

National Park Service
U.S. Department of the Interior

Arches National Park
Moab, Utah



Parkwide Road Maintenance and Modification Environmental Assessment

July 2013



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Parkwide Road Maintenance and Modification

Environmental Assessment

Summary

The Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA) in cooperation with the National Park Service (NPS) is proposing to rehabilitate approximately 23 miles of roads and pullouts along the Main Entrance Road, Windows Road, Delicate Arch Road, La Sal Mountain View Road, Panorama Point Overlook Road, Salt Valley Overlook Road, Fiery Furnace Road, Maintenance Road, Windows Loop Road including a turnaround segment, and Devils Garden Loop Road which also includes the construction of a turnaround segment. This project will include the removal and replacement of the bridge rail at the Courthouse Wash Bridge, drainage work on the channel near the entrance station as well as constructing an additional entrance lane intended as a bypass road for pass holders and future shuttle operation.

This Environmental Assessment (EA) evaluates two alternatives: a no action alternative and an action alternative. The no action alternative describes the current condition if no road maintenance was to occur, and no parking lots were expanded nor pulloffs formalized and turnarounds constructed. The action alternative addresses the rehabilitation, restoring and resurfacing of paved road as well as expanding parking and providing opportunities to move visitors safely through the park.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to the park's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics included in this document because the resultant impacts may be greater-than-minor include soil and vegetation resources and visitor use and experience. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document and comments were received, mostly in support of the proposed project.

Public Comment

If you wish to comment on the EA, you may post comments online at <http://parkplanning.nps.gov/arch> or mail comments to: Planning and Compliance Coordinator, Southeast Utah Group, National Park Service, 2282 S. West Resource Blvd, Moab, Utah 84532.

This EA will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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CHAPTER 1: PURPOSE AND NEED

Introduction

The Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA) in cooperation with the National Park Service (NPS) is proposing to perform resurfacing, restoration, and rehabilitation (3R) on approximately 23 miles of roads and pullouts in Arches National Park. Improvements will be made to the Main Entrance Road, Windows Road, Delicate Arch Road, La Sal Mountain View Road, Panorama Point Overlook Road, Salt Valley Overlook Road, Fiery Furnace Road, Maintenance Road and the Devils Garden Road. Short road segments, less than 100 feet each, would be constructed to facilitate re-entering the loop at the end of the Devils Garden and Windows road. Work will also include the removal and replacement of the bridge rail at the Courthouse Wash Bridge, drainage work on the channel near the entrance station, and constructing an additional lane before the entrance station which will be used as a bypass road for pass holders and future shuttle operation.

