Cultural Resources Program Manager. If testing is determined to be necessary, a testing plan must be prepared that would indicate the type and location of the probes, test units, or trenches, as well as a safety plan. If testing for nature and extent, the testing plan should include basic, or first-order, research questions. Testing should be limited to the minimum amount of disturbance necessary and should not diminish or substantially alter the significance or integrity of a property. Testing should be terminated once the necessary data are obtained either to recommend the site as eligible or to address the nature and extent of the deposits. The tested areas should be mapped with a global positioning system (GPS) and completely filled in when the testing is completed.

e. Reporting

For every project for which a consultant conducts both archaeological and architectural surveys, two reports will be produced: one on the archaeological resources identified and one on the architectural resources found. This will allow the reports to be filed in the appropriate location at the UDSH and will ensure that sensitive archaeological information is not available to the public in the Historic Preservation Section. Consult with the Region Archaeologist and Architectural Historian to determine the type and content of the report. For report content, refer to the UDOT guidance listed in Section 5.3(M)(1).

In addition to the standard report content referenced above, for each site or building identified for the undertaking, the following information must be provided:

- A recommendation of whether the site is eligible or not eligible for the NRHP; if eligible, which NRHP criterion or criteria apply
- For buildings, which UDSH – Historic Preservation Section rating applies

- If eligible under Criterion D (generally archaeological sites), a description of the types of research potential the site has (for example, chronology, subsistence, mobility, etc.)
- A clear statement justifying the recommendation in terms of the NRHP criteria and integrity of the building

Documentation (including photographs and maps) individual resources should follow the methods discussed previously and follow the guidance listed in Section 5.3(M)(1). Consultants should coordinate submission of draft reports with the Region Archaeologist and/or the Architectural Historian. Draft copies may be submitted electronically.

For archaeological reports, all sensitive information such as locations of archaeological sites, traditional cultural properties, sacred sites, or any information from which location could be derived must be placed in a detached or easily detachable appendix with a cover page that is clearly labeled with the same information that is on the cover of the report and is clearly labeled as "Appendices." Appendices will have limited distribution as directed by the Region Archaeologist.

The Region Archaeologist and/or the Architectural Historian review the draft reports and send comments to the consultant. Once comments are addressed and the draft final reports are approved by the Region Archaeologist and/or the Architectural Historian, it will be sent, along with determinations of eligibility (and possibly the finding of effect, depending on the stage of the project), to the SHPO for a 30-day review. Depending on the nature of the project, the report may be sent to other consulting parties for a 30-day review before it is sent to the SHPO. In the latter case, once consulting party comments are addressed, the report is then sent to the SHPO for an additional 30-day review.

f. Determinations of Eligibility

The following information applies to projects classified as Tier 2 projects (projects for which the finding of effect has been determined to be **no adverse effect** or **adverse effect**). Based on the cultural resource inventory report, the Region Archaeologist and/or the Architectural Historian prepare the DOE/FOE. This can be done in one consultation letter or submitted separately. Depending on the project, consulting parties may be provided an opportunity to review the DOE before it is submitted to SHPO. This section describes the process for preparing the DOE. For information on preparing the FOE, see Section 5.3(M)(3g).

There is a standard format/template for the DOE which should contain the following information:

- Appropriate regulatory paragraph which references applicable laws (Section 106, UCA 9-8-404) and PA. Include funding source (federal or state funded) and type of environmental document being prepared. For projects prepared under the CE

Assignment MOU or NEPA Assignment MOU, this should be stated and specific regulatory language included.

- Description of the project and the limits of disturbance (for example, roadway prism, toe-of-slope to toe-of-slope, existing UDOT right-of-way, etc.).
- Description of the APE, including size/length. If the APE and survey area differ, explain why. Also explain if there are different APEs for archaeology and architecture.
- All land jurisdictions (UDOT, private, BLM, SITLA, etc.).
- Description of survey methods, who conducted the survey, and results.
- Determinations of eligibility. If there are more than two or three resources, a table is recommended for presenting the eligibility information.
 - For archaeological resources, at a minimum the following information should be provided: (1) site number (and name, if applicable); (2) brief description of resource; (3) cultural affiliation (if known); (4) temporal assignment; (5) NRHP eligibility, including which criterion or criteria under which it is eligible; (6) whether the resource warrants preservation in place (see the Section 4(f) discussion below); and (7) a summary of the findings and eligibility recommendations.
 - For architectural resources, the table should include the following information: (1) an address; (2) an approximate date of construction; (3) a very brief building description noting the style or type; (4) the UDSH – Historic Preservation Section rating and NRHP eligibility; (5) the historic boundary; and (6) a photograph (if possible to include).
- Information regarding consultation with Native American tribes, CLGs, other agencies, and any other interested parties.
- For projects involving architectural resources, both the Region Archaeologist and the Architectural Historian should sign the DOE.
- A signature line for SHPO concurrence at the end of the letter.
- Include a project location map.

g. Findings of Effect

The following information applies to projects classified as Tier 2 projects (projects for which the finding of effect has been determined to be **no adverse effect** or **adverse effect**). Once project alternatives are developed enough to determine their potential impact on historic properties, the Region Archaeologist and/or Architectural Historian prepare a finding of effect (FOE). The FOE can be combined with the DOE or submitted as a separate consultation letter. Depending on the project, consulting parties may be

provided an opportunity to review the FOE before it is submitted to SHPO. This section describes the process for preparing the FOE. For information on preparing the DOE, see Section 5.3(M)(3f).

There is a standard format/template for the FOE which should contain the following information:

- Appropriate regulatory paragraph which references applicable laws (Section 106, UCA 9-8-404) and PA. Include funding source (federal or state funded) and type of environmental document being prepared. For projects prepared under the NEPA Assignment MOU or CE Assignment MOU, this should be stated and specific regulatory language included.
- Reference the previously submitted DOE.
- Brief project description with the description of the alternative or alternatives that will be, or have been, carried through the NEPA document. If a preferred alternative has been selected, the effect of only that alternative can be discussed.
- The finding of effect for each resource. If there are more than two or three resources, a table is recommended for presenting the effect information. Include the information mentioned in Section 5.3(M)(3f) and add a column for the effect.
- The finding of effect for the project.
- If there is an adverse effect, state that consultation will continue with the development of an MOA.
- Information regarding consultation with Native American tribes, CLGs, other agencies, and any other interested parties.
- Section 4(f) uses of historic properties (see Section 5.3[O]).
 - For individual and programmatic Section 4(f) evaluations, include information regarding the analysis of the Section 4(f) resource.
 - If there is a Section 4(f) *de minimis* impact finding the programmatic *de minimis* notification letter to the SHPO (dated June 12, 2007) will be attached.
- For projects involving architectural resources, both the Region Archaeologist and the Architectural Historian should sign the FOE.
- A signature line for SHPO concurrence at the end of the letter.
- Include a project location map.
- Attach plan sheets or other figures showing how the alternative(s) affect historic properties.

h. Resolution of Adverse Effects

1) Public Notice of Adverse Effect

The public and any interested parties should be notified that the project will have an adverse effect to historic properties. This can be done by publishing a notice in statewide or local newspapers, providing notice in a project newsletter, providing information at a public meeting, or other manner appropriate to the scope and complexity of the project.

2) Notifying ACHP

If the project is being conducted under Section 106 and the preferred alternative will have an adverse effect on historic properties, ACHP is notified of the adverse effect finding by letter, with supporting documentation (this can be on a CD) specified in 36 CFR 800.11(e). The Cultural Resource Program Manager prepares the notification letter and submits the package with required documentation to ACHP. ACHP responds within 15 days of receipt of the notification advising UDOT whether it will participate in the resolution of adverse effects. ACHP rarely participates.

3) Memorandum of Agreement (MOA)

The Region Archaeologist and Architectural Historian consult with the SHPO and other consulting parties to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate the adverse effects. Once mitigation measures are determined, an MOA will be executed that describes measures to be implemented. The MOA must be signed before the environmental document prepared for the project is approved. The executed MOA must be submitted to ACHP (unless it is a state project) along with the documentation specified in 36 CFR 800.11(f).

There is a standard format/template for an MOA which should contain the following basic elements:

- Title (what it is and who is involved)
- Background, stated as “WHEREAS” clauses
- What has been agreed to and who is going to do it, stated as “Stipulations”
- How administrative issues, unanticipated occurrences, and disputes will be handled (for example, public participation, monitoring and reporting on implementation, treatment of human remains, confidentiality, availability of records and data, disposition of archaeological collections, unanticipated discoveries, dispute resolution, amendment or termination of the agreement, “sunset” clause for duration of the agreement)
- Signature lines

- For projects processed under the 326 CE MOU, the following “WHEREAS” clause will be added:
 - In accordance with Stipulation II, Part A and Appendix B of the *Memorandum of Understanding, State Assumption of Responsibility for Categorical Exclusions (23 USC § 326)*, executed June 30, 2008, the UDOT assumes responsibility, assigned by the Federal Highway Administration (FHWA), for ensuring compliance with Section 106 of the NHPA and with Section 4(f) of the DOT Act of 1966, as amended.
- For projects processed under the 327 NEPA Assignment MOU, the following “WHEREAS” clause will be added:
 - In accordance with Part 3.2.1 of the *Memorandum of Understanding Between the Federal Highway Administration and the Utah Department of Transportation Concerning State of Utah’s Participation in the Surface Transportation Project Delivery Program Pursuant to 23 USC § 327*, executed January 17, 2017, the UDOT assumes responsibility, assigned by the FHWA, for ensuring compliance with Section 106 of the NHPA and with Section 4(f) of the DOT Act of 1966, as amended.

For projects processed in compliance with Section 106 under the 326 CE MOU and the 327 NEPA Assignment MOU, signatories to the MOA are UDOT, the SHPO, and ACHP (if it is participating). Invited signatories are other parties that assume a responsibility under the MOA, and additional parties whom UDOT wishes to invite. Invited signatories have the same rights with regard to seeking amendment or termination of the MOA. Concurring parties are any other consulting parties or other parties whom the signatories would like to concur in the MOA. The refusal of any party to concur does not invalidate the MOA.

i. Monitoring

The Region Archaeologist may recommend monitoring by a qualified archaeologist during construction if archaeological sites are located within the APE, if the project is located in a sensitive area, or if potential exists for uncovering buried cultural deposits. An archaeological monitor is often required as mitigation. Depending on the nature of the monitoring, a monitoring plan may be developed in consultation with the SHPO.

j. Discoveries

If previously unidentified archaeological or architectural properties are discovered after UDOT has completed the Section 106 or UCA 9-8-404 review and a discovery plan or monitoring plan has not been completed, Stipulation XI.B in the Section 106 PA will be followed for consultation. If a discovery or monitoring plan has been completed, Stipulation XI.A of the Section 106 PA will be followed for consultation. Regardless of

whether a discovery or monitoring plan has been completed, when a discovery occurs, the contractor will follow UDOT Standard Specification 01355, Part 3.8, Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites, or Human Remains.

1) Human Remains

Human remains and any funerary objects, sacred objects, or objects of cultural patrimony found during either archaeological investigations or construction will generally be treated in accordance with the Utah Native American Graves Protection and Repatriation Act ([Utah NAGPRA](#)). Utah NAGPRA applies on non-federal land. If the remains are found on federal land, the [federal NAGPRA](#) applies. When human remains are discovered, follow UDOT Standard Specification 01355, Part 3.8, which directs the contractor to cease activity, protect the discovery, and notify the Region Archaeologist. The Region Archaeologist will notify local law enforcement and the SHPO's office, and conduct appropriate tribal consultation.

k. Stakeholder Coordination

A cornerstone of the Section 106 and UCA 9-8-404 process is identifying the appropriate parties who need to be involved in assessing the effects of a project on historic properties and working through the process with those parties. Consultation with the SHPO (or THPO, if applicable) is required under 36 CFR 800. In addition, ACHP must be given a reasonable opportunity to comment on projects that will result in adverse effects. The UDOT Region Archaeologist and/or Architectural Historian are responsible for conducting consultation duties.

Section 106 regulations also specify that federally recognized Native American tribes that might attach cultural or religious significance to historic properties that could be affected by an undertaking will be consulting parties. FHWA and UDOT have executed Section 106 PAs with a number of Native American tribes and bands that streamline the Section 106 consultation process. These PAs authorize UDOT to initiate consultation with the tribes and bands. For implementation of the Section 106 process for each tribe, refer to the [specific agreements](#). The Region Archaeologist prepares tribal consultation letters and either sends them directly to tribes or coordinates mailing with FHWA if a particular tribe requests FHWA involvement.

Any land-managing agency whose land might be affected by the undertaking will be invited to participate in the Section 106 process. A representative of a local government with jurisdiction over the area in which the effects of an undertaking could occur is entitled to participate as a consulting party. Certain individuals and organizations with a demonstrated interest in the undertaking (such as CLGs and historic preservation or archaeology interest groups) can participate as consulting parties.

Outreach efforts to consulting parties, as well as the general public, should be commensurate with the nature and complexity of the undertaking and its effects on

historic properties, the likely interest in the effects on historic properties, and confidentiality concerns. It can be conducted in conjunction with the NEPA process or separately, whichever is appropriate for the project and provides meaningful consultation. Large, long-term projects may require sending several consultation letters and may involve several methods of communication and outreach (e.g., meetings, open houses, newsletters, emails, etc.).

N. Paleontological Resources

1. Laws, Regulations, and Guidance

- Paleontological Resources Preservation Act, March 30, 2009
- UCA 79-3-508, Agency Responsibilities

The Paleontological Resources Preservation Act became law on March 30, 2009, as part of the Omnibus Public Land Management Act of 2009 (Public Law 111-011). This law provides for the management and protection of paleontological resources on federal land. The state law protecting fossils in Utah is found in Section 508 of Title 79, Chapter 3, of the UCA ([UCA 79-3-508](#)). The agency responsible for overseeing compliance with UCA 79-3-508 is the [Utah Geological Survey \(UGS\), Office of the State Paleontologist](#). The statute reads as follows:

- (1) Before expending state funds or approving an undertaking, each state agency shall:
 - (a) Take into account the effect of the undertaking on a specimen that is included in or eligible for inclusion in the State Paleontological Register; and
 - (b) Allow the director or assigned staff a reasonable opportunity to comment regarding the undertaking or expenditure.
- (2) The director or assigned staff shall advise on ways to maximize the amount of scientific, paleontological, and educational information recovered, in addition to the physical recovery of specimens and the reporting of paleontological information, at current standards of scientific rigor.

2. Introduction

Paleontology is the study of ancient or past life. Paleontologists study the fossilized remains of life, including vertebrate organisms such as fishes, amphibians, reptiles, mammals, and dinosaurs (vertebrate paleontology); invertebrate organisms such as ancient snails, clams, ammonites, foraminifera, and arthropods (invertebrate paleontology); and preserved plants such as leaf impressions and petrified wood (paleobotany).

UDOT and UGS have an executed memorandum of understanding, *Memorandum of Understanding Between the Utah Department of Transportation and the Utah Geological Survey Concerning Agency Responsibilities Pursuant to U.C.A. 79-3-508*, executed March 25, 2010 ([UGS MOU](#)), that describes agency responsibilities for compliance with UCA 79-3-508. This agreement applies to all classes of undertakings, including encroachment on UDOT right-of-way for excavation, access construction, and other incidental construction undertakings. Certain types of projects have been found to have no effect on paleontological specimens that are on or eligible for inclusion in the State Paleontological Register and therefore do not require individual UGS notification and concurrence. All other projects require consultation with UGS.

Many of the tasks associated with compliance can be done by either the UDOT Region Archaeologist or an archaeological consultant. However, certain tasks, such as surveys, excavation, and monitoring, must be conducted by a qualified paleontologist.

a. Projects Exempt from UGS Notification

The UDOT Region Archaeologist reviews each undertaking to determine whether it is of a type that is exempted from UGS notification under the MOU (Stipulation D. 1-16 of the UGS MOU). These projects are generally pavement or maintenance related, located in urban environments, or involve very minor disturbance of original ground. If the project is one of the exempted types, consultation with UGS is not needed.

b. UGS Notification

For all other projects, the UDOT Region Archaeologist or an archaeological consultant submits a letter to UGS, Office of the State Paleontologist requesting a literature search for paleontological specimens or sites. The letter includes a description of the project and its APE, with as much detail as possible about ground disturbance; the legal location; and a copy of the 7.5-minute USGS topographic quadrangle map showing the project location. If a GIS shape file is available, it should be submitted to UGS as well.

c. UGS Response

UGS and the Utah Bureau of Land Management (BLM) have developed a classification system for geologic units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts ([BLM Instruction Memorandum \[IM\] 2008-009](#)):

- **Class 1 – Very Low.** Geologic units that are not likely to contain recognizable fossil remains.
- **Class 2 – Low.** Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- **Class 3 – Moderate or Unknown.** Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.
- **Class 4 – High.** Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. This class can be either an exposed unit (Class 4a) or areas where the geologic unit with high potential is buried (Class 4b).
- **Class 5 – Very High.** Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. These units are further classified as exposed units (5a) and buried units (5b).

