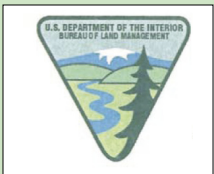


Arizona Department of Transportation

Guidelines for Highways on Bureau of Land Management and U.S. Forest Service Lands



Arizona Department of Transportation

Guidelines for Highways

on

Bureau of Land Management and U.S. Forest Service Lands



Arizona Department of Transportation (ADOT)
Federal Highway Administration (FHWA)
Bureau of Land Management (BLM)
United States Forest Service (USFS)

2008

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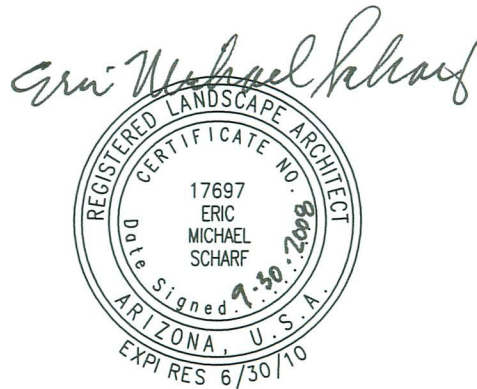
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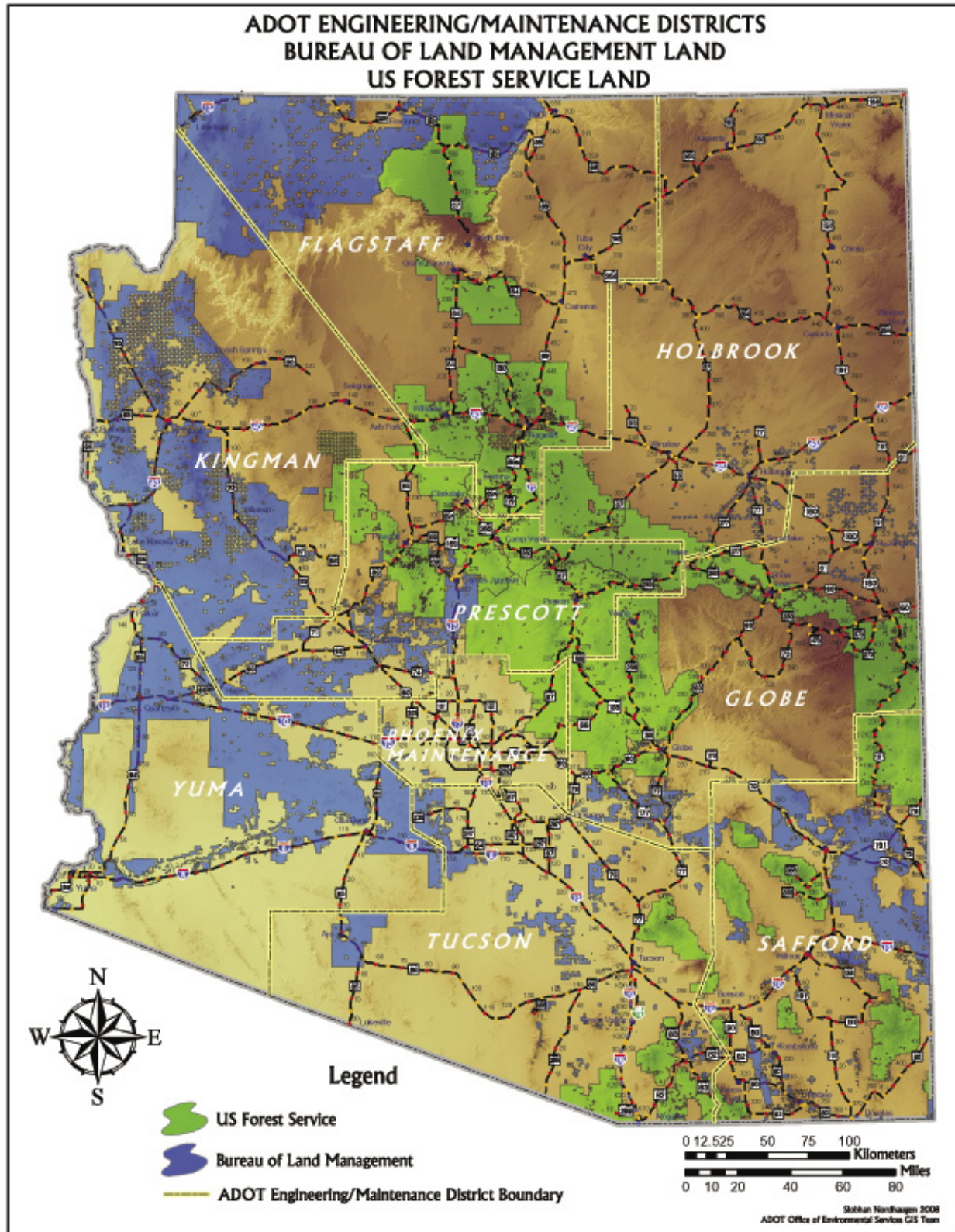


Figure 1.1 Boundary Map (from ADOT office of Environmental Services)

CHAPTER 1: INTRODUCTION

1.1 PURPOSE AND INTENT OF THIS MANUAL

Arizona has a wide range of unique landscapes, ranging from the Sonoran and Mohave Deserts, *Figure 1.2*, to mixed conifer forests, *Figure 1.3*. A



Figure 1.2 Arizona desert.



Figure 1.3 Arizona forests.

complex network of highway corridors managed by the Arizona Department of Transportation (ADOT) connects these diverse Arizona landscapes. These highway consist not only of the pavement that carry traveling vehicles, but also the constructed slopes, bridges, drainage structures, fencing, signs and intersections associated with those roadways. As will be discussed throughout this manual, highway corridors typically disturb resources such as wildlife, hydrology, vegetation and aesthetics. Addressing this disturbance requires the design, construction and maintenance of measures that minimize and mitigate the impacts.

It is the responsibility of the United States Department of Agriculture Forest Service (USFS) and Bureau of Land Management (BLM) to manage the full range of natural and cultural resources on agency lands. Where highway corridors are constructed within USFS or BLM boundaries, these agencies seek to minimize and mitigate highway-related disturbances to these resources. Therefore, it is important to integrate resource management concerns into the process of planning, design, construction and maintenance of highway corridors. The Federal Highway Administration (FHWA) defines this integration process as “Context Sensitive Solutions.”

This manual was developed to provide guidance for the design, construction and maintenance of ADOT projects on lands managed by BLM and the USFS. Differing agency missions can create conflict unless proposed activities are managed in a true partner relationship. This manual describes accepted procedures, as well as the needs and concerns of each agency in an effort to minimize conflict and facilitate the creation of safe, environmentally sound and aesthetically pleasing highway corridors, *Figure 1.4*. The central philosophy of this manual is that it is important for personnel from all agencies to consider strategies that may normally fall outside of their standard approaches to addressing challenges. It is recommended that ADOT, its design consultants, and the responsible land management agencies (USFS and BLM) use these guidelines during the development of highway corridors on public lands, *Figure 1.5*.



Figure 1.4 Aesthetically pleasing highway winding through mountainous terrain.

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Figure 1.5 Highway corridor.

The guidelines presented herein are not rigid requirements that will be applicable to every situation. Rather, they are intended to communicate philosophy, approach and examples from which new applications and techniques can be developed. Departures from these guidelines do not typically require formal documentation, but the involved agencies should coordinate with one another and carefully review suggested departures before implementation.

1.2 MEMORANDA OF UNDERSTANDING

In order to enhance coordination and facilitate the creation of highway corridors compatible with the concerns and needs of all affected parties, it is critical that the associated agencies actively and effectively cooperate with each other throughout the planning, design, construction and maintenance of these corridors. This process is formalized in two Memoranda of Understanding (MOU) (Appendix C contains the USFS-FHWA-ADOT MOU and Appendix D the BLM-FHWA-ADOT MOU).

1.3 ADOT, U.S. FOREST SERVICE, BUREAU OF LAND MANAGEMENT AND FEDERAL HIGHWAY ADMINISTRATION MISSIONS

Arizona Department Of Transportation (ADOT)
“To provide products and services for a safe, efficient, cost-effective transportation system that links Arizona to the global economy, promotes economic prosperity and demonstrates respect for Arizona’s environment and quality of life”.



Figure 1.6 Highway corridors link Arizona to global economy.

U.S. Forest Service (USFS)

“To sustain the health, diversity and productivity of the nation’s forests and grasslands to meet the needs of present and future generations”. As set



Figure 1.7 Highway through the forest.

forth in law, the mission is to achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of all people. The USFS motto captures the spirit of that agency: “Caring for the Land and Serving the People.” This mission includes the following directives:

- Advocating a conservation ethic that promotes the health, productivity, diversity, and beauty of forests and associated lands;
- Listening to people and responding to their diverse needs in making decisions;
- Assisting states and local communities to wisely use the forests to promote planned rural economic development while maintaining a quality rural environment; *Figure 1.8.*



Figure 1.8 Part of the USFS Mission is to maintain a quality rural environment.

- Developing and providing scientific and technical knowledge aimed at improving our abilities to protect, manage and utilize forests and rangelands.

Bureau of Land Management (BLM)

“To sustain the health, diversity and productivity of the public lands for the use and enjoyment of present and future generations”.

Federal Highway Administration (FHWA)

“Enhancing mobility through innovation, leadership and public service”.

1.4 LEARNING BY EXAMPLE

This manual is an attempt to summarize what has been learned from projects as well as introduce new techniques and public policies. The design, construction and maintenance of highways will continue to evolve following the publication of

this text. In order to continue to achieve high quality projects, it is important that transportation personnel communicate the lessons learned from previous and ongoing projects to their co-workers and colleagues.

1.5 ADDITIONAL RESOURCES

FHWA Context Sensitive Design:

<http://www.fhwa.dot.gov/environment/csd.htm>

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CHAPTER 2: ADOT DEVELOPMENT PROCESS ON BLM AND USFS LANDS

2.1 CHAPTER GOALS

Integrating the ADOT Project Development Process

Highway corridor development refers to the process by which roadways are planned, designed, constructed and maintained. As the state transportation agency, the Arizona Department of Transportation (ADOT) Project Development Process is described herein as the primary development process. The United States Forest Service (USFS), the Bureau of Land Management (BLM) and the Federal Highway Administration (FHWA) will integrate their input and reviews with this process. Therefore, one goal of this chapter is to outline the ADOT development process, describe the type of information that is typically prepared at each stage in this process and alert the reader to the significance of that information so that timely feedback can be provided.

Integrating the Environmental Review Process

The ADOT development process typically incorporates an extensive environmental analysis culminating in an environmental document. Because the management of natural, cultural and aesthetic resources is central to USFS and BLM agency mandates and their planning policies, this environmental analysis is of high concern to those agencies. A second goal of this chapter is to describe the types of issues that are typically included in the review so that the project team can anticipate and integrate these environmental concerns into the ADOT project development process.

BLM/USFS Policies

Both BLM and USFS have their own planning methods and policies that may affect ADOT's development process. The ADOT development process should be integrated with these federal procedures. A third goal of this chapter is to identify those BLM and USFS policies that may affect the ADOT development process.

2.2 ADOT PROJECT DEVELOPMENT PROCESS

To meet ADOT's responsibility for providing

a statewide network of highways, the State Transportation Board sets priorities for needed construction or reconstruction projects using the available funds. Each year, ADOT plans for the addition of these improvements to the State Highway System through the Five Year Construction Program. Development of the Five Year Construction Program results from long range planning. These processes are outlined below (for more information, refer to ADOT's Project Development Process Manual, available from the ADOT website listed at the conclusion of this chapter). Representatives from BLM or USFS have numerous opportunities to provide input into the planning process and these opportunities are also outlined below (as well as the approximate length of time).

Long-Range Planning (5 to 20-plus years prior to construction)

Long Range Planning includes:

- Regional Transportation Profiles.
- Small Area Transportation Studies.
- Multi-Modal Transportation Studies.
- Statewide Access Management Plan.
- Policy Issues.
- Long Range Plan.
- Feasibility/Corridor Study (18 months to prepare)
- Five-year Program.

It is important that ADOT long-range plans be coordinated with BLM/USFS long-range plans. BLM/USFS representatives may advise on the selection of projects to be recommended to the Transportation Board to be included in the Five Year Construction Program.

Project Scoping

- Project Scoping Documents are typically initiated five to seven years prior to construction and will be one of the types listed below:
 - Project Scoping Letter (6 months to prepare)
 - Project Assessment (12 months to prepare)
 - Location/Design Concept Report (LCR/DCR) (24+ months to prepare)

The project process for either the Feasibility/Corridor Study or the LCR/DCR includes the following in which BLM/USFS representatives can participate

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and/or review:

- Kick Off and Agency/Field Review
- Initial and final project scoping documents
- Environmental overview
- Public meetings, hearings or other opportunities for public input at various stages throughout the process

As discussed in Chapter 1, for highways constructed on BLM or USFS lands, the project team should strive for Context Sensitive Solutions; that is, it should seek to minimize impacts to natural and cultural resources, *Figures 2.1* and *2.2* integrate the proposed highway corridor with the surrounding natural landscape. The success of this integration



Figure 2.1 Natural Resources include flora and fauna.

depends largely on the project scoping document which will, in turn, set parameters for the design process. Therefore, the project team should carefully and fully explore implications for design that are contained in the scoping document. Issues typically addressed in the project scoping document that will affect the integration of the highway with the surrounding landscape (and that are described in greater detail in later chapters) include:

- The preferred roadway alignment.
- The proposed design speed, which will determine the maximum roadway grade, the minimum turning radius, the minimum sight distance and the size of the clear zone.
- The typical roadway section including the number of lanes and the widths of the shoulder and roadside ditch.
- The locations, numbers and types of major structures (bridges, box culverts and retaining walls).

- The anticipated cut slope heights and cut slope ratios. Proposed cut slope ratios should be made in association with the preliminary geotechnical information along with potential for revegetation. Both of which may not be completed until the Stage II (30%) review.

National Environmental Policy Act (NEPA) Process

The NEPA process begins during Project Scoping and culminates in the Environmental Document. The magnitude of the anticipated impacts resulting from the project will determine the type of NEPA process utilized and the resulting environmental document as follows:



Figure 2.2 Cultural Resources include sites such as Wupatki National Monument.

- Categorical Exclusion (CE).
- Environmental Assessment which results in a Finding of No Significant Impact (FONSI).
- Environmental Impact Statement which results in a Record of Decision (ROD).

Opportunities for BLM/USFS input during the NEPA process include the following:

- Participate as a member of the interdisciplinary team during the development of the Categorical Exclusion (CE), or the Environmental Assessment (EA) or the Environmental Impact Statement (EIS).
- Provide input on issues during agency environmental scoping meetings and/ or field reviews.
- Review and comment on the CE, EA or EIS throughout its development.
- Comment on Draft EA or EIS during agency review and public comment periods.

- Provide letter of concurrence for inclusion in the final NEPA document.
- Review the ROD for the EIS.

The NEPA process is discussed in greater detail later in this chapter.

Project Development (one to three years prior to construction)

Project development, also known as Stages I through V, includes increasingly detailed design submittals for review and comment in preparation of construction documents. At each of the stages, it is important to review the Scoping and NEPA documents to ensure that engineering and/or environmental mitigation requirements are carried through into the project contract documents. Opportunities for BLM/USFS input include participation in the following:

- Design Kick-Off Partnering Meeting and Field Review.
- Monthly coordination meetings during Stage I (15% plans development) and provide comments to Stage I documents. (Stage I may take place during Scoping or Project Development.) Stage I documents typically incorporate the following information:
 - Surveys and Mapping
 - Initial typical roadway sections, *Figure 2.3*, (refer to Chapter 4)
 - Initial Roadway Plan and Profile Drawings
 - Tentative plans layout
 - Initial environmental mitigation measures
 - Request for utility designation services
 - Structure Planning Report (refer to Chapter 5)
- Monthly coordination meetings during Stage II (30%) and provide comments to Stage II

documents. Stage II documents typically incorporate the following information:

- Surveys and Mapping
- Typical Roadway Sections
- Initial Roadway Alignment
- Initial Drainage Report (refer to Chapter 6)
- Initial Interchange and Intersection Layouts
- Initial Traffic Control and Construction Phasing
- Traffic Analysis Report
- Geotechnical, Pavement Design and Initial Materials Memo
- Structure Planning Report and Preliminary Foundation Investigation
- Initial R/W and Preliminary R/W Plans
- Quantities and Cost Estimate
- Monthly coordination meetings during Stage III (60%), participate in Field Review and provide comments to Stage III documents. Stage III typically marks the final stage at which changes to the preferred highway design described by the scoping document may be made. Stage III documents typically incorporate the following information:
 - Typical Roadway Sections
 - Plan and Profile Drawings including slope grading limits and recommended slope ratios
 - Final Drainage Report
 - Preliminary Interchange and Intersection Layouts.
 - Structure Selection Reports and Foundation Design
 - Proposed Traffic Control and Construction

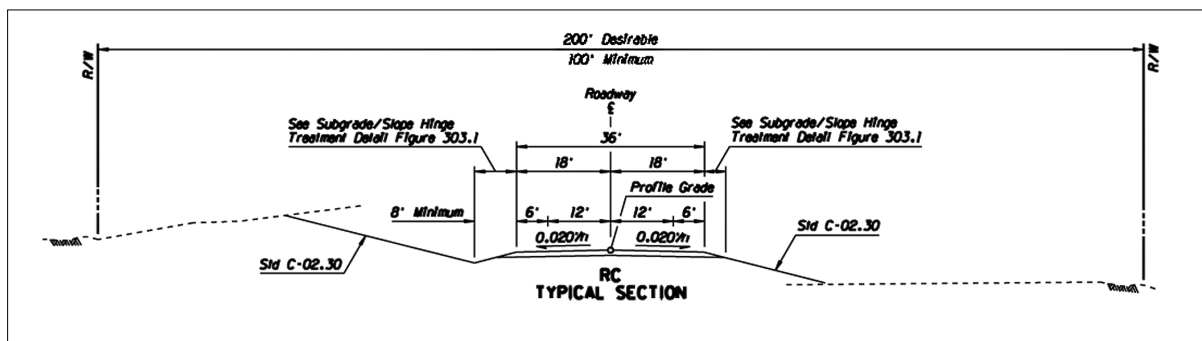


Figure 2.3 Example of a typical roadway section.

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- Phasing
 - Traffic Signal and Lighting Plans
 - ADOT and BLM/USFS signing requirements
 - Pavement Marking Plans
 - Utility Plans
 - Preliminary Resource Protection Plans
 - Preliminary Landscape and Environmental Mitigation Plans
 - Preliminary Storm Water Pollution Prevention Plans
 - Final R/W Plans
 - Draft Special Provisions
 - Preliminary Quantities and Cost Estimate
 - Final Materials Memo
- Monthly coordination meetings during Stage IV (95%) and provide comments to Stage IV documents. Stage IV documents are typically a complete set of construction documents for review. The end of Stage IV typically marks the completion of all environmental clearances.
- Provide input during development of or subsequent updates to NEPA during Project Development process.

At the conclusion of Project Development, ADOT advertises the project and accepts bids from qualified contractors; the State Transportation Board awards the project to the selected contractor.

Refer to ADOT's Project Development Process Manual for detailed submittal requirements for each Stage.

Construction (subsequent to award of contract by Transportation Board)

The following outline describes the traditional ADOT design-bid-build project. Opportunities for BLM/USFS input include the following:

- Participate in Construction Partnering Workshop.
- Communicate regarding any contractor proposed use areas that are not included in the contract documents.
- Participate in Field Inspections.
- Participate in weekly construction meetings and/or review and comment on minutes from those meetings.
- Participate in Field Reviews.
- Participate in Walk-Through (final Field Inspection).
- Participate in Partnering Closeout Workshop.

For design-build projects, design and construction take place at the same time.

Maintenance

Following completion and formal acceptance by ADOT of the constructed project, maintenance and operation of the highway begins. Opportunities for BLM/USFS input include the following:

- Participate in Annual Highway Maintenance Partnering
- Participate in NEPA review (when required).

2.3 NATIONAL ENVIRONMENTAL POLICY ACT

All projects constructed on lands administered by BLM or USFS are required to be in compliance with the National Environmental Policy Act (NEPA), which requires that social, economic and environmental issues, concerns and values be given consideration in decision-making along with economic and technical considerations. As described earlier in this chapter, the final product of the NEPA process is the Environmental Document. Depending on the nature and magnitude of the anticipated project-related impacts, the Document will be one of three types: (1) Categorical Exclusion, (2) EA Finding of No Significant Impact or (3) EIS Record of Decision. The NEPA documentation process is central to the highway corridor development process and is binding to all agencies involved. The NEPA process ensures that (a) environmental impacts resulting from construction are anticipated and identified, (b) measures to avoid, minimize or mitigate these impacts are recommended for public review and comment and (c) approved measures are ultimately incorporated into the constructed project.

The NEPA process typically examines the following aspects of the affected environment for ADOT projects:

- Social (includes schools, churches, medical facilities, police, firehouses, residences, relocations, etc.).
- Economics (includes commercial and industrial enterprises, employment, local tax bases, etc.).
- Minority (neighborhoods, businesses, residences, etc.).
- Land Use.
- Section 4(f) properties (includes parks,

- recreation, wildlife refuges, lakes, streams, school playgrounds, historical, etc.).
- Section 106 (Cultural Resources including historical and archaeological investigations; refer to Appendix G for process regarding USFS lands).
- Farmlands (prime and unique, statewide importance).
- Natural Resources (water, lands, air, etc.).
- Water Quality.
- Section 404 (Army Corps—dredged and fill materials in Waters of the U.S.).
- Threatened and/or Endangered Species (plants and wildlife).
- Native Plants (Arizona Native Plant Law).
- Riparian Habitats, *Figure 2.4*.
- Floodplains.
- Wetlands.
- Hazardous Materials (NESHAPs).
- Air Quality (TIP, STIP).
- Noise.
- Wild and Scenic Rivers.
- Local Traffic Patterns.
- Right-of-Way (additional and existing).
- Construction Impacts.
- Visual Qualities.
- Materials Pits and Waste Sites.



Figure 2.4 Riparian habitat.

- Utilities.
- Erosion Control (NPDES/AZPDES).
- Habitat Connectivity.

The level of environmental analysis and the documentation required, Categorical Exclusion (CE), Environmental Assessment (EA) or Environmental Impact Statement (EIS) is typically based on the anticipated level of potential impact that may result from a project. The level of analysis may, in turn, affect the length of time required to complete the NEPA process. For minor projects (i.e. minor road widening projects, projects with limited disturbances), a CE is usually adequate and may require a few days or up to 12 months. More complex projects typically require an EA or EIS, which can require 1-3 years or more to complete.

As part of the NEPA process, other public agencies may become involved in the review process in order to ensure compliance with pertinent laws and regulations such as:

- Endangered Species Act.
- National Historic Preservation Act.
- American Graves Protection and Repatriation Act.
- Archaeological Resources Protection Act.
- Others as may apply.

For major corridors, the design process may take place over several years and may encounter unforeseen conditions. The NEPA document can be reevaluated if during the subsequent course of design new additional significant environmental impacts are identified or if the final design differs substantially from what was originally approved. Reevaluation of the NEPA document can also be required if significant time passes prior to the initiation of project construction.

Even when full NEPA investigations are not required, biological and archaeological clearances will be required for all ground disturbing projects on BLM or USFS lands. The time required for these clearances will depend on the status of endangered species and/or archaeological sites within the project limits. When these species or sites are present, the review process may require 6 to 12 months or longer to complete and will require coordination with the US Fish and Wildlife Service, the BLM/USFS archaeologist and/or the State Historic Preservation Office.

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NEPA Process

Each federal public agency approaches the NEPA process in a different way based on that agency's mandates and adopted NEPA guidelines. For highway projects, the funding source used to design and construct the highway corridor will dictate which agency is assigned responsibility for complying with NEPA requirements, as seen in the flow chart on the following page, *Figure 2.6*. The responsible agency will, in turn, determine standards for addressing NEPA. The responsible agency is known as the "lead agency."

- For those projects that utilize Federal-aid transportation funds, the Federal Highway Administration (FHWA) acts as the lead agency. FHWA is therefore responsible for complying with NEPA (and other federal requirements such as the Endangered Species Act and the National Historic Preservation Act) and for related consultation with other agencies, including the U.S. Fish and Wildlife Service and the State Historic Preservation Office. As FHWA's agent, ADOT assumes that responsibility in accordance with FHWA standards. For all projects occurring on BLM Lands, BLM will be a cooperating agency, unless they notify FHWA that they choose to decline. For all projects occurring on USFS Lands, USFS will be a cooperating agency, unless they notify FHWA that they choose to decline.
- For projects on BLM or USFS lands that do not utilize Federal-aid funds, the BLM or USFS is the lead federal agency responsible for complying with NEPA. ADOT's role is that of an applicant and therefore it must address NEPA requirements in accordance with BLM or USFS guidelines.
- Regardless of the funding source, for projects on USFS lands, the USFS will act as the lead agency for Archaeological Resources Protection Act (1979) and the Native American Graves Protection and Repatriation Act (1990). These will be discussed further in this chapter.

Mitigation

As described above, the NEPA process documents the anticipated impacts resulting from highway construction. Other laws, such as Section 4(f) and the Endangered Species Act may require avoidance or mitigation of these anticipated impacts. These requirements will be included in

the Environmental Document; possible examples include the following:

- Design and construction of bridges over riparian habitats, *Figure 2.5*.
- Avoidance/preservation of outstanding natural vegetation or landscape features.
- Salvage of native vegetation.
- Habitat restoration outside of ADOT easement.
- Staining or painting of structures and rock cuts to blend better into the surrounding landscape.
- Reclamation of contractor use areas.
- Construction of replacement facilities where possible.

Since they are of critical concern to BLM/USFS and may be unique to the project, environmental mitigation measures require careful coordination between ADOT and BLM/USFS both during design and construction. During the design process, the project team should regularly review the NEPA document for required mitigation measures. These measures should become part of the construction documents. In addition, because they may be unique to the project and/or involve atypical construction practices, these measures should be "value analyzed" during design. **During the construction**



Figure 2.5 Steel bridge over riparian habitat.

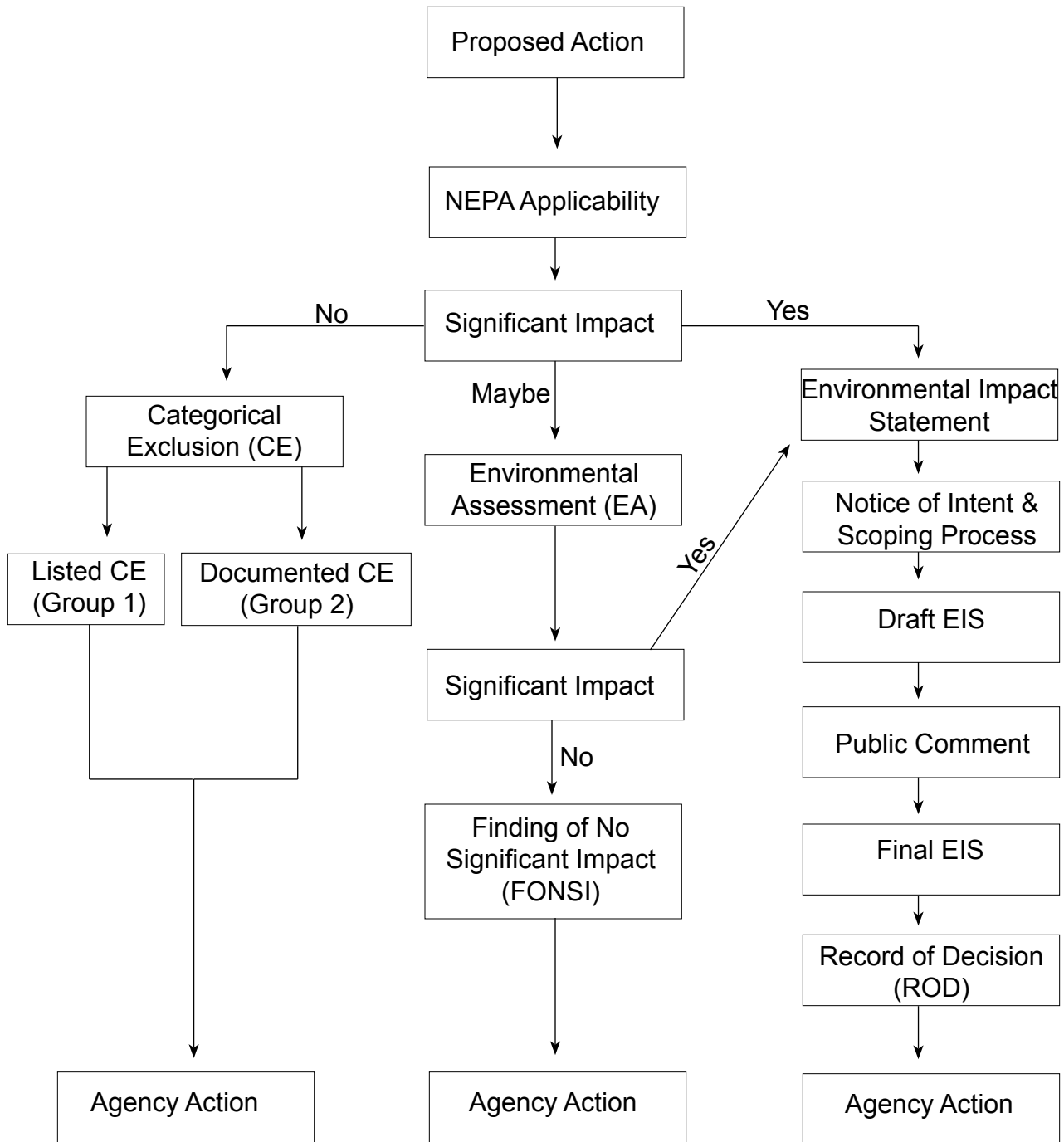


Figure 2.6 NEPA Process Flow Chart

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process, these mitigation measures may not be “value engineered” out of the project scope without the written approval of FHWA.

Visual Impact Assessment

As part of the effort to provide Context Sensitive Solutions, the planning and design teams should seek to visually integrate the highway corridor with the surrounding natural landscape on BLM or USFS lands.

The visual impacts—positive as well as negative—of a highway project should be thoroughly assessed during the NEPA process. These visual impacts must be studied from two perspectives:

- Views from the roadway, *Figure 2.7*.
- Views of the roadway from the surrounding area, *Figure 2.8*, especially in critical or popular viewing areas.

Visual impacts are typically prioritized by studying the following criteria:

- The number of potential viewers from both within and outside of the proposed right-of-way.
- The duration of those views.
- The type(s) of potential viewers: How concerned are the viewers (both within and outside of the



Figure 2.7 Views from the roadway.

proposed right-of-way) with the quality of the scene?

Visual resource investigation typically includes existing natural or man made features as well as the anticipated visual impacts resulting from the proposed highway. For projects on USFS lands, the USFS visual assessment model will be used. For projects on BLM lands, the BLM visual assessment model will be used.

The NEPA documents may require visual mitigation measures that affect the following highway features, explored in greater detail in later chapters:

- Roadway alignment and engineered slopes (refer to Chapter 4).
- Natural drainages and bridges (refer to Chapter 5).
- Preservation of existing vegetation (refer to Chapter 7).
- Procedures to reestablish vegetative cover (refer to Chapter 7).

NEPA and Geotechnical/Archaeological Reports

As will be discussed in greater detail later in this manual, geotechnical and archaeological investigations are important components of the design process of most highway projects and are typically performed during the early stages of design. Both types of investigation typically involve ground disturbing activities. Where the planned roadway will be located outside of an existing right-of-way, access to that future alignment (typically in the form of a “pioneer road”) will be required in order to complete these investigations. The design team should be aware that NEPA compliance will be



Figure 2.8 Views of the roadway.

required prior to the construction of the pioneer road and the onset of the geotechnical and archaeological investigations. (Biological and archaeological clearances are also typically required.)

NEPA and Cultural Resources (Section 106, ARPA and NAGPRA)

A part of the National Historic Preservation Act (1966), Section 106 refers to the federal review process designed to ensure that historic properties are considered during federal project planning and

execution. The review process is administered by the Advisory Council on Historic Preservation, an independent federal agency, with assistance from the State Historic Preservation Office.

For purposes of Section 106, any property listed in or eligible for the National Register of Historic Places is considered historic. The Register is this country's basic inventory of historic resources and is maintained by the Secretary of the Interior. The list includes buildings, structures, objects, sites, districts, and archaeological resources. The listed properties are not only of nationwide importance; most are significant at the state or local level. The protections of Section 106 extend to properties that possess significance but have not yet been listed or formally determined eligible for listing.

The Archaeological Resources Protection Act (ARPA, 1979) addresses the protection of archaeological resources on public lands. The Native American Graves Protection and Repatriation Act (NAGPRA, 1990) requires that federal agencies provide information regarding the discovery and recovery of Native American human remains and archaeological artifacts to Native American tribes.

USFS and BLM lands in Arizona have among the highest densities of historic property sites in the nation. Most sites are well preserved, have the potential for human remains and are frequently significant to Arizona tribes. The sites may or may not be visible from the surface. As discussed earlier in this chapter, during the ADOT planning process, a number of alternative corridors may be considered for a proposed highway. These corridors typically each incorporate significant areas of land and, consequently, may incorporate large numbers of historic property sites. As resource managers, the USFS and BLM have long-term stewardship responsibilities for all of these sites, both those that fall outside of and those that are included within the final approved easement.

Due to the fact that archaeological features may be buried or hidden from view, planning for historic property considerations can be challenging. In consideration of these challenges, it is critical that ADOT and the BLM/USFS coordinate early and throughout the highway development process. The coordination process between ADOT, FHWA and USFS is outlined in Appendix G.

NEPA and Water Development

During the construction of large highway projects, over 500,000 gallons of water per day may be needed for the proper compaction of embankment slopes and other fill areas and for dust control. These high water demands may impact local environments if that water is obtained from local watersheds. This issue is compounded by the facts that much of Arizona receives less than 12 inches of annual precipitation and aquifers are of limited size. Therefore, water is a precious resource for both natural resources and human activities. In addition, the State of Arizona places a high value on the maintenance of aquifers and the downstream effects of changes to those aquifers. Potential sources of water may be further complicated by the fact that surface and groundwater may be physically related but owned by separate parties.

For these reasons, it is often necessary to obtain both federal and state clearances when developing sources of water for construction. The project team may want to consider alternative sources when feasible, such as reclaimed water.

Given the potential impact to natural and human activities and possible necessary coordination with other public agencies, the project team should consider including the water development process in the NEPA review.

NEPA and Material Sources

As will be described in greater detail in Chapter 9, material sites are typically locations outside the highway corridor easement from which rock or other construction materials may be mined and processed to serve the needs of new construction and/or maintenance activities. Because they involve ground disturbing activities and because they take place outside of the easement, the development of material sources requires NEPA clearance. Depending on the nature of this disturbance, NEPA clearance may require several years to complete. Since the contractor generally identifies their material sources after the award of contract, these sources are not usually identified in the project NEPA document. For post award material source requirements refer to ADOT Specifications.

NEPA and Maintenance

Generally, operations and maintenance activities of an existing alignment do not require NEPA

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documentation. Refer to Chapter 11 for a listing of maintenance activities that typically do or do not require NEPA documentation.

2.4 PROJECT REFERENCE

For complex highway projects, the ADOT development and NEPA processes may require years to complete and involve numerous decisions that affect the final project contract documents and the subsequent construction of the highway. In order to properly design and construct the highway, it is important to retain a record of those decisions made during the life of the project. As described in greater detail in Appendix K, the Project Reference serves as a compilation of those decisions made during the planning and design processes that need to be implemented during design and construction. The reference is a means of tracking these decisions in order to ensure that they are not overlooked or forgotten during subsequent design and construction.

2.5 ARIZONA PARKWAYS, HISTORIC AND SCENIC ROADS

In response to public concerns regarding unchecked development adjacent to public roadways, ADOT was charged in 1982 with responsibility for administering the state's Parkways, Historic and Scenic Road Program. The program allows for the nomination, designation and maintenance of these types of roads. Any interested group or individual may nominate roads by requesting designation to the Parkways, Historic and Scenic Roads Advisory Committee, as described in *Application Procedures for Designation of Parkways, Historic and Scenic Roads in Arizona*. In addition to providing an inventory of the unique qualities of that road, the nomination process will include a list of recommendations to protect or enhance those unique features and special natural or cultural resources in the area. State laws applicable to this program provide for the exemption from standard construction and maintenance practices to ensure resource protection. Revised construction and maintenance procedures for such designated roads and parkways may be developed to reasonably provide for the safety and service of the traveling public. Possible recommendations include:

- Modifications to structures and signs.

- Pruning or removal or addition of plant materials.
- Enhancement of historical markers.
- Erosion control.
- Pedestrian traffic.
- Locations of scenic viewpoints.

When preparing plans for improvements to designated parkways, historic or scenic roads, the design team should review the documented resources in order to integrate these into the design. During construction or maintenance of any type, vehicular access should be carefully controlled in order to minimize disturbance. Maintenance of roadside vegetation should be timed to maximize opportunities for wildflower displays and seed production.

The FHWA National Scenic Byways Program, the USFS National Forest Scenic Byways and BLM Back Country Byways are other programs that recognize, preserve and enhance selected roads in Arizona.

2.6 USFS PROCESSES THAT AFFECT ADOT HIGHWAY DEVELOPMENT

Because USFS desires to work with ADOT as a partner in the Project Development Process, it is useful to outline the process by which USFS plans for transportation needs within National Forests. In addition to the processes described above, the following USFS processes may affect ADOT highway development process.

National Forest Land and Resource Management Plan

Each National Forest is required by law to develop, update and implement a Land and Resource Management Plan or "Forest Plan." The Plan typically specifies goals for environmental quality and natural resource management.

Access Management Objectives

As a part of the Plan implementation process, each Forest develops "Access Management Objectives" to provide public access to the Forest. These objectives describe the extent and form of access needed to achieve management goals. Forms of access may include hiking, horseback riding, motor vehicle, air or watercraft.

Access Management Process

Specific management objectives are developed by USFS District Rangers for each road and trail under USFS jurisdiction. Objectives for roads are known as “Road Management Objectives.” Objectives for off-highway travel are known as “Off-Highway Travel Management Objectives.” USFS engineers and technical specialists use the Objectives to develop road design standards, maintenance plans, sign plans, use restrictions, forest visitor maps and all other processes used to manage access to and within National Forests. Many Access Management Objectives developed to implement Forest Plans can be applied to highway corridors without impairing ADOT goals. Deviations from typical ADOT practices may be requested by the USFS to make projects comply with Forest Plans, such as slope treatments, setbacks and ditch widths.

Letter of Consent

The FHWA has authority to appropriate National Forest Land (BLM and USFS) for highway purposes. The USFS generally consents to FHWA appropriation and transfer of affected lands by means of a Letter of Consent (LOC). The LOC does not relate to highway engineering functional items, but it does include stipulations (terms and conditions) required for project construction and for future management of the easement. These stipulations assure adequate protection of resources and utilization of adjacent USFS lands.

Merchantable Timber

When merchantable timber must be cleared from within the project limits of a highway construction project, the exact quantity of timber must be measured and its value determined. The USFS must then sell that timber to ADOT prior to the commencement of roadway construction activities.

In order for the USFS to determine quantities of merchantable timber, the clearing limits of the project must be established on the ground by ADOT. These clearing limits cannot be marked until the roadway geometric design has been completed (Stages II and III). Clearing limits are usually established by “slope staking” limits of cuts and fills. Staking accuracy is required for an accurate timber inventory and must reflect slope rounding, warping and laying back ends of cut slopes.

Once clearing limits are established, USFS employees measure (cruise) the timber within the defined limits and make an appraisal of current market value. USFS employees will mark the trees that have been cruised, and only the trees that have been marked may be cut. The sale is then completed to ADOT.

The length of time needed for cruising, appraisal, sale and removal will depend on the scale of the operation. Weather may also impact the length of time required, especially in higher elevations where snow may be encountered during winter months. Where the proposed highway design will affect thousands of trees, the length of time required for cruising, appraisal, sale and removal can require up to five years.

If during construction, design changes require the removal of additional trees, these trees must not be cut until they are measured, marked and sold to ADOT. Failure to observe this procedure must be investigated as a timber theft under current USFS policy. Civil and criminal penalties may result.

2.7 BLM PROJECT DEVELOPMENT PROCESS

BLM’s project development process is similar to that of USFS and is described in the Operating Agreement (refer to Appendix D).

2.8 ADDITIONAL RESOURCES

ADOT home page:

<http://www.dot.state.az.us/>

ADOT Multimodal Planning Division:

<http://tpd.az.gov/pps/introduction.asp>

ADOT Project Development Process:

<http://www.azdot.gov/Highways/PPMS/ProjDevProcMan.pdf>

BLM home page:

<http://www.blm.gov/wo/st/en.html>

FHWA home page:

<http://www.fhwa.dot.gov/>, <http://www.byways.org/>

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USFS and NEPA:

<http://www.fs.fed.us/emc/>

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CHAPTER 3: HABITAT CONNECTIVITY**3.1 CHAPTER GOALS**

Wildlife/vehicle accidents are a major cause of injury and property damage to the motoring public and a significant cause of mortality to wildlife species. In addition to these safety issues, highway corridors both directly destroy wildlife habitat and effect large-scale changes to topography and natural drainage patterns, which can have far-reaching downstream effects. A wide range of pollutants is also associated with highways including noise, vibration, light and chemical. Lastly, highway corridors divide natural habitats, *Figure 3.1*, into smaller patches and



Figure 3.1 Habitat fragmentation as seen in this photo taken from Picacho Peak showing Interstate 10 separating Picacho Peak and Hayes Peak.

create barriers between remaining patches. This process is known as habitat fragmentation and it is the greatest ecological impact posed by highway corridors. Highways effectively form barriers that include both physical barriers (the ability to cross the pavement safely) and behavioral barriers (many sensitive species avoid roads entirely). Habitat fragmentation can have two primary effects on wildlife: first, it can reduce the sizes of habitat patches so much that they can no longer support viable populations of some species; second, habitat fragmentation can isolate the remaining patches so that animals have a low chance of moving between patches. Being unable to move between patches renders species vulnerable to local and regional extinction.

Habitat fragmentation may be caused by numerous human activities, which are often planned in relative isolation from larger ecological processes. Highway corridors as a cause of habitat fragmentation is typically not understood until after significant damage has occurred, often in the forms of injured motorists and diminished wildlife populations. The general and scientific communities are becoming increasingly aware that this issue has not been sufficiently addressed in the past and that current highway planning efforts are typically too limited to address larger ecological issues. There is growing public interest in mitigating roadway impacts to wildlife and ecosystems. The goal of this chapter is to review the means by which highways can be made more permeable to wildlife movement and to render them safer for both motorists and wildlife. Success means that wildlife passages reduce road barrier effects and road kills.

3.2 SCOPING AND NEPA PROCESSES

The approach recommended by this manual for planning new or upgrading existing highway corridors adopts the strategy that prevention is better than the cure regarding the negative effects of habitat fragmentation. When possible, designers should avoid alignments that lead to habitat fragmentation and thus require site mitigation. Therefore, during the scoping process the project team should first evaluate the natural heritage of the project area and identify sensitive areas. Time and funding required for gathering this information should be included in the scoping process. Appropriate information may include the following:

- Habitat types and sizes as well as existing and/or planned man-made facilities.
- Species and approximate sizes of populations that might be affected by construction of the highway.
- Existing wildlife corridors.
- Types of anticipated conflicts between wildlife (small and large species) and the highway corridor.
- The potential for effective mitigation of impacts caused by the highway.

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- Land tenure and long-term land use adjacent to wildlife habitat linkages/crossings adjacent to highway corridors.

Efforts must be made to maintain linear elements (such as riparian areas) that serve to funnel wildlife and that connect habitats and wildlife populations. These key areas should be mapped in order to illustrate possible effects of alternative highway routes. Points of conflict between natural processes and suggested alignments should be noted. At these points of conflict, begin evaluating possible design mitigation measures. Doing so early in the scoping process can greatly improve the effectiveness of these measures and save significant construction costs. If the planning process proves it impossible or impractical to avoid points of conflict and additional mitigation measures are required, compensating environmental



Figure 3.2 Highway laying lightly upon the natural terrain.

measures should be considered as a last resort. This approach forces infrastructure planning to look outside of the normal easement and to examine the development of the whole infrastructure network in relation to wider land use issues. As will be discussed throughout this manual, a cooperative, iterative method best addresses highway corridor concerns as they relate to wildlife issues. Wildlife and conservation biologists, landscape ecologists, planners, landscape architects and road engineers all have a valuable role to play throughout the scoping and design process. The multidisciplinary process will lead to recommendations of routing and alignments, planning of mitigation measures and other types of environmental adaptations.



Figure 3.3 Reducing speed by designing with steeper grades.

Other planning considerations:

- A roadway alignment that follows the natural terrain of the project area, *Figure 3.2*, will typically present fewer obstacles to wildlife movement than an alignment that requires substantial earthwork and drainage structures.
- When constructing a new roadway in areas of significant biological value, consider relaxing design standards without compromising safety. For example, in mountainous terrain, consider reducing the design speed to allow steeper grades, *Figure 3.3*, and tighter turning radii, both of which can reduce disturbances to the adjoining landscape.
- Consider ways to increase wildlife permeability at every opportunity. As will be discussed below, bridges are superior to embankments and culverts. Drainage culverts can be made to accommodate both wildlife and water flows.
- Where possible, choose an alignment that screens vehicles from adjoining areas, thereby preventing light and noise pollution from spilling

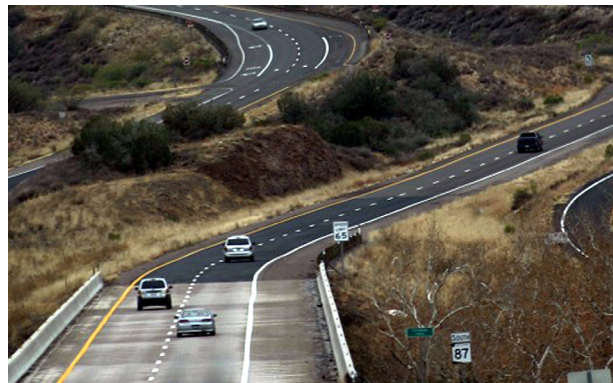


Figure 3.4 Vegetation and berms can screen light, noise and pollution.



Figure 3.5 With larger dimensions, long spans between bridge supports can have less of an impact on sensitive wildlife corridors while allowing traffic to move overhead.

beyond the easement. A natural or artificial berm or vegetative screen can also be effective, *Figure 3.4*.

- Widening or improving existing roads should be viewed as an opportunity to increase habitat connectivity, particularly since upgrading typically increases the barrier effect of the corridor. While direct habitat loss is unavoidable with highway construction/upgrading, a mitigation plan that strives to moderate adjacent habitat affects and facilitate safe movement of wildlife across the highway (highway permeability) is a key step in softening these ecological effects. In particular, reducing the barrier effect by maximizing highway permeability is an important objective of the highway design process.
- Recognize that one of the ultimate goals is ecosystem health while implementing a roadway system.
- Recognize land management agency planning decisions for wildlife movement corridors that identifies lands for retention or acquisition for this purpose.

3.3 DESIGN PROCESS

As discussed above, the first strategy for minimizing habitat fragmentation should be to avoid sensitive habitats. Where points of conflict occur between proposed highway alignments and the natural environment, general infrastructure planning should occur early in the planning process. The specific mitigation techniques described below should be viewed as parts of an integrated solution. The selection of the most appropriate types of fauna passages requires consideration of the landscape, habitats affected and target species. There is rarely only one measure that will effectively mitigate habitat fragmentation. Different species require different mitigative measures and design criteria: one size does not fit all. Instead, a package of integrated measures is required that address problems at specific sites and for the corridor as a whole. These measures should be cost-effective, properly located, and sensitive to anticipated future land use changes bordering the highway.

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General considerations include the following:

- Modifying engineering structures is often the most appropriate way to reduce the barrier effect of existing roads. Many such modifications are not costly and can significantly increase the permeability of the corridor as will be discussed below.
- Larger bridge spans, for example, *Figure 3.5*, facilitate joint use by both humans and many different species of wildlife.
- A large number of adapted passages may, in some cases, give better results than constructing one new specific passage. Modifications of existing riprap, correcting impassable slopes and installing channeling fences may be achieve desired goals. Total reconstruction of structures is not always necessary.
- Modification of maintenance procedures (e.g. treatment of vegetation) may improve conditions for wildlife.
- Designs for structures that encourage safe wildlife movement continue to evolve as new information is brought forth and it is critical that new information continue to inform the design process. It is also important to know if these connectivity measures are effective. Therefore, provisions should be made during design for the installation of monitoring tools such as cameras that are activated by passing wildlife. Costs associated with monitoring are modest when compared to the overall expense of most structures. These measures should be cost-effective, properly located and sensitive to anticipated future land use changes bordering the highway.

Wildlife Passages

Animal passages may be broadly categorized into



overpasses and underpasses. There are few general guidelines regarding their uses. Vegetation grows more easily on overpasses and for that reason can provide a greater number of microhabitats. A wider range of species may therefore use them. Creative design to accommodate the species of concern is encouraged and may provide additional mitigations that minimize the impacts to the highway facility.

Wildlife Overpasses

Wildlife overpasses, *Figure 3.6*, are bridges built over the highway corridor. Although they can be costly, in some cases it is actually cheaper to construct an overpass than an underpass due to terrain constraints.

- The wider an overpass, the more wildlife species it can support.
- Width, design and vegetation depend largely on the target species, which are usually ungulates or other mammals. Overpasses have also been shown to act as guiding lines for birds, bats and butterflies, not only enhancing the movements of flying animals that may be reluctant to cross open ground but also acting to reduce animal mortality.
- Overpasses can be better integrated into the surrounding landscape where the corridor creates a through-cut. Where the level of the overpass is higher than the adjoining land, the grades of the access ramps should be consistent with nearby natural grades.
- Costly structures such as overpasses should not be constructed for only one target species; the aim should be to connect habitats at the ecosystem level. This requires at least partial simulation of the habitat on each side of the corridor.
- The width of these crossing structures should



Figure 3.6 Planned wildlife overpasses for Big Horn Sheep on US 93, construction 2008 - 2009.

be based on the types of animals expected to use them. Smaller widths will provide movement only to less sensitive wildlife and widths less than 60 feet have been shown to be less frequently utilized. The longer an overpass is, the wider it should be; a minimum width to length ratio should be greater than 0.8.

- Vegetation should typically reflect species on either side of corridor. A line of larger shrubs across the bridge can provide a guiding line, cover and protection from vehicular lights and noise.
- Screening at the sides and approaches of the overpass seeks to reduce disturbance from vehicular lights and noise and may be created from vegetation, earthen berms or man-made materials. Artificial screens are more important on narrow overpasses. High screens should be avoided in order to prevent creating a “tunnel” effect. In general, screens should reach about six feet in height.
- Paved bridges constructed for light local traffic that span highway corridors are rarely utilized by wildlife in order to cross highway corridors. However, these can be improved for wildlife by adding a minimum three-foot wide strip of soil suitable for low vegetation. Where such joint-use bridges are designed, including a screen between the human and wildlife travelways will improve wildlife use.
- Fences facilitate guiding animals to an appropriate fauna passage and will be discussed later in this chapter.

Wildlife Underpasses

Underpasses for wildlife include all types of structures built as connections under the level of the roadway. Many underpasses are constructed for purposes other than wildlife passage. However, with modest adaptations, these structures can function as successful wildlife passages also and lessen the effect of habitat fragmentation.

Bridges

- Bridges typically cross natural drainages, *Figure 3.7*, and they are a valuable means for preserving riparian ecosystems. Natural drainages are preferred roads for many species of wildlife such as invertebrates and small vertebrates, which are strongly linked to particular vegetative types and rarely use culverts without plant cover. Although they are more expensive than embankment



Figure 3.7 Bridge crossing a natural drainage, built high to preserve riparian ecosystem.

slopes with culverts, bridges allow the preservation of valuable ecosystems.

- Even where natural drainages do not exist, “dry” bridges can be placed where needed to provide effective animal passage corridors.
- Cover beneath bridges, *Figure 3.8*, is important to encourage movement by small species.
 - ◆ To allow plant cover under the bridge, the bridge deck should be a minimum height of 15 feet.
 - ◆ For wide roads, travelways can be separated to provide extra light to the area below.
 - ◆ Where lack of water and light will restrict vegetative growth, provide artificial cover such as piles of tree stumps or rocks. Do not cover the ground with gravel, riprap or pavement.



Figure 3.8 Cover beneath bridges is important for animal movement.

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- Where the area under the bridge will serve both vehicles and wildlife, provide a screen between the two paths to shield wildlife from vehicular lights.
- Careful attention should be paid to embankment slopes.
 - ◆ These should remain outside of the drainage channel in order to provide wildlife with a relatively undisturbed means of movement.
 - ◆ Where embankments are constructed adjacent to perennial water sources, ensure that they are sufficiently set back from those water sources to provide wildlife crossings that remain dry.
 - ◆ Some wildlife species (e.g., bighorn sheep) prefer to migrate along the sides of drainages. Therefore, attention should be paid to embankment slope materials (concrete, riprap, gravel, soil) and slope ratios (vertical versus battered). For some wildlife species, these materials may form a barrier to movement.
 - ◆ For wildlife species that prefer the sides of drainages or where embankments encroach into the natural drainage channel, provide three- to five-foot



wide walkways across those embankments. Bridges can be fitted with bat boxes, *Figure 3.9*, of various designs, which can be placed on girders as well as cast-in-place type structures. It is recommended that bat boxes not be placed over live streams and

Figure 3.9
Placing a bat box under a bridge.

should be placed at the abutment ends of the bridges a minimum of 10 feet from the ground to prevent vandalism.

- The tops of bridge abutments can appear to offer prey species suitable ledges from which to ambush prey. Therefore, carefully consider the design and locations of

abutments. If less than eight feet high, set abutments back from likely wildlife trails.

- If greater than eight feet high, set abutments back from one another sufficiently to avoid creating a “tunnel” effect.
- To reduce the tunnel effect, an open median is recommended wherever feasible for better day lighting.
- Wildlife fences should be considered to funnel wildlife species under the bridge.

Box Culverts

Where possible consider the following:

- Box culverts, *Figure 3.10*, can be designed to allow the safe passage of large mammals. Target species include deer and large carnivores such as coyotes and mountain lions.
- Box culverts are less suitable than bridges for connecting habitats because the lack of water and light allow for only limited vegetative growth. In addition, boxes typically provide only limited visibility through and escape venues from the structure, which may deter prey species. Construction of boxes also permanently disturbs native vegetation and disrupts streambed morphology.
- Culverts should be located along wildlife corridors identified during the planning process. Where culverts cannot be located directly on the corridor, linking passages to the corridor is essential.
- The longer an underpass is, the wider and higher it will have to be. In general, recommendations for dimensions include a minimum width of 45 feet and a height of 10



Figure 3.10 Box culverts can be designed for larger species to travel through.



Figure 3.11 Culverts should be free of obstacles.



Figure 3.12 Small pipe culvert.

to 12 feet. A loose measure for dimensions can be calculated by multiplying width by height and dividing by length. This product should not be less than 1.0. When this value is less than 1.0 consider other structure options.

- Longer dark underpasses may present a barrier to wildlife movement. If possible, introduce natural light by means of intermediate grates overhead (in general, artificial lighting has not been successful). Sound barriers at these grates for vehicular traffic may improve the wildlife movement function of the underpass.
- The grade of the culvert should not exceed five percent.
- The floor of the culvert should be soil.
- The vegetation at the entrance of the culvert should be attractive to the target animals. Vegetation at these locations can also serve to screen wildlife from vehicles.
- If possible, provide earth berms or other means to screen entrances from traffic noise.
- Vegetative cuttings or stumps can be placed inside the culvert to create cover for small animals.
- Access to the culverts, *Figure 3.11*, should be level and free of obstacles for small animals. When designed to accommodate drainage needs culvert outfalls are also typically protected against erosion. This protection (such as riprap) may form a barrier to wildlife movement. Therefore, provide a means for wildlife access. For example, where riprap is used, grouted

riprap pathways may be constructed where the riprap meets the culvert headwall. Avoid the use of ungraded large riprap, which can act as a barrier to smaller wildlife species.

- If the culvert is to be jointly utilized by both humans and wildlife, create separate corridors for each separated by a screen. Fences should be constructed to lead animals toward the underpass.

Small Culverts

- Underpasses constructed for small animals consist of pipes, *Figure 3.12*, or small box culverts with a diameter/width of one to six feet.
- Pipes are often less expensive than box culverts and are easier to install under existing roadways. However, small box culverts are preferable for amphibians and possibly for other small species because the vertical walls provide better guidance.
- Pipe diameters need to be sufficiently large to allow for a level (flat) traveling surface. Ideally, this surface is as natural as possible such as soil and rock. Maintenance is more difficult with smaller diameter pipes.
- Culvert slopes that exceed five percent will not be utilized by most wildlife species.
- Concrete or metal pipes can be used for underpasses, but some species (such as rabbits and some carnivores) will avoid contact with metal surfaces.
- Small culverts dedicated exclusively to small wildlife species should always be considered.
- Where the underpass also acts as a

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Figure 3.13 Ungraded large riprap can act as a barrier to smaller wildlife.

drainage culvert that regularly flows, the structure must be adapted to keep a dry travelway. This can be achieved by means of an internal embankment or ledge.

- Culvert entrances should be located in recesses in highway fence lines so that animals are guided to them. Access to the entrances needs to be kept clear of obstructions, but also provide cover.
- When designed to also accommodate drainage needs, culvert outfalls are typically protected against erosion. Graded riprap is preferred to smooth concrete to facilitate movement by small animals. Avoid the use of ungraded large riprap, *Figure 3.13*, which can act as a barrier to smaller wildlife species.
- The outfall slopes should be less than 45 degrees.
- The invert elevations of both inlet and outfall should match that of the adjacent grade.

Fish Passages

Fish passage includes bridges and box and pipe culverts. This section includes general guidelines for culverts only. For all drainages where fish are found, consult a wildlife specialist.

- The optimal location for a fish passage will be where the passage has the same water flow and bottom substrate as the main watercourse.
- In general, there are four main criteria to consider in the design of appropriate fish passage:
 - ◆ Not too long
 - ◆ Not too steep

- ◆ Not too narrow
- ◆ No outfall drop
- Of these, outfall drop is the most critical. For most species, drops greater than two to four inches will obstruct passage. The scour pool at the pipe outfall may form a good habitat, but it can create a barrier for upstream movement.
- It is also important to maintain flow velocities through the culvert that do not exceed flows in the natural stream. Therefore, the invert elevation of the culvert, should be below the level of the streambed.
- The alignment of the culvert should be similar to that of the natural stream. A culvert with an extreme skew (greater than 30 degrees to the stream) will affect the success of fish passage by increasing inlet contraction and turbulence. In-channel deposition and bank scour will also often occur, leading to stream degradation. Conversely, culverts that are not skewed may be considerably longer.

Amphibian and Reptile Tunnels

Many species of amphibians and reptiles migrate to seasonal feeding and breeding areas. In doing so, they may cross roadways in highly concentrated numbers over relatively short periods of time. For this reason, passage structures can be temporary or permanent installations.

- Permanent barriers can be erected that guide amphibians into tunnels, *Figure 3.14*. Small mammals may also utilize these underpasses.
- As discussed earlier in this chapter, if culverts are installed to convey perennial stream flows, adapt the culvert to include a permanently dry path.
 - ◆ Tunnels with rectangular cross sections are recommended over round pipes because vertical walls provide better guidance. If round pipes are utilized, provide a flat-bottomed traveling surface.
 - ◆ Culvert slopes should be less than five percent.
 - ◆ Concrete is superior to metal or plastic.
 - ◆ A top constructed of metal grating will allow natural light into the tunnel, which

- ♦ will provide better guidance.
 - ♦ Guiding structures or fences should be perpendicular to the ground plane and should be at least 16 inches tall. They should not be constructed of netting, which can trap animals.
 - ♦ The ends of the guides should be U-shaped to prevent animals from leaving the fence. The top should be bent back in the direction of the animal.
 - ♦ Vegetation should provide cover but not obstruct the travelway adjacent to the guide structure.
- Temporary barriers can be erected along migration routes that guide amphibians into buckets, which are dug into the ground. The animals are collected from the buckets and released on the other side of the roadway on a regular basis during the migration season.

Fences and Walls

Fences are typically erected to reduce accidents due to collisions between large mammals and cars. They can also serve to reduce the number of smaller animals killed on roads. A disadvantage of fences is that they increase the barrier effect. Where fences or other barriers are erected, animal species will continue to need to cross the road. Therefore, fences must be designed and constructed to support wildlife passages, *Figure 3.15*. In these cases, they fulfill an important role in guiding animals to appropriate crossing points. Fences should only be erected where highway mortality may threaten a population or sufficient crossing structures are in place to ensure permeability. Otherwise, the fence may have more negative effects on the survival



Figure 3.14 Successful tortoise underpass on US 60.

of the population over time than mortality due to traffic.

- In general, fences should be constructed only in those areas where the number of animals is high or where there is a high risk of accidents involving wildlife. Therefore, they should typically be installed along high-speed, high-volume highways. On roads with low traffic density, fences should only be installed at high-risk locations. If fences are determined to be necessary, they should be installed along both directions of travel.
- The ends of fences are critical. Ideally, they should terminate at crossing structures such as bridges or at impervious natural surface (such as a steep slope). At a minimum, they should extend well beyond the known wildlife movement corridors. This distance will vary according to the target species. For example, for larger ungulates such as elk, deer or bighorn sheep, fences should extend one-half mile beyond the last crossing structure.
- Fence openings must be integrated with appropriate wildlife crossings. On lower-volume roads, fence openings can be installed at locations where drivers have sufficient sight distances to stop for crossing animals.
- Exits from within the easement, “jump outs”, must also be provided to allow for animals to escape. These should be placed at a minimum of ½ mile intervals and at the ends of bridge structures.
- Fence heights must be determined in relation to the target species and the local terrain (can the animal jump from a nearby slope?) and to the potential for snow cover, which may reduce the effective height of the fence. In general,



Figure 3.15 Fence designed to facilitate wildlife passage under the roadway.

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for larger species such as deer, elk or big horn sheep, fence height should reach at least seven feet. Extra wires attached to the top at 45 to 90 degree angles may be needed in order to reduce mountain lion jump-over.

- Fences are typically constructed of wire fabric attached to metal or wood posts. To prevent smaller species from entering the highway, it may be appropriate to use a smaller mesh size at the bottom half or third of the fence (opaque barriers should be used for amphibians as discussed above). The bottom wire must rest directly on or be buried into the adjacent grade (e.g., to prevent dig-out by coyotes, install bottom of fence four feet below grade). Where constructed across drainages or changes of grade, more fence posts will need to be installed to follow that grade.
- Consider the aesthetics of fence design and installation. In wooded areas, it may be relatively easy to hide the fence behind existing vegetation. In more open habitats, it may be necessary to set the fence at a greater than normal distance from the roadway in order to disguise its presence. The fence color should integrate with the project landscape.
- Provide sturdy fence structures to resist impacts from anticipated wildlife species.
- Short concrete walls (18 to 48 inches) can be effective in funneling smaller species. These herpetology (or “herp”) walls are typically smooth-faced and incorporate a small overhanging lip at the top of the wall to reduce climbing or jumping.

Roadside Vegetation

As will be discussed in Chapters 7 and 11, the reclamation of lands disturbed by highway construction is required for both aesthetic and environmental reasons. In general, disturbed soils are seeded with species native to the project ecology. Considerations regarding the selection of those seed mixes with respect to wildlife concerns include the following:

- Avoid including species of shrubs and trees that are attractive to large, browsing mammals.
- In forested environments and outside clear zones, consider including species of trees that can provide cover for birds and allow them to fly from one refuge to another while crossing the highway. Tall trees can lift their flight paths over

the roadway.

- Dense vegetation of an appropriate height can serve to funnel animals toward appropriate crossing locations, similar to fences.

Maintenance considerations regarding right-of-way vegetation include:

- Cutting and/or mowing vegetation within the right-of-way to reduce possible forage for and improve driver visibility of large mammals.

3.4 ENVIRONMENTAL MITIGATION

Good planning and use of measures to avoid or reduce adverse impacts to natural habitats are necessary to minimize the negative environmental effects of highway corridors. Where those negative effects are determined to be excessive, environmental mitigation may be necessary. Mitigation planning is a challenging endeavor when dealing with multi-species ecosystems. Mitigation in this sense is defined as creating, restoring or enhancing natural areas in order to offset ecological damages caused by the construction of a highway corridor. Mitigation should be considered as a “last resort” solution to be employed only when methods discussed above are determined to be insufficient. In contrast to those methods, environmental mitigation is generally constructed outside the highway easement area.

Mitigation measures should ideally aim to create similar ecological conditions to those that are impacted by the highway. Examples of environmental mitigation include restoration of degraded habitat (such as from over-grazing), restoration of damaged wildlife corridor (such as a riparian area) or a combination to improve the connectivity of isolated habitat patches.

3.5 MONITORING

Monitoring devices, should be addressed during the NEPA and design processes and when appropriate included in the construction documents. The purpose of monitoring is to measure the efficacy of the designs used to benefit wildlife, both in biological and economic terms. Monitoring efforts should provide information toward improved future project applications. Such monitoring must be tailored to the types of designs and species involved, *Figure 3.16* and *3.17*.

As an integral component of the success of habitat connectivity measures, monitoring should be included in the planning, design and, where feasible, the cost of the project. The particular monitoring requirements will have to be determined on a case-by-case basis. Monitoring can contribute to and help facilitate an adaptive management approach to structure placement and efficient design in current projects and those in the future.

One technique that has been utilized with some success for large structures is the installation of a built-in, lockable box, within each wall. These boxes should be at least 1-foot on each side, include a removable door, and be pre-wired for solar, battery, or alternating current power. Still photography or video cameras may be installed in these boxes and may be transferred between sites as required. This will provide for the least intrusive, most secure, most flexible, and most cost effective way to monitor wildlife usage of the various crossings, while minimizing human impact.



Figure 3.16 Testing for monitoring at an elk crossing.



Figure 3.17 Elk crossing and monitoring station.

Monitoring information about how well various measures are working can be obtained from Arizona Game & Fish, ADOT staff, ADOT consultants, the Arizona Trails Research Center (ARTC) and by searching for specific topics on the ADOT website.

3.6 ADDITIONAL RESOURCES

Useful websites that provide additional information regarding habitat connection and wildlife crossing design may be found at:

<http://www.wildlifecrossings.info/beta2.htm>

Eco-logical: An Ecosystem Approach to Developing Infrastructure Projects:

http://environment.fhwa.dot.gov/ecological/eco_entry.asp

Keeping It Simple: Easy Ways to Help Wildlife Along Roads:

<http://www.fhwa.dot.gov/environment/wildlifeprotection/index.cfm>

Safe Passage

<http://www.carnivoresafepassage.org/>

Arizona's Wildlife Linkages Assessment

http://www.azdot.gov/Highways/OES/AZ_Wildlife_Linkages/index.asp

Second Nature: Improving Transportation Without Putting Nature Second:

http://www.defenders.org/programs_and_policy/habitat_conservation/habitat_and_highways/resources/second_nature.php?ht=

Center for Environmental Excellence by AASHTO

<http://environment.transportation.org/>

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CHAPTER 4: ROADWAY DESIGN AND CONSTRUCTION

4.1 CHAPTER GOALS

This chapter will review considerations central to roadway design on BLM and USFS lands including highway alignment, design criteria, earthwork and retaining walls. The goals of this chapter are as follows:

Context Sensitive Solutions

As discussed in Chapter 2 and Appendix G, the NEPA and Section 106 processes provide reviews of project impacts caused by the proposed highway. One goal of this chapter is to describe specific Context Sensitive Design strategies that may be used to address these impacts: planning, design and construction processes that allow for the avoidance and protection of natural and cultural resources while providing for a safe, functional and economic highway corridor.

Visual quality

Lands managed by both BLM and USFS are frequently notable for their outstanding scenic qualities. Traveling for pleasure on these highways offers the primary form of recreation for many Arizonans and one that BLM and USFS seek to provide. The project team should respond to this concern by creating and maintaining highway corridors that visually blend in with the surrounding natural environment. Therefore, a second goal of this chapter is to describe the planning, design and construction of highway alignments and engineered slopes that are visually integrated with the surrounding natural landscape.



Figure 4.1 Highways of the past were narrow.

Erosion control

In order to meet the legal requirements of both the Arizona and National Pollutant Discharge Elimination System, ADOT must employ erosion control techniques for all soils disturbed by construction activity (refer to Chapter 8). To control erosion, cut and fill slopes are typically revegetated by mechanically applying seed to those slopes (refer to Chapter 7). Successful revegetation depends on appropriately designed slopes, the third goal of this chapter.

Environmental mitigation

Finally, the NEPA document will often provide requirements for grading, slope configuration and earthwork balance. A fourth goal of this chapter is to summarize mitigation techniques that may address these requirements.

4.2 SCOPING AND NEPA PROCESSES

The success of the project team in achieving a highway corridor that is integrated into the surrounding natural landscape depends largely on the existing terrain, the proposed roadway alignment and the design criteria set forth in the project scoping document. In preparing and reviewing the project scoping document and environmental scoping document, consider the following:

Existing Topography

Roads are linear elements imposed upon nonlinear landscapes. They are typically constructed with limited grades, with relatively constant widths and large radius curves. In contrast to highways of the past where roadways were narrow, Figure 4.1, and their profiles followed the contours of the



Figure 4.2 New highways have wider cross-sections and flatter profiles.

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land, contemporary highways, *Figure 4.2*, have wider cross sections and flatter profiles. Especially where located in hilly or mountainous terrain, the potential for large, highly visible cut and fill slopes increases significantly using modern highway design criteria. Constructed slopes typically form the most visible elements of a highway corridor in hilly or mountainous terrain.

Alignment

During the project scoping process, several alignments may be reviewed. Impacts to existing natural and cultural resources will vary with each alignment. Alternative alignments should be carefully evaluated for possible impacts to sensitive environments, such as riparian areas, wildlife corridors, significant visual elements, scenic landforms and features, and cultural resources. When impacts to important resources are unavoidable, consider design or mitigation measures to diminish and offset these impacts such as alignment adjustments, bifurcated roadways,



Figure 4.3 Bifurcated highway.

bridges, wildlife underpasses and improvement of degraded habitat outside the right-of-way. When proposed for hilly or mountainous terrain, consider a “bifurcated” alignment, that is, a design that splits the two directions of travel so that each road can follow a relatively independent path, *Figure 4.3*, with smaller cut and fill slopes than might be required for a single wider roadway. During design, for example, the project team should identify and may support retaining important existing features and vegetation in an undisturbed median in order

to reduce disturbance. Views between the two alignments should also be taken into account. Ideally, the two roadways should be treated as two independent alignments. The reader should note that while a bifurcated alignment typically results in an alignment with fewer visual impacts, the resulting median between the two alignments may be visually pleasing, but is generally lost as a resource for larger wildlife species.