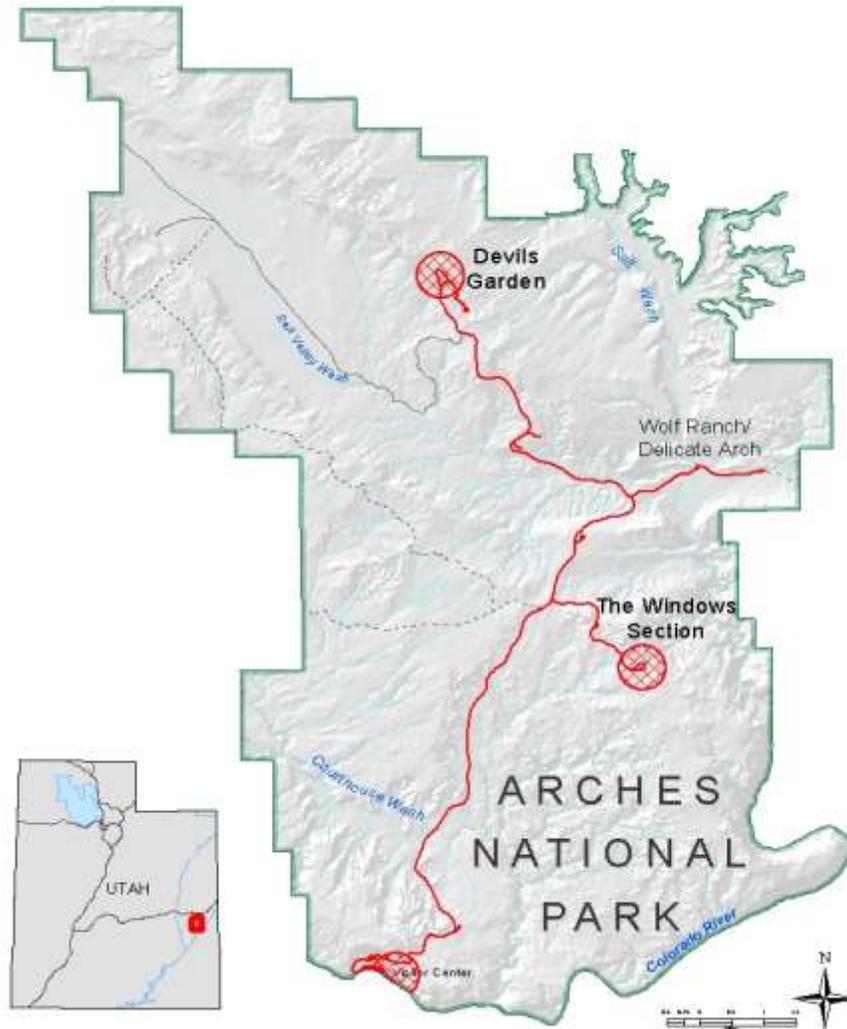
This Environmental Assessment (EA) was prepared to evaluate potential environmental, socioeconomic, and cultural resource effects from the preferred alternative to rehabilitate the main park road, parking areas and pull offs. The no action alternative does not propose to rehabilitate or improve the road or expand parking. There were also three alternative actions that were dismissed from further consideration for various reasons. This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and NPS **Director's Order (DO)-12** (*Conservation Planning, Environmental Impact Analysis, and Decision-Making*).

Background

Arches National Park is in the heart of canyon country in southeastern Utah and is considered one of America's scenic wonders. The park preserves 76,679 acres of high desert on the Colorado Plateau, punctuated by rocky ridges, canyons, fins, towers, monoliths, pinnacles, and more than 2,000 arches. Delicate Arch has become an icon; it is the adopted symbol for the Utah license plate and is a "must see" for visitors from around the world. The nearby town of Moab is a major tourist destination that serves as a hub for a wide range of recreational activities in the surrounding region. The prominent La Sal Mountains to the southeast rise to more than 12,600 feet above sea level and provide a scenic background for the park. **Arches'** extraordinary geological features are easily accessible, many by vehicle or short walking distances from trailhead parking areas making the park primarily known as a drive-through park.

Many of the park's dramatic features are visible from the main road, which enters at the southern extremity and runs to Devils Garden in the northern part of the park, with two side roads along the way (Figure 1). Since the park road winds through the above described features, it allows the visitor to see much of the park from the comfort of their vehicles.

Figure 1: Overview of the Park Roads and Areas Proposed for Maintenance



Purpose and Need

The proposed project is being considered because of the need to address the following problems and needs:

- The current pavement is aged in many locations, which has led to surface cracks, rutting, buckling, and unraveling of the pavement edge. The road was built with no base and was converted directly from a dirt road to asphalt. Years of chip seal patches with no base layer, have negatively impacted the road surface by making it rough and irregular. Continued crack seal and edge repair are not keeping up with

increasing wear, and fail to protect the road from surface water runoff. Surfaces and edges are deteriorating. Due to areas of narrow pavement width and rough areas large vehicles are driving on the edge of the road pavement, which threatens adjacent natural and cultural resources.