UGS responds within 2 weeks of receiving the written request. If UGS responds that the geologic units in the project area are either Class 1 or Class 2, compliance with UCA 79-3-508 is complete, unless UGS indicates otherwise.

If UGS responds that the geologic units in the project area are Class 3, the UDOT archaeologist should determine if construction activities will affect those geologic units. The UGS website contains [geologic maps](#), particularly the 30x60 quad maps that can help in making this determination. If the geologic units are exposed and will be affected, a survey should be conducted by a qualified paleontologist. If significant fossil localities are found and will be affected, consultation continues with UGS to seek ways to avoid, minimize, or mitigate the impacts. If the geologic units in the project area will be affected but are not exposed, monitoring or spot-checking by a qualified paleontologist during construction could be required.

If the geologic units in the project area are either Class 4 or Class 5 and are exposed, a survey by a qualified paleontologist is required. If paleontological specimens are found during the survey, or if there are known paleontological specimens in the APE, their significance is evaluated by the paleontologist and a determination is made about whether they will be affected by the project. If known paleontological specimens are significant and will be affected, consultation continues with UGS to seek ways to avoid, minimize, or mitigate the impacts. Even if there are no known paleontological localities, or if the geologic units are not exposed before construction, monitoring could be required.

If UGS responds that there are known fossil localities in the APE, a paleontological survey and/or monitoring will be conducted as determined in consultation with UGS. If fossil localities will be affected, an appropriate mitigation plan will be prepared.

If UGS responds that Class 3, 4, or 5 geologic units are in the project area and the project is on or adjacent to lands under federal jurisdiction (federal BLM, Forest Service, etc.) or other state jurisdiction, the paleontologist for these agencies will be consulted as

well. If the agency does not have a paleontologist, the agency archaeologist will be consulted. If a paleontological survey is to be conducted across BLM land, a BLM Paleontological Resources Use Permit must be obtained by a qualified paleontologist. Other agencies might have similar permit requirements.

d. Reporting

Following the completion of a field survey, a report by a qualified paleontologist is prepared (refer to [BLM Manual H-8270-1](#) and [IM 2009-011](#) for specific report requirements). This report is submitted to UGS by the UDOT archaeologist for a 30-day review and comment period. Comments will be addressed and a final report will be submitted to UGS. A request for concurrence by UGS on significance evaluations will be submitted with any report that contains specimens.

e. Mitigation

Mitigation of impacts may include, but is not limited to, avoiding impacts, minimizing impacts by redesign or by adding features such as retaining walls, collecting data and fossil material, obtaining representative samples of the fossils, and monitoring. The mitigation plan will be submitted by the UDOT Region Archaeologist to UGS either as part of the paleontological survey report or will be submitted as a stand-alone document if no survey was conducted but known significant fossil localities are located in the area that will be affected by the project.

f. Monitoring and Discoveries

Monitoring must be performed by a qualified paleontologist, according to the monitoring plan. The method and frequency of monitoring will depend on the specific geologic units in the project area and the nature of impacts. If significant paleontological resources are discovered, the construction contractor must follow UDOT Standard Specification 01355, Part 3.8, Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites, or Human Remains. If a mitigation plan has been agreed to by UGS prior to construction, it will be followed. If significant paleontological resources are discovered and there is no mitigation plan in place, the UDOT archaeologist will consult with UGS within 48 hours to determine the appropriate treatment.

O. Section 4(f) and Section 6(f) Resources

1. Section 4(f) of the DOT Act of 1966

a. Laws, Regulations, and Guidance

- Section 4(f) of the Department of Transportation (DOT) Act of 1966

- [Section 6009\(a\) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users \(SAFETEA-LU\)](#)
- 23 CFR 774
- [FHWA Section 4\(f\) Policy Paper \(2012\)](#)
- [FHWA Guidance](#)
- [AASHTO Practitioner's Handbook 11](#)

For projects undertaken pursuant to the 327 NEPA Assignment MOU and the 326 CE MOU, UDOT is responsible for implementing Section 4(f) of the DOT Act of 1966 on behalf of FHWA. As such, they are responsible for decisions related to Section 4(f) compliance for all EIS and EA documents and documented CEs. Section 4(f) applies to parks and recreation areas, wildlife/waterfowl refuges, historic sites, and other resources.

b. Introduction

Section 4(f) of the DOT Act of 1966, as amended, declares that:

- (a) "It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.
- (b) The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities" (49 USC 303, as amended).

UDOT may not approve the use of Section 4(f) property unless:

- (a) UDOT determines that:
 - (1) There is no feasible and prudent avoidance alternative to the use of land from the property; and
 - (2) The action includes all possible planning to minimize harm to the property resulting from such use; or
- (b) UDOT determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the project, will have a *de minimis* impact on the property (23 CFR 774.3).

c. Process

Section 4(f) analysis and documentation are generally undertaken by the UDOT cultural resource staff or qualified consultants.

1) Identification of Section 4(f) Resources

The first step in the process is to identify whether there are resources that qualify for protection under Section 4(f) in the project area (23 CFR 774.11). The determination of whether Section 4(f) applies is made by the UDOT Environmental Program Manager for cultural resources, in consultation with the official(s) with jurisdiction. For the most part, the official(s) with jurisdiction over parks, recreation areas, and wildlife/waterfowl refuges are the officials of the agency that owns or administers the land. For historic sites, the official with jurisdiction is the SHPO.

There are four main categories of Section 4(f) resources: parks and recreation areas, wildlife/waterfowl refuges, historic sites, and other resources.

Parks, Recreation Areas, and Wildlife/Waterfowl Refuges. To qualify for protection under Section 4(f), a park or recreation area must be publicly owned and open to the public, its major purpose must be for recreational activity, and it must be significant as a park or recreation area. A wildlife or waterfowl refuge must also be publicly owned, its major purpose must be that of a refuge, and it must be significant as a refuge (it does not have to be open to the public).

Publicly owned land is considered to be a park, recreation area, or wildlife/waterfowl refuge when it has been officially designated as such and the official(s) with jurisdiction over the land determine that one of its major purposes and functions is for a park, recreation area, or wildlife/waterfowl refuge.

The significance determination of the resource is also made by the official(s) with jurisdiction. For the purposes of Section 4(f), *significance* means that the resource plays an important role in meeting the park, recreation, or refuge objectives of the community or authority. Management plans or other official forms of documentation regarding the land, if they are available and up-to-date, are important in this determination. UDOT or its consultant makes a request to the official(s) with jurisdiction for a significance determination. The request letter should explain the meaning of the term *significance* for Section 4(f) purposes. If a determination from the official with jurisdiction cannot be obtained, assume the resource is significant unless UDOT reviews the determination and reaches a different conclusion.

Historic Sites. To qualify for protection under Section 4(f), historic sites must be on or eligible for the NRHP (determined through the NHPA Section 106 process). Historic sites do not have to be in public ownership for Section 4(f) to apply.

For the purposes of Section 4(f), historic sites correspond to the term *historic property* as used under Section 106 and can include any prehistoric or historic district, site, building, structure, or object on or eligible for the NRHP. The types of historic sites most often encountered are prehistoric and historic archaeological sites, architectural properties, structures, and traditional cultural properties. Eligible archaeological sites may qualify for protection under Section 4(f) if they are important because they have qualities or

information beyond what can be learned by data recovery and have value for preservation in place.

Other Resources. Other resources might or might not be Section 4(f) resources, depending on certain conditions. The applicability of Section 4(f) to these types of resources is made by the UDOT Environmental Program Manager for cultural resources in consultation with the officials having jurisdiction over the resource. The list of other resources includes, but is not limited to, publicly owned school playgrounds, fairgrounds, golf courses, wild and scenic rivers, planned facilities, bikeways, trails, zoos, and public multiple-use land holdings. Refer to the FHWA Section 4(f) Policy Paper for more information on these other resources. A resource's Section 4(f) status is determined not by its name but by the criteria that define it.

In 23 CFR 774.13, FHWA states that Section 4(f) does not apply in the following circumstances:

- (1) Restoration, rehabilitation, or maintenance of transportation facilities that are on or eligible for the NRHP when the project will not result in an adverse effect to the property, provided the SHPO/THPO has not objected to the effect finding.
- (2) NRHP-eligible archaeological sites that are important chiefly for what can be learned by data recovery and that have minimal value for preservation in place, provided the SHPO/THPO has not objected to the effect finding.
- (3) Designation of park and recreation lands, wildlife/waterfowl refuges, and historic sites that are made, or determinations of significance that are changed, late in the development of a project. This exception applies if the property interest in the Section 4(f) land was acquired for transportation purposes prior to the designation or change in the determination of significance and if an adequate effort was made to identify properties protected by Section 4(f) prior to the acquisition. However, if it is reasonably foreseeable that a property would qualify as eligible for the NRHP prior to the start of construction, the property should be treated as a historic site.
- (4) Temporary occupancies of land that are so minimal that they do not constitute a use within the meaning of Section 4(f). There are five conditions that must be satisfied; see 23 CFR 774.13(d).
- (5) Park road or parkway projects.
- (6) Certain trails, paths, bikeways, and sidewalks in the following circumstances:
 - (a) Trail-related projects funded under the Recreational Trails Program
 - (b) National Historic Trails and the Continental Divide National Scenic Trail, except those trail segments that are historic sites
 - (c) Trails, paths, bikeways, and sidewalks that occupy a transportation facility right-of-way

- (d) Trails, paths, bikeways, and sidewalks that are part of the local transportation system and that function primarily for transportation
- (7) Transportation enhancement projects and mitigation activities where the use of the property is solely for the purpose of preserving or enhancing the property, and the official(s) with jurisdiction agree.

On March 10, 2005, ACHP issued a Programmatic Agreement for an exemption regarding the historic preservation review process for effects to the [Interstate Highway System](#). This exemption releases all federal agencies from the Section 106 requirement of having to take into account the effects of their undertakings on the Interstate System, except for a limited number of individual elements associated with the system. The designated [elements that are excluded](#) from the exemption have been published by FHWA; there are none in Utah. The exemption does not take a position on the eligibility of the Interstate System as a whole. The exemption was incorporated into SAFETEA-LU as Section 6007, which amended 23 USC 103(c) to state that the Interstate System shall not be considered a historic site under 49 USC 303 or 23 USC 138 (that is, Section 4(f) does not apply).

2) Use of Section 4(f) Resources

The “use” of a Section 4(f) resource is defined in 23 CFR 774.17. Except as stated in 23 CFR 774.11 and 23 CFR 774.13, a “use” of Section 4(f) property occurs:

- (1) “When land is permanently incorporated into a transportation facility;
- (2) Where there is a temporary occupancy of land that is adverse in terms of the statute’s preservation purpose as determined by the criteria in 774.13(d); or
- (3) When there is a constructive use of a Section 4(f) property as determined by the criteria in 774.15”

“Use” under paragraph (1) above occurs when the right-of-way is acquired through direct purchase (fee simple title), permanently converting the property to a transportation use, or when a permanent easement is acquired for maintenance or utility access. “Use” under paragraph (2) above occurs when a temporary occupancy (for example, right-of-entry, construction, or other temporary easements of short-term arrangement) does not meet all of the criteria in 23 CFR 774.13(d). Temporary occupancy is not considered a use when it is minimal and meets all of the conditions in 23 CFR 774.13(d). “Use” under paragraph (3) above occurs when the proximity impacts of a transportation project on a 4(f) property, even without the acquisition of the property, are so great that the purposes of the property that qualify the resource for protection are substantially impaired. A constructive-use finding must be coordinated with and approved by the Director of Environmental Services and, per the terms of the 327 NEPA Assignment MOU, must also be reviewed by FHWA for any constructive-use finding.

Section 6009(a) of SAFETEA-LU amended the existing Section 4(f) legislation to simplify the processing and approval of projects that use a Section 4(f) property with only *de minimis* (minor) impacts on land protected by Section 4(f). *De minimis* impacts were incorporated into the new regulations at 23 CFR 774 and guidance on *de minimis* determinations is available in the FHWA Section 4(f) Policy Paper.

Once it has been determined which, if any, resources in the project area qualify for protection under Section 4(f), the next step is to determine if the project will use those resources. Use is determined by applying one of the three criteria listed in 23 CFR 774.117. It is important to note that not all direct property takes will be considered a use and that, even if there is no direct property take, the project's impacts might be considered a use.

3) Approval Options

If a use has been determined, the type of Section 4(f) analysis will be defined by one of three approval options: a *de minimis* impact finding, a programmatic evaluation, or an individual evaluation.

De Minimis Impact Finding. A use with a *de minimis* impact for a historic site is one with a finding of no historic properties affected or no adverse effect under Section 106, and for parks it is one where the attributes or activities that qualify the property for protection under Section 4(f) would not be adversely affected. If all of the uses from a project have been determined to be *de minimis* impacts, it is not necessary to conduct an avoidance or least-harm alternatives analysis. The *de minimis* impact finding is based on the degree or level of impact including any avoidance, minimization, and mitigation or enhancement measures that are included in the project to address the Section 4(f) use. *De minimis* impact findings must be expressly conditioned on the implementation of any measures that were relied on to reduce the impact to a *de minimis* level. *De minimis* impact findings are made for each individual Section 4(f) resource, but written concurrence of the official(s) with jurisdiction can be provided for the project as a whole as long as the *de minimis* impacts findings have been made for each resource individually.

For parks, recreation areas, and wildlife/waterfowl refuges, written concurrence with the *de minimis* impact finding must be obtained from the official(s) with jurisdiction. The public notice and comment process related to *de minimis* impact findings usually will be accomplished through the NEPA process. For those actions that do not routinely require public review and comment (for example, certain CEs and re-evaluations), but for which a *de minimis* impact finding will be made, a separate public notice and opportunity for review and comment will be necessary.

For historic sites, *de minimis* impact findings require written concurrence from the SHPO/THPO on the finding of no historic properties affected or no adverse effect under Section 106 (see Section 6.3(M)), and the SHPO/THPO must be informed of UDOT's

intent to make a *de minimis* impact determination. No additional public review process beyond that required for the Section 106 process is necessary.

De minimis impact findings do not require the same level of documentation and review as an individual Section 4(f) evaluation. They are approved by the UDOT Environmental Program Manager for cultural resources without a legal-sufficiency review.

Programmatic Section 4(f) Evaluation. Programmatic Section 4(f) evaluations are a time-saving procedural alternative to preparing individual Section 4(f) evaluations for certain minor uses of Section 4(f) property. There are currently five programmatic agreements; applicability criteria are provided with each one: (1) Minor Involvement with Public Parks, Recreation Lands, and Wildlife and Waterfowl Refuges; (2) Minor Involvement with Historic Sites; (3) Projects That Necessitate the Use of Historic Bridges; (4) Independent Bikeway or Walkway Construction Projects; and (5) Projects That Have a Net Benefit to a Section 4(f) Property. Programmatic Section 4(f) evaluations have no comment period, and they can be approved by the UDOT Environmental Program Manager for cultural resources for all projects processed under the NEPA Assignment MOU or CE Assignment MOU.

Approvals of *de minimis* impact findings have generally replaced many of the programmatic evaluations, except for the use of historic bridges. This programmatic evaluation can be used even when a historic bridge will be replaced and there is an adverse effect finding under Section 106. However, in certain situation, one of the other programmatic evaluations may be more appropriate.

Individual Section 4(f) Evaluation. An individual Section 4(f) evaluation is undertaken for uses that do not meet the *de minimis* impact criteria or for which a programmatic evaluation is not appropriate. An individual evaluation requires more time, effort, and documentation compared to a *de minimis* impact finding or a programmatic evaluation. As used by UDOT, an individual evaluation is generally necessary when there is an adverse effect finding on historic properties under Section 106, or when the features, attributes, or activities of a park, recreation area, or refuge will be adversely affected.

For all projects processed under the 327 NEPA Assignment MOU or 326 CE MOU, individual Section 4(f) evaluations must be reviewed by UDOT legal staff. A preliminary legal-sufficiency review is conducted before the EA or EIS is released for public review and comment, and a legal-sufficiency review is conducted before the final EA or EIS is approved.

The official(s) with jurisdiction over a park, recreation area, or wildlife/waterfowl refuge must be given an opportunity to review and comment on the Section 4(f) evaluation. They can be given either the Section 4(f) evaluation or a letter that describes the uses. For historic sites that have a finding of no adverse effect or adverse effect under Section 106, a letter separate from the DOE-FOE that describes the Section 4(f) uses will be submitted to the SHPO/THPO for review and comment.

In addition, the U.S. Department of the Interior (USDOI) must be given an opportunity to review and comment on the Section 4(f) evaluation. It is given a 45-day comment period, but, if no comments are received, an additional 15-day waiting period is required before moving forward.