Design Criteria

The project scoping document will provide criteria for roadway width (including number of lanes, widths of lanes, shoulders and roadside ditches) and design speed, which, in turn, sets maximum allowable limits for roadway grades, turning radii and sight distances.

When proposed for hilly or mountainous terrain, design criteria will dramatically affect impacts to existing slopes. Even slight changes in design criteria over small distances can translate into large-scale differences for the impact that a highway corridor has on the landscape. For example, changes of one half percent in maximum grade, of a minimum radius of 400 feet instead of 500 feet, a total roadway width of 28 feet instead of 30 feet or a ditch width of 4 feet instead of 6 feet can result in significant changes to the sizes of associated cut and fill slopes.

Environmental Mitigation

As discussed in Chapter 2, the NEPA process may reveal the need for mitigation work both within and outside of the highway easement necessary to address impacts caused by construction of the highway to the surrounding landscape. Outside the highway easement, these mitigation requirements may include reparation of degraded habitat, improved access to BLM/USFS facilities and/or the obliteration and restoration of unneeded BLM/USFS roads. Within the easement, mitigation work may include slope roughening (described later in this chapter), the laying back of slopes to open views for motorists to scenic vistas, the design of retaining walls and/or roadside barriers to avoid impacts to important resources.

Geotechnical Report

Land surveying necessary for the geotechnical report will typically begin during the project scoping process and the findings may impact the preferred

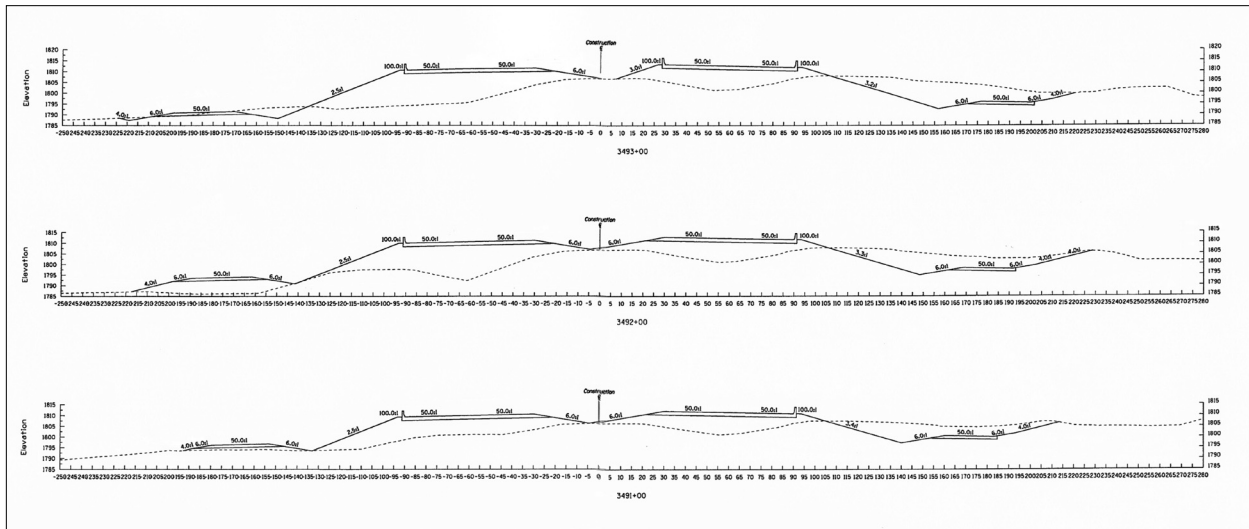


Figure 4.4 Typical cross sections of a highway corridor.

roadway alignment. Because they involve land-disturbing activities, geotechnical investigations in the field typically require NEPA documentation prior to onset of work. The design team should be aware that completing NEPA documentation will require additional time.

4.3 DESIGN

NEPA Documents and Environmental Mitigation

During the roadway design process, the project team should regularly review NEPA documents to ensure that mitigation recommendations related to earthwork activity are met and included in the construction documents. Since they are of critical concern to BLM/USFS and may be unique to the project, environmental mitigation measures require careful coordination between ADOT and BLM/USFS both during design and construction. In addition, because they may involve atypical construction practices, these measures should be “value analyzed” during design. During the construction process, these mitigation measures may **not** be “value engineered” out of the project scope.

Review Process

It is important to study the anticipated disturbances resulting from proposed earthwork. For this reason, Stage II (30%) and Stage III (60%) reviews should include visits to the project site. The centerline of the alignment should be staked for review by the

design team at these stages. Staking of slope limits and limits of planned disturbance adjacent to sensitive areas should also be included at the Stage III field review.

Since the local ADOT districts will be familiar with ongoing maintenance issues and will also be responsible for maintaining completed projects, it is important that local maintenance personnel be included in the project review process.

Safety

Clear Zone

Typical cross sections, *Figure 4.4*, are developed for each highway corridor. They describe the roadway, shoulder, roadside ditch and fore- and backslopes, the widths and slope ratios of which affect the clear zone.

The clear zone is the roadside border area, starting at the edge of the travelway, available for safe use by errant vehicles or emergencies. This area may consist of a shoulder, a recoverable slope and/or a clear run-out area. The width of clear zones varies according to the project and is to be constructed and maintained free of obstacles such as trees, boulders and man-made elements that may form barriers to errant vehicles. Slopes that are considered “recoverable” are flatter than 4:1.

Slopes between 3:1 and 4:1 are generally considered to be “traversable,” meaning that

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an errant vehicle cannot stop or return to the roadway but can be expected to reach the bottom of the slope. For backslopes of this nature, a clear runout area at the base of the slope that is free of obstacles is desirable.

Significant existing obstacles within the proposed clear zone may be protected by barrier (such as guardrail). Barriers should be considered where such obstacles are desirable to retain in the landscape, such as outstanding mature trees or rock features, *Figure 4.5*.

Roadside Ditch

The typical roadside ditch is installed at the toe of cut or fill slopes and its width is usually determined as a product of the drainage design. Safety concerns to consider are slope height, slope ratio, anticipated occurrence and anticipated sizes of falling rocks, undisturbed slopes above cuts, clear zone needs, sight distance requirements, blasting options and maintenance concerns such as snow storage requirements.

Roadside Barriers

Roadside barriers function to shield motorists from natural or built obstructions along the roadside. They are typically designed along non-traversable slopes or fixed objects as directed by the roadway engineer.

Barriers, *Figure 4.6*, may be constructed of formed concrete, masonry, galvanized steel, acid-etched steel, non-specular steel, self-weathering steel, with wood posts, steel posts, and hardware as required. Because they can be highly visible both within and outside of the



Figure 4.5 Rock feature to save.

right-of-way, finish materials should be carefully reviewed.

Because they are subject to impact from motor vehicles, long-term roadside barrier maintenance is an ongoing concern. For that reason, ADOT typically prefers to minimize barrier installation. Therefore, where barriers are recommended to shield existing resources (unusual rock outcroppings, large trees, etc.), ensure that these resources are actually visible to motorists or are valuable for other reasons.

Truck Escape Ramps

Truck escape ramps, *Figure 4.7*, are essential safety features in areas where there are long descending grades that may cause truck brakes to fail and result in a loss of control. Location and design guidelines for truck escape ramps are outlined in ADOT's Truck Escape Ramp Policy in the Roadway Design Guidelines.

Because they often require extensive grading, ramps can have a significant visual impact. Therefore, when possible locate ramps in areas where they can utilize an existing grade, thereby requiring less disturbance to nearby slopes and vegetation.

Slope Stability

Slope stability refers to the resistance of a given slope to failure and includes such concerns as erosive forces, susceptibility to moisture intrusion and surface-loading conditions. Stability concerns for rock slopes include orientation and frequency of discontinuities and types of material within the discontinuities. Stability is typically directly related to soil or rock type and slope ratios. Slope



Figure 4.6 Roadside barrier of steel with wood posts.



Figure 4.7 Truck escape ramp.

stability directly affects efforts to revegetate slopes successfully. This issue will be discussed in greater detail later in this chapter.

Earthwork

Earthwork is an important component of project design and may form the primary activity for the construction of a new highway. There are several important concerns that relate to earthwork:

Earthwork Balance

Typically, roadway designers seek to balance cut (excavated soil) and fill (soil placed as embankment). Earthwork balance involves calculations to estimate the shrink (amount of volume reduction associated with handling and placing soils) or swell (amount of volume expansion usually associated with rock).

Because it is very expensive to import additional material to the project site, designers usually incorporate excess excavation into their earthwork calculations as a project-specific percentage of the overall earthwork. It will be necessary to “waste” this excess excavation if not used for construction of the roadway (wasting will be described below in greater detail). For projects involving large volumes of earthwork, consider a smaller percent of that earthwork when calculating the excess material.

Excess Excavation (Waste)

During the design process, consider the storage



Figure 4.8 Fill slope made using waste material.

and handling of any excess excavation (waste) that may be generated during construction.

- Are there areas within the project limits in which the waste can be utilized to better integrate the highway corridor with the surrounding landscape? Both aesthetic and environmental benefits should be considered. For example, fill slopes may be made flatter using this waste material, *Figure 4.8*. This may be especially appropriate on the uphill side of an embankment where depressions can appear out of place in the landscape. Waste material may also be used to construct “false cuts” at the tops of fill slopes.
- Is it possible to reduce the volume of waste by means of retaining walls? (Retaining walls will be discussed later in this chapter.)
- Is it possible to reduce waste by adjusting the vertical alignment of the highway?
- Are there areas (both within and outside the project limits) that are less visible where excess material can be placed?
- Can waste be utilized on an existing roadway that will be obliterated?
- Does BLM, USFS or local public agencies anticipate the future construction of projects that can utilize the material such as trailhead- or overlook-parking areas?
- If the project is one of a series within a larger corridor, consider utilizing sites to be disturbed by future phases within that corridor.

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- How will areas receiving waste be designed to be visually compatible with surrounding topography and stabilized?

Cut Slope Ratios

In an effort to balance cut and fill, designers should generally not decrease cut slope ratios (make them steeper) in order to reduce waste material. Cut slopes are typically those slopes that are most noticed by the traveler. They are also the most difficult to revegetate because they are more prone to erosion, *Figure 4.9*. In general, long steep cut slopes are more difficult to revegetate than less steeply graded slopes. Eroded cut slopes devoid of vegetation damage the environment and may be in violation of the Arizona/National Pollutant Discharge Elimination System (AZPDES/NPDES; refer to Chapter 8 and the ADOT Erosion and Pollution Control Manual for more information). Eroded slopes are also visually obtrusive and ongoing maintenance liabilities.

Borrow

Borrow is additional soil or fill material transported to the project site in order to complete earthwork operations.

- If the design process reveals a need for borrow, consider sources carefully. Are there areas within the project limits that can be excavated to better integrate the highway corridor with the surrounding landscape? Cut slopes may be laid back at a greater (flatter) slope ratio than typical for the project, but doing so may require additional easement.
- Identify possible off-site borrow pits that



Figure 4.9 Long steep slopes are prone to erosion damage.

may be excavated with fewer environmental consequences.

- If rock is needed (typically for erosion control) and is not available from project earthwork, identify possible off-site sources that may be less expensive to access than privately-owned quarries.
- If the project is one of a series within a larger corridor, consider utilizing sites to be disturbed by future phases within that corridor.
- For all borrow sources, consider how those areas will be reclaimed.

Geotechnical Report

Slope design and earthwork calculations require an accurate geotechnical analysis. The analysis should describe the nature of below-grade soils and the presence and types of rock bodies that may exist below grade. These are important considerations in the design of the roadway, slopes, and ditches in the construction sequence as they inform the design parameters.

Testing is necessary for the geotechnical report will often continue up to the Stage III (60%) documents. The project team should be prepared to revise the roadway alignment and slope configurations in response to the Final Geotechnical Report.

Appearance

Slopes may form the most visible component of a highway corridor and may dominate views both within and outside the right-of-way. Careful visual analysis is central to the design of a successful roadway. To the fullest extent practical, constructed



Figure 4.10 Blending slopes into the surrounding landscape.

slopes should be designed to blend into the surrounding landscape, *Figure 4.10*. Doing so will require careful attention to slope ratios, mitigation, stability and revegetation. These considerations will be discussed in greater detail later in this chapter.

Easement acquisition should not be a limiting factor in the design of constructed slopes that blend harmoniously with the native landscape. Both BLM and USFS will consider greater than typical right-of-way acquisition where necessary in order to design and construct a highway. Additional easement might be considered for flatter slopes or slope rounding.

Revegetation

Unless constructed in rock, all slopes are to be revegetated. Concerns critical to successful revegetation are discussed in Chapter 7 and below.

Cut Slopes (Excavation)

Cut slopes, *Figure 4.11*, are typically the most visible slopes within a highway corridor. Final cut faces should blend with the form, grade, color and texture of the surrounding landscape.

Cut slopes are typically categorized as soil or rock cuts.

Soil Cuts

- **Slope Ratios.** To stabilize them, soil cuts are typically revegetated (refer to Chapter 7). Slopes that remain bare of vegetation following construction may not meet the requirements of the General Permit for revegetation and may be in violation of the National or Arizona Pollutant Discharge Elimination System (NPDES or AZPDES; for more information, refer to the ADOT Erosion and Pollution Control Manual). In addition, eroding slopes, *Figure 4.12*, stand out as visual eyesores, and therefore contradict BLM and USFS goals to integrate constructed slopes into the surrounding natural environment. Finally, eroding slopes are maintenance liabilities.

The success of the revegetation effort is largely dependent on slope ratios. In general, flatter slopes will revegetate more successfully than steeper slopes. Slopes steeper than two feet horizontally for



Figure 4.11 Cut slopes are the most visible slopes within a highway corridor.



Figure 4.12 Eroding slopes stand out as an eyesore and continuously add silt to highway ditches.

every vertical foot (2:1) are typically poor candidates for successful revegetation. Flatter slopes require a wider easement and more excavation and disturb a greater area, all of which will need to be addressed during design.

Soil and slope conditions can change from one cut to the next. A detailed geotechnical analysis is therefore key to determining stable slope ratios.

Grades of proposed cut slopes should be studied in relation to existing slopes. Sliver cuts (cuts less than one foot deep) should be avoided since they often unnecessarily increase the disturbed area and provide relatively little increased stability. A short, steeper-than-average slope or a retaining wall can serve to transition between the constructed slope and the existing slope.

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Figure 4.13 Example of ripping.



Figure 4.14 Seed, mulch and wattles applied on steep slopes.



Figure 4.15 Mini benches increase water retention.

Existing slope grades should also be studied for aesthetic reasons. Constructed slope ratios should be similar to those found outside the right of way in order to better integrate with the existing landforms.

- **Ripping.** Higher and longer cut and embankment slopes and slopes steeper than 3:1 should be ripped as they are being constructed. Slopes flatter than 3:1 should be ripped while under construction then have the fertilizer and soil amendments applied prior to final tillage and seeding, *Figure 4.13*. Ripping should be constructed on the contour. Ripping to the specified depth may be considered an erosion and sediment control BMP as it reduces runoff and improves rainfall infiltration and revegetation success. Soil amendments and fertilizers should be broadcast and seed and mulch applied by hydraulic equipment in stages at appropriate intervals during the construction, *Figure 4.14*.
- **Mini Benches.** For large cut slopes (more than 15 feet high), slopes that are steeper than 3:1 or slopes constructed in highly erodible soils, consider the construction of mini benches, *Figure 4.15*, instead of ripping. Like ripping, *Figure 4.16*, mini benches also slow down run-off, increasing water retention for vegetation establishment in a desert environment. Mini benches will soften in appearance over several years. Utilizing trees and larger shrubs in the revegetation effort can also help to blend slopes with surrounding vegetative cover.

Mini benches are best constructed as the slope is constructed; dimensions depend on the slope ratio. Refer to the ADOT Erosion and Pollution Control Manual for information regarding detailing and construction.
- **Track Walking.** Carefully review the need for track walking since soil compaction typically reduces successful revegetation. Track walking should be used after, not in lieu of ripping. Track walking must be constructed so that indentations are parallel to the contour. Refer to the ADOT Erosion and Pollution Control Manual for more information.
- **Slope Mitigation.** Refer to Appendix E for

Slope Design Details.

- ◆ **Rounding:** In order to blend cut slopes more harmoniously into the native landscape and reduce the visual impact of the highway corridor, the tops of cut slopes should be rounded, *Figure 4.17*. Study the existing and proposed slope ratios in order to determine appropriate rounding. The amount of rounding should reflect the appearance of existing ridge tops adjacent to the project. In general, the higher the cut slope, the more the top of the cut should be rounded. The success of a rounded slope can be achieved by thoroughly hashing out problems during design development.

The importance of not skimping on rounding cannot be stressed too much. Rounding helps to naturalize the shape of cuts to conform to the surrounding topography. Cuts with limited rounding call strong visual attention by contrasting with natural landforms, and this visual impact defeats the value of vegetation that may be saved. Vegetation near the edge of the cut slopes tends to die back for several years after construction due to changes in exposure and water infiltration rates and cut roots.

Vegetation and the visual impact it has on and at the edge of cuts is usually transitory, the rounding or lack of it is more visually intrusive.

Rounding may also reduce roadway maintenance. Removing additional material at the top of the cut may reduce the potential for undercutting trees or boulders from erosion.

- ◆ **Warping:** Warping is the excavation of additional material so that the cut face is not parallel to the roadway, *Figure 4.18*. Warping is typically performed in response to natural drainages. Where drainages intercept the top of a cut, the slope is warped back in relation to the drainage to ensure that runoff is carried within an engineered ditch. For large



Figure 4.16 Rippling improves moisture infiltration and revegetation success.



Figure 4.17 Rounded minibenched cut slopes blend into the native landscape.



Figure 4.18 Warping so that the cut face is not parallel to the roadway.

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and highly visible cuts, warping can also be designed to blend the slope more naturally with the topography of the native landscape.

- ◆ **Laying Back:** Where the highway corridor intercepts a major drainage and the earthwork transitions from a cut condition to a fill condition (known as a cut/fill transition), the end of the cut may be laid back: the slope ratio is progressively reduced to flatten the end of the cut. Doing so will provide a smoother transition to the adjacent earthwork. Where the highway alignment affords long views of the surrounding landscape, cut/fill transitions are typically of high visual interest to travelers.
- **Through Cuts**
On projects where earthwork may leave a small standing cut on the outside of a through cut, the resulting berm should be removed. Advantages of removing the berm may include the opening of a vista from the roadway, providing a roadside parking area, reducing shade cast on the pavement, improving drainage and/or eliminating an unnatural landform.
- **Crown Ditches**
Where cut slopes intercept existing slopes, runoff from those existing slopes may erode the cut slope. Crown ditches, *Figure 4.19*, intercept that runoff before it crosses the face of the cut slope. When properly



Figure 4.19 Crown ditch.

designed, constructed and maintained, crown ditches will not be highly visible to the traveler. Crown ditches will be described in greater detail in Chapter 6.

- **Rock Outcroppings**
Exposed rock, where safely embedded into the subgrade, can be left in place to improve slope aesthetics, *Figure 4.20*. This condition should be addressed in the geotechnical analysis and report.

Rock Cuts

- **Safety**
Of primary concern in the design of rock cuts is the stability of the finished cut. Even small rocks that become dislodged and fall onto the travelway (roadway and shoulder) can pose serious hazards to travelers. Therefore, it is imperative that the geotechnical analysis provides detailed, slope-specific information regarding rock types, recommended slope ratios and ditch widths and depths. Where rockfall is anticipated, the roadside ditch may be widened to contain fallen material. Widening the roadside ditch will affect the easement width and earthwork balance and should therefore be considered early in



Figure 4.20 Saving rock outcroppings.

the design process.

- **Aesthetics**

In general, rock cuts should be constructed to appear similar to natural rock faces found in the project area. To that end and to the extent practicable, they should follow naturally occurring joints, creating irregular ledges and sheer faces, *Figure 4.21*. Hard competent rock will typically produce safer cuts that appear more natural than cuts constructed in softer rock. Highly fractured, unorganized cuts, *Figure 4.22*, should typically be avoided as should smooth, featureless faces. On visible slopes, scars and drill-hole traces, *Figure 4.23*, resulting from construction equipment or blasting



Figure 4.21 Cuts should create irregular ledges and sheer faces.

operations should typically be removed from finished faces.

Where the cut rock face varies significantly in color from the surrounding rock areas, a penetrating oxide stain may be applied to the rock to provide a weathered rock appearance. For large rock cuts, the stain may need to be applied as the slope is constructed. Rock cuts that expose weathered rock surfaces, geologic features and colors or other natural features should not be stained.

- **Slope Ratios**

Rock slopes can typically be constructed



Figure 4.22 Highly fractured, unorganized cut.

at steeper slope ratios than soil or colluvial slopes. The rock type, discontinuity orientation and frequency and the height of the cut slope will determine the appropriate slope ratio. Of primary concern (as for all cut slopes) are constructability and slope stability. A slope of 0.25:1 (H:V) is a general maximum slope ratio for competent rock. It may be possible to achieve 0.1:1 in extremely competent rock. However, near vertical cuts may appear to travelers to encroach into the travelway, causing drivers to shy away from the slope. For this reason, near-vertical cuts should be set back from the travel lane.

- **Mechanical Excavation**

Since mechanical excavation is less



Figure 4.23 Visible scars from drill-hole traces.

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expensive than blasting, typically a contractor will excavate rock cuts mechanically if possible. In order to achieve rock cuts that appear more natural, the contractor must remove resulting scars.

- **Blasting**

There are two general blasting techniques that are relevant to highway corridor construction: controlled blasting and production blasting.

Controlled blasting consists of the controlled use of explosives and blasting accessories in carefully spaced and aligned drill holes, using different explosives and delays to produce specific, free surfaces or shear planes in the rock. Controlled blasting may result in visible drill hole scars, which require scaling to remove.

Production blasting consists of more widely spaced production holes drilled throughout the excavation area. Production-blasting techniques are typically employed to shatter large volumes of material for subsequent removal and processing and are not appropriate for final cut faces because of aesthetic and maintenance concerns.

Blasting Plans: General Blasting Plans are required for all projects for which blasting is anticipated. ADOT will review the Plans prior to any blasting activity. The Plans typically outline the blasting techniques proposed by the contractor and should include specific proposals for each major cut on the project.

In addition, the contractor must submit a specific Blasting Plan for each major cut to include the following information: the proposed drill hole grid defining the spacing and burden; the proposed types of explosives; and the proposed timing delay. ADOT, in consultation with the contractor and the BLM/USFS representatives, should review the plans against the specific cuts for which they are intended for possible collateral damage to adjacent environmentally or culturally significant areas. Where rock cuts are a major

component of a project, the contractor may be required to hire a blasting consultant to review all blasting plans.

To evaluate the proposed blasting plan, test blasts are often required before the contractor can proceed with production or controlled blasting. Typically, the test blast will be conducted in sections up to 100 feet in length. The project engineer, the blasting consultant (if used), and the BLM/USFS representatives will evaluate the results of the test blast.

- **Rockfall Containment**

Rockfall containment measures may be needed on any type of rock slope. Where such measures are considered, an analysis of potential rockfall should be performed in order to determine the potential size of dislodged material and where the rocks may come to rest. The project team should consider the visual impacts of any proposed containment systems.

Rockfall ditch. Of the containment measures described in this text, rockfall ditches are typically the least visually disruptive and often the most cost-effective containment system both to construct and maintain. Therefore, if determined by the rockfall analysis to be necessary, the project team should consider rockfall ditches first. Most ADOT projects call for the construction of a 20-foot wide roadside ditch to address drainage and safety concerns; this ditch width and the ditch depth may be increased to contain anticipated rockfall. Doing so will generate additional waste material that should be incorporated into the earthwork calculations.

Rock bolting and soil nailing. Generally used on slopes that are marginally stable, bolting and nailing consists of installing and grouting steel reinforcing bars into horizontal holes drilled into the rock face. Wire mesh can be attached to the rebar, *Figure 4.24*, to contain any loose rock. Rebar may also be formed into a steel framework to receive shotcrete facing. This shotcrete



Figure 4.24 Mesh attached to rebar.

can be formed and painted to mimic rock outcroppings, *Figure 4.25*.

Wire mesh. Wire mesh or chain link may be pinned at the top of the cut and draped over slopes, *Figure 4.26*, as a measure to control rockfall. While it does not prevent rockfall, it prevents falling rocks from bouncing out into the travelway. Roadside ditches (or benches, where appropriate) can serve to contain the fallen rock where it may be safely removed during maintenance operations. Because the visual impacts of this system vary widely with the mesh type and gauge, the project team should give careful consideration to the visual impact of the selected materials.

Fence/Barrier. A barrier and/or fence, *Figure 4.27*, can be placed at the edge of



Figure 4.26 Mesh draped over slopes for rockfall containment.

the ditch area to stop rockfall from entering the travelway.

Embankments (Fill Slopes)

As discussed earlier, slope ratios are critical to the successful revegetation of disturbed slopes. Therefore, embankment (fill) slopes should be constructed at a suitable ratio for stability, thus improving rainfall infiltration for establishment and maintenance of vegetative cover. Also discussed earlier is the fact that clear zone considerations will play a key role in the design of embankment slope ratios.

In general, embankments are not as visible to the highway traveler as are cut slopes. However, they may be highly visible from areas outside the right-of-way. Similar to cut slopes, embankments should be designed to integrate with the surrounding landscape. Mitigation treatments to achieve this



Figure 4.25 Shotcrete facing formed and colored to mimic rock outcropping.

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Figure 4.27 Fence at edge of ditch area to stop rock fall from entering roadway.



Figure 4.28 Obliteration of old highway corridor at the left and above new highway alignment.

effect may include warping the toe of the slope and creating slopes with complex slope ratios. With respect to the latter treatment, the fill slope is graded to alternate between steeper and flatter areas. Where constructed outside of the clear zone, the flatter slopes may be appropriate areas for larger types of vegetation, such as salvaged trees. Complex slope ratios are also typically less prone to erosion from storm water runoff. The designer will need to prepare details specific to those slopes for this sort of treatment.

The toe of embankments can also be warped to avoid disturbing outstanding features such as rock outcroppings or vegetation that warrant preservation.

Obliteration (Decommissioning) of Roads

Highway corridors that are no longer needed are to be physically obliterated, *Figure 4.28* and legally abandoned back to the appropriate federal agency. Abandoned highways will be identified during the NEPA process. During design, the project team should evaluate the need for, feasibility of and degree of obliteration as follows:

- Will the corridor continue to serve other uses such as for recreational off-highway vehicles, public grazing or utility access?
- To what degree should the existing cut and fill slopes be restored to their original condition?
- How visible is the abandoned corridor from outside of the right-of-way?
- To what degree should the existing drainage structures be removed and the original drainages restored?

- Should old structures and pavement be buried in place, salvaged or removed from the project area?
- Will the obliteration effort require additional material such as imported fill or rock for erosion control? The documentation of the obliteration effort may require earthwork calculations, which will require topographic survey information.
- Will contractor use areas be required to temporarily store materials such as rock or soil?
- If grades are restored to a near-original condition, how will the contractor gain access for revegetation work?

The design team should consider the contractual nature of obliteration work. Both BLM and USFS consider the restoration of old highway alignments to be as important as the proper design of new roadways. Therefore, the project contract documents should clearly specify the contractor's obligations with respect to this work.

Retaining Walls

Retaining walls introduce additional environmental and aesthetic considerations into the slope design process. While the need for retaining walls is typically determined during the project scoping process, they may be considered during the early stages of the design process up to the Stage II submittal.

Wall Applications

Retaining walls may be considered for a wide variety of circumstances including:

- Where existing slopes are steeper and longer than proposed embankment slopes.
- Where there are concerns regarding large or unsightly slopes.
- Where the proposed slope will result in a sliver cut or fill.
- Where easement width is limited.
- Where existing features such as a mature forest or natural drainage may restrict limits of disturbance.
- Where fill material needed for the construction of embankment slopes is limited.
- Where it is desirable to minimize excavation, thereby limiting fill material.
- Where protection of an embankment slope from scouring by an adjacent drainage is needed.

Wall Aesthetics

The designer should consider the constructability and aesthetics of the proposed wall. Walls should typically be constructed to integrate with the surrounding landscape. Retaining walls, *Figure 4.29*, can be painted or stained, constructed of coarse materials (rock or exposed aggregate concrete) and/or curved to better integrate into adjoining slopes. The project team should take care to avoid wall designs that are aesthetically more appropriate for urban applications.

Wall Alternatives

Wall types and costs vary widely. Common



Figure 4.29 Retaining wall colored to integrate into surrounding landscape.

wall types are described below:

- **Mechanically Stabilized Earth (MSE) walls.** Created by attaching facing material to a series of metallic or fabric grids that are embedded in lifts of engineered fill, MSE walls, *Figures 4.30, 4.31* can be constructed with relatively little specialized equipment and quickly if the contractor is able to transport fill material directly from the point of excavation to the new wall. The facing material can be stained to address aesthetic concerns on highly visible slopes.
- **Crib walls and Metal bin walls.** Similar to MSE walls, crib walls are gravity walls



Figure 4.30 Mechanically Stabilized Earth (MSE) wall.



Figure 4.31 MSE wall face.

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Figure 4.32 Crib walls can be open or closed, made of wood or concrete.



Figure 4.33 Gabion wall.



Figure 4.34 Soil nails to mimic natural rock outcroppings.

that utilize a series of open- or closed-face modules typically installed at 0.15:1 (H: V) to 0.25:1 batter. The modules, *Figure 4.32*, are pre-manufactured and can be constructed from concrete, metal or wood that blend with the surrounding landscape. Installation is relatively easy and fast requiring little specialized equipment. To address aesthetic concerns, open-face modules offer an opportunity for seeding or installation of nursery-grown plant material.

- **Gabions.** Constructed of welded or twisted wire fabric cages that are filled with rock, *Figure 4.33*, gabions typically are stacked in terraces. The rock may be hand-placed and/or stained to create a more pleasing finish surface where the wall is highly visible. Also consider wire cage corrosion in highly visible installations.
- **Modular Block Systems.** Relatively easy and inexpensive to install, modular block (or segmental) retaining walls employ interlocking concrete units that tie back into the associated slope. The wall may be battered depending on the manufacturer. A wide variety of colors and finishes are available to more fully integrate into the native landscape.
- **Soil nails.** Soil nails consist of installing and grouting steel reinforcing bars (rebar) into horizontal holes drilled into the face of the adjacent slope. Additional rebar is attached to these anchors to form a steel framework to receive shotcrete facing. The shotcrete can be carved and painted, *Figure 4.34*, to mimic natural rock outcroppings or other features.
- **Reinforced Concrete.** Typically cast-in-place using standard or custom formliners, concrete walls, *Figure 4.35*, allow for a wide variety of aesthetic treatments both in form and color.
- **Masonry faced.** MSE and concrete walls can be faced with masonry, or rock to blend with the surrounding terrain or other desired finish.

Construction Access

Temporary access for all aspects of slope construction should be identified early in the design process. The need for additional temporary

easements should be considered in the project NEPA documentation.

The impacts of disturbance caused by anticipated temporary construction access should be studied during the design process (refer to Chapter 5 for information related to riparian areas impacted by construction access). Where not obliterated by finished slopes, temporary access roads should typically be reclaimed to pre-construction conditions. Therefore, separate plans documenting construction access and reclamation of that access may be required in the contract documents. Restrictions on access should be specific in the construction documents: it should be made clear in the construction documents that the contractor's obligations require that work be restricted to the right-of-way or within approved limits.

Construction Documents

Construction documents should clearly define slope treatments and rounding. The contractor's willingness to provide slope treatments will be affected by his ability to be paid for that work. On many projects, slope treatment work is incidental to other bid items (typically earthwork) and not charged as a separate bid item. Consequently, contractors are reluctant to devote significant time to that work. The following are options for incorporating slope treatments into the contract documents:

- Provide clear construction details and properly describe in the Special Provisions the contractor's responsibilities and means of payment.
- Establish separate pay items for slope



Figure 4.35 Reinforced concrete, typically cast-in place can utilize form liners.

treatments. Rounding, for example, can be measured by the linear foot.

- Establish Force Accounts for slope work. Force Accounts typically reimburse the contractor directly for time and equipment use at an agreed-upon rate. However, because it requires direct inspection of the ongoing work and can result in higher construction costs, ADOT is typically reluctant to establish Force Accounts.
- Establish clear goals and objectives during construction partnering, making clear to the contractor his obligations as described in the contract documents.

4.4 CONSTRUCTION

As discussed earlier in this chapter and throughout this manual, it is important to integrate resource management concerns into the process of planning, design, construction and maintenance of highways on lands managed by BLM and USFS. In order to make prospective contractors aware of these resource concerns prior to the start of construction, the design team should consider including in the contract documents a requirement for a pre-bid site meeting. This meeting can serve to present and discuss special and unusual requirements such as might be included for projects constructed on BLM or USFS lands.

The following items should be addressed in the contract documents as appropriate and considered for discussion both at the pre-bid and partnering meetings:

- The contractor will typically not be allowed to develop sources of water within BLM/USFS boundaries that were not previously approved during the design process. As was discussed in Chapter 2, the project contract documents should clearly define approved sources of water that will be required during construction.
- Prior to any earth-disturbing activities and filing of the Notice of Intent (NOI), the contractor shall prepare and deliver to ADOT his proposed erosion control plans (SWPPP) for approval by the ADOT Engineer in consultation with BLM or USFS.
- Prior to allowing earth-moving equipment to operate on BLM/USFS lands, the equipment will require washing as described in the ADOT Erosion and Pollution Control Manual.

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- As discussed in greater detail in Chapter 7, the salvage of topsoil and its distribution over finished slopes form an important component of successful revegetation. Therefore, topsoil salvage should precede any earthwork activity.
- Where projects are constructed in areas with noxious and/or invasive plant species, control measures for these species may be required prior to and during construction (refer to Chapter 7).
- All erodible slopes will require surface treatment for stabilization (e.g., revegetation, slope paving, gunite, soil sealing, rock mulch). As discussed in Chapter 7, in order to create a proper environment for successful revegetation, it is imperative that the finish soil surface remains loose and friable so that applied seed may become established and sustain vegetative cover. It is also important that the slope finish remain “rough” and uncompacted on the slope face to allow precipitation to infiltrate. Note that these slope conditions typically require close coordination between two trades: (1) the earthmoving contractor who performs grading and ripping and (2) the revegetation contractor who applies soil amendments, seed and mulch.
- To protect disturbed slopes from erosion, install permanent drainage control devices as soon as possible in the construction sequence (refer to Chapter 6).
- To protect disturbed slopes from erosion while under construction, install temporary erosion control devices as the slopes are constructed (refer to Chapter 8).
- Project contract documents may call for close monitoring of slope treatments early in the construction process in order to ensure desired results.

4.5 ADDITIONAL RESOURCES

ADOT Roadside Development Section:

http://www.azdot.gov/Highways/Roadway_Engineering/Roadside_Development/index.asp

ADOT Roadway Engineering Group:

<http://www.azdot.gov/highways/rdwyeng/index.asp>

ADOT Intermodal Transportation Division: Bridge Design Service:

<http://www.azdot.gov/Highways/bridge/Staff/BgDesignService.asp>

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CHAPTER 5: MAJOR STRUCTURE DESIGN AND CONSTRUCTION

5.1 CHAPTER GOALS

The goal of this chapter is to describe opportunities and concerns for the design, construction and maintenance of bridges and box culverts in order to best integrate them into the existing landscape.

Major structures as described by ADOT include bridges, box culverts and retaining walls. In this chapter, major structures are termed “structures.” This chapter addresses the design, construction and maintenance of bridges and box culverts. Retaining walls are discussed in Chapter 4. Pipe culverts are addressed in Chapter 6.

Riparian areas are extremely important resources to both BLM and USFS. As defined in this manual and used in this chapter, riparian areas include natural perennial, intermittent and ephemeral streams and the habitats associated with them.

5.2 SCOPING AND NEPA PROCESSES

For highways constructed on BLM or USFS lands, the project team should seek to provide Context Sensitive Solutions. That is, the team should integrate the highway corridor with the surrounding landscape. The value of the environmental, wildlife and aesthetic resources that will be impacted must be taken into account when considering the costs of various structure alternatives. With respect to

major structures, this directive translates into the following considerations:

Riparian Areas

The protection of riparian areas is of critical importance. The proposed alignment should minimize impacts to existing drainage patterns, *Figure 5.1*, both within and outside of the right-of-way.

Where the preferred alignment will impact riparian habitat, changes to that habitat should be minimized as follows:

- The use of bridges. Bridges are typically less environmentally disruptive than are drainage culverts.
- The type of bridge. Impacts to the surrounding landscape will vary with bridge structure types, as will be discussed in greater detail later in this chapter.
- The relationship of the alignment of the proposed roadway to that of the existing natural drainage. Typically, unless extensive reconstruction of the natural drainage is required, the most cost-effective and least damaging approach is at a perpendicular angle to the direction of stream flow.
- Soil types and stream bank stability at the proposed site. Preferably, soils on either side of the drainage should be stable. Rock is ideal since it offers high stability for support of the new structure and resistance to erosion. In general, the banks of straight reaches of the drainage are more stable than those where the drainage turns.



Figure 5.1 Roadway alignments should minimize impacts on drainage patterns.

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- The character of the adjoining areas: the proposed structures should integrate with nearby natural and cultural resources.

Where damage to existing riparian areas is unavoidable, the project team should consider mitigation measures such as the restoration or enhancement of other riparian areas.

Visual Impacts

Where the NEPA process reveals that large cut and/or fill slopes will have significant and undesirable visual impacts, the project team should consider bridges in place of those fills. Bridge structures do not typically appear as natural features in the landscape. However, in general they are more attractive than large slopes.

Geotechnical Investigations

Geotechnical investigations for major structures will typically be initiated during the scoping process and will require subsurface investigations involving excavation and/or drilling. Natural drainages may need to be cleared and graded to prepare for this activity. The project team should attempt to limit the necessary disturbance for this and subsequent bridge construction activities to one area. In addition, the design team should be aware that NEPA, biological and archaeological clearances, Storm Water Pollution Prevention Plans and possibly other clearances will be required prior to the onset of the geotechnical investigation in the field.

Right of Way

Easement acquisition should not be a limiting factor in the design of major structures. Both BLM and USFS will consider a larger than typical right of way easement where necessary in order to design and construct a major structure.

5.3 DESIGN

NEPA Documents

As discussed in Chapter 2, the NEPA process may make recommendations regarding the types of structures. During the design process, the project team should regularly review NEPA documents to ensure that these recommendations are reviewed

and included in the construction documents.

Sections 404 and 401 of the Clean Water Act

Section 404 of the Clean Water Act regulates the discharge of fill or dredged materials into the waters of the United States and establishes a program to issue permits. In Arizona, the U.S. Army Corps of Engineers (Corps) administers this program. In addition, the U.S. Fish and Wildlife, the National Marine Fisheries Service and State resource agencies (Arizona Department of Environmental Quality, Arizona Game and Fish Department, Water Resources) have important advisory roles. The 404 program has considerable impact on the design, construction and maintenance of Arizona's highways in general and on highway structure design in particular. Essentially, any proposed work in washes, rivers, streams, lakes and wetlands requires ADOT's Environmental Protection Group (EPG) to obtain a permit from the Corps.

Section 401 of the Clean Water Act enables the State to provide certification that the draft 404 permit is in compliance with State law regarding water quality standards. ADOT EPG obtains 401 certification during the design process.

Riparian Areas

The project design team should seek to protect riparian areas in all cases. Bridges and box culverts affect both local and downstream riparian environments. These structures are also typically a major component of the corridor budget. Therefore, they are of central concern to all parties involved with the highway corridor. Their cost must be weighed against the value of the environmental, wildlife and aesthetic resources that will be impacted. Impacts to riparian areas may be minimized by consideration of the following during the design process:

- Changes to natural stream channel dynamics should be minimized. In general, the less the geometry of the natural drainage is altered, the smaller the impact to the dynamics of the natural flows.
- Avoid or minimize armored bank protection.
 - Installed primarily to control damage to structures, bank protection can take several forms including rock rip rap, *Figure 5.2*, gabion baskets, rail bank, revetment systems, concrete, shotcrete, soil cement and metal sheet piling.
 - Even where installed over relatively short



Figure 5.2 Bank protection of rip rap to control damage to bridge structure and embankment.

- stretches of streamside, bank protection can have far-reaching impacts to the dynamics of channel flows both up- and downstream.
- Bank protection can also act as a barrier to wildlife movement.
 - Alternatives to bank protection include changes in structure alignment and longer-span bridge structures that completely avoid the floodplain.
 - Riparian areas typically act as wildlife corridors. Seek input from wildlife experts to determine those species that may be negatively impacted, where those impacts are anticipated to occur and what preventive measures might be taken. Refer to Chapter 3 for more information concerning highway corridors and wildlife habitat.
 - For streams designated as important fisheries by Arizona Game and Fish, restrict construction activities that will affect streamflow to appropriate times of year as determined by Game and Fish.
 - Anticipate requirements for access during construction:
 - Temporary roads should not degrade water quality, damage streams, disturb channels nor impede fish passage.
 - Ensure that equipment is not allowed to operate in actively flowing streams.
 - For perennial streams designated as important fisheries by Arizona Game and Fish, design temporary access that allows the passage of fish and other riparian wildlife.
 - Evaluate options regarding temporary road construction. Potential techniques
 - include culverts, coarse rock fills, hardened fords, low water crossings and temporary bridges.
 - Minimize the number of temporary crossings.
 - Design temporary crossings to be as perpendicular to natural drainages as possible.
 - Minimize excavation at the stream banks.
 - Remove temporary crossings when permanent crossings become operational and reclaim the affected areas.
 - Anticipate requirements for maintenance access by coordinating with local ADOT maintenance districts during design.
 - Minimize sediment transport into riparian areas from excavated areas within the natural drainage:
 - Identify staging areas for stored materials that are clear of the floodplain.
 - Divert water flows around construction sites.
 - Minimize sediment transport into riparian areas caused by erosion of disturbed soils adjacent to riparian areas. Ensure proper design and installation of both temporary and permanent erosion control measures.
 - Reclaim areas disturbed by construction. Successful reclamation incorporates permanent erosion control and establishment of perennial native vegetation.
- Structure Type**
The type of structure selected is important for

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several reasons:

- Structures are among the most expensive items to construct in a given project. Bridges are typically more expensive than box culverts.
- Where structures serve to convey off-site runoff flows, they can dramatically affect the characteristics of that runoff. In general, box culverts collect a given flow into multiple channels, each of which is smaller than the natural drainage. Channeling flows into smaller and usually straighter courses typically increases flow velocities. Increased flow velocities increase the potential for downstream erosion and subsequent environmental degradation. Bridges typically affect natural flow patterns least. Longer-span bridges have less impact than shorter bridges with higher retaining wall abutments.
- Where crossings over perennial streams are anticipated, structures should allow for continued near-natural stream conditions, *Figure 5.3*.
- Natural drainages are frequently associated with high natural resource value. In general, drainages contain greater plant variety and numbers and therefore offer greater habitat value. They also typically serve as conduits for wildlife movement. As discussed in Chapter 3, bridges are less disruptive to natural resources and wildlife movement than are box culverts.
- The NEPA review and documentation process may provide direction for the design team with respect to structure type. The design team should carefully review NEPA requirements and integrate these into the project contract documents. In addition, other state and federal agencies (e.g., Corps of Engineers) may have

specific requirements.

- The design of the structure should include consideration of aesthetic values as applied to both the highway and surrounding areas.

Bridge Design

As discussed above and in Chapter 3, bridges typically offer the least environmentally disruptive type of drainage structure. Designers should review the following considerations:

- Locations of permanent bridge supports. In general, these should be minimized within the flood plain.
- Bridge abutments and embankment slopes:
 - These should remain outside of drainages in order to reduce disturbances to natural stream channel dynamics and to wildlife movement. Longer-span bridges, *Figure 5.4*, have less impact than shorter bridges with higher retaining wall abutments.
 - Embankment slope materials (concrete, riprap, gravel, soil) and grades (vertical versus battered) may impact wildlife movement and should therefore be carefully reviewed. Some wildlife species (e.g., bighorn sheep) prefer to migrate along the sides of drainages. Refer to Chapter 3 for more information.
 - Bridges form waterproof “roofs” to the areas below. Therefore, once disturbed, embankment slopes under bridge decks tend to remain bare and subject to erosion from runoff originating outside of this area. Designers should consider the use of rock mulch or other permanent, inert material to control erosion in these areas. The type and placement of these materials should



Figure 5.3 Bridge design allows for near-natural stream conditions.



Figure 5.4 Longer bridges have less impact to waterways.

- be coordinated with anticipated wildlife movement and aesthetic considerations.
- Bridge abutments that encroach into drainages can be eroded by storm water runoff flows, thereby damaging nearby riparian areas. As described in the ADOT Erosion Control Manual, designers should address this abutment/storm water runoff interface with permanent erosion control measures.
 - Geotechnical investigations at bridge sites typically require subsurface investigations involving excavation and/or drilling. Natural drainages will need to be cleared and graded to prepare for this activity. The design team should attempt to limit the necessary disturbance for this and subsequent bridge construction activities to one area.
 - Stormwater runoff. Bridges typically concentrate rainfall into gutters which daylight through scuppers. Where bridges are superelevated and/or sloped, the runoff from an entire bridge may flow through a small number of scuppers at a relatively high velocity. These fast concentrated flows can be erosive. In addition, the bridge runoff may carry pollutants that had been deposited on the bridge deck. Both of these issues become more critical in sensitive riparian areas. To address these concerns, designers should consider the installation of features to control storm water runoff. Designers should also provide maintenance access to these features.
 - Bridges frequently offer valuable habitat for bats, typically in the narrow joints between vertical elements such as girders. For this reason, the design team should consider providing alternate habitats for soffit fill bridges (bridges with no exposed girders or other structural elements).
 - Because aesthetics are of concern to both BLM and USFS, consider the appearance of the proposed bridge. Among others, trapezoidal box girders, concrete segmental bridges and arch bridges are attractive options. Consider both through and deck arches.
 - Bridges, columns, abutment structures, parapets, rails, etc., should incorporate appropriate context sensitive and cultural design elements and features such as icons, textures, patterns, rustication finishes and colors.
 - Bridges require some form of roadside barrier. ADOT typically installs F-barriers (Jersey barriers), *Figure 5.5*, because they require little maintenance and are relatively inexpensive to construct. However, it is difficult for motorists to see over these barriers. Since highway corridors through BLM and USFS lands are frequently constructed in scenic areas, consider the use of more transparent barriers, *Figure 5.6*.
 - During construction, all bridge structures require staging areas near the installation sites. Because subcontractors typically construct bridges, these staging areas will need to be independent of (or in addition to) staging areas required for other purposes. The design team should include provisions in the project contract documents for the recontouring and reclamation of these staging areas.
 - Bridges typically require regular maintenance and inspection following construction. Access for these purposes should be coordinated during design with ADOT Bridge Inspectors and maintenance staff. Review the need for access roads; if required, access roads should minimize impacts to riparian environments. The design of pullout parking areas, *Figure 5.7*, beyond the



Figure 5.5 F-Barrier (Jersey barrier).



Figure 5.6 F-Barrier with semi-transparent headlight screening.

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Figure 5.7 Pullout parking area.



Figure 5.8 Steel arch bridge with concrete deck.



Figure 5.9 Concrete I-Beam construction.

guardrail or barrier should be considered.

Bridge Type

- Steel. Because of its relatively low mass in relation to its strength, steel girders offer the greatest flexibility in terms of bridge design, *Figure 5.8*. However, steel construction is typically expensive.

- Concrete I-beam construction, *Figure 5.9*. Pre-cast concrete beams (also known as AASHTO girders) are typically the least expensive type of construction method based on transportation, time for construction and site access. This form of design poses several challenges:
 - The girders come in a variety of lengths, typically from 100 to 140 feet. Road access for construction is critical. Maximum allowable grades range from 8 to 9%. A 14- to 20-foot access road width is usually required in addition to generous widening at the curves. 70- to 80-foot radius turns are typical.
 - Suppliers usually like to have loop access, entering the bridge site by one road and continuing across the site to exit by a second road. Passing girders from crane to crane is possible in extremely tight or critically sensitive areas if loop access is not feasible.
 - Cranes require cleared, level pads, *Figure 5.10*, (approximately 50 by 50 feet) adjacent to the bridge alignment and outside of the access road. All tall objects (e.g., trees) need to be removed in order to swing the girders into place.
 - Crane pads are required at every bridge site, but usually only on one side of the bridge.
- Cast-in-place post-tension box girder design, *Figure 5.11*. This type of construction includes a variety of designs and considerations:
 - Longer spans are possible (200 feet is typical) than can be used for pre-cast concrete girder design. Therefore, supporting structures may be installed outside of the drainage, reducing long-term disturbance to riparian resources.
 - Temporary scaffolding is necessary the entire length of structure; therefore short-term disturbance to the riparian environment under the bridge alignment will occur. Where the height of the bridge deck is limited and/or where earth is readily available, it may be that soil can be used as a temporary support during construction.
 - Access roads to the bridge site are required for drilling equipment and concrete trucks. However, these roads can be steeper and narrower than are the roads required for transporting pre-cast concrete girders.

- Cast-in-place segmental box, *Figure 5.12*. This type of design and construction poses the least disturbance to adjacent environments but is expensive. Concrete piers are constructed first, then the bridge superstructure is constructed from the tops of the piers, counterbalancing in both directions. Disturbance in the drainage is limited to that required to construct the piers.

Construction and Access Requirements

Access during construction should be clearly identified early in the review process. Clearing limits, including those required for access, should be reviewed in the field at the Stage II (30%) level. Temporary stream crossings and erosion control measures should be identified and described. Where not obliterated by finished slopes, temporary access roads should typically be reclaimed to pre-construction conditions. Therefore, separate plans documenting construction access and mitigation and reclamation of that access may be required in the contract documents. Restrictions on access should be specific in the construction documents: it should be made clear to the contractor his obligations to work within the right-of-way or other approved areas. Identify and make provisions for maintenance that will be required following completion of construction.



Figure 5.10 Pads for cranes.



Figure 5.11 Cast-in-place post-tension box girder design.



Figure 5.12 Cast-in-place segmental box bridge design.

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ADOT Structure Design and Review Process

The development of major structure plans, including design criteria, consideration of alternatives, and final design of structures for a project occur throughout the ADOT project development process. The following are typical planning and design stages that offer opportunities for agency review.

Project Scoping

During the project scoping process, the need for new structures is identified as follows:

- Structure Site Identification: Includes site topography, possible structure size, existing hydrological data, existing geotechnical data, and rough cost estimate.
- Agency Coordination: Review of BLM or USFS management plans, environmental data and cooperative agreements; review of appropriate environmental regulations.
- Feasible Alternatives:
 - ◆ Review of possible structure types, including issues relating to natural resource damage, constructability, construction access, public detours and removal and obliteration of existing structures.
 - ◆ NEPA requirements should address pedestrian access and/or protection of natural or cultural resources.
 - ◆ Documentation of the Condition of Existing Major Structures: Evaluation of existing major structures including current National Bridge Inspection Standards (NBIS) inspection report, photos, existing structure plans, existing hydraulic reports, and existing geotechnical reports.
- Structure Planning Report:

The report includes detailed studies of the more promising sites within the limits of the selected corridor. The report should address the following concerns:

 - ◆ Site identification and reconnaissance: Site analysis including current site photos, existing hydraulic and geotechnical data, information regarding existing structures, field notes as well as traffic, safety and environmental considerations.
 - ◆ Site requirements and concerns: US FS Forest Plan, BLM or environmental requirements, construction and public

detour limitations, utility requirements, easement needs and abandonment and removal of existing structures.

- ◆ Design requirements: Applicable AASHTO and ADOT design standards.
- ◆ Structure alternatives and costs for rehabilitated existing or new alternatives. New structures should include number and locations of piers and abutments.
- ◆ Site Selection:

The Site Selection process should provide detailed studies of the more promising sites. Consider the following:

 - ◇ Skew angle relative to existing stream; an approach that is perpendicular to the drainage produces less impact.
 - ◇ Analysis of bank soils types; stable rock is desired.
 - ◇ Stream channel condition; avoid drainages where channels are shifting or eroding or where proposed structures will require changes to the natural drainage channel.
 - ◇ Respond to adjacent natural, cultural and aesthetic resources.
 - ◇ Visibility of proposed structure both from within and outside of easement.
 - ◇ Construction access.
- ◆ Site Surveys:

Site surveys should be conducted for each major structure. The Site Survey should be commensurate with the complexity of the site and the proposed structure. Sufficient environmental analysis should be completed at this point to allow access for geotechnical investigation, if required. This analysis could be part of the final environmental document or could be addressed separately as a preliminary environmental study.

 - ◇ Preliminary Foundation Investigation:
 - Review known information, including biological evaluation, archaeological data, and visual information.

- Conduct site visit to classify soil and rock type, evaluate their stability, and obtain information on topographic features, natural flora and fauna, and any built features.
- Conduct preliminary foundation investigation based on proposed layout for structure.
- Prepare preliminary bridge foundation report.
- ◇ Topographic Map
The site topographic map should be prepared using conventional or photogrammetric methods. The area covered must be sufficient to design and detail the drainage structure and related improvements such as dikes, channel improvements, bank protection measures, detour structures and overflow channels.

The successful integration of the highway with the surrounding landscape depends largely on the project scoping process which will, in turn, inform much of the design process. Therefore, the project team should carefully and fully explore implications to design that are contained in the project scoping document.

Stage II (30%)

Stage II documents should include a preliminary selection for bridge type(s), a preliminary geotechnical report (for structures) and the preliminary foundation investigation (if not completed earlier).

The Initial Drainage Report is submitted with the Stage II review. The Report describes existing natural drainage conditions and specifies the initial sizes and locations of structures (described in greater detail in Chapter 6).

As part of the Stage II (30%) review, the design team should conduct field reviews of

proposed structure types, locations and extent of resources impact.

Stage III (60%)

Stage III documents should include the final foundation investigation. Bridge design should be complete.

The Structure Selection Report is prepared for each major structure at this stage. The purpose of the report is to document the evaluation used in determining the recommended structure type and to present criteria for proceeding with final design. The report typically includes the following information as required:

- Structure geometrics including roadway and structure cross-sections, alignment, grade, location, minimum vertical and horizontal clearances and provisions for future expansion.
- Drainage concerns including hydrology and hydraulics for natural and man-made drainages and identification of bank protection needs.
- Bridge superstructure alternatives including cast-in-place concrete, pre-cast concrete or steel girders.
- Bridge substructure alternatives including piers, abutments, foundations and scour protection.
- Natural and cultural resource protection issues.
- Utility concerns.
- Aesthetic concerns and architectural treatments including rustication, railing details, and color.
- Availability of structural materials and components.
- Construction issues including phasing, traffic detours, falsework, erosion control and disruption to the site.
- Construction cost comparisons.
- Suggested alternatives based on comparisons made above.
- Supporting data including calculations and plans for various alternatives.

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5.4 CONSTRUCTION

- Since construction may take place in a particularly sensitive environment, maintain strict controls over contractor access.
- Prior to any earth-disturbing activities, the contractor shall prepare and deliver to ADOT proposed erosion control plans for approval by ADOT in consultation with BLM or USFS.
- Prior to allowing earth-moving equipment to operate on BLM/USFS lands, the equipment will require washing as described in the ADOT Erosion and Pollution Control Manual.
- Remove temporary access and restore disturbed areas in compliance with project plans and specifications.

5.5 ADDITIONAL RESOURCES

Illustrations of barrier options are shown at:

<http://www.fhwa.dot.gov/bridge/bridgerail/>

ADOT Intermodal Transportation Division: Bridge Design Service:

<http://www.azdot.gov/Highways/bridge/Staff/BgDesignService.asp>

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CHAPTER 6: DRAINAGE DESIGN AND CONSTRUCTION

6.1 CHAPTER GOALS

The goals of this chapter are to describe opportunities and concerns for the design, construction and maintenance of new drainage facilities to best integrate them into the existing landscape.

Drainage structures discussed in this chapter are limited to pipe culverts, channels and ditches. Bridges and box culverts are addressed in Chapter 5 (Major Structures).

Riparian areas are extremely important resources. As defined in this manual and used in this chapter, riparian areas include natural perennial, intermittent and ephemeral streams and the habitats associated with them.

Arizona Pollution Discharge Elimination System

Erosion is not only an aesthetic liability, it also results in sediment loss and material transport contributing to increased maintenance costs and to the degradation of water quality. Transported material is considered a pollutant. To address this concern, all ADOT projects must comply with Arizona Department of Environmental Quality requirements for erosion control as described in both the National and Arizona Pollution Discharge Elimination Systems (NPDES and AZPDES) (refer to Chapter 8).

In order to meet the requirements of NPDES/AZPDES, ADOT must employ permanent and temporary Best Management Practices (BMPs). The term BMP refers to operational or physical controls that reduce the discharge of pollutants and minimize potential impacts upon “receiving waters”. Receiving waters are standing bodies of water and natural drainages, and used in this context, include natural perennial, intermittent and ephemeral streams in Arizona.

Drainage structures are permanent BMPs. These structures will be discussed further in this chapter. Other permanent and temporary BMPs are described in greater detail in both the ADOT Erosion and Pollution Control Manual and the ADOT Post-

Construction BMP Manual.

6.2 SCOPING AND NEPA PROCESSES

For projects on lands managed by BLM or USFS, the following concerns must be considered early in project development:

- The protection of riparian areas is of critical importance.
- Where damage to existing riparian areas is unavoidable, mitigation may be required such as restoration, or enhancement of other riparian areas.
- The proposed design should minimize impacts to riparian areas both within and outside of the right-of-way.
- Easement acquisition should not be a limiting factor in the design of drainage structures. Both BLM and USFS will consider greater than typical right-of-way acquisition where necessary in order to design and construct a low impact highway. Additional easement might be considered for crown ditch alignment or for reducing (making flatter) cut slope ratios in order to reduce erosion and promote revegetation (refer to Chapter 7).
- Access for future maintenance to drainage structures following the conclusion of construction.

6.3 DESIGN

NEPA Documents

As discussed in Chapter 2, the NEPA process may make recommendations regarding impacts to natural resources. During the design process, the project team should regularly review NEPA documents to ensure that these recommendations are reviewed and included in the construction documents.

ADOT Drainage Report

Submitted as a part of Stages II (30%) and III (60%) reviews, the Drainage Report should gather the following information:

- Floodplain jurisdictional delineation.
- Assess existing and future conditions affecting watersheds, flow patterns and flood areas.
- Prepare drainage map showing topographic features and drainage features.
- Calculate hydrology for project area including peak runoff rates from each drainage area.
- Describe stream channels, including high and

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low water elevations, previous floods and other events, and the streambed material.

- Propose concepts for management of storm water during and after construction.
- Summarize design criteria, procedures, methodology and assumptions for analysis and design.
- Specify initial size and location of major drainage structures and channels that affect the roadway location.

Sections 404 and 401 of the Clean Water Act

Section 404 of the Clean Water Act regulates the discharge of fill or dredged materials into the waters of the United States and establishes a program to issue permits. In Arizona, the U.S. Army Corps of Engineers (Corps) administers this program. In addition, the U.S. Fish and Wildlife, the National Marine Fisheries Service and State resource agencies (Arizona Department of Environmental Quality, Arizona Game and Fish Department, Water Resources) have important advisory roles. The 404 program has considerable impact on the design, construction and maintenance of Arizona's highways in general and on highway drainage design in particular. Essentially, any proposed work in washes, rivers, streams, lakes and wetlands requires ADOT's Environmental Protection Group (EPG) to obtain a permit from the Corps.

Section 401 of the Clean Water Act enables the State to provide certification that the draft 404 permit is in compliance with State law regarding water quality standards. ADOT EPG obtains 401 certification during the design process.

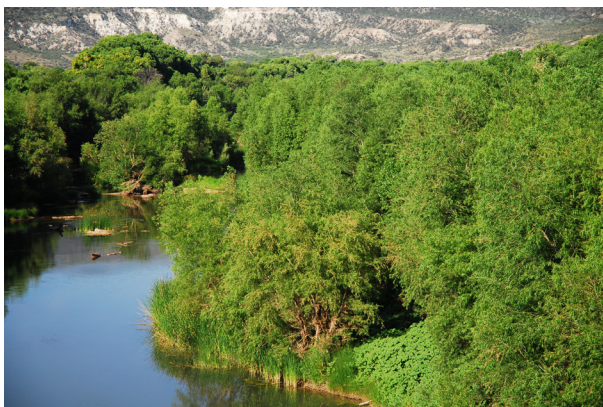


Figure 6.1 Riparian areas.

Riparian Areas

The designer shall seek to protect riparian areas in all cases. As used in this manual, riparian areas include natural drainages and the habitat associated with them, *Figure 6.1*. Waterflow in these drainages may be perennial, ephemeral or intermittent. Impacts to riparian areas may be minimized by consideration of the following during the design process:

- Riparian areas should be inventoried during the design process.
- Changes to natural stream channel dynamics should be minimized. In general, the less the geometry of the natural drainage is altered, the smaller the impact to the dynamics of the natural flows.
- Riparian areas typically act as wildlife corridors. Seek input from wildlife experts to determine those species that may be negatively impacted, where those impacts are anticipated to occur and what preventive measures might be taken. Refer to Chapter 3 for more information concerning highway corridors and wildlife habitat.
- Avoid or minimize armored bank protection.
 - Installed primarily to control the erosion of drainage structures, bank protection can take several forms including rock riprap, gabion baskets, *Figure 6.2*, rail bank, revetment systems, concrete, shotcrete, soil cement and metal sheet piling.
 - Even when installed over relatively short stretches of streamside, bank protection can have far-reaching impacts to the dynamics of channel flows both up- and downstream.
 - Alternatives to bank protection include



Figure 6.2 Gabion baskets used for bank protection.

- dip sections, changes in alignment, and bridge structures that completely avoid the floodplain.
 - Consider construction requirements for bank protection. Shotcrete, for example, requires large staging and batch plant areas and haul roads, all requiring significant clearing.
 - Consider the aesthetics of proposed bank protection.
- For streams designated as important fisheries by Arizona Game and Fish, restrict construction activities that will affect streamflow to appropriate times of year as determined by Game and Fish.
- Anticipate requirements for access during construction:
 - Temporary roads should not degrade water quality, damage streams, disturb channels nor impede fish passage.
 - Ensure that equipment is not allowed to operate in actively flowing streams.
 - For perennial streams designated as important fisheries by Arizona Game and Fish, design temporary access that allows the passage of fish and other riparian wildlife.
 - Evaluate options regarding temporary road construction and temporary stream crossings. Potential crossing techniques include culverts, coarse rock fills, hardened fords, low water crossings and temporary bridges. The temporary crossings should not erode into the riparian area.
 - Minimize the number of temporary crossings.
 - Design temporary crossings to be as perpendicular to natural drainages as possible.
 - Minimize excavation at the stream banks.
 - Remove temporary crossings at the conclusion of construction and reclaim the affected areas.
- Minimize sediment transport into riparian areas from excavated areas within the natural drainage:
 - Provide temporary erosion control measures for containing sediment eroded during in-channel and in-stream excavation.
 - Identify staging areas for stored materials that are clear of the floodplain.
 - Divert water flows around construction



Figure 6.3 Successful reclamation incorporates perennial vegetation.

- sites.
- Minimize sediment transport into riparian areas caused by erosion of disturbed soils adjacent to riparian areas. Ensure proper design and installation of both temporary and permanent erosion control measures.
- Reclaim areas disturbed by construction. Successful reclamation incorporates permanent erosion control and establishment of perennial native vegetation, *Figure 6.3*, (refer to Chapter 7).

Drainage Structures

As part of drainage design, the project team shall review the need for and the design of drainage structures in order to minimize erosion to (a) the structures themselves, (b) to the new cut and fill slopes and (c) to the inlets and outfalls of the structures. These concerns are discussed as follows:

Ditches and Dikes

These are concentrated flow structures used to intercept and direct surface runoff into a drain or into an existing drainage.

Because they concentrate storm water runoff, ditches are highly susceptible to erosion. Therefore, the designer should consider the following:

- Calculations of peak runoff flows and velocities and appropriate erosion control measures.
- Installation of riprap for all ditches and dikes that exceed profile grades of four percent in order to prevent downcutting. Riprap should be embedded into both fore- and backslopes to prevent blowout.

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Figure 6.4 Rock check dams reduce runoff velocity.



Figure 6.5 Crown ditch installed at the top of slopes to divert sheet flow.



Figure 6.6 Slope ditch installed to intercept sheet flow and convey concentrated flows.

- Installation of rock check dams, *Figure 6.4*, to reduce runoff velocity and capture eroded sediment.
- Aesthetics of erosion-control materials, especially where applied near rest areas, roadside viewpoints, trailheads, etc. Materials that appear more natural are preferred.

Ditches and dikes also act as devices to prevent erosion to new cut and fill slopes:

- **Crown ditches:** Installed at the tops of slopes to divert sheet flow from adjacent undisturbed slopes onto newly constructed cut slopes, *Figure 6.5*.
 - ◆ Construction should take place prior to excavation of the slope.
 - ◆ The designer should give careful consideration to ditch alignment and outlets. In order to avoid erosion and to minimize ditch maintenance, ditches should not be installed parallel to the roadway, which can lead to steep ditch profile grades and subsequent scouring by concentrated runoff flows during storm events. Instead, ditch profile grades should be designed in response to existing site topography and project soil types in order to minimize ditch scouring.
 - ◆ Ditches should be designed to daylight into existing drainages.
 - ◆ Both measures described above will possibly require additional easement.
 - ◆ Since crown ditches can be highly visible to motorists, consideration should be given to ditch layout and existing vegetation. Ditches should typically be staked in the field before construction and ditch alignment should avoid existing vegetation where possible.
 - ◆ Design team should keep in mind that all ditches require maintenance; therefore, crown ditch access should be a consideration.
- **Slope ditches:** Installed between the top and toe of a slope to intercept and carry sheet flow and convey concentrated flows, *Figure 6.6*.
 - ◆ **Embankment curbs:** Installed on fill slopes at the edge of the roadway to intercept sheet flow from paved surfaces. Embankment curbs are of special consideration where the roadway is super-elevated, thereby directing all sheet flow to one side of the pavement. The designer should pay particular attention to the locations and spacing of spillways or downdrain

pipes that drain concentrated runoff collected by these curbs. Spillways and associated outfalls should be armored against erosion. Downdrain pipes should be buried.

- ◆ **Cut-to-fill slope transition protection:** Installed at the intersection of cut and fill slopes. Cut ditches that discharge at cut-to-fill slope transitions, *Figure 6.7*, will normally require erosion protection until runoff flows reach an existing stable drainage.

Overside Drains

Overside drains are pipes, downdrains and spillways used to protect slopes against erosion by collecting surface runoff and conveying it down the slope to a stable drainage. The designer should consider their use as follows:

- **Cut slope spillway:** Installed where offsite runoff will intercept a cut slope, *Figure 6.8*. The designer should give careful consideration to the following:
 - ◆ The angle at which the existing drainage intersects the top of the cut slope. The constructed spillway should typically follow that same angle down the face of the slope.
 - ◆ Anticipated runoff volumes: the constructed spillway should be oversized to prevent blowout from storm events.
 - ◆ Spillways should be armored. Where rock riprap is used, note that slopes steeper than 10H: 1V will require some means of rock containment (typically wire mesh).
 - ◆ Because cut slopes typically are visible to motorists, consideration should be given to the aesthetic design of these structures. They are typically warped back into the cut slope.
- **Fill slopes:** Where embankment curbs are installed, openings in the curb are constructed that drain into a spillway, *Figure 6.9*, or downdrain pipe. Generally, downdrain pipes are used for aesthetic reasons where slopes will be visible from a main roadway.



Figure 6.7 Erosion protection at cut-to-fill transition.



Figure 6.8 Area where runoff will intercept a cut slope.



Figure 6.9 Embankment curb opening into a spillway.

Culvert and Channel Inlets and Outfalls

Culvert and structural channel inlets and outfalls are typically areas of high concern for erosion. The designer should consider the following:

- Careful review of inlet invert elevation: When lower than the existing natural channel, the channel backslope must be protected to avoid headcutting of that slope by runoff.

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- Flared end section: These are typically installed at the inlets and outfalls of pipes and channels to improve the hydraulic operation, retain the embankment near pipe conveyances and help prevent scour, *Figure 6.10*.
- Outfall protection/ velocity dissipation devices: To prevent scour at the outfall and to reduce runoff flow velocity, rock riprap,



Figure 6.10 Flared end-section of a culvert.



Figure 6.11 Riprap helps to reduce erosion at outfalls.



Figure 6.12 Protection from erosion at edge of bridge abutments.

Figure 6.11, or some other measure is typically installed. These devices should be constructed during or immediately after construction of the culvert. Refer to Chapter 3 for concerns regarding armoring and wildlife habitat.

- Protection at the soil/ drainage structure interface: The interface between fill slope soils and concrete or metal structures is typically prone to erosion. While this interface frequently occurs at drainage structure openings, it is also possible at the edges of spillways and bridge abutments, *Figure 6.12*. The designer should consider the use of rock or other protective measure to prevent erosion in this area.

Aesthetics

As discussed for some drainage structures earlier in this chapter, the appearance of these structures should be considered during the design process.

- Highly visible concrete headwalls may be constructed utilizing formliners, concrete stain, exposed aggregate, paint or integral concrete.
- Riprap may be stained.
- Highly visible channels and ditches can be laid out in less rectilinear and more curvilinear alignments.
- Crown ditches should be staked in the field in order to minimize disturbance to existing vegetation.
- Culvert inlets and outfalls can be trimmed or formed to follow the finish grade.
- Cut slopes can be warped to better hide slope spillways.

6.4 CONSTRUCTION

- Prior to allowing earth-moving equipment to operate on BLM/USFS lands, the equipment will require washing as described in the ADOT Erosion and Pollution Control Manual.
- Prior to any earth-disturbing activities, the contractor shall prepare and deliver to ADOT his proposed erosion control plans for approval by ADOT in consultation with BLM or USFS. Drainage structures carry storm water runoff from the upstream side of the highway to the downstream side. Where that runoff enters areas disturbed by construction activities, it

will typically erode those areas and transport sediment eroded from those soils. Therefore, drainage structures should be installed as early in the construction sequence as possible. Before they are installed and during their construction, ensure that temporary erosion control measures are properly installed and maintained.

- As described above, invert elevations of culverts will strongly affect streambed geometries. Ensure that the elevations of the concrete forms are properly set before allowing installation of concrete.
- Review and adjust, if necessary, proposed alignments for crown ditches prior to excavation.
- Review project contract documents regarding contractor access into natural drainages.
- Review project contract documents regarding contractor staging areas adjacent to drainages: minimize potential for erosion of disturbed soils into natural drainages.
- Remove temporary access and restore disturbed areas as soon as possible.