- The existing paved width varies from 21 feet to 30 feet. The wider sections of pavement include the paved ditch areas. The existing travel lanes are very narrow ranging from 9 to 10 feet. The existing roadway shoulders vary in width and purpose; from no paved shoulder to 11 foot paved ditches that act like shoulders. Consistent widening of the travelway on the existing road bench is needed to improve safety and reduce maintenance.
- A review of the accident history for the roads was conducted to identify safety issues that need to be addressed. Additionally, general safety improvements appropriate for the project will be incorporated in the design.
- The parking capacity for the park, although initially designed and limited through **the Visitor's Experience and Resource Protection (VERP) analysis in the early 2000's**, the demand for parking has exceeded available parking capacity ever since. In previous transportation planning efforts the thought was to control the capacity of visitors by the limits of available parking spaces. Parking areas at popular attractions are frequently congested, causing visitors to park outside of paved areas, potentially damaging sensitive soils, vegetation, and cultural resources. The need to create more parking spaces within the current parking lot design without detracting **from a visitor's experience is an opportunity park management** would like to pursue.
- Visitors have been parking in unpaved areas along the roadside for a variety of reasons (such as for photo stops, orientation, and scenic views). A current pull-off analysis has been completed and has identified the need to implement formalization or closures of social pull-offs.
- Two culverts near the entrance station continue to flood and require maintenance. Although the two culverts have the capacity to pass the 50 year peak flows, deposition of sediment is likely caused by the backwater from the downstream culvert, which is smaller than the upstream culvert and consequently reduces the velocity in the drainage between the two locations. Park staff continuously has to clean and re-grade the channel between the two culverts. In addition, head-cutting and bank erosion are threatening park housing upstream of both culverts. There is a need for culvert replacement as well as bank stabilization at both culvert locations.
- The structural design (asphalt thickness) of the road currently does not accommodate shuttles. In order to improve the park road to better support future shuttle operations, there is a need for thicker pavement as well as a bypass lane. The bypass lane is needed to reduce congestion and provide expedited access for construction, employees and shuttles to the visitor center.
- The Courthouse Wash Bridge railing, although in generally good condition, does not meet current crash test requirements and is in need of replacement.

Overall, the proposed improvements would protect park resources, improve traffic safety, facilitate maintenance, and provide a pleasant driving experience. The objectives of the proposed project are to:

1. Protect park resources
 - Protect park natural and cultural resources and values
 - Maintain the scenic quality of the road
2. Provide for visitor enjoyment and safety
 - Improve the road condition and width to safely accommodate traffic
 - Improve access and safety at pullouts and parking areas
 - Reduce the incidence and risk of traffic accidents
 - Efficiently implement rehabilitation work while minimizing impacts to visitors
3. Improve the efficiency of park operations
 - Repair damaged and deteriorating road pavement, drainage, and other structural features
 - Reduce maintenance requirements and costs due to deficiencies in the condition of the road.

Relationship to Other Plans and Policies

Current plans and policy that pertain to this proposal include the park's 1989 *General Management Plan* (GMP) (NPS 1989), the 2006 *Transportation Implementation Plan* (NPS 2006a), and the 2006 *Management Policies* (NPS 2006), 1984 NPS Park Roads Standards and **Director's Order – 87A: Park Roads and Pathways**. Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is consistent with the park's 1989 GMP, which establishes that the main park road will remain the same in width and standard. **Delicate Arch road's existing** alignment will also be maintained as much as possible. The park should meet the existing demand for parking at most overlooks and trailheads. Parking pullouts along the road will be redesigned as necessary for safety which may require elimination of some and widening and lengthening others. Road signs will be evaluated and changed as necessary. The GMP also identifies that physical barriers will be installed to prevent damage to park resources by overflow parking along road shoulders and short cutting trailheads.
- **This project is consistent with the park's 2006 Transportation Implementation Plan.** This plan recommends improving the function of the roadway system through implementation of roadside pull off and traffic calming improvements. This plan also recommends "hardening" existing parking areas by delineation methods that contain parking areas to a maximum vehicle capacity, including curbing, striping, signing, fencing, placement of boulders and other types of treatments.
- The proposal is consistent with the goals and objectives of the 2006 *Management Policies* (NPS 2006) **which states in section 9.2.1 "park roads will be well constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience."** **The purpose of park roads is to enhance visitor experience by providing access to park facilities, resources, and recreational opportunities.** Park roads are not intended to provide fast and convenient transportation, but rather to access areas of recreation while being sensitive to the natural and cultural resources in the area (section 9.2.1.1 *Management Policies*). Park