4) Feasible and Prudent Alternatives Analysis

If it is found that the project will use a Section 4(f) resource (other than a *de minimis* impact finding), evaluation of feasible and prudent avoidance alternatives must be undertaken. A feasible and prudent avoidance alternative is one that “avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property” (23 CFR 774.17). A determination of *de minimis* impact for a specific Section 4(f) property may be made without considering avoidance alternatives for that property, even if that use occurs as part of an alternative that also includes other uses that are greater than *de minimis*.

The process for evaluating feasible and prudent avoidance alternatives is described in detail in the FHWA Section 4(f) Policy Paper. It is often necessary to develop and analyze new alternatives, or new variations of alternatives rejected for non-Section 4(f) reasons during earlier phases. Potential alternatives to avoid the use of Section 4(f) property should include the no-build and may include one or more of the following, depending on project context:

- **Location Alternatives** – re-routing the entire project along a different alignment
- **Alternative Actions** – different modes of transportation such as rail or bus, or some action that does not involve construction such as transportation management systems
- **Alignment Shifts** – re-routing of a portion of the project to a different alignment to avoid a specific resource
- **Design Changes** – modification of the proposed design that would avoid impacts, such as reducing the planned median width, building a retaining wall, or incorporating design exceptions

When considering alignment shifts and design changes, it is important to consider the range of allowable configurations specified in design standards. Where it may be appropriate to select a value or dimension outside of the ranges that are established in state and national guidelines, design exceptions are encouraged and permitted. However, the consideration and selection of a value outside of the established ranges should be based on the context of the facility and an analysis of how the design may affect the safety, flow of traffic, constructability, maintainability, environment, cost, and other related issues.

Once the potential avoidance alternative(s) has been identified, the next task is to determine for each potential avoidance option, whether avoiding the Section 4(f) property is feasible and prudent. The CFR provides criteria for determining if an avoidance alternative is feasible and prudent (23 CFR 774.17):

- (1) A feasible and prudent avoidance alternative avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. In assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the resource to the preservation purpose of the statute.
- (2) An alternative is not feasible if it cannot be built as a matter of sound engineering judgment.
- (3) An alternative is not prudent if:
 - (i) It compromises the project to a degree that is unreasonable to proceed with the project in light of its stated purpose and need;
 - (ii) It results in unacceptable safety or operational problems;
 - (iii) After reasonable mitigation, it still causes:
 - (A) Severe social, economic, or environmental impacts;
 - (B) Severe disruption to established communities;
 - (C) Severe disproportionate impacts to minority or low-income populations; or
 - (D) Severe impacts to environmental resources protected under other federal statutes;
 - (iv) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
 - (v) It causes other unique problems or unusual factors; or
 - (vi) It involves multiple factors in paragraphs (3)(i) through (3)(v) of this definition that, while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.”

Supporting documentation of the process used to identify, develop, analyze and eliminate potential avoidance alternatives is very important. If the information is especially voluminous, a technical report should be prepared, summarized, and referenced in the Section 4(f) evaluation. Possible methods for organizing the discussion include a chronological discussion, a discussion organized geographically by project alternatives or project phases of construction, or by the type of Section 4(f) properties. For larger projects, it may be desirable to divide the analysis into a macro-level analysis for end-to-end avoidance alternatives and micro-level analysis of design options to avoid using a single Section 4(f) property.

5) Alternative with Least Overall Harm

If there is a feasible and prudent avoidance alternative, it must be selected. If there is not, and there is only one reasonable alternative that uses Section 4(f) properties and that meets the purpose and need, that alternative can be selected. However, if there is more than one alternative that uses Section 4(f) properties, and each is reasonable and meets the purpose and need, the alternative with the least overall harm in light of the statute's preservation purpose must be selected. "Least overall harm" is determined by balancing the following factors (23 CFR 774.3(c)(1)):

- (i) "The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- (ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- (iii) The relative significance of each Section 4(f) property;
- (iv) The views of the official(s) with jurisdiction over each Section 4(f) property.

When comparing alternatives under these factors, mitigation for each alternative should be comparable. Mitigation included in this comparison should be incorporated into the selected alternative. The remaining three factors enable UDOT to take into account any substantial problem with any of the alternatives remaining under consideration on issues beyond Section 4(f). These factors are:

- (v) The degree to which each alternative meets the purpose and need for the project;
- (vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- (viii) Substantial difference in costs among the alternatives."

The least overall harm balancing test is set forth in 774.3(c)(1). Through this balancing of factors, UDOT may determine that a serious problem identified in factors (v) through (vii) outweighs relatively minor net harm to a Section 4(f) property. The least overall harm determination also provides a way to compare and select between alternatives that would use different types of Section 4(f) properties when competing assessments of significance and harm are provided by the officials with jurisdiction over the affected properties.

6) All Possible Planning to Minimize Harm

Once the least-harm alternative has been selected, it must be demonstrated that the action includes all possible planning to minimize harm to the property resulting from such use. "All possible planning" means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or to mitigate for adverse impacts and effects must be included in the project.

For public parks, recreation areas, and wildlife/waterfowl refuges, some of these measures can include (but are not limited to) design modifications or design goals, replacement of land or facilities of comparable value and function, or monetary compensation to enhance the remaining property or to mitigate the adverse impacts of the project in other ways (23 CFR 774.17(1)). For historic sites, the measures normally serve to preserve the historic activities, features, or attributes of the site as agreed to by UDOT and the SHPO/THPO during the Section 106 process.

7) Coordination

The identification of resources and evaluation of impacts to Section 4(f) resources must be coordinated with the official(s) with jurisdiction (discussed above).

For parks, recreation areas, and wildlife/waterfowl refuges, initial coordination will generally include notifying the officials about the project, getting their input on the project, discussing the significance and primary use of the property, and determining whether there are any restrictions or covenants attached to the property. Once impacts have been determined, the coordination should include discussion of impacts to the property, avoidance alternatives, and measures to minimize harm. Before UDOT makes the Section 4(f) approval, the 4(f) evaluation must be provided for coordination and comment to the official(s) with jurisdiction. Prior to making *de minimis* impact determinations, public notice and an opportunity for public review and comments must be provided. This requirement can be satisfied with the public involvement activities conducted for NEPA. UDOT informs the official(s) with jurisdiction of its intent to make a *de minimis* impact finding, and the official(s) must concur in writing that the project will not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection. This concurrence can be combined with other comments on the project provided by the official(s).

For *de minimis* impacts on historic sites, the consulting parties identified in accordance with 36 CFR 800 must be consulted during the Section 106 or UCA 9-8-404 process, and there must be written concurrence from the SHPO/THPO (and from ACHP, if it is participating) in a finding of no historic properties affected or no adverse effect. UDOT informs the SHPO/THPO of its intent to make a *de minimis* impact determination based on their concurrence in the finding of effect. This letter is generally attached to the FOE or the DOEFOE. Public notice and comment, beyond that required by 36 CFR 800, are not required.

The SHPO/THPO must also concur with (or have no objections to) applying the 4(f) exception for any archaeological site. The easiest way to indicate this is in the table of the properties and their eligibility on the DOE (or DOEFOE). If appropriate, a separate letter will be sent for SHPO concurrence on the 4(f) uses (other than *de minimis*). This letter will be a simple letter that references the FOE and will be sent at the same time as the FOE.

The coordination required for programmatic Section 4(f) evaluations is specified in each programmatic document. When there are federal encumbrances on Section 4(f) property (such as Land and Water Conservation Fund Act [LWCFA] grants; see Section 6.3(O)(2) below), coordination with the appropriate federal agency is required to determine the agency's position on the proposed impact as well as to determine whether any other federal requirements apply to converting the Section 4(f) land to a different function.

For individual Section 4(f) evaluations, USDOJ is provided with the evaluation for coordination and comment. USDOJ is given a minimum of 45 days for submitting comments. If comments are not received within 15 days after the comment deadline, UDOT can assume a lack of objection and proceed with the action.

8) Format for Individual Section 4(f) Evaluations

Following is the recommended format for individual Section 4(f) evaluations as revised from the Technical Advisory T6640.8A.

Introduction and Regulatory Setting

At a minimum, this section introduces the regulatory setting. The individual definitions (of 4(f) resource, use, *de minimis*, etc.) can be stated either here or at the beginning of each appropriate section. It is preferable to quote the laws and regulations rather than trying to paraphrase them.

Proposed Action

Where a separate Section 4(f) evaluation is prepared as a stand-alone document (such as for a CE), describe the project and explain the purpose of and need for the project. Where the Section 4(f) evaluation is incorporated into an EA or EIS, these can be summarized and the NEPA document referenced.

Identification of Section 4(f) Resources

Describe each Section 4(f) resource that would be used by any alternative under consideration. For those resources in the project/study area that are protected by Section 4(f) but would not be used by the project, give a brief description and illustrate their locations on a map. It is also helpful to identify other resources that were determined not to be protected under Section 4(f) (reference the Affected Environment chapter of the NEPA document). This allows the reviewer to determine if consideration was given to all parks, recreation areas, refuges, and historic sites. For each park, recreation area, or wildlife/waterfowl refuge that is protected under Section 4(f), provide the following information:

- A detailed map or drawing at a small enough scale to identify the relationship of the alternatives to the Section 4(f) property

- Size (acres or square feet) and location (maps or other exhibits such as photos, sketches, etc.)
- Ownership (and management) and type of Section 4(f) property (park, recreation area, or refuge)
- Function of or available activities on the property (ball playing, swimming, golfing, etc.)
- Description and location of all existing and planned facilities (ball diamonds, picnic pavilions, playgrounds, tennis courts, etc.)
- Access (pedestrian, vehicle) and usage (approximate number of users/visitors, etc.)
- Relationship to other similarly used lands in the vicinity
- Applicable clauses that affect the ownership, such as lease, easement, covenants, restrictions, or conditions, including forfeiture
- Unusual characteristics of the Section 4(f) property (flooding problems, terrain conditions, or other features) that either reduce or enhance the value of all or part of the property

For each historic site that would be used, provide the following information:

- A detailed map or drawing at a small enough scale to identify the relationship of the alternatives to the Section 4(f) property.
- Resource identifier (address, name, site number, etc.).
- Description of the property. For archaeological sites, list only those that warrant preservation in place; these are identified in the Affected Environment chapter of the NEPA document.
- Boundaries, as determined through the Section 106 process.
- NRHP eligibility.
- Building rating (UDSH – Historic Preservation Section), if applicable.

Use of Section 4(f) Resources

Discuss the impacts on each Section 4(f) property from each alternative—for example, amount of land to be used, facilities and functions affected, description of use, type of use (permanent, temporary occupancy, or constructive), and whether the use has a *de minimis* impact. For historic sites, also describe the effect, as determined through the Section 106 process. Where an alternative (or alternatives) would use land from more than one Section 4(f) property, a summary table is useful in comparing the various

impacts of the alternative(s). Impacts that can be quantified should be quantified; other impacts that cannot be quantified should be described.

Alternatives Analysis

Avoidance Alternatives Analysis. Identify and evaluate location and design alternatives that would avoid the Section 4(f) property. Generally, location alternatives would be on either side of the property, such as parallel streets or new streets in front of or in back of the property. Design alternatives should be in the immediate area of the property and should consider minor alignment shifts, a reduced facility, retaining structures, etc. Where an alternative would use land from more than one Section 4(f) property, the analysis must evaluate alternatives that avoid all properties. Briefly discuss alternatives that were eliminated in the screening process (generally identified in the Alternatives chapter of the EA or EIS). If alternatives were eliminated because they did not meet the purpose and need, describe here the specific parts of the purpose and need that were not met. It might be necessary to evaluate other avoidance alternatives that were not discussed in the Alternatives chapter. If avoidance alternatives are found but are determined not to be feasible and prudent, document the alternatives in terms of the factors in 23 CFR 774.17 and described in Section 6.3(O)(c)(3). Systematically evaluate each factor, with a specific reference to the factor and citations to the regulations.

Least-Harm Analysis. If more than one alternative uses Section 4(f) properties and the alternatives are reasonable and meet the purpose and need, the alternative with the least overall harm in light of the statute's preservation purpose must be selected. "Least overall harm" is determined by balancing the factors in 23 CFR 774.3(c)(1). Discuss each alternative systematically with regard to each factor and conclude which alternative has the least overall harm. This section should include alternatives studied in detail in the NEPA document plus any other shifts or design modifications for each Section 4(f) resource that minimize use.

Measures To Minimize Harm

Discuss all possible measures that are available to minimize the impacts of the preferred alternative on the Section 4(f) property(ies). Detailed discussions of mitigation measures in the EIS or EA can be referenced and appropriately summarized. All design work done during the development of the preferred alternative to avoid and minimize harm should be discussed here.

Coordination

Discuss the results of coordination and consultation. For historic sites, most of this will take place as part of the Section 106 process. Potential consulting parties under Section 106 include the official(s) with jurisdiction (SHPO/THPO), federal and state agencies, CLGs, Native American tribes, other individual and non-governmental organizations

(NGOs), and the public. For parks, recreation areas, and refuges, discuss the coordination with the official(s) with jurisdiction, which can include federal and state agencies, Cities, Counties, school districts, etc. Also discuss the coordination with other individuals and NGOs as well as the public. The final Section 4(f) evaluation will also summarize the appropriate formal coordination with the Headquarters Office of USDO I (and/or appropriate agency under USDO I).

In the final Section 4(f) evaluation, add the following concluding statement if a least-harm analysis was conducted:

Based upon the above considerations, there is no feasible and prudent alternative to the use of land from the [*identify Section 4(f) property*]. Alternative [X] has been determined to be the alternative that causes the least overall harm to Section 4(f) properties in light of the statute's preservation purpose, and the proposed action includes all possible planning to minimize harm to the [*Section 4(f) property*] resulting from such use.

If no least-harm analysis was conducted, use the sentence from the FHWA [Technical Advisory T6640.8A](#) (Section IX.B(6)):

Based upon the above considerations, there is no feasible and prudent alternative to the use of land from the [*identify Section 4(f) property*], and the proposed action includes all possible planning to minimize harm to the [*Section 4(f) property*] resulting from such use.

2. Section 6(f) of the Land and Water Conservation Fund Act

a. Laws, Regulations, and Guidance

- [Land and Water Conservation Fund Act](#) (LWCFA) of 1965, as amended; 16 USC 4601-4
- [36 CFR 59](#)

b. Introduction

The purposes of the LWCFA of 1965 (16 USC 4601-4), as amended, are

to assist in preserving, developing, and assuring accessibility to all citizens of the United States of America of present and future generations and visitors who are lawfully present within the boundaries of the United States of America such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation in such recreation and to strengthen the health and vitality of the citizens of the United States by

- (1) providing funds for and authorizing federal assistance to the States in planning, acquisition, and development of needed land and water areas and facilities and
- (2) providing funds for the federal acquisition and development of certain lands and other areas.

The Act establishes a Land and Water Conservation Fund (LWCF) that can be used for federal purposes to acquire land, water, and interests in lands and waters as specified in the Act and other stated purposes. It also allows certain types of acquisitions for the national park and national forest system and for the national wildlife refuge system. The Act authorizes the Secretary of the Interior to provide financial assistance to states for outdoor recreation planning, acquisition of land or waters or interests in land or waters, and facilities development.

Section 4601-8[Sec 6](f)(3) of the Act, otherwise known as Section 6(f), contains provisions to protect the federal investment and the quality of resources developed with LWCF assistance:

No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he [or she] finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he [or she] deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

Code of Federal Regulations [36 CFR 59.3\(b\)](#) lists the following prerequisites for conversion approval:

- (1) All practical alternatives to the proposed conversion have been evaluated.
- (2) The fair market value of the property to be converted has been established, and the replacement property is of at least equal fair market value.
- (3) The property proposed for replacement is of reasonably equivalent usefulness and location to that being converted.
 - i. The property to be converted must be evaluated to determine what recreation needs are being fulfilled, and the replacement property must be evaluated to determine if it will meet recreation needs at least of the magnitude and impact to the user community as the converted site.
 - ii. The replacement property does not have to be directly adjacent to or close by the converted site.
 - iii. The acquisition of one parcel of land can be used to satisfy several approved conversions.

Code of Federal Regulations 36 CFR 59.3(b)(4) lists additional eligibility requirements for acquiring replacement property that is currently in public ownership, including, among other provisions, that it was not acquired for recreation, it has not been dedicated or managed for recreational purposes while in public ownership, and no federal assistance was provided in the original acquisition unless it was expressly for matching or supplementing LWCFA assistance.