6.5 ADDITIONAL RESOURCES

ADOT Roadway Engineering Group: Drainage Design Section:

http://www.azdot.gov/Highways/Roadway_Engineering/Drainage_Design/index.asp

ADOT Post-Construction BMP Manual:

www.azdot.gov/adot_and/storm_water/PDF/draft_adot_post_construction_bmp_manual.pdf

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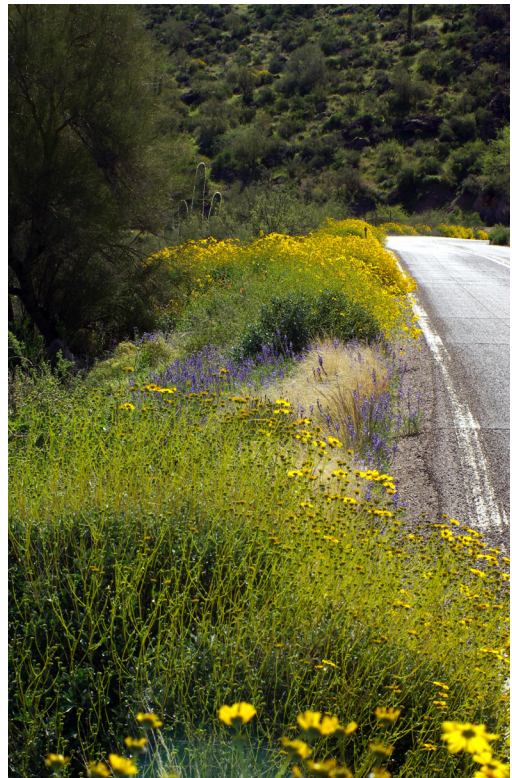
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CHAPTER 7: LANDSCAPE RESTORATION

7.1 CHAPTER GOALS

Landscape restoration is the integration and blending of the highway facility with the surrounding natural landscape. Constructed earthforms must reflect and consider the area's natural landforms to achieve Context Sensitive Solutions. Landscape restoration includes aesthetic considerations in earthform design of slopes, rounding and transitions between cuts and fills. Reclamation, revegetation and stabilization of disturbed soils for the purposes of erosion control are predicated on successful earthform design. Both BLM and USFS consider the success of this work to be critical to the success of the project.

The goals of this chapter are to describe the issues relating to preservation and restoration of native vegetation that are critical to the visual integration of the highway corridor with the surrounding landscape, and to define the steps necessary to achieve successful restoration of disturbed soils.

The ADOT Roadside Development Section and consulting landscape architects assume responsibility for landscape restoration requirements in the project contract documents. Other specific aspects of highway design for which Roadside Development is typically responsible include aesthetic decisions regarding slopes, bridges, walls, drainage structures, storm water controls and safety barriers. Refer to the Table of Contents for other chapters in this manual that describe these features in greater detail.

7.2 SCOPING AND NEPA PROCESSES

As natural resource agencies, BLM/USFS place a high value on the protection, preservation and enhancement of the natural environment. The project team should seek to integrate the highway corridor with the surrounding natural landscape. The success of this integration begins with the Scoping Document and continues through the design and construction process. The project team should carefully and fully explore implications to the design and landscape restoration requirements contained in the Document as described in other

chapters. The Document provides preliminary information from which Context Sensitive Solutions are developed and incorporated into the design construction documents. Those Solutions must be clearly defined in the construction documents to be biddable and constructable.

7.3 DESIGN

Slopes

Slope design must consider:

- Geotechnical soil and rock stability information.
- Existing topography and natural landforms.
- Revegetation potential and limitations.
- Management of storm water run-off.

Refer to Chapter 4 for additional information on earthwork and slope design and to Appendix E for Slope Design Details.

Existing Vegetation

Protect existing trees and natural vegetation within the project limits to minimize the visual impact of the new improvements. Preserving existing vegetation, *Figure 7.1*, will also reduce the amount of disturbed soil exposed to erosive forces.

- Protect existing vegetation from equipment by staking, flagging and/or fencing. When appropriate, establish damage penalties in the

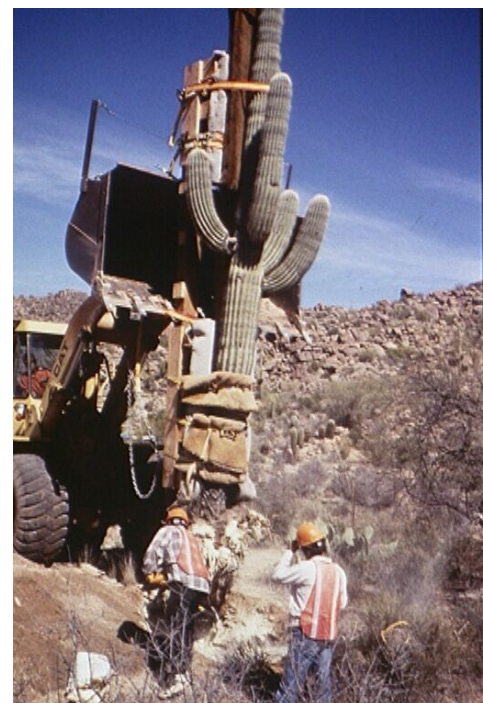


Figure 7.1 Salvaging existing vegetation.

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Figure 7.2 Beautiful, large saguaro protected by gabion wall..

construction documents.

- Within the limits of disturbance, plants with outstanding value and/or character may be preserved by means of retaining walls, *Figure 7.2*.
- Protect existing vegetation from blasting damage by controlling sizes of explosive charges and through the use of temporary earth berms and/or blankets.
- Protect existing vegetation in drainage ways by minimizing changes to natural flow dynamics.

Considerations that may direct the design team to remove and/or salvage existing vegetation include:

- Where roots will be significantly damaged by new cut or fill slopes.
- Trees that may be downed by wind (Hazard Trees).
- Sight distance requirements.
- Tolerance for highway conditions.
- Plants that are diseased or in poor condition.
- Maintenance access to the tops of cut slopes and toes of fill slopes.
- Snow storage.
- Pullouts for vistas of scenic areas.
- Trees that will create potentially hazardous shading in winter.
- The presence of noxious or invasive plant species within the project limits.

Whether in the forest or desert, the design team should consider reducing the contrast between cleared and undisturbed areas in the following ways:

- Create an undulating cleared edge to break up the unnatural appearance of a straight line and

create a series of enclosures and openings.

- Feather the cleared edge by both reducing plant density and creating a gradation of low to tall vegetation, *Figure 7.3*, in a transition zone. When selecting vegetation for removal, consider the following:
 - Trees that may fall into the roadway if allowed to remain on site.
 - Understory shrubs that may not survive if the tree canopy is removed.
 - Plants that cannot tolerate snow-removal chemicals.



Figure 7.3 Feathered by plant density and gradation.

During the design process, review the project limits for the presence of noxious and invasive plant species and treat as described in Chapter 11. Some invasive species will respond aggressively to any disturbance or change whether in the forest or desert.

Disposal Methods for Vegetation

When road construction produces vegetative debris, the methods of disposal are typically described in the project contract documents. Noxious plant species must be disposed of such that plants and seeds are not dispersed. On-site disposal strategies include:

- Vegetation may be piled and burned and/or burned with an incinerator. (Burning does not kill all seed).
- Vegetation may be shredded or chipped for use as mulch on project slopes.
- Smaller, more easily decomposed leaves, needles, small branches, etc. may be salvaged and stockpiled with salvaged topsoil (discussed below). Prior to distributing this material over the surfaces of finished slopes, it may be combined with topsoil and bermed at the toes of embankment slopes to form temporary erosion

control berms. The designer should review this strategy for potential fire hazard.

- Vegetation can be buried.

Off-site disposal methods include removal to an approved disposal site. In forested areas, merchantable timber may be produced (refer to Chapter 2).

Revegetation

The goal of revegetation is to stabilize disturbed soils against erosion, reduce sedimentation, and improve visual quality. Revegetation of disturbed soils is a legal requirement imposed by EPA/ADEQ, which enforce the National/Arizona Pollutant Discharge Elimination System (NPDES/AZPDES) (refer to Chapter 8). Because the success of revegetation efforts depends on weather conditions, it is important to optimize chances for success by close attention to the following:

Slope ratios

In general, flatter slopes will revegetate more successfully than steeper slopes. Slopes that are steeper than two feet horizontal for every vertical foot (2:1) are typically poor candidates for successful revegetation and erosion/sediment control. Flatter slopes may require more excavation and disturb a greater area.

Topsoil Salvage

Once constructed, most cut and fill slopes are sterile; that is, they are devoid of organic material, including mycorrhizal fungi which form beneficial associations with plant roots to aid in the uptake of water and nutrients. Organic matter and native mycorrhiza are typically found in the topsoil of undisturbed soils. The salvage of topsoil and its distribution over finished slopes may contribute to successful revegetation of those slopes. When appropriate, the design team should consider the following:

- Before any earth disturbing construction activities, any noxious or invasive plant species must be removed.
- Salvage and stockpile the top 12 inches of soil, including roots, detritus, leaves and small twigs.
- Limit stockpile height of the salvaged soil to less than five feet to preserve microbial organisms.
- Stockpiled soil may be staged at the tops and toes of future cut and fill slopes.

- Salvaged soil may be used in berms for erosion control of disturbed areas.
- During or following construction of large cut slopes, salvaged soil may be placed across the slope as a topdressing over the face of the slope.
- In addition to salvaged soil, add compost to slopes.

Slope Finishes

Refer to Appendix E for Slope Design Details.

- **Mini-Benching:** In general, cut slopes are more difficult to revegetate successfully than fill slopes because they tend to shed more rainfall. Properly designed and constructed mini benches retain rain water where it falls, resulting in improved infiltration, *Figure 7.4*. Mini benches are discussed in detail in Chapter 4.



Figure 7.4 Mini benching allows for more water retention thus giving seeds a better chance to take hold.

- **Slope Roughening:** In order to create a proper environment for successful revegetation, it is imperative that the finished



Figure 7.5 Slope roughening keeps the soil loose and friable so that seeds may take root.

soil surface remains loose and friable, *Figure 7.5*, to help applied seed may take root. It is also important that slope finishes remain “rough” and uncompacted to allow precipitation to infiltrate. Achieving such slope conditions typically requires close coordination between two contractors: (1) the earthmoving contractor who performs grading and ripping and (2) the revegetation contractor who applies seed and mulch. If the soil of a completed slope becomes crusted over from rainfall or compacted from vehicles, it is imperative that slope be ripped again before the seeding.

Seeding

Large highway projects may result in the disturbance of hundreds of acres of soil. In order to address restoration at that scale in a cost effective and timely fashion, disturbed soils are typically reclaimed by applying compost, fertilizers and soil amendments, seed and mulch. The following concerns should be considered during the design process:

- In addition to using ADOT Standard and Stored Specifications, the landscape architect should prepare Special Provisions to address unique project conditions.
- Successful revegetation, *Figure 7.6*, greatly depends on slope ratios and on preparation of the finish grade prior to applying seed. Refer to Chapter 4 for more information.
- **Compost:** Compost should be applied at the times and rates specified in the contract documents.
- **Fertilizers and soil amendments:** Inorganic fertilizers and soil amendments should be tilled into the soil before seed is



Figure 7.6 Successful revegetation using seeding on a cut slope.

applied as described in the project contract documents. In general, Nitrogen (N) and Phosphorus (P) should be applied in a slow-release, low solubility form. Incorporation of such fertilizers into the soil minimizes the movement of Nitrogen and Phosphorus into waterways and aquifers.

- **Seed mixes:** Seed is typically applied as a mix of several species:
 - ◆ Seed mixes should reflect the plant species that are native to the project area. When a project includes several biotic communities, appropriate seed mixes should be developed for each zone.
 - ◆ Multiple seed mixes where appropriate are prepared for ADOT highway projects: one mix to be applied to areas within the clear zone; another mix to be applied to areas outside of the clear zone; and another for areas near drainage structures or wetlands. Tree species are not included in the clear zone and drainage structure mixes (refer to Chapter 4 for a description of clear zone).
 - ◆ The designer should research seed availability to help ensure that desired seed mix species will be commercially available at time of construction. The development of seed mixes should be coordinated by the landscape architect with seed suppliers and ADOT Roadside Development.
 - ◆ Seed mixes should include species that can be relied on to establish themselves under difficult conditions and should allow for both immediate and long-term stabilization. Typically, a seed mix includes both annual and perennial species of wildflowers grasses, shrubs and trees. Seed mixes should include a mix of warm and cool season species reflecting local, seasonal rainfall patterns.
 - ◆ ADOT project specifications require compliance with federal and state seed laws. These specifications spell out requirements concerning testing, labeling, purity and viability. Both federal and state seed laws contain provisions that address issues of

noxious and invasive plant species. Tags and laboratory test results for each seed species furnished by the contractor must be provided to the field inspector prior to beginning seeding operations. Multiple species seed mixes will be combined at project site after approval by the Engineer.

- **Seed application rates:** The landscape architect will specify application rates in pounds of Pure Live Seed (PLS) per acre in the project contract documents.
- **Seed application techniques:** Seed is typically applied by drilling or by hydraulic equipment (hydroseeding), *Figure 7.7*.
 - ◆ Drilling ensures positive seed/soil contact and seed coverage. It requires slopes flatter than 3:1 that are free of rock to be effective. Also, seed drills may not be able to apply some seeds in the mix that are very large, very small, with long awns or those that tend to clump.
 - ◆ Hydroseeding, is more commonly employed on ADOT projects. Seed, tackifier and wood fiber are mixed in a slurry and hydraulically applied to prepared soil. This method allows for application to steep and rocky slopes or slopes where equipment access is difficult.
- **Mulches:** Once applied to prepared soil, seed should be covered with mulch to provide protection from predation, solar exposure and erosion. In order to be effective, mulch needs to remain in place as a protective mat following its application.



Figure 7.7 Slope on the right has been hydroseeded.

The project contract documents require that mulch be maintained in place by the contractor for 45 days. Mulches are generally one of two types:

- ◆ **Straw.** Straw, *Figure 7.8*, provides superior erosion control and insulation against heat and moisture loss. It is typically blown onto the prepared soil by mechanical means. All wheat straw must be free from noxious and invasive weeds in compliance with the standards and procedures of the North American Weed Management Association (NAWMA) or the Arizona Crop Improvement Association (ACIA).
- ◆ **Hydraulically Applied Straw.** Hydraulic equipment can generate pressure sufficient to apply material over greater distances than can mechanical equipment. The use of Hydraulically Applied Straw requires prior approval by the Engineer. Straw must be certified as weed free under NAWMA.
- ◆ **Wood fiber.** Only in rare instances will wood fiber be approved as a mulch material. Wood fiber does not provide erosion control or moisture retention as effectively as straw. Wood fiber is typically applied by hydraulic equipment; therefore, it may be applied over greater distances than straw. On roughened slopes, it may be necessary to apply mulch from more than one angle in order to avoid “shadowing.”
- **Tackifier:** Tackifier is used to stabilize the applied mulch on the slope. When straw mulch is used, the tackifier is applied in



Figure 7.8 Straw provides superior erosion control and insulation against heat and moisture loss.

combination with a small amount of wood fiber to hold the straw in place. When hydraulically applied straw or wood fiber is used as mulch, tackifier and straw or wood fiber are applied in the same application. There are several different types of tackifiers and the performance of most types will vary with project weather conditions. The project contract documents should provide the contractor with the appropriate methods, rates and materials to be used.

- **Mobilization:** Seed application uses specialized equipment that will be required at the job site according to the general contractor's earthmoving schedule. To maintain compliance with SWPPP and provide adequate erosion protection, the seeding contractor may be required to mobilize numerous times. For complex or large projects, the project contract documents should include a separate bid item providing for multiple mobilizations.
- **NOT requirements:** As described in greater detail in the *ADOT Erosion and Pollution Control Manual*, ADOT and the contractor must comply with the ADEQ/EPA Statewide Permit regarding storm water permits and provide to ADEQ or EPA a Notice of Termination (NOT) at the conclusion of construction. Successful revegetation is an essential component of final stabilization. The ADOT protocol for determining final stabilization may be found at the ADOT Storm Water Program website listed at the conclusion of this chapter.

Native Plant Salvage

Native vegetation should be considered for salvage. Issues related to plant salvage include:

- **Cost:** Operations related to meeting ADOT-approved levels of plant salvage and replanting are described in ADOT Roadside Development's website listed at the conclusion of this chapter.
- **Appropriate species:** The design team should review the requirements of Arizona Native Plant Law, 404 Permit and NEPA documents as well as discuss the subject with appropriate BLM/USFS representatives. In addition, the design team should consider salvaging species that

are difficult to regenerate naturally or are important for local wildlife. Salvaged plants must be able to sustain themselves at the conclusion of the two-year Establishment Period.

- **Appropriate quantities:** The design team should review existing conditions in the project area and seek to establish similar conditions in the Right-Of-Way.
- **Contractor access:** Salvage operations typically occur prior to earthwork. Therefore, the salvage contractor may need to construct pioneer roads to gain access to the desired plants and boulders. For projects in areas with rugged topography, this access may be a constructability and restoration issue and affect salvage costs.
- **Once-move:** Salvaged plants may be once-moved: they are transplanted in a single operation from their original growing locations into areas that will remain outside the limits of disturbance. This technique is appropriate for plants that do not transplant easily, such as saguaro cacti, *Figure 7.9*. Temporary irrigation may be required for these relocated plants.
- **Temporary nurseries:** Salvaged plants may be relocated to an on-site nursery, or series of nurseries, *Figure 7.10*. The design team should attempt to identify appropriate nursery sites within the project limits. These sites will require restoration. Note that while in temporary nurseries, salvaged plants may require irrigation and care similar to a commercial nursery.
- **Container sizes:** A variety of sizes may be required to maximize chances for survival



Figure 7.9 Salvaged plants may be once-moved, such as large cacti.

- and to develop a varied plant palette.
- Appropriate final planting locations:
 - ◆ Salvaged plants should be placed at locations where they are self-sustaining and will naturalize constructed slopes and disturbed areas.
 - ◆ Where feasible, salvaged plants can be intermixed with plants that have been protected in place during construction.
 - ◆ Salvaged plants can be located to screen undesirable views.
 - ◆ Salvaged plants can be located in more highly visible areas, *Figure 7.11*, such as cut/fill transitions and parking areas.
 - ◆ Salvaged plants can be concentrated in order to create resource islands that can provide seed for surrounding areas.
 - ◆ Plants should not be located in areas where they will interfere with maintenance activities.
 - ◆ Establishment Period: A part of the project contract documents, the Establishment Period describes contractor obligations regarding maintenance and survival rates for transplanted plants for a given length of time (generally two years following installation). Salvaged plants will typically require a temporary irrigation system. Smaller plant species may also require temporary protection from predation. Temporary irrigation equipment and plant protection should be removed at the conclusion of the Establishment Period.



Figure 7.10 Salvaged plants may be relocated to an on-site nursery.

Container-Grown Stock

Container-grown stock typically consists of tree or shrub species native to the project area supplied by an approved nursery. They can be installed where the design team determines that more rapid revegetation of disturbed slopes is needed (for example: bridge embankment slopes adjacent to natural drainages that serve as wildlife corridors).

- Select species that are native to the project area.
- Container stock will require temporary irrigation until established. This Establishment Period is typically two years.
- Container stock will typically require protection from predation from wildlife during the Establishment Period. Protective sleeves and fencing are commercially available for this purpose. Sleeves may be removed at the end of the landscape establishment period or remain in place until desired as defined in the project contract documents.

Live Cuttings and Pole Plantings

Dormant branches cut from riparian trees (e.g. cottonwood and willow) may be planted directly into moist riparian soils where rooting and establishment can take place.

- Cuttings should be gathered and planted in late winter/early spring before trees leaf out.
- Branches may be 1-4" diameter and should be stripped of leaves.
- Install branches with same orientation as original sap flow.



Figure 7.11 Salvaged plants can be located in highly visible areas.

Noxious and Invasive Vegetation

If allowed to become established, noxious and invasive vegetation, *Figure 7.12*, pose significant economic and ecological threats to the long-term biological health of an area. The term “noxious weed” has legal ramifications: both the State of Arizona and the federal government publish lists of noxious weed species (refer to Chapter 11 for links to state and federal websites listing noxious weeds). An “invasive plant” is one that grows and spreads rapidly, replacing desirable native plants. Invasive plants are covered by federal and state executive orders.

Noxious and invasive plants species are frequently problematic because they are typically able to



Figure 7.12 Cuscuta L., dodder, a plant species on the Arizona State Noxious Weed list.

quickly and efficiently colonize disturbed areas. Highways and their associated disturbed slopes provide abundant opportunities for these plant species to establish and spread into surrounding landscapes. Roadways can provide “linear routes” for invaders by conveying them along the entire disturbed area into new landscapes. It is critical that efforts be made to minimize the chances for the introduction and establishment of noxious and invasive plants in highway corridors:

- Begin control of noxious and invasive plant species of the project right-of-way area during the design phase as per Chapter 11.
- The construction documents should specify the contractor’s responsibilities for noxious and invasive plant control during the entire contract period.
- The contractor must provide control prior to ground-disturbing activities as per the specifications. Project staging areas should be free of noxious or invasive plants. Where these

species are present, a control plan should be developed in coordination with ADOT and BLM/USFS.

- Equipment transported from outside of the BLM/USFS district should be cleaned prior to entering the project area. If necessary and in consultation with BLM/USFS, identify site(s) where equipment can be cleaned. All mud and plant debris should be removed and contained as directed in ADOT’s *Erosion and Pollution Control Manual*.
- If operating in areas infested with noxious and invasive plant species, clean all equipment before leaving the project site as described above.
- Inspect material sources on site and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication: strip and stockpile contaminated material for proper disposal. Document and closely inspect those areas where treated soils are used during construction to ensure that any noxious and invasive plant species transported to the site are promptly detected and controlled.
- Maintain stockpiled material in a weed-free condition.

Existing Boulders

Where they exist in the project area, consider salvaging boulders from the surface prior to



Figure 7.13 Salvaged boulders should be placed in groups for a more natural appearance.

earthmoving activities. These should be moved using slings or other equipment that won’t mar the weathered surfaces. Similar to salvaged plant material described above, the project contract documents should provide direction regarding final

locations. In general, boulders placed in groups, *Figure 7.13*, appear more natural than when placed alone.

7.4 CONSTRUCTION

As discussed throughout this manual, the integration of the highway into the surrounding landscape is of central concern to both BLM and USFS. Aesthetic considerations in earthform design of slopes, rounding and transitions between cuts and fills are the foundation for successful landscape restoration. Revegetation of these constructed slopes is a critical component of integrating highways with their surroundings. In addition, NEPA and other environmental documents may provide specific requirements for the restoration of the project area. Finally, as described in Chapter 8, ADOT is legally obligated to revegetate and stabilize soils disturbed by construction. The application of storm water BMPs must be coordinated with slope construction and revegetation. It is crucial during construction that field staff closely attend to the project contract documents as they relate to revegetation. Issues as varied as the condition of the finished grade (compacted or loose, crusted or friable), the timing of seed applications (for large cut and fill slopes), the inspection of seed mixes, tackifiers and composts and the review of proper application techniques will all affect the successful restoration of the project.

7.5 ADDITIONAL RESOURCES

ADOT Roadside Development Section:

http://www.azdot.gov/Highways/Roadway_Engineering/Roadside_Development/index.asp

ADOT Stored Specifications:

http://azdot.gov/highways/cns/CNS_Stored_specs.asp

ADOT Methodology for Determining Final Stabilization (NOT Criteria):

http://www.azdot.gov/Highways/Roadway_Engineering/Roadside_Development/PDF/ADOT_Methodology_V5_Propo_31Jan06.pdf

Visual Impact Assessment for Highway Projects:

<http://www.contextsensitivesolutions.org/content/reading/visual-impact-2/>

ADOT Erosion and Pollution Control Manual:

http://www.azdot.gov/adot_and/storm_water/stormwater.asp

State Noxious Weed List:

<http://www.azda.gov/PSD/quarantine5.htm>

Federal Noxious Weed List: <http://plants.usda.gov/java/noxious?rptType=Federal>

Executive Order 13112:

<http://www.invasivespeciesinfo.gov/laws/execorder.shtml>

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CHAPTER 8: STORM WATER AND POLLUTION CONTROL

8.1 CHAPTER GOALS

As described in greater detail in the *ADOT Erosion and Pollution Control Manual*, the goal for erosion control on ADOT projects is to comply with the U.S. Environmental Protection Agency or the Arizona Department of Environmental Quality requirements for control of storm water quality as described in the National Pollution Discharge Elimination System (NPDES) and the Arizona Pollution Discharge Elimination System (AZPDES). In order to meet the requirements of NPDES or AZPDES and the ADOT Storm Water Management Plan, ADOT must employ permanent and temporary Best Management Practices (BMPs). The term BMP refers to operational or physical controls that reduce the discharge of pollutants and minimize potential impacts upon receiving waters. “Receiving waters” include perennial, intermittent and ephemeral streams in Arizona.

Permanent Pollution Prevention BMPs are intended to improve storm water quality both during and after construction of the project. They include:

- Minimization of impermeable surfaces.
- Preservation of existing vegetation, *Figure 8.1*, and the re-establishment of vegetation on disturbed soils.
- Evaluation of and response to increased runoff flows.
- Design of concentrated flow structures (refer to Chapter 6).



Figure 8.1 Transplanting existing vegetation.

- Design of measures to protect disturbed slopes (refer to Chapters 4 and 6).

Temporary Pollution Prevention BMPs are intended to improve storm water quality during the construction process. They include:

- Temporary soil stabilization and sediment control, *Figure 8.2*.
- Management of waste and hazardous materials.

8.2 DESIGN

Plans illustrating BMP installation are typically needed to address NPDES/AZPDES requirements and are required for any project that will disturb lands managed by USFS or BLM. In general, permanent BMPs are described in the roadway and drainage plans; temporary BMPs are described in a separate section of the contract documents. Temporary BMP plans (referred to as Storm Water Pollution Prevention Plans—SWPPP—or as Erosion Control Plans) are typically prepared at Stage III, although an estimate for their cost is included in earlier Stages.

In addition to a SWPPP for the new highway, the design team should be aware that in the event that the project requires the construction of a pioneer road for geotechnical, archaeological or other site investigations, ADOT and BLM/USFS will require a SWPPP for the pioneer road.



Figure 8.2 Temporary sediment control.

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8.3 CONSTRUCTION

Prior to earth-disturbing activities, the contractor shall prepare and deliver to ADOT the proposed SWPPP for approval by ADOT in consultation with BLM or USFS.

During the construction process, temporary BMPs require regular maintenance. Field staff should review project contract documents regarding requirements that address BMP maintenance.

8.4 ADDITIONAL RESOURCES

ADOT Stormwater Program:

http://www.azdot.gov/adot_and/storm_water/stormwater.asp

ADOT Post-Construction BMP Manual:

www.azdot.gov/adot_and/storm_water/PDF/draft_adot_post_construction_bmp_manual.pdf

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CHAPTER 9: MATERIAL SITES

9.1 CHAPTER GOALS

ADOT desires to establish a statewide network of materials sources, some of which will need to be located on USFS and BLM lands. Each source may require environmental documentation, geotechnical investigation, and master planning in addition to analyses of accessibility, haul distances, other potential users and long- and short-term needs.

Through interagency cooperation and communication, existing and potential material source and waste sites throughout the state can be utilized efficiently and meet environmental standards.

Material sites are locations outside the highway corridor easement from which rock and soil materials may be mined and processed to serve the needs of new construction and/or maintenance activities, *Figure 9.1*. Material sites may also serve as repositories for excess materials generated by new construction and/or maintenance activities. Activities associated with the development of material sources may include constructing access to and excavation of the material site as well as treatment of the excavated material such as crushing, sorting and stockpiling, *Figure 9.2*. Because they take place outside of the easement and on lands managed by USFS or BLM, these activities require a USFS or BLM permit as will be discussed below.



Figure 9.1 Material sites located outside of the highway corridor.

Excess material is defined as solid by-products of highway construction, reconstruction and maintenance, and as materials source by-products including removed vegetation, timber, stumps and slash. The following examples are not considered excess materials: used cans, oils, machine and equipment parts, paint, fresh concrete, wash water from concrete operations, cement, hazardous materials, plastic and rubber products, discarded metals, and building materials. This unacceptable waste should be disposed of properly at a designated landfill or other acceptable disposal facility. BLM/USFS has discretion regarding acceptable waste to be placed on BLM or USFS land.

9.2 SCOPING

Authorization Process

Because they often take place outside of the ROW, the development of materials sources requires that ADOT obtain approval from BLM or USFS for sources on Federal Lands. A chart summarizing the main issues is shown in Appendix I. Requirements typical for the authorization process include the following:

- Preparation of a Source Development Plan. The purpose of the plan is to anticipate, direct and document the proper management of the source. The plan should address the following:
 - Site location and survey (which requires a licensed land surveyor).
 - Estimated lifespan, estimate of volumes of usable and unusable material, basis of estimate and horizontal and vertical extent



Figure 9.2 Locations need to be set aside for site stockpiling.

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Figure 9.3 Excavation work.



Figure 9.4 Batch plant and crusher.



Figure 9.5 Waste areas and stockpiles.

- of differing materials.
- Anticipated construction activities: excavation work, *Figure 9.3*, batch plant with crusher, *Figure 9.4*, and/or waste areas and stockpiles, *Figure 9.5*.
- Existing features or planned activities that require special attention (e.g., visual concerns, public safety, pollution control, blasting concerns, etc.).

- Design and maintenance of long-term site access.
- End use of the site (e.g. reclamation, campground, wildlife/stock pond, day use area, helicopter pad, waste area). Site activities should be consistent with this end use design.
- The authorization process may require NEPA documentation in addition to archaeological and biological clearances, 404 permits and others. The design team should anticipate that the authorization process might require months to complete (or years for projects that disturb significant natural resources).
- A fee may be assessed to materials wasted off of USFS lands.
- Material sources used for multiple projects are classified as industrial facilities for the purposes of storm water management. Industrial facilities that discharge to Waters of the US are eligible for coverage under ADOTs Individual Permit (AZPDES Individual Permit No. AZS000018-2008). The Individual Permit may require the preparation of a Storm Water Pollution Prevention Plan (SWPPP), installation of Best Management Practices (BMPs), and possibly two types of monitoring: analytical and compliance (pit dewatering only). Additional information on material source SWPPP preparation and monitoring requirements may be found in the ADOT *Material Source SWPPP Template* and the ADOT *Storm Water Monitoring Guidance Manual for Industrial Activities*. These SWPPP requirements are available from the ADOT Storm Water Program website listed at the conclusion of this chapter.

Geotechnical Investigations for Material Sources

Geotechnical investigations are usually needed to evaluate the extent, type and engineering properties of the materials encountered. They typically consist of constructing access to the proposed material source, backhoe test pits and/or borings by drill rigs. Since they may also take place outside of the existing right-of-way, geotechnical investigations for material sources require authorization from BLM/USFS as described above. In order to meet the requirements of that authorization, the following information is typically included:

- Environmental Clearance (NEPA)
- Access to the material source site:



Figure 9.6 Location needed for drilling equipment.

- Use of existing roads (if adequate to meet requirements of equipment).
- If necessary, new road location and design (amount of cut/fill required, width, length) and type of equipment required for road construction (e.g. bulldozer, grader, backhoe).
- Descriptions of existing streams or natural drainages that must be traversed and proposed drainage improvements (e.g. water bars, culverts).
- Access road maintenance schedule.
- Methods for controlling unauthorized access.
- Geotechnical investigation schedule.
- Possible need for phased investigations.
- Locations for drilling equipment, *Figure 9.6*, (typically, a 30-foot by 20-foot cleared, graded pad is constructed).
- Clearing limits and locations for topsoil salvaged from material source site.
- Methods for erosion control of disturbed sites.
- Rehabilitation of disturbed areas.

9.3 OPERATION

Material Sources

ADOT will operate source sites in accordance with the approved Source Development Plan. When unanticipated construction activities are deemed necessary or desirable, ADOT will need to amend the Plan in consultation with BLM/USFS.

ADOT may inform its contractors of available material sources in the project contract documents. BLM/USFS will typically allow access only to those material sources where ADOT has previously received authorization. Contractors may pursue authorization for other material sources on BLM/USFS lands, but should be reminded that this process is lengthy and may require months to complete as discussed above.

Plan of Operations

A contractor or public agency may make application to ADOT to utilize a material source or waste site for which an approved Source Development Plan has

been developed. It will do so by preparing a Plan of Operations, which must be consistent with the goals of the Source Development Plan described above. The Plan will require BLM/USFS approval and, at a minimum, will include the following information:

- Name and address of the permit holder (typically ADOT) and names of ADOT field contacts.
- Name/number of the materials source and location map and probable start/end dates. When necessary, the plan should be amended in consultation with BLM/USFS to adjust these dates.
- Plan drawings showing views of clearing limits, areas of excavation and elevation/section views of benches and cut faces. Note that this work will require engineer designs for which ADOT is ultimately responsible as the party authorized by BLM/USFS.
- Project access, drainage design and environmental mitigation.
- Clearing limits including methods of vegetation removal and locations for salvaged topsoil.
- Type and magnitude of operations (e.g. batch plant, equipment area, stockpiles) and haul routes.
- Anticipated type(s) and volume(s) of material to be excavated.
- Locations and methods of excavation.
- Volume and usage of oversize material produced.
- Blasting plans.
- SWPPP to address erosion control, storage and cleanup for fuels, oils and explosives.
- Site monitoring schedule including required SWPPP reviews.
- Restoration plan including proposed end-of-project grading plan. Stockpiles, if not utilized, may require ongoing maintenance by ADOT.
- Prior to the contractor's release from an ADOT materials source, BLM/USFS and ADOT will determine compliance with the terms of the authorization permit and the Source Development Plan.

Joint Use Material Sources

"Joint use" refers to use by more than one agency or party (e.g. USFS, BLM, ADOT, city, county). Typically, within a joint use source, each user has a designated area. It is recommended that each designated area be a discreet area and not immediately adjacent to another user's designated

area. Each user must provide a Plan of Operations to ADOT that is consistent with the Source Development Plan. BLM/USFS, in conjunction with ADOT, may designate which portion of the source site is assigned for use to a specific user. Plans of Operation for joint use areas are usually developed by ADOT and BLM/USFS, but ADOT may be required to provide a plan for the entire site. A third party user will be required to abide by the approved ADOT plan.

As described in the authorization permit, ADOT will act as the manager of the site and will assume responsibility for complying with the requirements of the permit.

Excess Material (Waste)

Waste sites are typically identified during project planning and design and should be described in the project contract documents. However, contractors may request additional (unplanned) waste sites. For unplanned waste sites and all other waste sites outside of the highway corridor right-of-way, the contractor or ADOT will need to apply for a permit from BLM or USFS similar to that required for material sites. Other possible options for excess material disposal during construction are described in Chapter 4.

Inspections

During both the geotechnical investigation and early development materials sites, representatives from both BLM/USFS and ADOT should provide regular inspections so that adjustments can be made and undesirable consequences minimized. Once operational, it is important that sites be inspected on a regular basis to evaluate compliance with requirements described in the Source Development Plan and Plan of Operation.

9.4 RESTORATION OF MATERIAL SOURCES AND WASTE SITES

Since they involve removal of existing vegetation and require below-grade excavation, material sources are typically susceptible to erosion. Upon completion of excavation activities, the site should be prepared for its end use as described in the Source Development Plan. Typically, this requires final site grading, distribution of stored topsoil, erosion control and restoration and revegetation of

disturbed soils. Unless needed for other reasons, access roads to the site should be regraded to original contour, ripped, drained, blocked to traffic and seeded.

9.5 ADDITIONAL RESOURCES

ADOT Storm Water Program:

http://www.azdot.gov/adot_and/storm_water/stormwater.asp

Arizona State Mine Inspector:

<http://www.asmi.state.az.us/>

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GUIDELINES

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CHAPTER 10: CONSTRUCTION

10.1 CHAPTER GOALS

In addition to safely constructing a quality project on schedule and within budget, important goals related to building highway corridors on lands managed by USFS or BLM include:

- Compliance with mitigation measures to fulfill NEPA requirements.
- Implementation and maintenance of temporary and permanent erosion control measures (refer to ADOT's *Erosion and Pollution Control Manual*) when needed.
- Protection of riparian areas and other significant resources during construction.
- Strict delineation of construction limits in order to protect the adjacent landscape.
- Restoration and stabilization of all slopes and soils disturbed by construction.

10.2 ADOT/FHWA/BLM/USFS INTERACTION DURING CONSTRUCTION: PARTNERING

As has been discussed throughout this text, highway corridors through lands managed by BLM and USFS are to be managed as a joint effort between ADOT and BLM or USFS. Open communication between appropriate personnel in each agency is essential, accordingly this is especially true during the construction process when issues need to be resolved quickly. In order to foster open communication, ADOT, BLM and USFS have agreed to the philosophy of "Partnering". Partnering is defined as the cooperative management of project development activities.

During construction, ADOT, as agent for FHWA, will ensure compliance with all such terms and conditions identified in the NEPA document, the Letter of Consent (LOC) and any special conditions designed to protect BLM or USFS lands and resources to which all parties have agreed (refer to Chapter 2).

During construction, BLM or USFS will typically:

- Monitor the progress of the contract.
- Assist the ADOT Resident Engineer (RE) in addressing or clarifying the intent of provisions

or measures that involve BLM/USFS land and resources.

- Provide input on construction issues during the weekly construction meetings.
- Review construction for compliance with the Storm Water Pollution Prevention Plan (SWPPP).
- Assist coordination with other involved agencies, such as the Arizona State Game and Fish Department, US Fish and Wildlife Service, etc.

In addition to inter-agency cooperation, it is important that during construction the contractor receives clear instructions and responses to queries in a timely fashion; a clear chain of command is essential. To meet that need, shortly after award of the contract and prior to the onset of construction activities, ADOT requires the contractor to host a "Partnering" meeting. BLM/USFS will be given an opportunity to provide input on construction issues during the construction partnering meeting. The goals of this meeting include establishing:

- Contacts and defining the roles of key agency representatives.
- Common project objectives and guidelines.
- NEPA requirements including compliance with National Emission Standards for Hazardous Air Pollutants (NESHAPs).
- Unique project conditions and requirements.
- An issue/problem resolution process.
- A joint evaluation process.

If BLM/USFS identifies a situation where it appears there may be non-compliance with NEPA, the LOC or the project contract documents, BLM or USFS will work directly with the ADOT Project Manager or RE and the FHWA Area Engineer to resolve the issue. BLM/USFS will not initiate direct contact with any contractor under contract to ADOT. Exceptions include BLM/USFS law enforcement authority and responsibility for fire control. In emergency situations such as incidents relating to fire, safety, or the irretrievable loss of resources, BLM/USFS has the authority to deal directly with all involved parties, including the contractor.

10.3 CHANGES AND MODIFICATIONS TO PROJECT CONTRACT DOCUMENTS

When changes to the project contract documents are required, environmental impacts will be evaluated in addition to construction costs prior to permitting the contractor to proceed. Mitigation measures described as part of the NEPA process are not subject to Value Engineering.

10.4 TEMPORARY ACCESS

Temporary construction access needs should be identified during the planning and design process and included in the environmental clearances. Required temporary access should be described in the project contract plans and specifications, and must be followed by the contractor. However,



Figure 10.1 Erosion control includes sediment basins to catch flows over disturbed soils.

contractors may request additional or unplanned temporary access to fences, bridge sites, cut and fill slopes, staging areas, hot plant sites, crushing sites, decking (timber staging) areas or detours. Additional environmental documentation may be required in these cases. Contractors should identify areas not included in the approved Environmental Document as soon as possible in the construction process. ADOT/BLM/USFS will assist in determining the appropriate environmental analysis and time required for any proposed changes. The Partnering process offers an opportunity to request changes and define requirements for approval.

Where crossing natural drainages, temporary construction approaches should be narrow and as perpendicular to the streambed as possible, and disturbance to the stream bank minimized. Approaches should be treated to minimize erosion into the drainage. If applicable Clean Water Act Section 404 Permit mitigations must be complied with. Refer to Chapters 5 and 6 for more information.

10.5 EROSION AND POLLUTION CONTROL

SWPPP and NOI

After award of the project and prior to the start of construction, the contractor must submit his own Storm Water Pollution Prevention Plan (SWPPP) to ADOT (refer to Chapter 8). These plans shall also be reviewed by BLM/USFS. ADOT and BLM or USFS personnel should review the contractor's SWPPP in particular regard to the following concerns:

- During construction, areas of disturbed soil that are not protected by permanent erosion control measures (seeding, impervious surfaces, etc.) should be kept to a minimum as described in the project contract documents.
- Storm water flows must be guided through or diverted around construction sites. Flows over disturbed soils should be detained in sediment basins, *Figure 10.1*.
- Diversion structures should be made of non-erodible material, such as concrete, plastic or rock.
- Diversion structures should be in place prior to commencement of soil disturbing activities.
- All stream diversions must comply with State and Federal water quality standards as they are implemented.

All disturbed areas must be addressed by the SWPPP, and Best Management Practices (BMPs) must be applied and installations maintained in good working order (refer to ADOT's *Erosion and Pollution Control Manual* for more information).

After concurrence of the SWPPP by BLM/USFS and approval by the RE, and prior to any earth-disturbing activities, the contractor must submit an application for a Notice of Intent (NOI) to the Arizona Department of Environmental Quality (ADEQ).



Figure 10.2 Seeding is a way in which soils can be stabilized after construction activities.

Equipment Washing

To minimize the introduction and spread of invasive and noxious plant species, all equipment that will operate on the project must be washed prior to operating within BLM or USFS lands, and washed again prior to leaving the project. Refer to ADOT's *Erosion and Pollution Control Manual* for proper washing techniques.

Spill Prevention Containment and Countermeasures

As described in greater detail in the ADOT *Erosion and Pollution Control Manual*, the contractor's SWPPP should address pollutants such as fuels, lubricants, bitumens, raw sewage, wash water from concrete or aggregate operations and other harmful materials.

Seeding

In order to meet Clean Water Act requirements, soils disturbed by construction activities must be stabilized. Stabilization is typically achieved by means of seeding, *Figure 10.2*, in order to re-establish native vegetation. The success of revegetation on construction projects relies heavily

on inspection and attention paid to complying with the project contract documents.

As discussed in greater detail in Chapters 4 and 7, seeding success is dependent upon proper soil conditions. Field personnel should review the project contract documents as they relate to slope preparation.

Contractors may request substitute seed species for those listed in the project contract documents. Readily available commercial seed and plant species that the contractor may suggest may not be appropriate for substitution for projects on BLM/USFS lands. Prior to considering substitutions proposed by the contractor, the RE should consult ADOT Roadside Division as well as BLM/USFS.

Seed, tackifier, compost, fertilizers and soil amendments must be delivered to the construction site in compliance with the project contract documents. For large projects, multiple applications may be necessary, requiring multiple contractor mobilizations. Refer to Chapter 7 for more information.

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NOT Requirements

As described in greater detail in the *ADOT Erosion and Pollution Control Manual*, ADOT and the contractor must comply with the ADEQ/EPA Statewide Construction General Permit regarding storm water permits and provide to ADEQ or EPA a Notice of Termination (NOT) at the conclusion of construction. For most ADOT projects on BLM and USFS lands, successful revegetation is an essential component of final stabilization. The ADOT methodology for determining final stabilization may be found at the ADOT Storm Water Program website listed at the conclusion of this chapter.

10.6 FIRE CONTROL

The BLM/USFS typically provide required wildland fire information in the project contract documents. During the construction project BLM/USFS should continue to monitor and provide updated Fire Control Plan information.

10.7 CLEARING LIMITS AND VEGETATION PROTECTION DURING CONSTRUCTION

Clearing and Grubbing

Staking of clearing limits, including top of cut, toe of fill, warping, laying back cut slopes, rounding, access areas, staging areas and all other limits of construction, *Figure 10.3*, is required prior to clearing. As described in the project contract documents, clearing limit stakes should be checked by both ADOT and BLM or USFS prior to beginning clearing.



Figure 10.3 Staking of clearing limits is required prior to clearing.

If work is needed beyond the clearing limits, separate environmental documentation and authorization may be required.

For projects with large rights-of-way, areas to be left undisturbed should be described in the project contract documents and clearly identified in the field. Barrier marking materials, *Figure 10.4*, may be required to protect areas.

Early installation of easement fences may be desirable to protect the site from off-road vehicles or animals, and to delineate contractor operations.

Merchantable Timber

As described in Chapter 2, USFS must appraise and sell timber to ADOT where warranted by the project location. ADOT typically enters into a separate contract for the removal of the timber. Up to six months may be required in order to inventory the timber and complete the transfer to ADOT.

If during construction, design changes require the removal of additional trees, these trees must not be cut until they are measured, marked and sold to ADOT. Failure to observe this procedure could result in penalties.

10.8 WATER

Riparian Awareness

As described in the project contract documents, construction personnel should be properly trained in the identification, importance and protection of riparian areas and values.



Figure 10.4 Barrier marking materials may be required for areas to be left undisturbed.



Figure 10.5 Types of archaeological resources include sites such as Wupatki Pueblo, Arizona.

Water Source Development

Water source development is sometimes needed to supply water for road construction and dust control. Separate BLM/USFS or other agency approval may be required to pump water from an existing stream or pond, depending on water rights and use. If required, this approval should be secured during the planning and design process as discussed in Chapter 2. If the contractor chooses to pursue an independent source of water, he should be reminded that doing so may require addressing NEPA obligations (refer to Chapter 2).

Where cofferdams or water holes are constructed in natural streams, they should be constructed from sandbags filled with clean sand or from other inert materials. They should not be constructed of soil, which can erode into the stream. Weirs should be constructed to address overflows, which should be directed back into the stream following removal of suspended sediment. At no time should downstream water flow be reduced to a level that may be detrimental to aquatic resources, fish passage, or other established uses.

10.9 ARCHAEOLOGICAL/CULTURAL AWARENESS

If any archaeological, *Figure 10.5*, or cultural resources are discovered during construction, the RE should stop work in that area immediately and report findings to the ADOT archaeologist for evaluation. The BLM/USFS must also be notified immediately of such findings.

10.10 WILDLIFE ENCOUNTERS

Wildlife encounters and awareness training should be provided as a part of the required orientation training for any highway project construction in wildlife areas. The training should emphasize safety for workers, safety for wildlife, and minimization of work disruption.

10.11 TRAFFIC CONTROL DURING CONSTRUCTION

Projects on BLM/USFS land will generally require weekend and holiday shutdowns, which will require strict enforcement by the RE. These issues should be clearly identified in contract documents.

10.12 ACCEPTANCE OF WORK

Phased Acceptance of Work

The RE may request the BLM/USFS to review work in progress for input on interim work (phased acceptance) prior to payments. Phased acceptance by ADOT may be considered to be final acceptance **only** for that portion of the work completed.

Final Project Acceptance

ADOT, BLM/USFS and the contractor should conduct a final project walk-through and project inspection prior to final acceptance of the project. This will afford all project owners/stakeholders an opportunity to review the project and ensure compliance with the intent of the project contract documents. A final punch list should be developed at this time in order to reach agreement and resolve any remaining construction issues.



Figure 10.6 A bobcat could be a potential wildlife encounter.

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10.13 ADDITIONAL RESOURCES

ADOT Construction Manual:

http://www.azdot.gov/Highways/ConstGrp/construction_manual/index.asp

ADOT Storm Water Program:

http://azdot.gov/adot_and/storm_water/stormwater.asp

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CHAPTER 11: MAINTENANCE OPERATIONS**11.1 CHAPTER GOALS**

The goals of this chapter include the following:

- Describe how ADOT maintenance activities may be best integrated with BLM/USFS resource management concerns.
- Describe the Annual Highway Maintenance Partnering Meeting, which will serve to initiate and facilitate effective communication between ADOT maintenance districts and their associated BLM field offices and/or USFS districts.
- Outline opportunities for ADOT maintenance personnel to provide input during the design of proposed highway corridors.
- Outline routine ADOT maintenance activities and appropriate strategies for accomplishing those activities.

As defined in this chapter and for the purposes of ADOT maintenance, “existing alignment” refers to the roadway pavement, structures as well as the Clear Zone as approved at the time of construction and as noted on project records.

11.2 MAINTENANCE PARTICIPATION IN PLANNING AND DESIGN

Personnel that are involved in the maintenance operations and management of new and reconstructed roadways and facilities are involved in the highway development process which provides an opportunity to review and comment on proposed designs. This review should include comments from the ADOT District Maintenance Supervisor, District Environmental Coordinator, the ADOT Natural Resources Management Group Regional Manager, the local BLM office or USFS District Ranger and USFS Engineer. Written comments regarding the plan submittals should be submitted to the ADOT Project Manager for transmittal to the design team.

11.3 MAINTENANCE OPERATIONS ON BLM/USFS LANDS**Annual Highway Maintenance Partnering Meeting**

Each ADOT District in coordination with the BLM Field Office(s) or USFS District(s) located within that ADOT District should prepare a draft Annual Maintenance Plan that describes anticipated maintenance activities within that district. Prior to finalizing the Plan, the ADOT District should forward the following information to those offices:

- Descriptions, locations and approximate schedules of proposed routine ADOT maintenance activities on those roads and facilities.
- Descriptions of unplanned/emergency type activities.
- Listing of all non-routine ADOT projects (new construction, pavement preservation, slope erosion repair, rock fall mitigation, etc.)
- Map of ADOT-maintained roads and facilities (such as rest areas, maintenance yards, equipment storage and material sources) that are located within lands managed by BLM/USFS. This map should be color-coded by public agency jurisdiction.

The draft of the Annual Maintenance Plan shall have a cover letter addressed to the BLM Field Office Manager and/or USFS District Ranger indicating information needed from them for finalizing the Annual Maintenance Plan which may include:

- Threatened and Endangered Species.
- Sensitive habitats.
- Noxious invasive species.
- Archaeological/Cultural sites.
- Types of required environmental reviews.
- Changes to ADOT/BLM/USFS signage.
- BLM/USFS resource management concerns

The Annual Maintenance Plan will be the basis for the Meeting to be held between ADOT and BLM/USFS. The Meeting will offer personnel from these agencies an opportunity to re-establish working relationships and to review, amend, approve and/or reject proposed maintenance activities. At a minimum, the ADOT Office of Environmental Services Director, ADOT District Engineer, ADOT District Maintenance Engineer, ADOT District Environmental Coordinator, ADOT Maintenance Supervisor, ADOT Maintenance Superintendent, ADOT Natural Resources Regional representative, BLM Field Office Manager/USFS District Ranger and BLM/USFS Engineer should attend this meeting. The agenda for this meeting should

typically be as follows:

- Review of past maintenance performed and lessons learned.
- General review of maintenance activities (routine, non-routine, and unplanned/emergency).
- Review and exchange of sensitive information such as Threatened and Endangered species, archaeological sites and noxious or invasive species, etc. This item should include locations and any recommended protection measures.
- NEPA planning updates.
- Discussion of environmental documentation required for maintenance activities and identification of associated agency responsibilities. Schedule of actions and deliverables should be agreed upon.
- Meeting administration including:
 - Identification or update of agency contact information.
 - Listing of agreed upon items (compliance) and action items (planning).
 - Scheduling of next years meeting and any necessary additional sessions.

Minutes from this meeting should be taken and later distributed by the ADOT district.

Environmental Compliance and Documentation for Maintenance Operations

Each federal public agency approaches the NEPA process and compliance with other resource laws in different ways. For highway projects, generally the funding source used to design, construct or maintain the highway corridor will dictate which agency has responsibility for complying with NEPA and/or other resource laws when applicable. However, the type of a given maintenance activity may also dictate whether a NEPA decision is required and/or which agency is responsible for administration and compliance with other resource laws. The responsible agency will, in turn, determine the standards for addressing these requirements.

Maintenance activities on existing alignments within BLM/USFS lands **do not require additional NEPA documentation**. However, these activities are not excluded from complying with other laws and regulations such as the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act, the Clean Water Act (402 and 404) and the Endangered Species Act.

These maintenance activities include but are not limited to:

- Emergency repairs.
- Restoration of surfacing, shoulders, roadsides.
- Restoration or replacement of all structures (including bridges).
- Cleaning ditches and cross-drainages.
- Minor (less than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons.
- Controlling brush and roadside vegetation to maintain clear zones, sight distance and to remove hazard trees.
- Slope stabilization and scaling.
- Removal of hazards and other obstructions.
- Preserving and adding traffic control measures to conform with the Manual on Uniform Traffic Control Devices (MUTCD).

Rehabilitation and reconstruction activities on BLM/USFS lands where all activities stay within the existing right of way **do require an additional NEPA decision**. These activities include but are not limited to:

- Minor realignment (e.g. straightening excessive curves).
- Minor widening (e.g. adding a lane and/or shoulder width); adding auxiliary lanes (passing, turning, climbing, parking).
- Major (more than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons, etc.

Maintenance activities that require NEPA clearance and that do not utilize federal funding will be discussed at the Meeting to determine which agency will be responsible for fulfilling these requirements. In general, BLM or USFS will act as the lead federal agency. ADOT's role will typically be that of an applicant or designee. ADOT will address NEPA requirements in accordance with BLM or USFS standards.

Any demolition of load bearing structures requires National Emissions Standards for Hazardous Air Pollutants (NESHAPs) compliance.

Maintenance activities that utilize federal funding will require NEPA clearance and will coordinate with FHWA as the lead federal agency.

11.4 ADOT MAINTENANCE OPERATION ACTIVITIES

ADOT maintenance operations should minimize impacts to natural and cultural resources using standard work methods identified in the Performance Control System (PeCoS), Best Management Practices (BMPs), and BLM/USFS sensitive resources information and protection measures agreed to at the Meeting. In all cases, ADOT maintenance operations should minimize impacts to natural drainages and associated environments as required by the NPDES and AZPDES. ADOT should avoid or minimize disturbing soils that will



Figure 11.1 Maintenance equipment may be parked for short periods at developed pullouts.

erode into drainages, even those ditches and slopes that are not directly adjacent to streams. Where soils are disturbed, ADOT maintenance personnel should employ BMPs as described in the ADOT Maintenance and Facilities Best Management Practices Manual.

Typical operation activities include the following:

Equipment Parking

All maintenance equipment should be stored or parked overnight in acceptable locations. During routine daily operations, vehicles may be parked for short periods at developed pullouts, *Figure 11.1*, parking areas and other locations specifically agreed upon at the Meeting.

Waste Disposal

For routine maintenance activities undertaken with maintenance personnel, storage, staging

and waste disposal areas should be identified in the project plans or documentation, for review by BLM/USFS. Waste materials should not be sidecast indiscriminately over shoulders, embankments, in drainageways or at retaining wall locations. Existing storage yards and waste disposal areas should be utilized to the fullest extent possible.

Storage and Staging Areas

Areas designated for waste/excess material disposal should be identified during the Meeting. Joint use of BLM/USFS maintenance yards for temporary storage (to expedite efficient moving, storage and/or distribution of materials) should be investigated and reviewed during the Meeting. The potential for reuse and/or placement of waste materials by the BLM/USFS should be coordinated and agreed upon between the agencies.

Material Sites

Refer to Chapter 9

Vegetation Management Activities

ADOT is responsible for providing the motoring public with safe and aesthetically pleasing highway corridors. Accordingly, ADOT uses a variety of vegetation management techniques such as, mechanical, chemical, manual and cultural, in an integrated approach to control vegetation along Arizona highways.

Each BLM/USFS local office should clearly state local policy regarding the removal of vegetation in the ADOT easement; this information will be discussed at the Meeting. The policy should address opportunities and requirements for salvage timber sales and timber cruising timeliness associated with



Figure 11.2 *Pennisetum ciliare*, Buffelgrass, is a highly flammable invasive species.

removal of trees.

Noxious and Invasive Species

Noxious and invasive plant species, *Figure 11.2*, pose significant threats to both natural and human environments and highway corridors can act as conduits for the spread of these undesirable species (refer to Chapter 7). Highway maintenance activities should be coordinated to minimize the colonization and establishment of these species. Measures that can minimize the spread of weeds in highway corridors include:

- Learn to recognize noxious and invasive plant species (see end of this chapter for links to websites listing state and federal noxious weeds). At the Meeting, agree to strategies for reporting locations of and treating these plant species.
- Before ground-disturbing maintenance activities begin, inventory and prioritize weed infestations for treatment in project operation areas and along access routes. Control weeds as necessary, as early as possible in the project planning process.
- Locate and use weed-free project staging areas.
- Clean equipment transported from outside of the BLM/USFS district prior to entering the local district. If necessary and in consultation with BLM/USFS, identify site(s) where equipment can be cleaned. All mud and plant debris should be removed and contained as directed in the *ADOT Erosion and Pollution Control Manual*. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway.
- Do not blade or pull roadsides and ditches that are infested with noxious plant species unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, wherever possible, eradicate weeds prior to maintenance activities. If eradication is not feasible, ensure that the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.
- Avoid acquiring water for dust abatement where access to the water is through weed-infested

sites.

- If operating in areas infested with weeds, clean all equipment before leaving the project site as described above.
- Maintenance personnel need to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. Proper disposal means bagging the seeds and plant parts and incinerating them.
- Inspect material sources on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication: strip and stockpile contaminated material for proper disposal. Inspect and document the area where material from treated weed-infested sources is used, annually for at least three years after project completion, to ensure that any noxious and invasive plant species transported to the site are promptly detected and controlled.
- Maintain stockpiled material in a weed-free condition.
- In heavily forested environments, retain shade to the extent possible to suppress noxious and invasive plant species and prevent their establishment and growth.
- Where maintenance activities disturb soil, salvage weed-free topsoil and seed disturbed



Figure 11.3 Selective tree removal needs to be discussed at the annual partnering meeting.

areas with native vegetation species in order to minimize opportunities for weed establishment (refer to Chapter 7).

- Where soils are disturbed in weed-infested areas, document and inspect these areas for at least three growing seasons and provide follow-up maintenance as required.



Figure 11.4 Shading on pavement in the winter results in icy conditions.

Selective Tree Removal

Maintenance crews routinely remove hazardous vegetation within the clear zone of the highway. Therefore, these activities should be discussed at the Meeting, including appropriate means by which trees will be removed (e.g. felling, cutting, chipping, debris disposal) *Figure 11.3*, and any necessary mitigation.

Hazardous (Unsound) Vegetation

Hazardous trees and brush within transportation corridors may be removed for safety purposes, including clear zones and other areas within the rights-of-way. American Association of State Highway Transportation Officials (AASHTO) guidelines on hazardous obstructions and clear zones are followed.

Unsound trees within the rights-of-way should be jointly identified by ADOT and BLM/USFS. However, timely removal of unsound trees is both necessary and important to protect the safety of the traveling public. Should specific trees become unsound before an agency agreement, trees will be removed and appropriate personnel will be notified.

Sight Distance

Standards for calculating sight distances are drawn from AASHTO and the *ADOT Roadway Design Manual*. These documents should be referenced to evaluate sight distance requirements along existing roadways where vegetation has grown in the shoulder area.

Clearing plans should be prepared for any areas requiring vegetation removal and should be reviewed at the Meeting. Potential sight distance problems should be assessed in the field by a multi-

agency review team.

Visual impacts of tree removal and pruning should also be considered for any vegetation removed from the ADOT easement and should also be discussed during the Meeting. Techniques such as feathering the edges of clearing lines and varying the sizes of open spaces can help reduce visual impacts. Refer to USFS publication “Landscape Aesthetics A Handbook or Scenery Management”.

If pruning or tree removal is necessary, branches should be pruned back to the trunk and tree stumps cut flush to the ground line, ground in place or disposed of properly. If trees are removed from the ADOT easement, the log skid marks and any other disturbed areas should be reseeded at the next appropriate season.

Winter Pavement Shading

Shading of pavement during the winter months may result in prolonged icy conditions on highways, *Figure 11.4*. Winter shading problems should be assessed in the field by a multi-agency review team, and problem areas documented. Impacts of alternatives, including de-icing agents and associated costs, should be evaluated, and a course of action determined. A clearing plan will be prepared for any areas requiring vegetation removal and be reviewed at the Meeting.

As with any removal of vegetation, visual and other environmental considerations should be addressed. Disturbed areas may need to be reseeded.

Brush Removal for Sight Distance

Requirements for brush removal for sight distance should correspond to those for tree removal. Brush



Figure 11.5 A boom axe used to remove trees and brush.

removal should be considered in areas where significant hazards exist and when adequate resources are available to remove all stumps and reseed if necessary.

Mowing machines should not be used to remove trees and brush. A boom axe, *Figure 11.5*, operated from the road shoulder is preferable.

Mowing of Shoulders

Mowing may be utilized to control vegetation within recovery areas and other areas that need to remain open for visibility or other considerations. Mowing should be limited to areas where plant stems/trunks are no larger than two inches in diameter.

Herbicide Use

The USFS publication, *Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest Lands in Arizona*, regulates ADOT's herbicide use on USFS lands and provides a list of approved herbicides. The associated Memorandum of Understanding provides a strategy for ADOT-USFS coordination regarding the presence of invasive plants and hazardous vegetation and planned activities to control and/or remove this vegetation. All ADOT chemical herbicide application activities on roads crossing NF lands are subject to the terms and conditions detailed in the Environmental Assessment (EA) and accompanying MOU (a website link to the EA is listed at the conclusion of this chapter).

Herbicide use on BLM land is limited to those chemicals approved by BLM. ADOT districts should contact the appropriate BLM representative prior to application.

Fertilization and Seeding

Plantings and seed applications should incorporate low solubility and slow release fertilizers in order to reduce the transport of nutrients into waterways.

Seed should be tested and mulches certified to meet the BLM/USFS "Weed Free" requirements (refer to Chapter 7). Seed mixes should be composed of species that are indigenous to the project area.

Drainage Structures

Drainage structures should be reviewed during the annual joint field review by both ADOT and BLM/

USFS. Where structures are not functioning as designed, determine the scope of work required and if immediate action is required.

- If the proposed work is outside the scope of normal maintenance efforts or will impact visual, environmental, and/or cultural resources, include the proposed work in the next Meeting.
- If immediate action is required, repair the facility to its original designed condition.
- When repairing existing drainage structures:
 - Ensure that temporary erosion control measures are taken in order to address concentrated water flows (refer to Chapter 8).
 - Clearly mark limits of disturbance: maintenance activities should minimize changes to natural stream channel dynamics and minimize removal of native riparian vegetation.
 - Maintenance activities that require disturbing natural stream channels may require a 404 permit from the Corps of Engineers (in addition meeting other regulatory reviews as discussed above).
- If both ADOT and BLM/USFS determine that the structure is inadequate and substantial redesign and construction are required, include the proposed work in the next Meeting.

Ditch Cleaning and Shoulder Maintenance Activities

For traffic safety, smooth transitions must be maintained between the edge of the pavement and the adjacent road ditch or shoulder material. This requires occasional build-up or grading of the shoulders and cleaning of ditches below cut slopes, *Figure 11.6*.

- In order to reduce disturbance to existing



Figure 11.6 Cleaning of ditches below slopes includes cleaning the occasional build-up of rock fall.

vegetation, utilize an appropriately sized front loader.

- If a grader is used, take care to avoid removal of existing vegetation along the shoulder or ditch. If possible, material should only be removed from the ditches and shoulders to the point of existing plant bases.
- The limits of clearing should not exceed the original designed recovery zone.
- Any activities requiring the removal of plant cover should be reseeded.
- As described earlier in this chapter, dispose of waste material derived from routine maintenance activities in approved designated areas.
- In areas requiring shoulder build-up, consider using waste materials removed from nearby areas, such as drainages and shoulders. If none is available, use material from approved material source sites only (refer to Chapter 9).

Cut Slope Maintenance

- **Rock Cuts:** Rock outcroppings that interfere with sight distance or the turning radii of longer vehicles should be identified and reviewed at the Meeting.
- **Soil Cuts:** Cuts slopes that are badly eroding may be identified for installation of erosion control devices. If non-routine work is required, these slopes may be identified and reviewed at the Meeting.

Unpaved Surfaces

There are a small number of unpaved roads, *Figure 11.7*, on BLM/USFS lands that are maintained by ADOT.

- Maintenance practices for unpaved roads include installation of BMPs, grading, dust



Figure 11.7 Maintenance of unpaved roads include installation of BMPs.

control and repair or improvement to the drainage structures.

- Environmental documentation may be required for maintenance activities such as surfacing.
- Consider new materials and techniques such as plant-resin-based soil stabilizers in environmentally sensitive locations.
- Paving of unimproved surfaces should be evaluated as a project, taking into consideration the environmental and social benefits.

Bridges

As discussed in Chapter 5, access for bridge maintenance should be considered during the design process. In order to minimize disturbances to riparian environments, consider performing bridge maintenance from the bridge deck utilizing mechanical lifts. If work in the stream channel is required, clearly mark limits of disturbance: maintenance activities should minimize changes to natural stream channel dynamics and minimize removal of native riparian vegetation.

Fences

Fences are installed along easement lines to control access by vehicles, pedestrians and livestock. ADOT District Maintenance is typically responsible for the maintenance of all easement fences. When damaged by BLM/USFS activities such as logging, fuel wood sales, controlled burns and wildland fires BLM or USFS should repair easement fences to the original or better condition.

Walls

Walls and related structures should be checked regularly for bulges, cracks, settling, or other problems. Where maintenance is required, disturbances to adjacent slopes should be minimized. Maintenance vehicle access should



Figure 11.8 Non-specular steel roadside barrier.

be carefully reviewed prior to onset of work. Waste materials should be hauled to designated waste disposal areas. Disturbed areas should be reviewed for re-seeding.

Roadside Barriers

When required, non-standard roadside barriers (such as non-specular steel, *Figure 11.8*) will be replaced with similar materials. The ADOT districts stockpile non-standard barriers for that purpose. If agreed to at the Meeting and if the district exhausts its inventory of non-standard barriers, any damaged barrier will be repaired with the current standard barrier. This standard barrier may be scheduled for replacement by non-standard barrier.

Winter Storm Management Program

It is ADOT's responsibility to keep roads safe and operational during adverse winter weather. ADOT employs various techniques to control snow and ice including snow removal, application of anti-icing/de-icing and abrasive materials, reduction of shade over travelways and installation of snow fences. Techniques used and amount of material applied vary with storm intensity, season, location, temperatures, etc.

Consistent with the ADOT Winter Storm



Figure 11.9 Snow removal should ensure inert materials do not interfere with drainage structures as the snow melts.

Management Operations Manual and as a part of the Meeting, ADOT should supply BLM/USFS with annual winter storm management plans that include proposed activities and materials.

Snow Removal

Snow removal operations and route priorities are

identified in district-specific snow guidelines. When blading snow to the side of the travelway, ensure that cinders and other inert materials that are also plowed to do not interfere with drainage structures as the snow melts, *Figure 11.9*.

Application of Anti-icing/De-icing and Abrasive Materials

The application of anti-icing/de-icing and abrasive materials may occur prior to, during, and/or after a storm event to prevent ice from bonding to pavement or provide additional traction to snow-covered surfaces. ADOT has a general statewide schedule for application of anti-icing, de-icing, and abrasive materials. This schedule provides recommendations for types of materials to be applied based on local soil regimes, water quality and other related factors. Those materials utilized most frequently by ADOT include Sodium Chloride, Magnesium Chloride, Calcium Chloride, Calcium Magnesium Acetate, cinders and sand. Ethylglycol may NOT be used within USFS boundaries.

Shade Reduction

Flattening of slopes and removal of trees and other shade producing structures are long-term options to reduce maintenance expense and improve inclement weather driving conditions.



Figure 11.10 Properly located native vegetation can minimize snowdrift.

Snowdrift Control

Since snowdrift is typically a problem in open areas, aesthetics should be considered when selecting the necessary control measures. Properly located native vegetation, *Figure 11.10*, and/or snow fences can both serve as windbreaks to control snowdrift. Color and materials should be reviewed for man-made windbreaks, which should be removed during

the off-season.

11.5 EMERGENCY PROCEDURES

Emergency Notification

Each ADOT District Maintenance Supervisor and BLM/USFS staff should maintain an emergency contact listing for notification in the event of emergency events. Coordination of activities and repairs should be discussed and agreed upon to restore the system to the original state as soon as possible.

Emergency Maintenance Procedures

Maintenance procedures that are required as a result of emergencies or natural disasters generally need to begin immediately after the incident. In order to maintain traffic, protect resources or populations, operations are often implemented in the field without extensive plans or documentation. Emergency relief funding can be offered to agencies to repair damaged facilities. Projects implemented under these circumstances are categorically excluded under NEPA.

Repairs should be prioritized according to a predetermined set of criteria, such as the repair of major structures on the main route, repair of a structures on secondary routes, repair of a drainage systems, revegetation work, etc.

As directed in Federal-Aid Highway Emergency Relief Program, emergency repairs and maintenance operations should focus on restoring features to their pre-incident state with the least impacts to the area. Features that were not existent prior to the incident should not be added immediately after an incident with emergency funds. For instance, an undersized culvert should not be upgraded to a bridge following the incident. However, the Program allows consideration of a reasonable level of improvement to make the roadway less susceptible to damage in the future. Therefore, for the example cited above, while a bridge should not replace a damaged pipe (a total change of function), a larger pipe might be an appropriate consideration in making the repairs.

11.6 BLM/USFS MAINTENANCE OPERATION ACTIVITIES

BLM/USFS activities requiring coordination with ADOT District Highway Traffic Division and ADOT District Maintenance Operations include the following and should be reviewed at the Meeting:

- Slash burning and other controlled burns (including back-burning for fire breaks).
- Care must be taken to avoid damage to highway structures such as guardrail, fence and fence supports and signs.
- Logging across highways.
- Temporary road access to highways.
- Maintenance of minor roads intersecting with highways.

Minor BLM/USFS roads provide access to recreational areas, private property, and businesses. Where the vertical alignment of an unpaved minor road slopes toward the highway, storm water runoff can damage highway earthwork and carry sediment and debris onto the road surface, creating a potential driving hazard. Vehicles entering the highway may track unacceptable quantities of mud and debris onto the highway. Therefore, BLM/USFS need to maintain the approaches of these minor roads. Consider surfacing the road with sufficient aggregate to dislodge the mud and debris from wheels before the vehicles enter the highway.