roads provide access for the protection, use, and enjoyment of the resources that constitute the park.

- The proposal is consistent with the *1984 NPS Park Roads Standards* which state that roads in national parks serve a distinctly different purpose from most other road and highway systems. Among all public resources, those of the national park system are distinguished by their unique natural, cultural, scenic, and recreational qualities. Park roads are to be designed with extreme care and sensitivity to provide access for the protection, use, and enjoyment of the resources that constitute the national park system.
- The proposal is consistent with the *Director's Order – 87A: Park Roads and Pathways* which states that park roads are constructed only where necessary to provide access for the protection, use, and enjoyment of the natural, historical, cultural, and recreation resources that constitute our national park system. Park roads should enhance the visitor experience while providing safe and efficient accommodation of park visitors and to serve essential management action needs. Park roads are designed with extreme care and sensitivity with respect to the terrain and environment through which they pass—they are laid lightly onto the land.

Impact Topics Retained For Further Analysis

Impact topics for this project were identified on the basis of federal laws, regulations, and orders; *2006 Management Policies*; and NPS knowledge of resources at Arches. Impact topics that are carried forward for further analysis in this EA include:

- Soil Resources
- Vegetation Resources
- Archeological Resources
- Visitor Use and Experience

Impact Topics Dismissed From Further Analysis

In this section, NPS takes a “hard look” at all potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates “major” effects as “significant” effects. The identification of “major” effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines “measurable” impacts as moderate or greater effects. It equates “no measurable effects” as minor or less effects. “No measurable effect” is used by NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of “no measurable effects” in this EA pertains

to whether NPS dismisses an impact topic from further detailed evaluation in the EA. The reason NPS uses **“no measurable effects” to determine whether impact topics are** dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with CEQ regulations at 1500.1(b).

In this section of the EA, NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented.

Geologic Resources

Arches National Park was established to protect extraordinary examples of geologic features including arches, natural bridges, windows, spires, balanced rocks, and other features of geologic, historic, and scientific interest. Geologic features and natural geologic processes together are considered by NPS to be geologic resources. NPS policy is to preserve and protect geologic resources as integral components of park natural systems (NPS 2006).

Initial construction of park roads in Arches involved several cuts through bedrock topographic features. However, proposed road maintenance and modifications described and examined in this EA do not involve additional such cuts through bedrock. Components of the proposed action would result in negligible to minor adverse impacts to geologic and topographic features. Therefore, the topic of geologic resources is dismissed from further analysis in this document.

Wildlife

According to *2006 Management Policies*, NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of native animal populations (NPS 2006). Types of wildlife commonly found in the park include lizards, snakes, toads, and many small mammals such as bats, mice, squirrels, and rabbits. In addition, over 170 native bird species have been documented to occur in the park. Of these, about 45 species are considered to be common. Larger animals such as desert bighorn sheep, coyotes, mule deer, porcupines, raccoons, and beavers are present but relatively uncommon. Mountain lions are rare in the park (NPS 2012).

Roads are known to have numerous direct and indirect impacts on wildlife, including direct injury and mortality from vehicle collisions, altered behavior and patterns of habitat

use, and increased human use and disturbance of wildlife in roaded areas (Forman and Alexander 1998, Trombulak and Frissell 2000, Gerow et al. 2010). The proposed action involves maintenance of the existing road system and limited construction of new road surfaces in locations where roads already exist. Increased noise levels during the construction phase of this project could result in temporary increases in localized disturbances to wildlife. Overall, these actions would result in negligible to minor adverse impacts to wildlife populations in the park. Therefore, the topic of wildlife is dismissed from further analysis in this document.