The official responsible for administering the LWCF program at the state level is the LWCF Program Coordinator at the [Utah Division of State Parks and Recreation](#). Early coordination among UDOT, recipients of the funds, the State Parks official, and the National Park Service (NPS) if necessary is the key to identifying affected LWCFA lands in a timely manner.

c. Process

Most (but not all) parks, recreation areas, and wildlife/waterfowl refuges that are protected under Section 6(f) of the LWCFA are also protected by Section 4(f) of the DOT Act of 1966. When coordinating with the official(s) with jurisdiction over the Section 4(f) resource, UDOT or the consultant must also identify if there are any restrictions or covenants attached to the land. To ensure that proper identification is made, contact the LWCF Program Coordinator at the [Utah Division of State Parks and Recreation](#). If the property has been wholly or partially developed with an LWCFA grant and any land is proposed to be acquired for transportation purposes, replacement land of reasonably equivalent usefulness and location must be found in coordination with the official(s) with jurisdiction and the LWCF Program Coordinator.

A formal letter is then written to the LWCF Program Coordinator stating what the sponsor is planning to do and the reasons why. The sponsor is responsible for filling out the project amendment form from the State (Proposal Description and Environmental Screening Form). A boundary map of the property to be converted and a boundary map of the replacement property should be provided. Both maps must contain meets and bounds and the total acreage for each property. A map should also be provided showing the proximity of the converted property and the replacement property to each other.

Both the converted property and the replacement property must be appraised by a state-certified appraiser using the Uniform Appraisal Standards for Federal Land Acquisitions. The properties are to be appraised as raw land at the highest and best economic use without any improvements. Examples of highest and best use are commercial, residential, and agricultural. The replacement land must be of equal or greater value and recreational utility compared to the converted property. The acreage of the replacement property does not have to equal that of the converted property, but huge discrepancies might be disallowed. An additional certified appraiser must review all appraisals. Appraisals are valid for only 6 months from the time of completion. The conversion must be processed by the State before the 6-month period is up, or another appraisal must be done.

The proposed conversion of the property is reviewed by the LWCF Program Coordinator, who submits it to the NPS for final approval. The process of obtaining approval for the conversion of the land is not complete until the decision document has been signed. However, before the environmental document is completed, coordination should be conducted with the official(s) with jurisdiction and the LWCF Program Coordinator to ensure that replacement property is available and that the officials have agreed conceptually to the conversion.

1) Format for Section 6(f) Evaluations

If property acquired or developed with funds from the LWCF will be affected by any alternative, it should be discussed in a chapter or section separate from the Section 4(f) evaluation. Following is the recommended format.

Introduction and Regulatory Setting—Introduce Section 6(f) and the regulatory setting.

Identification of Section 6(f) Resources—Describe the property in the same terms used to describe Section 4(f) properties. Explain how the 6(f) funds were used (acquisition or development of facilities), and describe the management plan for the property. Research any conversions that occurred since the property was acquired or developed, and examine the current land-use plans for the surrounding community.

Impacts to Section 6(f) Resources—Discuss the impacts on each Section 6(f) property for each alternative (for example, amount of land to be used, facilities and functions affected, description of use, and type of use).

Mitigation—This section should discuss the general requirements for conversion of the Section 6(f) property to transportation use but does not have to identify the specific parcels for replacement. Before the environmental document is completed, coordinate with the official(s) with jurisdiction and the LWCF Program Coordinator to ensure that replacement property is available and that the officials have agreed conceptually to the conversion.

Coordination—Discuss all coordination that has occurred with the official(s) with jurisdiction, the LWCF Program Coordinator, and the NPS, as appropriate. Include copies of correspondence in an appendix.

P. Wetlands

1. Laws, Regulations, and Guidance

- Rivers and Harbors Act of 1899
- [Clean Water Act \(CWA\)](#); 33 USC 1251 *et seq.* (1972)
- [Executive Order 11990, Protection of Wetlands \(May 24, 1977\)](#)
- [USACE Regulatory Guidance Letters](#)

a. Rivers and Harbors Act and Clean Water Act

Two federal statutes mandate the jurisdiction of the U.S. Army Corps of Engineers (USACE) over navigable waterways and adjacent wetlands. These are Section 10 of the Rivers and Harbors Act of 1899 and [Section 404 of the Clean Water Act](#). Section 10 of the Rivers and Harbors Act applies to all navigable waters of the United States, and Section 404 of the CWA applies to all waters, including wetlands, that have a sufficient nexus to interstate commerce.

b. Executive Order 11990, Protection of Wetlands

Under [Executive Order 11990, Protection of Wetlands](#), each federal agency must provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Each agency, to the extent permitted by law, must avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds that (1) there is no practical alternative to such construction and (2) the proposed action includes all practical measures to minimize harm to wetlands that could result from such use. In making this finding, the head of the agency can take into account economic, environmental, and other pertinent factors.

c. Regulatory Guidance Letters

Regulations, laws, and guidance regarding wetlands are constantly changing as new Supreme Court decisions are rendered and as new administration policies revise past policies. The USACE issues Regulatory Guidance Letters on a regular basis to help clarify its regulations. The USACE [Sacramento District website](#) is a good resource to use on a regular basis to be kept informed of the latest changes and guidance.

2. Introduction

The USACE has permitting authority over activities that affect waters of the United States. Waters of the United States include surface waters such as navigable waters and their tributaries, all interstate waters and their tributaries, natural lakes, all wetlands adjacent to other waters, and all impoundments of these waters.

Section 404 of the CWA requires authorization from the Secretary of the Army, acting through the USACE, for discharging dredged or fill material into all waters of the United States, including wetlands. Discharges of fill material on transportation projects generally include placing fill for roadways or the construction of structures in waters of the United States. A USACE permit is required whether the work is permanent or temporary. Examples of temporary discharges include temporary fills for construction access roads, cofferdams, and storage and work areas.

3. Process

a. Waters of the U.S. Delineation

In order to process an application for a 404 permit, the USACE must first have verified the Waters of the U.S. delineation for the project area. The delineations should be conducted early in the project development process so that projects can be designed or have alignments selected that would avoid or minimize impacts to wetlands.

Depending on the project location, delineations should be conducted using the 1987 *Corps of Engineers Wetlands Delineation Manual* and either one of the following: 1) [Arid West Supplement](#); or 2) [Western Mountains, Valleys, and Coast Supplement](#). Ordinary High Water Marks should be determined by using [A Field Guide to the Identification of the Ordinary High Water Mark \(OHWM\) in the Arid West Region of the Western United States](#).

To improve the quality and consistency of delineations, the Sacramento District has developed [minimum standards necessary for accepting delineation](#) for verification of the jurisdictional boundaries. Submitted delineations that do not meet these requirements will be returned to the preparer. Before resubmittal, the applicant or a consultant must correct all deficiencies. The USACE has also established standards for [mapping](#).

b. Approved Jurisdictional Determination versus Preliminary Jurisdictional Determination

When submitting a delineation report to the USACE for verification, the UDOT Region should request in writing whether it wants an approved Jurisdictional Determination (JD) or a preliminary Jurisdictional Determination. By requesting and signing a preliminary JD, the applicant is agreeing that all wetlands and other water bodies on the site that are affected in any way by that activity are jurisdictional waters of the United States, and the preliminary JD precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, in any administrative appeal, or in any federal court. In return, a request for a preliminary JD is intended to expedite the permitting process by agreeing that all delineated waters of the United States within the project area are potentially jurisdictional. If there are significant wetlands identified in the project area that UDOT asserts are non-jurisdictional, then a preliminary JD should not be used. Wetland determinations that the USACE concedes have the potential of being non-jurisdictional are sent to EPA and reviewed for concurrence, which adds time to the verification process.

c. Types of Department of the Army Permits

1) Nationwide Permits

A nationwide permit is a form of general permit that authorizes a category of activities throughout the nation. These permits are valid only if the conditions applicable to the permits are met. If the conditions cannot be met, a regional or individual permit will be required. There are about 50 nationwide permits (NWP), and those that typically apply to transportation projects include NWP-14 (Linear Transportation Projects), NWP-12 (Utility Line Activities), and NWP-33 (Temporary Construction, Access and Dewatering). Nationwide Permit 14 has a 0.5-acre threshold. Projects that would affect more than 0.5 acre of wetlands are required to apply for an individual permit. Project designers should strive to reduce wetland impacts below 0.5 acre if possible to avoid the longer and more rigorous process of obtaining an individual permit.

To apply for a nationwide permit, the project team must submit a Pre-Construction Notification (PCN) to the USACE. The minimum requirements to include in a PCN are explained under Section A, General Condition 27, in the Nationwide Permit Summary. Additional PCN requirements are found under Section B (I), Regional Conditions, Sacramento District, and Section B (IV), Utah Only. General Conditions 18 (Endangered Species), 20 (Historic Properties), and 23 (Mitigation) need to be addressed in the PCN, or the application will be returned as incomplete. The USACE South Pacific Division's [Nationwide Permit PCN form](#) should be used to provide all required information.

2) Letter of Permission

The Sacramento District implemented a Letter of Permission (LOP) procedure in 2011 to more efficiently authorize activities with minor impacts on the aquatic environment that involve discharges of dredged or fill material into Waters of the U.S. In order to qualify for this abbreviated permit, the activities must meet criteria and conditions described in the [public notice](#).

3) Individual (Standard) Permits

The project team will need to obtain an Individual Permit for projects with unavoidable wetland impacts that exceed 1 acre or projects whose impacts to waters of the United States exceed the limitations for a nationwide permit or LOP.

Individual Permits are issued following a full public interest review of an application for a Department of the Army permit. A Public Notice is distributed to all known interested persons. After evaluating all comments and information received, the USACE makes a final decision on the application.

The permit decision is generally based on the outcome of a public interest balancing process in which the benefits of the project are balanced against the detriments. The

USACE will not grant a permit unless it determines that the proposal is not contrary to the public interest.

Potential applicants for standard permits are encouraged to participate in pre-application meetings with the USACE and appropriate agencies to discuss potential mitigation requirements and information needs.

To apply for an individual permit, the applicant should submit a Department of the Army Permit (Engineering Form 4345) and enough information for the USACE to prepare the Public Notice. The public notice is the primary method for advising all interested parties of the proposed activity for which a permit is sought and for soliciting comments and information necessary to evaluate the probable impact on the public interest. Therefore, the notice must include enough information to give the public a clear understanding of the nature and magnitude of the activity in order to generate meaningful comments. The applicant should include the following information in the permit application:

- The application must include a complete description of the proposed activity including necessary drawings, sketches, or plans sufficient for public notice (detailed engineering plans and specifications are not required); the location; the purpose of and need for the proposed activity; scheduling of the activity; the names and addresses of adjoining property owners; the location and dimensions of adjacent structures; and a list of authorizations required by other federal, interstate, state, or local agencies for the work, including all approvals received or denials already made.
- All activities that the applicant plans to undertake that are reasonably related to the same project and for which a Department of the Army permit would be required.
- If the activity would involve dredging in or discharge of fill material into a water of the United States, the application must include a description of the type, composition, and quantity of the dredged or fill material.
- The application must contain a statement, which will be included in the public notice, explaining how impacts associated with the proposed activity will be avoided, minimized, and/or compensated for. This explanation must address the proposed avoidance and minimization and the amount, type, and location of any proposed compensatory mitigation, including any out-of-kind compensation, or must indicate an intention to use an approved mitigation bank or in-lieu fee program. The level of detail provided in the public notice must be commensurate with the scope and scale of the impacts.
- The application must be signed by the person (that is, the applicant) who desires to undertake the proposed activity or by a duly authorized agent.

The USACE should determine within 15 days if the application is complete and, if it is complete, issue the public notice. The comment period for a public notice is typically

30 days, after which the USACE will assemble the received comments and include its own comments and forward them to the applicant for response. The applicant should prepare responses to the comments as quickly as possible. If the USACE does not receive a response letter within 30 days, they can withdraw the application until comments are received, and restart the permit process clock.

d. Mitigation

Avoidance, minimization, and compensation are all considered parts of mitigation. Prior to issuing a permit, the USACE must determine that the applicant has avoided and minimized impacts to the maximum extent practicable. After avoidance and minimization, compensatory mitigation will be considered for unavoidable impacts to Waters of the U.S. A statement regarding avoidance, minimization, and mitigation is required in a permit application. Restoration should be the first option considered since the likelihood of success is greater. Restoration also helps reduce impacts to ecologically important uplands, such as mature forests, where compensatory mitigation activities might be proposed because of land availability.

e. 404(b)(1) Guidelines

As part of Section 404 of the Clean Water Act, Subpart (b)(1) (or the “B-1 Guidelines”) was included to give further guidance on implementation of the Act (40 CFR Subpart B 230.10 (a)). The “B-1 Guidelines” state that:

No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge [that] would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

The practicability of an alternative is determined by availability, cost, technology, and logistics. An alternative is practicable if it is physically available and capable of being implemented after taking into consideration cost, existing technology, and logistics in light of the overall project purposes. The term *existing technology* refers to whether materials and construction methods exist in order to build the proposed alternative. The term *logistics* refers to whether the alternative can be constructed given the existing characteristics of the project site.

Where the proposed activity does not require access to or siting within the special aquatic site (that is, it is not “water dependent”), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Practicable alternatives to the proposed discharge that do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.

The first requirement says that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge [that] would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.”

The second requirement states that discharges can be permitted only when permit applicants take all “appropriate and practicable” steps to *minimize* unavoidable impacts.

The third requirement states that permit applicants must *compensate* for those impacts remaining after all appropriate and practicable efforts have been made to avoid and minimize project impacts. Compensation can be provided by restoring former wetlands, enhancing existing wetlands, creating new wetlands, and creating additional floodplain areas and riparian areas for stream impacts.

f. Compensatory Mitigation

Compensatory mitigation for unavoidable wetland impacts should follow the USACE [Compensatory Mitigation for Losses of Aquatic Resources: Final Rule](#) published April 10, 2008. The Final Rule establishes an order of preference regarding which type of mitigation to use. The first choice for consideration should be a wetland mitigation bank, if it is available in the project area, followed by in-lieu fee and finally permittee-responsible mitigation. Since there are few banks and in-lieu fee programs available in Utah, many UDOT projects with wetland impacts will be responsible for developing their own mitigation. Mitigation sites should be selected based on a high probability of success, ease of construction, and low future long-term maintenance costs to UDOT. The South Pacific Division USACE published the [Regional Compensatory Mitigation and Monitoring Guidelines](#) in 2015 to supplement the 2008 USACE Final Rule.

g. Mitigation Plan

A mitigation plan is required for all forms of compensatory mitigation, whether permittee-responsible mitigation, mitigation banks, or in-lieu fee mitigation projects.

1) Permittee-Responsible Mitigation

Individual (Standard) Permits

The permittee must prepare a draft mitigation plan and submit it to the USACE for review. When the USACE has approved the draft mitigation plan, the permittee must prepare a final mitigation plan and resubmit to the USACE before the USACE will issue the Individual Permit.

The final mitigation plan must be incorporated into the Individual Permit by reference and must include the 12 components listed below. The level of detail of the plan should be commensurate with the impacts.

The USACE may determine that it would be more appropriate to address any of the 12 components listed below as permit conditions instead of as components of a mitigation plan.

General Permits (Nationwide Permits and Letters of Permission)

The USACE may approve a conceptual or detailed mitigation plan.

A final mitigation plan incorporating the 12 components listed below, at a level of detail commensurate with the impacts, must be approved by the USACE before the permittee begins work in waters of the United States.

The USACE may determine that it would be more appropriate to address any of the 12 components listed below as permit conditions instead of as components of a mitigation plan.

2) Using Mitigation Banks or In-Lieu Fee Programs

Individual (Standard) Permits

For permittees meeting their mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, their mitigation plans need to include only components 4 (baseline information) and 5 (determination of credits) and the name of the mitigation bank or in-lieu fee program to be used.

General Permits (Nationwide Permits and Letters of Permission)

For permittees that will meet their mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, their mitigation plans need to include only components 4 (baseline information) and 5 (determination of credits) and either (1) the name of the mitigation bank or in-lieu fee program to be used or (2) a statement indicating that a mitigation bank or in-lieu fee program will be used (contingent on approval by the USACE).

3) Twelve Components of a Compensatory Mitigation Plan

Mitigation plans must include the following 12 components for each mitigation project site. The USACE may require additional information as necessary to determine the appropriateness, feasibility, and practicability of the mitigation project

1. **Objectives.** A description of the resource type(s) and amount(s) that will be provided, the method of compensation (restoration, establishment, preservation, etc.), and how the anticipated functions of the mitigation project will address watershed needs.
2. **Site selection.** A description of the factors considered during the site selection process. This should include consideration of watershed needs, onsite

alternatives where applicable, and practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the mitigation project site.