11.7 ADDITIONAL RESOURCES

ADOT Storm Water Program website (including link to Maintenance and Facilities Best Management Practices Manual):

http://www.azdot.gov/adot_and/storm_water/PDF/maintenance_and_facilities_bmp_manual.pdf

State Noxious Weed List:

<http://www.azda.gov/PSD/quarantine5.htm>

Federal Noxious Weed List:

<http://plants.usda.gov/java/noxious?rptType=Federal>

Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona:

<http://www.fs.fed.us/r3/projects/ro/ea-noxiousweeds/ea-noxious-weeds.pdf>

Forest Service Pesticide Use Proposal Form (FS 2100-2):

http://www.fs.fed.us/r3/coronado/forest/projects/environ/EAs/eas/invasive_plant_ea/appendix-b.pdf

Report 341, Integrated Roadside Vegetation Management, National Cooperative Highway Research Program:

http://gulliver.trb.org/publications/nchrp/nchrp_syn_341.pdf

Arizona Wildlands Invasive Plant Working Group (AZ-WIPWG): *Invasive Non-Native Plants That Threaten Wildlands in Arizona*

<http://sbsc.wr.usgs.gov/research/projects/swepic/SWVMA/InvasiveNon-NativePlantsThatThreatenWildlandsInArizona.pdf>

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APPENDIX A: ACRONYMS AND ABBREVIATIONS

AASHTO—American Association of State Highway Transportation Officials

ACIA—Arizona Crop Improvement Association

ADEQ—Arizona Department of Environmental Quality

ADOT—Arizona Department of Transportation

AO—Authorized Officer (BLM Field Manager or designee)

ARPA—Archeological Resources Protection Act

ARS—Arizona Revised Statutes

AZPDES—Arizona Pollutant Discharge Elimination System

BCT—Breakaway Cable Terminal (guard rail).

BE—Biological Evaluation

BLM—Bureau of Land Management

BMP—Best Management Practice

C&S—ADOT Contracts and Specifications Section

CAA—Clean Air Act

CE—Categorical Exclusion (used by ADOT/ FHWA relating to environmental analysis)

CEQ—Council on Environmental Quality

CFR—Code of Federal Regulations

CWA—Clean Water Act

CX—Categorical Exclusion (used by BLM relating to environmental analysis)

DCR—Design Concept Report

DOI—Department of Interior

DOT—Department of Transportation

EA—Environmental Assessment

ED—Environmental Determination

EIS—Environmental Impact Statement

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EPG—ADOT Environmental Planning Group

ESA—Endangered Species Act or Environmental Site Assessment

FHWA—Federal Highway Administration

FLPMA—Federal Land Policy and Management Act

FLT—Federal Land Transfer

FONSI—Finding of No Significant Impact

FUP—Free Use Permit

H(#)—Haul Road Number for material sites

HAZMAT—Hazardous Material

HED—Highway Easement Deed

ID Team—Inter-Disciplinary Team

IRM—Integrated Resource Management

ISA—Initial Site Assessment, Phase I parcel-specific assessment for HAZMAT

LMP—Land Management Plan

LOC—Letter of Consent

LRMP—BLM Land and Resource Management Plan

LUP—Land Use Plan

MMA—Minerals Management Act

MOU—Memorandum of Understanding

MS—Material Site

MSEB—ADOT Material Site Excavation Boundaries

MSGP—Multi-Sector General Permit

MSROW—Mineral Site Right-of-Way

MUTCD—Manual of Uniform Traffic Control Devices

MVD—Motor Vehicle Division

NAGPRA—Native American Graves Protection and Repatriation Act

NAWMA—North American Weed Management Association

NBIS—National Bridge Inspection Standards

NEPA—National Environmental Policy Act

NHPA—National Historic Preservation Act

NESHAPs—National Emission Standard for Hazardous Air Pollutants

NHS—National Highway System

NOI—Notice of Intent

NOT—Notice of Termination

NPDES—National Pollutant Discharge Elimination System

OA—Operating Agreement

PA—Project Assessment

PeCoS—Performance Control System

PIP—Project Implementation Process

PISA—Preliminary Initial Site Assessment (project overview for HAZMAT)

PM—ADOT Project Manager or ADOT Plat Map showing material site boundaries and haul road locations

PR—Project Reference

PRWB—Proposed Right-of-Way Boundaries

PS&E—Plans, Specifications and Estimate

PS—ADOT Pit Sketch (aerial photo showing location of material site and usually the haul road location)

R/W—Right-of-Way (ROW)

ROD—Record of Decision

ROW—Right-of-Way (R/W)

SHPO—State Historic Preservation Office

STB—State Transportation Board

STIP—State Transportation Improvement Program

SWPPP—Storm Water Pollution Prevention Plan

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T&E—Threatened and Endangered (Species)

TCE—Temporary Construction Easement

TIP—Transportation Improvement Program

Title 23—Title 23 United States Code. Highways

Title 30—Title 30 United States Code. Mineral Lands and Mining

Title 43—Title 43 United States Code, Public Lands: Interior

TUP—Temporary Use Permit

USDAFS—United States Department of Agriculture Forest Service (**USFS**)

VER—Valid Existing Rights

APPENDIX B: GLOSSARY OF TERMS**Abandonment—**

As defined by ADOT: To convey R/W to another governmental agency.

As defined by FHWA: To relinquish public interest in existing R/W with no intent to reclaim or reuse for R/W purposes (an action which ADOT calls “vacate and extinguishment” for public lands or “vacate and extinguishment” for private lands).

As defined by BLM: Abandonment of the site by the authorized user without official notification.

As defined by USFS: A change in Transportation Facility Jurisdiction to another governmental entity.

Abandonment to a public authority would necessitate fulfillment of requirements set forth in the Letter of Consent.

Access—The right of a traveler (vehicle, bicycle, pedestrian, etc.) to ingress to and egress from a highway corridor.

Access Control—The process of regulating ingress to or egress from the highway (i.e. Interstate Standard for Access).

Access Rights—

As defined by ADOT: The right of reasonable and adequate ingress and egress from a highway corridor to an adjoining property. This right is subordinate to public safety.

As defined by the USFS: A privilege or right of a person or entity to pass over or use another person’s or entity’s travel way. (36 CFR 212.1, FSM 5460.5-Rights of Way Acquisition, FSM 7700-Transportation System).

Acquisition—The process of taking possession of real property.

Aggradation—To fill and raise the level of the bed of a stream by deposition of sediment.

Appraisal—The act or process by which a qualified professional develops an opinion of value of a real property.

Appropriation—The act of acquiring Right-of-Way from BLM or USFS lands for transportation purposes.

As-Builts—The final set of ADOT construction plans generated upon completion of a project showing improvements as ultimately constructed.

Aspect—A position facing a particular direction; exposure.

Backslope—A cut slope (contrast to Foreslope).

Best Management Practice (BMP)—Any program, technology, process, siting criteria, operating method, measure or device that prevents, controls, removes or reduces pollution.

Bid Documents—Construction plans and specifications issued to contractors for the purpose of bidding.

Bifurcated Highway—A design in which the two directions of vehicular travel are separated so that each roadway can follow an independent path.

Borrow Site—A source of rock or soil material for use in construction.

Bridge—A structure, including support, erected over a depression or an obstruction and having a passageway for carrying traffic or other moving loads. A bridge has an opening measured along the center of the roadway of more than 25 feet between undercopings of abutments or springlines of arches,

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or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

Clear Zone—The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope (generally 4H:1V or flatter) and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry (*2006 AASHTO Roadside Design Guide*).

Colluvial—Soils that have been eroded and transported from their origin. A colluvial slope contains a mixture of soil and rock and may exhibit more stability than a soil slope.

Competent Rock—Unbroken hard rock that is native and is an undisturbed rock-mass condition typically with limited fractures.

Complex Slope Ratio—An engineered slope constructed of variable or multiple slope ratios (in contrast to a uniform slope ratio). Depending on soil type and design, slopes of this nature may be less prone to erosion.

Contractor Use Area—Staging area where contractor may store material and/or equipment. Contractor Use Areas are typically included in the contract documents so that they may be included in the environmental review process during design. These areas may or may not require reclamation (typically to include re-grading and seeding) at the conclusion of the project.

Controlled Access Highway—A highway, street or roadway to or from which owners or occupants of abutting lands and other persons have no legal right of access except at such points and in a manner determined by the public authority that has jurisdiction over the highway, street or roadway.

Controlled Blasting—The planned use of explosives and blasting accessories in carefully spaced and aligned drill holes, using different explosives and delays to produce specific, free surfaces or shear planes in the rock. Controlled blasting may result in visible drill hole scars, which require scaling to remove.

Construction Plans—Set of design plans and details intended for construction that form a part of the Bid Documents.

Conventional Highway—All highways and streets that are not freeways.

Cushion Blasting—A controlled blasting technique where drill holes are widely spaced, producing a finish rock face with a rougher finish than typically achieved with presplit blasting techniques.

Cut Slope—A slope that is excavated (contrast with Fill Slope).

Decking Area—A temporary log storage and staging area during tree clearing.

Decommission—Demolition, dismantling, removal, obliteration and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. Decommissioning includes applying various treatments, which may include one or more of the following:

- Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation.
- Blocking the entrance to a road; installing water bars.
- Removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed.
- Completely eliminating the roadbed by restoring natural contours and slopes.

Development Plan—Site management plan for material and waste sites.

Disposal—The conveyance of the State’s interest in real property determined to be in excess of State transportation needs.

Driver Expectancy Elements—The recurring elements along a roadway corridor (such as design speed, horizontal and vertical curves, clear zone width, shoulder and lane width, etc.) that might surprise a driver if a sudden exception occurred.

Easement—

As defined by ADOT: An interest in real property that conveys specific use, but not ownership rights, in another’s property. Easements can be permanent or temporary and utilized for such purposes as access, drainage, ponding or slope construction or for the highway corridor itself. A special-use authorization for a R/W that conveys a conditioned interest (stipulation) in National Forest System land.

As defined by USFS: An interest in land owned by another party that entitles the holder to a specific limited use or enjoyment. (FSM 5460.5).

Easement Deed— See HIGHWAY EASEMENT DEED

Embankment—Fill slope or elevated area created with fill or borrow material (contrast with Cut Slope).

Encroachment—An authorized or unauthorized physical feature that extends into the Right-of-Way and may connect with the roadway.

Environmental Analysis—An assessment of potential impacts resulting from all highway-related activities and including such considerations as existing land use, hazardous materials, air quality, noise abatement, sensitive or endangered species, historic sites, natural resources, visual resources, cultural resources and socio-economic issues.

Ephemeral Stream—A drainage that actively flows only in response to specific storms (contrast to perennial stream).

Extinguishment—

As defined by ADOT: The vacating of a transportation facility and dissolution of State interests in existing R/W that is held via easement on private property.

As defined by USFS: Depending on the situation, see either Road Decommissioning or Easement.

Federal Land Transfer—FHWA appropriation of lands from another federal agency (such as BLM or USFS).

Federal-Aid Highway—Highway corridors that are eligible for federal-aid funding such as interstates, primary, secondary and urban roads and off-system bridges.

Fines—Inorganic solid particles having a grain diameter smaller than 1/16 inch.

Fly Rock—Rock that is launched into the air by a blast. Elimination of fly rock is a goal of controlled blasting.

Form—The contour and structure of a visual element.

Foreslope—A fill slope (contrast to Backslope).

Freeway—A divided arterial highway on the interstate or primary system with full control of access and with grade separated intersections.

Gabion—A wire basket usually filled with stone that is used for erosion control and/or slope protection.

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Game Reflectors—Reflectors placed along a roadway at known wildlife movement areas to warn motorists.

Geotechnical Investigation—Investigation of soil and rock qualities to determine parameters for design of earth slopes, structural foundations and/or embankments

Hardscape—All structural elements that are not a part of the natural terrain such as, paving, sidewalks, guard rail, walls, drainage culverts, signs, etc.

Haul Road—Access road leading to an ADOT material site (not open to the public).

Highway Corridor—

A general location usually up to two miles in width, in which a roadway could potentially be planned or constructed.

OR

An existing public roadway and associated easement.

Highway Easement Deed—

The document issued by FHWA to ADOT for official conveyance of permanent Right-of-Way.

OR

Land set aside for construction, operation and maintenance (including future minor improvements) of a highway described by sidelines of variable width that are generally parallel to the road centerline and include construction limits as well as undisturbed land. Except for unusual circumstances, the sidelines of a variable width right-of-way should parallel the centerline and extend a minimum of 250 feet before changing width from centerline.

OR

The document executed by FHWA to ADOT for official conveyance of permanent Right of Way Easement (subject to a reversionary clause) for a transportation facility (both linear rights of way and material sites/ haul roads) exclusively utilized for a Federal-Aid Project. (For non-Federal-Aid Projects ADOT would go directly to the BLM or USFS for a Highway Easement Deed).

Hinge Point—The point at which the roadway grade meets the slope grade.

Interdisciplinary—A group of people from various professions including: engineering, biology, hydrology, landscape architecture, etc. An interdisciplinary approach to project design is used to define resource relationships and integrate procedural requirements.

Intermittent Stream—A natural drainage that flows sporadically throughout year.

Intermodal—Interaction or connection between or among more than one mode (of transportation).

Integrated Resource Management—A land management philosophy that recognizes that all natural resources are connected through an intricate series of interrelationships.

Laid Back Slope—A California slope. Also, a cut slope made flatter (less steep). Slopes may be laid back to generate additional embankment material, to improve aesthetics and/or to decrease erosion.

Letter of Consent—The document issued by BLM or USFS authorizing FHWA to appropriate public land for transfer to ADOT for construction of a highway corridor. The LOC grants ADOT immediate right of entry to commence construction activities in advance of actual HED conveyance.

Lifters—Horizontal holes drilled into rock for placement of explosives that “lift” the excavated material upon detonation.

Line—A visually continuous contour or edge of a form. A straight line usually has an unnatural appearance in the landscape.

Local Access Road—A highway or street, including National Forest roads, that serves primarily to provide access to adjacent land.

Maintenance—

As defined by ADOT: Includes but is not limited to grading, resurfacing, cleaning culverts, clearing roadside vegetation, bridge maintenance, surveying, striping, etc. Does not require a permit from the USFS if performed within the R/W.

As defined by USFS: The preservation of the entire highway, including surface, shoulders, roadsides, structures and such traffic-control devices as are necessary for its safe and efficient utilization. (USC: Title 23, Section 101(a)).

Materials—For purposes of this text, material includes borrow, sub-base and base materials and mineral aggregates used for concrete structures and for surfacing materials. If derived from on-site sources, materials are described in project documents.

Material Sources or Sites—Sites approved for excavation and removal of material to be used in the construction, maintenance and/or operation of an ADOT project.

Minor Drainage Structures (Minor Miscellaneous Structures)—All highway structures not defined as “bridges” are considered minor drainage structures or minor miscellaneous structures, retaining walls, etc. Reference is also made to the USFS Handbook, FSH7709.56b-Drainage Structures Handbook, where culverts are divided between major culverts and minor culverts.

Mitigate (Mitigation)—To reduce or eliminate adverse impacts.

National Environmental Policy Act—Provides for study and public review of environmental impacts caused by planned activities (such as highway corridor construction).

Non-Federal-Aid Highway—State roads that are the sole responsibility of the state and are not eligible for federal-aid funding.

Notice of Intent (NOI)—An application to notify the permitting authority (typically EPA or ADEQ) of a facility’s intention to be covered under a general permit allowing the discharge of storm water runoff from a highway construction site.

Notice of Termination (NOT)—An application to notify the permitting authority of a facility’s intent to terminate the NOI.

Operating Agreement—A documented agreement among BLM or USFS, FHWA and ADOT establishing procedures and supplementing the Memorandum of Understanding.

Oversight Agreement—An agreement between ADOT and FHWA regarding project Administrative Procedures for Federal Projects.

Ownership Record Sheet—A component of Right-of-Way plans; includes parcel-specific information (parcel number, owner name, legal description, total parcel size, existing Right-of-Way, new fee and easement Right-of-Way requirements).

Overburden— Soil or mixed soil and rock that overlies a proposed rock material source. The volume of overburden will affect the strength of a blast required to break up a given rock outcropping.

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Parcel—A piece of land in one ownership entity. ADOT assigns a Right-of-Way Parcel Number to each parcel to be acquired that is used throughout the acquisition process and also becomes a historical reference number.

PeCos System—Maintenance planning and accounting system utilized by ADOT.

Perennial stream—A natural drainage that carries live water throughout the year.

Permit—

As defined by ADOT: A written approval granted by the Department for construction of a fixed or temporary improvement within a state highway right-of-way, or an activity requiring the temporary use of or intrusion upon a state highway.

As defined by USFS: A written license or warrant used by one party to a second party granting the second party permission to do some act that is not forbidden by law without such license or warrant. A permit gives permission but does not vest a right. In some states a permit may become non-revocable after a statutory period of time.

Personal Property—Property that is not permanently attached to or part of the real property; property that can be moved.

Pit—See Material source

Plan of Operations—Short-term, individual project plan for the entry, removal or disposal of rock material.

Plating—Soil placed in designated areas for revegetation. May be composed of native or imported soil; may or may not meet topsoil specifications.

Presplitting—A method of blasting wherein drill holes are closely spaced, resulting in a desired final cut face. Drill hole scars typically remain visible in the rock face, creating an unnatural appearance. However, presplitting also typically produces safe rock cut slopes with minimal rockfall. Presplitting is recommended for slopes where the remaining drill scars are not visible from the road or other nearby viewpoints.

Prior Rights—The identification of utilities (public and private) that were in place prior to establishment of highway corridor. Utilities with no prior rights are present within the Right-of-Way by permit and must relocate at their own expense when necessary. ADOT is responsible for utility relocations when that utility has prior rights.

Production Blasting—Blasting typically used to break up large quantities of rock for excavation. Drill holes are widely spaced throughout the excavation area.

Project Contract Documents-- Construction drawings (plans), an invitation to bid, instructions to bidders, specifications and addenda issued to contractors for the purposes of preparing competitive or negotiated bids.

Project Implementation Process—An interdisciplinary approach to project design used by the USFS to adequately identify resource interrelationships, predict the effects of projects, and assure that planned projects are consistent with Forest Plans and other appropriate laws and regulations. An interdisciplinary approach identifies the resources involved, defines the resource interrelationships, and predicts the effects or impacts of the project.

Project Reference—An electronic, online document availability system covering documents throughout the life cycle (planning through maintenance) of an ADOT highway construction project. The BLM and USFS have access to all Project References for ADOT projects on the land they manage.

Public Authority—A Federal, State, County, Town or township, Indian tribe, municipal or other local government or instrumentality thereof, with authority to finance, build, operate or maintain toll or toll-free highway facilities.

Pullout—An additional lane or area designated for slow vehicles to temporarily pull over allowing faster traffic to pass.

Quarry—A source for rock material, typically requiring blasting and manufacturing (crushing, screening, blending, etc.) prior to utilization.

Ravel—Erosion due to storm water runoff across the face of a cut slope.

Real Property—Land and any improvements affixed thereto, including (but not limited to) fee interests, easements, air or access rights and the rights to control use, leasehold and leased fee interests.

Realty Permits—A generic term used to refer collectively to the various types of land use authorizations (temporary use permits, Rights-of-Way, 2920 permits, etc.) issued by BLM allowing use of BLM-managed surface estate.

Reclamation—Those actions performed during or after soil disturbing activities to shape, stabilize, revegetate, or otherwise treat the affected lands in order to achieve a safe and ecologically stable condition.

Rehabilitation—The restoration of a disturbed area to a condition similar to its original condition (also see Reclamation).

Relinquishment—

As defined by ADOT: The vacating of a transportation facility and return of acquired property to state or federal agencies.

As defined by FHWA: The conveyance of Right-of-Way to another public agency for continued use as a transportation facility (ADOT defines this action as “abandonment”).

As defined by BLM: The voluntary discontinuation of an authorized use.

As defined by USFS: The fulfillment of requirements set forth in the Letter of Consent and/or road decommissioning.

Resource Protection Need—A requirement that addresses a threat or risk of damage, obstruction, or negative impact to a natural resource.

Right-of-Way—

As defined by ADOT: Right-of-Way consists of real property and rights therein used for the construction, operation or maintenance of a transportation or related facility.

As defined by USFS: Land to be used or occupied for the construction, operation, maintenance and termination of a project or facility passing over, upon, under or through such land (36 CFR 251.51).

Right-of-Way Plans—Engineer drawings that delineate the Right-of-Way requirements (both existing and proposed) for a highway corridor project. Right-of-Way plans differ from construction plans in that they are primarily concerned with Right-of-Way issues and show such features as parcel ownership limits and existing improvements. Right-of-Way plans are typically developed concurrently with the construction/ design plans.

Riparian—Pertaining to an area influenced by a natural course of water.

Riparian Area—The vegetation and habitat associated with natural drainages. Especially in arid

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environments, riparian areas typically contain higher diversities of both flora and fauna and therefore, are of high natural resource value. Riparian areas may or may not contain perennial streams; in other words, natural drainages associated with ephemeral streams may be described as riparian areas.

Ripping—Roughening of a soil slope with equipment to a depth specified.

Riprap—Sized rock specified by class (representing a range of sizes by volume and weight) used to control erosion.

Roadside Barrier—A protective device intended to reduce the severity of highway accidents by preventing errant vehicles from entering hazardous areas and by redirecting an errant vehicle parallel to the direction of travel while holding the deceleration rate to a tolerable level.

Rockfall—Loosening and fall of rock from cut slopes onto the roadway area.

Rounded Slope—A cut slope the top of which is smoothed over to blend more naturally with the existing undisturbed grade.

Route Continuity—See Driver Expectancy Elements.

Scale—A progressive classification of size.

Scaling—The removal of hazard rocks on roadway cut slopes; can be done with sprayed water, mechanically or manually.

Shy Distance—The distance from a perceived obstacle to which a driver will take evasive action.

Site—A location that is reserved for a specific use (such as, stockpile site, hot plant site).

Slash—Debris left from a timber harvest composed of branches, twigs and needles/leaves.

Sliver Cuts—Typically undesirable cuts of minimal depth that closely parallel the slope ratio of the existing slope from which it is excavated. Such slopes are typically allowed to remain as is in order to minimize disturbance.

Slope Ratio—Run:Rise (horizontal:vertical) ratio. For example, a 3:1 slope will rise one (1) foot for every three (3) feet of run.

Soffit Fill—A temporary fill constructed to serve as a form for structural concrete.

State Highway—The segments of state routes designated and accepted as state highways by the State Transportation Board.

State Route—Corridor locations that have been designated by the State Transportation Board as a location for the construction of a state highway.

Storm Water Pollution Prevention Plan (SWPPP)—Dynamic document beginning with an NOI and including all activities and BMPs through completion of construction to final stabilization and NOT.

Structure Identification—Procedures are established by the National Bridge Inspection Standards and refer to the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges prepared by the FHWA.

Surcharge—The additional loading of soil above natural ground level.

Temporary Construction Easement (TCE)— Easements that terminate upon completion of construction. TCE's fall into two general categories: Those that involve construction that benefit the property owner, such as improved access, utility reconnection or fence relocation; and those that are required by ADOT for the construction of a project.

Temporary Road—A road authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the forest transportation system and not necessary for long-term resource management.

Test Pit—An excavation from which material is obtained for geotechnical test purposes.

Texture—The grain or surface quality of a visual element.

Topsoil—Specified productive A-horizon soil for use in restoration projects; the upper layer of overburden; the nutritive soil layer.

Transportation Facility Jurisdiction—The legal right to control or regulate use of a transportation facility derived from fee title, an easement, an agreement, or other similar method. While jurisdiction requires authority, it does not necessarily reflect ownership.

Trimline—The desired final limit of disturbance of a new cut slope.

Turnout—An intersecting roadway.

Type 1 Roads—Conventional State highways.

Type 2 Roads—All highways, streets and roads, including national forest roads, that access conventional State highways; local access roads.

Unsuitable or Unusable Material—Soil or rock material that is not appropriate or needed for construction.

Utility Facility—Electric, water, gas, steam power or materials transmission or distribution system. Any communications system (including cable television). Any fixtures, equipment, transportation system or other property associated with the operation, maintenance or repair of any such system. May be publicly, privately or cooperatively owned.

Utility Relocation—The adjustment of a utility facility required by a highway improvement project, which may include the acquisition of additional Right-of-Way in order to remove and reinstall the displaced facility.

Vacate—The termination of ADOT's easement interest for an existing Right-of-Way. This action typically accompanies a relinquishment or extinguishment action. Vacation of a R/W back to the USFS necessitates fulfillment of requirements set forth in the Letter of Consent and road decommissioning.

Valid Existing Rights—The rights for use of BLM-managed lands, regardless of lack of written documentation for such rights. May be granted by Congress, Executive or Presidential proclamation, BLM, a previous land owner, another federal agency when the land was under their jurisdiction, mining claims properly filed under the General Mining Laws, etc. Federal RS-2477 - governs ADOT's activity under this definition - the test for "valid existing rights" for ADOT is to prove that existing roads are used for commerce or travel and BLM must concur.

Value Analysis—An independent review of a proposed design to determine if that design is meeting the

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project needs as economically as possible; required for all federal-aid projects estimated to cost more than \$20 million.

Value Engineering—A proposal submitted by the project contractor to the Engineer for modifying the plans, specifications, or other requirements of the contract for the sole purpose of reducing the total costs of construction without impairing in any manner the essential function or characteristics of the project.

Warping—Cut slope warping refers to a non-parallel cut slope. Fill slope warping refers to site specific steepening or flattening of fill slopes to create undulations, or to avoid significant resources near the toe of the fill. Major warping is achieved by excavating 20 to 40 feet back from the typical projected top/toe of slope to create variety in land form along a corridor. Minor warping is achieved by creating an irregular, jagged cut face, for added texture and shading.

Waste—Excess earth and/or rock

**APPENDIX C: MOU AMONG ADOT, FHWA AZ, AND THE
USDA FOREST SERVICE, SOUTHWESTERN REGION**

Appendix C consists of Sections I – X, Addendum Number 1 and Illustration 1: Highway Easement Deed.

Amended

MEMORANDUM OF UNDERSTANDING

AMONG

**THE ARIZONA DEPARTMENT OF TRANSPORTATION,
THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA DIVISION
AND THE USDA, FOREST SERVICE, SOUTHWESTERN REGION**

REGARDING

**THE CONSTRUCTION, OPERATION AND MAINTENANCE OF
HIGHWAYS IN ARIZONA CROSSING NATIONAL FOREST
SYSTEM LANDS**

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*PAGE NUMBERS CORRESPOND TO THE ORIGINAL DOCUMENT

AMENDED MEMORANDUM OF UNDERSTANDING
AMONG
THE ARIZONA DEPARTMENT OF TRANSPORTATION,
THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA DIVISION, AND
THE USDA, FOREST SERVICE, SOUTHWESTERN REGION

BACKGROUND

I. PURPOSE

This Amended Memorandum of Understanding (MOU) outlines policies and procedures for the Arizona Department of Transportation (ADOT), Arizona Division of Federal Highway Administration (FHWA), and the USDA, Forest Service, Southwestern Region, (Forest Service), to establish and improve cooperative working relationships specifically by:

- A. Developing a mutual understanding of the missions, goals, constraints and responsibilities of the Forest Service, ADOT and FHWA as they relate to ADOT Highways crossing National Forest System lands;
- B. Defining Forest Service, ADOT and FHWA organizational structures and identifying areas of cooperation to facilitate coordinated work efforts;
- C. Developing procedures and standardized methods for communication and coordination; and
- D. Minimizing duplication of work and streamlining work processes.

This MOU provides for a coordinated approach to accomplish National Forest System Land, (NFS) and Resource Management, transportation development and operation management in completing Forest Service, ADOT and FHWA goals and objectives. Such coordination is subject to the respective authorities of each agency, and is designed to reduce and, if possible, eliminate duplication of work; to establish procedures for streamlining work processes; to ensure each agency is provided sufficient lead time for proper sequential function; to make more efficient use of and share available resources; and to develop and execute action programs which maximize responsiveness to public needs and concerns. Such programs, projects and activities complement the agencies missions and are in the best interests of the public.

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II. AUTHORITY

The general authorities for this MOU include, but are not limited to, the following:

- A. Forest and Rangeland Renewable Resources Planning Act of 1974, as amended Secs. 6 and 15, 90 Stat. 2949, 2952, 2958 (16 U.S.C. 1604, 1613); and 5 U.S.C. 301, as amended.
- B. National Forest Management Act of 1976 as amended.
- C. 36 CFR Part 219 National Forest System Land Management Planning
- D. Various Federal Aid Highway Acts codified in 23 U.S.C.
- E. National Environmental Policy Act of 1969 (Pub.L. 91-190, 83 Stat. 852), as amended (42 U.S.C. 4321 et seq.).
- F. Title IV of the Intergovernmental Cooperation Act of 1968 (Pub. L. 90-577; 82 Stat. 1098), as amended (31 U.S.C. 6501 et seq.).
- G. Federal Grants and Cooperative Agreement Act of 1977 (Pub.L. 95-224; 92 Stat. 3), as amended (31 U.S.C. 6301 et seq.).
- H. Arizona Revised Statutes Sections 28-332 and 28-334.

Other authorities, and regulations for administering such authorities, if applicable, will be cited within the Guidelines for Highways on BLM and US Forest Service Lands in Arizona, ("Guidelines"). This MOU No. 06-MU-11031600-013, amends the MOU and supplements the National MOU dated August 20, 1998 between the United States Department of Agriculture, Forest Service, and the United States Department of Transportation, Federal Highway Administration.

III. ORGANIZATION AND WORK FLOW

Refer to the "Guidelines" description of each agency's organizational structure and a map depicting the geographic boundaries of each agency's organization. All parties to this MOU agree to utilize the "Guidelines" as a best practice approach to project delivery. Furthermore, all parties have the understanding the "Guidelines" may be modified / amended in the future without amending this MOU.

IV. AGENCY RESPONSIBILITIES

- A. FHWA is responsible for administration and management of the Federal-aid highway program, compliance with the National Environmental Policy Act (NEPA) consistent with 23 C.F.R. 771 and application for right-of-way appropriation consistent with 23 C.F.R. 710.601. FHWA is responsible for ensuring that the Highway Agent, when

designing and constructing a Title 23 highway will comply with the conditions set forth in the Letter of Consent.

- B. ADOT is responsible for the design, construction, operation, maintenance and management of the State highway system in Arizona and, as such, is the Highway Agent for the purposes of this MOU. The Highway Agent is the organization that undertakes the construction and/or maintenance of the highway facility.
- C. The Forest Service is responsible for the protection and multiple-use management of Forest Service lands and resources for the use and benefit of the public, and for integration of the development of State highway systems with Forest transportation systems needed to accomplish this purpose. The Forest Service, acting as the Agent for the FHWA, will be responsible for the monitoring and enforcement of the conditions set forth in the letter of consent, including written notification, to the Highway Agent, of violations of these conditions and any subsequent action necessary to enforce compliance of the conditions. If necessary, the Forest Service will request assistance from the FHWA.

V. OBJECTIVES

It is the objective of each party to cooperatively design and implement projects that promote transportation efficiency and safety, minimize impacts to the environment and integrate with Forest Service land management plans.

- A. It is the objective of the Forest Service, in collaboration with other Federal agencies, State Agencies, tribal governments and the public, to provide for the protection and multiple-use management of NFS lands and resources for the use and benefit of the public.
- B. It is the objective of ADOT to provide a safe and efficient transportation system, together with the means of revenue collection, licensing and safety programs, which meets the needs of the citizens and visitors to Arizona.
- C. It is the objective of the FHWA to provide leadership, expertise, resources, and information to improve the quality and safety of Arizona's highway system and intermodal connectors in cooperation with their partners, while protecting natural and cultural values.

VI. AREAS OF COOPERATION

The Forest Service, ADOT and FHWA recognize the need to work together to develop coordinated action plans; to establish procedures for timely disposition of issues or problems connected with the planning, scoping studies, design, construction, operation and maintenance of public road systems on NFS lands in the State of Arizona; and to achieve maximum efficiency from their respective agency funds and personnel. Therefore the parties hereto agree to:

- A. Develop a mutual understanding of each other's missions, goals and objectives.
- B. Develop effective communication by: 1) taking advantage of existing and new forums for issue identification; 2) defining and eliminating communication barriers; and 3) sharing information using appropriate communication vehicles, such as E-mail, video conferencing, annual meetings, etc.
- C. Achieve effective conflict resolution by: 1) developing and implementing a process for resolving conflicts (see Section VIII of this MOU); 2) maintaining a commitment to use the process developed; 3) honoring past commitments; 4) maintaining a solutions-oriented approach; and 5) recognizing the need for flexibility, especially to meet public safety needs.
- D. Streamline and improve timeliness of review processes by: 1) early involvement of all relevant parties through proactive participation; 2) effective and efficient use of expertise and resources; 3) striving for single points of contact; and 4) eliminating unnecessary paperwork and processing steps.
- E. Coordinate planning processes by: 1) holding, at a minimum, yearly coordination meetings; 2) integrating transportation needs with Forest Service Forest Plans; 3) using an interdisciplinary approach throughout all processes; and 4) developing, where possible, consensus on the environmental review process.
- F. Develop and maintain effective teamwork by: 1) undertaking additional training in team building and partnering; 2) striving for mutual respect; and 3) evaluating the resulting partnership on an annual basis.
- G. Adhere to the procedures for Easement Development as identified and attached hereto as Appendix A.
- H. Agree to utilize when applicable the Highway Easement Deed as identified and attached hereto as Appendix B.

In addition, the Forest Service, ADOT and FHWA agree to develop a programmatic approach to streamline interagency coordination of the NEPA process and reduce repetitive documentation for low impact projects.

VII. COORDINATION MEETINGS

The Forest Service, ADOT and FHWA agree to hold coordination meetings as follows:

- A. Local coordination meetings or contacts between each Forest Service Forest Supervisor's Office and corresponding ADOT Districts will be held as often as needed, but not less frequently than annually. Attending these meetings will be the Forest Land Staff Officers and appropriate Forest Service Ranger staffs, FHWA and ADOT District Engineers. The meetings will be scheduled by joint action of the Forest Engineer and ADOT District Engineers. Other groups, agencies and individuals, as deemed necessary or beneficial to the intent of the meeting, may be invited to attend. The purpose of these local meetings are:
 1. Share information and keep each other informed of progress on ongoing projects and the partnering effort, including developing action items.
 2. Review agency responsibilities, programs and priorities, including preliminary plans which may develop into future cooperative efforts.
 3. Identify additional opportunities for improvement that may require the attention and/or support of the next level of management and/or should be included on the agenda for the State meeting.
 4. Work out exchanges of materials, workers or equipment on a temporary basis and on specific case related work areas where such an arrangement would be to the mutual benefit of the Forest Service, ADOT and FHWA. Any exchanges will require a separate written agreement.
- B. Coordinate ADOT highway maintenance activities with the local Forest Service District Ranger. A written annual maintenance plan shall be prepared by ADOT and submitted to the Forest Service to address items requiring Forest Service coordination and assistance such as additional clearing outside the original clearing limits, disposal of slough material, changes in road drainage patterns, material sources and storage, rock scaling and similar actions. The Forest Service shall review and comment on the plan within three (3) weeks of receipt from ADOT. Areas of concern should be jointly reviewed.
- C. Emphasize the importance of cooperation and the timely resolution of issues and jointly agree to participate in "partnering". Partnering is a process for improving communications, encouraging cooperation, assisting decision making and developing and sustaining a level of trust among the partners. It is also agreed that Forest Service representatives shall attend ADOT sponsored partnering meetings for highway design and construction projects on NFS lands.
 1. The identification and protection of historic properties is the responsibility of our combined agencies. The National Historic Preservation Act Part 800 Protection of Historic Properties Section 106 purpose is to evaluate the effects of any federal undertaking on cultural

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resources as early in the NEPA process as possible. A historic property evaluation and/or study(s) must be completed for the proposed project and submitted to the State Historic Preservation Officer (SHPO) for review and concurrence. Historic resources and any potential impact to them must be identified.

FHWA is the lead Federal Agency for this requirement and customarily designates this responsibility to ADOT but may also designate it to the Forest Service. At the initiation of a Federal-aid project on Forest Service lands, Forest Service, ADOT and FHWA agree to hold a partnering meeting to adopt a process to comply with this Federal requirement.

Listed below are the goals of the partnering meeting regarding historic property issues:

- I. FHWA will assign the designee for Section 106 issues.
 - II. The Forest Service, ADOT and FHWA will jointly develop a scope of work for the project.
 - III. The Forest Service, ADOT and FHWA will agree to jointly review all relevant work products produced.
 - IV. The Forest Service, ADOT and FHWA will establish an escalation chart for the resolution of issues similar to the one in Section VIII of this MOU.
 - V. The Forest Service, ADOT and FHWA will produce a project schedule. The schedule will require project milestones and review timelines.
 - VI. The Forest Service, ADOT and FHWA will agree to meet these project milestones and deadlines established.
- D. Statewide meetings as necessary, but not less frequently than annually, and preferably after concluding all the local meetings, will be scheduled by joint action of the Forest Service Regional Engineer, ADOT State Engineer, and FHWA Division Administrator or their respective designees. Agenda items and participants will be discussed as needed before the meeting. Three meetings shall be held among ADOT, FHWA and Forest Service each year: Forest Highways Meeting to discuss the Public Lands Highway (PLH) Program and the State Five-Year Highway Construction Programs, the Annual Invasive Species / Herbicide Group Coordination Meeting and the Annual Forest Service, ADOT and FHWA meeting. The purpose of the State meetings are:
1. Discuss each agency's short and long range plans, annual work plans, and programming processes to provide adequate time for submission of budget requests to ensure simultaneous scheduling of programs and completion of scheduled work.

2. Develop and maintain procedures designed to coordinate Forest Service, ADOT and FHWA work on a statewide basis.
3. Review priorities and designate critical functional and/or geographical areas.
4. Conduct joint evaluations of the coordination efforts and review of plans and/or completed work.

VIII. CONFLICT RESOLUTION

The Administrative Disputes Resolution Act (5 U.S.C. 581-591), specifically authorizes and encourages Federal agencies to use alternative means of dispute resolution, including mediation, conciliation, and arbitration in lieu of adjudication. All parties hereto agree to work cooperatively to minimize conflicts in implementation of this MOU. Where an impasse has been reached, each party agrees to involve relevant agency management as necessary to resolve the conflict as quickly as possible. Final resolution of any continuing impasse will be a matter for determination by the Forest Service Regional Forester, ADOT Transportation Director, and FHWA Division Administrator or their respective designees.

- A. If an impasse arises, it shall be escalated as follows:

<u>FOREST SERVICE</u>	<u>ADOT PROGRAM DEVELOPMENT</u>	<u>ADOT CONSTRUCTION</u>	<u>ADOT MAINTENANCE</u>	<u>FHWA</u>
Ranger District Representative which is customarily delegated to the Project Engineer	Project Manager	Resident Engineer	District Maintenance Engineer/State Natural Resources Manager	Area Engineer or Right-of-Way Officer
Ranger District Representative which is customarily delegated to the Forest Engineer	Group Manager	District Engineer	District Engineer/State Maintenance Engineer	Senior Engineering Manager – Operations
Forest Supervisor	Deputy State Engineer, Development, and/or Operations or State Engineer	Deputy State Engineer, Operations or State Engineer	Deputy State Engineer, Operations, and/or State Engineer	Assistant Division Administrator
Regional Forester which is customarily delegated to the Regional Engineer	Transportation Director	Transportation Director	Transportation Director	Division Administrator

- B. When representatives at the lowest level for each party have reached an impasse and have agreed to escalate, a meeting date will be established within a time acceptable to all parties, but no more than five (5) working days. At that time, representatives from both levels will meet to discuss the issues related to the impasse and attempt resolution. If an agreement cannot be reached, then the issue will be escalated to the next level and a meeting date will be established within a time acceptable to all parties, but no more than five (5) working days. At that time, representatives from all three levels will meet to discuss the issues related to the impasse and attempt resolution. If an agreement cannot be reached, the issue will be escalated to the highest organizational level and a meeting date will be established

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within a time acceptable to all parties, but no more than five (5) working days. At that time, all parties at all levels will meet to resolve the issue.

- C. The parties hereto agree that any resolution to an impasse secured through the conflict resolution process set forth in this section shall be communicated in writing to all parties (with any communication including the technical, policy or business rationale for the resolution).

IX. ADMINISTRATION

- A. The US Federal government will be responsible for errors, omissions or negligence of its officers, employees or agents to the extent provided by Congress under the Federal Tort Claims Act, 28 U.S.C. 1346 (b) - 2041(b) as amended.
- B. All parties to this MOU shall comply with all Federal Statutes, including but not limited to those relating to nondiscrimination, employments and civil rights.
- C. This MOU is subject to all applicable Federal and State laws and regulations. Nothing in this MOU is intended to conflict with any Federal statute or regulation. If a conflict is determined to occur, applicable Federal statutes and regulations shall control.
- D. This MOU shall become effective upon signature by all parties and shall continue in effect unless and until it is terminated by written request of at least one of the parties hereto. This MOU shall terminate following the expiration of 30 days after written notice to the other parties of intent to terminate by any party.
- E. Modifications within the scope of the instrument shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed.
- F. This MOU is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between the parties to this MOU will be handled in accordance with applicable laws, regulations, and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority.
- G. Any information furnished to the Forest Service under this MOU is subject to the Freedom of Information Act (5 U.S.C. 552).

H. Principal Contacts:

Program Contact	Agency
Steve Thomas, (602) 382-8976	FHWA, AZ Division
Marjorie Apodoca (505) 842-3852	USDA Forest Service
Mary Viparina, P.E., (602) 712-7707	ADOT

Administrative Contact	Agency
Steve Thomas, (602) 382-8976	FHWA, AZ Division
Carmen Melendez, (505) 842-3199	USDA Forest Service
Mary Viparina, P.E., (602) 712-7707	ADOT

- I. This instrument in no way restricts the Parties Hereto from participating in similar activities with other public or private agencies, organizations, and individuals.
- J. AUTHORIZED REPRESENTATIVES. By signature below, each party certifies that the individuals listed in this document as its representatives are authorized to act in their respective areas for matters related to this agreement.
- K. RESPONSIBILITIES OF PARTIES. The Forest Service, ADOT and FHWA and their respective agencies will handle their own activities and utilize their own resources, including the expenditure of their own funds, in pursuing these objectives. Each party will carry out its separate activities in a coordinated and mutually beneficial manner.

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X. SIGNATURES

In witness whereof, the parties hereto have executed this MOU as of the last date written below:

USDA, Forest Service, Southwestern Region
333 Broadway SE
Albuquerque, NM 87102

For 

Corbin Newman, Regional Forester, Region 3

Date 10/16/2008

Federal Highway Administration, Arizona Division
4000 North Central, Suite 1500
Phoenix, AZ 85012-1096



Robert E. Hollis, Arizona Division Administrator

Date 10/8/08

Arizona Department of Transportation
206 South 17th Avenue
Phoenix, AZ 85007



Victor Mendez, Director

Date 10/08/08

ADDENDUM NUMBER 1

**TO MEMORANDUM OF UNDERSTANDING
(MOU Number 06-MU-11031600-013) AMONG
THE ARIZONA DEPARTMENT OF TRANSPORTATION,
THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA DIVISION,
AND THE USDA, FOREST SERVICE, SOUTHWESTERN REGION
REGARDING THE CONSTRUCTION, OPERATION AND
MAINTENANCE OF HIGHWAYS IN ARIZONA
CROSSING NATIONAL FOREST SYSTEM LANDS**

C

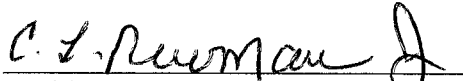
GUIDELINES

1. After receipt of written agreement from the Forest Service, ADOT will submit the appropriate Highway Easement Deed to FHWA for signature. (See Illustration 1 for the template deed). The template deed specified in Illustration 1 has been certified as legally sufficient by legal counsel for ADOT and FHWA, and such certification is on file at ADOT and the FHWA Arizona Division Office. This form deed may be augmented only by insertion of the ADOT project and parcel information, National Forest information, legal description, signatures and notarization information. Any other additions or modifications to these form deeds will require separate certifications of legal sufficiency by legal counsel for ADOT and FHWA.

2. After signature by FHWA, ADOT will cause the easement deed to be recorded in the appropriate county or counties and submit a copy of the recorded deed to the Forest Service Forest Supervisor and to the FHWA Realty Officer.

In witness whereof, the parties hereto have executed this Addendum as of the last date written below:

USDA, Forest Service, Southwestern Region
333 Broadway SE
Albuquerque, NM 87102



Corbin Newman, Regional Forester

Date August 26, 2008

Federal Highway Administration, Arizona Division
One Arizona Center
400 East Van Buren Street, Suite 410
Phoenix, AZ 85004-2285



Robert E. Hollis, Arizona Division Administrator

Date 8/28/08

Arizona Department of Transportation
206 South 17th Avenue
Phoenix, AZ 85007



Victor Mendez, Director

Date 09/02/08

+WHEN RECORDED RETURN TO
ARIZONA DEPARTMENT
OF TRANSPORTATION,
R/W OPERATIONS SEC. (612E)
205 S. 17TH AVENUE
PHOENIX, AZ 85007

PROJECT: «PROJECT»
«RW_No»
SECTION: «SECTION»
PARCEL: «PARCEL»
NFS: «FOREST»

EXEMPT PER A.R.S. 11-1134-A2

HIGHWAY EASEMENT DEED

THIS DEED is made this _____ day of _____, 20____, by and between the **UNITED STATES OF AMERICA**, acting by and through the **DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION**, hereinafter referred to as the **DEPARTMENT**, and the **STATE OF ARIZONA**, acting by and through its **DEPARTMENT OF TRANSPORTATION**, hereinafter referred to as the **GRANTEE**:

WITNESSETH:

WHEREAS, the **GRANTEE** has filed application under the provisions of the Act of Congress of August 27, 1958, as amended (*23 U.S.C. Section 317*) for the right-of-way of a highway over certain federal land under the jurisdiction of the Department of Agriculture - U.S. Forest Service in the State of Arizona; and

WHEREAS, the Arizona Division Administrator of the Federal Highway Administration, pursuant to delegation of authority from the Secretary of Transportation, has determined that an easement over the land covered by the application is reasonably necessary for a right-of-way for a highway in connection with the construction of Project «FedConst»; and

WHEREAS, the Department of Agriculture, acting by and through the U. S. Forest Service, in its consent to the appropriation of the federal land, has agreed to the transfer by the **DEPARTMENT** of an easement over the land to the **GRANTEE**; and

WHEREAS, the Arizona Department of Transportation, Arizona Division of the Federal Highway Administration and the U.S. Forest Service have entered into a Memorandum of Understanding, dated October 20, 2005, for which this deed form was developed.

C

GUIDELINES

PARCEL: «Parcel»

PAGE 2

NOW THEREFORE, the DEPARTMENT, as authorized by law, and in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, nondiscrimination in federally-assisted programs of the Department of Transportation (49 CFR 21.1 - 21.23) pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. Sections 2000d- 2000d-4), does hereby grant to the GRANTEE an easement for right-of-way for the construction, operation, and maintenance of a highway (including control of access thereto from adjoining lands, if a controlled access highway) and use of the space above and below the established grade line of the highway pavement for highway purposes on, over, across, in, and upon the following described federal land within the United States in the «Forest» National Forest, County of «County», State of Arizona, Gila and Salt River Meridian, Arizona:

<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Subdivision</u>
-----------------	--------------	----------------	--------------------

TABULAR LEGAL HERE

as shown on the right of way plans for Project «Project»/«RW_No»/«Section» on file in the Office of the State Engineer at Phoenix, Arizona.

Subject however, to the following terms and conditions:

1. This easement is subject to outstanding valid claims, if any, existing on the date of this grant, and the GRANTEE shall obtain permissions as may be necessary on account of any such claims;
2. The GRANTEE and the Forest Supervisor shall make determination as to the necessity for archaeological and paleontological reconnaissance and salvage within the right-of-way, and such reconnaissance and salvage to the extent determined necessary because of construction or reconstruction of the highway facility, is to be undertaken by the GRANTEE in compliance with the acts entitled “An Act for the Preservation of American Antiquities”, approved June 8, 1906 (34 Stat. 225, 16 U.S.C. 432-433), the National Historic Preservation Act of 1966 as amended through 2000 (16 U.S.C. 470 et seq), the Archaeological Resources Protection Act of 1979 (93 Stat. 721, 16 U.S.C. 470 aa et seq), the Native American Grave Protection and Repatriation Act approved November 16, 1990 (104 Stat. 3048, 25 U.S.C. 3002(d):43 CFR Part 10.4), and State laws where applicable.

PARCEL:

«Parcel»

PAGE 3

3. The easement herein granted shall terminate twenty (20) years from the date of the execution of this deed by the United States of America in the event construction of a highway on the right-of-way is not started during such twenty-year-period.
4. The easement herein granted is limited to use of the described right-of-way and the space above and below the established grade line of the highway for the purposes of construction, reconstruction, maintenance, and operation of the highway in accordance with the approved plans, as identified at the end of the property description above and does not include the grant of any rights for non-highway purposes or facilities:

Provided, that the right of the Forest Service to use or authorize the use of any portion of the right-of-way for non-highway purposes shall not be exercised when such use would be inconsistent with the provisions of Title 23 of the United States Code and of the Federal Highway Administration regulations issued pursuant thereto or would interfere with the free flow of traffic or impair the full use and safety of the highway, and, in any case, the GRANTEE and the Federal Highway Administration shall be consulted prior to the exercise of such rights;

Provided further, that the Forest Service may locate National Forest and other Department of Agriculture information signs on the portions of the right-of-way outside of construction clearing limits; and

All signing within the right-of-way, except temporary emergency fire suppression signing, will be approved by the GRANTEE and compliant with the Manual on Uniform Traffic Control Devices (MUTCD), where applicable.

5. The design, construction, operation, and maintenance of highways situated on this right-of-way will be in accordance with the provisions of Title 23, United States Code (USC)—Highways, and amendments; the regulations contained in Title 23, Code of Federal Regulations (CFR)—Highways and amendments; Section 4 (f) of the United State Department of Transportation Act, codified in both Title 23 U.S.C. §138 and Title 49 U.S.C. §303 the provisions of the Federal-Aid Policy Guide; the construction specifications of the State highway department as approved by the Federal Highway Administration for use on Federal-aid projects, the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Division of the Federal Highway Administration and the Forest Service, dated October 20, 2005, including any amendments, supplements or modifications thereto, and any other federal and state laws that are applicable or may become applicable.

The Forest Supervisor will be provided an opportunity to review plans relative to effects, if any, that the project works as planned will have upon adequate protection and utilization of the land traversed by the right-of-way and adjoining land under the administration of the Forest Service for the purposes for which such land is being administered. Those features of design, construction, and maintenance of the highway facility and of use of the right-of-way that would have effect on the protection and utilization of the land under the administration of the Forest Service are to be

mutually agreed upon by the Forest Supervisor and the **GRANTEE** by conference or other communication during the preparation of the plans and specifications for each construction project, and the plans shall be revised, modified, or supplemented to meet the approval of the Forest Supervisor, or when deemed appropriate, supplemented by written stipulation between the Forest Supervisor and the **GRANTEE**, prior to the start of construction.

The final design and construction specifications for any highway construction project on the right-of-way shall be presented to the Forest Supervisor for approval; construction or reconstruction shall not begin until such approval is given: Provided, that if it is subsequently deemed necessary that the approved plans, specifications or stipulations be amended or supplemented, any amendment or supplement shall be approved by the Forest Supervisor and the **GRANTEE** before construction or reconstruction begins.

6. Consistent with highway safety standards, **GRANTEE** shall;
 - a. protect and preserve soil and vegetative cover and scenic and esthetic values on the right-of-way outside of construction limits;
 - b. provide for the prevention and control of soil erosion within the right-of-way and adjacent lands that might be affected by the construction, operation, or maintenance of the highway;
 - c. vegetate and keep vegetated with suitable species all earth cut or fill slopes feasible for revegetation or other areas on which ground cover is destroyed where it is deemed necessary during a joint review between the Forest Supervisor and the **GRANTEE** prior to completion of the highway;
 - d. maintain all terracing, water bars, leadoff ditches, or other preventive works that may be required to protect adjacent National Forest System lands. This provision shall also apply to slopes that are reshaped following slides which occur during or after construction.
7. The **GRANTEE** shall not establish the following within the right-of-way, unless shown on approved construction plans, without first obtaining approval of the Forest Supervisor: borrow, sand, or gravel pits; stone quarries, permanent storage areas; sites for highway operation and maintenance facilities, camps, supply depots, or disposal areas.
8. The **GRANTEE** may maintain the right-of-way clearing by means of chemicals only IF the Forest Supervisor has given specific written approval. Application for such approval must be in writing and must specify the time, method, chemicals, and the exact portion of the right-of-way to be chemically treated.
9. The **GRANTEE** may remove mineral material and vegetation as necessary for the construction, maintenance, and safe operation of the highway subject to the following:

PARCEL: «Parcel»

PAGE 5

- a. the Forest Service will retain the right to any merchantable timber within the boundaries of the appropriation. The **GRANTEE** shall notify the Forest Service when timber is scheduled to be removed. The Forest Service will determine what method of sale or storage of the timber shall be utilized;
 - b. the Forest Service will retain the right to any mineral materials within the boundaries of the appropriation. The **GRANTEE** shall notify the Forest Service when mineral material is scheduled for removal and use within or disposal outside the appropriation area. The Forest Service will determine if the material has value and what method shall be utilized to recover any such value for the United States.
10. Upon termination of this easement, the **GRANTEE** shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the Forest Supervisor, unless an alternative agreement is reached by both parties and documented in writing. If the **GRANTEE**, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the Forest Supervisor may order the removal and disposal of any improvements and restore the area at **GRANTEE'S** expense.
 11. When need for the easement herein granted shall no longer exist and the area has been reasonably rehabilitated to protect the public and environment, the **GRANTEE** shall give notice of that fact to the **DEPARTMENT** and the Forest Service and the rights herein granted shall terminate and the land shall revert immediately to the full control of the Forest Service or assigns.
 12. The **GRANTEE**, in consideration of the conveyance of said land, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that:
 - a. no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed;
 - b. the **GRANTEE** shall use said land so conveyed in compliance with all requirements imposed by or pursuant to Title 49, Transportation, subtitled A, Part 21, Code of Federal Regulations (49 CFR §21.1 to §21.23), pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §2000d to §2000d-4).
 13. In the event of breach of any of the above mentioned nondiscrimination conditions, the **DEPARTMENT** shall have the right to re-enter said land and facilities on said land, and the above-described land and facilities shall thereupon revert to the full control of the Forest Service or assigns.

C

GUIDELINES

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**APPENDIX D: MOU BETWEEN ADOT, FHWA AZ, AND
THE BUREAU OF LAND MANAGEMENT, AZ**

Appendix D consists of Sections I – X; Appendices A, B, C; Illustrations V, VI, VII; and the Glossary.



**MOU No. AZ-931-0309
AMENDMENT #4**

MEMORANDUM OF UNDERSTANDING

BETWEEN

**THE ARIZONA DEPARTMENT OF TRANSPORTATION,
THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA,
AND
THE BUREAU OF LAND MANAGEMENT, ARIZONA**

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE ARIZONA DEPARTMENT OF TRANSPORTATION,
THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA, AND
THE BUREAU OF LAND MANAGEMENT, ARIZONA

BACKGROUND

I. PURPOSE

This Memorandum of Understanding (MOU) outlines policies and procedures for the Arizona Department of Transportation (ADOT), Arizona Division of Federal Highway Administration (FHWA), and Arizona Bureau of Land Management (BLM) to establish and improve cooperative working relationships for implementing the BLM/FHWA Interagency Agreement Number AA-851-IA2-40 of July 27, 1982 (attached as Appendix A), specifically by:

- A. Developing a mutual understanding of the missions, goals, constraints and responsibilities of the BLM, ADOT and FHWA as they relate to land and resource management practices on public lands under or contiguous to ADOT highways; ADOT development and operation practices on highways located on public lands; and public lands needed for transportation purposes;
- B. Defining BLM, ADOT and FHWA organizational structures and identifying areas of cooperation to facilitate coordinated work efforts;
- C. Developing procedures and standardized methods for communication and coordination; and
- D. Minimizing duplication of work and streamlining work processes.

This MOU provides for a coordinated approach to accomplish land and resource management and transportation development and operation management in completing BLM, ADOT and FHWA goals and objectives. Such coordination is subject to the respective authorities of each agency, and is designed to reduce and, if possible, eliminate duplication of work; to establish procedures for streamlining work processes; to ensure each agency is provided sufficient lead time for proper sequential function; to make more efficient use of and share available resources; and to develop and execute action programs which maximize responsiveness to public needs and concerns.

II. AUTHORITY

The general authorities for this MOU include, but are not limited to, the following:

- A. Federal Land Policy and Management Act of 1976 (Pub.L. 94-579; 90 Stat. 2744), as amended (43 U.S.C. 1701 et seq.).
- B. Taylor Grazing Act of 1934 (Act of June 28, 1934; 48 Stat. 1269), as amended (43 U.S.C. 315).
- C. Various Federal Aid Highway Acts codified in 23 U.S.C.

- D. National Environmental Policy Act of 1969 (Pub.L. 91-190, 83 Stat. 852), as amended (42 U.S.C. 4321 et seq.).
- E. Title IV of the Intergovernmental Cooperation Act of 1968 (Pub. L. 90-577; 82 Stat. 1098), as amended (31 U.S.C. 6501 et seq.).
- F. Federal Grants and Cooperative Agreement Act of 1977 (Pub.L. 95-224; 92 Stat. 3), as amended (31 U.S.C. 6301 et seq.).
- G. Arizona Revised Statutes Sections 28-332 and 28-334.

Other authorities, and regulations for administering such authorities, if applicable, will be cited within the supplemental Operating Agreement attached as an Appendix to this MOU. This MOU provides an operating framework for the 1982 Interagency Agreement (AA 851-IA2-40) between BLM and FHWA, and all amendments, memoranda, and other supplements thereto; and such other State of Arizona and/or Federal legislation and regulations as may apply. This MOU supersedes former MOU No. "BLM-MOU-2800-AZ931-9702", dated May 2, 1997.

III. ORGANIZATION AND WORK FLOW

Refer to Appendix B for description of each agency's organizational structure and a map depicting the geographic boundaries of each agency's organization.

IV. AGENCY RESPONSIBILITIES

- A. FHWA is responsible for administration and management of the Federal-aid highway program and application for right-of-way appropriation consistent with 23 C.F.R. 710.601 Subpart F.
- B. ADOT is responsible for the design, construction and management of the highway system within Arizona for which it has responsibility.
- C. BLM is responsible for administration and management of certain public lands and interests in lands within Arizona.

V. OBJECTIVES

It is the objective of each party to cooperatively design and implement projects that promote transportation efficiency and safety, minimize impacts to the environment and are integrated to BLM land management plans.

- A. It is the objective of BLM, in collaboration with other Federal agencies, State Agencies, tribal governments and the public, to provide for a wide variety of public land uses without compromising the long-term health and diversity of the land and without sacrificing natural, cultural, and historical values.
- B. It is the objective of ADOT to provide a safe and efficient transportation system, together with the means of revenue collection, licensing and safety programs, which meets the needs of the citizens of Arizona.
- C. It is the objective of the FHWA to provide leadership, expertise, resources, and information to improve the quality and safety of Arizona's highway system and intermodal connectors in cooperation with their partners without sacrificing natural and cultural values.

AGREEMENT

VI. AREAS OF COOPERATION

The BLM, ADOT and FHWA recognize the need to work together to develop coordinated action plans; to establish procedures for timely disposition of issues or problems connected with the planning, scoping, environmental studies, design, construction and maintenance of public road systems on BLM-managed public lands in the State of Arizona; and to achieve maximum efficiency from their respective agency funds and personnel. Therefore the parties hereto agree to:

- A. Develop a mutual understanding of each other's missions, goals and objectives.
- B. Develop effective communication by: 1) taking advantage of existing and new forums for issue identification; 2) defining and eliminating communication barriers; and 3) sharing information using appropriate communication vehicles, such as E-mail, video conferencing, etc.
- C. Achieve effective conflict resolution by: 1) developing and implementing a process for resolving conflicts (see Section VIII of this MOU); 2) maintaining a commitment to use the process developed; 3) honoring past commitments; 4) maintaining a solutions-oriented approach; and 5) recognizing the need for flexibility, especially to meet the public safety needs.
- D. Streamline and improve timeliness of review processes by: 1) early involvement of all relevant parties through proactive participation; 2) pooling and sharing of expertise and resources; 3) striving for a single point of contact; 4) eliminating unnecessary paperwork and processing steps; and 5) removing, where feasible and appropriate, FHWA from routine right-of-way transactions.
- E. Coordinate planning processes by: 1) holding, at a minimum, yearly coordination meetings; 2) integrating transportation needs with BLM land use plans; 3) using an interdisciplinary approach throughout all processes; and 4) developing consensus on the environmental review process.
- F. Develop and maintain effective teamwork by: 1) undertaking additional training in team building and partnering; 2) striving for mutual respect; and 3) evaluating the resulting partnership on an annual basis.
- G. Follow the established roles, responsibilities and operating procedures as outlined in the Operating Agreement attached hereto as Appendix C.

In addition, the BLM, ADOT and FHWA agree to develop a programmatic approach to streamline interagency coordination of the NEPA process and reduce repetitive documentation for low impact projects.

VII. COORDINATION MEETINGS

The BLM, ADOT and FHWA agree to hold coordination meetings as follows:

- A. Local coordination meetings or contacts between each BLM Field Office and corresponding ADOT Districts will be held as often as needed, but not less frequently than annually. Attending these meetings will be the BLM Field Manager, FHWA and ADOT District Engineers, and appropriate staffs. The meetings will be scheduled by joint action of the BLM Field Managers and ADOT District Engineers. Other groups, agencies and individuals, as deemed necessary or beneficial to the intent of the meeting, may be invited to attend. The purpose of these local meetings is to:
1. Share information and keep each other informed of progress on ongoing projects and the partnering effort, including developing action items.
 2. Review agency responsibilities, programs and priorities, including preliminary plans which may develop into future cooperative efforts.
 3. Identify additional opportunities for improvement that may require the attention and/or support of the next level of management and/or should be included on the agenda for the State meeting.
 4. Work out exchanges of materials, workers or equipment on a temporary basis and on specific case related work areas where such an arrangement would be to the mutual benefit of the BLM, ADOT and FHWA.
- B. Statewide meetings as necessary, but not less frequently than annually, and preferably after concluding all the local meetings, will be scheduled by joint action of the BLM State Director, ADOT State Engineer, and FHWA Division Administrator or their respective designees. Agenda items and participants will be discussed as needed before the meeting. The purposes of the State meetings are to:
1. Discuss each agency's short and long range plans, annual work plans, and programming processes to provide adequate time for submission of budget requests to ensure simultaneous scheduling of programs and completion of scheduled work.
 2. Develop and maintain procedures designed to coordinate BLM, ADOT and FHWA work on a statewide basis.
 3. Review priorities and designate critical functional and/or geographical areas.
 4. Conduct joint evaluations of the coordination efforts and review of plans and/or completed work.

VIII. CONFLICT RESOLUTION

All parties hereto agree to work cooperatively to minimize conflicts in implementation of this MOU. Where an impasse has been reached, each party agrees to involve relevant agency management as necessary to resolve the conflict as quickly as possible. Final resolution of any continuing impasse will be a matter for determination by the State Director, BLM, Arizona State Office; Director, ADOT; and Division Administrator, FHWA, or their respective designees.

A. If an impasse remains, it shall be escalated as follows:

<u>BLM</u>	<u>ADOT PROGRAM DEVELOPMENT</u>	<u>ADOT CONSTRUCTION</u>	<u>ADOT MAINTENANCE</u>	<u>FHWA</u>
Project Manager	Project Manager	Resident Engineer	District Maintenance Engineer/State Natural Resources Manager	Area Engineer or Right-of-Way Officer
Field Manager & District Manager	Group Manager	District Engineer	District Engineer/State Maintenance Engineer	Senior Engineering Manager-- Operations
Deputy State Director, Resources	Deputy State Engineer, Development and/or Operations or Development or State Engineer	Deputy State Engineer, Operations or State Engineer	Deputy State Engineer, Operations and/or State Engineer	Assistant Division Administrator
State Director	Director	Director	Director	Division Administrator

B. When the representatives at the lowest level for each party have reached an impasse and have agreed to escalate an impasse, a meeting date will be established within a time acceptable to all parties. At that time, representatives from both levels will meet to discuss the issues related to the impasse and attempt resolution. If an agreement cannot be reached, then the issue will be escalated to the next level and a meeting date will be established within a time acceptable to all parties. At that time, representatives from all three levels will meet to discuss the issues related to the impasse and attempt resolution. If an agreement cannot be reached, the issue will be escalated to the highest organizational level and a meeting date will be established within a time acceptable to all parties. At that time, all parties at all levels will meet to resolve the issue. If resolution cannot be secured, then at the option of any of the parties hereto, and pursuant to section IX.F. herein, this MOU may be terminated.

C. The parties hereto agree that any resolution to an impasse secured through the

conflict resolution process set forth in this section shall be communicated in writing to all parties (with any communication including the technical, policy or business rationale for the resolution).

IX. ADMINISTRATION

- A. Each party hereto shall fund any activities which it may undertake pursuant to this MOU, or may, on a voluntary basis, assist other parties in the implementation of this MOU. However, if the voluntary assistance identified herein involves a substantial commitment of personnel or other resources, the parties may enter into an appropriate interagency agreement. Nothing in this MOU shall be construed as obligating any of the parties to expend in excess of appropriations authorized by law and administratively allocated for the purposes set forth in this MOU.
- B. BLM and FHWA agree to assume liability for any act or omission of its officers, employees or agents only to the extent legally permissible under the Federal Tort Claims Act, 28 U.S.C. 2671 et seq.
- C. No member of, or delegate to, Congress shall be admitted to any share or part of this MOU, or to any benefit that may arise there from, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
- D. All parties to this MOU shall comply with all Federal Statutes, including but not limited to those relating to nondiscrimination, employments and civil rights.
- E. This MOU is subject to all applicable Federal and State laws and regulations. Nothing in this MOU is intended to conflict with any Federal statute or regulation. If a conflict is determined to occur, applicable Federal statutes and regulations shall control.
- F. This MOU shall become effective upon signature by all parties and shall continue in effect unless and until it is terminated by written request of at least one of the parties hereto. This MOU shall terminate following the expiration of 30 days after written notice to the other parties of intent to terminate by any party.
- G. This MOU may be amended as necessary by mutual consent of all parties upon issuance of written notification of such modification, signed and dated by all parties.

X. SIGNATURES

IN WITNESS WHEREOF, the parties hereto have caused Amendment #4 to be executed by the Director, Arizona Department of Transportation; the Division Administrator, Federal Highway Administration, Arizona; and the State Director, Bureau of Land Management, Arizona, effective the 19th day of November, 2008.

ARIZONA DEPARTMENT OF TRANSPORTATION

BY: *Victor Mendez*
Victor Mendez
Director

09/02/08
Date

FEDERAL HIGHWAY ADMINISTRATION, ARIZONA

BY: *Robert E. Hollis*
Robert E. Hollis
Arizona Division Administrator

8/25/08
Date

BUREAU OF LAND MANAGEMENT, ARIZONA

BY: *Elaine Y. Zielinski*
Elaine Y. Zielinski
State Director

8/28/08
Date

AA 851-1A2-40
INTERAGENCY AGREEMENT

Bureau of Land Management
and
Federal Highway Administration

I. Purpose. This Interagency Agreement provides procedures by which the Secretary of Transportation acting through the Federal Highway Administration (FHWA) may appropriate public lands for highway rights-of-way and sources of materials for the Federal-aid Highway System and those classes of highways provided for in Chapter 2, 23 U.S.C. The lands appropriated are for use by the States for highways and/or highway material purposes. The appropriation is subject to conditions the Secretary of the Interior acting through the Bureau of Land Management (BLM) may deem necessary for adequate protection and utilization of the public land and protection of the public interest.

II. Authority.

- A. The Federal Land Policy and Management Act of 1976, 90 Stat. 2766, 43 U.S.C. 1737.
- B. The Act of August 27, 1958, as amended, 23 U.S.C., Sections 107(d) and 317.

III. Procedures. BLM and FHWA recognize the need for streamlined procedures by which the FHWA may appropriate BLM-administered public lands for highway and highway materials for the Federal-aid System and those classes of highways provided for in Chapter 2, 23 U.S.C. To accelerate the appropriation process, FHWA and BLM agree to the following procedures:

- A. FHWA will notify BLM, as far in advance as possible, of any highway project being contemplated and arrange a meeting with the BLM authorized officer and the participating State agency to discuss the proposed project to ascertain whether or not the appropriation of the lands for highway or highway materials is consistent with BLM resource management programs and develop a plan of action to complete the appropriation within a reasonable time.
- B. It will be the responsibility of FHWA to comply with the National Environmental Policy Act and other legal requirements in arriving at its determination that the lands are necessary for the project.

Encl. 1-1

- C. FHWA shall submit to the authorized officer of BLM a written request for appropriation, accompanied by a map showing the location of lands it desires to appropriate, a statement of its determination that the lands are necessary for the project, a copy of the environmental assessment, and/or a copy of the environmental impact statement.
- D. The authorized officer of the BLM, after receipt of the request and attachments, shall review the material and, within a period of four months, notify FHWA, in writing, either (a) that the appropriation would be contrary to the public interest or inconsistent with the purposes for which the public lands or materials are being managed or (b) that BLM is in agreement with the appropriation subject to conditions of adequate protection and utilization of the public lands. If within a period of four months, the Bureau of Land Management has not responded, in writing, to the request for appropriation, such lands may be considered appropriated by FHWA and transferred to the State for right-of-way purposes as requested.
- E. Disagreement to the appropriation will be in the form of a letter, from BLM to FHWA, clearly stating the reasons why such an appropriation would be contrary to the public interest or inconsistent with the purposes for which the public lands or materials are being managed.
- F. Agreement to the appropriation will be in the form of a "Letter of Consent" which clearly states the conditions under which the agreement is given. These conditions involve the following:
1. Resolution of existing valid claims and use authorizations.
 2. Granting authority to FHWA within the appropriation is limited to rights-of-way for the Federal-aid Highway System and those classes of highways provided for in Chapter 2, 23 U.S.C.
 3. BLM retains the authority to grant additional right-of-way uses within and across the appropriated highway or material site right-of-way. Such additional uses include, but are not limited to, transportation and utility systems for water, power, communications, oil and gas, or any other facilities which are in the public interest, are not directly associated with highway use, operation and related highway purposes, and are not inconsistent with Title 23 of the U.S. Code. The FHWA shall be consulted prior to the issuance of such authorizations.

Encl. 1-2

4. The appropriation will automatically terminate if construction is not started within ten (10) years or sooner if agreed upon.
 5. Conditions providing for development and use of the adjacent public lands, such as, reasonable access and signing.
 6. Conditions protecting the adjacent public lands from right-of-way construction and maintenance activities which may cause off right-of-way adverse effects, such as, wildfire, chemical control of vegetation and animals, runoff drainage and revegetation with non-native species.
- G. FHWA, when transferring the highway right-of-way or highway material appropriation to the State will make it subject to BLM's conditions as contained in the "Letter of Consent". FHWA will administer these conditions. BLM will work with or through FHWA when they observe non-compliance to the appropriation "Letter of Consent" conditions.
- H. When the need for the appropriation no longer exists and the State has reasonably rehabilitated the area to protect the public and environment, FHWA will notify BLM in writing. Upon receipt of this notice and acceptance of the rehabilitation, the lands appropriated shall revert to the BLM.
- I. A copy of the right-of-way use document from FHWA to the respective State shall be furnished to the BLM authorized officer.
- J. Amendments to or modifications of this Interagency Agreement may be initiated by either party, but shall not become effective or binding until agreed upon by both parties.
- IV. Tenure. This document shall become effective upon the revocation of 43 CFR 2820-Roads and Highways and shall remain in effect unless terminated by mutual agreement or one agency after giving the other agency thirty (30) days prior written notice.