Special Status Species

Special status species are those that are listed or are candidates for listing under the **federal Endangered Species Act, species identified on the State of Utah's sensitive species list**, and other species that are of special management concern in the park due to uniqueness, rarity, declining population trends, and/or particular sensitivity to human impacts. The Endangered Species Act of 1973 requires examination of impacts on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. NPS policy is to protect and strive to recover all federally listed species that are native to the park, to manage state-listed species similarly to federally listed species to the extent possible, and to manage other species of management concern to maintain their natural distribution and abundance (NPS 2006).

For the purposes of this analysis, the U.S. Fish and Wildlife Service was contacted with regards to federally- and state-listed species to determine those species that could potentially occur on or near the project area. A letter from the U.S. Fish and Wildlife Service (USFWS) dated February 27, 2013 indicated that because there are no listed species present in the project area, the proposed action poses no issues of concern to the USFWS and no further consultation under §7 of the Endangered Species Act is necessary (USFWS 2013).

In addition to listed species, other species of management concern include nesting raptors and desert bighorn sheep. Nesting raptors as a group are of management concern because of their high degree of sensitivity to disturbance from human activities. Desert bighorn sheep (*Ovis canadensis nelsoni*) is of management concern in the park because of its value as an iconic species that is uncommon and also is sensitive to disturbance from human activities (Papouchis, et al. 2001). Nesting raptors and desert bighorn sheep generally avoid the existing road system or occur near roads in limited numbers in cases where individual animals have become habituated to certain human activities such as vehicle traffic. For these reasons, and because the proposed action involves only maintenance of existing roads and limited construction of new road surfaces in high-visitation areas where roads already exist, the project would have negligible to minor adverse impacts on nesting raptors and desert bighorn sheep. Therefore, the topic of special status species is dismissed from further analysis in this document.

Water Resources

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and for regulating water quality standards for surface waters. The purpose of the Clean Water Act is to "restore and maintain the chemical,

physical, and biological integrity of the Nation's waters." 2006 *Management Policies* requires protection of water quality consistent with the Clean Water Act and also states that NPS will perpetuate surface waters and groundwaters as integral components of park **aquatic and terrestrial ecosystems**. Due to the park's arid climate, water resources are scarce and are particularly important for sustaining a disproportionately high diversity of native plant and animal species.

Roads can affect the condition of water resources through alteration of surface runoff and drainage patterns, alteration of associated hydrologic and geomorphic processes, and by introducing compounds from construction activities, road materials, or motor vehicles that may contribute to water contamination (Trombulak and Frissell 2000). The proposed action involves road widening and limited construction of new road surfaces, both of which would increase the spatial extent of impervious surfaces and increase the generation of runoff from road surfaces. The proposed action also includes upgrades to roadside ditches and culverts to facilitate drainage of runoff from road surfaces and the passage of flows in natural drainage channels affected by the road alignment. Overall, the incremental changes in surface runoff and drainage patterns would be small relative to effects of the existing road system, and additional long-term effects on hydrologic processes would be minor or less. Short-term effects of construction activities on sedimentation and water quality also would be minor or less due to implementation of mitigation measures identified in a Storm Water Pollution Prevention Plan (SWPPP) to be prepared by CFHWA and implemented by the contractor in conjunction with a Utah Pollutant Discharge Elimination System (UPDES) permit issued by the State of Utah. For these reasons, the topic of water resources is dismissed from further analysis in this document.

Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in 2006 *Management Policies* and **Director's Order 77-1 Wetlands Protection** strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with *DO 77-1 Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands. These orders and policies further direct that direct or indirect impacts to wetlands be avoided whenever there are practicable alternatives.