3. **Site protection instrument.** A description of the legal arrangements and instrument including site ownership that will be used to ensure the long-term protection of the mitigation project site.
4. **Baseline information.** A description of the ecological characteristics of the proposed mitigation project site should be included. Also, if an application for a Department of Army permit is being requested, the description should include the site where impacts are proposed. This can include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other characteristics appropriate to the type of resource proposed as compensation. The baseline information should include a delineation of waters of the United States on the proposed mitigation project site. A prospective permittee who plans to secure credits from an approved mitigation bank or in-lieu fee program needs to provide only baseline information about the impact site.
5. **Determination of credits.** A description of the number of credits to be provided including a brief explanation of the rationale for this determination. The South Pacific Division provides guidance on determining mitigation [ratios](#).

For permittee-responsible mitigation, this item should include an explanation of how the mitigation project will provide the required compensation for unavoidable impacts from the permitted activity to aquatic resources.

For permittees who intend to secure credits from an approved mitigation bank or in-lieu fee program, this item should include the number and resource type of credits to be secured and how these were determined.
6. **Mitigation work plan.** Detailed written specifications and work descriptions for the mitigation project, including the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water; methods for establishing the desired plant community; plans to control invasive plant species; proposed grading plan; soil management; and erosion-control measures. For stream mitigation projects, the mitigation work plan can also include other relevant information, such as planform geometry, channel form (for example, typical channel cross-sections), watershed size, design discharge, and riparian area plantings.
7. **Maintenance plan.** A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.

8. **Performance standards.** Ecologically based standards that will be used to determine whether the mitigation project is achieving its objectives.
9. **Monitoring requirements.** A description of parameters monitored to determine whether the mitigation project is on track to meet performance standards and whether adaptive management is needed. A schedule for monitoring and reporting monitoring results to the District Engineer must be included.
10. **Long-term management plan.** A description of how the mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.
11. **Adaptive management plan.** A management strategy to address unforeseen changes in site conditions or other components of the mitigation project, including the party or parties responsible for implementing adaptive management measures.
12. **Financial assurances.** A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the mitigation project will be successfully completed in accordance with its performance standards. Because UDOT is a governmental agency with appositive reputation with the USACE for fulfilling mitigation commitments, UDOT is not required to provide financial assurances.

Q. Threatened and Endangered Species

1. Laws, Regulations, and Guidance

- [Endangered Species Act](#); 7 USC 136; 16 USC 1531 *et seq.* (1973)
- [Bald and Golden Eagle Protection Act](#)
- [Fish and Wildlife Coordination Act, 16 USC 661 et seq.](#)
- [Anadromous Fish Conservation Act, 16 USC 757 et seq.](#)

a. Endangered Species Act

The Endangered Species Act requires federal agencies to ensure that their actions neither jeopardize the continued existence of species listed as endangered or threatened nor result in destruction or adverse modification of the critical habitat of these species. Federal agencies must consult with the USFWS if an action would result in “take” of a listed animal species, where “take” means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” an individual of a protected species (16 USC 1532 *et seq.*). Projects with a federal nexus follow the Section 7 consultation process (including local government projects with federal funding). Projects that have no federal nexus follow the Section 10 process (this is not typical).

b. Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the take, sale, purchase, possession, barter, or transport, or offer to do any of the above, of either the bald or golden eagle at any time or in any manner (16 USC 668a–d). The Bald and Golden Eagle Protection Act could apply to the project if any individual or nest of these two eagle species could be affected.

The Endangered Species Act no longer applies to the bald eagle. On June 28, 2007, the bald eagle was delisted from threatened status under the Endangered Species Act. The bald eagle is still protected by the Bald and Golden Eagle Protection Act.

2. Introduction

Transportation projects can cause impacts to threatened and endangered (T&E) species, including their habitat. The Endangered Species Act requires “each federal agency to ensure that its actions do not jeopardize the continued existence of any threatened, endangered, or candidate species, or adversely modify the habitat of such species.”

The primary objective of USFWS’s Endangered Species Program is to protect endangered, threatened, or candidate wildlife species and restore them to a secure status in the wild. Responsibilities of the program include the following:

- Listing, reclassifying, and delisting species under the Endangered Species Act
- Providing biological opinions to federal agencies on their activities that could affect listed species
- Overseeing recovery activities for listed species
- Providing for the protection of important habitat
- Assisting States and private landowners with their endangered species and conservation efforts

3. Section 7 Process

UDOT’s responsibility with regard to the Endangered Species Program is to ensure that all transportation-related projects minimize impacts to listed threatened, endangered, and candidate (listed) species and their designated critical habitats. A list of such species can be found in 50 CFR 17.

Section 7 consultation has two types that apply to UDOT projects: informal consultation and formal consultation. Informal consultation can be converted to formal consultation as circumstances require.

In most situations, only a federal agency can enter into formal Section 7 consultation. However, for UDOT projects processed pursuant to the 327 NEPA Assignment MOU and 326 CE MOU, UDOT has assumed FHWA’s responsibilities for formal Section 7 consultation. Additionally, 50 CFR 402.08 allows a federal agency to designate a non-

federal representative, such as the UDOT Wildlife Program Manager, to conduct informal Section 7 consultation and to prepare biological assessments (BAs) when necessary. UDOT has assumed responsibility for Section 7 consultation for all projects processed under the 327 NEPA Assignment MOU and the 326 CE MOU.

a. Informal Consultation

The project team will notify the UDOT Wildlife Biologist of the project early in the environmental study phase. The team should send a project description along with a location map (preferably on an aerial photograph) and UDOT project number/PIN to the UDOT Wildlife Biologist via email. All projects must be reviewed to determine whether T&E species or designated critical habitat would be affected. For local government projects, the consultant should make a determination as to whether any T&E species or designated critical habitat would be affected and forward the determination to the UDOT Wildlife Biologist for agreement.

USFWS maintains an online [Information, Planning, and Conservation System \(IPaC\)](#) that serves information including species lists, species life history, designated critical habitat, *Federal Register* documents, recovery plans, and conservation plans. In accordance with 50 CFR 402.13, the UDOT Wildlife Biologist will review the project for potential impacts to listed species and designated critical habitat. If the project will have “no effect” on listed species or designated critical habitat, the UDOT Wildlife Biologist will issue a clearance memo for inclusion in the environmental document. This memo serves the same function as a concurrence letter from USFWS. For local government projects, the UDOT Wildlife Biologist should provide documentation for agreement with the consultant’s “no effect” determination (email is sufficient) and no further action is needed. According to a letter from the Utah Field Supervisor for the Utah Field Office of USFWS, dated January 27, 2006, USFWS “will no longer provide concurrence for ‘no effect’ determinations. Written concurrence from our office is not required for ‘no effect’ determinations.”

If a project “may affect but is not likely to adversely affect” listed species or designated critical habitat, the manager will consult with the project team on these findings and possible mitigation measures. The UDOT Wildlife Biologist requests concurrence from USFWS on UDOT’s findings. USFWS will provide a written response which needs to be included in the environmental document. The review usually takes 3 to 4 weeks, but additional time might be required depending on the logistics and complexity of the project, site, and species involved.

b. Formal Consultation

If the UDOT Wildlife Biologist (or USFWS) determines or concurs that a project is “likely to adversely affect” or to “jeopardize” the future existence of a threatened or endangered species or its designated critical habitat, a Biological Assessment (BA) will be prepared.

This can be done either by the UDOT Wildlife Biologist or by a qualified consultant. The UDOT Wildlife Biologist will review the BA, then submit it to the Environmental Program Manager for natural resources who will initiate formal consultation on behalf of UDOT. UDOT will send a letter, including the BA, to USFWS, thus initiating formal Section 7 consultation as required under 50 CFR 402.14(b). UDOT acts as FHWA for USFWS consultation under the 327 NEPA Assignment MOU.

A BA describes the T&E species of concern and their habitat and determines the expected project impacts on the species and/or their designated critical habitat. Suggested mitigation measures are listed as part of the BA. If approved, these measures must be included in the project's environmental document and project plans.

After reviewing the BA, the UDOT Environmental Program Manager will meet with USFWS to discuss the project. USFWS then issues a Biological Opinion (BO) based on the BA and project meetings. The BO might list further mitigation measures discussed in project meetings that need to be added to those proposed in the BA. USFWS should provide a BO within 135 days the written request for formal consultation.

The BO will result in either a "jeopardy" opinion or a "no jeopardy" opinion.

- If a "no jeopardy" opinion is issued along with required mitigation measures, the process is complete, and the project can proceed with the mitigation measures outlined in the BO.
- If a "jeopardy" opinion is issued, UDOT then must notify USFWS of its decision to either accept the necessary measures to convert the "jeopardy" opinion to a "no jeopardy" opinion or revise the project to reduce or avoid impacts. If UDOT agrees with USFWS's requirements, the process is complete.

If T&E or candidate plants or animals would be threatened by a project, USFWS may require UDOT to obtain an Incidental Take Permit. *Take* is defined in the Endangered Species Act as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any T&E species. *Harm* can include significant habitat modification that kills or injures members of a listed species by impairing the species' essential behavior (for example, nesting or reproduction).

Depending on the likely impacts, the project team in consultation with the UDOT Wildlife Biologist decides whether to pursue an Incidental Take Permit. This should be done concurrently with the Section 7 formal consultation process, and the permit, if approved, will be issued by USFWS along with its BO.

4. Section 10 Process

If there is no federal action, Section 10 of the ESA applies. An incidental take permit is required when non-federal activities will result in the "take" of T&E species. A Habitat

Conservation Plan (HCP) must accompany an application for an incidental take permit. A HCP consists of the following:

- An assessment of impacts that are likely to result from the proposed “taking”
- Measures that UDOT or the permit applicant will undertake to monitor, minimize, and mitigate impacts
- Identification of funding that will be made available to implement such measures
- Procedures to deal with unforeseen or extraordinary circumstances
- Alternative actions to the “taking” that UDOT analyzed, and the reasons why UDOT did not adopt such alternatives
- Additional measures that USFWS may require as necessary or appropriate

Once submitted, the USFWS Regional Director decides whether to issue an Incidental Take Permit based on findings that:

- The “taking” will be incidental to an otherwise lawful activity
- The impacts will be minimized and mitigated to the maximum extent practicable
- Adequate funding will be provided
- The “take” will not appreciably reduce the likelihood of the survival and recovery of the species
- All other necessary measures are met

A qualified biologist will be designated to be responsible for monitoring the provisions of the HCP. This can be the UDOT Wildlife Biologist or a qualified consultant. This person will monitor the project for compliance with the terms of the Incidental Take Permit or HCP. USFWS will require this person to make periodic inspections and report his or her findings to USFWS. In this way, USFWS maintains oversight responsibility for implementing the HCP’s terms and conditions. If the HCP addresses all these requirements to the USFWS Regional Director’s satisfaction and all other applicable laws are addressed, the permit may be issued.

5. Utah Prairie Dog Programmatic Biological Opinion

A formal Section 7 consultation was held between FHWA (on UDOT’s behalf) and USFWS on UDOT’s Highway Preservation and Improvement Program and its effects on the Utah prairie dog. A Programmatic Biological Assessment was submitted to USFWS on September 12, 2012, and a final Programmatic Biological Opinion (PBO), including an Incidental Take Statement, was issued on January 30, 2013.

The PBO covers UDOT’s routine upgrade, maintenance, preservation and improvement activities on existing state roads in south-central Utah for the 20-year planning horizon. Improvement activities would result in permanent impacts to Utah prairie dogs and their habitat. The PBO lists conservation measures that must be incorporated where projects occur within mapped habitat. In order to mitigate for impacts, UDOT purchased credits from the Utah Prairie Dog Habitat Credit Exchange. Each individual project will count against the total mitigation credits purchased. Total temporary and permanent impacts

must be established in pre-construction surveys for each project within mapped Utah prairie dog habitat.

6. Utah Sensitive Species

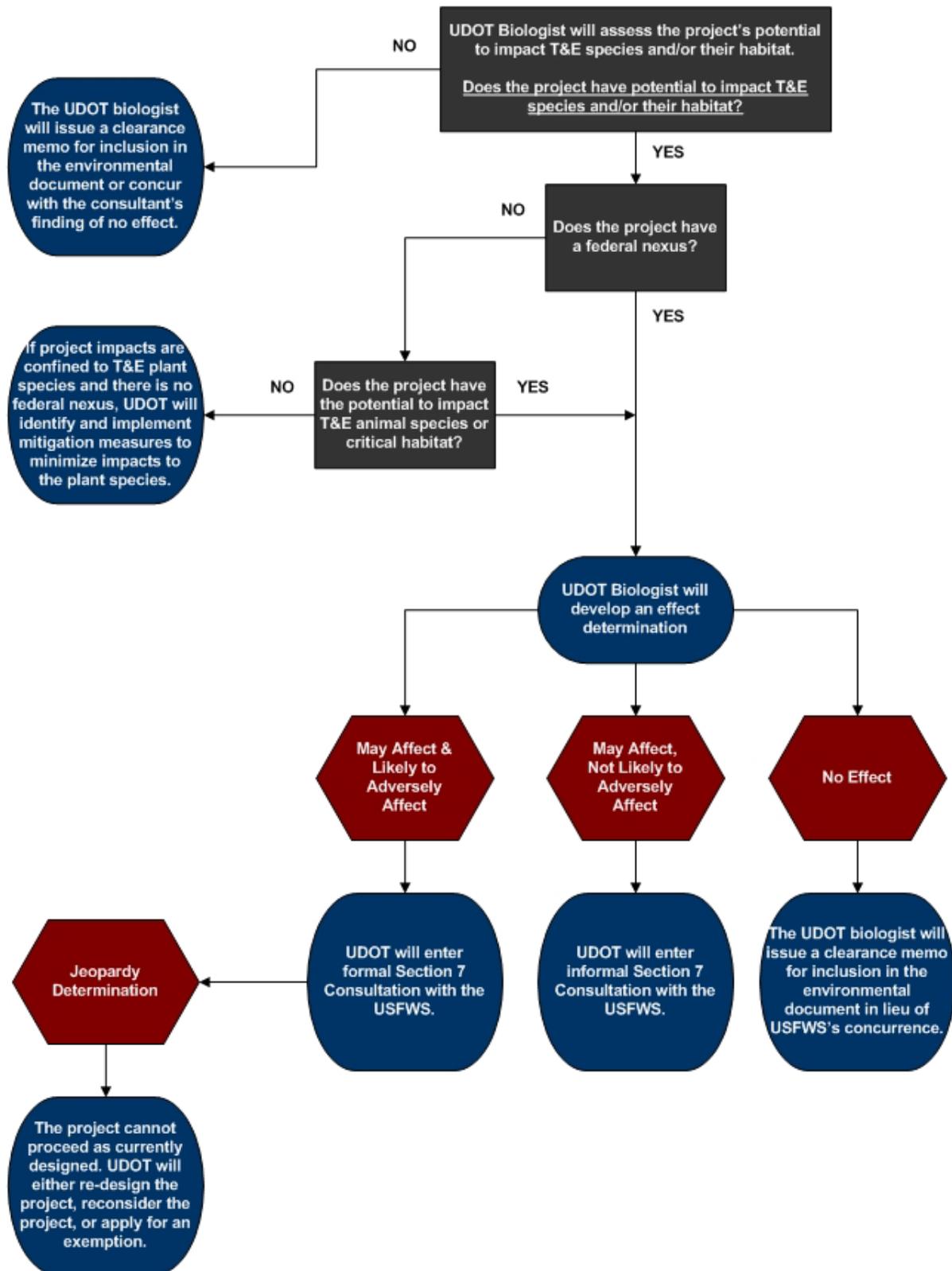
In addition to species listed as threatened, endangered, or candidate by USFWS, many other plant and animal species have been classified as sensitive by the Utah Division of Wildlife Resources (UDWR). UDWR Administrative Rule R657-48 provides that wildlife species that are federally listed, that are candidates for federal listing, or for which a conservation agreement is in place automatically qualify for the Utah Sensitive Species List. Additional species included on this list, “wildlife species of concern,” are those species for which there is credible scientific evidence to substantiate a threat to continued population viability. Information on these species can be requested from the UDWR [Utah Natural Heritage Program](#).

If a proposed UDOT project would negatively affect wildlife, particularly State Sensitive Species, the UDOT Wildlife Biologist notifies the project team and coordinates with UDWR. The Wildlife Program Manager, along with the project team, discusses potential mitigation measures with UDWR including avoidance, minimization, and potential mitigation measures.

7. Navajo Nation Sensitive Species

When a project is located on the Navajo Nation Reservation, the UDOT Wildlife Biologist contacts the wildlife biologist with the Navajo Nation Department of Fish and Wildlife and discusses the project and possible concerns. This could require a survey of the project site for sensitive species. The UDOT Wildlife Biologist will coordinate with the Navajo Nation and the project team to resolve any conflicts.