H ROBERT F. BURFORD
Director, Bureau of Land Management

S R.A. BARNHART
Administrator, Federal
Highway Administration

7-1-82

Date

7-27-82

Date

ORGANIZATION AND WORK FLOW

A. Bureau of Land Management

1. Arizona BLM organizational structure consists of three levels of line management—Field Managers, District Managers and the State Director. Decision-making authority for most actions occurring on public lands has been delegated to the respective Field Managers within the following seven Field Offices administering BLM public lands in Arizona:
 - a. Colorado River District
 - (1) Yuma Field Office – Yuma, Arizona
 - (2) Lake Havasu Field Office – Lake Havasu City, Arizona
 - (3) Kingman Field Office – Kingman, Arizona
 - b. Phoenix District
 - (1) Phoenix Field Office – Phoenix, Arizona
 - c. Arizona Strip District
 - (1) Arizona Strip Field Office – St. George, Utah
 - d. Gila District
 - (1) Tucson Field Office – Tucson, Arizona
 - (2) Safford Field Office – Safford, Arizona
2. Staff positions provide technical and administrative assistance and support to both levels of line management. One additional level of staff assistance is available at the BLM National applied Resource Science Center in Denver, Colorado.
3. BLM's customary internal workflow is from the technical staff specialist to the Field Manager and from the Field Manager to the State Director. Generally, on intergovernmental working relationships, the Field Managers and their staffs work with their local counterpart, and the State Director and his/her staff work with State and field offices.

B. Arizona Department of Transportation

1. ADOT operates under a centralized structure with the primary support offices in Phoenix. There are ten districts throughout the State as follows:

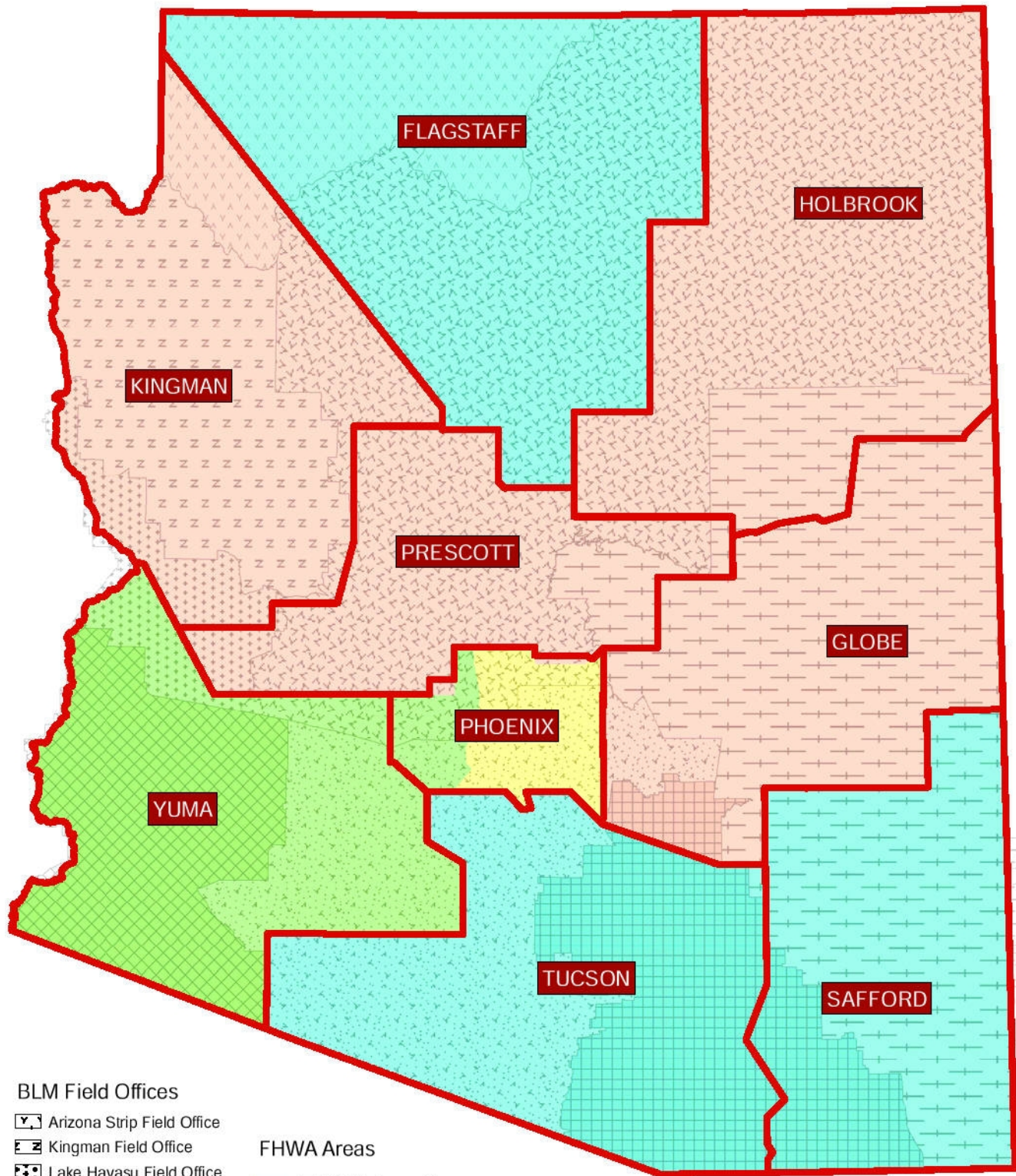
Kingman	Flagstaff
Globe	Holbrook
Yuma	Tucson
Safford	Phoenix Maintenance
Phoenix Construction	Prescott

2. Each District maintains the roadways within their District boundaries. Additionally, they support local customers by reviewing customer needs, concerns and opportunities. Each District has a support administration team, a construction team and a maintenance team.
3. The ADOT central office, located in Phoenix, provides the technical support for all of ADOT. This office provides engineering, right-of-way, environmental, project development, utility location and computer technical support.

C. Federal Highway Administration

1. The Arizona Division organizational structure consists of three levels of line management: District Engineer, Assistant District Administrator, Division Administrator.
2. The Division Office uses an Operations Team organizational structure. The leadership of the Operations Team is led by a District Engineer who has administrative authority statewide. The Team includes an Environmental Specialist with oversight responsibilities on environmental issues for the entire State and five Area Engineers with responsibilities as delineated in Paragraph 3 below.
3. Each Area Engineer has oversight responsibilities for project development, environment and project approvals. The Area Engineer designated A-1 is responsible for activities in ADOT's Phoenix (East/Central) District. The Area Engineer designated A-2 is responsible for activities in ADOT's Tucson, Flagstaff and Safford Districts. The Area Engineer designated A-4 is responsible for ADOT's Prescott, Globe, Holbrook and Kingman Districts. The Area Engineer designated A-5 is responsible for activities in ADOT's Phoenix (West) and Yuma Districts.
4. In addition, the Arizona Division has a Right-of-Way Officer responsible for right-of-way actions and issues for the entire State.

ADOT Engineering Districts, BLM Field Offices, and FHWA Boundaries



BLM Field Offices

- Arizona Strip Field Office
- Kingman Field Office
- Lake Havasu Field Office
- Lower Sonoran Field Office
- Phoenix Field Office
- Safford Field Office
- Tucson Field Office
- Yuma Field Office

FHWA Areas

- FHWA Area 1
- FHWA Area 2
- FHWA Area 3
- FHWA Area 4

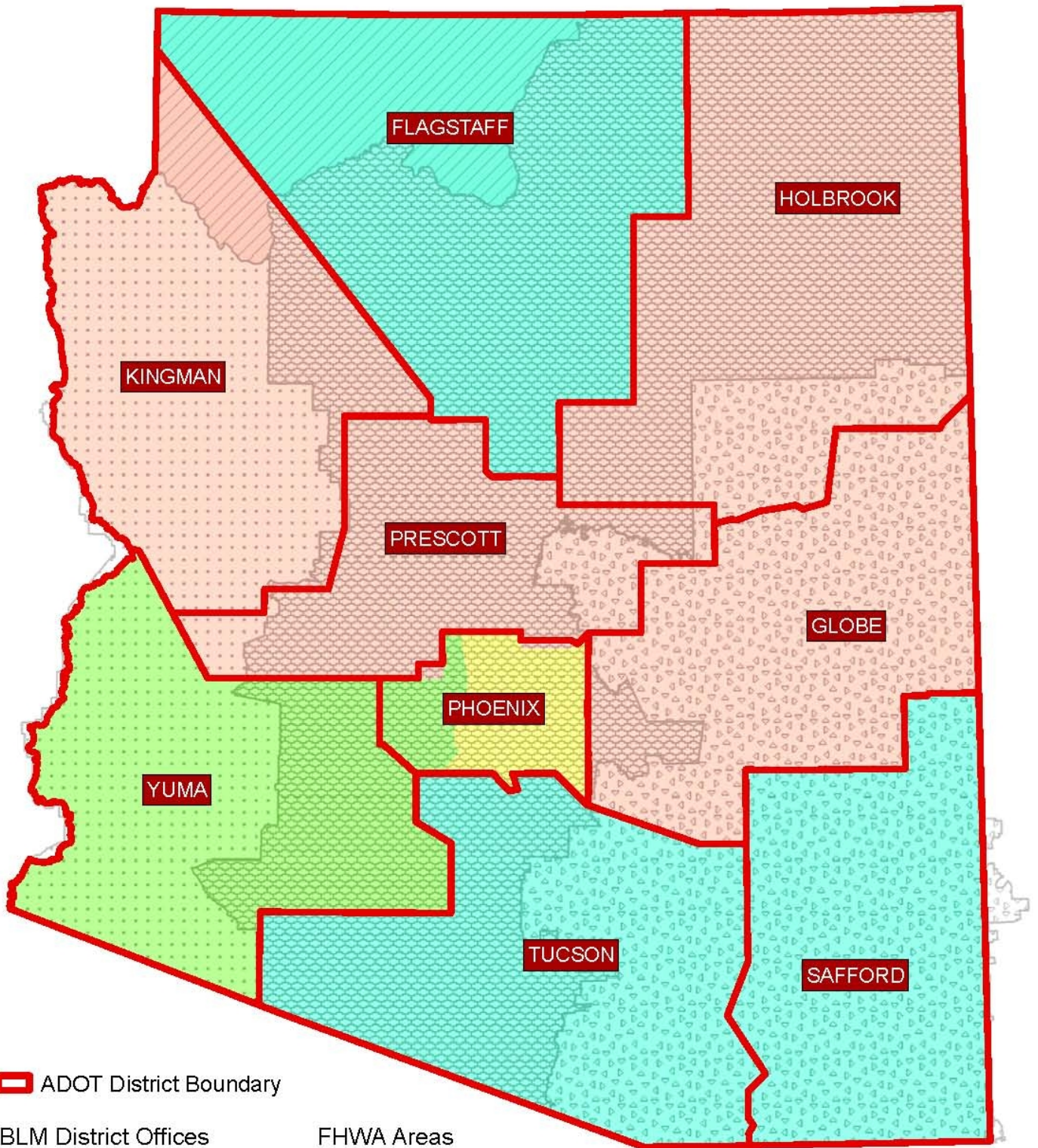
ADOT District Boundary

D-14



Prepared by:
 Arizona Department of Transportation
 Planning Division, Data Bureau GIS Section
 (602) 712-7333
 February, 2006

ADOT Engineering Districts, BLM District Offices, and FHWA Boundaries







 ADOT District Boundary

BLM District Offices

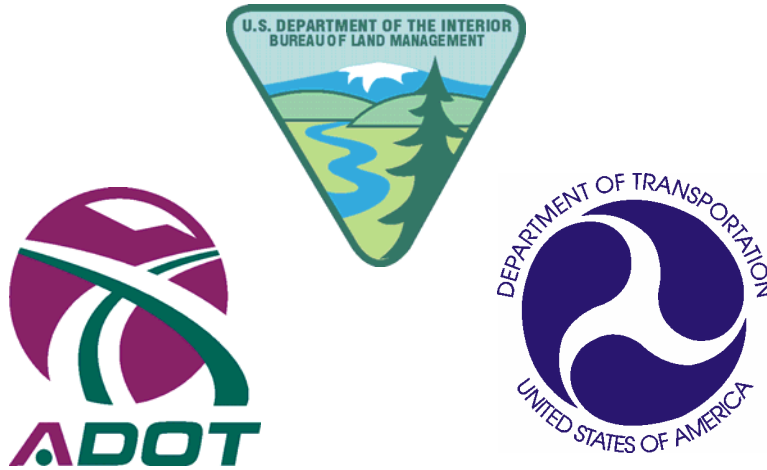
-  Arizona Strip District
-  Colorado River District
-  Gila District
-  Phoenix District

FHWA Areas

-  FHWA Area 1
-  FHWA Area 2
-  FHWA Area 3
-  FHWA Area 4



Prepared by:
 Arizona Department of Transportation
 Planning Division, Data Bureau GIS Section
 (602) 712-7333 February, 2006



APPENDIX C

OPERATING AGREEMENT

RELATED TO HIGHWAY PROJECTS

BETWEEN

THE BUREAU OF LAND MANAGEMENT, ARIZONA

THE ARIZONA DEPARTMENT OF TRANSPORTATION

AND

THE FEDERAL HIGHWAY ADMINISTRATION, ARIZONA

SUPPLEMENTING

MEMORANDUM OF UNDERSTANDING

NO. AZ-931-0309

→ Amendment #4

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COMMON ACRONYMS & ABBREVIATIONS AND GLOSSARY OF TERMS

OPERATING AGREEMENT Related to Highway Projects

BACKGROUND

I. HISTORY

In January 1997, Arizona Department of Transportation (ADOT), Bureau of Land Management (BLM), and Federal Highway Administration (FHWA) held a two-day partnering workshop to begin enhancing and streamlining coordination among the three agencies. A Partnering Charter was developed, and on May 2, 1997, a Memorandum of Understanding (MOU) between the three agencies became effective. The MOU was purposely written as a general “umbrella” agreement with the intent that one or more Operating Agreements would be developed to supplement the MOU. The original MOU has been revised and replaced by MOU No. AZ-931-0309 dated April 23, 2003.

II. PURPOSE

The purpose of this Operating Agreement is to supplement MOU No. AZ-931-0309 dated April 23, 2003, as amended September 10, 2004 and March 21, 2006, to establish roles, responsibilities, and operating procedures between ADOT, BLM and FHWA relating to highway projects on lands administered by BLM.

III. AUTHORITY

MOU No. AZ-931-0309 and authorities cited therein. BLM policy for implementing these authorities is contained in BLM Manual 2805 – Federal Agencies.

AGREEMENT

IV. RESPONSIBILITIES

- A. FHWA will be the lead federal agency with the responsibility to comply with the National Environmental Policy Act, as amended (NEPA), National Historic Preservation Act as amended (NHPA), Endangered Species Act as amended (ESA), and other legal requirements for all Title 23 transportation-related projects on land administered by BLM. FHWA will invite, in writing, BLM to be a cooperating agency.
- B. BLM will be the lead federal agency with the responsibility to comply with NEPA, NHPA, ESA, and other legal requirements for the development of all BLM land management plans and amendments and on transportation-related projects without FHWA involvement. BLM will invite, in writing, FHWA and ADOT to be cooperating agencies in developing and amending its land use plans. In the event of a project using Federal-aid funds on a non-transportation related project (i.e. some Transportation Enhancement projects), the BLM Field Office will contact FHWA to discuss the specific roles of each agency.
- C. ADOT will be co-lead agency and will serve as FHWA's agent in the project development process for Title 23 projects.

V. PLANNING AND IMPLEMENTATION

A. Introduction

It is the intent of the three agencies to coordinate early, consistently and throughout each agency's process. Agency processes and input points follow.

B. ADOT Process and BLM Input (*Illustration V-1*)

1. Long Range Planning

- a. ADOT Long Range Planning typically occurs 20 or more years prior to construction.
- b. ADOT Long Range Planning includes Regional Transportation Profiles, Small Area Transportation Studies, Multi-Modal Transportation Studies, Statewide Access Management Plan, Policy Issues, the Long Range Plan and the Five Year Program.
- c. The ADOT contact for Long Range Planning (except for the Five Year Program) is its State and Regional Planning Section Manager.
- d. The ADOT contact for the Five Year Program is its Priority Program Manager.
- e. If there will be an impact to the BLM, ADOT will invite the BLM to be a Technical Advisory Committee (TAC) Member.
- f. BLM input opportunities into the following ADOT Regional Transportation Profiles, Small Area Transportation Studies, Statewide Access Management Plan, Policy Issues and Long Range Plan include:
 - (1) Attend TAC Meetings.
 - (2) Attend Public Meetings.
 - (3) Review and comment on working papers.
 - (4) Review and comment on draft final report.
- g. Activities that occur during ADOT's Five Year Program process include:
 - (1) Rank projects to be scoped based on requests received from engineering districts. (This is an in-house TAC function).
 - (2) Rank scoped projects received from engineering districts. (This is an in-house TAC function).
 - (3) Select projects to be included in the Tentative Five Year Program. (This is an in-house TAC function).
 - (4) The State Transportation Board approves the Tentative Five Year Program.

- (5) ADOT holds Public Hearings on its Tentative Five Year Program.
 - (6) The State Transportation Board approves the Final Five Year Program.
 - (7) After the Final Five Year Program approval, the Three Year State Transportation Improvement Plan (STIP) is developed.
 - (8) Note: BLM's involvement in the Five Year Programming process is during the scoping and design phases of the project.
2. ADOT Project Development includes the following phases: Scoping, National Environmental Policy Act (NEPA) documentation, Design, Construction and Maintenance.
 3. Scoping Phase
 - a. ADOT's Scoping Phase typically occurs five to seven or more years prior to construction.
 - b. The BLM may provide input into ADOT's scoping document. Types of scoping documents include: Scoping Letter, Project Assessment, Feasibility/Corridor Study and Location/Design Concept Report.
 - c. The scoping process for either the Feasibility/Corridor Study or Location/Design Concept Report includes: Kick Off/Agency/Field Review, Initial Document, Draft Environmental Document, Final Environmental Document and Engineering Document.
 4. NEPA Documentation
 - a. ADOT's NEPA process begins during Scoping and continues through Stage V of Design.
 - b. The ADOT contact for NEPA is its Environmental and Enhancement Group Manager.
 - c. The BLM has the opportunity to:
 - (1) Be a Cooperating Agency during development of an Environmental Assessment (EA) or Environmental Impact Statement (EIS) and participate as a member of an Interdisciplinary (ID) Team throughout the duration of the process.
 - (2) Provide input on issues during agency scoping meetings and/or field reviews.
 - (3) Review and comment on the predraft EA or EIS during its 30 day period.
 - (4) Review and comment on the initial Design Concept Report (DCR) during its 30 day period.
 - (5) Comment on the Draft EA or EIS during the 30 day public comment period.

- (6) Review the Summary of Comments prepared for IDCR during its one week period.
- (7) Review the prefinal EA or EIS; Provide a letter supporting findings for inclusion in final NEPA document during the 30 day period.
- (8) Provide input during development and subsequent updates to NEPA documentation concurrent with all of V. B. 3, 4 and 5 herein.

5. Design Phase

- a. ADOT's Design Phase typically occurs 1 to 3 years prior to construction.
- b. The ADOT contact for the Design Phase is its Valley Group Manager (for Maricopa County) or its Statewide Manager (for other counties).
- c. The BLM has the opportunity to:
 - (1) Participate in the Design Kick Off Partnering Meeting, Field Review and General Plan Development.
 - (2) Receive key project documents through the Project Reference document distribution system concurrent with V. B. 5 and 6 herein.
 - (3) Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage I of the design. These may occur during scoping or design. These take the design to 15%.
 - (4) Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage II of the design. These take the design to 30%.
 - (5) Participate in the constructability review.
 - (6) Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage III of the design and participate in the field review. These take the design to 60%.
 - (7) Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage IV of the design. These take the design to 95%. All clearances are completed by the end of Stage IV.
- d. Following Stage IV of the design, the following occur:
 - (1) Stage V of the design produces Plans, Specifications and Estimate (PS&E).
 - (2) FHWA authorization.
 - (3) ADOT advertises the project.
 - (4) The State Transportation Board awards the project to the contractor.

6. Construction Phase

- a. The Construction Phase occurs subsequent to the award of contract by the State Transportation Board.
- b. The ADOT contact for the Construction Phase is its Construction State Engineer.
- c. The BLM has the opportunity to:
 - (1) Participate in the Construction Kick Off Partnering Workshop.
 - (2) Participate in creating the project Issue Resolution Ladder.
 - (3) Communicate regarding mobilization/ancillary facilities.
 - (4) Participate in the Field Inspection.
 - (5) Participate in Weekly Construction Meetings.
 - (6) Participate in Field Reviews.
 - (7) Participate in Partnering Refresher Workshops.
 - (8) Participate in Public Meetings.
 - (9) Participate in the Walk Through.
 - (10) Participate in the Partnering Close Out Workshop.
- d. Note: The permit process is ongoing throughout the entire ADOT process.
- e. Note: Paragraph V. B. outlines the process for ADOT's typical design-bid-build projects. In design-build projects and construction manager at risk projects, design and construction are intermingled.

7. Maintenance Phase

- a. The ADOT Maintenance Phase includes both natural resources and maintenance and is ongoing through the entire ADOT process.
- b. The ADOT contact for maintenance is its State Maintenance Engineer. The ADOT contact for natural resources is its Statewide Natural Resources Manager.
- c. The Maintenance Phase includes activities to operate and maintain the highway.
- d. Herbicide Use.
 - (1) ADOT is responsible for providing the motoring public with safe and aesthetically pleasing highway corridors. Accordingly, ADOT uses a variety of vegetation management techniques - mechanical, chemical, manual and cultural, in an intergraded approach to control hazardous vegetation and

noxious weeds along Arizona highways.

- (2) Herbicide use on lands managed by the BLM is regulated by NEPA guidelines for the BLM. Only those chemical herbicides approved for use on BLM managed lands will be considered by ADOT for use on roads crossing BLM managed lands.
- (3) The FHWA's role is to facilitate agreement between ADOT and BLM as needed.
- (4) ADOT, BLM and FHWA will meet once annually to coordinate herbicide vegetation management activities. The purpose of the meeting will be to identify issues and opportunities, plan vegetation control actions, and resolve potential difficulties and/or conflicts related to ADOT's vegetation management activities on roads crossing BLM managed lands. ADOT's Statewide Natural Resources Manager will contact BLM's State Invasive Species Coordinator and FHWA's Environmental Program Manager to schedule and plan this meeting.

8. Other Opportunities

The BLM also may provide input at State Transportation Board Meetings and at the Five Year Program Development/Public Hearings.

C. BLM Land Use Planning Process and ADOT/FHWA Input (*Illustration V-2*)

1. The BLM's Land Use Planning (LUP) process includes a Comprehensive Evaluation, development and approval of a Preparation Plan, issuance of a Notice of Intent (NOI) Federal Register (FR) Notice, Notice of Availability (NOA), Draft Resource Management Plan (RMP)/Draft Environmental Impact Statement (EIS) FR Notice, NOA Proposed RMP/Final EIS FR Notice and issuance of Approved RMP Record of Decision (ROD) FR Notice. The BLM will give ADOT and FHWA input into its LUP process as follows:
 2. Comprehensive Land Use Plan Evaluation
 - a. The BLM conducts a Comprehensive LUP Evaluation every three years.
 - b. The BLM will notify its partners (including ADOT and FHWA) that the BLM is about to conduct a Comprehensive LUP Evaluation. This also will be shown on the BLM's approved LUP.
 - c. The BLM's contact is its State Planning and NEPA Lead.
 - d. ADOT contacts are ADOT District Engineers, State Engineer, Deputy State Engineers, Director of Transportation Planning Division and Environmental & Enhancement Group Manager.
 - e. The FHWA contact is its Environmental Program Manager.
 - f. If the BLM's evaluation indicates that the LUP needs to be either amended or revised, then it moves on to the next phase, which is to develop and approve the

Preparation Plan. Otherwise, no action is required.

3. Develop and Approve Preparation Plan

ADOT, BLM and FHWA will follow their Agreement Number AZ-910-0417 (Memorandum of Understanding Between the Department of Interior, Bureau of Land Management, Arizona Office, All Arizona Field Offices and U.S. Department of Transportation, Federal Highway Administration, Arizona Division Office as a Cooperating Agency and The State of Arizona, Arizona Department of Transportation as a Cooperating Agency) in the development and approval of the Preparation Plan.

4. Issue Notice of Intent Federal Register Notice

ADOT and FHWA have an opportunity to contribute issues and concerns to be addressed in the LUP related to the NOI FR Notice during the following activities:

- a. Develop Scoping Report.
- b. Planning Criteria.
- c. Formulate Alternatives and develop Preferred Alternative.
- d. Describe Affected Environment.
- e. Assess and describe Impacts.

5. Notice of Availability Draft Resource Management Plan/Draft Environmental Impact Statement Federal Register Notice

ADOT and FHWA have an opportunity to contribute issues and concerns that need to be addressed in the LUP related to the NOA Draft RMP/Draft EIS during the following activities:

- a. Analyze Comments.
- b. Respond to Comments and Text Revisions.

6. Notice of Availability Proposed Resource Management Plan/Final Environmental Impact Statement Federal Register Notice

ADOT and FHWA have an opportunity to contribute issues and concerns to be addressed in the LUP related to the NOA Proposed RMP/Final EIS during the following activities:

- a. 30 Day Protest Period.
- b. 60 Day Governor's Consistency Review.

7. Issue Approved Resource Management Plan/Record of Decision Federal Register Notice

BLM will send ADOT and FHWA a copy of the approved RMP/ROD FR Notice. Then,

BLM's process moves to implementation.

D. BLM Project Implementation Process and ADOT/FHWA Input (*Illustration V-3*)

1. BLM's NEPA phases for project implementation are to determine the scope, conduct NEPA analysis, make the NEPA determination, document the decision and allow administrative review/appeal.
2. Phase 1: Determining the Scope
 - a. Categorical Exclusion Process
 - (1) ADOT and FHWA have an opportunity for input when the BLM fleshes out a brief description of the proposed project.
 - (2) The BLM determines whether a project is on the BLM or Department of Interior Categorical Exclusion List.
 - b. Determination of NEPA Adequacy
 - (1) ADOT and FHWA have an opportunity for input when the BLM fleshes out a brief description of the proposed project and identifies and lists other related NEPA documents.
 - (2) The BLM determines LUP conformance.
 - c. EA Level Analysis Process
 - (1) ADOT and FHWA have an opportunity for input when the BLM fleshes out a brief description of the proposed project, invites Cooperating Agencies and determines the scope of the EA level analysis.
 - (2) The BLM determines LUP conformance.
 - d. EIS Level Analysis Process
 - (1) ADOT and FHWA have an opportunity for input when the BLM fleshes out a brief description of the proposed project, invites Cooperating Agencies and during the public review and comment period.
 - (2) The BLM determines LUP conformance and publishes a NOI in the Federal Register. BLM allows a minimum 30 day public review and comment period.
3. Phase 2: Conducting NEPA Analysis
 - a. Categorical Exclusion Process

ADOT and FHWA have an opportunity for input when the BLM conducts an analysis to determine if any of the extraordinary circumstances apply to the project.
 - b. Determination of NEPA Adequacy Process

ADOT and FHWA have an opportunity for input when the BLM conducts an analysis using seven criteria for determining NEPA adequacy.

c. EA Level Analysis Process

- (1) ADOT and FHWA have an opportunity for input when the BLM prepares the EA.
- (2) Preparing the EA includes preparing the Need for the Proposal, Alternatives including the Proposed Action, site specific affected environment and a list of agencies and individuals committed.

d. EIS Level Analysis Process

- (1) ADOT and FHWA have an opportunity for input when the BLM prepares the draft EIS.
- (2) Preparing the EIS includes preparing the Purpose and Need Statement, Proposed Action and Alternatives including No Action, affected environment, environmental consequences, list of agencies and individuals to whom copies are sent, appendices, glossary and references cited.
- (3) The BLM publishes a Federal Register Notice of Availability for the draft EIS.
- (4) The BLM provides and ADOT and FHWA have an opportunity for input into the 60 day Review and Comment Period.

4. Phase 3: Making the NEPA Determination

a. Categorical Exclusion Process

The BLM responsible official makes the determination whether the proposal is categorically excluded and whether any additional NEPA analysis is needed.

b. Determination of NEPA Adequacy Process

The BLM responsible official makes the determination whether the existing NEPA analysis is adequate to implement the proposal.

c. EA Level Analysis Process

The BLM prepares the Finding of No Significant Impact (FONSI).

d. EIS Level Analysis Process

- (1) ADOT and FHWA have an opportunity for input when the BLM conducts analysis of public comments received, prepares responses to comments and prepares text changes.
- (2) The BLM publishes a Federal Register NOA for the Final EIS. This is followed by a 30 cooling off period.

5. Phase 4: Documenting Decision

a. Categorical Exclusion Process

The BLM responsible official makes the decision whether to implement the proposal.

b. Determination of NEPA Adequacy Process

The BLM responsible official makes the decision whether to implement the proposal.

c. EA Level Analysis Process

(1) The BLM responsible official makes the decision whether to implement the proposal.

(2) The BLM publishes a Decision Record (DR).

d. EIS Level Analysis Process

The BLM publishes a ROD.

6. Phase 5: Administrative Review/Appeal Process

For Phases 1 through 4 above, an administrative review/appeal process is provided. ADOT and FHWA have an opportunity for input during Phase 5.

VI. TITLE 23 PROJECTS

In this Operating Agreement, unless the context otherwise requires, “necessary environmental clearances” shall be understood as including compliance with the National Environmental Policy Act, Section 7 of the ESA, Section 106 of the NHPA, and all other pertinent and applicable Federal and State environmental protection laws.

A. Agency Roles

1. As the lead Federal agency for highway projects eligible for funding pursuant to 23 U.S.C. (Title 23), FHWA is ultimately responsible for compliance with NEPA and other necessary environmental clearances. No NEPA decision is required by the BLM for a Title 23 U.S.C. funded highway project unless the proposed action does not conform to BLM’s land use plan for the affected lands. BLM, as federal land manager on public lands, retains responsibility for enforcement of, and compliance with, the Native American Graves Protection and Repatriation Act (NAGPRA) and the Archaeological Resources Protection Act (ARPA). In situations where a land use plan amendment is required, the NEPA analysis and documentation must meet both FHWA and BLM regulatory standards.
2. Unless otherwise agreed, ADOT serves as agent for FHWA in meeting FHWA’s responsibility for NEPA and other necessary environmental clearances.

3. ADOT Environmental and Enhancement Group (EEG), or its designated consultant, will coordinate with the appropriate BLM Field Office(s) where BLM-managed lands needed for highway purposes are located during the various stages of a highway project.

B. Early Project Coordination

1. Early in the planning and NEPA stages of a Federal-aid-eligible highway project on BLM-managed lands, FHWA will send written notification of the project to all affected BLM Field Offices, with a copy to ADOT EEG: (1) inviting BLM to participate as a cooperating agency, (2) requesting that BLM identify known issues and concerns relating to protection of valid existing rights and resources on BLM-managed lands potentially affected by the project, and (3) requesting a determination whether the proposed project is in conformance with BLM land use plans.
2. BLM will provide a written response to FHWA, with a copy to ADOT EEG, in a timely manner, usually within 30 days after receipt of the notification, which:
 - a. acknowledges receipt of the notification;
 - b. verifies whether or not the proposal is in conformance with BLM land use plans;
 - c. states whether or not BLM will be a “cooperating agency with special expertise” or, in the case where a land use plan amendment is required, a “cooperating agency with jurisdiction;”
 - d. provides readily available information on wildlife, wildlife habitat, areas where threatened or endangered plant or animal species are known to occur, information on special status or sensitive species of plants or animals, special fencing needs, grazing, cultural resources, valid existing rights, etc.;
 - e. identifies any known unique or special conditions, based on knowledge of existing resources, including any anticipated special protective measures, which may be necessary;
 - f. provides the name, phone number and email address of the designated point of contact (BLM Project Manager); and
 - g. identifies the BLM Serial Number assigned to the project.
3. When more than one BLM Field Office will be affected by the proposed project, the BLM State Director will designate a Lead Office that will then assign a Project Manager. The BLM Project Manager will send written notification to FHWA, with a copy to ADOT, identifying which office is the BLM Lead Office.
4. The BLM Project Manager will coordinate with all other BLM Field Offices affected by the project and will provide consolidated responses to ADOT and FHWA on issues affecting BLM-managed lands throughout the life of the project.
5. The BLM Serial Number, the FHWA Project Number, and the ADOT TRACS Number(s) or Material Site Number will be referenced on all future correspondence relating to the project, whether correspondence is by formal letter, email, or fax transmittal.

C. Development of Environmental Document

1. Before any public/agency scoping meetings are held, BLM, FHWA, and ADOT will meet to identify the primary points of contact for each agency and determine members needed on the Inter-disciplinary (ID) Team. The ID Team will meet on a regular basis to discuss and resolve issues pertaining to (but not limited to) alternatives, methodology, potential mitigation, and levels of analysis. The ID Team will also develop a team partnering charter that identifies the roles and responsibilities of each member.
2. At the beginning of each ID Team meeting, the team will review, modify if necessary, and approve the minutes from the previous meeting. These minutes will serve as the documentation which demonstrates the issues on which the team has, or has not, reached consensus.
3. Every attempt will be made to resolve differences relating to measures BLM may feel are necessary for protection of adjacent BLM-managed lands and resources. If agreement cannot be reached at the lowest level of each organization, the dispute resolution process described in Section VIII of the MOU shall be followed.
4. BLM will have opportunity to formally review the NEPA and engineering documents and provide written comments to FHWA, with copies to ADOT EEG, within the following times (*Illustration V-1*):
 - a. Administrative draft of the Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS) - 30 to 45 days after receipt.
 - b. Initial Design Concept Report (DCR) - 30 to 45 days after receipt.
 - c. Draft EA or EIS during the public comment period - 30 days after receipt for an EA, and 45 days after receipt for an EIS.
 - d. Administrative final EA or EIS - 30 days after receipt.
5. The BLM Project Manager shall provide FHWA a letter, signed by the BLM Authorized Officer, supporting the findings for inclusion in the Final EA or EIS.
6. Field reviews may be scheduled by ADOT, their consultant, FHWA, or BLM. Review of project submissions, environmental documentation and participation in field reviews provides the opportunity for BLM to identify specific concerns relating to resource issues on BLM-managed lands throughout the entire NEPA process. This will ensure adequate time for all parties to discuss and come to resolution regarding specific mitigation measures to be implemented for the project.
7. ADOT and FHWA will mitigate highway construction impacts to resources on BLM-managed lands in a practical and reasonable manner. Proper highway design, including safety, is the responsibility of ADOT and FHWA. Where conflicts arise in selection of project design features, highway safety will be the overriding factor.
8. Special measures which BLM believes are necessary to protect BLM-managed lands adjacent to but outside the right-of-way will be discussed with the ID Team during the early consultation, environmental analysis, and throughout the design phases of the project. The BLM Project Manager will submit, in writing to ADOT with a copy to FHWA,

any special measures determined necessary for protection of BLM-managed lands or resources, along with a rationale for each measure identified. Upon agreement with such protective measures, ADOT will reply, in writing with a copy to FHWA, that such measures will be included in the project design. If ADOT disagrees with the identified measures, ADOT will provide a written response to BLM, with copy to FHWA, stating the rationale for not agreeing to inclusion of the measures in the project design. All such documentation will be included in the Project Reference (see Section D below).

D. Project Reference

Given increased environmental awareness, as well as federal and state government streamlining, the parties recognized the need for a new method of coordinating highway construction project activities. This resulted in the creation of the Project Reference (*Illustration VI-1*), a cooperative effort of the Arizona Department of Transportation and the Arizona offices of the Bureau of Land Management and the Federal Highway Administration.

ADOT management embraced the Project Reference concept and encouraged the continuing development of this system. In 2005, the Project Reference Subgroup was established to refine what began in 2001 as a hardcopy “document **distribution** system.” As a result of the efforts of this Subgroup, ADOT now has established an electronic, paperless Project Reference. This “document **availability** system” can be accessed directly through the ADOT Information Data Warehouse (AIDW). The Project Reference is “the way to do business” on all ADOT highway projects.

ADOT will create a Project Reference for all its highway projects which start design after July of 2007. Accordingly, each such project on BLM managed land will have a Project Reference.

The following information provides a brief overview of the Project Reference.

1. Definition:

The Project Reference is designed to:

- a. Provide ready access to key documents and information applicable to an ADOT project;
- b. Ensure that timely information is available to ADOT personnel and project stakeholders throughout the life of the project;
- c. Enhance project organization and teamwork;
- d. Provide an historical file for an individual project.

2. Benefits:

- a. The public benefits from better informed government staff with regard to highway projects.
- b. The system makes the most current information available to all ADOT personnel and stakeholders in a timely manner.

- c. Project documents are centrally located (in the AIDW) and easily accessible.
- d. The system reduces delay, confusion, misunderstanding and conflict.
- e. The system increases efficient use of time, contributes to clarity and understanding and engenders positive working relationships.
- f. The system enhances the project team members' ability to successfully understand and contribute to the project.

3. Contents:

Not all project-related information will be available when the Project Reference is created, and information will change as the project progresses through the design and implementation phases, each of which occur over a period of several years. When presented at the design kick off meeting, the Project Reference will consist of, at a minimum:

- a. Table of Contents;
- b. Purpose (Section 1.1 of the Project Reference);
- c. Project Design and Implementation (Section 1.2 of the Project Reference);
- d. Project Summary (Section 1.3 of the Project Reference);
- e. Available environmental information to include project specific mitigation measures;
- f. Copy of current Operating Agreement.

4. Implementation:

- a. Creating and contributing to the Project Reference will be a collective effort among the disciplines within ADOT and the project stakeholders. The system includes documents from all project phases ("cradle to grave"). These include Links to Planning and Long Range Plans, a Project Summary, Guiding Documents, Environmental Documents, Design Documents, Ancillary Permits and Agreements, Construction Documents and a Post-Construction Punch List.
- b. Project Reference electronic document compilation begins at the time an ADOT project tracking (TRACS) number is requested.
- c. Prior to construction, the ADOT Project Manager is responsible for overseeing the Project Reference.
- d. For projects where a Pre-Negotiation Partnering Meeting is held prior to beginning design, the ADOT Project Manager educates workshop participants about the Project Reference availability system.
- e. At the Design Kick Off Partnering Workshop, the ADOT Project Manager educates the participants about the value and use of the Project Reference and the importance of making the most current information available in a timely manner. The ADOT Project Manager identifies the ADOT disciplines responsible for system updates and assures that discipline representatives have received the proper training to check

documents into the AIDW. Project team members who wish to receive notification when new documents become available may indicate this on the workshop sign-in sheet or by a request to the Project Manager.

- f. Where documents are provided by project stakeholders other than ADOT personnel, those stakeholders give their documents to the ADOT Project Manager who checks those documents into the Project Reference.

Example: ADOT Environmental Planning Group is responsible for checking documents generated through the NEPA process into the Project Reference.

Example: BLM Field Office Representative is responsible for providing baseline information, i.e. information related to valid existing rights such as mining claims, mineral leases and permits, rights-of-way, grazing leases, known locations of habitats for sensitive or T&E wildlife and plant species, big horn sheep lambing grounds, etc., and information pertaining to third party ancillary facilities.

Example: ADOT Right of Way Coordinator is responsible for providing copies of the Arizona State Trust Land approvals and “Special Conditions” information, i.e. cost-to-cure, salvage, right-of-way contracts on private parcels.

Example: ADOT Resident Engineer is responsible for providing copies of signed application for the Corps of Engineers permits and agreements reached throughout the development and construction phases of a project.

Example: ADOT Utilities is responsible for providing information regarding prior rights and any signed agreements resulting from their research.

- g. All stakeholders are responsible for going online and viewing the documents on the Project Reference throughout the development process.
- h. The ADOT Resident Engineer assumes responsibility for the Project Reference when the project moves from design to construction.
- i. At the Construction Kick-Off Partnering Workshop, the ADOT Resident Engineer educates participants about the value and use of the Project Reference and the importance of having the most current information available in a timely manner. The ADOT Resident Engineer identifies additional ADOT disciplines responsible for system updates and assures that discipline representatives have received the proper training to check documents into the AIDW. Additional project team members who wish to receive notification when new documents become available may indicate this on the workshop sign-in sheet or by a request to the ADOT Resident Engineer.
- j. During construction, where documents are provided by project stakeholders other than ADOT personnel, those stakeholders give their documents to the Resident Engineer who checks those documents into the Project Reference.
- k. Upon completion of construction, the ADOT Resident Engineer creates the Post Construction Punch List. The ADOT District Maintenance Engineer assumes responsibility for overseeing the Project Reference, using the Post Construction Punch List as a resource.

- I. Over time, the Project Reference remains as the historical project file for the document types it includes.

E. Project Design

In addition to the opportunities for formal review and comment during the NEPA process discussed above in Section VI.C.4, BLM will also have opportunity for review and comment during the design process as follows:

1. during the design kickoff meeting and/or field review;
2. at the monthly progress meetings;
3. during the 30%, 60%, and 95% plan reviews; and
4. on any subsequent NEPA re-evaluations or supplemental analysis.

BLM will provide all comments resulting from such reviews in writing to the ADOT Project Manager, with a copy to FHWA.

F. Appropriation Process

1. Request for Appropriation

- a. After completion of NEPA and prior to sending the formal Request for Appropriation to BLM, ADOT will send notification to, preferably via email, the FHWA Realty Officer requesting concurrence that the BLM-managed lands are needed for the project. The notification and concurrence may include a request for more than one project. (*Illustration VI-2 or VI-3 for linear or material site rights-of-way, respectively*).
- b. The FHWA Realty Officer will reply to ADOT's request, preferably via email, either concurring or not concurring to the determination of public necessity for the project (*Illustration VI-4 or VI-5 for linear or material site rights-of-way, respectively*).
- c. ADOT will submit directly to the appropriate BLM Field Office, with a copy to FHWA, the formal Request for Appropriation consistent with 23 C.F.R. Section 710, Subpart F. ADOT will use the standard letter (*Illustration VI-6 or VI-7 for linear or material site rights-of-way, respectively*) for requesting appropriation of linear or material site rights-of-way and any associated haul/access roads. The Request for Appropriation will identify both the permanent easement and any temporary construction easements (TCE) necessary for the project.
- d. A complete Request for Appropriation will consist of the appropriate letter (*Illustration VI-6 or VI-7 for linear or material site rights-of-way, respectively*) accompanied by the following:
 - (1) Reference to the final, approved NEPA document by name and date, for the project, a copy of which will have already been provided to the BLM Project Manager.
 - (2) Right-of-Way Plans for linear rights-of-way; plat maps and mining and reclamation plan for material site rights-of-way;

- (3) Highway Easement Deed (HED) with legal description of the requested permanent right-of-way and separate description of temporary construction areas; and
 - (4) A copy of the email from FHWA to ADOT (*Illustration VI-4 or VI-5 for linear or material site rights-of-way, respectively*) concurring that the lands are necessary for the project.
- e. The BLM Project Manager will acknowledge receipt of the formal Request for Appropriation within 30 days, as follows:
- (1) If the package is incomplete, the BLM Project Manager will send notification, preferably via an email, to ADOT, with copy to FHWA, to state the package is incomplete and identify what is missing.
 - (2) If the package is complete, BLM will follow the procedures in VI.F.2 or 4 below.

2. Agreement to Appropriation

- a. Agreement to the request for appropriation will be in the form of a Letter of Consent (LOC), signed by the BLM Authorized Officer (*Illustration VI-8 or VI-9 for linear or material site rights-of-way, respectively*) in accordance with Section VI.F.3 below.
 - b. The LOC will be addressed to FHWA but will be sent directly from BLM to ADOT, with a copy to FHWA. The LOC will cover both the permanent easement, any associated haul/access roads, and any identified TCEs.
- c. After receipt of the LOC, ADOT will submit the appropriate Highway Easement Deed (HED) (*Illustration VI-10, VI-11, and VI-12 for the form deeds for linear, ,material site or temporary construction rights-of-way, respectively*) to FHWA for signature. The form deeds specified in Illustrations VI-10, VI-11, and VI-12 have been certified as legally sufficient by legal counsel for ADOT and FHWA and such certifications are on file at ADOT and the FHWA Arizona Division Office. These deeds may be augmented only by insertion of ADOT project and parcel information, BLM reference number, execution dates, 23 U.S.C. appropriation section reference, legal description, signatures and notarization information. Any other additions or modifications to these deeds will require separate certifications of legal sufficiency by legal counsel for ADOT and FHWA in accordance with 23 U.S.C. §§ 107 (d) and 317 and implementing regulations at 23 C.F.R. § 710.601.
- d. After signature by FHWA, ADOT will have the easement deed recorded in the appropriate county or counties, and submit a copy of the recorded deed to the BLM Project Manager and to FHWA Realty Officer.
 - e. ADOT will notify BLM in writing, with a copy to FHWA, when TCEs lying outside the permanent right-of-way are no longer needed and request a joint inspection with BLM to coordinate rehabilitation of the TCEs. Upon determination that the TCEs have been rehabilitated to the satisfaction of BLM, a letter acknowledging that the TCEs are no longer part of the appropriation will be signed by the BLM Authorized Officer. The letter will be addressed to FHWA but will be sent directly to ADOT, with a copy to FHWA.

3. Conditions of Appropriation

All appropriations shall be subject to and conditioned upon compliance with the standard conditions of approval as stated below. Title 23 Material Site Rights-of-Way (MSROWs) are established for the purpose of extraction, processing, and storage of materials for the construction, operation, and maintenance of federal aid-eligible projects. ADOT will evaluate whether there is a continuing need for the MSROWs upon completion of the construction project. The following conditions will not be specifically elaborated in each LOC or HED. However, BLM's consent to the appropriation, and thus the LOC and HED, are wholly contingent upon ADOT and FHWA concurrence to, and conformance with, the following conditions:

- a. All appropriations shall be subject to any additional conditions agreed to, in writing, in accordance with this Operating Agreement during the early coordination, environmental analysis, and design phases, whether or not those conditions are specifically carried forward in the request for appropriation or the LOC.
- b. If outstanding valid rights exist on the date of the use authorization, ADOT shall obtain such permission as may be necessary on account of any such rights.
- c. The use right authorized shall terminate 10 years, or sooner if agreed upon, from the date of execution of the HED by FHWA to ADOT in the event construction of a highway or use of the material site has not been started during such period.
- d. The use right authorized is limited to the described right-of-way and the space above and below for federal highway purposes and does not include any rights for non-federal highway purposes.
- e. BLM retains the right to use, or authorize use on, any portion of the right-of-way for non-highway purposes provided such uses would not interfere with ADOT's use of the right-of-way, impair the full use and safety of the highway, or be inconsistent with the provisions of Title 23 U.S.C. and the FHWA regulations issued pursuant thereto. Such use will be authorized only after consultation with, and written concurrence from, ADOT.
- f. BLM may locate information signs conforming to the Manual on Uniform Traffic Control Devices (MUTCD) on portions of the right-of-way outside of clear zone limits, however, such signs shall not be located on the right-of-way of an Interstate System.
- g. Consistent with highway safety standards, ADOT shall:
 - (1) Protect and preserve soil and vegetative cover and scenic and esthetic values on the right-of-way outside of construction limits.
 - (2) Provide for the prevention and control of soil erosion within the right-of-way and on adjacent lands that might be affected by the construction, operation, maintenance, minor rehabilitation, and termination of the highway project.
 - (3) Vegetate and keep vegetated with suitable species all earth cut or fill slopes feasible for re-vegetation or other areas on which ground cover is destroyed where it is deemed necessary prior to completion of the highway and shall maintain terracing, water bars, leadoff ditches, or other preventive works that may be required to accomplish this objective. This provision shall also apply to

slopes that are reshaped following slides which occur during or after construction.

- h. No sites for highway operation and maintenance facilities, camps, supply depots, or disposal areas within the right-of-way may be established without obtaining written approval of the BLM authorized officer.
- i. ADOT shall maintain the right-of-way clearing by means of chemicals only after consultation with the appropriate BLM Field Office, specifying the time, methods, chemicals and locations of the right-of-way to be treated.
- j. The provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d-2000d-4) shall be complied with.
- k. ADOT shall follow the standard procedures contained within the 1973 Department of Interior "Manual of Survey Instruction" in removing, resetting, referencing or otherwise perpetuating the position of any cadastral survey monuments which may be subject to disturbance during construction or maintenance of any highway project.
- l. ADOT and BLM will cooperate in responding to and keeping each other informed of oil and gas and hazardous material spills of mutual concern. Contact for coordination shall be between the ADOT District Maintenance Engineer, the BLM Field Manager, and Arizona Department of Environmental Quality (ADEQ). Specific contingency plans shall be discussed annually at District and/or State coordination meetings or as needed to facilitate full cooperation. Unless otherwise agreed in writing by supplement to this Operating Agreement or other written instrument, ADOT will respond to emergency response/cleanup for oil and gas or hazardous materials spills **within** the highway right-of-way and will immediately notify BLM of any such incidents. BLM will respond to emergency response/cleanup for oil and gas or hazardous materials spills **outside of the right-of-way but which may impact** the highway project and immediately notify ADOT of such incidents.

4. Disagreement to Appropriation

As a result of the cooperative process developed by FHWA, ADOT and BLM as documented within the MOU No. AZ-931-0309 dated April 23, 2003, and amendments thereto, the parties believe it is highly unlikely BLM would issue a formal disagreement to an appropriation request. However, if such a unique situation were to arise, disagreement to a request for appropriation would be in the form of a letter, signed by the State Director, with supporting documentation clearly substantiating that:

- a. appropriation would be contrary to the public interest;
- b. appropriation would be inconsistent with the purposes for which the BLM-managed lands or minerals are managed; or
- c. FHWA and ADOT will not accept the conditions BLM determines necessary for protection of the BLM-managed land or resources.

5. Appropriation by Operation of Law

If, within four months, BLM has not responded, in writing, to the Request for Appropriation, such land may be considered appropriated by FHWA and transferred to

ADOT for the purposes requested. Before exercising this authority, FHWA will notify BLM that it has appropriated the land.

G. Construction

1. During construction or during the use of a material source, ADOT, as agent for FHWA, will ensure compliance with all such terms and conditions identified in the NEPA document, the LOC, and any special conditions designed to protect the BLM-managed land and its resources to which all parties have agreed. If BLM identifies a situation where it appears there may be non-compliance with such terms and conditions, BLM will work directly with the ADOT Project Manager or Resident Engineer to resolve the issue. BLM will not initiate direct contact with any contractor working for ADOT.
2. If necessary, ADOT, FHWA and BLM will coordinate a joint meeting to resolve differences. Escalation procedures outlined in Section VIII of the MOU will be followed if differences cannot be resolved at the joint meeting between ADOT, BLM and FHWA.
3. The BLM Field Office staff will be given an opportunity to provide input on construction issues during the construction partnering meeting and the weekly construction meetings.

H. Operation, Maintenance, Minor Rehabilitation

1. Operation and maintenance **within a highway easement** includes standard highway-related preservation activities to ensure a continued safe and efficient highway for the public (23 CFR 460, 625, 635, 771). Such activities include, but are not limited to: emergency repair; restoration of surfacing, shoulders, roadsides; restoration or replacement of structures (including bridges); cleaning ditches and cross-drainage; minor (less than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons; controlling brush and roadside vegetation to maintain clear zones, sight distance and to remove hazard trees; slope stabilization and scaling; removal of hazards and other obstructions; preserving and adding traffic control measures to conform with the Manual on Uniform Traffic Control Devices (MUTCD), etc. These activities are approved in the easement and do not require an additional NEPA decision. However, compliance by FHWA, and thus ADOT acting as their agent, with all other applicable laws and regulations is required. BLM, as federal land manager, retains the responsibility for enforcement of, and compliance with NAGPRA and ARPA.
 - a. If any BLM facilities will be impacted by operation or maintenance, ADOT will notify the affected BLM Field Office(s).
 - b. If highway operation or maintenance will require use of BLM-managed lands outside the right-of-way, ADOT will notify the affected BLM Field Office to secure the appropriate authorization prior to commencing the work. If an emergency situation arises where public safety may be at risk, ADOT may proceed without specific BLM authorization and will notify BLM as soon as possible of the situation.
2. Minor rehabilitation **within a highway easement** includes non-standard highway-related operation and maintenance to provide minor upgrades to a highway (23 CFR 625, 635, 771). Such activities include but are not limited to: minor realignment (i.e., straightening dangerous curves); minor widening (adding lane and/or shoulder width); adding auxiliary lanes (passing, turning, climbing, parking, etc.); major (more than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons, etc. If federal funds will be used for any of these activities, additional NEPA by

FHWA would be required. A CE may be sufficient in most cases. No NEPA decision or additional authorization by BLM is needed for minor rehabilitation work **within** a highway easement, however BLM, as federal land manager, retains the responsibility for enforcement of, and compliance with NAGPRA and ARPA.

- a. If any BLM facilities will be impacted by minor rehabilitation, ADOT will notify the affected BLM Field Office(s) before implementing such activities. BLM facilities may include, but are not limited to, such items as fences, cattle guards, signs, etc.
- b. If minor rehabilitation will require use of BLM-managed lands outside the right-of-way, ADOT will notify the affected BLM Field Office to secure the appropriate authorization.

→ I. Assignment, Reversion and Termination of Title 23 Rights-of-Way

This section establishes procedures for assignment, reversion and termination of Title 23 rights-of-way on BLM-managed lands that ADOT, or, where appropriate, its assignee, determines are no longer appropriate or needed for state transportation purposes. This includes:

1. Assignments of state highways to local jurisdictions for continued use as specified in the Federal Land Transfer deed or for another public transportation use which FHWA determines is appropriate under Federal Land Transfer provisions. The assignee of ADOT can not further assign the right-of-way.
 2. Reversions by ADOT to BLM of highway, material site or TCE right-of-way no longer needed for state transportation purposes and not appropriate for assignment or by an ADOT assignee to BLM if the highway or material site right-of-way is no longer needed for the approved transportation purpose.
 3. Terminations of easements where construction is not started within 10 years from the date of execution of the highway easement deed by the United States of America or where the time period stated in a TCE has expired.
1. Assignment of Existing Title 23 Highway Rights-of-Way to Local Jurisdictions (Note: These procedures in this MOU are “alternative arrangements” to a reversion, as permitted by 23 CFR 710.601(h).)
 - a. When the ADOT Right of Way Titles Section receives a Recommendation for Disposal (Form 60-3311) from an ADOT District Office, a letter of “notification of intention to assign interest” will be provided to the FHWA, the affected BLM Field Office, the local jurisdiction and the ADOT District Engineer. [NOTE: FHWA must approve and BLM must concur with any assignment]. The letter will also request the concurrence of BLM and that FHWA approve the assignment, both subject to acknowledgement of the conditions of assignment by the local jurisdiction (Illustration VI-13). Such concurrence and approval will take into consideration the appropriateness of the local jurisdiction’s operation of the highway or highway segment and the adequacy of the terms and conditions of the original HED. If BLM concurs and FHWA approves the assignment, the ADOT Right of Way Titles Section continues the abandonment process (which is the process under which ADOT can “abandon” its interest in the land for state highway and “assign” its interest for continued use under the Federal Land Transfer deed to a local jurisdiction) as outlined in the ADOT Right of Way Manual. If the ADOT District has not already provided, the ADOT Right of Way Titles Section will obtain the approval from the local jurisdiction that states they agree to the terms and conditions of the original grant of

right of way to ADOT, and/or any amendments thereto (Illustration VI-14).

- b. Prior to presenting the Resolution of Abandonment (Illustration VI-15) to the State Transportation Board (STB) for approval, a draft of this resolution, including plats and/or a legal description and a copy of the FHWA approval and BLM concurrence will be provided to the receiving local jurisdiction, FHWA, the affected BLM Field Office, and the ADOT District Engineer for review and comment.
 - c. Upon approval by the State Transportation Board, the Resolution of Abandonment (Illustration V-15) will be recorded in the appropriate County, thereby becoming effective. A copy of the recorded resolution will be provided by ADOT Right of Way Titles Section to the ADOT District Office, the receiving local jurisdiction, FHWA and the affected BLM Field Office. Said abandonment area will also be depicted on the Right of Way plans at this time.
 - d. In the event the local jurisdiction's need for the easement herein granted no longer exists, the provisions of paragraph 2 c below shall apply.
2. Reversion of Existing Title 23 Right-of-Way on BLM Lands No Longer Needed for Transportation Purposes
- a. Prior to reversion of Title 23 rights-of-way on BLM-managed lands, ADOT District Office will send written notification to the affected BLM Field Office, with a copy to FHWA, indicating that ADOT no longer needs to use the land for transportation purposes and intends to return it to BLM.
 - b. ADOT will arrange a joint inspection of the facility with the appropriate staff from the BLM Field Office and ADOT District Office to finalize a plan for rehabilitation and reversion. The plan, and any supplemental agreements thereto, will be documented in writing and signed by ADOT and the BLM authorized officer.
NOTE: Should new construction eliminate the need for existing Title 23 rights-of-way, rehabilitation proposals will be developed during the design process.
 - c. Prior to reversion or termination of this easement, ADOT shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the BLM Field Manager, unless an alternative agreement is reached by both parties and documented in writing. If ADOT, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the BLM Field Manager may order the removal and disposal of any improvements and restore the area at ADOT's expense.
 - d. Upon satisfactory completion of rehabilitation by ADOT and written acceptance by BLM authorized officer, ADOT District will initiate Recommendation for Disposal (Form 60-3311) and forward to the ADOT Right of Way Titles Section for processing. Note that ADOT handles Federal Land Transfer reversions under its disposal process.
 - e. When the ADOT Right of Way Titles Section receives a Recommendation for Disposal (Form 60-3311) from an ADOT District Office, a letter of notification of disposal commencement will be provided to FHWA, the affected BLM Field Office, and the ADOT District Engineer. The ADOT Right of Way Titles Section continues the disposal process as outlined in the ADOT Right of Way Manual, as appropriate for a

reversion under 23 CFR 710.601(h).

- f. Prior to presenting the Resolution of Disposal to the State Transportation Board for approval, ADOT will provide a draft including plans and/or a legal description to FHWA, the affected BLM Field Office, and the ADOT District Engineer for review and comment.
- g. Upon approval by the State Transportation Board, the Resolution of Disposal (Illustration VI-16) will be recorded in the appropriate County, thereby becoming effective. A copy of the recorded resolution will be provided by ADOT Right Way Titles Section to FHWA the affected BLM Field Office, and the ADOT District Engineer.

3. Termination of Easement for expiration of time limit

- a. Federal Land Transfer deed contain the condition: "The easement herein granted shall terminate 10 years from the date of execution of the highway easement deed by the United States of America in the event construction of a highway on the right-of-way is not started during such period." TCEs contain language terminating the easement after a specified time period.
- b. If ADOT identifies no further need for the right of way prior to the expiration date identified in 3 a above, ADOT shall notify BLM and FHWA of its desire to terminate the easement.
- c. In the event ADOT has a continued need for the easement, ADOT will, prior to the expiration of the time limit, send the BLM Field Manager a letter so stating. If the BLM Field Manager agrees to the continued use, ADOT and the BLM Field Manager will prepare necessary documentation.
- d. In the event ADOT no longer has a continued need for a TCE and lets the deed expire at the stated time limit, ADOT will rehabilitate the land as required in 2(c), above, and the easement will expire on its own accord. If the time 10-year period has expired with no use of the property or if an easement is extended without a new stated time limit, the provisions of paragraph 2 b, c, d, e, f and g above shall apply when ADOT no longer needs the easement.

VII. NON- TITLE 23 PROJECTS

In this Operating Agreement, "necessary environmental clearances" shall be understood to include the following: compliance with the National Environmental Policy Act (NEPA), Section 7 of the Endangered Species Act (ESA), Section 106 of the National Historic Preservation Act (NHPA), and all other pertinent and applicable federal and state environmental protection laws.

As it relates to this Operating Agreement, there are two basic types of uses for which ADOT could request authorization from BLM. One type of use would be a right-of-way (ROW) or temporary use permit (TUP) pursuant to Title V of the Federal Land Policy and Management Act (FLPMA), as amended (43 U.S.C. 1761-1771) and the implementing regulations at 43 C.F.R. Part 2800. The other type of use would be a Title 30 Free Use Permit (FUP) for materials pursuant to the Act of July 31, 1947, as amended (30 U.S.C. 601), and the implementing regulations at 43 C.F.R. Part 3600.

A. Agency Roles

1. As the lead federal agency for non-Title 23 projects, BLM is ultimately responsible for compliance with NEPA and other necessary environmental clearances. BLM is also responsible for enforcement of, and compliance with, the Native American Graves Protection and Repatriation Act (NAGPRA) and the Archaeological Resources Protection Act (ARPA). BLM is the lead federal agency for development of all BLM land use plans (LUP) and amendments to such plans.
2. FHWA typically has no role in non-Title 23 actions occurring on BLM-managed land.
3. ADOT's role in obtaining a non-Title 23 eligible use of BLM-managed lands is that of Applicant. In situations where a contractor is ADOT's authorized agent, ADOT would still be considered the Applicant.

B. NEPA Evaluation

As lead federal agency for compliance with NEPA, BLM must adhere to the following:

1. Council of Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, 40 C.F.R., Part 1500;
2. Department of the Interior Manual (DOI), 516 DM 1-15; and
3. BLM Manual Section 1790, National Environmental Policy Act and the accompanying handbook, H-1790-1, National Environmental Policy Act Handbook. This guidance emphasizes use of existing environmental analyses, when available, to avoid duplication.

C. Title V Rights-of-Way/Temporary Use Permits

Use of public land for highway-related purposes that are not eligible for Title 23 funding requires written authorization by BLM, unless the proposed use is determined by the BLM Authorized Officer (AO) to be casual use. Examples of casual use include driving vehicles over existing roads, surveying, marking routes, collecting data to prepare an application for a use authorization, and certain other activities that do not cause any appreciable disturbance or damage to the public lands, resources, or improvements.

It is anticipated that there will be few situations where ADOT will need to obtain a right-of-way (ROW) or temporary use permit (TUP) for use of public lands pursuant to Title V of the Federal Land Policy and Management Act (FLPMA) and the implementing regulations at 43 C.F.R. Part 2800. A contractor, on the other hand, is more likely to need a ROW or TUP for highway-related uses outside the highway ROW. The entire process is elaborated herein to ensure better understanding of the full process that BLM is required to follow in considering any application for a ROW or TUP on public lands, whether the application is filed by ADOT or by a contractor.

ADOT is exempt from paying cost recovery fees and rental when obtaining a ROW or TUP. A contractor, however, is required to pay cost recovery and rental for a ROW or TUP on public lands, unless the contractor is officially designated by ADOT to serve as ADOT's authorized agent. In such cases, ADOT would still be considered the Applicant and any authorization would be issued to ADOT, not the contractor. The following discussion is

written as though ADOT, or a contractor serving as ADOT's authorized agent, is requesting a ROW or TUP, and therefore, contains no references to payment of cost recovery or rent.

1. Early Project Coordination

- a. Early in the development of a project, ADOT will establish contact with the BLM Field Office responsible for managing the affected public lands to arrange a pre-application meeting so that potential constraints may be identified and processing of an application tentatively scheduled. The objective of the pre-application meeting, which may be held in the office or on site, is to expedite application processing by fostering a mutual understanding of the process and the needs of both ADOT and BLM.
- b. When more than one BLM Field Office will be affected by the proposed project, the BLM State Director will designate a Lead Office that will then assign a Project Manager. The BLM Project Manager will send written notification to ADOT identifying which office is the BLM Lead Office.
- c. The BLM Project Manager will coordinate with all other BLM Field Offices affected by the project and provide consolidated responses to ADOT on issues affecting BLM-managed land throughout the life of the project.

2. Application Filing

- a. ADOT will submit an application for ROW or TUP (SF-299, available by accessing BLM's internet website www.blm.gov, then selecting "What We Do", "Lands and Realty", "Right-of-Way Information") to the appropriate BLM Field Office. The application may be submitted by mail, fax transmission, or in person.
- b. The BLM Serial Number and ADOT project reference number will be referenced on all future correspondence relating to the project, whether correspondence is by formal letter, email or fax transmittal.
- c. The directions for completing the SF-299 application are contained on the form. Items 1, 3, 4, 5, 7, 8, 10, 12, 19, signature and date are required. Items 2, 6, 11 are required only if applicable. Items 9, 13, 14, 15, 16, 17, and 18 are optional. The Supplemental Page is only required if the project is an oil or gas pipeline.

3. Application Processing

- a. BLM will review the application to determine whether: (1) the form is complete; (2) the map is submitted and adequately shows the public lands and the proposed project in relationship to other on-the-ground uses; and (3) the application is properly signed and dated. BLM will notify ADOT if any deficiencies in the application are found and identify what is needed to correct such deficiencies.
- b. Upon acceptance of a complete application package, BLM will conduct an internal "administrative scoping" of the proposal to schedule, coordinate and determine the level of effort required to process the application.

4. NEPA Processing Time

- a. Proposals that are categorical exclusions (CX) for either BLM or DOI should be

processed within 30 days. Proposals requiring environmental assessments should be processed within 60 days. If processing the application and reaching a decision on whether or not a ROW or TUP may be authorized is expected to take longer than 60 days, BLM will notify ADOT in writing and provide an explanation for the delay and an estimate of when the processing of the application may be completed.

- b. To expedite the NEPA analysis, ADOT may choose to assist BLM in processing the application by offering to prepare or contract preparation of all or part of any special study or environmental assessment (EA) to BLM standards. If it is determined that an Environmental Impact Statement (EIS) is required, BLM will immediately notify ADOT and request a meeting to discuss the anticipated schedule for complying with NEPA. BLM must select the NEPA contractor for an EIS level analysis.

5. Offer to Grant

- a. An “offer-to-grant” (Illustration VII-1) is used to offer the ROW or TUP and obtain ADOT’s written acceptance of the terms and conditions of authorization. The offer-to-grant package consists of:
 - (1) offer letter;
 - (2) ROW or TUP (BLM Form 2800-14) and other attachments, as appropriate.
- b. ADOT signifies agreement with the terms and conditions of the ROW or TUP by signing and dating Form 2800-14 and returning it to BLM within 30 days of receipt.
- c. Upon receipt of the signed Form 2800-14 from ADOT, the BLM AO will sign and date the form. The Grant becomes effective when signed by the BLM AO.

6. Decision

- a. Decisions are used to take BLM’s final and formal action on an application (Illustration VII-2). A final Decision of the BLM AO is subject to appeal to the Interior Board of Land Appeals (IBLA).
- b. BLM is required to send a copy of its Decision and supporting analysis to any party who may be adversely affected by the Decision, otherwise they shall be made available upon request. Either ADOT or any party who may be adversely affected by BLM’s Decision may file an appeal. If an appeal is filed, the Decision remains in full force and effect unless the appellant petitions for, and IBLA grants, a stay of the Decision pending IBLA’s final ruling.

7. Term of Authorization

- a. Term of the ROW shall be specific and is dependent upon a reasonable period of time needed to accomplish the purpose of the authorization. Most ROW grants are renewable.
- b. Term of a TUP is 3 years or less and is not typically renewable.

8. Relinquishment/Termination of Right-of-Way

When the ROW or TUP is no longer needed, Holder will notify the affected BLM Field Office to arrange a joint inspection of the ROW or TUP to finalize a plan for rehabilitation. The rehabilitation plan will be documented in writing and concurred with, in writing, by both Holder and the BLM AO. Upon satisfactory completion of rehabilitation, the Holder will relinquish the ROW or TUP and BLM will accept the relinquishment, in writing, and close the case.

D. Title 30 Use Permits

Use of mineral materials from public land for highway-related purposes that are not eligible for Title 23 funding requires written authorization by BLM, unless the proposed use is determined by the BLM Authorized Officer (AO) to be casual use. Examples of casual use include driving vehicles over existing roads, surveying, marking routes, collecting data to prepare an application for a use authorization, and certain other activities that do not cause any appreciable disturbance or damage to the public lands, resources, or improvements.

ADOT may need to obtain a free use permit (FUP) for use of mineral materials from public lands pursuant to Title III of the Federal Land Policy and Management Act (FLPMA), 34 U.S.C. 1732(b), and the implementing regulations at 43 C.F.R. Part 3600. A contractor will need a mineral material sales contract (MMSC) for mineral materials for non-Title 23 highway-related uses, unless they use mineral materials as an ADOT agent from a FUP site. The entire process, here and below, is subject to applicable statutes and regulations, and is elaborated herein to ensure better understanding of the full process that BLM is required to follow in considering any application for a FUP or MMSC on public lands, whether an application is filed by ADOT or by a contractor.

ADOT is exempt from paying cost recovery and material purchase fees when obtaining a FUP. There may be mitigation costs or fees which are charges as part of the free use permit. A contractor, however, is required to pay cost recovery and material purchase fees for a MMSC on public lands, unless the contractor is officially designated by ADOT to serve as ADOT's authorized agent on a FUP. In such cases, ADOT would still be considered the applicant and any authorization would be issued to ADOT, not the contractor. The following discussion is written as though ADOT, or a contractor serving as ADOT's authorized agent, is requesting a FUP, and therefore, contains no references to payment of cost recovery or mineral material purchase. When a contractor acts as ADOT's agent, the contractor's role is solely as applicant and operator. In this instance ADOT should be involved in the NEPA review process so that ADOT understands and participates in the development of the terms and conditions of the FUP. ADOT must sign accepting the terms and conditions of the FUP and is responsible for ensuring that the contractor complies with the terms and conditions of the FUP.