The project area includes a persistent, ponded wetland where the Delicate Arch road crosses Salt Wash at Wolfe Ranch. The wetland occurs immediately upstream and downstream of the road crossing, and the road segment in contact with the wetland consists of a concrete battery of culverts. Under the proposed action, no work is planned for the concrete culvert battery. Work proposed for adjoining asphalt sections of the road near the wetland includes stripping, pulverizing, and reapplying existing asphalt to the current road surface. Since the proposed action includes no disturbance of the concrete

road section in contact with the wetland, and includes no disturbance beyond the existing surface of adjoining asphalt road sections near the wetland, the project will not impact the wetland. For this reason, the topic is dismissed from further analysis in this document.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under 2006 *Management Policies and Director's Order 77-2 Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to *Director's Order 77-2 Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains.

Although the lane expansion of the park entrance road is within a 100-year floodplain and near Bloody Mary Wash, "entrance, access, and internal roads to or within units of the NPS" are exempted from the requirements specified in the *National Park Service Floodplain Management Guidelines* (NPS 1993). The proposed new lane would be constructed on the opposite side of Bloody Mary Wash and would not modify the wash system in any way. Therefore, this topic was dismissed from further analysis in this document.

Historic Structures

Section 106 of the NHPA of 1966, as amended (16 USC 470, et seq.) and its implementing regulations under 36 CFR 800 require all federal agencies to consider effects of federal actions on historic properties, including historic structures, eligible for or listed in the National Register. In order for a structure to be listed in the National Register, it must be associated with an important historic event, person(s), or that embodies distinctive characteristics or qualities of workmanship. Cultural resource investigations found no historic structures within the area of potential effect eligible for listing on the National Register. There are no historic structures in the area of potential effect that would be affected by the no action or preferred alternative, therefore, this topic was dismissed from further analysis in this document.

Ethnographic Resources

E.O. 13007 directs federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Specifically, federal agencies are directed to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites. According to *Director's Order -28*, ethnographic resources are defined by the National Park Service as a "site, substance, object landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it".

Purple Sage, an identified Traditional Cultural Property (TCP), is in the general vicinity. Mitigations were identified and completed during the original realignment of the park entrance road, which destroyed the majority of the TCP. Consultation with tribes over the remaining identified TCP took place during the 2006 Arches Transportation Implementation Plan EA as well as with this project and there will be no further impact

during the current proposed project. The alternative Purple Sage location has been identified, and the pull-outs associated with it will not be altered. Therefore this topic has been dismissed from further analysis in this document.

Cultural Landscapes

According to the NPS DO-28: *Cultural Resource Management Guideline*, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. A cultural landscape inventory has not been conducted for the project area; however, as previously described, there are no historic structures in the vicinity and no potential for a cultural landscape. Due to the absence of historic structures, which limits the potential for a landscape, cultural landscapes were dismissed from further analysis in this document.

Museum Collections

According to Director's Order-24 *Museum Collections*, NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, National Park Service museum collections. The preferred alternative and no action alternative would not affect the museum collections of Arches. Given the lack of archeological resources within the project area, it is unlikely that anticipated ground disturbance would generate additional artifacts during discovery situation and even if artifacts were discovered during construction monitoring, the park museum collections would not increase appreciably as a result. Because they would not be adversely impacted by either alternative, museum collections were dismissed as an impact topic in this document.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public **health and welfare by protecting and enhancing the nation's air quality**. The act establishes specific programs that provide special protection for air resources and air quality-related values associated with National Park Service units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality-related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts (EPA 2009). Arches National Park is designated as a Class I air quality area under the Clean Air Act. The law requires for Class I areas that ambient air quality must essentially remain unchanged and cannot sustain increases in air pollution above baseline levels.