Figure 5-5. Threatened and Endangered Species Assessment Flow Chart



R. Wildlife

1. Laws, Regulations, and Guidance

- [Migratory Bird Treaty Act of 1918](#)

The Migratory Bird Treaty Act makes it unlawful at any time, by any means, or in any manner, to pursue, hunt, take, capture, kill, or sell migratory birds. The law grants full protection to any bird parts and applies to the removal of nests occupied by migratory birds during the breeding season. It applies to all migratory birds in the U.S. with the exception of a few exotic species. Even though the bald eagle was delisted from threatened status under the Endangered Species Act, it is still protected under the Migratory Bird Treaty Act, as are many other species of migratory birds

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (signed by President Bill Clinton on January 10, 2001), directs federal agencies taking actions likely to affect migratory birds to support the Migratory Bird Treaty Act, including requiring agencies to evaluate the effects on migratory birds and species of concern in NEPA studies.

2. Introduction

Transportation projects can cause impacts to various types of small wildlife, fish species, big game species, avian species, state-listed sensitive species, and their habitats. Projects should be studied to assess the expected impacts to these resources.

3. Process

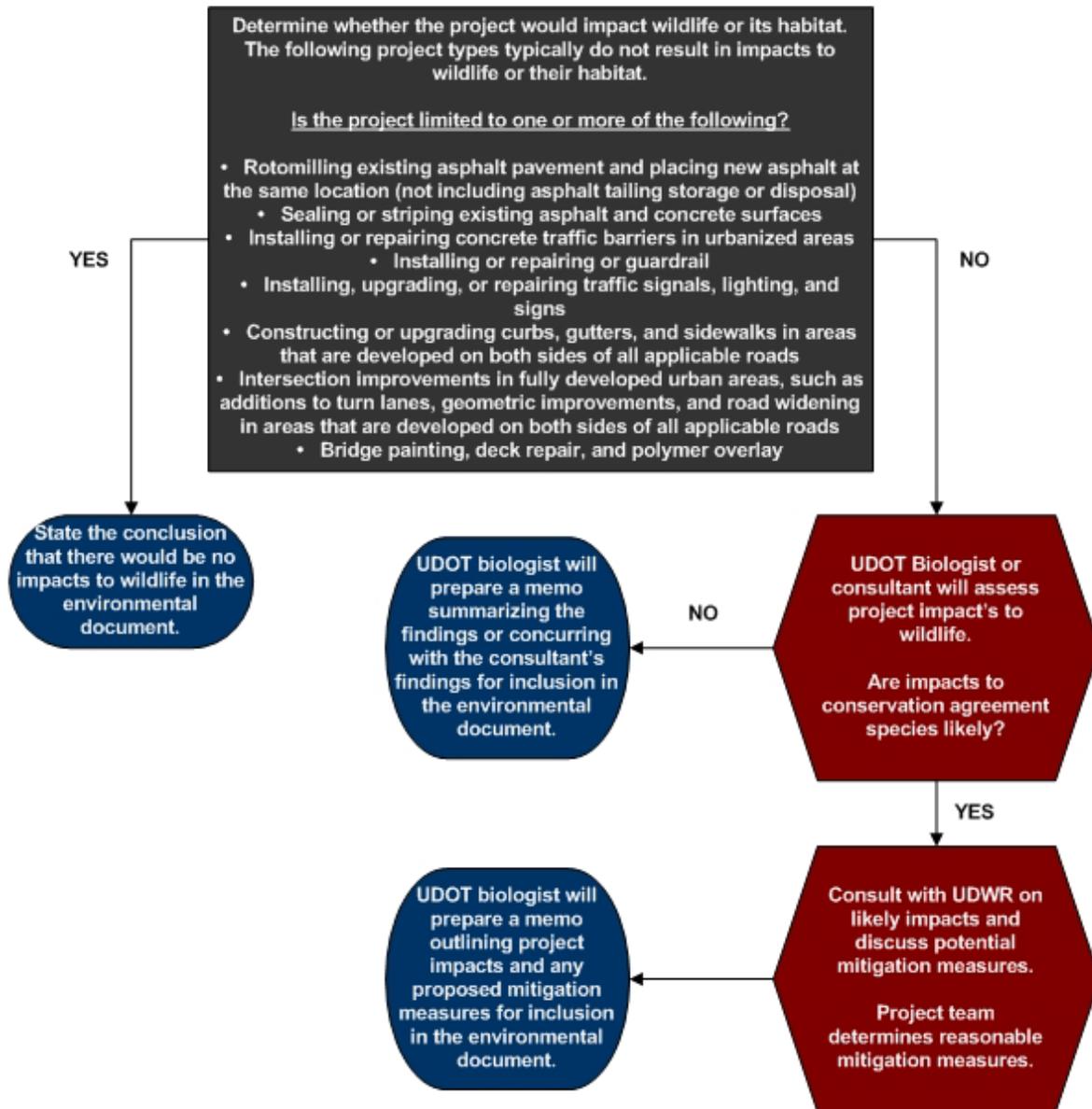
Generally, pavement-preservation projects, intersection-improvement projects, and projects in urban areas have very few or no impacts on wildlife. However, projects on new alignments or in rural areas have a greater potential for wildlife impacts and should be studied at an appropriate level of detail.

If the project has the potential for impacts, the UDOT consultant or the UDOT Wildlife Biologist investigates the project in accordance with applicable laws. If impacts to wildlife and/or habitat are likely, then the UDOT Wildlife Biologist and project team consult with UDWR regarding the expected impacts and reasonable mitigation measures, if applicable. The UDOT consultant or UDOT Wildlife Biologist prepares a memo explaining the results, conclusions, and recommended mitigation measures, if warranted.

a. Wildlife Passage

The UDOT Wildlife Program Manager compiles information on locations where projects could conflict with wildlife passage and migration routes. When possible, measures should be considered to minimize any conflicts. The UDOT Wildlife Biologist coordinates with the project team and UDWR to discuss these issues and possible mitigation measures. Such mitigation measures could include wildlife crossing structures; fences, escape ramps, and other barriers to prevent wildlife from accessing the roadway; roadside warning signs; and vegetation management.

Figure 5-6. Wildlife Assessment Flow Chart



S. Hazardous Materials and Hazardous Waste Sites

1. Laws, Regulations, and Guidance

- [Comprehensive Environmental Response, Compensation, and Liability Act \(CERCLA\) of 1980](#)
- [Resource Conservation and Recovery Act \(RCRA\) of 1976](#)

While NEPA does not specifically mandate the completion of hazardous materials investigations, other laws do. In general, hazardous materials investigations are conducted in response to two laws: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Resource Conservation and Recovery Act (RCRA) of 1976. CERCLA establishes liability that forces cleanup costs of contaminated sites on the responsible parties. The Superfund Amendment and Reauthorization Act (SARA) of 1986 modified CERCLA to provide defenses to the liability provisions for contaminated sites. RCRA deals with the manufacturing, storage, transportation, use, treatment, and disposal of wastes including hazardous materials. In addition, Utah Administrative Code Title 19 (Environmental Quality Code) provides guidance on addressing the presence or potential presence of hazardous sites when planning for and constructing transportation projects.

2. Introduction

This section contains policies and procedures for dealing with hazardous or problem materials encountered or potentially encountered on property UDOT owns, manages, plans to sell, or plans to purchase. Hazardous materials investigations are prepared either during the environmental study phase or after, when a commitment is made in the environmental document to undertake such studies. The purpose of the hazardous materials investigation is to determine if hazardous materials and/or regulated substances are present within, or adjacent to, the proposed right-of-way limits.

The following concerns are raised when a transportation project could affect hazardous waste sites:

- The spread of existing soil or groundwater contamination through road-construction activities
- Potential for increased construction costs
- Potential for construction delays
- Construction worker health and safety
- The short-term and long-term liability associated with acquiring environmentally distressed properties

3. Process

Use the following process to determine if a property has been contaminated with hazardous materials and/or regulated substances. Properties of concern and the issues associated with the properties should be identified to establish a baseline condition of the study area. The primary objectives of the investigations are:

- To identify properties with potential environmental concerns
- To establish a defense to CERCLA liability if UDOT purchases the property for right-of-way
- To develop reasonable procedures to manage contaminated properties where they cannot be avoided

The hazardous materials and hazardous waste site section of a NEPA document provides a preliminary identification of known parcels that contain hazardous waste sites. During the final design phase for the project and before any property is acquired, assessments need to be conducted on sites of concern to determine the possible presence of contamination and establish the exact nature and limits of the chemical hazard.

To determine the location of potential hazardous waste sites in the study area, review existing databases and files maintained by regulatory agencies, such as the Utah Division of Environmental Response and Remediation (DERR) [Interactive Map](#) and the EPA [Envirofacts database](#). Supplement the site search with a review of the Utah Division of Solid and Hazardous Waste active and closed landfills database. If needed, conduct a site visit to confirm that the sites are within the study area and to determine if there are other unrecorded sites with potential hazardous materials.

A number of land uses are typically considered to be suspect parcels. In general, investigate all industrial properties and gasoline service stations. Other land uses that could be suspect parcels are dry cleaners, automobile and metal painting facilities, automobile repair shops, metal fabricators, official and illegal waste disposal sites, junkyards, and railroads. The task of collecting historical land-use information can include interviews with property owners, employees, or other area residents. The study might identify sites that could contain contaminants and that could influence or control the development of the project alignment.

In general, the next steps of the hazardous materials investigation entail the screening of hazardous waste-related sites and facilities to identify those that have a higher probability of containing contaminated soil or groundwater and those that are located closer to the proposed alternatives. The sites that meet both of these criteria could affect or be affected by the proposed alternatives. These sites are listed in the NEPA document impacts section as sites of greatest concern. Also listed are sites of secondary concern and additional sites of concern. The screening process involves the following two steps 1) Identify the type of site (database listing) and its current status, and 2) Compare the site's location to that of the proposed alternatives.

a. Site Type

To determine whether a site should be listed as a site of greatest concern, group the site types according to their probability of existing soil or groundwater contamination.

High Probability of Contamination. The following sites typically have a higher probability of soil or groundwater contamination:

- CERCLA sites
- National Priorities List sites
- Open leaking underground storage tank (LUST) sites

These types of sites typically have had known releases of a large quantity of hazardous chemicals. Open LUST sites could have had either a large or small release of petroleum products, since even relatively small leaks can require a LUST action. The status of these types of sites should be re-evaluated at the time of construction to determine the nature and extent of contamination, if any, and the potential effects on construction.

Moderate Probability of Contamination. The following sites have a moderate probability of contamination:

- Closed LUST sites
- Active or closed landfills
- Resource Conservation and Recovery Information System–Treatment, Storage, or Disposal Facilities (RCRIS-TSDF) sites
- MINES sites
- Active underground storage tank (UST) sites
- Toxics Release Inventory (TRI) System sites

Closed LUST sites can have residual contamination, or contamination might have been left in place if it did not pose a threat to human health or the environment and was allowed under applicable regulations. If the site is disturbed again, additional remediation could be required. Solid-waste landfills can be a source of soil and groundwater contamination and landfill gas. Constructing a roadway over a landfill could require removing buried waste to avoid future liability and to ensure the stability of the roadway.

RCRIS-TSDF sites are those that treat, store, or dispose of hazardous wastes, although these sites have not necessarily had releases of contaminants. Contamination also might be present at sites with historic mining or processing operations. Active UST sites are regulated by DERR. They are likely to have leak-detection measures in place but typically have not been thoroughly investigated for petroleum releases. TRI sites are required to monitor and report the toxic chemicals used, manufactured, treated, transported, or released into the environment (land or water). The status of these types of sites should be re-evaluated at the time of construction to determine the nature and extent of contamination, if any, and the potential effects on construction.

Low Probability of Contamination. The following sites have a relatively low probability of contamination:

- RCRIS small-quantity and large-quantity waste generators
- Emergency Response Notification System (ERNS) hazardous material spill sites
- Removed and closed USTs
- Registered aboveground storage tank (AST) sites
- Federal Insecticide, Fungicide, and Rodenticide Act/Toxic Substances Control Act Tracking System (FTTS) sites

RCRIS waste generators produce hazardous wastes, but the presence of a RCRIS generator does not imply an uncontrolled release of hazardous materials. However, small quantities of hazardous materials could be stored on site. In the case of documented releases of hazardous materials at ERNS sites, such releases were likely remediated adequately when they occurred or shortly afterward. Removed or closed USTs typically indicate a site that has been remediated or did not require remediation when the UST was removed from the ground or closed. The closed status means that the tank is no longer storing material. Leaking ASTs are easily detected compared to LUSTs, so they are usually repaired before a large release occurs. A large-quantity release at an FTTS site would show up in a separate database, mostly likely RCRIS or CERCLIS.

b. Site Location

The second criterion for determining the sites of greatest concern involves analyzing each site's location relative to the project alternatives. Sites of greatest concern are sites with a high probability of contamination whose property boundaries are within the proposed right-of-way of the alternatives. Sites of secondary concern are sites with a high to moderate probability of contamination that are outside, but near (within 1,000 feet to 0.5 mile depending on the site type), the right-of-way for the alternatives. Additional sites of concern are sites with a low probability of contamination whose property boundaries are within the right-of-way for the alternatives. Also, consider the inferred direction of groundwater flow in the evaluation.

c. Mitigation Measures

If a contaminated property is identified, avoidance, minimization, or mitigation must be considered. If sites containing hazardous material would be affected by the project, UDOT coordinates with DERR and/or EPA, the construction contractor, and the appropriate property owners during the final design phase of the project. This coordination involves determining the status of the sites of concern at the time of construction and identifying the nature and extent of remaining contamination (if any) to minimize the risk to all parties involved. Identify the potential to affect newly discovered sites by reviewing DERR records. UDOT determines the need for phase I environmental

site assessments at suspect properties during the final design phase to further evaluate the potential for encountering hazardous materials within the right-of-way for any of the action alternatives. If the assessments determine that contamination is still present, the remedial measures are determined based on the nature and extent of contamination through coordination with DERR and/or EPA.

Previously unidentified sites or contamination (such as buried drums, fuel USTs, or solvent USTs) could be encountered during construction. In such a case, all work should stop in the area of the contamination according to UDOT Standard Specifications, and the contractor should consult with UDOT and DERR to determine the appropriate remedial measures. Hazardous wastes are handled according to UDOT Standard Specifications and the requirements and regulations of the Utah Department of Environmental Quality and EPA.

T. Soils and Geology

1. Laws, Regulations, and Guidance

The soils and geology analysis is not specifically referred to in federal regulations but is needed to address the requirements of 23 CFR 771 to “prepare documentation of compliance to a level appropriate to the undertaking’s potential to cause significant harm to the environment.” In addition, NEPA, 42 USC 4321, requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as impacts to the earth are given due weight in project decision-making.

2. Introduction

This section includes information and requirements for describing geologic and soil conditions (including hazard areas) in the project area and detailing the potential significant adverse environmental impacts of the project alternatives on these conditions.

The purpose of the preliminary soils and geology (geotechnical) study is to identify geotechnical features that could affect the project design. The study identifies the area’s topography, soil types, subsurface formations, areas of unstable materials, potential liquefaction areas, caves, and sinkholes. Recommendations are also made to address any geotechnical issues identified. Information is typically available from USGS and NRCS.

Some of these issues could result in alignment shifts; other issues will require commitments in the NEPA document that explain how materials will be handled and/or disposed of. The planner summarizes the results of the study for the NEPA document and includes any agreed-on minimization or mitigation measures. Include the geotechnical study in the project files. In the post-NEPA design phase, in-depth geotechnical studies will be undertaken as warranted.

3. Process

Establish the existing soil and geology conditions for the reasonable alternatives by reviewing existing published material and aerial photographs of soils, subsoils, geologic formations, geologic hazards, and mineral and fossil resources. [Google Earth](#) has data layers that can help identify this information. Validate the published data during the field reconnaissance of the project area. Zones of geotechnical, geologic, and seismic interest in the study area are documented and located on maps. Identify physical properties and characteristics including general soil classification, soil expansion potential, general geologic classification, stability of material and cut-and-fill slopes, and potential seismicity and other geologic hazards.

To help determine potential impacts, identify the locations of areas that require substantial grading and filling. Evaluate construction impacts, including excavating top and subsoils, generating debris and spoil, stockpiling, grading and fill locations, extensive excavating of geologic materials for tunnels, recontouring of cut banks and slopes, and top-dressing with suitable topsoil. Areas of potential soil or geologic instability that would affect the project design or construction are identified and presented as part of the existing conditions description.

If geological hazards are encountered in the area, make sure that these areas are avoided, if possible, or that they are clearly identified so that they can be accounted for during final design.

U. Visual and Aesthetic Resources

1. Laws, Regulations, and Guidance

One of the most readily recognized effects of a transportation project is its visual presence. FHWA regulations do not specifically require a visual impact analysis in NEPA documents. However, NEPA states that visual effects (“aesthetics”) are one environmental factor that must be considered in environmental impact analysis.