1. Obtaining a FUP

a. Early Project Coordination

Early in the development of a project, ADOT will establish contact with the BLM Field Office responsible for managing the affected public lands to arrange a pre-application meeting so that potential constraints may be identified and processing of a request tentatively scheduled. The objective of the pre-application meeting, which may be held in the office or on site, is to expedite processing by fostering a mutual understanding of the process and the needs of both ADOT and BLM.

b. Application Filing

- (1) ADOT will submit a request for a FUP to the appropriate BLM Field Office. There is no specific form for the request. At the pre-application meeting BLM will inform ADOT of the information needed in the request. The signed written request may be submitted by mail, email, fax transmission, or by personal delivery.
- (2) The BLM Serial Number and ADOT project reference number will be referenced on all future correspondence relating to the project, whether correspondence is by formal letter, email or fax transmittal.
- (3) At a minimum the request will contain a map or aerial photograph of the area of the proposed FUP, the type and approximate volume of materials needed, the depth of removal, access to the site, mining and reclamation plan, equipment used, fuel storage, maintenance area, hours of operation, and the approximate length of time required for removal of material, and equipment when material removal is complete.
- (4) ADOT may apply for a FUP out of a designated BLM Community Pit. In that event, ADOT's use would not be exclusive. All other applications will be considered exclusive use.

c. Request Processing

- (1) BLM will review the request to determine whether: (1) the request is complete; (2) the map is submitted and adequately shows the public lands and the proposed project in relationship to other on-the-ground uses; and (3) the request is properly signed and dated. BLM will notify ADOT if any deficiencies in the request are found and identify what is needed to correct such deficiencies.
- (2) Upon acceptance of a complete request package, BLM will conduct an internal "administrative scoping" of the proposal to schedule, coordinate and determine the level of effort required to process the request.

d. NEPA Processing Time

- (1) Proposals that are categorical exclusions (CX) would normally be processed by BLM within 30 days. Proposals requiring environmental assessments would normally be processed by BLM within 60 days. If processing the request and reaching a decision on whether or not a FUP may be authorized is expected to take longer than 60 days, BLM will notify ADOT in writing and provide an explanation for the delay and an estimate of when the processing of the request may be completed.
- (2) To expedite the NEPA analysis, at any time ADOT may offer to assist BLM in processing the request by offering to prepare or contract preparation of all or part of any special study or environmental assessment (EA) to BLM standards. If it is determined that an Environmental Impact Statement (EIS) is required, BLM will immediately notify ADOT and request a meeting to

discuss the anticipated schedule for complying with NEPA. BLM must select the NEPA contractor for an EIS level analysis.

e. Use Authorization Decision

(1) If the BLM AO approves the request:

- (a) BLM will send a decision letter, along with BLM form 5510-1 with the terms, conditions and approved mining plan of operations to ADOT. BLM may require a bond in accordance with 43 CFR 3604.25 if ADOT has not fulfilled its obligations under the terms of previous permits.
- (b) ADOT signifies agreement with the terms and conditions of the FUP by signing and dating Form 5510-1 and returning it to BLM within 30 days of receipt. If a bond is requested by BLM, the bond or proof of the bond or other financial guarantee, will be returned with the executed Form 5510-1.
- (c) Upon receipt of the signed Form 5510-1 from ADOT, and a bond if required, the BLM AO will sign and date the form. The FUP becomes effective when signed by the BLM AO.

(2) If the BLM AO denies the request, BLM will send a decision, which will include appeal instructions, to ADOT.

f. Decision

- (1) Decisions are used to make BLM's final and formal action on a request. Pursuant to 43 C.F.R. Part 4(4.401 et seq.) a final Decision of the BLM AO is subject to appeal to the Interior Board of Land Appeals (IBLA).
- (2) BLM is required to send a copy of its Decision and supporting analysis to any party who may be adversely affected by the Decision, otherwise they shall be made available upon request. Either ADOT or any party who may be adversely affected by BLM's Decision may file an appeal. If an appeal is filed, the Decision remains in full force and effect unless the appellant petitions for, and IBLA grants, a stay of the Decision pending IBLA's final ruling, pursuant to 43 C.F.R. 4.21 et seq.

g. Term of Authorization

- (1) BLM will determine the term of the FUP. BLM will not grant FUPs to ADOT for terms exceeding 10 years.
- (2) BLM may extend a FUP term for a single additional period not to exceed one year.

h. Annual Reporting

ADOT Materials must submit annual reports of production from the FUPs to the AO. This includes years where there is no production.

i. Relinquishment/Termination of FUP

Prior to the termination date, if the FUP is no longer needed, ADOT Materials will notify the affected BLM Field Office to report total production from the FUP and arrange a joint inspection of the FUP to finalize a reclamation and rehabilitation plan. This plan will be documented in writing and concurred with, in writing, by both ADOT and the BLM AO. Upon satisfactory completion of the reclamation, BLM will notify ADOT, in writing, and close the case.

2. Obtaining a MMSC

This discussion has been shortened to reflect time constraints placed on contractors bidding for an ADOT highway contract. Bids for ADOT contracts have a 30 day deadline and rarely is it possible for BLM to issue a contract, for volumes needed to fill an ADOT contract, in less than 30 days.

If a contractor chooses to apply for a MMSC, Nos. 1 – 6 above apply generally. Form 5510-1 does not apply. When requesting a MMSC outside of a community pit, the contractor will be required to pay cost recovery. The time required for BLM to process the request, unless the MMSC is for less than 5 acres and 50,000 cubic yards of material and qualifies for a categorical exclusion or is from a community pit, will normally take at least 30 days. If it is determined that there is competitive interest in the sale, BLM must hold a competitive sale. This would require a significantly longer time than 60 days.

(Note: If form numbers change in the future, the BLM can provide the current applicable forms).

VIII. Mineral Estate Ownership Issues

The purpose of this section is to (1) establish procedures for conducting preliminary title work for both Title 23 and non-Title 23 actions on BLM-managed lands and (2) clarify procedures for dealing with situations where mining claims and split federal estate may affect Title 23 linear and material site rights-of-way (MSROW).

A. Project Assessment & NEPA

1. Title 23 MSROWS may only be used for federal-aid eligible highways and FHWA will be the lead Federal agency for the purpose of NEPA compliance. Free use permits or material sales, both under Title 30, shall be used for non-federal-aid eligible highways, and BLM will be the lead Federal agency for the purpose of NEPA compliance.
2. ADOT may apply for a Title 30 free use permit through the local BLM Field Office for existing community pit material sources. Approval may be granted in a Letter of Approval for a Free Use Permit. BLM will be responsible for NEPA documentation for Title 30 community pit material sources. ADOT may utilize information from the BLM NEPA analysis to aid in preparation of any required environmental analysis. ADOT may allow a contractor to operate under the auspices of its Free Use Permit with the written approval of BLM.

3. The contractor will be responsible for compliance with BLM mitigation measures developed through the NEPA process and other required terms and conditions and ADOT environmental requirements when utilizing a material source on BLM-managed land. When contractors are obtaining material sources from non-BLM-land, the BLM will not be involved in the permitting process for the material source.
4. ADOT/FHWA will be responsible for compliance with BLM mitigation measures developed through the NEPA process and other required terms and conditions when utilizing an authorized material source on BLM-managed land. When ADOT is obtaining material sources from non-BLM-managed land, the BLM is not involved in the permitting process for the material source.
5. Prior to requesting a Title 23 appropriation on BLM-managed lands, ADOT shall take necessary steps to communicate and discuss with the BLM Field Office personnel the need for MSROWs in an area.

B. Land and Title Work

For both Title 23 and non-Title 23 actions, ADOT will conduct preliminary title work to identify ownership interests, possible valid existing rights and possible mitigation activities prior to submission of a Title 23 request for appropriation to FHWA or an application for a Title 30 materials permit or a Title V ROW or TUP to BLM.

1. In instances when full fee estate is in federal ownership and managed by BLM, ADOT will make application for Title 23 rights-of-way pursuant to Section VI and non-Title 23 uses pursuant to Section VII of this Operating Agreement.
2. In instances when BLM manages split federal estate, ADOT may seek to gain right of entry for a proposed Title 23 MSROW in the following manner:
 - a. Federal mineral estate with private/State surface estate: ADOT will send a request to the affected BLM Field Office for a determination of whether mineral materials are administered by the BLM. If so, ADOT will seek to procure right of entry to the surface with the private/State surface estate owner. Once the right of entry is obtained, ADOT will make application for a Title 23 MSROW pursuant to the procedures of this Operating Agreement. If the mineral materials are not administered by the BLM, ADOT will determine ownership and seek agreement with the mineral materials owner.
 - b. Federal surface estate with private/State mineral estate: ADOT will send a request to the affected BLM Field Office for a determination about the ownership of the mineral materials. ADOT will confer with the affected BLM Field Office for right of entry. Once the appropriate right of entry (if any is necessary) is obtained that satisfies the private/State mineral right, and BLM determines that it administers the mineral materials, ADOT will make application for a Title 23 MSROW pursuant to the procedures of Section VI of this Operating Agreement. If BLM does not administer the mineral materials, ADOT must seek agreement with the owner of the mineral materials.

C. Mining Claims

In instances when a mining claim exists, ADOT will request that BLM determine the rights of the mining claimant. In the interest of cooperation and ADOT/BLM timelines, BLM may require the assistance of ADOT to determine the nature and extent of such mining claims. In general the following types of mining claims exist and should be handled as follows:

1. Post July 23, 1955, Mining Claims: ADOT should attempt to obtain a waiver from the mining claimant for purposes of extracting the needed materials from the proposed MSROW or for use of the land for highway purposes. If ADOT experiences “deadlocked” negotiations with the mining claimant, then ADOT may request assistance from BLM in obtaining proper authority. Within 30 days, BLM will review the request and make a public interest determination whether it will exercise its authority under the general mining laws to pursue administrative remedies. Once the proper waiver is obtained or proper authority by BLM is granted, ADOT will make application for a Title 23 right-of-way for highway or MSROW purposes pursuant to the procedures of this Operating Agreement.
2. Pre July 23, 1955, Mining Claims: ADOT must obtain a waiver from the mining claimant for purposes of extracting the needed materials from a proposed MSROW or for use of the land for highway purposes. This waiver is required prior to BLM taking any action relating to issuance of a Letter of Consent (LOC) for use of such lands for Title 23 highway or MSROW purposes. ADOT may request assistance from BLM in obtaining the waiver. Within 30 days, BLM will review the request and make a public interest determination whether it will exercise its authority under the general mining laws to pursue administrative remedies.
3. Status of Title 23 Appropriated Lands
 - a. Once appropriated, Title 23 mineral MSROWs are closed to (withdrawn from) location and entry under the general mining laws.
 - b. Linear rights-of-way authorized pursuant to Title 23 are not closed to (segregated from) location and entry under the mining laws upon appropriation. Consent to the appropriation of a linear right-of-way under Title 23 does, however, establish a dominant right to which any later use of the land or filing of a mining claim is subordinate.
 - c. A Title 23 MSROW will only be used for federal-aid eligible projects.
 - d. There will be no subsequent use for non-Title 23 purposes of a MSROW allowed by BLM or ADOT.

IX. ACCESS TO STATE HIGHWAYS

This section establishes the procedures to be followed when BLM or a customer of BLM (referred to as a “third party”) requests access pursuant to Title V of FLPMA and the implementing regulations at 43 C.F.R. Part 2800 between BLM-managed land and State highways. For highways not designated as controlled access highways, the procedures will be as in paragraphs A and B below. For highways designated as controlled access highways, the procedures will be as in paragraphs A, B and C below.

A. Third Party Access Roads

1. When BLM receives a request from a third party for an access road on BLM-managed lands that is proposed to connect to an ADOT highway, the affected BLM Field Office will send written notification to the affected ADOT District Office (with a copy to the ADOT Chief Right of Way Agent, and, if the highway is part of the National Highway System, a copy to the FHWA Realty Officer). The affected BLM Field Office will include a copy of the application, if appropriate, and a copy of a map showing the proposed access to the ADOT highway.
2. The ADOT District Office personnel will arrange a meeting with the affected BLM Field Office and/or the third party to discuss the requested access to the highway.
3. If ADOT is not agreeable to the request, ADOT will provide the affected BLM Field Office a written explanation of the reason(s). BLM will not grant a right-of-way that accesses an ADOT highway if ADOT states in writing that an access permit will not be issued.
4. If ADOT is agreeable to the request, ADOT will provide the affected BLM Field Office a written statement outlining the requirements for issuance of an access permit. BLM will include those requirements in the description of the proposed action for compliance with NEPA in processing the application.
5. If BLM's Decision is to approve the application, the right-of-way grant will be subject to the Holder complying with the terms and conditions of ADOT's access permit and any other terms and conditions BLM determines are necessary to protect the public land and its resources.
6. BLM's right-of-way grant, if authorized, will be up to the highway right-of-way line, but will not extend into the highway right-of-way.

B. BLM Access Roads

1. If BLM needs to construct a BLM road connecting to an ADOT highway, the affected BLM Field Office will file a written request with the affected ADOT District Office (with a copy to the ADOT Chief Right of Way Agent, and, if the highway is part of the National Highway System, a copy to the FHWA Realty Officer).
2. ADOT will determine whether the request for access to the highway will be approved and will notify the affected BLM Field Office in writing.
3. If ADOT is not agreeable to the request, ADOT will provide the affected BLM Field Office a written explanation of the reason(s).
4. If ADOT is agreeable to the request, ADOT will provide the affected BLM Field Office a written statement outlining the requirements for issuance of a permit. BLM will include those requirements in the description of its proposed action for compliance with NEPA for the project. BLM will comply with ADOT requirements for an access permit.

C. Highway Segments Designated as Access Controlled

1. Generally new access will not be approved on access-controlled segments except at locations designated in ADOT's Access Management Plan. Approval of access to a

highway will require more extensive engineering studies showing intersection and/or interchange types.

2. Proposals for new access points on controlled access facilities will require extensive early planning by both ADOT and BLM.
3. Approvals by ADOT will be necessary prior to issuance of any right-of-way grant by BLM.
4. When ADOT proposes to convert an existing non-access controlled highway to an access controlled highway, ADOT will advise and coordinate with BLM to discuss the anticipated impacts that more restricted access may have on BLM-managed lands. ADOT and BLM will coordinate in the development of an Access Management Plan, including the identification of existing access points on BLM-managed land used by the general public and other users such as right-of-way holders, grazing permittees, mining claimants, etc.
5. FHWA approval is required for changes in the control of access involving the Interstate Highway System.

X. ADMINISTRATION

- A. This amended Operating Agreement, identified as Appendix C to MOU No. AZ-931-0309, becomes effective upon signature of all parties to Amendment #3 to MOU No. AZ-931-0309.
- B. This amended Operating Agreement, identified as Appendix C to MOU No. AZ-931-0309, may be amended or modified as necessary by mutual consent of all parties upon written notification of such modification, signed and dated by all parties. Such amendment/ modification will supercede this amended Operating Agreement, identified as Appendix C, but will not necessarily require an amendment to MOU No. AZ-931-0309.
- C. Nothing in this Operating Agreement is intended to conflict with any Federal statute or regulation. If a conflict is determined to occur, applicable Federal statutes and regulations shall control.

BLM INPUT OPPORTUNITIES INTO ADOT'S PROCESS

Long Range Planning (20+ years prior to construction)

1a- Participate on a Technical Advisory Committee (TAC) for a plan/study
(Note: Every project in ADOT's Five Year Program has been through a TAC)

Long Range Planning includes:

- Regional Transportation Profiles
- Small Area Transportation Studies
- Multi-Modal Transportation Studies
- Statewide Access Management Plan
- Policy Issues
- Long Range Plan
- FiveYear Program

Note: If there will be an impact to BLM, ADOT will invite them to be a TAC Member
(Note: 1a through 1d below apply to Regional Transportation Profiles, Small Area Transportation Studies, Statewide Access Management Plan, Policy Issues and Long Range Plan)

**ADOT CONTACT FOR LONG RANGE PLANNING (EXCEPT FIVE YEAR PROGRAM):
STATE AND REGIONAL PLANNING SECTION MANAGER**

1b- Attend TAC meetings

1c- Attend Public meetings

1d- Review and comment on working papers

1e- Review and comment on draft final report

ADOT CONTACT FOR FIVE YEAR PROGRAM: PRIORITY PROGRAM MANAGER

5 Year Program

Rank projects to be scoped based on requests received from engineering districts (in house TAC function)

Rank scoped projects received engineering districts (in house TAC function)

Select projects to be included in the Tentative Five Year Program (in house TAC function)

State Transportation Board approves Tentative Program

Public hearings on Tentative program

State Transportation Board approves the Final Five Year Program

After Final Five Year Program approval, the Three Year STIP is developed

Note: BLM's involvement in the Five Year Programming process is during the Scoping and Design phases of the project.

Project Development

ADOT CONTACT FOR SCOPING PHASE: PREDESIGN SECTION MANAGER

Scoping Phase

(Typically 5-7+ years prior to construction)

2- Provide input into Scoping Document

(The scoping document will be one of the four below):

- Scoping Letter (6 months)
- Project Assessment (12 months)
- Feasibility/Corridor Study (18 months)
- Location/Design Concept Report (24+ months)

The Scoping process for either the Feasibility/Corridor Study or Location/Design Concept Report includes:

- Kick Off/Agency/Field Review (Stakeholders and Public) (technical analysis, engineering and literal research (environmental))
- Initial Document
- Draft Environmental Document
- Final Environmental Document
- Engineering Document

National Environmental Policy Act (NEPA) Documentation

(NEPA process begins during Scoping and continues through Stage V of Design)

ADOT CONTACT FOR NEPA: ENVIRONMENTAL & ENHANCEMENT GROUP
MANAGER

3a- Opportunity to be a Cooperating Agency during development of EA or EIS and participate as member of Interdisciplinary (ID) Team (duration of process)

3b- Provide input on issues during agency scoping meeting and/ or field review (per meeting)

3c- Review and comment on predraft EA or EIS (30 days)

3d- Review and comment on Initial DCR (30 days)

3e- Comment on Draft EA or EIS during public comment period (30 days)

3f- Review Summary of Comments prepared for IDCR (One week)

3g- Review prefinal EA or EIS. Provide letter supporting findings for inclusion in final NEPA Document (30 days)

3h- Provide input during development/subsequent updates to NEPA documentation (varies)
(Concurrent with all of # 2, 3 and 4)

Design Phase

(Occurs 1-3 years prior to construction)

ADOT CONTACT FOR DESIGN PHASE: VALLEY GROUP MANAGER (FOR MARICOPA COUNTY) OR STATEWIDE GROUP MANAGER (FOR OTHER COUNTIES)

4a- Participate in Design Kick Off Partnering Meeting and Field Review
General Plan Development

4b- Receive key project documents through Project Reference document distribution system
(Concurrent with # 4 and 5)

4c- Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage I of design
(May occur during Scoping or Project Development. Takes the design to 15%)

4d- Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage II of design
(Takes the design to 30%)

4e- Participate in constructability review

4f- Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage III of design and participate in the Field Review
(Takes the design to 60%)

4g- Participate in monthly coordination meetings, review plans and special provisions and provide comments during Stage IV of design

(Takes the design to 95%. All clearances are completed by the end of Stage IV)

Stage V of design produces Plans, Specifications and Estimate (PS&E)

FHWA Authorization

ADOT advertises project

State Transportation Board awards project to contractor

Construction Phase

(Occurs subsequent to award of contract by State Transportation Board)

ADOT CONTACT FOR CONSTRUCTION PHASE: CONSTRUCTION STATE ENGINEER

ADOT CONTACT FOR PERMITS: DISTRICT ENGINEER

5a- Participate in Construction Kick Off Partnering Workshop

5b- Participate in creating project Issue Resolution Ladder

5c- Communicate regarding mobilization/ancillary facilities

5d- Participate in Field Inspection

5e- Participate in Weekly Construction Meetings

5f- Participate in Field Reviews

5g- Participate in Partnering Refresher Workshops

5h- Participate in Public Meetings

5i- Participate in Walk Through

5j- Participate in Partnering Close Out Workshop

Permit process is ongoing throughout the entire timeline.

[Note: The foregoing outlines the process for ADOT's typical design-bid-build projects. In design-build projects and construction manager at risk projects, design and construction are intermingled]

Maintenance Phase

ADOT CONTACT FOR MAINTENANCE: STATE MAINTENANCE ENGINEER
ADOT CONTACT FOR NATURAL RESOURCES: STATEWIDE NATURAL RESOURCES
MANAGER

6-Operate and maintain highway

Other Opportunities

ADOT Transportation Board meetings

Five Year Program Development/Public Hearings

ADOT/FHWA INPUT OPPORTUNITIES INTO BLM'S LAND USE PLANNING (LUP) PROCESS

Comprehensive LUP Evaluation

(Conducted every 3-5 years)

1. BLM notifies all partners (including ADOT and FHWA) that BLM is about to conduct a Comprehensive LUP Evaluation. ADOT contacts are ADOT District Engineers, State Engineer, Deputy State Engineers, Director of Transportation Planning Division and Environmental & Enhancement Group Manager. FHWA contact is its Environmental Program Manager.

If evaluation indicates that the LUP needs to be either amended or revised, then it moves on to the next phase. Otherwise, no action is required.

Develop and Approve Preparation Plan

2. During the time that BLM is developing and approving the Preparation Plan, the Cooperating Agency MOU between BLM, ADOT and FHWA should be reviewed for accuracy and appropriateness, and modified when needed.

Issue Notice of Intent (NOI) Federal Register (FR) Notice

3. During the "formal scoping period" ADOT and FHWA should identify issues and concerns that need to be addressed in the LUP (such as, "Are the transportation corridors accurately identified?" "Do we need to talk about mineral and material sales," etc)?

RMP/EIS Development Process Steps

- a. Issue Identification and Development of the Scoping Report
 - b. Develop Planning Criteria and Announce Availability
 - c. Inventory and Data Collection
 - d. Analysis of the Management Situation
 - e. Alternative Formulation and Development of Preferred Alternative
 - f. Estimation of Effects
4. During each step of the RMP/EIS development process, ADOT and FHWA should participate in all cooperating agency meeting, provide information and analysis as agreed upon in the cooperating agency MOU.

Notice of Availability (NOA) for the Draft Resource Management Plan and Draft Environmental Impact Statement (DRMP/DEIS)
(A Notice Published in the Federal Register (FR))

5. The 90-day public review and comment period begins the day that the Environmental Protection Agency's (EPA) publishes it's NOA for the DRMP/DEIS in the FR. During this step of the process, ADOT and FHWA may be involved in the public comment analysis process and asked to provide assistance in preparing responses to comments and text revisions.

NOA for the Proposed RMP and Final EIS (PRMP/FEIS)
(FR Notice)

6. A 30-day protest period begins the day that EPA publishes it's NOA for the PRMP/FEIS in the FR. During this step of the process, ADOT and FHWA may be involved in the protest resolution process and asked to provide information or assistance in preparing responses. Also running concurrently at this time is the 60-day Governor Consistency Review.

Publish the Approved RMP and Record of Decision (ROD)
(FR Notice)

7. ADOT and FHWA will receive copy of document.

Implementation and Monitoring of Approved RMP and ROD

8. ADOT, FHWA and BLM should continue to partner and collaborate during the implementation, monitoring and any needed modification of the approved RMP.

BLM PROJECT IMPLEMENTATION GRAPH
 [Note: Asterisk * indicates opportunity for ADOT input]

BLM NEPA Process Phases	Categorical Exclusion Process	Determination of NEPA Adequacy Process	EA Level Analysis Process	EIS Level Analysis Process
Determining the Scope	*Flesh out brief description of proposed project BLM determines whether a project is on the BLM or DOI CX List.	*Flesh out brief description of proposed project. Determine LUP conformance *Identify & list other related NEPA documents	*Flesh out brief description of proposed project. Determine LUP conformance *Invite Cooperating Agencies. *Determine scope of EA Level Analysis	*Flesh out brief description of proposed project. Determine LUP conformance *Invite Cooperating Agencies Publish NOI in Federal Register (minimum 30 day *public review and comment period)

BLM PROJECT IMPLEMENTATION GRAPH
 [Note: Asterisk * indicates opportunity for ADOT input]

BLM NEPA Process Phases	Categorical Exclusion Process	Determination of NEPA Adequacy Process	EA Level Analysis Process	EIS Level Analysis Process
<p>Conducting NEPA Analysis</p>	<p>*Conduct Analysis to determine if any of the extraordinary circumstances apply to the project</p>	<p>*Conduct analysis using seven criteria for determining NEPA adequacy</p>	<p><u>*Prepare EA</u></p> <ul style="list-style-type: none"> • Need for the proposal • Alternatives including the proposed action • Affected environment (site specific) • List of agencies and individuals committed 	<p><u>*Prepare draft EIS</u></p> <ul style="list-style-type: none"> • Purpose & Need Statement • Proposed Action and Alternatives including No Action • Affected Environment • Environmental consequences • List of agencies & individuals to whom copies are sent • Appendices, Glossary, References cited <p>Publish Federal Register Notice of Availability for draft EIS</p> <p>* Provide 60 day Public Review and Comment period</p>

BLM PROJECT IMPLEMENTATION GRAPH

[Note: Asterisk * indicates opportunity for ADOT input]

BLM NEPA Process Phases	Categorical Exclusion Process	Determination of NEPA Adequacy Process	EA Level Analysis Process	EIS Level Analysis Process
Making NEPA Determination	BLM responsible official makes determination whether or not the proposal is categorically excluded and whether any additional NEPA analysis is needed.	BLM responsible official makes determination whether existing NEPA analysis is adequate to implement the proposal	Prepare and Sign FONSI	*Conduct analysis of public comments received *Prepare responses to comments *Prepare text changes Publish Federal Register NOA for Final EIS (30 day cooling off period)
Documenting Decision	BLM responsible official makes decision whether or not to implement the proposal	BLM responsible official makes decision whether or not to implement the proposal	BLM responsible official makes decision whether or not to implement the proposal Publish a Decision Record (DR)	Publish record of Decision (ROD)
*Administrative Review/ Appeal Process Provided	*Administrative Review/ Appeal Process Provided	*Administrative Review/ Appeal Process Provided	*Administrative Review/ Appeal Process Provided	*Administrative Review/ Appeal Process Provided

**PROJECT
REFERENCE**

for

Route

Highway

Section Name

Other Identifying Information

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NOTE: This Project Reference originally was developed as a cooperative effort among the Federal Highway Administration, the Bureau of Land Management (Arizona State Office) and the Arizona Department of Transportation. It now is intended to be used on all projects managed by ADOT. It is composed, in part, of copies of original documents stored elsewhere in official files. Copies of the documents are provided for inclusion in the Project Reference as they are created and made available to appropriate stakeholders. Where Agency “concurrence,” “approval,” or “consultation” is referenced, the discussion pertains to actions located on public lands under the jurisdiction of the Federal or State Agency

Section 1.1 – Purpose of Project Reference

The purpose of this reference document (Project Reference) is to provide a roadmap and compendium of documents and information applicable to the implementation of this project. Not all project-related information is available when the Project Reference is initially created and information changes as the project progresses through the design and implementation stages, each of which occur over a period of several years. It is therefore anticipated that there will be both change and growth of the contents included in the Project Reference over time.

The Project Reference will be initiated when a project begins (when an ADOT tracking “TRACS” number is assigned). Information will be included as it is generated, leading to a continuous change in the physical content as information becomes available and decisions are made during project development. New sections may be added to the basic list as the need arises.

The Project Reference has no specific status in or of itself and does not change or supercede any other document(s). As a roadmap, the Project Reference provides a convenient collection of data and information that was originally developed, approved and filed elsewhere for specific purposes. It does not attempt to repeat, interpret, clarify or modify information or direction existent elsewhere. It is simply a compilation of project-related information collected by and for the convenience of the holder. When continuously updated, it provides a collection of reference material for a specific project.

Section 1.2 - Project Design and Implementation

Project design and implementation are discovery processes that result in continuing adjustments and changes. As project knowledge increases and the design matures, the need for different solutions often becomes apparent and designs and mitigation measures change in response. Therefore, the design is not considered “final” until the project is placed under contract. Even then, some modification, consistent with the environmental documents and within the scope and parameters of the design guidelines, may be dictated by on-site conditions. Even though there is some flexibility for modification, ADOT must ensure that the final design meets both the approved environmental clearance and the design criteria.

Section 1.3 - Project Summary

Please enter project summary here, including breakdown of acres by ownership (private, federal, state) Refer to sample reference for guidance

Section 2 – Documents

2.1 GUIDING DOCUMENTS

	Document	Responsible Party	Comments
A.	Land Management Agency Agreements Applicable to this Project	PM designated on TRACS	
B.	Interagency Agreements Applicable to this Project	PM designated on TRACS	
C.	Programmatic Agreements (such as cultural and weed control)	PM designated on TRACS	
D.	Joint Project Agreements	9170 or PM designated on TRACS	
E.	Stakeholder Lists (To be updated frequently)	PM designated on TRACS	
F.	Engineering Scoping Documents	PM designated on TRACS	
	Scoping Letter		
	Project Assessment		
	Feasibility/Corridor Study		
	Location/Design Concept Report		
	Scoping/Other		
G.	[Placeholder]		
H.	[Placeholder]		
I.	Other		

2.2 ENVIRONMENTAL DOCUMENTS

	Document	Responsible Party	Comments
A.	401 Certifications	Org 9151	
B	404	Org 9151	
	Certification Application		
	Jurisdictional Delineation		
	Individual Permits		
	Nationwide Permits		
	Preconstruction Notice (PCN)		
C.	Air Quality Report	Org 9152	
D.	Biology	Org 9152	
	Survey Reports		
	Biological Evaluation		
	Biological Review		
	In-house evaluations		
	Invasive Species		
	Agency Scoping Letters		
	USFWS Concurrence		
	AGFD Concurrence		
	Biological Opinion		
	Agency Correspondence		
	Native Plants		
E.	Clearance Documents	Org 9151	
	Categorical Exclusions		
	Environmental Determination		
	Environmental Assessment		
	Environmental Impact Statement		
	Environmental Overview		
	Finding of No Significant Impact (FONSI)		
	Geotechnical Clearances		See Section 2.3 (G)

2.2 ENVIRONMENTAL DOCUMENTS (continued)

	Document	Responsible Party	Comments
E.	Clearance Documents (continued)	Org 9151	
	Reassessments		
	Record of Decision (ROD)		
	Re-evaluations		
	Supplemental EA		
	Supplemental EIS		
F.	Clearance Memo	Org 9151	
G	Cultural	Org 9152	
	Report		
	SHPO Letter		
	Agency Letter		
	Cultural Initiation Form (CIF)		
	Programmatic Agreements/Memorandums of Agreement		See Section 2.1(C)
H.	Floodplains	Org 9151	
I.	Hazmat	Org 9152	
	PISA		
	Report		
	Phase I		
	Phase II		
J.	Noise Report	Org 9152	
K.	Riparian/Wetlands	Org 9151	
L	Tribal Information	Org 9152	
M.	Visual	Org 9151	
N.	Other	Org 9151	

2.3 DESIGN

	Document	Responsible Party	Comments
A.	Design Scope of Work /Dictionary of Standard Work Tasks	PM designated on TRACS	
	Design Scope of Services		
	Responsibility Matrix		
	MC Task Order		
	Project Number Request		
B.	Consultant Selection/Notification	PM designated on TRACS	
C.	[Placeholder		
D.	Design Kick Off Partnering Workshop Report	PM designated on TRACS	
E.	Design Progress Meeting Notes	PM designated on TRACS	
F.	Design Agreements	PM designated on TRACS	
	(These are changes that are outside of, or a change to the scope of work or mitigation requirements)		
G.	Geotechnical and Archaeological Testing and Recovery Approval		
	Field Investigation Plan & Archaeological Testing and Recovery Plan	9910 or 9152	
	Temporary Right of Entry for ground disturbing activities	9340	
	Environmental Clearance/ground disturbing activities	9151	
	Storm Water Pollution Prevention Plan (SWPPP) for ground disturbing activities	9910	
	Geotechnical Design Report	9908	
H.	Materials Final Design Memo	9912	

2.3 DESIGN (continued)

	Document	Responsible Party	Comments
I.	Design Submittals	PM designated on TRACS	
	Stage II		
	Stage III		
	Stage IV		
	PS&E		
J.	Utility and Railroad Coordination	9440	
	Agreements with Utilities and Railroad companies		
	Railroad Clearance		
	Utility Clearance		
K.	Right of Way Information		
	Right of Way Contract	9370 or 9380	
	Right of Way Clearance	9390	
	Demo/Improvement Report	9320	
	Right of Entry / Ground Disturbing Activities		See Section 2.3(G)
	Right of Way Plans	9340	
	Right of Way Disposal	9330	
L.	Drainage	9597	
	Initial Drainage Report		
	Final Drainage Report		
	Flood Plain Coordination		
M.	Roadside Development	9596	
	Plant Inventory/Transplant Plans		
	Resource Protection Plan		
	Storm Water Pollution Prevention Plan (SWPPP)		
N.	Project Changes	PM designated on TRACS	
	Project Change Request		
	PPAC & Board Approval Documents		

2.3 DESIGN (continued)

	Document	Responsible Party	Comments
O.	Contracts and Specifications	9460	
	Bid Schedule and Summary		
	Addendums		
	Engineers & Agreement Estimates		
	Bid Advertisement		
	[Placeholder]		
	Award and Board Minutes		
P.	Other		

2.4 ANCILLARY PERMITS AND AGREEMENTS

	Document	Responsible Party	Comments
A.	Site Agreements	PM designated on TRACS	
	Nursery		
	Staging		
	Magazine		
B.	Borrow-Material Pit Information (including environmental clearance)	9908	
C.	Weed Control	9596	
D.	Burn Permit	RE designated on Design Stakeholder List	
E.	Private Party Agreements	PM designated on TRACS or RE designated on Design Stakeholder List	
F.	Access Permits	PM designated on TRACS	
G.	Construction Water	PM designated on TRACS or RE designated on Design Stakeholder List	
H.	Other		

2.5 CONSTRUCTION ACTIVITIES

	Document	Responsible Party	Comments
A.	Mitigation/Monitoring Requirements	RE designated on Design Stakeholder List	See Section 2.2(B) and (F)
B.	Construction Kick Off Partnering Workshop Report	RE designated on Design Stakeholder List	
C.	Storm Water Pollution Prevention Plan (SWPPP) – Construction	RE designated on Design Stakeholder List	
D.	Notice of Intent (NOI)	RE designated on Design Stakeholder List	
E.	404 Extension	RE designated on Design Stakeholder List	
F.	Weed Control	9596	
G.	Notice of Termination (NOT) (Contractor)	RE designated on Design Stakeholder List	
H.	Schedule and Work Sequence Information	RE designated on Design Stakeholder List	
I.	Subcontractor List	RE designated on Design Stakeholder List	
J.	Public Notification	RE designated on Design Stakeholder List	
K.	Supplemental Agreement Tracking System (SATS)	RE designated on Design Stakeholder List	
L.	Meeting Notes	RE designated on Design Stakeholder List	
M.	Final Acceptance	RE designated on Design Stakeholder List	
N.	Initiate Right of Way Disposal if needed		See Section 2.3 (K)

2.5 CONSTRUCTION ACTIVITIES (continued)

	Document	Responsible Party	Comments
O.	Construction Partnering Close Out Workshop Report	RE designated on Design Stakeholder List	
P.	As-Built Plans/Final Costs	PM designated on TRACS or RE designated on Design Stakeholder List	
Q.	Other		

2.6 POST CONSTRUCTION PUNCH LIST

	Document	Responsible Party	Comments
A.	Vegetation Survivability	9596	
B.	Monitoring Commitments	RE designated on Design Stakeholder List	
C.	Fence Maintenance	RE designated on Design Stakeholder List	
D.	Erosion	9596	
E.	Notice of Termination (NOT) (ADOT)	RE designated on Design Stakeholder List	
F.	MOU/JPA Commitments	PM designated on TRACS or RE designated on Design Stakeholder List	
G.	Initiate Right of Way Disposal if needed		See Section 2.3 (K)
H.	Other		

Section 3.1 – List of Known Agreements

Agreements Affecting ADOT		
List of Known Agreements with Land Management Agencies		
BLM; FHWA	Interagency Agreement, Bureau of Land Management and Federal Highway Administration (AA 851-IA2-40) July 27, 1982	This National level MOU articulates the requirements and process to be used by FHWA to appropriate Public lands administered by the BLM for highway use.
ADOT; FHWA (AZ); USDA FS (SW Region)	Memorandum of Understanding Among The Arizona Department of Transportation, the Federal Highway Administration, Arizona Division and the USDA, Forest Service, Southwestern Region Regarding the Construction, Operation and Maintenance of Highways in Arizona Crossing National Forest System Lands (06-MU-11031600-013) October 20, 2005	This <u>MOU</u> , among the Arizona office of FHWA, the Southwestern Region of USDA Forest Service and ADOT establishes the principles under which the agencies agree to collaborate in transportation construction and maintenance projects on National Forest System lands.
ADOT; BLM (AZ); FHWA (AZ)	Memorandum of Understanding between the Arizona Department of Transportation, The Federal Highway Administration, Arizona, and the Bureau of Land Management, Arizona (AZ-931-0309 – Amendment #2) March 21, 2006	This <u>MOU</u> - among ADOT and the Arizona offices of the BLM and FHWA - establishes the principles under which the agencies agree to collaborate in Land Use and Project Planning. The document includes Appendices (Operating Agreement, Project Reference) that provide specific direction on agency roles, responsibilities and operating procedures.
BLM (AZ); FHWA (AZ); ADOT	Memorandum of Understanding between the Department of the Interior, Bureau of Land Management, Arizona State Office, All Arizona Field Offices and U.S. Department of Transportation, Federal Highway Administration, Arizona Division Office as a Cooperating Agency, and the State of Arizona, Arizona Department of Transportation as a Cooperating Agency (AZ-910-0417) September 10, 2004	This <u>MOU</u> among BLM, FHWA and ADOT establishes the principles under which ADOT and FHWA will collaborate as cooperating agencies with the BLM on its Land and Resource Management planning efforts.
ADOT; FHWA (AZ); USDA FS (SW Region)	Memorandum of Understanding between the Arizona Department of Transportation, the Federal Highway Administration and USDA Forest Service, Southwestern Region (03-MU-11030600-48)	This <u>MOU</u> among ADOT, FHWA and USDA Forest Service establishes a cooperative process and protocols for survey and control of invasive species and hazardous vegetation within ADOT easements that cross National Forest System lands within the Southwestern Region.

		May 27, 2003	
	USDA Forest Service; FHWA	<p>Memorandum of Understanding between United States Department of Agriculture, Forest Service and United States Department of Transportation, Federal Highway Administration Regarding the Appropriation and Transfer of National Forest System Lands for Highway Purposes (no number assigned)</p> <p style="text-align: center;">August 20, 1998</p>	<p>This National level <u>MOU</u> articulates the requirements and process to be used by FHWA to appropriate National Forest System lands for highway use. Its language specifically amends and supersedes similar direction previously issued on May 11, 1981.</p>
	ADOT USFS	<p>Memorandum of Understanding between the Arizona Department of Transportation, Highways Division and the United States Department Agriculture, Forest Service on procedures related to state highways over national forest lands. (16-R3-92-0025)</p> <p style="text-align: center;">April 14, 1992</p>	<p>This <u>MOU</u> establishes procedures for coordinating the location, design, construction, management, operation, maintenance, signing, access, protection, conservation of environment, and other matters related to State highway development, use, and occupancy of National Forest Lands.</p>

List of Known Agreements with Other Agencies

<p>Corps (AZ); FHWA (AZ) ADOT</p>	<p>Operating Agreement – The Integration Process Relative to the National Environmental Policy Act and Section 404 of the Clean Water Act for projects involving: US Army Corps of Engineers – Arizona Area Office, Arizona Division of the Federal Highway Administration, Arizona Department of Transportation (No number assigned) February 8, 2005</p>	<p>This <u>Operating Agreement</u> describes the protocols used to meet NEPA requirements of both FHWA and COE with one document</p>
<p>EPA (Region IX); FHWA (AZ)</p>	<p>US Environmental Protection Agency, Region IX, US Department of Transportation Federal Highway Administration, Arizona Division, Memorandum of Understanding, Sole Source Aquifer Review Pursuant to Section 1424(e) of the Safe Drinking Water Act (No MOU number assigned) November 27, 2002</p>	<p>This <u>MOU</u> outlines the coordination protocols to be used by the EPA and FHWA within the bounds of designated soul source aquifers within Arizona to verify that the potential impacts of projects will not cause health hazards or cause the installation of additional treatment facilities to meet National Primary Drinking Water Regulations.</p>
<p>FHWA (AZ); SHPO (AZ);</p>	<p>Programmatic Agreement among the Federal Highway Administration, The Arizona State Historic Preservation Office, the Advisory Council on Historic Preservation, and the Arizona Department of Transportation for Administration of the Federal Aid – Highway Program (No number assigned) December 21, 2001</p>	<p>This <u>Programmatic Agreement</u> establishes agreed upon roles, responsibilities and activities the agencies will take to coordinate the protection of cultural sites that could be affected by highway projects</p>
<p>FHWA; National Conference of SHPOs; Advisory Council</p>	<p>Nationwide Programmatic Agreement Among the Federal Highway Administration (FHWA), the National Conference of State Historic Preservation Officers (National Conference of SHPOs), and the Advisory Council on Historic Preservation (ACHP), for Implementation of Transportation Enhancement Activities (no number assigned) April 29, 1997</p>	<p>This National level <u>Programmatic Agreement</u> establishes agreed upon roles, responsibilities and activities the agencies will take to coordinate the protection of cultural sites that could be affected by highway projects. It provides the basic agreement that states agencies can tier to.</p>
<p>FHWA (AZ); ADOT; SHPO (AZ)</p>	<p>Interim Procedures for the Treatment of Historic Roads (no number assigned) November 15, 2002</p>	<p>This document provides temporary guidance agreed upon among FHWA (AZ), ADOT and SHPO (AZ) for interim procedures for in-use and abandoned Historic Roads with ADOT project areas while a Historic Roads Programmatic</p>

			Agreement is being prepared.
FHWA (AZ); ADOT	Arizona Programmatic Categorical Exclusion Approval (no number assigned) August 4, 2000		FHWA issued this approval to provide ADOT with authority to make a determination that federally funded projects that meet FHWA's regulatory requirements under 23 CFR 771.117(c) (i.e., Group 1) are categorically excluded from detailed NEPA analysis and articulates the process to be used for actions which qualify under 23 CFR 771.117(d) (Group 2).
ADOT; AZGFD	Memorandum of Understanding between Arizona Highway Department and Arizona Game and Fish Department Regarding Highway Construction and Management of Wildlife Resources (no number assigned) December 31, 1963		Establishes how ADOT and AZGFD will communicate about proposed highway projects and collaborate minimize impacts to wildlife resources within Arizona.
FHWA (AZ); SHPO (AZ); ADOT	Programmatic Agreement among the Federal Highway Administration, The Arizona State Historic Preservation and the Arizona Department of Transportation for Administration of the Transportation and Enhancement and Local Government Programs (SHPO-2003-0979) May 20, 2003		This <u>Programmatic Agreement</u> establishes agreed upon roles, responsibilities and activities the agencies will take to coordinate the protection of cultural sites that could be affected by Local Government projects
ADOT (AZ) SHPO (AZ)	Programmatic Agreement between the Arizona Department of Transportation and the Arizona State Historic Preservation Officer regarding implementation of the cultural resources management program for the Arizona Department of Transportation July 16, 2001		This <u>Programmatic Agreement</u> establishes agreed upon roles, responsibilities and activities the agencies will take to coordinate the protection of cultural sites that could be affected by state highway projects.
ADOT FHWA	Operating Partnership Agreement between the Arizona Department of Transportation and the Arizona Division of the Federal Highway Administration regarding the administration of Federal-aid transportation projects in the State of Arizona. November 4, 2004		This ADOT-FHWA <u>Operating Partnership</u> defines the respective responsibilities of ADOT and establishes procedures and implementation in accordance with 23 USC 106(b) and applicable State laws and regulations.

Section 3.2 – Links to Planning and Long Range Plans

Section 3.3 – Project Reference Template

Section 4 – [Placeholder]

*(The following is sample text for an e-mail transmission initiated by ADOT R/W Acquisition Section requesting FHWA's concurrence of necessity for the appropriation for **Linear Rights of Way** and/or temporary construction easements on BLM land.)*

To: *(NAME – FHWA Realty Officer)*

Subject: *(R/W Parcel #)* BLM Lands Appropriation Concurrence

PROJECT: (Insert Federal project and tracs number for construction)
(Insert Federal project and tracs number for Right of Way)

HIGHWAY:

SECTION:

PARCEL #:

BLM SERIAL #:

The Arizona Department of Transportation has determined a public need to acquire lands for the above referenced highway project. The project consists of *(brief project description)* and requires the acquisition of _____ acres of new right of way; and _____ acres of temporary construction easement from lands under the jurisdiction of the Bureau of Land Management (BLM) *(Field Office Name)*.

We hereby request your concurrence that the land identified above is reasonably necessary for the stated highway purpose in order to proceed with application for appropriation of these federal lands as identified on the right of way and/or construction plans for this project. Upon receipt of your concurrence, we will submit an appropriation request directly to the BLM *(Field Office Name)*. A copy of the submittal will be provided to you for your files.

(NAME) Acquisition Agent

*(The following is sample text for an e-mail transmission initiated by ADOT Materials Geotechnical Design Section requesting FHWA's concurrence of public necessity for the appropriation on **Material Site & Haul Road Rights of Way** from BLM.)*

To: *(NAME)* FHWA Realty Officer

Subject: *(MS #)* BLM Lands Appropriation Concurrence

HIGHWAY(s):

MS #:

The Arizona Department of Transportation has determined a public need to acquire lands for the above referenced material site and haul road. The material from this site will be used for *(brief description)* and requires the acquisition of _____ acres of new right of way lands under the jurisdiction of the Bureau of Land Management (BLM) *(Field Office Name)*.

We hereby request your concurrence of public necessity in order to proceed with application for appropriation of these federal lands as identified on the plat map and aerial photograph for this site. Upon receipt of your concurrence, we will submit an appropriation request directly to the BLM *(Field Office Name)* and a copy of the submittal will be provided to you for your files.

(NAME) Acquisition Agent

(The following is sample text for FHWA's e-mail response to ADOT R/W Acquisition Section.)

The Federal Highway Administration (FHWA), Arizona Division, has determined that the lands subject to this request are reasonably necessary for the stated highway purpose and concurs with this request pursuant to the provisions of Title 23 U.S.C. Section *(107(d) or 317)*.

(NAME) FHWA Realty Officer

Original Transmission from ADOT:

To: *(NAME – FHWA Realty Officer)*

Subject: *(R/W Parcel #)* BLM Lands Appropriation Concurrence

PROJECT: (Insert Federal project and tracs number for construction)
(Insert Federal project and tracs number for Right of Way)

HIGHWAY:

SECTION:

PARCEL #:

BLM SERIAL #:

The Arizona Department of Transportation has determined a public need to acquire lands for the above referenced highway project. The project consists of *(brief project description)* and requires the acquisition of _____ acres of new right of way; and _____ acres of temporary construction easement from lands under the jurisdiction of the Bureau of Land Management (BLM) *(Field Office Name)*.

We hereby request your concurrence of public necessity in order to proceed with application for appropriation of these federal lands as identified on the right of way and/or construction plans for this project. Upon receipt of your concurrence, we will submit an appropriation request directly to the BLM *(Field Office Name)* and a copy of the submittal will be provided to you for your files.

(NAME) Acquisition Agent

(The following is sample text for FHWA's e-mail response to ADOT Materials Geotechnical Design Section.)

The Federal Highway Administration has reviewed this request and concurs in the necessity of the lands for use on a Federal or Federally eligible project pursuant to the provisions of Title 23 U.S.C. Section *(107(d) or 317)*.

(NAME) FHWA Realty Officer

Original Transmission from ADOT:

To: *(NAME)* FHWA Realty Officer

Subject: *(MS #)* BLM Lands Appropriation Concurrence

HIGHWAY(s):

MS #:

The Arizona Department of Transportation has determined a public need to acquire lands for the above referenced material site and haul road. The material from this site will be used for *(brief description)* and requires the acquisition of _____ acres of new right of way lands under the jurisdiction of the Bureau of Land Management (BLM) *(Field Office Name)*.

We hereby request your concurrence of public necessity in order to proceed with application for appropriation of these federal lands as identified on the plat map and aerial photograph for this site. Upon receipt of your concurrence, we will submit an appropriation request directly to the BLM *(Field Office Name)* and a copy of the submittal will be provided to you for your files.

(NAME) Acquisition Agent



**Arizona Department of Transportation
Intermodal Transportation Division**

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
Governor

Victor M. Mendez
Director

Floyd Roehrich
State Engineer

(DATE)

*(Bureau of Land Management Field Office)
(Street Address)
(City, State, Zip Code)*

RE: APPLICATION FOR HIGHWAY RIGHT OF WAY AND/OR TEMPORARY
CONSTRUCTION EASEMENT

PROJECT: (Insert Federal project and tracs number for construction)
(Insert Federal project and tracs number for Right of Way)

HIGHWAY: *(ADOT Highway Designation)*

SECTION: *(ADOT Section Designation)*

PARCEL #: *(ADOT Parcel Number)*

BLM SERIAL #: *(BLM Serial Number)*

Dear *(Field Manager)*:

Application is hereby made by the State of Arizona, acting by and through its Department of Transportation (ADOT), for a federal land transfer located within the jurisdiction of your Field Office in *(County)* County, pursuant to the provisions of Section *(107(d) or 317 of Title 23, U.S.C.)*.

This application requires *(# of acres) of right of way* for the construction, operation and maintenance of the above-referenced highway project and/or *(# of acres)* of temporary construction easements for temporary construction activities for the purpose of *(identify activities)* and is in the best interest of public safety, necessity and convenience. We further request immediate right of entry to avoid project delays.

Enclosed are the proposed Highway Easement Deed (HED) and appropriate plans that provide a graphic depiction of the right of way and/or temporary construction easements required on portions of public lands described as:

REFER TO ATTACHED EXHIBIT(S)

(Gila & Salt River Base and Meridian)

This project is being completed in accordance with the specific conditions as agreed to during the environmental and design phases, which will be incorporated into the ADOT Special Provisions for the above-referenced project

(BLM Field Office)
(R/W Parcel #)
(Date)
Page 2

The Federal Highway Administration (FHWA), Arizona Division, has determined that the lands shown are reasonably necessary for use on a Federal Highway administered project and has concurred with this request (see attached e-mail correspondence). If the appropriation of these lands is not contrary to public interests, or inconsistent with the purpose for which such lands have been acquired, please provide your Letter of Consent authorizing the transfer of this land and immediate right of entry, directly to ADOT, with a copy to FHWA. Upon receipt of your Letter of Consent, the enclosed Highway Easement Deed will be sent to FHWA for execution. You will be provided a copy of the executed deed upon recording.

If you have any questions, you may contact me in writing at Arizona Department of Transportation, Right of Way Acquisition Section, 205 South 17th Avenue – 612E, Phoenix, Arizona 85007-3213, via e-mail at *(e-mail address)* or call me at *(telephone number)*. Thank you for your consideration.

Sincerely,

(Agent Name)
Right of Way Agent

Enclosures
Cc: (w/enc.): *(Realty Officer Name)*, Realty Officer
FHWA, Arizona Division



**Arizona Department of Transportation
Intermodal Transportation Division**

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
Governor

Victor M. Mendez
Director

Floyd Roehrich
State Engineer

(Date)

*(Bureau of Land Management Field Office)
(Street Address)
(City, State, Zip Code)*

RE: APPLICATION FOR MATERIAL SOURCE & HAUL ROAD
HIGHWAY(s): *(ADOT Highway Designation)*
MATERIAL SITE #: *(Material Site Number Designation)*

Dear *(Field Office Manager)*

Application is hereby made by the State of Arizona, acting by and through its Department of Transportation (ADOT), for a federal land transfer located within the jurisdiction of your Field Office in *(County)* County, pursuant to the provisions of Section *(107(d) or 317)* of Title 23, U.S.C.

Right of way is needed for a material source and haul road for the construction, operation and maintenance of the above-referenced highway(s) and is in the best interest of public safety, necessity and convenience. We further request immediate right of entry to avoid project delays.

Enclosed is a proposed Highway Easement Deed and a description for the requested right of way, a plat map, mining and reclamation plan, and environmental documentation for the material source covering this application for right of way on portions of the following public lands (Gila & Salt River Base and Meridian):

(LEGAL DESCRIPTION)



MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

(BLM Field Office)

(Material Site #)

(Date)

Page 2

The Federal Highway Administration (FHWA), Arizona Division, has determined that the lands shown are reasonably necessary for use on a Federal Highway administered project and has concurred with this request (see attached e-mail correspondence). If the appropriation of these lands is not contrary to public interests, or inconsistent with the purpose for which such lands have been acquired, please provide your Letter of Consent authorizing the transfer of this land and immediate right of entry, directly to ADOT, with a copy to FHWA. Upon receipt of your Letter of Consent, the enclosed Highway Easement Deed will be sent to FHWA for execution. You will be provided a copy of the executed deed upon recording.

If you have any questions, you may contact me in writing at Arizona Department of Transportation, Materials Group – Geotechnical Design Section, 1221 North 21st Avenue – 068R, Phoenix, Arizona 85009-3740, via e-mail at *(e-mail address)*, or call me at *(Phone Number)*. Thank you for your consideration.

Sincerely,

(Right of Way Agent Name)

Right of Way Agent

Enclosures

Cc: (w/enc.): *(NAME)*, Realty Officer
FHWA, Arizona Division

Illustration 8, Application for Material Source and Haul Road, Revised 1-25-06

Draft Letter of Consent for Linear Rights-of-Way
BLM LETTERHEAD

AZA- _____
Federal Project and tracs number for construction: _____
Federal Project and tracs number for right of way: _____
Highway: _____
Section: _____
Parcel: _____

Date

Division Administrator
Federal Highway Administration
One Arizona Center, Suite 410
400 E. Van Buren
Phoenix, AZ 85004

Dear _____:

A request has been received for the appropriation of, and immediate right of entry to, lands managed by the Bureau of Land Management (BLM) within the State of Arizona for use by the State of Arizona, acting by and through its Department of Transportation for _____ (Project name.

(The request includes provisions for temporary access for construction activities as identified in the application). The request is
pursuant to U.S.C. Title 23: Highways, (Section 317 OR Section 107(d).

The area requested lies in the: [Legal description – if legal description is excessively long, it may be attached as an exhibit and referenced accordingly] as shown on the map(s) provided with the application. _____.

In accordance with the provisions of the Interagency Agreement No. AA-851-IA2-40, dated July 27, 1982, between the Bureau of Land Management (BLM) and the Federal Highway Administration (FHWA), the BLM agrees to the appropriation and transfer of the above-described lands for the foregoing purpose, together with immediate right of entry for construction purposes. This appropriation is subject to: the standard conditions of appropriation contained in the Memorandum of Understanding between Arizona Department of Transportation (ADOT), Federal Highway Administration (FHWA) and Bureau of Land Management (BLM) dated April 23, 2003, as amended November 20, 2008, and supplemented by the Operating Agreement (Appendix C), and all other specific conditions as agreed to during the environmental and design phases, which will be incorporated into ADOT's Special Provisions for the above-referenced project.

Sincerely,

[NAME]
Field Manager

cc: Realty Officer, FHWA, Arizona Division
Right of Way Agent, ADOT

Draft Letter of Consent for Material Site Rights-of-Way
BLM LETTERHEAD

AZA-_____
Highway(s):_____
MS#:_____

Date

Division Administrator
Federal Highway Administration
One Arizona Center, Suite 410
400 E. Van Buren
Phoenix, AZ 85004

Dear _____:

Request has been received for the appropriation of and immediate right of entry to BLM-managed lands within the State of Arizona for use by the State of Arizona, acting by and through its Department of Transportation for _____ (Material Site #) _____, pursuant to U.S.C. Title 23: Highways, Section 317 [OR] Section 107(d).

The area requested lies in the: [Legal description – if legal description is excessively long, it may be attached as an exhibit and referenced accordingly] as shown on the map titled _____ and marked _____.

In accordance with the provisions of the Interagency Agreement No. AA-851-IA2-40, dated July 27, 1982, between the Bureau of Land Management (BLM) and the Federal Highway Administration (FHWA), the BLM agrees to the appropriation and transfer of the above-described lands for the foregoing purpose, together with immediate right of entry for construction purposes. This appropriation is subject to: the standard conditions of appropriation contained in the Memorandum of Understanding between Arizona Department of Transportation (ADOT), Federal Highway Administration (FHWA) and Bureau of Land Management (BLM) dated April 23, 2003, as amended September 10, 2004 and March 21, 2006, and supplemented by the Operating Agreement (Appendix C), and the mining and reclamation plan and mitigation measures identified in the environmental document for the above-referenced project and all other specific conditions as agreed.

Sincerely,

[NAME]
Field Manager

cc: Realty Officer, FHWA, Arizona Division
Right of Way Agent, ADOT

Parcel: «Parcel»

WHEN RECORDED RETURN TO
 ARIZONA DEPARTMENT OF TRANSPORTATION
 R/W OPERATIONS SEC. (612E)
 205 S. 17TH AVENUE
 PHOENIX, AZ 85007-3212

PROJECT: « CONSTRUCTION PROJECT/TRACNo»
 « ROW PROJECT/TRACNo»
 SECTION: «SECTION»
 PARCEL: «PARCEL»
 BLM #:

EXEMPT PER A.R.S. 11-1134-A2

HIGHWAY EASEMENT DEED

THIS DEED made this _____ day of _____, 20 ____, by and between the **UNITED STATES OF AMERICA**, acting by and through the **Department of Transportation, Federal Highway Administration**, hereinafter referred to as **DEPARTMENT**, and the **STATE OF ARIZONA**, acting by and through its **Department of Transportation**, hereinafter referred to as the **GRANTEE**:

WITNESSETH:

WHEREAS, the **GRANTEE** has filed application under the provisions of the Act of Congress of August 27, 1958, as amended (*23 U.S.C. Section 317 or Section 107(d) – if Interstate*), for the right-of-way of a highway over certain federal land under the jurisdiction of the Department of the Interior – Bureau of Land Management, hereinafter referred to as Bureau of Land Management, in the State of Arizona; and

WHEREAS, the Arizona Division Administrator of the Federal Highway Administration, pursuant to delegation of authority from the Secretary of Transportation, has determined that an easement over the land covered by the application is reasonably necessary for right-of-way for construction, operation and maintenance of Project «Construction_No»; and

WHEREAS, the Department of the Interior, acting by and through the Bureau of Land Management, in its consent to the appropriation of the federal land, has agreed to the transfer by the **DEPARTMENT** of an easement over the land to the **GRANTEE**;

NOW THEREFORE, the **DEPARTMENT**, as authorized by law, does hereby grant to the **GRANTEE** an easement for right-of-way for the construction, operation, and maintenance of a highway (including control of access thereto from adjoining lands, if Interstate or other controlled access) and use of the space above and below the established grade line of the highway pavement for highway purposes on, over, across, in, and upon the following described federal land within the United States in the County of «County», State of Arizona, Gila and Salt River Meridian:

(continued)

MOU DEED (Lin) 7/31/2008

Parcel: «Parcel»

TOWNSHIP **RANGE** **SECTION** **SUBDIVISION**

As shown on the right of way plans for project «Project» / «CompleteTracNo» / «Section» on file in the office of the State Engineer at Phoenix, Arizona.

Subject, however, to the following terms and conditions:

1. This easement is subject to outstanding valid claims, if any, existing on the date of this deed, and the **GRANTEE** shall obtain such permission as may be necessary on account of any such claims;
2. Unless an alternative agreement is reached between the **GRANTEE** and **DEPARTMENT** and documented in writing and recorded in the office of the applicable County Recorder, the easement herein granted shall terminate 10 years from the date of execution of this deed by the United States of America in the event construction of a highway on the right-of-way is not started during such period;
3. The design, construction, operation and maintenance of highway projects situated on this right-of-way, will be in accordance with the provisions of Title 23, U.S.C. – Highways, and amendments; applicable State laws; the construction specifications of the Arizona Department of Transportation as approved by the Federal Highway Administration for use on Federal-aid projects; and the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Divisions of the Federal Highway Administration and the Bureau of Land Management, dated April 23, 2003, as amended .
4. The easement herein granted is limited to use of the described right-of-way and the space above and below the established grade line of the highway pavement for the purpose of construction, operation, and maintenance of a highway in accordance with the approved plans and does not include the grant of any right for non-highway purposes or facilities: Provided, that the right of the Bureau of Land Management to use or authorize the use of any portion of the right-of-way for non-highway purposes shall not be exercised when such use would be inconsistent with the provisions of Title 23, U.S.C., and amendments, and the Federal Highway Administration Regulations issued pursuant thereto; or would interfere with the free flow of traffic or impair the full use and safety of the highway, and in any case the Federal Highway Administration and **GRANTEE** shall be consulted prior to the exercise of such rights; and Provided further, that nothing herein shall preclude the Bureau of Land Management from locating Department of the Interior information signs on the portions of the right-of-way outside of construction clearing limits [except that such signs shall not be located on the right of way of an Interstate System];

(continued)

MOU DEED (Lin) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Parcel: «Parcel»

5. Grantee may not assign its rights hereunder without the prior written approval of the **DEPARTMENT** and the Bureau of Land Management in accordance with provisions of the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Divisions of the Federal Highway Administration and the Bureau of Land Management, dated April 23, 2003, as amended.
6. When need for the easement herein granted shall no longer exist and the area has been reasonably rehabilitated to protect the public and environment, the **GRANTEE** shall give notice of that fact to the **DEPARTMENT** and, Bureau of Land Management and upon approval by the Arizona State Transportation Board, the rights herein granted shall terminate and land shall immediately revert to the Department of the Interior, or assigns.
7. Prior to reversion or termination of this easement, **GRANTEE** shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the BLM Field Manager, unless an alternative agreement is reached by both parties and documented in writing. If **GRANTEE**, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the BLM Field Manager may order the removal and disposal of any improvements and restore the area at **GRANTEE**'s expense.

The **GRANTEE**, in consideration of the conveyance of said land, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that:

- a. No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over or under such land hereby conveyed;
- b. The **GRANTEE**, shall use said land so conveyed in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in federally-assisted programs of the Department of Transportation, in effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

In the event of breach of any of the above-mentioned nondiscrimination conditions, the **DEPARTMENT** shall have the right to re-enter said land and facilities on said land, and the above-described land and facilities shall thereupon revert to the Department of the Interior, or assigns, as such interest existed prior to this instrument.

(continued)

MOU DEED (Lin) 7/31/2008

Parcel: «Parcel»

IN WITNESS WHEREOF, I, _____, Arizona Division Administrator, pursuant to delegations of authority from the Secretary of Transportation and the Federal Highway Administrator, by virtue of authority in me vested by law, have hereunto subscribed my name as of the day and year first above written.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

By _____
Arizona Division Administrator

STATE OF ARIZONA)
) ss
County of)

I, _____, a Notary Public in and for the State of _____, do hereby certify that on this the ____ day _____, 20 ____, before me personally appeared _____, Arizona Division Administrator, Federal Highway Administration, and acknowledged that the foregoing instrument bearing date of _____, 20 ____, was executed by him/her in his/her official capacity and by authority in her/him vested by law, for the purposes and intents in said instrument described and set forth, and acknowledged the same to be her/his free act and deed as Arizona Division Administrator, Federal Highway Administration.

Witness my hand and seal this ____ day of _____, 20 ____

Notary Public

(SEAL)

My Commission Expires _____

(continued)

MOU DEED (Lin) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Parcel: «Parcel»

In compliance with the conditions set forth in the foregoing deed, the **STATE OF ARIZONA**, certifies, and by the acceptance of this deed, accepts the right-of-way over certain land herein described and agrees to abide by the conditions set forth in said deed.

Accepted this _____ day of _____, 20 _____.

By _____
Chief Right of Way Agent
Right of way Group

STATE OF ARIZONA)
) ss
County of)

I, _____ , a Notary Public in and for said County and State, hereby certify that _____ , whose name is signed to the foregoing conveyance and who is known to me, acknowledged before me on this day that, being informed of the contents of the conveyance, he/she in his/her capacity as Chief Right of Way Agent, Right of Way Group, executed the same voluntarily on this day.

Given under my hand and seal of office this _____ day of _____, 20 _____.

Notary Public

(SEAL)

My Commission Expires _____

M.S. #:

WHEN RECORDED RETURN TO
ARIZONA DEPARTMENT OF TRANSPORTATION
MATERIALS GROUP (068R)
1221 N. 21ST AVENUE
PHOENIX, AZ 85009-3740

HIGHWAY(S):
M.S.#:
BLM #:

EXEMPT PER A.R.S. 11-1134-A2

HIGHWAY EASEMENT DEED

THIS DEED made this _____ day of _____, 20____, by and between the **UNITED STATES OF AMERICA**, acting by and through the **Department of Transportation, Federal Highway Administration**, hereinafter referred to as **DEPARTMENT (GRANTOR)**, and the **STATE OF ARIZONA**, acting by and through its **Department of Transportation**, hereinafter referred to as the **GRANTEE**:

WITNESSETH:

WHEREAS, the **GRANTEE** has filed application under the provisions of the Act of Congress of August 27, 1958, as amended (*23 U.S.C. Section 317 and Section 107(d) - if Interstate*), for the right to excavate and remove and/ or store materials for construction, operation and maintenance of highways (material site) and a road to transport said materials (haul road) over certain federal land under the jurisdiction of the Department of Interior - Bureau of Land Management, in the State of Arizona, and

WHEREAS, the Arizona Division Administrator of the Federal Highway Administration, pursuant to delegation of authority from the Secretary of Transportation, has determined that an easement over the land covered by the application is reasonably necessary for the construction and maintenance of highways on the Federal Aid Highway System; and

WHEREAS, the Department of Interior, acting by and through the Bureau of Land Management, in its consent to the appropriation of the federal land, has agreed to the transfer by the **DEPARTMENT** of an easement over the land to the **GRANTEE**;

NOW THEREFORE, the **DEPARTMENT**, as authorized by law, does hereby grant to the **GRANTEE** an easement for the construction, operation, and maintenance of a material site and haul road (including control of access thereto from adjoining lands), for highway purposes on, over, across, in, and upon the following described federal land within the United States in the County of «County», State of Arizona, Gila and Salt River Meridian:

(continued)

MOU DEED (Mat) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

M.S. #:

TOWNSHIP RANGE SECTION SUBDIVISION

As more particularly shown on the plat for M.S.#_____ on file in the office of the Assistant State Engineer at Phoenix, Arizona.

Subject, however, to the following terms and conditions:

1. This easement is subject to outstanding valid claims, if any, existing on the date of this deed, and the **GRANTEE** shall obtain such permission as may be necessary on account of any such claims;
2. The easement herein granted shall terminate 10 years from the date of execution of this deed by the United States of America in the event use of the material site is not started during such period;
3. The design, construction and maintenance of material site and haul road situated on this right-of-way will be in accord with the provisions of Title 23, United States Code (U.S.C.) - Highways, and amendments; applicable State laws; the construction specifications of the Arizona Department of Transportation as approved by the Federal Highway Administration for use on Federal-aid projects; and the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Divisions of the Federal Highway Administration and the Bureau of Land Management, dated April 23, 2003, as amended.
4. The easement herein granted is limited to use of the described right-of-way for the purpose of construction, operation, and maintenance of a material site and haul road in accordance with the approved plans and does not include the grant of any rights for non-highway purposes or facilities: Provided, that the right of the Bureau of Land Management to use or authorize the use of any portion of the right-of-way for non-highway purposes shall not be exercised when such use would be inconsistent with the provisions of Title 23, U.S.C., and amendments, and the Federal Highway Administration Regulations issued pursuant thereto, or would interfere with the free flow of traffic or impair the full use and safety of the material site and haul road, and in any case the Federal Highway Administration and **GRANTEE** shall be consulted prior to the exercise of such rights; and Provided further, that nothing herein shall preclude the Bureau of Land Management from locating Department of the Interior information signs on the portions of the right-of-way outside of construction clearing limits;

(continued)

MOU DEED (Mat) 7/31/2008

MOU No. AZ-931-0309
 → Amendment #4
 11/19/2008

M.S. #:

5. Grantee may not assign its rights hereunder without the prior written approval of the **DEPARTMENT** and the Bureau of Land Management in accordance with provisions of the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Divisions of the Federal Highway Administration and the Bureau of Land Management, dated April 23, 2003, as amended .
6. When need for the easement herein granted shall no longer exist and the area has been reasonably rehabilitated to protect the public and environment, the **GRANTEE** shall give notice of that fact to the **GRANTOR** and, upon approval by the Arizona State Transportation Board, the rights herein granted shall terminate and land shall immediately revert to the Department of Interior, or assigns.
7. Prior to reversion or termination of this easement, **GRANTEE** shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the BLM Field Manager, unless an alternative agreement is reached by both parties and documented in writing. If **GRANTEE**, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the BLM Field Manager may order the removal and disposal of any improvements and restore the area at **GRANTEE**'s expense.

The **GRANTEE**, in consideration of the conveyance of said land, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that:

- a. No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over or under such land hereby conveyed;
- b. The **GRANTEE**, shall use said land so conveyed in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in federally-assisted programs of the Department of Transportation, in effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

In the event of breach of any of the above-mentioned nondiscrimination conditions, the Department shall have the right to re-enter said land and facilities on said land, and the above-described land and facilities shall thereupon revert to the Department of Interior, or assigns, as such interest existed prior to this instrument.

(continued)

MOU DEED (Mat) 7/31/2008

MOU No. AZ-931-0309
 → Amendment #4
 11/19/2008

M.S. #:

IN WITNESS WHEREOF, I, _____, Arizona Division Administrator, pursuant to delegations of authority from the Secretary of Transportation and the Federal Highway Administrator, by virtue of authority in me vested by law, have hereunto subscribed my name as of the day and year first above written.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

By _____
Arizona Division Administrator

STATE OF ARIZONA)
) ss
County of)

I, _____, a Notary Public in and for the State of _____, do hereby certify that on this the ____ day _____, 20____, before me personally appeared _____, Arizona Division Administrator, Federal Highway Administration, and acknowledged that the foregoing instrument bearing date of _____, 20____, was executed by him/her in his/her official capacity and by authority in her/him vested by law, for the purposes and intents in said instrument described and set forth, and acknowledged the same to be her/his free act and deed as Arizona Division Administrator, Federal Highway Administration.

Witness my hand and seal this ____ day of _____, 20____

Notary Public

(SEAL)

My Commission Expires _____

(continued)

MOU DEED (Mat) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

M.S. #:

In compliance with the conditions set forth in the foregoing deed, the **STATE OF ARIZONA**, certifies, and by the acceptance of this deed, accepts the right-of-way over certain land herein described and agrees for itself, its successors and assigns forever to abide by the conditions set forth in said deed.

Accepted this ____ day of _____, 20____.

By _____
Assistant State Engineer
Materials Group

STATE OF ARIZONA)
) ss
County of)

I, _____, a Notary Public in and for said County and State, hereby certify that _____, whose name is signed to the foregoing conveyance and who is known to me, acknowledged before me on this day that, being informed of the contents of the conveyance, he/she in his/her capacity as Assistant State Engineer, Materials Group, executed the same voluntarily on this day.

Given under my hand and seal of office this ____ day of _____, 20 ____.