Construction activities associated with the proposed action such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized. Contract specifications will require the construction contract to control dust by applying water at the locations, rates, and frequencies ordered by the NPS contracting officer. Overall, the project could result in negligible adverse effects on local air quality conditions, but such effects would be temporary, lasting only as long as construction. Because there would be negligible effects on air quality, this topic is dismissed from further analysis in this document.

Soundscape Management

In accordance with *2006 Management Policies and Director's Order-47 Sound Preservation and Noise Management*, an important component of NPS's mission is the preservation of natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed action would occur along the existing road system in developed areas of the park where sounds from vehicular traffic and other human activities are common. During the project, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors, employees, and natural soundscape conditions. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this document.

Scenic Values

2006 Management Policies states that the park's scenery and scenic features are included among the resources and values that are to be protected and conserved unimpaired for enjoyment by current and future generations. The scenic vistas for which Arches is renowned would not be adversely affected by the proposed action. Under the no action alternative, road conditions would continue to deteriorate, which would detract from the scenic quality of the road corridor through the park. Visual impacts from construction activities under the preferred alternative would be short-term, negligible, and localized. The long-term effect on visual quality would be beneficial under the preferred alternative, with a long-term minor adverse effect under the no action alternative. Because these effects are minor or less in degree, this topic is dismissed from further analysis in this document.

Natural Lightscape

In accordance with *2006 Management Policies*, NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). The park strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The park also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. No outdoor lighting is proposed as part of this project and no night work would occur that would affect the night sky. Because there would be minor or less impact, this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

In response to current and predicted future changes in climate, NPS policy is to include climate-change considerations in all park planning efforts (NPS 2010). In addition, NPS

policy is to reduce carbon emissions associated with park operations as a means of mitigating NPS contributions to global climate change and enhancing the long-term sustainability of park operations (NPS 2010). In the Southwest, there is increasing evidence that human-induced climate change currently is affecting temperatures, mountain snowpack, and streamflow (Karl et al. 2009). Climate models project increasing aridity in the region in coming decades (Seager et al. 2007). These changes likely would affect park resources, visitor experiences, and park operations in multiple ways that cannot be predicted accurately with our current level of scientific understanding. For this reason, the topics of climate change and sustainability are dismissed from further discussion in this document.

Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Moab, Utah, as well as Grand County due to minimal increases in employment opportunities for the construction workforce and revenues for local businesses and governments generated from these additional construction activities and workers. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Because the impacts to the socioeconomic environment would be negligible, this topic is dismissed from further analysis in this document.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the NRCS, the project area does not contain prime or unique farmlands (NRCS 2003). Because there would be no effects on prime and unique farmlands, this topic is dismissed from further analysis in this document.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The **parks'** lands and resources related to this project are not held in trust by the Secretary of the Interior for the benefit of Native Americans. Because there is no Indian trust resources related to this project, this topic is dismissed from further analysis in this document.

Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on

minorities and low income populations and communities. Because the roads, parking lots and pull offs would be available for use by all visitors regardless of race or income, and the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low income populations or communities. For these reasons, this topic is dismissed from further analysis in this document.

CHAPTER 2: ALTERNATIVES

During the summer of 2012, an interdisciplinary team (IDT) of National Park Service employees and CFLHD met for the purpose of developing project alternatives and road designs. In January 2013 the NPS IDT met to define of project objectives as described in the *Purpose and Need*, and a list of alternatives that could potentially meet these objectives. A total of five action alternatives and the no action alternative were originally identified for this project. Of these, four of the action alternatives were dismissed from further consideration for various reasons, as described later in this chapter. One action alternative and the no action alternative are carried forward for further evaluation in this EA. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Carried Forward

Alternative A – No Action

Under Alternative A, the no action alternative, the main park road would not be rehabilitated, nor parking and pull-offs modified or expanded. ARCH staff would continue routine road maintenance and minor repairs as it has in the past. Exiting signage and road markings would remain. The road pavement and structural integrity would continue to deteriorate and safety concerns would persist. Visitors would continue to have issues with parking in formal and informal parking areas and pull-offs. The no action alternative would not correct identified structural problems or visitor safety issues associated with the width of the road and pavement conditions. Drainage issues would also continue. No highway funds would be expended for rehabilitation; however, road maintenance costs would likely increase to address deteriorating road conditions. There would be no bypass constructed for construction vehicles, future shuttle operators or pass holders at the entrance station.