United States Code 23 USC 109(h) requires aesthetic values to be considered during project development. The CEQ regulations for implementing NEPA, Section 1508.8, Effects, also state that aesthetic effects should be considered. In January 2015, FHWA released their [Guidelines for the Visual Impact Assessment of Highway Projects](#). The Forest Service and BLM both have visual assessment methodologies that are similar to FHWA’s and are acceptable to UDOT as alternate methodologies. The BLM [Visual Resources Manual](#) (*Manual 8400, Visual Resource Management*) and the 1995 Forest Service manual, [Landscape Aesthetics: A Handbook for Scenery Management](#), Agriculture Handbook 701; are available online.

2. Introduction

The aesthetic quality of a community or area depends on its visual resources—the physical features that make up the visible landscape, including land, water, vegetation, and human-made features such as buildings, roadways, and structures. The visual analysis should consider the visual resources present along the proposed alternatives as well as typical user groups that would view those resources.

UDOT seeks a consistent approach to aesthetics that provides continuity throughout the state while also allowing projects to exhibit unique features. Aesthetically consistent corridors are established to ensure statewide continuity, and themes are developed to allow projects to include some unique characteristics.

3. Process

The level of visual analysis in the environmental study document should be appropriate for the scope and magnitude of a project and its impacts as well as public concerns. In general, for an EIS when there is a potential for visual impacts, a visual impact assessment is prepared and summarized in the EIS. For an EA, the need to discuss the visual effects of the project depends on the visual characteristics of the project area. If the visual environment encompasses visually sensitive elements or if it is considered unique by its viewers, a visual analysis might be warranted.

The public nature of highways and their visual prominence in the environment requires that visual impacts—both positive and negative—are adequately addressed and considered in the environmental study phase. Community acceptance of a project can be strongly influenced by its visual effects.

Whether the visual/aesthetic analysis is prepared for direct insertion into the environmental study document or is prepared as a stand-alone analysis, the following visual issues are typically addressed:

- Describe the visual environment and areas where physical changes associated with the project alternatives could be seen. Views can be looking outward from the proposed alternatives or looking toward the alternatives. The visual environment is influenced by existing topography, vegetation, and structures and diminishes with hilly topography and tall vegetation or structures.
- Identify visually sensitive resources and locations. For example, this could include areas with historic or culturally important resources, areas of recognized scenic beauty, parks, and residential areas.
- Describe the user groups, or viewers, that look to and from the highway. For the purpose of a visual analysis, there are two basic user groups associated with a transportation network: those who use the network (who have views from the

roadway) and those who look at the transportation network (who have views of the roadway).

- Describe potential visual impacts, both positive and negative. For example, new highways will cause some degree of visual change in an area. Identify the project's level of effect on visually sensitive resources and locations based on changed views to or from the resources and the perceptions of viewers.
- If appropriate, describe potential measures to minimize or mitigate adverse visual impacts. When considering mitigation measures, follow the guidance in UDOT's [Aesthetic Policy and Guidelines](#). These guidelines are briefly summarized below:
 - The project team determines the priority level of aesthetics (high, medium, or low/no). The project team considers the project scale, community impacts, traffic characteristics, the corridor setting, and the aesthetics budget when considering mitigation measures.
 - The project team obtains public input regarding possible mitigation measures including enhancement opportunities, maintenance obligations, project schedule, and corridor theme.
 - Potential mitigation measures for aesthetics will be approved by the Aesthetics Committee and the local community.

V. Construction Impacts

1. Laws, Regulations, and Guidance

Applicable laws, guidance, and permits for specific resources are discussed in the individual sections of this manual.

2. Introduction

Construction activities can cause temporary impacts to adjacent areas and environmental resources. The following topics should be considered and addressed as applicable:

- Access to businesses, residences, and other properties
- Discovery of unknown hazardous materials and waste disposal
- Utility relocation and service disruption
- Discovery of unknown archaeological sites
- Erosion control, sediment control, and water quality
- Temporary wetland and wildlife impacts
- Air quality
- Invasive weed species

- Noise and vibration
- Visual and light construction impacts
- Construction phasing

3. Process

The environmental document should describe the expected construction-related impacts and possible mitigation measures to minimize impacts. Mitigation measures and other project commitments can include the following:

- Fugitive-dust-control plan
- Street sweeping
- Construction vehicle emission-reduction strategies
- Noise and vibration measures
- Managing construction lights during night work
- Following required permits
- Avoiding or minimizing work in environmentally sensitive areas
- Following UDOT Specifications and Special Provisions

W. Wild and Scenic Rivers Impacts

1. Laws, Regulations, and Guidance

- [Wild and Scenic Rivers Act, October 2, 1968](#)

2. Introduction

According to the Wild and Scenic Rivers Act, it is the policy of the United States that “certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.” The national Wild and Scenic Rivers Act safeguards the special character of designated rivers while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

Wild and scenic rivers can be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or a state agency. Designated segments do not need to include the entire river and can include tributaries. For federally administered rivers, the designated boundaries generally average 0.25 mile on either bank in the lower 48 states and 0.5 mile for rivers outside national parks in Alaska in order to protect river-related values.

3. Process

Rivers are classified as wild, scenic, or recreational.

- **Wild river areas** – those rivers or sections of rivers that are free of impoundments and are generally inaccessible except by trail, with watersheds or shorelines that are essentially primitive and waters that are unpolluted. These represent vestiges of primitive America.
- **Scenic river areas** – those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds that are still largely primitive and with shorelines that are largely undeveloped but accessible in places by roads.
- **Recreational river areas** – those rivers or sections of rivers that are readily accessible by road or railroad that could have some development along their shorelines and that might have undergone some impoundment or diversion in the past.

On March 30, 2009, the Virgin River and selected tributaries were designated as wild and scenic. A complete list of [Wild and Scenic Rivers and tributaries](#) is available online. If a project could adversely affect a designated river, tributary, or river added to the listing for study or through designation, undertake early coordination with NPS. Analyze the expected effects of the project; adverse effects include altering the free-flowing nature of the river, altering the setting, or reducing the water quality. If adverse effects are identified, consult with NPS to avoid or mitigate the impacts. In addition, publicly owned waters of designated rivers are subject to Section 4(f), and public lands adjacent to designated rivers might be subject to Section 4(f).

X. Water Quality and Water Resources

1. Laws, Regulations, and Guidance

- [Clean Water Act \(CWA\)](#)
- [Utah Division of Water Quality](#)
- [Utah Division Drinking Water](#)

a. Utah Water Quality Standards

Under the Clean Water Act, every state must establish and maintain water quality standards designed to protect, restore, and preserve the quality of waters in the state. These standards consist of narrative standards for all waters, specific numeric chemical and biological standards for protecting beneficial uses, and anti-degradation provisions.

- Water bodies are considered to have various beneficial uses such as providing drinking water, supporting wildlife, supporting agriculture, and supporting recreation.
- **Numeric standards** for the allowed amount of pollutants (such as ammonia, chlorine, organic compounds, and trace elements) in a water body are intended to protect the beneficial uses of the water.
- **Narrative standards** are more general statements that prohibit unacceptable water quality conditions such as visible or floating pollution.
- **Anti-degradation provisions** are intended to maintain high-quality waters at levels above the applicable water quality standards. If a surface water body is designated as a high-quality water, the quality of the water body is better than the established standards for the water body's beneficial uses and should be maintained at the same level of high quality (that is, a project cannot cause the existing water quality to be degraded).

Surface water bodies are classified according to their beneficial uses (Table 5-10), and most classifications have associated numeric water quality standards.

Table 5-10. Beneficial Uses for Rivers, Streams, Lakes, and Reservoirs in Utah

Class	Description
1	Protected for use as a raw water source for domestic water systems.
1C	Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
2	Protected for recreational use and aesthetics.
2A	Protected for primary contact recreation such as swimming.
2B	Protected for secondary contact recreation such as boating, wading, or similar uses.
3	Protected for use by aquatic wildlife.
3A	Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
3B	Protected for warm-water species of game fish and other warm-water aquatic life, including the necessary aquatic organisms in their food chain.
3C	Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
3D	Protected for waterfowl, shore birds, and other water-oriented wildlife not included in classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.
3E	Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.
4	Protected for agricultural uses including irrigation of crops and stock watering.

Table 5-10. Beneficial Uses for Rivers, Streams, Lakes, and Reservoirs in Utah

Class	Description
5	The Great Salt Lake. Protected for primary and secondary contact recreation, waterfowl, shore birds, and other water-oriented wildlife including the necessary aquatic organisms in their food chain, and mineral extraction.

Sources: Utah Administrative Code Rule 317-2-13, Classification of Waters of the State; Utah Division of Water Quality 2007

b. Regulations for Surface Waters

EPA has delegated authority for the National Pollutant Discharge Elimination System (NPDES) program in Utah to the Utah Department of Environmental Quality (UDEQ). Under this program, certain industries that could discharge wastewater, storm water, or other pollutants into water bodies must obtain a Utah Pollutant Discharge Elimination System (UPDES) permit to minimize impacts to water quality. Construction activities that disturb 1 or more acres of natural ground surface are required to obtain a UPDES permit.

When a lake, river, or stream fails to meet the water quality standards for its beneficial uses, Section 303(d) of the Clean Water Act requires the State to place the water body on a list of “impaired” waters (also known as a Section 303(d) list) and prepare an analysis called a Total Maximum Daily Load (TMDL). This analysis establishes the maximum amount of a pollutant that the water body can contain while maintaining all of its beneficial uses.

UDEQ regulations also address “high-quality waters,” which are surface waters whose existing quality is better than the established standards for the designated uses. “High-quality” waters should be maintained at high quality (that is, a project cannot cause the existing water quality to be degraded). See Table 5-11 for all water quality regulations.

c. Drinking Water Source Protection Plans and Zones

Drinking water wells and springs are vulnerable to contamination. The State of Utah’s Drinking Water Source Protection program was implemented to provide water system owners with a tool to help protect wells and springs from accidental contamination. Owners of water systems are responsible for protecting sources of drinking water from contamination and for submitting a Drinking Water Source Protection Plan to the Utah Division of Drinking Water. Drinking Water Source Protection Plans identify drinking water source protection zones around each drinking water source (such as a lake, river, spring, or groundwater well), existing sources of contamination, and the types of new construction projects that are restricted within each zone.

The Utah Division of Drinking Water requires the Drinking Water Source Protection Plan to identify four distinct drinking water source protection zones for each well:

- **Zone 1** is the area within a 100-foot radius of the wellhead. Introducing uncontrolled potential contamination sources or pollution sources is prohibited in Zone 1.
- **Zone 2** is the area within a 250-day groundwater time of travel to the wellhead. Introducing pollution sources is prohibited in Zone 2 unless their contaminant discharges are controlled with design standards.
- **Zone 3** is the area within a 3-year groundwater time of travel to the wellhead. Restrictions in Zone 3 are at the option of the local government.
- **Zone 4** is the area within a 15-year groundwater time of travel to the wellhead. Restrictions in Zone 4 are at the option of the local government.

Table 5-11. Water Quality Regulations

Regulation	Regulatory Agency and Requirement
Clean Water Act Section 401 State Water Quality Certification	EPA requires UDEQ to certify that the project would not cause Utah water quality standards to be exceeded.
Clean Water Act Section 402 (UAC R317-8) NPDES Permit (UPDES in Utah) (Limits discharges)	EPA has delegated authority for the NPDES program in Utah to UDEQ. Industrial projects that discharge stormwater to surface water and construction projects that disturb more than 1 acre of land must obtain a UPDES permit to minimize impacts to water quality.
Clean Water Act Section 303(d) Total Maximum Daily Load for Impaired Waters (Limits discharges)	EPA requires the Utah Division of Water Quality to identify water bodies that do not meet state water quality standards and therefore do not support their designated beneficial use(s). The Division submits a 303(d) list of these impaired waters to EPA biannually. The Division conducts a TMDL analysis on the impaired waters to determine the maximum contaminant load that the water body can accept and still meet the standards. The Division then assigns point-source dischargers (UPDES permit holders) a numeric limit for the maximum amount of particular pollutants they can discharge based on the TMDL analysis. This regulation applies if a project would affect an impaired water body that is on the 303(d) list.
UAC R317-2-7.2, Narrative Water Quality Standards (Limits discharges)	This regulation states that it is unlawful to discharge substances that could cause undesirable effects on human health or aquatic life into surface waters.
UAC R317-2-14, Numeric Criteria (In-stream standard)	Numeric standards for water quality are based on the beneficial use, such as providing drinking water, supporting game fish, or swimming. Projects cannot cause water quality standards to be exceeded. If a standard is already being exceeded, a TMDL limit could be applied to the project.
UAC R317-2-3, Anti-degradation Policy of High-Quality Waters (In-stream standard)	UDEQ regulations state that waters whose existing quality is better than the established standards for the designated uses should be maintained at high quality (that is, the project cannot cause the existing water quality to be degraded).
UAC R309-605, Drinking Water Source Protection for Surface Waters (Regulates activities near drinking water sources)	Owners of public water systems are responsible for protecting sources of drinking water and for submitting a Drinking Water Source Protection Plan to the Utah Division of Drinking Water. Drinking Water Source Protection Plans identify drinking water source protection zones around each drinking water source (such as a lake or river), existing sources of contamination, and the types of new construction projects that are restricted within each zone.

2. Introduction

Roadway systems are a potential source of pollutants that can be discharged to adjacent areas and downstream water resources. Various materials can accumulate on roadway surfaces, median areas, and adjacent right-of-way as a result of vehicle traffic and maintenance activities. A common source of pollutants on roads is vehicle operation. Pollution can result from vehicle emissions, engine fluids, component wear, and normal operation. Other sources of pollutants include accidental spills and anti-icing practices such as sanding and salting. Therefore, projects need to be studied in order to assess their impacts on surface waters and groundwater resources.

Impacts could include changes in surface drainage, increased storm water runoff, increased erosion, impacts to drinking water source protection areas, and changes in groundwater flows due to soil compaction from earthwork activities.

The analysis should identify and document the expected impacts to water resources and water quality and reasonable mitigation measures in accordance with the goals of the Clean Water Act, the Safe Drinking Water Act, and state regulations. The analysis should include the study area, adjacent water bodies, and other affected water resources as applicable.

3. Process

a. Surface Water Analysis Procedures

1. **Determine the likely increase in storm water runoff from the project.** If the project would increase the amount of impervious area, use guidance in the UDOT Drainage Manual to determine the quantity of storm water runoff expected. If there is no substantial increase (< 1 cfs, or cubic foot per second) in storm water runoff, a detailed analysis of storm water is generally not required. However, a detailed analysis is required if the project would increase storm water to a water resource that is either a “high-quality” water or is on the 303(d) list of impaired water bodies.
2. **Determine the locations and characteristics of water resources and receiving waters.** Locate existing water resources, natural stream channels, wetlands, groundwater resources, and drinking water source protection zones in the project study area. Use current maps, including GIS resources, and field-verify them as appropriate.

Document the existing physical characteristics and beneficial-use status of all receiving waters. Investigate to determine if the receiving water body is on the 303(d) list of impaired water bodies.

3. **Determine the pollutants of concern.** The pollutants of concern should be determined based on how the project alternatives could affect receiving waters. Note the specific pollutants that are causing the water resource to be impaired; the analysis will likely focus on these pollutants. The project team might need to consult with the Utah Division of Water Quality for additional pollutants of concern. Individual pollutants should be described, analyzed, and disclosed in the environmental document. Pollutants that could result from transportation facilities include:
 - o *Suspended solids* – From dust, erosion of adjacent surfaces, and particles deposited on the roadway from human activities, vehicles, and the atmosphere.

- *Metals* – From vehicle sources; often transported via suspended solids.
- *Nutrients* – Phosphorus and nitrogen can result from fertilizers applied to adjacent areas and are often transported via suspended solids.
- *Oil and grease* – From vehicles, but are mostly found in low concentrations both locally and nationally.
- *TMDL pollutants* – As determined for receiving waters on the 303(d) list of impaired water bodies.

4. **Determine pollutant concentrations from runoff due to the action alternatives.** For high-quality waters, impaired waters, and water bodies with approved TMDLs that would be affected by the project, determine likely pollutant concentrations using USGS regression equations. The regression equation methodology is explained in FHWA-PD-96-032, *Evaluation and Management of Highway Runoff Water Quality* (FHWA, June 1996).

Also for high-quality and impaired waters, a total dissolved solids (TDS) analysis is recommended in order to analyze the impacts from salt applications and their effect on the beneficial-use classifications of adjacent waters. UDOT has developed a spreadsheet that approximates TDS concentrations in snowmelt due to road salt applications given an assumed snowfall.