Notary Public

(SEAL)

My Commission Expires _____

Parcel: «Parcel»

WHEN RECORDED RETURN TO
ARIZONA DEPARTMENT OF TRANSPORTATION
R/W OPERATIONS SEC. (612E)
205 S. 17TH AVENUE
PHOENIX, AZ 85007-3212

PROJECT: «CONSTRUCTION PROJECT/TRAC»
ROW PROJECT/TRAC
SECTION: «SECTION»
PARCEL: «PARCEL»
BLM #:

EXEMPT PER A.R.S. 11-1134-A2

HIGHWAY EASEMENT DEED TEMPORARY CONSTRUCTION

THIS DEED made this _____ day of _____, 20 ____, by and between the **UNITED STATES OF AMERICA**, acting by and through the **Department of Transportation, Federal Highway Administration**, hereinafter referred to as **DEPARTMENT**, and the **STATE OF ARIZONA**, acting by and through its **Department of Transportation**, hereinafter referred to as the **GRANTEE**:

WITNESSETH:

WHEREAS, the **GRANTEE** has filed application under the provisions of the Act of Congress of August 27, 1958, as amended (*23 U.S.C. Section 317 or Section 107(d) – if Interstate*), for a temporary construction easement over certain federal land under the jurisdiction of the Department of the Interior – Bureau of Land Management, in the State of Arizona; and

WHEREAS, the Arizona Division Administrator of the Federal Highway Administration, pursuant to delegation of authority from the Secretary of Transportation, has determined that a temporary construction easement over the land covered by the application is reasonably necessary for construction of Project <<Construction No.>> and

WHEREAS, the Department of the Interior, acting by and through the Bureau of Land Management, in its consent to the appropriation of the federal land, has agreed to the transfer by the **DEPARTMENT** of a temporary construction easement over the land to the **GRANTEE**;

NOW THEREFORE, the **DEPARTMENT**, as authorized by law, does hereby grant to the **GRANTEE** a temporary construction easement for the following activities marked with an “x”:

- | | |
|-----------------------------------------------------------------|-------------------------------------------------------------------------|
| <input type="checkbox"/> Grading | <input type="checkbox"/> Temporary Detour Roads |
| <input type="checkbox"/> Equipment Storage Areas | <input type="checkbox"/> Processing Areas |
| <input type="checkbox"/> Plant Salvage Nurseries | <input type="checkbox"/> Magazine Sites |
| <input type="checkbox"/> Material Sites & Associated Haul Roads | <input type="checkbox"/> Batch / Hot Plants |
| <input type="checkbox"/> Driveway / Turnout Connections | <input type="checkbox"/> Temporary Access Roads |
| <input type="checkbox"/> Material Storage / Stockpile Sites | <input type="checkbox"/> Well Sites |
| <input type="checkbox"/> Temporary Stock Tanks for Water | <input type="checkbox"/> Contractor Use Area (temporary Office / yards) |

(continued)

MOU DEED (TCE) 7/31/2008

Parcel: «Parcel»

associated with the construction and or maintenance of a highway upon the following described federal land within the United States in the County of «County», State of Arizona, Gila and Salt River Meridian

<u>TOWNSHIP</u>	<u>RANGE</u>	<u>SECTION</u>	<u>SUBDIVISION</u>
------------------------	---------------------	-----------------------	---------------------------

As shown on the design/construction plans for project «Project» / «Construction Project/TracNo» / «Section» on file in the office of the State Engineer at Phoenix, Arizona.

Subject, however, to the following terms and conditions:

1. This temporary construction easement is subject to outstanding valid claims, if any, existing on the date of this grant, and the GRANTEE shall obtain such permission as may be necessary on account of any such claims;
2. The temporary construction easement herein granted shall terminate 5 years from the date of execution of this deed by the United States of America unless terminated sooner;
3. The design and construction of highway projects situated within the temporary construction easement will be in accordance with the provisions of Title 23, U.S.C. – Highways, and amendments; applicable State laws; the construction specifications of the Arizona Department of Transportation as approved by the Federal Highway Administration for use on Federal-aid projects; and the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Divisions of the Federal Highway Administration and the Bureau of Land Management, dated April 23, 2003, as amended .
4. The temporary construction easement herein granted is limited to use in accordance with the approved construction plans and does not include the grant of any right for non-highway purposes or facilities: Provided, that the right of the Bureau of Land Management to use or authorize the use of any portion of the temporary construction easement for non-highway purposes shall not be exercised when such use would be inconsistent with the temporary construction easement herein granted.
5. Prior to reversion or termination of this easement, GRANTEE shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the BLM Field Manager, unless an alternative agreement is reached by both parties and documented in writing. If GRANTEE, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the BLM Field

(continued)

MOU DEED (TCE) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Parcel: «Parcel»

Manager may order the removal and disposal of any improvements and restore the area at GRANTEE's expense.

6. When need for the temporary construction easement herein granted shall no longer exist and the area has been satisfactorily rehabilitated to protect the public and environment, the **GRANTEE** shall give notice of that fact to the **DEPARTMENT** and Bureau of Land Management and, the rights herein granted shall terminate and the land shall revert to the Department of the Interior or its assigns.

The **GRANTEE**, in consideration of the conveyance of said land, does hereby covenant and agree as a covenant running with the land, that:

- a. No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over or under such land hereby conveyed;
- b. The **GRANTEE**, shall use said land so conveyed in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in federally-assisted programs of the Department of Transportation, in effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

In the event of breach of any of the above-mentioned nondiscrimination conditions, the **DEPARTMENT** shall have the right to re-enter said land and facilities on said land, and the above-described land and facilities shall thereupon revert to the Department of Interior, or assigns, as such interest existed prior to this instrument.

(continued)

MOU DEED (TCE) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Parcel: «Parcel»

IN WITNESS WHEREOF, I, _____, Arizona Division Administrator, pursuant to delegations of authority from the Secretary of Transportation and the Federal Highway Administrator, by virtue of authority in me vested by law, have hereunto subscribed my name as of the day and year first above written.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

By _____
Arizona Division Administrator

STATE OF ARIZONA)
) ss
County of)

I, _____, a Notary Public in and for the State of _____, do hereby certify that on this the ____ day _____, 20 ____, before me personally appeared _____, Arizona Division Administrator, Federal Highway Administration, and acknowledged that the foregoing instrument bearing date of _____, 20 ____, was executed by him/her in his/her official capacity and by authority in her/him vested by law, for the purposes and intents in said instrument described and set forth, and acknowledged the same to be her/his free act and deed as Arizona Division Administrator, Federal Highway Administration.

Witness my hand and seal this ____ day of _____, 20 ____

Notary Public

(SEAL)

My Commission Expires _____

(continued)

MOU DEED (TCE) 7/31/2008

MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Parcel: «Parcel»

In compliance with the conditions set forth in the foregoing deed, the **STATE OF ARIZONA**, certifies, and by the acceptance of this deed, accepts the temporary construction easement over certain land herein described and agrees for itself, its successors and assigns, forever to abide by the conditions set forth in said deed.

Accepted this ____ day of _____, 20 ____.

By _____
Chief Right of Way Agent
Right of way Group

STATE OF ARIZONA)
) ss
County of)

I, _____ , a Notary Public in and for said County and State, hereby certify that _____ , whose name is signed to the foregoing conveyance and who is known to me, acknowledged before me on this day that, being informed of the contents of the conveyance, he/she in his/her capacity as Chief Right of Way Agent, Right of Way Group, executed the same voluntarily on this day.

Given under my hand and seal of office this _____ day of _____, 20 ____.

Notary Public

(SEAL)

My Commission Expires _____



**Arizona Department of Transportation
Intermodal Transportation Division**

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
Governor

Victor M. Mendez
Director

Floyd Roehrich
State Engineer

Mr. Robert E. Hollis
Division Administrator
Federal Highway Administration
Department of Transportation
One Arizona Center
400 East Van Buren Street, Suite 410
Phoenix, Arizona 85004-2285

Re: Project:
Highway:
Section:
Disposal:

Dear Mr. Hollis:

Conforming with 23 CFR Part 620, Subpart B, we wish to advise you of the State's intent to relinquish portions of right of way to (Local Jurisdiction), for a continued public transportation use.

The right of way to be relinquished is located _____, and applicable Right of Way and As-Built plans are attached hereto, along with the Department's acquisition documents.

The (Local Jurisdiction) has agreed to comply with and be bound by all terms and conditions of the (right of way grants or highway easement deeds), as evidenced by the attached letter from said jurisdiction.

The State Engineer has requested this relinquishment action, which will alleviate the Department from liability and maintenance issues. Access control will not be altered by this proposal.

Our Roadside Development Services has determined that this area need not be retained for highway beautification purposes. A review of the Department's Five Year Highway Construction Program indicated that no projects or activity will affect the area of relinquishment.



MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Mr. Robert E. Hollis

Page 2

In compliance with 23 CFR Part 620, Subpart B, and in accordance with Arizona Revised Statutes Section 28-7209, the right of way as depicted on the maps for this relinquishment will be removed from the State Highway System and placed under the jurisdiction of (Local Jurisdiction) for a continued public transportation use.

In accordance with 23 CFR Part 620, Subpart B, (Local Jurisdiction) is not required to compensate the State for the right of way.

We respectfully request your endorsement of this action.

Sincerely,

(Disposal Unit, Titles Section)

enclosure

cc: (BLM), (FHWA)



Arizona Department of Transportation
Intermodal Transportation Division

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano
Governor

Victor M. Mendez
Director

Floyd Roehrich
State Engineer

Re:

Dear _____ :

The Arizona Department of Transportation intends to abandon the above location to the _____ should it be approved by the Arizona State Transportation Board.

The _____ can immediately accept the proposed area of abandonment by waiving A.R.S. 28-7209, which is the Advance Four Year Notice of Abandonment.

In order to complete the transfer of right of way, please sign the acceptance waiver that is attached hereto and forward to me in the enclosed postage paid envelope at your earliest convenience.

Upon receipt, the Department will be in a position to submit a Resolution of Abandonment to the Arizona Transportation Board for review and approval. You will receive a recorded copy of the Resolution upon approval and recordation in the records of _____ County.

Sincerely,

Lucy Mellema
Resolution / Disposal Unit Team Leader, Titles Section
Arizona Department of Transportation
205 S. 17th Avenue, Mail Drop 612E
Phoenix, Arizona 85007-3212
(602) 712-8757(ph) (602) 712-8756(fax)

Attachment
cc: (BLM) (FHWA)



MOU No. AZ-931-0309
→ Amendment #4
11/19/2008

Date:

(Local Jurisdiction)
(address/Contact)

RE: Highway:
Section:
Project:
Resolution:

By signing below, (Local Jurisdiction) hereby waives the Advance Four-Year Notice of Abandonment and Pavement Quality Report in accordance with Arizona Revised Statutes Section 28-7209, which will allow ADOT to abandon right of way for continued public transportation use to said (Local Jurisdiction).

In addition, (Local Jurisdiction) does hereby acknowledge and agree to comply with and be bound by all terms and conditions of all Right of Way Grant(s) or Highway Easement Deeds as follows: (All R/W's issued from BLM/FHWA/Forest). It is understood that said right of way documents have been previously provided to (Local Jurisdiction) during the process and consideration of this abandonment request.

If Board or Council action is required to legally bind the abandonment action for the (Local Jurisdiction), said document is required to be attached hereto. Should no action be attached, it is considered acknowledgement by the (Local Jurisdiction) that said action is not required and that the person signing below has the proper delegate authority to act on behalf of the (Local Jurisdiction).

Signature

Title

Date

ARIZONA DEPARTMENT OF TRANSPORTATION
205 SOUTH 17TH AVENUE
R/W Operations, MD 612E
PHOENIX, AZ 85007-3213

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

RESOLUTION OF ABANDONMENT

VICTOR M. MENDEZ, Director, Arizona Department of Transportation, on _____, presented and filed with this Transportation Board his written report under Arizona Revised Statutes Section 28-7046, recommending the abandonment of _____ within the above referenced project.

The portion of right of way to be abandoned is depicted in Appendix "A" and delineated on maps and plans on file in the office of the State Engineer, Intermodal Transportation Division, Phoenix, Arizona, entitled "Right of Way Plans, _____ Highway, Project _____."

WHEREAS said portion of right of way is no longer needed for state transportation purposes; and

WHEREAS this Board finds that public safety, necessity and convenience will be served by accepting the Director's report; therefore;

WHEREAS the _____ has acknowledged and agreed to be bound by all terms and conditions of the (Insert: right of way grants & date and/or highway easement deeds and recording information); therefore, be it

RESOLVED that the recommendation of the Director is adopted and made part of this resolution; be it further

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

RESOLVED that the _____ has acknowledged and agreed to be bound by all terms and conditions of the (Insert: right of way grants & date and/or highway easement deeds and recording information); be it further

RESOLVED that the portion of right of way depicted in Appendix "A" is hereby removed from the State Highway System and abandoned to _____ as provided in Arizona Revised Statute Section 28-7207 and 28-7209, and effective upon recordation in the Office of the County Recorder in accordance with Arizona Revised Statute Section 28-7213; be it further

RESOLVED that the Director provide written notice to evidencing the abandonment of the State's interest.

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

REPORT AND RECOMMENDATION

TO THE HONORABLE ARIZONA TRANSPORTATION BOARD:

The Intermodal Transportation Division has made a thorough investigation concerning the abandonment of a portion of right of way acquired for within the above referenced project.

This portion was previously established by .

A portion of the previously acquired right of way is no longer needed for state transportation purposes. has agreed to accept jurisdiction of the right of way, and has acknowledged and agreed to be bound by all terms and conditions of the (Insert: right of way grants & date and/or highway easement deeds and recording information); Accordingly, I recommend that the State's interest in the portion of right of way be abandoned.

The portion of right of way to be abandoned is depicted in Appendix "A" and delineated on the maps and plans on file in the office of the State Engineer, Intermodal Transportation Division, Phoenix, Arizona, entitled "Right of Way Plans, Highway, Project ."

I further recommend that the portion of right of way depicted in Appendix "A" be removed from the State Highway System and abandoned to , for a continued public transportation use.

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

All other rights of way and easements and appurtenances thereto subject to the provisions of Arizona Revised Statutes Section 28-7210 shall continue as they existed prior to the disposal of right of way depicted in Appendix "A".

Pursuant to Arizona Revised Statutes Section 28-7046, I recommend that the Transportation Board adopt a resolution making this recommendation effective.

Respectfully submitted,

VICTOR M. MENDEZ, Director
Arizona Department of Transportation

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

CERTIFICATION

I, VICTOR M. MENDEZ, Director of the Arizona Department of Transportation, do hereby certify that the foregoing is a true and correct copy from the minutes of the Transportation Board made in official session on .

IN WITNESS WHEREOF I have hereunto set my hand and the official seal of the Transportation Board on .

VICTOR M. MENDEZ, Director
Arizona Department of Transportation

ARIZONA DEPARTMENT OF TRANSPORTATION
205 SOUTH 17TH AVENUE
R/W Operations, MD 612E
PHOENIX, AZ 85007-3213

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:
PARCEL:

RESOLUTION OF DISPOSAL

VICTOR M. MENDEZ, Director, Arizona Department of Transportation, on _____, presented and filed with this Transportation Board his written report under Arizona Revised Statutes Section 28-7046, recommending the removal of easement right of way from the State Transportation System.

The easement right of way to be removed from the State Transportation System is depicted in Appendix "A" and delineated on maps and plans on file in the office of the State Engineer, Intermodal Transportation Division, Phoenix, Arizona, entitled "Right of Way Plans, _____ Highway, Project _____."

WHEREAS said easement right of way is no longer needed for State transportation purposes, nor will it be used for public highway purposes; and

WHEREAS because of these premises, this Board finds public convenience requires that said easement right of way be removed from the State Transportation System, extinguished and relinquished to _____; therefore be it

RESOLVED that the recommendation of the Director is adopted and made a part of this resolution; be it further

RESOLVED that the easement right of way is removed from the State Transportation System, extinguished and relinquished to _____.

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

REPORT AND RECOMMENDATION

TO THE HONORABLE ARIZONA TRANSPORTATION BOARD:

The Intermodal Transportation Division has made a thorough investigation concerning the disposal of easement right of way originally acquired for use within the above referenced project.

This portion of _____ was previously established as a state route and state highway by _____.

This easement for right of way is no longer required in the State Transportation System, nor will it be used for public highway purposes.

Accordingly, I recommend that said easement right of way be removed from the State Transportation System, extinguished and relinquished, to _____, according to law.

The easement right of way to be removed from the State Transportation System was acquired by _____ and is depicted in Appendix "A" and delineated on maps and plans on file in the office of the State Engineer, Intermodal Transportation Division, Phoenix, Arizona, entitled "Right of Way Plans, _____ Highway, Project _____."

All other rights of way, easements and appurtenances thereto, subject to the provisions of Arizona Revised Statutes Section 28-7210, shall continue as they existed prior to the disposal by relinquishment of the easement right of way depicted in Appendix "A".

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

Pursuant to Arizona Revised Statutes Section 28-7046, I recommend the adoption of a resolution making this recommendation effective.

Respectfully submitted,

VICTOR M. MENDEZ, Director
Arizona Department of Transportation

RES. NO.
PROJECT:
HIGHWAY:
SECTION:
ROUTE NO.:
ENG. DIST.:
COUNTY:

CERTIFICATION

I, VICTOR M. MENDEZ, Director of the Arizona Department of Transportation, do hereby certify that the foregoing is a true and correct copy from the minutes of the Transportation Board made in official session on .

IN WITNESS WHEREOF I have hereunto set my hand and the official seal of the Transportation Board on .

VICTOR M. MENDEZ, Director
Arizona Department of Transportation

Disposal 3/21/06

Sample Offer Letter for BLM ROW Grant

BLM LETTERHEAD

AZA-_____ [BLM Office Code]

[date]

Arizona Department of Transportation

Dear _____:

Enclosed is a right-of-way (ROW) grant offer (BLM Form 2800-14) for your proposed _____, Serial Number AZA-_____. Please review the grant form, sign in the space provided, and return to the address shown above. Upon receipt of the signed grant offer on BLM Form 2800-14, the Bureau of Land Management (BLM) will be able to issue the ROW grant absent any unresolved issues.

This ROW grant, and the authority to use the public lands described in the document, becomes effective on the date it is signed by a BLM Authorized Officer (AO). A copy of the signed ROW grant will be returned to you when signed by the BLM AO.

You are allowed 30 days from receipt of this offer in which to submit the signed ROW grant. If we do not receive the signed grant within thirty days, the application may be denied.

If you have any questions, please contact _____ at _____.

Sincerely,

Field Manager

Enclosure

Offer Ltr 3-21-06

Sample Decision Letter Issuing ROW Grant)
BLM Letterhead

AZA- _____ [BLM Office Code]

[date]

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
Arizona Department of Transportation

DECISION

Right-of-Way Grant AZA-_____ Issued

Enclosed is a copy of Right-of-Way (ROW) Grant (Serial Number AZA-_____) which was approved by the Bureau of Land Management on _____. The issuance of this ROW Grant constitutes a final decision by the BLM in this matter.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days of receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) or 43 CFR 2804.1 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay **must** also be submitted to each party named in this decision and to the Interior Board of Lands Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied,
- (2) The likelihood of the appellant's success on the merits,
- (3) The likelihood of immediate and irreparable harm if the stay is not granted, and
- (4) Whether the public interest favors granting the stay.

Sincerely,

Field Manager

2 Enclosures

ROW Grant AZA-_____
Form 1842-1, Information on Taking Appeals to the Board of Land Appeals

Decision Ltr 3/21/06

COMMON ACRONYMS & ABBREVIATIONS AND GLOSSARY OF TERMS

PREAMBLE:

Between 2000 and 2004, Subgroups consisting of representatives from the Arizona Department of Transportation and the Arizona offices of the Bureau of Land Management and the Federal Highway Administration met to increase efficiency, effectiveness and standardization of processes in the following areas of interagency coordination: Right-of-Way, National Environmental Policy Act (NEPA), Access and Materials.

The three agencies found that they often used terms differently. Therefore, they determined that a joint understanding of commonly-used words would be beneficial. It is with this intent that the following *Common Acronyms & Abbreviations* and *Glossary of Terms* was developed. *NEPA Words That Have Caused Confusion* follow with additional discussion.

The definitions provided are not intended to be utilized as legal definitions, but rather to facilitate communications between these three agencies when discussing interagency issues.

ADDITIONAL REFERENCES:

Arizona Revised Statutes governing right-of-way issues primarily include §28-7091 - §28-7215.

United States Code.

Code of Federal Regulations, Title 23, Title 30 and Title 43.

Memorandum of Understanding between ADOT, BLM & FHWA, dated April 23, 2003.

Operating Agreement, dated April 23, 2003 (supplements MOU).

Amendment Number 1, dated September 10, 2004 modifying MOU and Operating Agreement dated April 23, 2003.

More detailed information regarding ADOT's environmental analysis processes can be found on the Environmental and Enhancement Group website which can be accessed either via the ADOT Net Homepage – select “About ADOT” – “by Section/Group” – “Environmental Planning”; or directly via the internet at <http://adotenvironmental.com>

ACRONYMS AND ABBREVIATIONS

AASHTO:	American Association of State Highway Transportation Officials
ADEQ:	Arizona Department of Environmental Quality
ADOT:	Arizona Department of Transportation
AO:	Authorized Officer (BLM Field Manager or delegate)
ARPA:	Archaeological Resources Protection Act
ARS:	Arizona Revised Statutes
AS:	Archaeological Survey (relating to environmental analysis)
BE:	Biological Evaluation (relating to environmental analysis)
BLM:	Bureau of Land Management
C&S:	ADOT Contracts & Specifications Section
CAA:	Clean Air Act
CE:	Categorical Exclusion, as used by ADOT/FHWA (relating to environmental analysis)
CEQ:	Council on Environmental Quality
CFR:	Code of Federal Regulations
CWA:	Clean Water Act
CX:	Categorical Exclusion, as used by BLM (relating to environmental analysis)
DCR:	Design Concept Report
DOI:	Department of Interior
DOT:	Department of Transportation
EA:	Environmental Assessment (relating to environmental analysis)
ED:	Environmental Determination (relating to environmental analysis)
EEG:	ADOT Environmental and Enhancement Group
EIS:	Environmental Impact Statement (relating to environmental analysis)
EPG:	ADOT previous Environmental Planning Group (renamed EEG)
ESA:	Endangered Species Act
ESA:	Environmental Site Assessment (Phase II – site specific HAZMAT identification) (Phase III – site specific HAZMAT remediation). May also be used to refer to the “Endangered Species Act” (see NEPA Glossary)
FHWA:	Federal Highway Administration
FLPMA:	Federal Land Policy and Management Act

FLT:	Federal Land Transfer
FONSI:	Finding Of No Significant Impact (relating to environmental analysis)
FUP:	Free Use Permit
H(#):	Haul Road Number (for material sites)
HAZMAT:	Hazardous Materials (part of environmental assessment)
HED:	Highway Easement Deed
ID Team:	Inter-disciplinary Team
ISA:	Initial Site Assessment (Phase I) (parcel-specific assessment for HAZMAT)
LMP:	Land Management Plan
LOC:	Letter of Consent (issued by BLM)
LRMP:	BLM Land and Resource Management Plan
LUP:	Land Use Plan
MMA:	Minerals Management Act
MOU:	Memorandum of Understanding (specifically between ADOT/BLM/FHWA dated April 23, 2003)
MS:	Material Site
MSEB:	Material Site Excavation Boundaries (ADOT material site where material is approved for excavation or removal)
MSROW:	Material Site Right-of-Way
MUTCD:	Manual of Uniform Traffic Control Devices
MVD:	Motor Vehicle Division
NAGPRA:	Native American Graves Protection and Repatriation Act
NEPA:	National Environmental Policy Act
NHPA:	National Historic Preservation Act
NHS:	National Highway System
NPDES:	National Pollutant Discharge Elimination System
OA:	Operating Agreement
PA:	Project Assessment (relating to environmental analysis)
PISA:	Preliminary Initial Site Assessment (project overview for HAZMAT)
PM:	ADOT or BLM Project Manager; may also be used to refer to a material site “Plat Map” (ADOT map showing material site boundaries & haul road location)
PR:	Project Reference
PRWB:	Proposed Right-of-Way Boundaries (material site expansion area)

PS&E:	Plans, Specifications & Estimate (ADOT's bid package prepared for advertising and soliciting contractor bids for a highway project)
PS:	Pit Sketch (ADOT aerial photo showing location of material site & usually the haul road location)
R/W:	Right-of-way (also "ROW")
ROD:	Record of Decision (action by FHWA relating to environmental analysis)
ROW:	Right-of-Way
SHPO:	State Historic Preservation Officer
STB:	State Transportation Board
T & E:	Threatened and Endangered
TCE:	Temporary Construction Easement
Title 23:	Title 23 United States Code. Highways
Title 30:	Title 30 United States Code. Mineral Lands & Mining
Title 43:	Title 43 United States Code, Public Lands: Interior
TUP:	Temporary Use Permit
VER:	Valid Existing Rights

GLOSSARY OF TERMS

ABANDONMENT: This term is used differently by ADOT, FHWA & BLM. ADOT uses this term to convey R/W to another governmental agency for continued use as a transportation facility. FHWA utilizes this term to mean the relinquishment of public interest in existing R/W, with no intent to reclaim or reuse for R/W purposes (an action which ADOT calls either "vacate and extinguishment" or "vacate and relinquishment", depending on whether the lands are public or private). BLM uses this term when the authorized user "walks away" or abandons the site without notification.

ACCESS CONTROL: The process of regulating ingress to or egress from the highway.

ACCESS RIGHTS: The right of ingress to and egress from a property that abuts an existing street or highway that is a private property right that cannot be taken without just compensation. However, this right is not unlimited, but subordinate to the public's safe use of the route. Thus, abutting owners are not entitled to access at any and all points along the public roadway, rather to reasonable and adequate access.

ACCESS: Regarding highways refers to the right to ingress (enter) or egress (leave) the highway facility by a vehicle, pedestrian, bicycle or other user.

ACQUISITION: The process and those activities required to obtain an interest in, and possession of, real property.

AGENCY: A governmental organization (Federal, State, or local) or a quasi-governmental organization (such as a utility company) that acquires real property. NOTE: BLM does not include quasi-governmental entities in their use of this term.

APPRAISAL: The act or process by which a qualified appraiser develops an independent opinion of defined value of a property as of a specific date, based on analysis of relevant market information. The term "appraisal" is also synonymous with the appraiser's report setting forth such opinions. NOTE: The transfer of land from BLM to ADOT does not require appraisal.

APPROPRIATION: The act of acquiring right-of-way on BLM lands for federal-aid highway purposes, issued by BLM to FHWA under Title 23.

AS-BUILTS: The final set of ADOT construction plans generated upon completion of a project showing improvements as ultimately constructed. These plans often differ from the plans generated at the time the contract for the project is awarded due to changes made "in the field" during the construction and landscaping phases of a project. BLM uses this term to define a survey or similar document that shows the alignment "footprint" after construction, to document the actual surface of the land occupied by the authorized user. NOTE: This information is contained in ADOT's final R/W plans.

→ **ASSIGNMENT:** The conveyance of right-of-way to another governmental agency for continued use as a public transportation facility. (This is also called "abandonment" by ADOT).

AUTHORIZED OFFICER: BLM Field Manager or delegate who is authorized to consent to FHWA appropriation of BLM lands.

COMMUNITY PIT: A relatively small, defined area from which BLM can make disposals

for mineral materials to many persons. The surface disturbance is usually extensive in a confined area.

CONSTRUCTION PLANS: A set of engineering design plans which define the improvements for a highway project. Construction plans differ from R/W plans in that they specifically define construction issues, including existing and proposed highway, profiles, typical sections, new slope limits, and all construction features, structures and items. Also called "Design Plans".

DESIGN PLANS: See "Construction Plans".

DISPOSAL: The conveyance of the State's interest in real property determined to be in excess of State transportation needs. Disposal by ADOT may be accomplished by sale or any of several formal processes, as outlined in §28-7095 and §28-7201-§28-7215. See also "Abandonment", "Extinguishment", "Relinquishment", and "Vacate" for definitions of various processes. NOTE: Any disposal of real property by ADOT (other than excess land sales) requires a resolution by the State Transportation Board in accordance with §28-7046.

EASEMENT: An interest in real property that conveys specific use, but not ownership rights in another's property. Easements can be permanent or temporary and required for such purposes as access, drainage, ponding, slopes, or perpetual easements for the roadway itself. The term is used to describe either the right itself or the document conveying the right. See "Highway Easement Deed" and "Temporary Construction Easement".

ENCROACHMENT: A physical feature (not placed by ADOT) within or extending into the right-of-way which could be authorized or unauthorized.

ENVIRONMENTAL ANALYSIS: An assessment of potential impacts for all highway-related projects. This analysis considers such factors as: existing land uses, hazardous materials, air quality, noise abatement, sensitive or endangered species whose habitat may be within the project area, historic sites, cultural resources and other socio-economic issues. Additional information regarding environmental issues can be found in the NEPA Glossary and on ADOT's Environmental Planning Group website, which is listed in the Additional References section.

EXTINGUISHMENT: ADOT utilizes this term to vacate the transportation facility and extinguish interests in existing R/W that is held via easement interest only from private individuals.

FEDERAL LAND TRANSFER: FHWA activities involved in the appropriation of lands from another Federal agency (such as BLM).

FEDERAL-AID HIGHWAY: Highway facilities on the Federal-Aid Highway System which involve or are eligible for federal-aid funding. Interstates, primary, secondary & urban roads and off-system bridge replacements are major components of the federal highway program.

HASH MARKS: The symbol used on plan sheet to visually represent the access control described in the deeds or legal documents.

HAUL ROADS: Access roads (which are not public roadways) leading to an ADOT material site.

HIGHWAY EASEMENT DEED: The conveying document issued by FHWA to ADOT for permanent right-of-way (both linear rights of way and material sites & haul roads).

LETTER OF CONSENT: The document issued by BLM authorizing FHWA to appropriate

the public lands and transfer to ADOT for highway purposes. Also grants ADOT immediate right of entry to commence construction activities in advance of actual HED conveyance.

LODE CLAIM: Claim for minerals, usually metallic minerals i.e. gold, lead, silver zinc, copper, lead, etc., that are in place and have not been moved by erosive forces - water, wind, ice, gravity. Maximum dimensions are 600 ft by 1500 ft and should be a parallelogram. The end lines - short dimension - must be parallel. Claimant has extra lateral rights, if holding apex of vein, to mine vein down dip.

MAINTENANCE: Includes, but is not limited to, grading, resurfacing, cleaning culverts, clearing roadside brush, pruning vegetation, surveying, striping, etc. If performed within existing right-of-way, no permit is needed.

MATERIAL SITES: Sites approved for excavation and removal of material to be used in the construction, maintenance and/or operation of an ADOT project.

MATERIALS: For purposes of this Operating Agreement, "materials" are borrow (including soil), sub base and base materials, mineral aggregates for concrete structures and mineral aggregates for surfacing materials specified for use from sources either designated on the project plans or in the Special Provisions.

MILL SITE CLAIM: A claim for non-mineral land. Maximum of 5 acres in size and usually located by legal subdivision. Should be used for processing and storage of minerals and waste products from the processing of those minerals.

MINERAL ESTATE: Anything that has value separate and distinct from the enjoyment and use of the surface estate. The "mineral estate" and the "subsurface estate" are the same as far as minerals are concerned.

MINING CLAIM: Any unpatented mining claim, mill site or tunnel site properly located and recorded under the mining laws. "Unpatented" means ownership of the land and minerals has not been granted by patent (deed) from the U.S. to another entity.

NATIONAL HIGHWAY SYSTEM: A system of highways as defined in 23 U.S.C. 103(b).

NEGOTIATIONS: The process used by acquiring agencies to reach amicable agreements with property owners for the acquisition of needed property.

NON-FEDERAL-AID HIGHWAY: State roads not eligible for federal-aid funding, which are the sole responsibility of the state.

OPERATING AGREEMENT: A documented agreement between ADOT, BLM and FHWA establishing procedures and supplementing the Memorandum of Understanding (dated April 23, 2003).

OVERSIGHT AGREEMENT: An agreement between ADOT and FHWA regarding project Administrative Procedures for Federal Projects (most recently dated December 12, 2002).

OWNERSHIP RECORD SHEET: A component of the R/W plans, which provides parcel specific information, i.e. R/W parcel number, owner name, legal description, total parcel size, existing R/W, and new R/W requirements (both fee & easement).

PARCEL: A piece of land in one ownership entity. ADOT assigns a R/W Parcel Number to each parcel to be acquired which is used throughout the acquisition process and also becomes a historical reference number.

PERSONAL PROPERTY: Property that is not permanently attached to, or a part of the real

property. Essentially, it is property that can be moved.

PLACER CLAIM: Claim for minerals that have been moved by erosive forces. Usually located by legal subdivision. Standard size is 20 acres. Association placers can take in more ground, up to a total of 160 acres, but must have additional locators (claimants) for each increment of 20 acres.

PRIOR RIGHTS: The identification that utilities, public and private, were in place prior to establishment of a public roadway. If the roadway is in place prior to the establishment of the utility, then the utilities are there "by permit" and must relocate at their expense. If the utility has "prior rights" then ADOT is responsible for utility relocations.

REAL PROPERTY: Land and any improvements affixed thereto, including but not limited to, fee interests, easements, air or access rights, and the rights to control use, leasehold, and leased fee interests.

REALTY PERMITS: A generic term used to refer collectively to the various types of land use authorizations (such as temporary use permits, rights-of-way, 2920 permits, etc.) issued by the BLM allowing use of BLM-managed surface estate.

RELINQUISHMENT: This term is used differently by ADOT & FHWA. ADOT uses this term to vacate the transportation facility and return lands acquired (typically via a perpetual easement type interest) from Federal or State agencies (such as BLM, BOR, BIA, FS, SLD) back to these agencies when the R/W is no longer to be utilized as a transportation facility. FHWA utilizes this term to mean the conveyance of the R/W to another governmental agency for continued use as a transportation facility (ADOT calls this action "abandonment"). BLM uses this term when the authorized user no longer needs the use authorization and voluntarily gives it up.

→ **REVERSION:**

The return to BLM of permanent highway and material site right-of-way or of temporary construction easements (where the period of the easement has not yet expired) no longer needed for state transportation purposes and not appropriate for assignment. (This is also called "relinquishment" by ADOT).

RIGHT-OF-WAY PLANS: R/W plans consist of engineering drawings, which delineate the right-of-way requirements (both existing and proposed) for a highway project. R/W Plans differ from construction plans in that they are primarily concerned with R/W issues and show such features as parcel ownership limits and existing improvements. R/W plans are developed concurrently with the construction/design plans at various stages of submittal.

RIGHT-OF-WAY: R/W consists of real property and rights therein used for the construction, operation, or maintenance of a transportation or related facility. R/W is also the name of the Group within ADOT responsible for acquiring or disposing of such real property.

SCOPING: NEPA process wherein stakeholder agencies and the public are given the opportunity to express concerns and identify issues regarding proposed highway project.

SPLIT ESTATE: A condition of title where full fee estate is not owned by one entity, i.e., one entity owns the surface and another owns the full mineral estate, or one entity owns the oil and gas rights (estate) and another owns the surface and all other mineral rights (estate), etc. These estates/rights maybe split between/among two or more entities.

STATE HIGHWAY: State highways consist of the parts of the state routes designated and accepted as state highways by the State Transportation Board.

STATE ROUTE: State routes consist of corridor locations that have been designated by the State Transportation Board as a location for the construction of a state highway.

SURFACE ESTATE: Anything that is not included in the mineral estate.

TEMPORARY CONSTRUCTION EASEMENT: By definition, TCEs are temporary in nature and the areas involved revert back to the property owner at a specified time, typically upon completion of the construction project for which it was acquired. TCEs typically fall into two categories: (1) those benefiting the property owner for purposes of driveway or utility reconnection, fencing replacement, etc.; or (2) those required by the Department to facilitate construction of the project for purposes such as detour roads, slope flattening, drainage channelization, storage of materials, etc.

→ **TERMINATION:**

The return to BLM of highway and material site right-of-way due to the lapse of an easement resulting from construction activity not being initiated (i.e., non use) or when the time period set in a temporary construction easement has expired.

TUNNEL SITE CLAIM: Claim for land to construct mine workings for drainage of or access to mine workings. The claim is a maximum of 3000 feet in length. If minerals are encountered, claimant has possessory right to 1500 ft of any blind loads cut, discovered or intersected by such tunnel.

TYPES OF MATERIAL SITES: There are Title 23 material sites for use on federal aid eligible projects and Title 30 material sites for use on any project. Title 30 material sites include community pits and exclusive use pits.

TYPES OF MINING CLAIMS: Types of mining claims include *lode claims, placer claims, mill site claims and tunnel site claims.*

UTILITY FACILITY: Electric, gas, water, steam power, or materials transmission or distribution system; any communications system including cable television; and any fixtures, equipment, transportation system, or other property associated with the operation, maintenance, or repair of any such system. A utility facility may be publicly, privately, or cooperatively owned.

UTILITY RELOCATION: The adjustment of a utility facility required by a highway improvement project, which may include the acquisition of additional R/W in order to remove and reinstall the displaced facility.

VACATE: The termination of ADOT's easement interest in existing rights of way, with no intent to reclaim or reuse for R/W by a public agency. This action typically accompanies a relinquishment or extinguishment action.

VALID EXISTING RIGHTS: The rights for use of BLM-managed lands, regardless of whether there is written documentation of such rights. These rights may have been granted by Congress (i.e. RS2477 rights-of-way), Executive or Presidential proclamation, BLM, a previous land owner, another federal agency when the land was under their jurisdiction, mining claims properly filed under the General Mining Laws, etc.

NEPA WORDS THAT HAVE CAUSED CONFUSION

The Arizona Department of Transportation (ADOT); the Bureau of Land Management (BLM), an agency within the Department of the Interior (DOI); and the Federal Highway Administration (FHWA), an agency within the Department of Transportation (DOT); have entered into a partnership to cooperate in planning efforts and to facilitate completion of projects affecting all three agencies. Each agency has its own mission, value structure and way of doing business, which have contributed to each agency's development of its own jargon. Often, the same word or phrase has different implications across the agencies. Since ADOT does much of the National Environmental Policy Act (NEPA) staff work for the FHWA, these agencies have developed relatively similar interpretations. Conversely, the BLM's NEPA regulations were promulgated within the DOI rather than the DOT where different processes and agency mission cause differing interpretations and results when compared to those in FHWA and ADOT. The following matrix has been assembled to summarize the variation in definition, innuendo, and implication where it occurs. The definitions provided are not intended to be utilized as legal definitions, but rather to display how the agencies have resolved to operate with the apparent conflicts.

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
Jurisdiction	Lead Agency	<p>“Jurisdiction by law” means agency authority to approve, veto, or finance all or part of the proposal. (40 Code of Federal Regulations (CFR) 1508.15)</p> <p>“Lead agency” means the agency or agencies preparing or having taken primary responsibility for preparing the environmental impact statement (40 CFR 1508.16)</p>	<p>The lead federal agency has the responsibility to certify the adequacy of the NEPA process as part of its decision, therefore, the NEPA process follows the lead federal agency’s regulation.</p> <p>As the lead federal agency for highway projects with a federal “trigger,” the FHWA is the responsible federal agency for all NEPA within the ROW. As the federal agency holding the BLM easement for the highway, the FHWA is also the responsible agency for activities within the ROW. Both as a cooperating partner and as an agent of FHWA, ADOT is responsible for the planning, design, construction and maintenance of the State Highway System within Arizona.</p> <p>As the management agency for public lands, the BLM retains responsibility for non-highway activities (i.e., for actions not undertaken under Title 23). The BLM has an oversight responsibility within FHWA easements to monitor project implementation and maintenance activities to ensure environmental requirements (Clean Water Act, Clean Air Act, National Pollutant Discharge Elimination System, etc.) and BLM Land Management Plan (LUP) objectives are being met. The BLM discusses perceived shortcomings with FHWA as the ultimate authority for lands within roadway easements.</p>
	Cooperating Agency	<p>“Cooperating Agency” means any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment. The selection and responsibilities of a cooperating agency are described in §1501.6. A state or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe may by agreement with the lead agency become a cooperating agency. (40 CFR 1508.5)</p>	<p>The Council on Environmental Quality (CEQ) regulation recognizes that overlapping federal jurisdictions have different missions and, hence, regulations. This creates a dilemma when the regulations don’t fit together easily. The designated lead federal agency ordinarily is the agency responsible for the project, and therefore, its regulations have primacy. As a matter of course and per the CEQ regulations, other agencies are invited to participate in the decision process as cooperating agencies.</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
		<p>Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition any other Federal agency which has special expertise with respect to any environmental issue, which should be addressed in the statement may be a cooperating agency upon request of the lead agency. An agency may request the lead agency to designate it as a cooperating agency. (40 CFR 1501.7)</p>	
	<p>Conformance with the BLM Land Management Plan</p>	<p>Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition any other Federal agency which has special expertise with respect to any environmental issue, which should be addressed in the statement may be a cooperating agency upon request of the lead agency. An agency may request the lead agency to designate it as a cooperating agency. (40 CFR 1501.7)</p>	<p>FHWA has a responsibility to ensure its project is not outside the LUP direction. For example, BLM’s LUP provides for protection of the sonoran desert tortoise, which is not subject to the Endangered Species Act and therefore its protection is not a matter of law. As the lead agency, the FHWA ensures that the highway project designs provide for the protection of sonoran desert tortoise as prescribed in the BLM LUP.</p> <p>The CEQ regulation recognizes that there are overlapping federal jurisdictions and that each agency has a different mission and, hence, different regulations. This creates a dilemma when the regulations don’t fit together easily. The designated lead federal agency ordinarily is the agency responsible for the project, and therefore, its regulations have primacy. Even so, the project must incorporate the needs of cooperating agencies.</p> <p>LUPs were developed by the BLM, after intensive public scoping, to provide a range of “zoning” options that describe appropriate uses of specific public lands. The BLM is required to manage the public lands as it committed to within its LUP – regardless the proponent - or it must amend the plan to provide consistency.</p>
<p>Decision</p>	<p>Decision</p>	<p>At the time of its decision (§ 1506.10) or, if appropriate, its recommendation to Congress, each agency shall prepare a concise public record of decision. The record ... shall: a) state what the decision</p>	<p>The CEQ uses the term “decision” very specifically to refer to the document that formally approves a project made following consideration of the data assembled in the NEPA analysis for the project. The decision is required to include several specific elements. All three agencies adhere to the CEQ definition in discussions relative</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
		<p>was. b) identify all alternatives considered ... c) state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not why they were not. A monitoring and enforcement program shall be adopted and summarized wherever applicable for any mitigation. 40 CFR 1505.2.</p>	<p>to NEPA.</p> <p>The BLM maintains formal use of the word “decision” by restricting its use to identified actions that can be appealed (where an authorizing signature is applied). The BLM grant through FHWA to ADOT of land needed for a project (i.e., ROW via Title 23) is not a BLM decision and is not appealable.</p> <p>Conversely, the FHWA uses the strict NEPA sense for “decision” within the context of NEPA documents, but uses the term informally to discuss resolutions of design issues resolved within the context of the NEPA decision.</p> <p>FHWA makes its NEPA decisions on corridors rather than on alignments. Therefore, unless the corridor changes (i.e., a design would exceed the ROW, there is a change in mitigation, etc.) the alignment may be modified without a new NEPA decision. For example, both bridges and box culverts can be designed to accommodate large game wildlife. Either could be substituted during design and remain within the scope of the NEPA decision. However, a culvert would likely not accommodate large game wildlife and could not be substituted for a bridge during design if the NEPA document prescribed a bridge to promote large game wildlife crossing at that location. A modified (new) NEPA decision would have to be made.</p>
	Determination	<p>A Determination of NEPA Adequacy (DNA) is a conclusion by BLM that NEPA documentation previously prepared by the BLM fully covers a proposed action (site specific) and no additional analysis is needed.</p>	<p>BLM’s regulations also allow the use of a DNA, which is not a “new, formal NEPA decision.” Rather, the DNA is a finding that a specific activity or action was disclosed and addressed within the original NEPA decision. As such, it is similar to FHWA’s “Supplemental Information Report.”</p>
	Mitigation /mitigating the proposal / pre-mitigation	<p>“Mitigation” includes:</p> <p>(a) Avoiding the impact altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (d) Reducing or</p>	<p>FHWA and ADOT prefer to develop mitigation measures as an integral part of each alternative. This results in the disclosure of a “net impact to the environment” in a straightforward discussion.</p> <p>Conversely, another approach is to develop an unmitigated alternative, identify all impacts, identify mitigation measures, identify the degree the mitigation measures mitigate the impact, and finally disclose the “net impact to the environment.” FHWA and ADOT consider the latter approach to be both confusing and an unrealistic portrayal of the</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
		eliminating the impact over time by preservation and maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments. (CFR 1508.20)	alternative being proposed.
Analysis Process	Corridor	A strip of land between two termini within which traffic, topography, environment, and other characteristics are evaluated for transportation purposes. (American Association of State Highway Transportation Officials (AASHTO))	<p>Outside FHWA and ADOT, the terms “alignment” and “corridor” are often perceived as equivalent. This has caused some difficulty in communications. A corridor is a generalized location where road alignments are feasible.</p> <p>With some qualifications, the FHWA and ADOT NEPA process will provide an environmental clearance for the entire corridor. Corridors are wide enough to accommodate several different individual alignments. The design phase will establish the actual alignment through an iterative process that responds to the environmental clearance, AASHTO requirements, ADOT design criteria, district and Motor Vehicle Division requests, design team discussions, and other factors of varying influence.</p>
	Alternative	<p>e) Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. (40 CFR 1500.2 (e))</p> <p>Based on the information and analysis presented in the sections on the Affected Environment (§ 1502.15) and the Environmental Consequences (§ 1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public. In this section agencies shall: a) rigorously</p>	<p>The NEPA regulations promulgated by FHWA recognize that the design phase for linear transportation projects have a very large cost. The regulations require the development of alternatives, but do not require the development of a “proposed action” against which to array alternatives. Therefore, in its NEPA documents the FHWA advocates the elimination of unreasonable alternatives as soon as feasible to concentrate emphasis on the best alternatives in design. One action alternative and one no-action alternative is considered normal.</p> <p>The NEPA regulations promulgated by BLM advocate the elimination of unreasonable alternatives as part of the alternative selection process, but advocates carrying all reasonable alternatives through the complete analysis. DOI regulations require the articulation of a “proposed action” to compare alternatives to. Therefore, two or more action alternatives and one no-action alternative is considered normal.</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
		<p>explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated. b) ... c) ... d) ... e) Identify the agency’s preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference. f) ... (40 CFR 1502.14)</p> <p>d) Requiring that the alternatives considered by the decisionmaker are encompassed by the range of alternatives ... (40 CFR 1505.1)</p> <p>It is the policy of the Administration that: ... b) alternative courses of action be evaluated and decisions be made in the best overall public interest based upon a balanced consideration of the need for safe and efficient transportation; of social, economic, and environmental impacts of the proposed transportation improvement ; and of national, state, and local environmental protection goals. (23 CFR 771.105)</p>	
	Significant	<p>“Significantly” as used in NEPA requires consideration of both context and intensity: a) context. b) intensity 1) – 10). (40 CFR 1508.27)</p> <p>“Finding of no significant impact: means a document by a Federal agency briefly presenting the reasons why an action, not</p>	<p>Due to its specific meaning under NEPA, the word “significantly” is not used loosely by federal agencies.</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

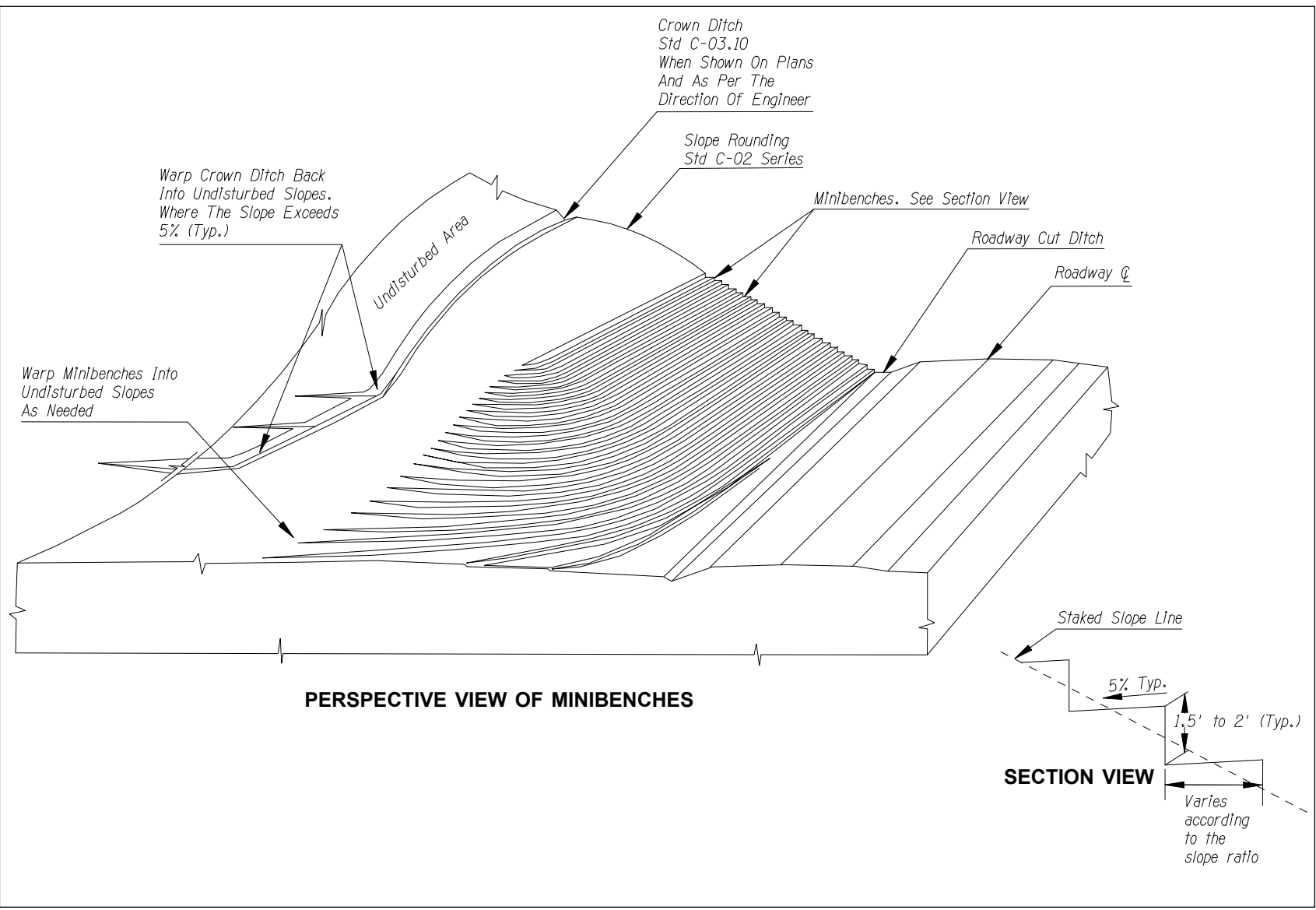
TOPIC	JARGON	DEFINITION	DISCUSSION
		<p>otherwise excluded (§ 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. (40 CFR 1508.13)</p>	
<p>Design Process</p>	<p>Alignment</p>	<p>Horizontal alignment – A combination of tangents, horizontal curves and spirals which defines the horizontal location of a roadway.</p> <p>Vertical Alignment – A combination of tangent grades and vertical curves which define the vertical location of a roadway. (ADOT)</p>	<p>Outside FHWA and ADOT, the terms “alignment” and “corridor” are often perceived as equivalent. This has caused some difficulty in communication. An alignment is a site-specific location for the road. FHWA and ADOT utilize NEPA regulations promulgated by the DOT, which were developed primarily to analyze linear transportation projects with consideration given to the planning and design processes these agencies use. These agencies consider the alignment to be an element that is created during the design phase, which occurs after the NEPA analysis phase. Therefore, in its NEPA documents the FHWA has adopted conventions that disclose project specifics less intricately than do BLM documents.</p> <p>NEPA implementation regulations promulgated by the Department of the Interior were developed primarily to analyze a wide variety of projects of BLM initiative as well as projects generated in the private sector which a proponent presents as an appropriate use of public lands under BLM regulation. The BLM regulations were developed to analyze a wide range of ground disturbing projects. It ordinarily has more site-specific information about the proposal and its effects. These regulation require the BLM to disclose “site-specific” impacts during the NEPA process. In its NEPA documents the BLM has adopted conventions that disclose project specifics more intricately than the FHWA’s documents. The NEPA documents completed by the FHWA for highway projects crossing public lands under BLM jurisdiction look different from NEPA documents created by the BLM for the projects it implements elsewhere on the public land it administers.</p>
	<p>Refinements / refining the alignment</p>	<p>c) Agencies: 1) shall prepare supplements to either draft or final environmental impact statements if: i) The agency makes</p>	<p>The NEPA analysis identifies the right-of-way within which a generalized alignment will be placed and a facility designed. The actual design and cross section, as well as the construction plans, are developed through a</p>

NEPA WORDS THAT HAVE CAUSED CONFUSION

(Glossary)

TOPIC	JARGON	DEFINITION	DISCUSSION
		<p>substantial changes in the proposed action that are relevant to environmental concerns; or ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. (40 CFR 1502.9)</p>	<p>series of iterations starting with the generalized alignment. The generalized alignment is refined to the final alignment as more site-specific survey data and agency input is acquired and design criteria, AASHTO requirements, etc. are incorporated in more detail than is feasible during the NEPA analysis. The iterations must implement the environmental clearance and remain within the scope of the analysis. If the iterations exceed the scope of the analysis - for instance, if the alignment were to go outside the ROW - additional NEPA analysis is required.</p> <p>In its NEPA documents the BLM has adopted conventions that disclose project specifics more intricately than the FHWA’s documents. For example, the BLM would prefer that a more specific alignment be identified as part of the NEPA process than FHWA considers feasible for large highway projects. A fixed alignment would allow more intricate discussion of impacts during the analysis, similar to discussions done under the BLM regulation.</p>
Requirement / Wants		<p>Requirement – A requisite or essential condition.</p> <p>Want – To have or feel a need or desire.</p>	<p>A “requirement” is either regulatory or the official, written agency policy and is enforceable. A “want” is a desire and is permissive.</p> <p>The CEQ regulations promote cost control in numerous places. Some of the more well known relate to paperwork reduction by confining the analysis to the essential issues to sharply define the issues and provide a clear basis for choice among options. (40 CFR 1500.1; 40 CFR 1500.2 (f); 40 CFR 1500.4; 40 CFR 1502.14; etc.).</p> <p>FHWA and ADOT representatives have questioned whether some specific items introduced by some BLM representatives as being “required by the LUP” are actually necessary to meet the objectives of the LUP or are merely wants that are not necessary to achieve conditions targeted by the LUP.</p> <p>BLM representatives propose project design and mitigation measures similar to those required on similar projects generated internally or proposed by business or a private party.</p>

APPENDIX E: SLOPE DESIGN DETAILS

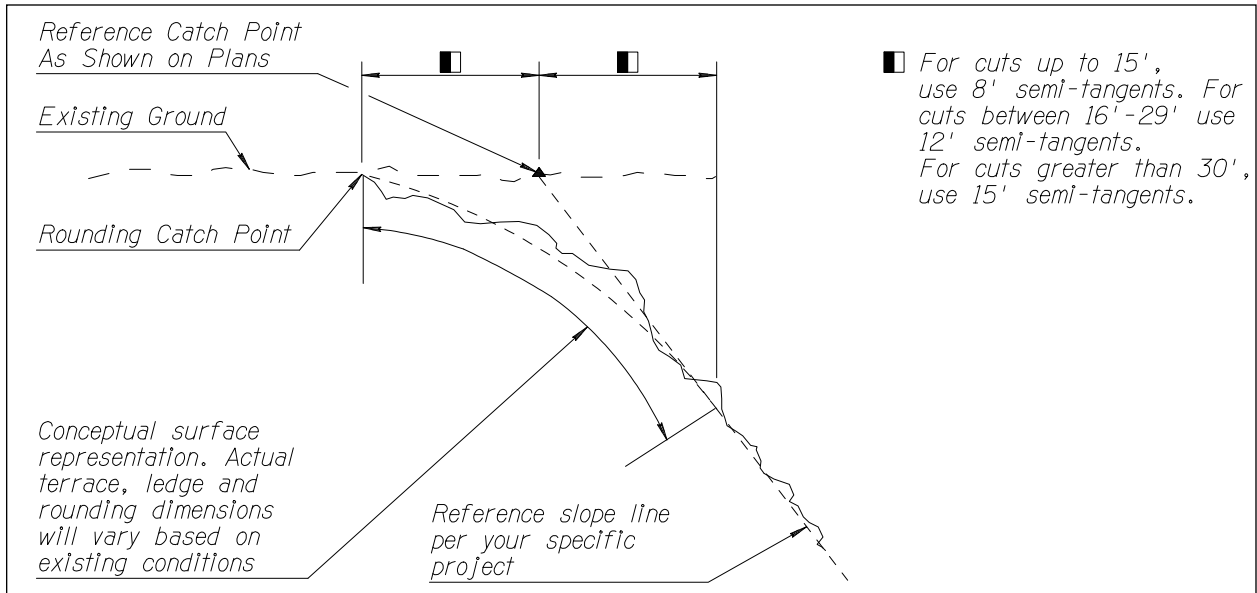


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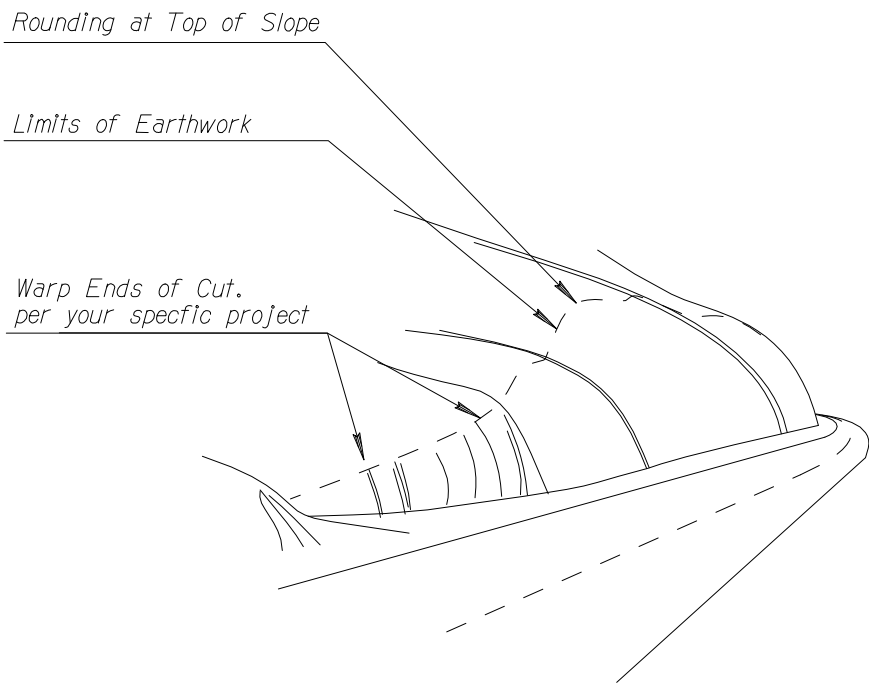
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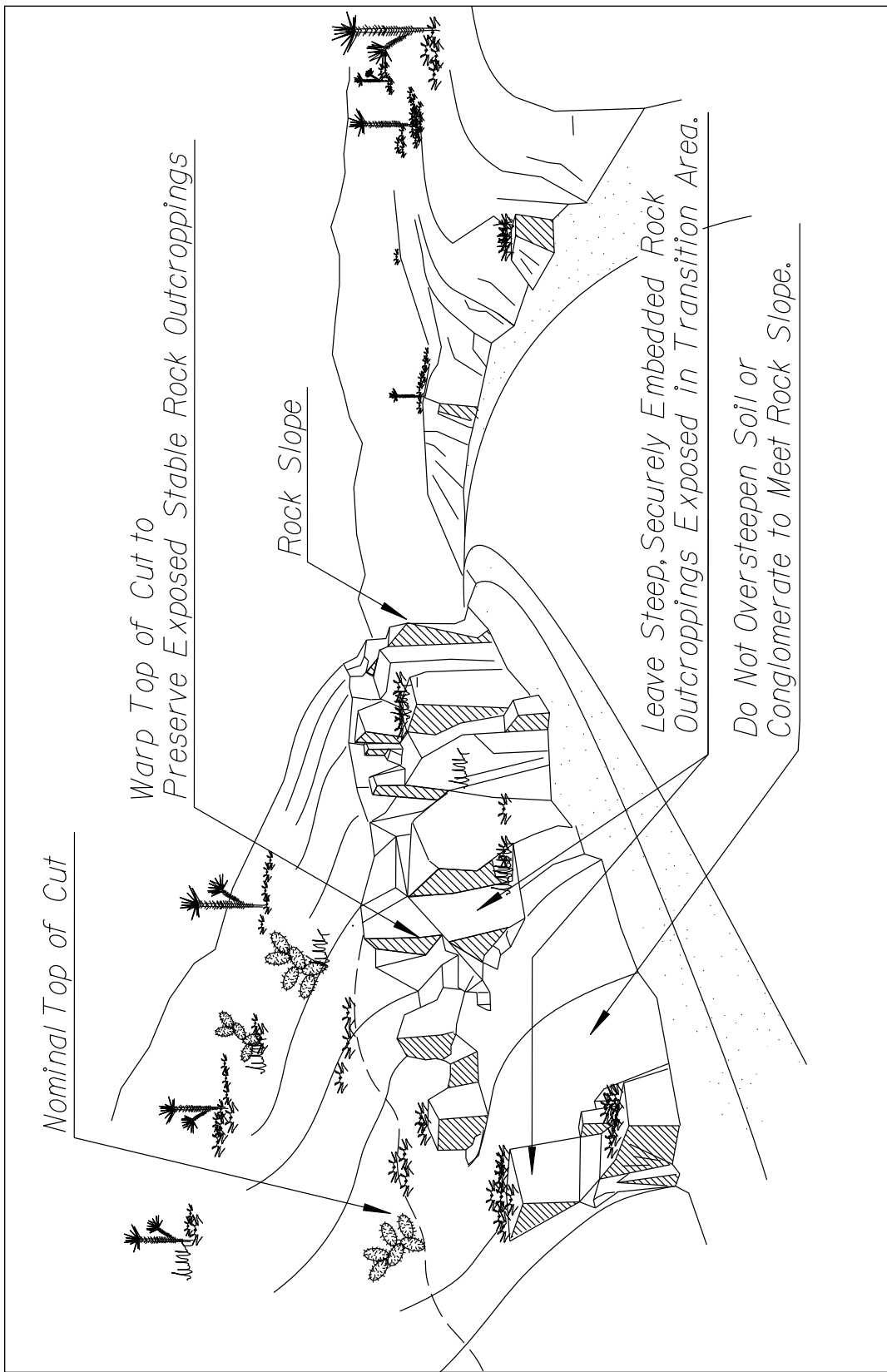
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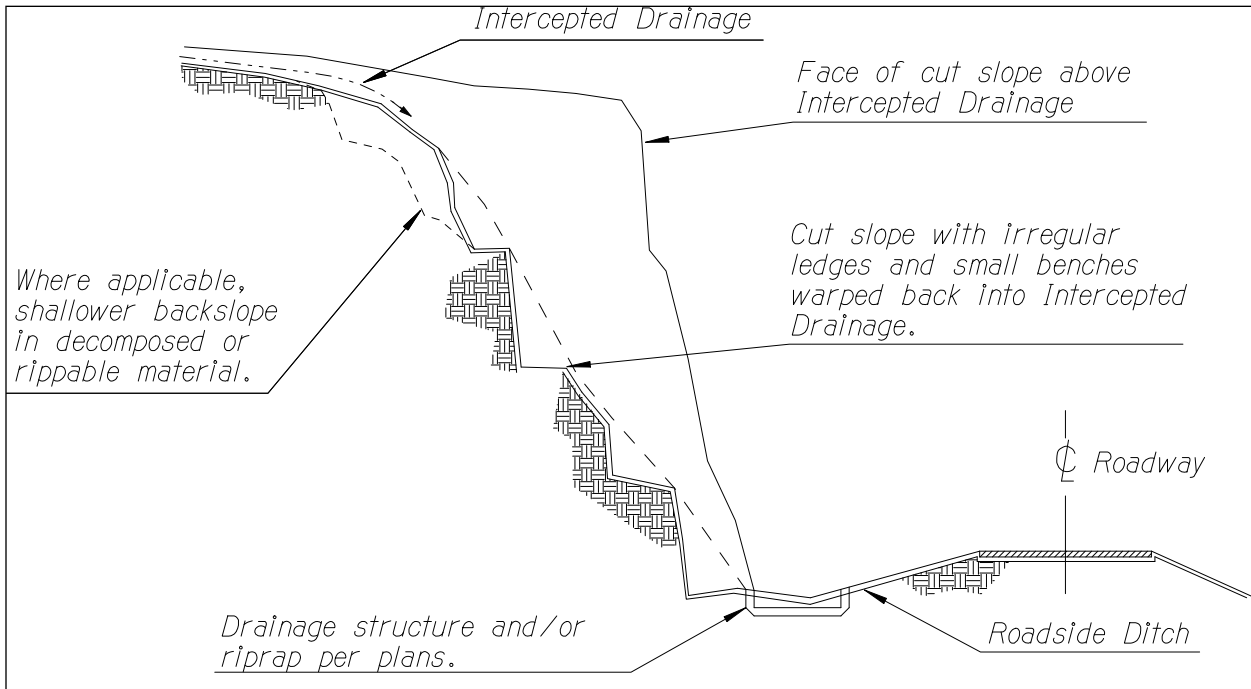
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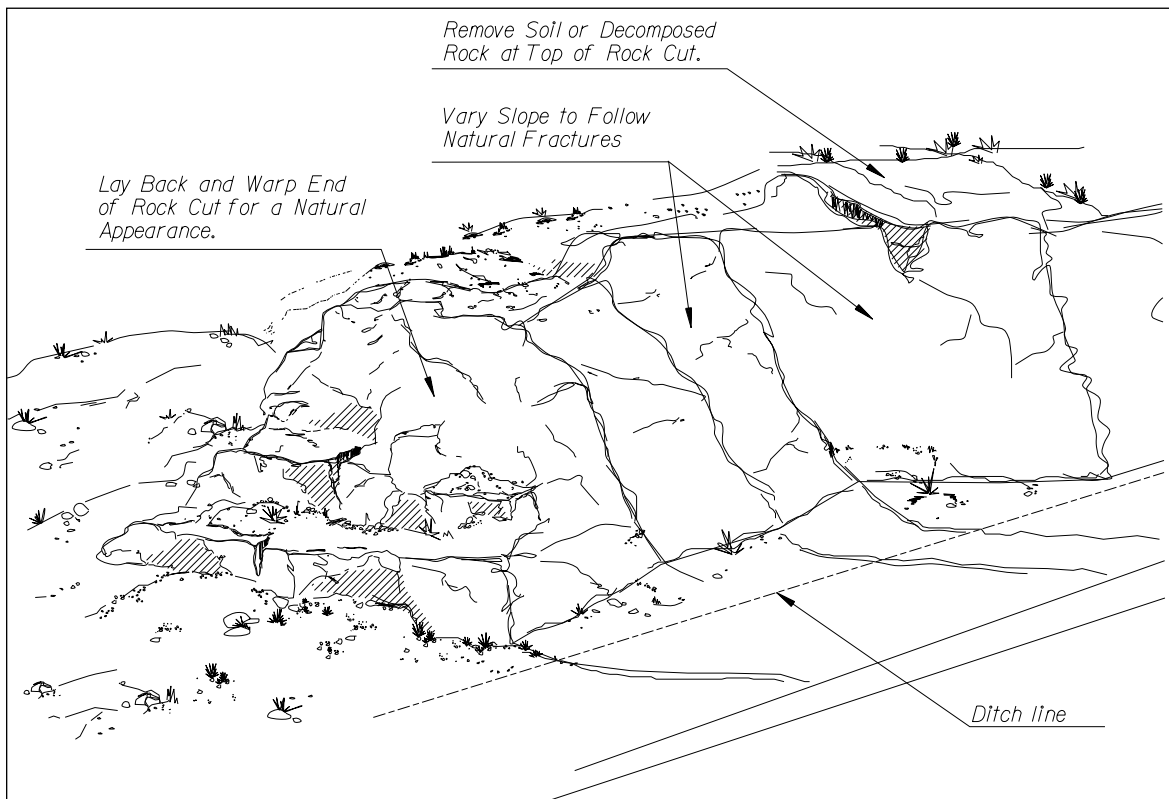
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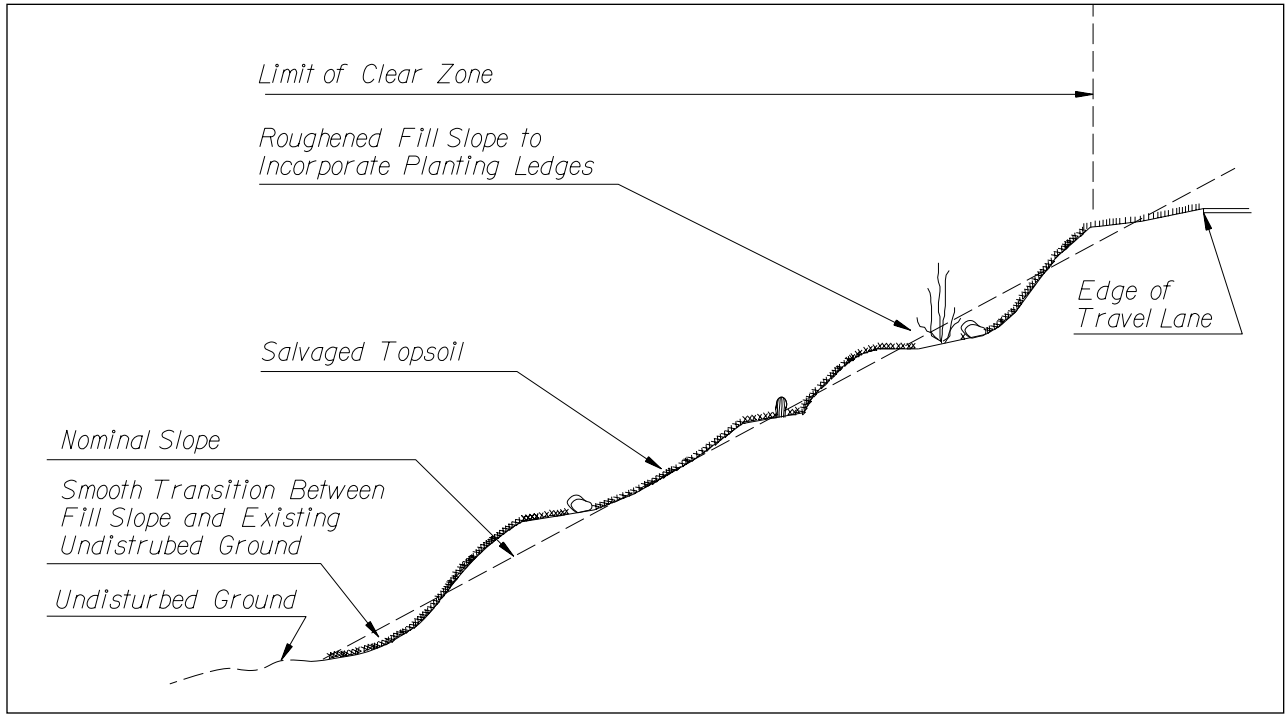
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INTERCEPTED DRAINAGES CONCEPT - SECTION



CUT SLOPE CONCEPTS



**SLOPE ROUGHENING
SECTION**

GUIDELINES

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APPENDIX F: EASEMENT DEVELOPMENT

DEVELOPMENT OF EASEMENTS

Proposed alignments and associated easements are identified during Project Scoping. It is important to recall that during the Project Scoping phase, requirements regarding environmental and engineering issues are identified during the NEPA process and these requirements may impact the location and size of the project easement.