5. **Apply a dilution model.** A common situation is when storm water runoff is collected and conveyed to one or more detention ponds and then discharged into a river or stream. Detention ponds allow total suspended solids (TSS) and floatable pollutants to be removed; however, some pollutants become dissolved and cannot be economically removed. Apply a dilution model for action alternatives that would discharge storm water into high-quality or impaired waters to determine pollutant concentrations when storm water is discharged and mixed with river or stream flows. To apply a dilution model, refer to Chapter 4 of *Evaluation and Management of Highway Runoff Water Quality*, referenced above in item 4.
6. **Compare results of the analyses with the appropriate standards and current condition.** Compare pollutant concentrations with state water quality standards and current baseline conditions. Also, compare the likely change in runoff quantity and pollutant loads of the project's action alternatives with the no-action condition.
7. **Discuss long-term and short-term impacts to hydrology and water quality.** In general, evaluate impacts to surface waters from each alternative including:
- An in-stream numeric analysis of typical roadway runoff pollutants to determine if numeric water quality standards would be exceeded

- Effects on impaired 303(d)-listed waters and high-quality waters in the study area
 - Effects on the surface water's beneficial-use classifications
 - Temporary construction-related impacts
8. **Discuss proposed mitigation measures.** Discuss and list the mitigation measures to be included for the project. Mitigation for water quality could include:
- Temporary and permanent best management practices (BMPs) described in the UDOT Erosion and Sediment Control Manual
 - Good housekeeping measures in the UDOT Spill Prevention and Response Plan to prevent and contain spills
 - Detention/retention basin(s) with oil/water separator(s) and controlled outlet(s) to maintain pre-development flows
 - Vegetated swales, filter strips, or other mechanisms to filter surface runoff

b. Groundwater Analysis Procedures

1. **Document locations of wells and drinking water source protection zones.** Determine if the project would likely affect these resources due to either project proximity or construction activities. Locations of wells and source protection zones can be obtained from the Utah Division of Drinking Water.
2. **Document the location of groundwater resources including springs and aquifers.** Determine if the project would likely affect these resources. Impacts to groundwater can result from proximity to the project, roadway excavation activities including interrupting natural groundwater movement, intersecting aquifers, and direct impacts to groundwater quality.
3. **Consult with the local water system owner on expected impacts.** In general, certain types of development are not allowed within a designated drinking water source protection zone unless the project sponsor can show that the withdrawal point is isolated from the contaminant source by a confining layer or that the specific development would not be a source of contamination. Two methods of ensuring that water quality is protected are zoning ordinances and land-use restrictions within each source protection zone.

Y. Floodplains

1. Laws, Regulations, and Guidance
 - 23 CFR 650(A)

- [Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input](#)
- Executive Order 11988, Floodplain Management
- [FHWA guidance on assessing floodplain impacts](#)

Executive Order 11988, Floodplain Management (May 24, 1977), directs federal agencies to avoid to the extent possible adverse impacts associated with floodplains and to avoid direct or indirect support of floodplain development. USDOT Order 550.2, Floodplain Management and Protection, also intends to avoid or minimize highway encroachments within the 100-year (base) floodplains, where practicable, and to avoid supporting land-use development that is incompatible with floodplain values.

Executive Order 13630 amends Executive Order 11988, "Floodplain Management" (1977), and, among other things, provides 3 approaches that federal agencies can use now to establish the flood elevation and hazard area for consideration in their decisionmaking: climate-informed science approach, adding 2-3 feet of elevation to the 100-year floodplain, and using the 500-year floodplain.

2. Introduction

The intent of these regulations is to avoid or minimize highway encroachments within the 100-year (base) floodplains, where practicable, and to avoid supporting land-use development that is incompatible with floodplain values. Floodplains are defined as normally dry areas that are occasionally inundated by high snowmelt or stormwater runoff or high lake water. Development in floodplains can reduce their flood-carrying capacity and extend the flooding hazard beyond the developed area.

In response to escalating taxpayer costs for flood disaster relief, Congress established the [National Flood Insurance Program](#) (NFIP). This program is a voluntary mitigation program administered by the [Federal Emergency Management Agency](#) (FEMA). Under this program, the federal government makes flood insurance available in those communities that practice sound floodplain management. This incentive encourages state and local governments to develop and implement a floodplain management program.

In the 1980s, FEMA performed location hydrologic and hydraulic studies to identify and map special flood hazard areas within communities. A result of the FEMA studies is the development of flood insurance rate maps (FIRMs) that show the floodplain for each river, lake, or other surface water resource that was studied. A *special flood hazard area* is the area that would be inundated by a 100-year flood. Special flood hazard areas are given a zone designation based on the level of detail of the FEMA study and the anticipated type of flooding. *Base flood elevation* (BFE) refers to the calculated or estimated 100-year flood water surface elevation. A *special flood hazard area* is an area with a 1% chance (1 in 100) of being flooded in any given year. The special flood hazard

areas are further defined as numbered and un-numbered “A” zones, which describe whether the flood hazard area determination is based on approximate or detailed flood studies and whether formal BFEs have been established.

- **Zone A** indicates areas that would be flooded by a 100-year flood and where the exact elevation of that flood is not known. This zone is established through approximation.
- **Zones AE and A1–A30** are areas that would be flooded by a 100-year flood and where the base flood elevations have been derived from a detailed hydraulic analysis.
- **Zone AH** usually corresponds to areas of ponding with relatively constant surface elevations. Average depths are between 1 and 3 feet.
- **Zone AO** corresponds to areas of shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet.
- **Zone AR** corresponds to areas in the floodplain that are protected by flood-control structures (such as levees) that are being restored.
- **Zone A99** corresponds to areas that will be protected by a federal flood-protection structure or system where construction has reached statutory milestones. No BFEs are depicted in these zones.
- **Zone D** indicates the possible but undetermined presence of flood hazards.
- **Zone V** indicates additional coastal flooding hazards such as storm waves. Studies are approximate, and no BFEs are shown.
- **Zone VE** indicates additional coastal flooding hazards such as storm waves. Studies are detailed, and BFEs are shown.
- **Zones B, C, and X** correspond to areas outside the 1% recurrence floodplain with a 1% chance of shallow sheet flow or minor stream flooding with water depths of less than 1 foot. Studies are approximate, and no BFEs are shown for these areas.

The 100-year floodplain for rivers and streams is the area in and around the river or stream that would be inundated by a 100-year flood. The 100-year floodplain for a lake or reservoir is the area inundated by a water surface elevation that is expected to occur on average one time every 100 years.

3. Process

Environmental documents should identify whether proposed alternatives would encroach on 100-year floodplains, preferably delineated by NFIP maps. Coordinate with FEMA and appropriate state and local government agencies for each floodway encroachment. If a floodway revision is necessary, the environmental document should include evidence

from FEMA and state or local agencies showing that such a revision would be acceptable.

The NFIP FIRMs are designed for insurance purposes. For this reason, most are not accurate enough to rely on for engineering design or land-use decision-making. The FIRMs tend to underestimate both the extent and depth of inundation, so take this tendency into account. Some of the drawbacks of the FIRMs are:

- Many do not have calculated BFEs.
- Many are based on outdated hydrographic and channel cross-section data.
- Many are based on inadequate topographic data.
- The delineation of channel migration zones (CMZs) and the relationship between the CMZs and the 100-year floodplain are not well established on the FIRMs, yet these are extremely important considerations with regard to planning transportation projects in the vicinity of floodplains, particularly those located near the larger, more dynamic rivers.

A preliminary analysis is needed in the environmental phase to determine whether a project alternative will encroach on any base (100-year) floodplain and/or regulatory floodway, and, if so, to determine the “worst-case” amount of encroachment—that is, the amount of encroachment (generally in acres) if no structures are built to span part or all of an area.

The project team should work with a qualified individual or firm to undertake the level of floodplain analysis needed. The level of analysis required for the environmental document includes:

- Floodplain designation
- Type of encroachment (parallel or perpendicular)
- Project construction schedule (since FEMA coordination and permitting take time)
- A determination by the project team whether the encroachment would be a “significant” encroachment as defined by FHWA

Information of community participation in NFIP is available in the [National Flood Insurance Program Community Status Book](#). The FIRM, aerial photographs, and USGS quadrangle maps are all needed to conduct the analysis. The [Utah AGRC](#) has data layers for all of the available digitized FEMA floodplains.

If NFIP maps exist for a community, they must be reviewed. [Frequently asked questions \(FAQ\)](#) regarding the NFIP maps are available online, and FEMA maps can also be viewed online or ordered from the FEMA flood map store. It is helpful to overlay the floodplain limits on project mapping, such as functional plans or USGS quad maps. If a

highway project encroaches on the base floodplain within an NFIP-participating community, notify the floodplain administrator of the local government that has land-use jurisdiction. Communities in the regular NFIP program generally have detailed flood insurance studies performed. In such communities, the NFIP map will be an insurance rate map, and, in the majority of cases, a regulatory floodway and hydraulic model is in effect. Also, ask the local floodplain administrator to provide a copy of local floodplain regulations, if they exist. Communities in the NFIP emergency program usually have no detailed flood insurance study and only limited floodway and floodplain data. For these communities, the map will be a hazard boundary map without a regulatory floodway.

The environmental document identifies the locations and sizes of floodplains. If applicable, the document includes an evaluation of the encroachment to determine if the encroachment is significant. A significant encroachment would result in a potential for interruption of a transportation facility which is needed for emergency vehicles or provides the community's only evacuation route; a significant risk, including property loss or hazard to life; or a significant adverse impact on the natural and beneficial floodplain values.

If an alternative causes a floodplain encroachment, supports incompatible floodplain development with substantial impacts, or requires a commitment to build a particular structure size or type, the environmental document should include an evaluation and discussion of practicable alternatives to the structure or to the substantial encroachment. The evaluation also includes a preliminary analysis of whether the encroachment would be consistent with or require a revision to the regulatory floodway. If a floodway revision is necessary, the final NEPA document includes evidence from FEMA and the applicable local floodplain regulatory agency that such revision would be acceptable.

If the project would cause a physical change to the flood hazard information shown on the FIRM, a Conditional Letter of Map Revision (CLOMR) must be submitted to FEMA prior to construction. A CLOMR gives FEMA an opportunity to comment on whether the project meets the minimum floodplain management criteria of the National Flood Insurance Program and, if so, what revisions will be made to the effective NFIP map.

[Guidance on preparing Letters of Map Change](#) can be found online. The various types of Letters of Map Change are listed in Table 5-12.

Table 5-12. Letters of Map Change

Type	Description
CLOMA	A Conditional Letter of Map Amendment (CLOMA) is FEMA's comment on whether a project would be excluded from the Special Flood Hazard Area (SFHA) shown on the effective National Flood Insurance Program (NFIP) map. The letter becomes effective on the date sent. This letter does not revise an effective NFIP map but indicates whether the project, if built as proposed, would or would not be removed from the SFHA by FEMA if later submitted as a request for a Letter of Map Amendment (LOMA).
CLOMR	A Conditional Letter of Map Revision (CLOMR) is FEMA's comment on a project that would affect the hydrologic and/or hydraulic characteristics of a flooding source and thus modify the existing regulatory floodway or effective base flood elevations (BFE). There is no appeal period. The letter becomes effective on the date sent. This letter does not revise an effective NFIP map but indicates whether the project, if built as proposed, would or would not be removed from the SFHA by FEMA if later submitted as a request for a Letter of Map Revision (LOMR).
CLOMR-F	A Conditional Letter of Map Revision Based on Fill (CLOMR-F) is FEMA's comment on whether a project involving the placement of fill would exclude an area from the SFHA shown on the NFIP map. The letter becomes effective on the date sent. This letter does not revise an effective NFIP map but indicates whether the project, if built as proposed, would or would not be removed from the SFHA by FEMA if later submitted as a request for a Letter of Map Revision Based on Fill (LOMR-F).
LOMA	A Letter of Map Amendment (LOMA) is an official amendment, by letter, to an effective NFIP map. A LOMA establishes a property's location in relation to the SFHA. The letter becomes effective on the date sent.
LOMR	A Letter of Map Revision (LOMR) is an official revision, by letter, to an effective NFIP map. A LOMR could change flood insurance risk zones, floodplain and/or floodway boundary delineations, planimetric features, and/or BFE. The letter becomes effective on the date sent.
LOMR-F	A Letter of Map Revision Based on Fill (LOMR-F) is an official revision, by letter, to an effective NFIP map. A LOMR-F provides FEMA's determination concerning whether a structure or parcel has been elevated on fill above the BFE and excluded from the SFHA. The letter becomes effective on the date sent.

Source: FEMA, Letter of Map Amendment (LOMA) and Letter of Map Revision–Based on Fill (LOMR-F) Process

Z. Energy

2. Laws, Regulations, and Guidance

NEPA, 42 USC 4321, requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations are given due weight in project decision-making. Federal implementing regulations are at 23 CFR 771 (FHWA) and 40 CFR 1500–1508 (CEQ).

3. Introduction

This section covers energy invested in construction activities as well as resources such as materials used in construction. For large-scale projects with substantial energy impacts, the draft environmental document (usually an EIS) should discuss the major direct and/or indirect energy impacts and the energy-conservation potential of each alternative.

4. Process

For most projects, only general construction and operational energy requirements and the potential for energy conservation need to be discussed. A detailed energy analysis is needed only for large-scale projects. For most projects, the environmental document discusses in general terms the construction and operation requirements and the conservation potential of the project alternative(s). The planner can review previously completed NEPA documents for examples of acceptable discussions.

For large-scale projects with substantial energy impacts, the discussion includes:

- Existing energy consumption (if applicable).
- If the project will cause no net increase in energy consumption, say so and briefly explain why. If the project will increase energy consumption, describe this increase in terms of British thermal units or quantities of fuel consumed.
- Energy consumed directly by the operation of vehicles predicted to use the facility, compared to that for the existing facility (if any). Identify a pay-back period. Consider the effects of increased or decreased smoothness of traffic flow.
- Energy consumed in maintaining the facility compared to that for the existing facility (if any).
- Energy consumed in the region as a result of the operation of the facility compared to existing energy consumption. Consider the effects of increased or decreased smoothness of traffic flow, vehicle-miles traveled, and growth generated by the project.
- Impact on the production of energy, if any.

- Combined energy used during construction and energy used (or saved) during operation. Does one affect the other? Are they substantial when added together?
- Indirect energy impacts from project construction and/or changes in the types of vehicles used or the number of vehicles.

[FHWA's Infrastructure Carbon Estimator](#) can be used to calculate energy consumption associated with construction and maintenance activities.

The final environmental document discusses any conservation measures that will be implemented as part of the preferred alternative (for example, high-occupancy-vehicle [HOV] incentives and measures to improve traffic flow).

AA. Short-Term Uses versus Long-Term Productivity

1. Laws, Regulations, and Guidance

- FHWA Technical Advisory T6640.8A

2. Introduction

The short-term use of the environment versus preserving its long-term productivity relates to converting the natural productivity of the land, viewed as a renewable use, to a developed use that has a relatively short economic life. For example, if a project area is mostly developed, there is little remaining natural productivity such as wildlife habitat, vegetation, and wetlands. This section is included in EISs, but it is not required for EAs.

Typically, UDOT projects provide the following long-term productivity enhancements:

- Alternate choice of transportation throughout the region
- Enhanced transit and traffic capacity throughout the region
- Improved access to employment
- Reduced congestion at key intersections
- Improved safety conditions in the region
- Long-term improvements in economic conditions
- Enhanced potential for high-density, transit-oriented development

3. Process

The EIS should discuss in general terms how the project will affect the relationship between local, short-term impacts and the use of resources and the maintenance and enhancement of long-term productivity. This general discussion might recognize that the action alternatives would have similar impacts. The discussion should point out that transportation improvements are based on state and/or local comprehensive planning, which considers the need for present and future traffic requirements within the context of present and future land-use development. In such a situation, one might then conclude that the local, short-term impacts and use of resources by the project is consistent with

the maintenance and enhancement of long-term productivity for the local area or the state.

BB. Irreversible and Irretrievable Commitment of Resources

1. Laws, Regulations, and Guidance

- FHWA Technical Advisory T6640.8A

2. Introduction

The term *irreversible commitment of resources* refers to the use of nonrenewable resources including fossil fuels, historic buildings and other unique cultural resources, manufactured structural materials, and land converted to long-term business and industrial use. *Irretrievable commitments of resources* can also cause the lost production or use of renewable resources such as timber, rangeland, or wildlife habitat. This section is included in EISs, but it is not required for EAs.

The construction of a project usually requires a substantial expenditure of local and federal funds, which, once spent, would not be retrievable. The commitment of these resources is based on the premise that residents in the region would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and savings in travel time, both of which are anticipated to outweigh the commitment of the financial resources.

3. Process

The EIS should discuss in general terms the project's irreversible and irretrievable commitment of resources. This general discussion might recognize that the action alternatives would require a similar commitment of natural, physical, human, and fiscal resources. An example of such discussion would be as follows:

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the period that the land is used for a highway. However, if a greater need arises for use of the land or if the highway is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be expended. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply, and their use will not have an adverse effect on the continued availability of these resources. Any construction would also require

a substantial one-time expenditure of both state and federal funds, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services, which are anticipated to outweigh the commitment of these resources.