When constructing highway corridors on lands managed by the BLM or the United States Forest Service (USFS), those federal agencies retain ownership of the land and grant easements to the ADOT for the operation and maintenance of that highway. When the ADOT determines that a highway corridor is no longer needed, the easement created for that corridor is terminated and responsibility for managing that former corridor reverts back to the BLM or the USFS.

USFS PROCESS

REQUEST FOR APPROPRIATION

1. ADOT shall meet with the appropriate Forest Service Representative (FS) and discuss the project and possible alignments as early in the process as possible. The ADOT shall solicit comments regarding the proposed alignments from Forest Service staff.
2. After concluding that the use of the desired lands for the highway project is consistent with the Forest Plan and the completion of NEPA; the ADOT will submit a formal Request for Appropriation to the FHWA Realty Officer in accordance with 23 CFR Part 710.601 (c), requesting concurrence that the USFS-managed lands are reasonably necessary for the project. The Request for Appropriation may include a request for more than one project.
3. In accordance with 23 CFR Part 771, 40 CFR 1501.6, and 1501.5(b),(c), and (e), it will be the responsibility of the FHWA to comply with NEPA and other legal requirements in arriving at its determination that the lands are reasonably necessary for the project, and the USFS will act as a cooperating agency or, at the discretion of the FHWA, as a joint lead agency in the development of any required NEPA document. The FHWA and the USFS will coordinate on the determination of the appropriate environmental analysis.
4. The FHWA will submit to the USFS, a detailed and documented request for the lands needed for the project including lands permanently required for the project and immediate right of entry for construction activities. The request will include a statement that the desired lands are reasonably necessary, and will include the following documents:
 - a. Reference to the final, approved NEPA document by name and date, for the land transfer and, if available at the time of request, the mitigation measures and signature page of the NEPA document for the project, a copy of which will have already been provided to the FS by the ADOT. The name and contact information for the ADOT and Forest Service persons for questions or other required information.
 - b. Right-of-Way Plans for rights-of-way requested; and

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GUIDELINES

- c. Aliquot description of the requested permanent right-of-way. The FS will acknowledge receipt of the formal Request for Appropriation within 30 days, as follows:
- d. If the package is incomplete, the FS will send notification, preferably via an email, to FHWA, with copy to the ADOT contact person, to state the package is incomplete and identify what is missing.
- e. If the package is complete, and the USFS agrees to the appropriation the USFS will follow the procedures in the sections entitled 'Agreement to Appropriation' and 'Conditions of Appropriation', identified below. If the package is complete, but the USFS does not agree to the appropriation, the USFS will follow the procedures in Section entitled 'Disagreement to Appropriation', identified below.

AGREEMENT TO APPROPRIATION

1. Agreement to the request for appropriation will be in the form of a Letter of Consent (LOC) with immediate right of entry for construction activities, signed by the USFS Authorized Officer in accordance with the Section entitled 'Conditions of Appropriation', identified below.
2. The LOC will be addressed to the FHWA Division Administrator but will be sent directly from the USFS to the ADOT representative, with a copy to the FHWA Realty Officer. The LOC will cover both the permanent easement, and the immediate right of entry for construction activities.
3. After receipt of the LOC, the ADOT will complete the appropriate Highway Easement Deed (HED) and submit the HED to FHWA for execution. HED's which meet the requirements under the programmatic certification, on file with the ADOT Chief R/W Agent and the Arizona Attorney General's office, will not be required to be submitted for further FHWA legal review. Those HED's which do not meet the programmatic certification will be certified by an attorney duly licensed within the State of Arizona and submitted to FHWA for further legal sufficiency review.
4. After execution by the ADOT Chief Right of Way Agent and the FHWA Division Administrator, the ADOT will have the HED recorded in the appropriate county or counties, and submit three (3) copies of the recorded HED to the USFS and one (1) to the FHWA Realty Officer.
5. Rehabilitation of TCEs lying outside of the permanent R/W will be coordinated between the ADOT and the USFS. Any rehabilitative measures will be identified at the time of the joint inspection. Any agreed rehabilitative measures will be performed by ADOT(or ADOT's contractor) prior to the completion of the project.

CONDITIONS OF APPROPRIATIONS

The following conditions as agreed to by the USFS, the ADOT and the FHWA will be specifically included as conditions to the consent for appropriation of lands and incorporated into each LOC and HED, in which the Grantee is defined as ADOT. Legal counsel for USFS, ADOT and FHWA have agreed to and certified as meeting legal sufficiency of each agencies Statutory and Regulatory requirements, the conditions as identified below:

1. This easement is subject to outstanding valid claims, if any, existing on the date of this grant, and the GRANTEE shall obtain permissions as may be necessary on account of any such claims;
2. The GRANTEE and the Forest Supervisor shall make determination as to the necessity for archaeological and paleontological reconnaissance and salvage within the right-of-way, and such reconnaissance and salvage to the extent determined necessary because of construction or

reconstruction of the highway facility, is to be undertaken by the GRANTEE in compliance with the acts entitled “An Act for the Preservation of American Antiquities”, approved June 8, 1906 (34 Stat. 225, 16 U.S.C. 432-433), the National Historic Preservation Act of 1966 as amended through 2000 (16 U.S.C. 470 et seq), the Archaeological Resources Protection Act of 1979 (93 Stat. 721, 16 U.S.C. 470 aa et seq), the Native American Grave Protection and Repatriation Act approved November 16, 1990 (104 Stat. 3048, 25 U.S.C. 3002(d);43 CFR Part 10.4), and State laws where applicable.

3. The easement herein granted shall terminate twenty (20) years from the date of the execution of this deed by the United States of America in the event construction of a highway on the right-of-way is not started during such twenty-year-period.

4. The easement herein granted is limited to use of the described right-of-way and the space above and below the established grade line of the highway for the purposes of construction, reconstruction, maintenance, and operation of the highway in accordance with the approved plans, as identified at the end of the property description above and does not include the grant of any rights for non-highway purposes or facilities:

Provided, that the right of the Forest Service to use or authorize the use of any portion of the right-of-way for non-highway purposes shall not be exercised when such use would be inconsistent with the provisions of Title 23 of the United States Code and of the Federal Highway Administration regulations issued pursuant thereto or would interfere with the free flow of traffic or impair the full use and safety of the highway, and, in any case, the GRANTEE and the Federal Highway Administration shall be consulted prior to the exercise of such rights;

Provided further, that the Forest Service may locate National Forest and other Department of Agriculture information signs on the portions of the right-of-way outside of construction clearing limits; and

All signing within the right-of-way, except temporary emergency fire suppression signing, will be approved by the GRANTEE and compliant with the Manual on Uniform Traffic Control Devices (MUTCD), where applicable.

5. The design, construction, operation, and maintenance of highways situated on this right-of-way will be in accordance with the provisions of Title 23, United States Code (USC)—Highways, and amendments; the regulations contained in Title 23, Code of Federal Regulations (CFR)—Highways and amendments; Section 4 (f) of the United State Department of Transportation Act, codified in both Title 23 U.S.C. §138 and Title 49 U.S.C. §303 the provisions of the Federal-Aid Policy Guide; the construction specifications of the State highway department as approved by the Federal Highway Administration for use on Federal-aid projects, the Memorandum of Understanding between the Arizona Department of Transportation and the Arizona Division of the Federal Highway Administration and the Forest Service, dated October 20, 2005, including any amendments, supplements or modifications thereto, and any other federal and state laws that are applicable or may become applicable.

The Forest Supervisor will be provided an opportunity to review plans relative to effects, if any, that the project works as planned will have upon adequate protection and utilization of the land traversed by the right-of-way and adjoining land under the administration of the Forest Service for the purposes for which such land is being administered. Those features of design, construction, and maintenance of the highway facility and of use of the right-of-way that would have effect on the protection and utilization of the land under the administration of the Forest Service are to be mutually agreed upon by the Forest Supervisor and the GRANTEE by conference or other communication during the preparation of the plans and specifications for each construction project, and the plans shall be revised, modified, or supplemented to meet the approval of the Forest Supervisor, or when deemed appropriate, supplemented by written stipulation between the Forest Supervisor and the GRANTEE, prior to the start of construction.

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The final design and construction specifications for any highway construction project on the right-of-way shall be presented to the Forest Supervisor for approval; construction or reconstruction shall not begin until such approval is given: Provided, that if it is subsequently deemed necessary that the approved plans, specifications or stipulations be amended or supplemented, any amendment or supplement shall be approved by the Forest Supervisor and the GRANTEE before construction or reconstruction begins.

6. Consistent with highway safety standards, GRANTEE shall;
 - a. protect and preserve soil and vegetative cover and scenic and esthetic values on the right-of-way outside of construction limits;
 - b. provide for the prevention and control of soil erosion within the right-of-way and adjacent lands that might be affected by the construction, operation, or maintenance of the highway;
 - c. vegetate and keep vegetated with suitable species all earth cut or fill slopes feasible for revegetation or other areas on which ground cover is destroyed where it is deemed necessary during a joint review between the Forest Supervisor and the GRANTEE prior to completion of the highway;
 - d. maintain all terracing, water bars, leadoff ditches, or other preventive works that may be required to protect adjacent National Forest System lands. This provision shall also apply to slopes that are reshaped following slides which occur during or after construction.
7. The GRANTEE shall not establish the following within the right-of-way, unless shown on approved construction plans, without first obtaining approval of the Forest Supervisor: borrow, sand, or gravel pits; stone quarries, permanent storage areas; sites for highway operation and maintenance facilities, camps, supply depots, or disposal areas.
8. The GRANTEE may maintain the right-of-way clearing by means of chemicals only IF the Forest Supervisor has given specific written approval. Application for such approval must be in writing and must specify the time, method, chemicals, and the exact portion of the right-of-way to be chemically treated.
9. The GRANTEE may remove mineral material and vegetation as necessary for the construction, maintenance, and safe operation of the highway subject to the following:
 - a. the Forest Service will retain the right to any merchantable timber within the boundaries of the appropriation. The GRANTEE shall notify the Forest Service when timber is scheduled to be removed. The Forest Service will determine what method of sale or storage of the timber shall be utilized;
 - b. the Forest Service will retain the right to any mineral materials within the boundaries of the appropriation. The GRANTEE shall notify the Forest Service when mineral material is scheduled for removal and use within or disposal outside the appropriation area. The Forest Service will determine if the material has value and what method shall be utilized to recover any such value for the United States.
10. Upon termination of this easement, the GRANTEE shall remove, within a reasonable time, any structures and improvements, and shall restore the site to a condition satisfactory to the Forest Supervisor, unless an alternative agreement is reached by both parties and documented in writing. If the GRANTEE, within a reasonable period, fails to remove the structures or improvements and restore the area, or to implement the alternative agreement, the Forest Supervisor may order the removal and disposal of any improvements and restore the area at GRANTEE'S expense.
11. When need for the easement herein granted shall no longer exist and the area has been reasonably

rehabilitated to protect the public and environment, the GRANTEE shall give notice of that fact to the DEPARTMENT and the Forest Service and the rights herein granted shall terminate and the land shall revert immediately to the full control of the Forest Service or assigns.

12. The GRANTEE, in consideration of the conveyance of said land, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that:

a. no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed;

b. the GRANTEE shall use said land so conveyed in compliance with all requirements imposed by or pursuant to Title 49, Transportation, subtitled A, Part 21, Code of Federal Regulations (49 CFR §21.1 to §21.23), pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §2000d to §2000d-4).

13. In the event of breach of any of the above mentioned nondiscrimination conditions, the DEPARTMENT shall have the right to re-enter said land and facilities on said land, and the above-described land and facilities shall thereupon revert to the full control of the Forest Service or assigns

DISAGREEMENT TO APPROPRIATIONS

As a result of the cooperative process developed by FHWA, USFS and ADOT, it is not believed there will be a formal disagreement to an appropriation request.

However, if such a unique situation were to arise, disagreement to a request for appropriation would be in the form of a letter, signed by the applicable FS, with supporting documentation clearly substantiating that:

1. Appropriation would be contrary to the public interest;
2. Appropriation would be inconsistent with the purposes for which the USFS-managed lands or minerals are managed; or
3. FHWA and ADOT will not accept the conditions USFS determines necessary for protection of the USFS-managed land or resources.

APPROPRIATION BY OPERATION OF LAW

Statutory requirements of Title 23 USC 317 allow for FHWA to appropriate the Federal lands if the USFS has not responded, in writing, within four months to the request for consent to appropriate for the purpose requested. The agencies have agreed to respond within 30 days if feasibly possible.

DISPOSAL OF TITLE 23 RIGHTS-OF-WAY

This section establishes procedures for disposal of Title 23 rights-of-way on USFS-managed lands that the ADOT determines are no longer needed for state transportation purposes that will revert to the USFS as provided in the HED.

If the 20-year use requirements provided for in the Conditions of Appropriation in the HED are not met, USFS will notify the ADOT and the FHWA in writing. The letter will request a meeting to discuss the inactive project within 30 days. At the request of the USFS, the ADOT will follow the procedures below. Disposal of Existing Title 23 Highway Rights-of-Way on USFS Lands No Longer Needed For Transportation Purposes:

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1. Prior to disposal of Title 23 rights of way on USFS-managed lands, ADOT District Office will send written notification to the affected FD, with a copy to the FHWA, of its intent to dispose. FHWA concurrence will be obtained.
2. ADOT will arrange a joint inspection of the facility with the appropriate staff from the USFS, ADOT District Office, and the FHWA to finalize a plan for disposal and rehabilitation. The Rehabilitation Plan and any supplemental agreements thereto, will be documented in writing and signed by the ADOT and the USFS Authorized Officer (USFS AO). NOTE: Should new construction eliminate the need for existing Title 23 rights-of-way, rehabilitation proposals will be developed during the design process.
3. Upon satisfactory completion of rehabilitation by the ADOT and written acceptance by the USFS AO, ADOT District will initiate Recommendation for Disposal (Form 60-3311).
4. When the ADOT Right of Way Titles Section receives a Recommendation for Disposal (Form 60-3311) from an ADOT District Office, a letter of notification of disposal commencement will be provided to the FHWA, and the affected FD, ADOT District Engineer, and ADOT Right of Way Section.
5. Prior to the STB meeting, ADOT Right of Way Titles will provide copies of resolution plats and/or legal description and FHWA concurrence to FHWA, the affected FD, ADOT District Engineer, and ADOT Right of Way Project Management Section for review.
6. Upon approval by the STB, the Resolution of Disposal stating "Area of right of way has been removed from the State Transportation System" will be recorded in the appropriate County, thereby becoming effective. A copy of the recorded resolution will be provided by ADOT Right Way Titles Section to FHWA and the affected FS, ADOT District Engineer, and ADOT Right of Way Sections.
7. The USFS will notify FHWA in writing, with copy to ADOT that the appropriation no longer exists.

BLM PROCESS

REQUEST FOR APPROPRIATION

1. After completion of NEPA and prior to sending the formal Request for Appropriation to BLM, ADOT will send notification to, preferably via email, the FHWA Realty Officer requesting concurrence that the BLM-managed lands are needed for the project. The notification and concurrence may include a request for more than one project
2. The FHWA Realty Officer will reply to ADOT's request, preferably via email, either concurring or not concurring to the determination of public necessity for the project
3. ADOT will submit directly to the appropriate BLM Field Office, with a copy to FHWA, the formal Request for Appropriation consistent with 23 C.F.R. Section 710, Subpart F. ADOT will use the standard letter or 10 for linear for requesting appropriation of linear or material site rights-of-way and any associated haul/access roads. The Request for Appropriation will identify both the permanent easement and any temporary construction easements (TCE) necessary for the project.
4. A complete Request for Appropriation will consist of the appropriate letter accompanied by the following:
 - a. Reference to the final, approved NEPA document by name and date, for the project, a copy of which will have already been provided to the BLM Project Manager.

- b. Right-of-Way Plans for linear rights-of-way; plat maps and mining and reclamation plan for material site rights-of-way;
 - c. Highway Easement Deed (HED) with legal description of the requested permanent right-of-way and separate description of temporary construction areas; and
 - d. A copy of the email from FHWA to ADOT concurring that the lands are necessary for the project.
5. The BLM Project Manager will acknowledge receipt of the formal Request for Appropriation within 30 days, as follows:
- a. If the package is incomplete, the BLM Project Manager will send notification, preferably via an email, to ADOT, with copy to FHWA, to state the package is incomplete and identify what is missing.
 - b. If the package is complete, BLM will follow the procedures identified in sections entitled 'Conditions of Appropriation' or 'Disagreement to Appropriation' , identified below.

AGREEMENT TO APPROPRIATION

1. Agreement to the request for appropriation will be in the form of a Letter of Consent (LOC), signed by the BLM Authorized Officer in accordance with Section VI.F.3 below.
2. The LOC will be addressed to FHWA but will be sent directly from BLM to ADOT, with a copy to FHWA. The LOC will cover both the permanent easement, any associated haul/access roads, and any identified TCEs.
3. After receipt of the LOC, ADOT will submit the appropriate Highway Easement Deed (HED) to FHWA for signature. The form deeds specified in Illustrations 13 and 14 have been certified as legally sufficient by legal counsel for ADOT and FHWA and such certifications are on file at ADOT and the FHWA Arizona Division Office. These deeds may be augmented only by insertion of ADOT project and parcel information, BLM reference number, execution dates, 23 U.S.C. appropriation section reference, legal description, signatures and notarization information. Any other additions or modifications to these deeds will require separate certifications of legal sufficiency by legal counsel for ADOT and FHWA in accordance with 23 U.S.C. §§ 107 (d) and 317 and implementing regulations at 23 C.F.R. § 710.601.
4. After signature by FHWA, ADOT will have the easement deed recorded in the appropriate county or counties, and submit a copy of the recorded deed to the BLM Project Manager and to FHWA Realty Officer.
5. ADOT will notify BLM in writing, with a copy to FHWA, when TCEs lying outside the permanent right-of-way are no longer needed and request a joint inspection with BLM to coordinate rehabilitation of the TCEs. Upon determination that the TCEs have been rehabilitated to the satisfaction of BLM, a letter acknowledging that the TCEs are no longer part of the appropriation will be signed by the BLM Authorized Officer. The letter will be addressed to FHWA but will be sent directly to ADOT, with a copy to FHWA.

CONDITIONS OF APPROPRIATION

All appropriations shall be subject to and conditioned upon compliance with the standard conditions of approval as stated below. Title 23 Material Site Rights-of-Way (MSROWs) are established for the purpose of extraction, processing, and storage of materials for the construction, operation, and maintenance of federal aid-eligible projects. ADOT will evaluate

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whether there is a continuing need for the MSROWs upon completion of the construction project. The following conditions will not be specifically elaborated in each LOC or HED. However, BLM's consent to the appropriation, and thus the LOC and HED, are wholly contingent upon ADOT and FHWA concurrence to, and conformance with, the following conditions:

1. All appropriations shall be subject to any additional conditions agreed to, in writing, in accordance with this Operating Agreement during the early coordination, environmental analysis, and design phases, whether or not those conditions are specifically carried forward in the request for appropriation or the LOC.
2. If outstanding valid rights exist on the date of the use authorization, ADOT shall obtain such permission as may be necessary on account of any such rights.
3. The use right authorized shall terminate 10 years, or sooner if agreed upon, from the date of execution of the HED by FHWA to ADOT in the event construction of a highway or use of the material site has not been started during such period.
4. The use right authorized is limited to the described right-of-way and the space above and below for federal highway purposes and does not include any rights for non-federal highway purposes.
5. BLM retains the right to use, or authorize use on, any portion of the right-of-way for non-highway purposes provided such uses would not interfere with ADOT's use of the right-of-way, impair the full use and safety of the highway, or be inconsistent with the provisions of Title 23 U.S.C. and the FHWA regulations issued pursuant thereto. Such use will be authorized only after consultation with, and written concurrence from, ADOT.
6. BLM may locate information signs conforming to the Manual on Uniform Traffic Control Devices (MUTCD) on portions of the right-of-way outside of clear zone limits, however, such signs shall not be located on the right-of-way of an Interstate System.
7. Consistent with highway safety standards, ADOT shall:
 - a. Protect and preserve soil and vegetative cover and scenic and esthetic values on the right-of-way outside of construction limits.
 - b. Provide for the prevention and control of soil erosion within the right-of-way and on adjacent lands that might be affected by the construction, operation, maintenance, minor rehabilitation, and termination of the highway project.
 - c. Vegetate and keep vegetated with suitable species all earth cut or fill slopes feasible for re-vegetation or other areas on which ground cover is destroyed where it is deemed necessary prior to completion of the highway and shall maintain terracing, water bars, leadoff ditches, or other preventive works that may be required to accomplish this objective. This provision shall also apply to slopes that are reshaped following slides which occur during or after construction.
8. No sites for highway operation and maintenance facilities, camps, supply depots, or disposal areas within the right-of-way may be established without obtaining written approval of the BLM authorized officer.
9. ADOT shall maintain the right-of-way clearing by means of chemicals only after consultation with the appropriate BLM Field Office, specifying the time, methods, chemicals and locations of the right-of-way to be treated.

10. The provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d-2000d-4) shall be complied with.

11. ADOT shall follow the standard procedures contained within the 1973 Department of Interior "Manual of Survey Instruction" in removing, resetting, referencing or otherwise perpetuating the position of any cadastral survey monuments which may be subject to disturbance during construction or maintenance of any highway project.

12. ADOT and BLM will cooperate in responding to and keeping each other informed of oil and gas and hazardous material spills of mutual concern. Contact for coordination shall be between the ADOT District Maintenance Engineer, the BLM Field Manager, and Arizona Department of Environmental Quality (ADEQ). Specific contingency plans shall be discussed annually at District and/or State coordination meetings or as needed to facilitate full cooperation. Unless otherwise agreed in writing by supplement to this Operating Agreement or other written instrument, ADOT will respond to emergency response/cleanup for oil and gas or hazardous materials spills within the highway right-of-way and will immediately notify BLM of any such incidents. BLM will respond to emergency response/cleanup for oil and gas or hazardous materials spills outside of the right-of-way but which may impact the highway project and immediately notify ADOT of such incidents.

DISAGREEMENT TO APPROPRIATION

As a result of the cooperative process developed by FHWA, ADOT and BLM as documented within the MOU No. AZ-931-0309 dated April 23, 2003, as amended September 10, 2004, and this Operating Agreement, the parties believe it is highly unlikely BLM would issue a formal disagreement to an appropriation request. However, if such a unique situation were to arise, disagreement to a request for appropriation would be in the form of a letter, signed by the State Director, with supporting documentation clearly substantiating that:

1. appropriation would be contrary to the public interest;
2. appropriation would be inconsistent with the purposes for which the BLM-managed lands or minerals are managed; or
3. FHWA and ADOT will not accept the conditions BLM determines necessary for protection of the BLM-managed land or resources.

APPROPRIATION BY OPERATION OF LAW

If, within four months, BLM has not responded, in writing, to the Request for Appropriation, such land may be considered appropriated by FHWA and transferred to ADOT for the purposes requested. Before exercising this authority, FHWA will notify BLM that it has appropriated the land.

CONSTRUCTION

1. During construction or during the use of a material source, ADOT, as agent for FHWA, will ensure compliance with all such terms and conditions identified in the NEPA document, the LOC, and any special conditions designed to protect the BLM-managed land and its resources to which all parties have agreed. If BLM identifies a situation where it appears there may be non-compliance with such terms and conditions, BLM will work directly with the ADOT Project Manager or Resident Engineer to resolve the issue. BLM will not initiate direct contact with any contractor working for ADOT.

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2. If necessary, ADOT, FHWA and BLM will coordinate a joint meeting to resolve differences. Escalation procedures outlined in Section VIII of the MOU will be followed if differences cannot be resolved at the joint meeting between ADOT, BLM and FHWA.
3. The BLM Field Office staff will be given an opportunity to provide input on construction issues during the construction partnering meeting and the weekly construction meetings.

OPERATION, MAINTENANCE, MINOR REHABILITATION

1. Operation and maintenance within a highway easement includes standard highway-related preservation activities to ensure a continued safe and efficient highway for the public (23 CFR 460, 625, 635, 771). Such activities include, but are not limited to: emergency repair; restoration of surfacing, shoulders, roadsides; restoration or replacement of structures (including bridges); cleaning ditches and cross-drainage; minor (less than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons; controlling brush and roadside vegetation to maintain clear zones, sight distance and to remove hazard trees; slope stabilization and scaling; removal of hazards and other obstructions; preserving and adding traffic control measures to conform with the Manual on Uniform Traffic Control Devices (MUTCD), etc. These activities are approved in the easement and do not require an additional NEPA decision. However, compliance by FHWA, and thus ADOT acting as their agent, with all other applicable laws and regulations is required. BLM, as federal land manager, retains the responsibility for enforcement of, and compliance with NAGPRA and ARPA.
2. If any BLM facilities will be impacted by operation or maintenance, ADOT will notify the affected BLM Field Office(s).
3. If highway operation or maintenance will require use of BLM-managed lands outside the right-of-way, ADOT will notify the affected BLM Field Office to secure the appropriate authorization prior to commencing the work. If an emergency situation arises where public safety may be at risk, ADOT may proceed without specific BLM authorization and will notify BLM as soon as possible of the situation.
4. Minor rehabilitation within a highway easement includes non-standard highway-related operation and maintenance to provide minor upgrades to a highway (23 CFR 625, 635, 771). Such activities include but are not limited to: minor realignment (i.e., straightening dangerous curves); minor widening (adding lane and/or shoulder width); adding auxiliary lanes (passing, turning, climbing, parking, etc.); major (more than 100 feet in length) slope flattening for erosion mitigation, snow removal, sight distance or other safety reasons, etc. If federal funds will be used for any of these activities, additional NEPA by FHWA would be required. A CE may be sufficient in most cases. No NEPA decision or additional authorization by BLM is needed for minor rehabilitation work within a highway easement, however BLM, as federal land manager, retains the responsibility for enforcement of, and compliance with NAGPRA and ARPA.
5. If any BLM facilities will be impacted by minor rehabilitation, ADOT will notify the affected BLM Field Office(s) before implementing such activities. BLM facilities may include, but are not limited to, such items as fences, cattle guards, signs, etc.
6. If minor rehabilitation will require use of BLM-managed lands outside the right-of-way, ADOT will notify the affected BLM Field Office to secure the appropriate authorization.

DISPOSAL OF TITLE 23 RIGHTS-OF-WAY

(Reserved)

APPENDIX G: SECTION 106 PROCESS ON FOREST SERVICE LANDS

Section 106 Coordination Guidelines

1. ADOT, FHWA, and FS will be consulting parties for implementation of Section 106.
2. ADOT, FHWA, and FS will be signatories on Section 106 Memoranda of Agreement and Programmatic Agreements.
3. ADOT will ensure that contractors obtain necessary cultural resource permits from FS for work on National Forest System lands.
4. The Section 106 lead will assure that ADOT, FHWA, and FS will be given the opportunity to provide input and comments on the following documents, within the timeframes specified in the project Section 106 Process:
 - Draft Section 106 agreements
 - Draft contract scopes of work.
 - Draft testing and data recovery plans.
 - Draft reports, including site forms.
 - Draft determinations of eligibility and effect.
5. If there are differences of opinion among ADOT, FHWA, and FS regarding site eligibility or determinations of effect, the Section 106 lead will consult with the parties to resolve the issue. If the issue cannot be resolved, FHWA, or FS if lead, will forward the comments of the objecting party(ies) to the SHPO along with consultation documentation and determinations and will follow the applicable procedures in 36 CFR 800.
6. ADOT, FHWA, and FS will coordinate on the review of technical proposals for complex projects.
7. ADOT, FHWA, and FS shall be invited to participate in all pre-work meetings, on-site meetings, and field inspections with archaeological contractors.
8. ADOT, FHWA, and FS shall be invited to participate in all meetings and fieldtrips with tribes regarding Section 106.
9. ADOT will ensure that FS will be notified immediately regarding the discovery of human remains.
10. ADOT, FHWA, and FS will be copied on all SHPO, Advisory Council, and tribal correspondence.

Consideration of Historic Properties

Goals

Transportation projects proposed by FHWA and ADOT require investigations to locate, document, evaluate, assess effects on, and avoid or mitigate adverse impacts to historic properties. With respect to historic properties on FS lands, the goals of managing these properties are:

- To protect historic properties.
- To recover and preserve significant information about those properties which cannot be protected.
- To fully cooperate and coordinate with FHWA and ADOT in managing these properties throughout the planning, design, construction and maintenance processes.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, 36 CFR 800 "Protection of Historic Properties", became effective August 5, 2004.

What Are Historic Properties?

Historic properties refers to archaeological sites, historic structures, objects, and districts, which are typically 50 or more years old that meet the criteria of significance established by the *National Register of*

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Historic Places and include the following categories:

- Archaeological sites represent the locations of prehistoric or historic occupations or activities. They may be evinced by a small scatter of chipped stone flakes or by the extensive ruins of a Hohokam settlement or a historic period fort.
- Historic structures may include bridges, residences, commercial buildings, objects, historic roadways, causeways or constructed features such as retaining walls, culverts, etc.
- Historic objects include items that are relatively small in scale or that are primarily artistic in nature. Examples include monuments, boundary markers, sculptures, etc.
- Historic districts are groups of associated buildings that retain integrity as a whole. Examples of historic districts include the commercial center of a small town or a residential neighborhood.
- Cemeteries and burial places.
- Rural historic landscapes are geographic areas that were modified by human activity and that possess a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features. Rural historic landscapes commonly reflect the day-to-day occupational activities of people engaged in traditional work such as farming or mining.
- Traditional cultural properties are properties eligible for inclusion in the National Register that are associated with cultural practices or beliefs of a living community. These practices or beliefs must be rooted in that community's history and be important in maintaining the continuing cultural identity of the community. Examples include a locality used by generations of an Indian tribe for ceremonies or traditional gathering activities, as well as an ethnic neighborhood that reflects the cultural values and traditions of its inhabitants through architectural details, organization of space, and activities.

The Section 106 Process

The 36 CFR 800 regulations recommend commencing the Section 106 review process at the earliest possible stage of project planning so that a broad range of protection and treatment alternatives may be considered. The review process consists of five steps:

1. Initiate the Section 106 Process by Identifying Consulting Parties.
2. Identify Historic Properties within the Area of Potential Effect.
3. Evaluate the Eligibility of Identified Properties for the National Register of Historic Places.
4. Assess Effects on National Register Listed or Eligible Properties.
5. Resolve Adverse Effects.

During the Section 106 process, in consultation with the State Historic Preservation Officer (SHPO) and sometimes the Advisory Council on Historic Preservation, decisions are made about how listed or eligible properties will be protected or how unavoidable effects will be minimized or mitigated. These decisions may include:

- Avoidance of the property.
- Limiting the size or scope of the undertaking to reduce the effect on listed or eligible properties. Since many archaeological sites are relatively small in size, it may be possible to avoid a site by reducing the size of the proposed undertaking in the vicinity of the affected resource.
- Modification of the undertaking through redesign, reorientation or other similar actions. For example, a highway alignment may be bifurcated in order to avoid a significant property.
- Repair, rehabilitation or restoration of an affected property. Although typically associated with historic structures, this mitigation measure may be applicable in the case of some historic archaeological sites that contain architectural features.
- Protection of archaeological deposits by filling over buried archaeological sites.
- Restriction of ground-disturbing activities to depths less than the undisturbed zone of significant

archaeological sites.

- Monitoring of ground disturbing activities to record significant archaeological remains if they are encountered. This technique is particularly useful if anticipated ground disturbance is limited or where excavation prior to construction is not feasible.
- Data recovery. If the avoidance and minimization alternatives described above are not feasible, then data recovery prior to disturbance or demolition may be warranted.

Section 106 Implementation for Federal-Aid Highway Projects

1. Agency Roles:

The identification and protection of historic properties is the joint responsibility of FHWA, ADOT and FS:

- FHWA funds, oversees, and is ultimately responsible for implementing Federally Funded Transportation Projects. By statute, FHWA is the lead Federal Agency for Section 106 compliance. FHWA customarily designates this responsibility to ADOT, but may also designate the FS to be the lead agency for Section 106 on certain projects.
- ADOT, acting as FHWA's agent, is typically charged with implementing the planning, design, and construction of these projects, including historic property considerations. As FHWA's designee, ADOT will prepare all Section 106 agreements, "consultation letters", eligibility and effect determinations, etc., for signing by the FHWA representative. ADOT also typically becomes the agency that maintains the constructed highway.
- The FS manages the National Forest lands traversed by Federal-Aid highways and manages historic properties until lands are appropriated by FHWA. After an easement has been secured by FHWA, the FS continues to have an interest in cultural resources within the easement in anticipation of future maintenance activities and future relinquishment of the easement by ADOT. Finally the FS continues to have protection responsibilities under the Archaeological Resources Protection Act (ARPA) and the Native American Graves Protection and Repatriation Act (NAGPRA).
The FS, if designated by FHWA as the lead agency for Section 106, will prepare and sign Section 106 documents and determinations, in consultation with FHWA and ADOT.

2. Section 106 Consultation Schedule:

The following Section 106 consultation schedule will be utilized for Federal-Aid highway projects on FS lands. The schedule is based on the ADOT Project Development Process outlined in Chapter 2.

A. Project Scoping:

The Section 106 consultation process will be completed during the ADOT Project Scoping Phase unless otherwise agreed to by all parties (FHWA, ADOT, FS). The nature and distribution of historic properties will be analyzed, and the effects of the construction of each proposed highway alignment will be summarized and disclosed in the NEPA process. This consultation process will require one of the following:

1. Completion of inventory, evaluation, effect determinations, and resolution of adverse effects, if present, in accordance with 36 CFR 800.3 through 36 CFR 800.7.
2. For more complex projects, execution of a Memorandum of Agreement or Programmatic Agreement outlining how these activities and determinations will be completed as project planning proceeds.

B. Project Management (Design Phase)

If not completed during the Scoping/NEPA phase, the project team will plan, implement, and complete the inventory and evaluation of historic properties as specified in the Project Section 106 Process and Section consultation conditions or agreements. To the extent possible, the following milestones will be incorporated into the Project Section 106 Process:

1. Stage I (15% Plans)
Initiation of the Section 106 process by development of Executive Summary and Draft Project

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- Section 106 process documentation (see below).
- 2. Stage II (30% Plans)
Completion of survey and evaluation of historic properties.
- 3. Stage III (60% Plans)
Data recovery plans completed and implemented if possible. At this point, the Section 106 and project schedules will be reviewed and adjusted if necessary.
- 4. Stage IV (95% Plans)
Final data recovery if not completed during the Stage III phase.

C. Project Management (Construction Phase)

The project team will implement Section 106 requirements, such as monitoring, fencing, and erosion control measures, specified in the Project Section 106 Process and Section 106 consultation conditions or agreements. ADOT, FHWA, and FS will jointly review any problems identified during monitoring and agree on corrective measures that should be taken. ADOT, FHWA, and FS will receive copies of all monitoring and inspection reports.

FHWA, ADOT, and FS will coordinate regarding Section 106 responsibilities for new project-related activities or unanticipated project modifications that involve lands outside the project right-of-way.

D. Project Management (Maintenance Phase)

See Chapter 11.

3. Process for Developing Section 106 Consultation Schedule:

In order to develop a realistic Section 106 consultation schedule to which all parties can agree, the following process is suggested:

A. Executive Summary

As early as possible in the Project Scoping Phase, ADOT will prepare a general summary of the proposed highway project to include:

1. Project funding sources and amounts.
2. Project goals and preliminary design information.
3. Map of project area.
4. Map of project area showing agency (both ADOT and FS) jurisdictions.
5. Relevant project details
6. Project schedule.

B. Draft Project Section 106 Process

In addition to this Executive Summary, ADOT will prepare for review a Draft Section 106 Process outlining the Section 106 objectives for the project and the proposed methods for realizing these objectives. The Draft will include:

1. Summary of personnel and agencies:
 - a. Highway project team members (including private consultants) and descriptions of their responsibilities as they relate to Section 106 issues. This will include FS, for responsibilities related to cultural resource permits and NAGPRA and for Section 106 lead if applicable. Responsibilities for tribal consultation and fieldwork inspection will also be identified.
 - b. Key stakeholders and their Section 106 needs and interests in the project.
 - c. SHPO and other Consulting Parties as defined by Section 106. This will include FHWA, ADOT, and FS as well as tribes that might attach traditional cultural or religious significance to historic properties.
 - d. Others who will receive Section 106 submittals.
 - e. Interaction chart illustrating project team members, stakeholders and consulting

- parties.
2. Draft scope of work regarding Section 106 issues to include:
 - a. A detailed, project-specific list of submittals.
 - b. The required activities associated with those submittals.
 - c. Member of project team responsible for each submittal or activity.
 3. Draft Communications Plan/Chart to include:
 - a. Project team members, stakeholders and consulting parties who will receive information.
 - b. The nature of that information.
 - c. How they will receive that information.
 4. Draft project schedule:
 - a. Estimated time to complete each activity.
 - b. Estimated completion dates for each submittal.
 - c. Maximum number of days allowable for agency reviews of submittals.
 - d. Proposed funding and collection agreement needs.

NOTE: In order to provide completion dates, the Draft 106 Process will define a project-specific agency review time. For relatively simple projects, the agency review time will be set at 30 calendar days. For more complex projects, a longer agency review time may be defined, but will be no more than 45 calendar days. A maximum of 10 working days will be allowed for review of subsequent draft submittals. If additional time is desired, a request must be made to the ADOT Section 106 compliance representative prior to the lapse of allowable time. All parties (FHWA, ADOT and FS) must agree to both an extension and a definite completion date. If time has lapsed without submittal of review comments and without an agreement of extension, all parties shall assume that there are no comments on the document and the process shall proceed.

C. Agency Review of Proposed Project

1. ADOT will forward the Executive Summary and Draft Project Section 106 Process to:
 - a) District Ranger
 - b) Forest Archeologist or designee
 - c) FHWA staff.
 - d) ADOT staff.
 - e) Others as required.
2. In response to the Draft Process, recipients may respond as follows:
 - a) Concur with the proposed Draft Process by signing and returning the Draft to ADOT. If all parties concur with the proposed Draft Process, a Partnering Meeting will not be required.
 - b) Notify ADOT within 30 working days, unless otherwise agreed to by FHWA, ADOT and FS, that further discussion regarding the Draft Process is needed in order to jointly review the project and agree on the draft scope of work, submittals, proposed time frame and other aspects of the Project Section 106 Process. If any recipient requests further review and discussion, ADOT will organize a Partnering Meeting.

If ADOT receives no comments to the Draft Section 106 Process within the 30- day, or otherwise agreed upon, review period, it will assume that the recipient approves the Draft.

D. Section 106 Partnering Meeting (if necessary)

For small projects, it might be possible to convene a partnering meeting by phone or other means. For complex projects, it is suggested that these meetings be directly attended and facilitated.

Prior to the Partnering Meeting, all recipients should review the Executive Summary and Draft Section 106 Process described in Step 1.

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Partnering Meetings will follow ADOT guidelines for partnering meetings. All parties must agree that they will negotiate in good faith and that the meeting results will be the established project process. All parties will agree to follow the established process. Meeting minutes must be taken. The goal of the meeting should be the review of the Draft Process described in Step1. Special attention should be paid to:

1. Draft scope of work relevant to Section 106 issues.
2. Consultants' scopes of work (if applicable).
3. Anticipated project submittals.
4. Proposed project schedule/timeline and agency review times. If the draft schedule is not possible to meet based on the estimated duration of anticipated activities, the partners should be prepared to:
 - a) Suggest adjustments to the submittal deadline and justify changes to the proposed schedule.
 - b) If adjustments are not feasible, identify additional resources that could be utilized in order to meet the schedule, and estimate the additional costs associated with those additional resources.
 - c) If neither a nor b (above) appear feasible, explore alternative strategies in consultation with SHPO.

Prior to implementation, the ADOT Project Manager and the ADOT District Representative must approve any suggested changes that would impact the scope, schedule or budget of a proposed project.

5. FHWA decision
Upon agreement of all parties to the Project Section 106 Process, FHWA will announce their decision on which agency will serve as their designee or lead for the Section 106 process.
6. Upon agreement of all parties to the Project Section 106 process, the agency designated by FHWA as Section 106 lead, will finalize the Section 106 Plan and provide copies to all parties.
7. Escalation
If the partners cannot agree upon an acceptable Project Section 106 Process, the matter will be escalated (see below).

E. Section 106 Escalation Process (if necessary)

If necessary, partners will escalate the Draft Project Section 106 Process as follows:

FHWA	ADOT	USFS
Environmental Coordinator	HPT Team Coordinator	Forest Archaeologist
Environmental Coordinator	EPG Group Manager	District Ranger
Operations Team Leader	Director, Office of the Environment	Forest Supervisor
Assistant Division Administrator	State Engineer	Deputy Regional Forester
Division Administrator	Office of the Director	Regional Forester

APPENDIX H: TYPICAL BLASTING PLAN CONTENT

A Typical Blasting Plan consists of:

- Names and experience of blasting supervisors;
- Methods for and locations of explosives transportation, storage and use;
- Traffic control and other public safety precautions;
- General methods and approach to blasting, which account for the full range of geologic settings and physical conditions present on the project;
- Method and equipment for pre-blast survey, environmental monitoring, and anticipated peak particle velocity levels;
- Equipment intended to be used in or support of blasting operations;
- Method of containment to prevent rock material from escaping the construction limits, and contingency measures for unanticipated rock fall.

Most slopes will need additional, site specific, blasting designs, as one blasting plan does not fit every slope on the project. The blasting pattern plan for specific cuts should include the following features: the drill hole grid, explosive types, sonic velocity and seismic velocity of the rock, and delays in timing.

On some projects, the contractor is also required to submit specific blasting plans prior to proceeding with each blast. Following is an outline of contents of a typical Specific Blasting Plan:

- Station limits of proposed shot;
- Scale drawings showing plan and section views of all variations of the proposed drill pattern, including clearing limits, free face, burden, blast hole spacing, drill hole location, subdrill depths, lift height, blast hole diameters, and blast hole angles;
- Loading diagram showing powder factor, type and amount of explosives, primers, initiators, and locations and depths of stemming for all substantial variations within the pattern;
- Initiation method and sequence of blast holes, including delay times and delay system;
- Manufacturer's data sheets for all explosives, primers, and initiators to be employed;
- Fly rock control measures;
- Estimated quantities of cubic yards of rock in-place and linear feet of both production and controlled blast drill hole;
- Location and attitude of significant fracturing, rock type changes, faulting, and special circumstances to be accounted for in the plan;
- Identification of environmental monitoring method, equipment and location.

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APPENDIX I: COMPARISON OF PERMIT PROCESSES FOR MATERIAL SITES

TOPIC	FOREST SERVICE	BUREAU OF LAND MANAGEMENT
Regulations	36 CFR 228, Subpart A (locatable minerals)	<p>CFR 3802 (Wilderness Study Areas - only two in Arizona)</p> <p>43 CFR 3809 (All other Public Land including Designated Wilderness Areas in conjunction with Wilderness Regulations) also 43 CFR 3809 standards apply to Stock Raising Homestead Lands</p> <p>43 CFR 3715 All Public Lands where BLM is the managing agency for both the surface and mineral estates.</p>
Casual Use	N/A	<p>Casual use definition applicable only to 43 CFR 3809. For activities below regulatory threshold (e.g., sampling with a rock hammer or short term tent camping less than 15 days), no Notice or Plan required. No definition of casual use under 43 CFR 3802. Occupancies over 15 days in any 90-day period require concurrence under 43 CFR 3715 regardless of surface disturbing activities.</p>
Notice	<p>All activities that might cause surface disturbance require a Notice of Intent to Operate (36 CFR 228.4(a)). Such notice of intent shall be submitted to the District Ranger having jurisdiction over the area in which the operations will be conducted. If the District Ranger determines that such operations will likely cause significant disturbance of surface resources, the operator must submit a proposed Plan of Operations.</p>	<p>Five acres or less total disturbance on lands outside Wilderness, Wild-Scenic Rivers, Areas of Critical Environmental Concern, etc. No Notices allowed under 43 CFR 3802. Contents of a Notice described at 43 CFR 3715.3-2 and 43 CFR 3809.1-3 and 43 CFR 3715 for occupancies. Review time frame for notices is 15 days. Notices that incorporate 43 CFR 3715 occupancies are not subject to this time frame for concurrence of the occupancy.</p>
Plan	<p>If proposed operations will likely cause significant disturbance of surface resources, a Plan of Operations must be submitted (36 CFR 228.4 (a)). Contents of the Plan of Operations are described at 36 CFR 228.4 (c).</p> <p>A plan of operations can be submitted</p>	<p>More than five acres total surface disturbance on lands subject to 43 CFR 3809. Contents of a Plan described at 43 CFR 3715.3-2 and 43 CFR 33802.1-4 and 43 CFR 3809.1-4. All activities that occur in a Wilderness, Wilderness-Study Area, Wild-and-Scenic River, etc. need a Plan of Operation regardless of their</p>

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	initially and independently of a notice if significant disturbance of surface resources is anticipated by the proponent.	size or type.
Bonding	Any operator who conducts operations under an approved plan of operations will be required to furnish a bond in an amount specified by the authorized officer. In calculating bonds, the authorized officer shall consider the estimated cost of stabilizing, rehabilitating and reclaiming areas disturbed by the operations.	Not required for notices. Bond amounts for plans of operation at 100 percent of the cost to perform reclamation by BLM or a third party contractor.
Closure and Bond Release	The operator and agency should ensure that all requirements of the approved Plan of Operation are met and that the environmental effects of the operations are as predicted in the NEPA document. When all or part of reclamation has been completed in accordance with the approved plan, the authorized officer may release that portion of the reclamation bond which covers the work, providing it meets standards established in the Plan of Operations.	The operator and agency should ensure that all requirements of the notice or approved plan are met. When all of these conditions are met, the authorized officer will release the bond.
NEPA	Forest Service mining regulations contain guidelines for environmental protection, (36 CFR 228.8) and require the Forest Service to conduct an analysis that meets NEPA requirements. This analysis is the basis upon which the agency requires changes or modifications to the plan of operations if needed and serves as a basis for development of required mitigation measures.	3809 regulations require that at a minimum, an Environmental Assessment (EA) be prepared for all plans of operation to determine if an EIS is required. No NEPA review required for casual use or Notice level operations. Unless those operations involve occupancy as defined by 43 CFR 3715. Any operation involving occupancy under 43 CFR 3715 requires NEPA analysis. Most occupancies at the casual use and notice level in Arizona are covered by a programmatic EA. Operations disturbing more than 640 acres always require an EIS.
Non-Compliance	Operator's failure to comply with 36 CFR 228 regulations or approved operating plans, which results in surface resource damage, will result in being served a Notice of Non-Compliance. Continued noncompliance can result in court actions. In cases where unnecessary or unreasonable damage is occurring	Operator failing to comply with 43 CFR 3715 or 43 CFR 3809 may be served a Notice of Non-Compliance. Operators with a record of non-compliance must file a plan of operations and post bonds for 100 percent of reclamation costs even if their activities affect 5 acres or less.

	and where reasonable attempts fail to obtain an operating plan or to secure compliance with an approved operating plan, the operator may be cited for criminal violation (36 CFR 261 or 262).	State Bonds cannot be used to meet this requirement. Lawsuits in Federal District Court are needed for operators that ignore a BLM order that is upheld by IBLA. 3715 provides additional recourse to criminal penalties.
Residential Occupancy	A claimant to an unpatented mining claim is entitled to uses of the surface that are reasonably necessary to the accomplishment of a bona fide prospecting, exploration, mining and processing of locatable minerals. In order for structures to be authorized under the U.S. mining laws and regulations requiring the management of surface resources, two conditions must be met. First, the structure must be reasonably necessary for use in prospecting, mining or processing of locatable mineral resources and, second, the structure must be covered by an approved operating plan. Occupancy is generally not authorized except in special cases.	Can occur at casual use level, under a Notice or a Plan when requirements of 43 CFR 3715 are met. Generally no occupancy authorized except in cases where production is occurring continuously and/or there is a need to protect the public, equipment or valuable minerals from accidents, theft or loss.
Resolution of Unauthorized Use and Occupancy.	Upon a finding that the occupancy or use is not reasonably incident to mining, or approved in an approved plan of operations, willing cooperation in resolving the trespass will be sought. A notice of noncompliance and/or legal remedies will be utilized as needed.	Upon a finding that the occupancy or use is not reasonably incident to mining, four avenues for resolution of trespass: 1) Temporary Suspension Order 2) Cessation Order 3) Notice of Non-Compliance 4) Authorization by other means.
Appeals	Related NEPA decisions are subject to appeal in accordance with 36 CFR 215 regulations for those actions on Forest Service lands. Decisions affecting authorization for mining activities are subject to appeal by the proponent under 36 CFR 251 regulations. The proponent may appeal under 251 or 215, but not both. Matters such as mining claim validity are heard before the Department of the Interior, Office of Hearings and Appeals.	Appeal filed with the decision issuing office. The appeal by an operator is reviewed by the State Director under 43 CFR 3809.4. Decisions of the State Director appealed to the Interior Board of Land Appeals (43 CFR Part 4). Where questions of fact need to be resolved in 3809 cases, there is a hearing before Administrative Law Judge, with appeal of adverse decision to the IBLA. 3802 appeals go directly to IBLA. 3715 Notices of Non-Compliance, Suspension Orders and Cessation Orders are appealed directly to IBLA.

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		Appeals filed by a third party for a 3809 action are sent directly to IBLA.
Undue or Unnecessary Degradation	N/A	Surface disturbance greater than what would normally result when an activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, including those resources outside the area of operations. Failure to initiate and complete reasonable mitigation measures, including reclamation of disturbed areas or creation of a nuisance may constitute unnecessary or undue degradation. Failure to comply with applicable environmental protection statutes and regulations there under will constitute unnecessary or undue degradation.

APPENDIX J: SIGNING

This appendix is an overview of ADOT/BLM/USFS signing for projects on BLM/USFS lands. Links to signing guidelines and manuals with in-depth technical sign designs and requirements are provided as the ultimate reference for each agency's requirements.

The purposes of this appendix are to:

- Provide resource information for procedures, responsibilities and authorities for signing State highways crossing BLM/USFS lands.
- Provide examples of ADOT, BLM and USFS signage.

ADOT/BLM/USFS Sign Planning

Sign planning should begin early in the project development process and include highway signing requirements, installation responsibilities and identification of funding sources. Requests for signing on highways that cross BLM/USFS lands should be submitted to the ADOT Regional Traffic Engineer for review. Interstate and traffic interchange requests should be submitted to the State Traffic Engineer. The BLM/USFS Sign Coordinator and ADOT Regional Traffic Engineer and/or State Traffic Engineer should jointly resolve signing issues through "Partnering" concepts. Sign installation should be coordinated with ADOT and BLM/USFS.

ADOT/BLM/USFS Sign Guidelines

Signing requirements for highways on BLM/USFS lands vary according to the resources, attractions and facilities accessible from that highway. Requirements are very specific and can be complex. The following publications define those requirements and should be reviewed prior to sign planning for each highway project.

As per the Code of Federal Regulations, the *Manual on Uniform Traffic Control Devices*, U.S. Department of Transportation Federal Highway Administration (MUTCD), 2003, <http://mutcd.fhwa.dot.gov/>, supersedes all sign guidelines on any highway open to public travel.

ADOT signing reference publications include the *Traffic Engineering Manual of Approved Signs (MOAS)*, <http://azdot.gov/highways/traffic/MOASStds.asp> with links to Destination and Distance Signs, Information Signs, Route Marker Signs and Warning Signs; and *Traffic Signing and Marking Standard Drawings*, <http://azdot.gov/highways/traffic/SMStds.asp> with links to sign design and installation drawings. Additional signing resources are available on the Traffic Engineering Standards webpage at <http://www.dot.state.az.us/highways/traffic/Standards.asp>.

The *BLM Sign Guidebook*, <http://www.blm.gov/pgdata/etc/medialib/blm/wy/signs/docs.Par.61916.File.dat/guidebook.pdf>, establishes standards and guidelines for planning, developing and managing signs for BLM-administered public lands and waters. The Guidebook describes the agency's National Sign Program planning process, sign types and appropriate locations; outlines national design standards and provides sign material and specification requirements.

The *US Forest Service Manual 7100, Chapter 7160 Signs and Posters*, <http://www.fs.fed.us/im/directives/fsm/7100/7160.doc>, defines USFS policy regarding signs and posters. The *USFS Sign and Poster Guidelines for the Forest Service EM 7100-15*, http://www.fs.fed.us/t-d/php/library_card.php?p_num=EM7100-15, provides detailed information and illustrations of USFS signage. The 16 chapters of EM 7100-15 discuss signing policy and principles, types of USFS signs, procurement and sign maintenance. The *USFS Incident Sign Installation Guide*, http://www.t2.unh.edu/video_pub/incident_sign.pdf, provides information

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on temporary traffic control for incidents such as wild land fires, floods, accidents and hazardous material spills.

Types of Signs

Signing on highways through BLM/USFS lands encompasses many types of signs with specifications for each type including sign size and color, required logos, defined text styles and locations. Refer to the ADOT/BLM/USFS guidelines for these requirements.

The following are examples of signs that may be used on highways through BLM/USFS lands.

Boundary Signing



Informational and Guide Signing



Recreation Area, Recreation Site and Recreational Facilities Signing



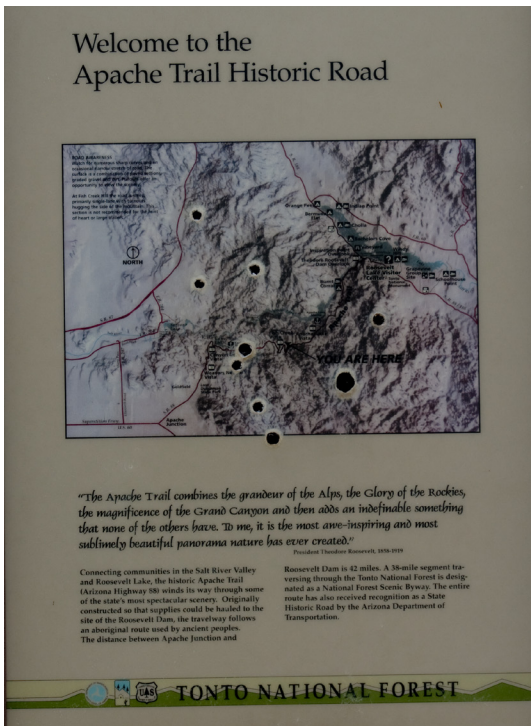
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Administrative Office (Ranger Station) Signing



Interpretive Signing



Adopt-a-Highway Program Signing

Adopt-a-Highway signing is an ADOT program whereby the public assists the State in roadside litter maintenance. This program is applicable to and signing may be installed on State highways traversing BLM/USFS lands.



ADOT Parkways, Historic and Scenic Roadways; BLM Back Country Byways; and USFS Scenic Byways Signing

Conventional State highways that traverse BLM/USFS lands and that are designated as Parkways or Scenic and Historic Roadways, or Back Country Byways, or Scenic Byways should be signed accordingly.

When a route is both an ADOT Parkway or Scenic and Historic Roadway and a Back Country Byway or a Scenic Byway, both signs will be used at the beginning of the route (portal) and only the ADOT sign will be used as the reassurance sign through the route.



FHWA National Scenic Byway or All-American Road Signing

Routes with the additional FHWA National Scenic Byway or All-American Road designation should also have appropriate signage.



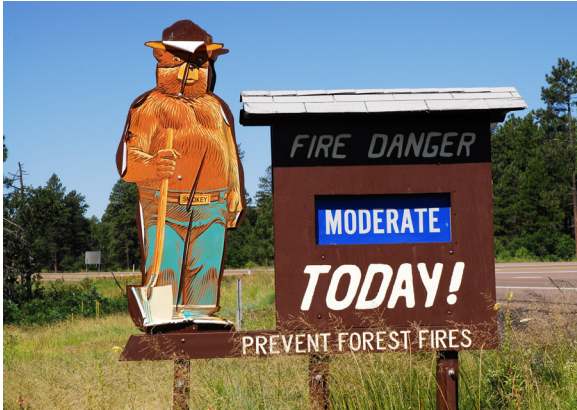
Route Marker



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Fire Rating Signing



Scenic Attraction Signing



Temporary Operations Signing and Incident Signing



Responsibility for Furnishing and Installing Signing within the ADOT Easement on BLM/USFS Lands

Responsibility for signing highways on BLM/USFS lands should be identified in the planning phase of each project. The following serves as a guideline for most signs.

Signs typically furnished by BLM/USFS and installed by ADOT during construction projects include: boundary signs; directional signing to BLM/USFS Administrative Offices; interpretive signing in rest areas, scenic vistas and pull-outs; and BLM/USFS Route Markers.

Fire Rating Signs are furnished and installed by BLM/USFS under permit from ADOT. BLM/USFS update the fire danger ratings as conditions dictate.

Temporary Operations Signs and Incident Signs are furnished and installed by BLM/USFS under an annual permit from ADOT.

ADOT may furnish and install motorist information signs. Requirements for such signing should be discussed during project planning with responsibility for furnishing and installing confirmed at that time.

Additional Resources:

Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, American Association of State Highway and Transportation Officials (AASHTO), 2002, 2003, 2006 Interims. https://bookstore.transportation.org/item_details.aspx?ID=74

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APPENDIX K: PROJECT REFERENCE FACT SHEET

Purpose

It is imperative that the Arizona Department of Transportation (ADOT) process benefits ADOT and all project stakeholders by providing the most current project information available.

The development of the Project Reference began as a cooperative effort of the Arizona offices of the Bureau of Land Management, the Federal Highway Administration and ADOT in early 2001. ADOT management embraced the concept and encouraged the continuing development of this system. In 2005, the Project Reference Subgroup was established to refine what began in 2001 as a hardcopy “document **distribution** system.” As a result of the efforts of this Subgroup, ADOT now has established an electronic, paperless Project Reference. This “document **availability** system” can be accessed directly through the ADOT Information Data Warehouse (AIDW). The Project Reference is “the way to do business” on all ADOT highway projects.

Definition:

The Project Reference is a document availability system designed to:

1. Provide ready access to key documents and information applicable to an ADOT project;
2. Ensure that timely information is available to ADOT personnel and project stakeholders throughout the life of the project;
3. Enhance project organization and teamwork;
4. Provide an historical file for an individual project.

Benefits:

1. The public benefits from better informed government staff with regard to highway projects.
2. The system makes the most current information available to all ADOT personnel and stakeholders in a timely manner.
3. Project documents are centrally located (in the AIDW) and easily accessible.
4. The system reduces delay, confusion, misunderstanding and conflict.
5. The system increases efficient use of time, contributes to clarity and understanding and engenders positive working relationships.
6. The system enhances the project team members’ ability to successfully understand and contribute to the project.

Implementation Summary

1. Creating and contributing to the Project Reference is a collective effort among the disciplines within ADOT and the project stakeholders. The system includes documents from all project phases (“cradle to grave”). These include Links to Planning and Long Range Plans, a Project Summary, Guiding Documents,

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Environmental Documents, Design Documents, Ancillary Permits and Agreements, Construction Documents and a Post-Construction Punch List.

2. Project Reference electronic document compilation begins at the time an ADOT project tracking (TRACS) number is requested.
3. Prior to construction, the ADOT Project Manger is responsible for overseeing the Project Reference.
4. For projects where a Pre-Negotiation Partnering Meeting is held prior to beginning design, the ADOT Project Manager educates workshop participants about the Project Reference document availability system.
5. At the Design Kick-Off Partnering Workshop, the ADOT Project Manager educates the participants about the value and use of the Project Reference and the importance of making the most current information available in a timely manner. The ADOT Project Manager identifies the disciplines responsible for system updates and assures that discipline representatives have received the proper training to check documents into the AIDW. Project team members who wish to receive notification when new documents become available may indicate this on the workshop sign-in sheet or by a request to the ADOT Project Manager.
6. Where documents are provided by project stakeholders other than ADOT personnel, those stakeholders give their documents to the ADOT Project Manager who checks those documents into the Project Reference.
7. The ADOT Resident Engineer assumes responsibility for overseeing the Project Reference when the project moves from design to construction.
8. At the Construction Kick-Off Partnering Workshop, the ADOT Resident Engineer educates participants about the value and use of the Project Reference and the importance of having the most current information available in a timely manner. The ADOT Resident Engineer identifies additional disciplines responsible for system updates and assures that discipline representatives have received the proper training to check documents into the AIDW. Additional project team members who wish to receive notification when new documents become available may indicate this on the workshop sign-in sheet or by a request to the ADOT Resident Engineer.
9. During construction, where documents are provided by project stakeholders other than ADOT personnel, those stakeholders give their documents to the ADOT Resident Engineer who checks those documents into the Project Reference.
10. Upon completion of construction, the ADOT Resident Engineer creates the Post Construction Punch List. The ADOT District Maintenance Engineer assumes responsibility for overseeing the Project Reference, using the Post Construction Punch List and using the Project Reference as a resource.
11. Over time, the Project Reference remains as the historical project file for the document types it includes.

NOTE: Not all project-related documents will be available when the Project Reference is initiated. New documents will be added and some documents will change as the project progresses through the project phases, which each occur over a period of several years.

APPENDIX L: NATIVE PLANT SALVAGE & REPLANTING EVALUATION GUIDELINES

Arizona vegetative zones include many rare and unusual plant species that may be found only in limited numbers, geographic areas and in some cases limited to the State. Native Plant Salvage and replanting on a project must be in conformance to the requirements of Arizona Native plant laws.

Mitigation requirements, project stipulations and impacts require during the design development that appropriate evaluation of project area vegetative cover be made using the following and other additional project specific criteria as appropriate in the evaluation for plant salvage and replanting within the highway right of way.

Plant salvage, nursery establishment and maintenance and replanting on the project under usual conditions should be limited to \$200,000 per mile not including a one or two year establishment period. Exceptions would be in cases where *Carnegiea gigantea*, Saguaro, *Ferocactus wislizenii*, Fishhook Barrel Cactus, *Fouquieria splendens*, Ocotillo and other primary or climax species such as *Olneya tesota*, Ironwood may require additional funding to accomplish the ADOT approved level of plant salvage and replanting.

Non Discretionary Evaluation Requirements:

1. Conformance to requirements of Arizona Native Plant Law.
2. NEPA Decision Document requirement.
3. Highway safety would not be compromised.
4. Mitigation for 404 permit requirement.
5. Plants must be species that would be self-sustaining after planting and establishment.

Discretionary Evaluation Requirements

1. Replanting of salvaged or planting of nursery plant materials would maintain or restore wildlife habitat value for cover and movement connectivity between habitat areas crossing the highway.
2. Plant species that exhibit difficulty in regenerating naturally or establishing from seeding.
3. Designed replanting quantities should not exceed the area's existing density for individual species and area plant spacing which are good indicators of the areas capacity for sustainable plant survival.
4. Maintain or enhance the visual resource quality of the highway right of way, professional judgment should be used to achieve an appearance similar to the surrounding area and at the same time self-sustaining with the available natural moisture.
5. Required maintenance activities would not be affected such as ditch and culvert cleaning, mowing, shoulder repair and vegetative management and erosion control within a vehicle clear zone.
6. Plants are in good condition with high level of assurance for survival and reestablishment. Locations of plants are accessible for equipment.
7. Salvage and transplanting of primary or climax vegetation is emphasized over transitional or secondary species.

Unique species, densities and site conditions that result in estimated plant salvage, nursery and planting costs above \$200,000 per mile requires project specific justification and cost increase approval.

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APPENDIX M: REFERENCES AND PHOTOGRAPHY CREDITS

1. Arizona Department of Transportation (ADOT) Roadway Design Guide, 2007.
2. ADOT Landscape Design Guidelines for Urban Highways.
3. ADOT Construction Manual, 2008.
4. ADOT Construction Standards (C-Stds), 2007.
5. ADOT Post-Construction Best Management Practices Manual for Highway Design and Construction, 2008.
6. ADOT Erosion and Pollution Control Manual for Highway Design and Construction, 2005.
7. ADOT Maintenance and Facilities Best Management Practices Manual, 2008.
8. ADOT Application Procedures for Designation of Parkways Historic and Scenic Roads In Arizona, 1993.
9. ADOT CADD Standards and Specifications.
10. ADOT Standard Specifications For Road and Bridge Construction, 2008.
11. ADOT Traffic Engineering Policies, Guidelines and Procedures.
12. ADOT Bridge Design Guidelines.
13. ADOT Maintenance Manual.
14. ADOT Winter Storm Management Plan.
15. American Association of State Highway Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 2004.
16. AASHTO Roadside Design Guide, 2006.
17. Manual on Uniform Traffic Control Devices (MUTCD), 2003.
18. Supplement to the 2003 MUTCD, 2004.
19. U.S. Department of Agriculture, Forest Service. Landscape Aesthetics A Handbook for Scenery Management, Agriculture #701, 1995.

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Figures

- 1.1 ADOT Office of Environmental Services
- 1.2 Luis Colon
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- 2.1 WSA archives, Chelsea Marshall
- 2.2 Luis Colon
- 2.3 ADOT
- 2.4 WSA archives
- 2.5 WSA archives
- 2.6 WSA archives
- 2.7 Luis Colon
- 2.8 Luis Colon

Beginning page of Chapter 3:

Top: ADOT, Bottom left: Luis Colon

Bottom right: USFS

- 3.1 www.flickr.com accessed 5/07
- 3.2 Luis Colon
- 3.3 Luis Colon
- 3.4 Luis Colon
- 3.5 Luis Colon
- 3.6 ADOT
- 3.7 Luis Colon
- 3.8 Luis Colon
- 3.9 www.flicker.com accessed 5/07
- 3.10 Luis Colon
- 3.11 Luis Colon
- 3.12 Luis Colon
- 3.13 Luis Colon
- 3.14 USFS
- 3.16 Luis Colon
- 3.17 Luis Colon

Beginning page of Chapter 4:

All photos: Luis Colon

- 4.1 Luis Colon
- 4.2 Luis Colon
- 4.3 Luis Colon
- 4.4 WSA archives
- 4.5 Luis Colon
- 4.6 Luis Colon
- 4.7 Luis Colon
- 4.8 Luis Colon
- 4.9 WSA archives
- 4.10 Luis Colon

- 4.11 Luis Colon
- 4.12 WSA archives
- 4.13 Luis Colon
- 4.14 Luis Colon
- 4.15 Luis Colon
- 4.16 Luis Colon
- 4.17 Luis Colon
- 4.18 Luis Colon
- 4.19 Luis Colon
- 4.20 WSA archives
- 4.21 WSA archives
- 4.22 Luis Colon
- 4.23 Luis Colon
- 4.24 Luis Colon
- 4.25 Luis Colon
- 4.26 WSA archives
- 4.27 Luis Colon
- 4.28 Luis Colon
- 4.29 Luis Colon
- 4.30 WSA archives
- 4.31 Luis Colon
- 4.32 www.retainingsolutions.com 6/07
- 4.33 Luis Colon
- 4.34 WSA archives
- 4.35 ADOT

Beginning page of Chapter 5:

All photos: Luis Colon

- 5.1 Luis Colon
- 5.2 Luis Colon
- 5.3 Luis Colon
- 5.4 Luis Colon
- 5.5 Luis Colon
- 5.6 Luis Colon
- 5.7 Luis Colon
- 5.8 Luis Colon
- 5.9 Luis Colon
- 5.10 WSA archives
- 5.11 Luis Colon
- 5.12 Luis Colon

Beginning page of Chapter 6:

All photos: Luis Colon

- 6.1 Luis Colon
- 6.2 Luis Colon
- 6.3 Luis Colon
- 6.4 Luis Colon
- 6.5 Luis Colon
- 6.6 Luis Colon
- 6.7 Luis Colon
- 6.8 Luis Colon
- 6.9 Luis Colon
- 6.10 Luis Colon
- 6.11 Luis Colon

6.12 Luis Colon

Beginning page of Chapter 7:

All photos: Luis Colon

- 7.1 WSA archives
- 7.2 Luis Colon
- 7.3 Luis Colon
- 7.4 Luis Colon
- 7.5 WSA archives
- 7.6 Luis Colon
- 7.7 Luis Colon
- 7.8 Luis Colon
- 7.9 WSA archives
- 7.10 Luis Colon
- 7.11 Luis Colon
- 7.12 www.fireflyforest.com 6/07
- 7.13 WSA archives, Dara Widner

Appendix J:

Temporary Operations Signing and Incident

Signing: USFS

All other photos: Luis Colon

Beginning page of Chapter 8:

All photos: Luis Colon

- 8.1 Luis Colon
- 8.2 Luis Colon

Beginning page of Chapter 9:

All photos: Luis Colon

- 9.1 Luis Colon
- 9.2 ADOT
- 9.3 ADOT
- 9.4 ADOT
- 9.5 ADOT
- 9.6 ADOT

Beginning page of Chapter 10:

Top left: ADOT, Top right: Luis Colon

Bottom: Luis Colon

- 10.1 WSA archives
- 10.2 Luis Colon
- 10.3 Luis Colon
- 10.4 Luis Colon
- 10.5 Luis Colon
- 10.6 WSA archives

Beginning page of Chapter 11:

All photos: Luis Colon

- 11.1 ADOT
- 11.2 WSA archives, Dara Widner
- 11.3 ADOT
- 11.4 Luis Colon
- 11.5 ADOT
- 11.6 Luis Colon
- 11.7 Luis Colon
- 11.8 Luis Colon
- 11.9 Luis Colon
- 11.10 Luis Colon

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APPENDIX N: ADDITIONAL PHOTOS

Appendix N is a digital appendix included only with the ADOT website Guidelines document. Photographs will be continually added to supplement each chapter's text and concepts. Access the website document at:

http://www.azdot.gov/Highways/Roadway_Engineering/Roadside_Development/HwyBLM_USFS.asp

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