The no action alternative provides a basis for comparison with the preferred alternative and the respective environmental consequences. Should the no action alternative be selected, the Park Service would respond to future needs and conditions without major actions or changes in the present course.

Alternative B – Park Road Improvements (Preferred Alternative)

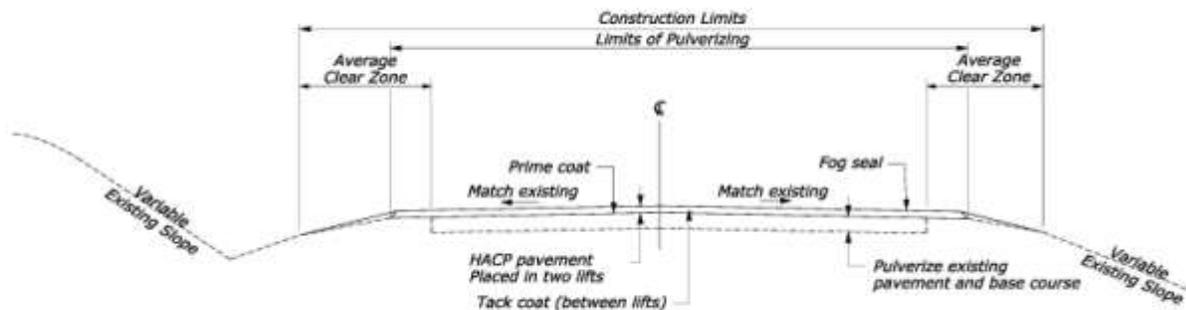
Alternative B includes proposed resurfacing, restoration, rehabilitation, and associated improvements needed to address the identified deficiencies along approximately 23 miles of the park road. The majority of the proposed work is programmed for 2018 subject to available funds and the estimated construction cost is \$30 million. However, starting in fiscal year 2014, the work proposed for Devils Garden would start. In addition, the remaining road construction plans and specifications will be complete and ready for advertisement should funding become available. The following sections describe the proposed road rehabilitation and improvements.

Road Design and Pavement

Main Entrance Road

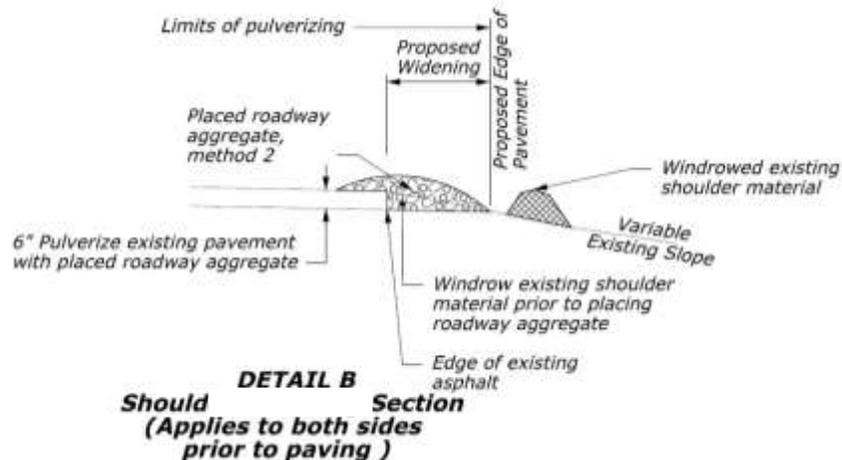
The average existing paved roadway width is 22 feet for the Main Entrance Road. The existing paved width varies from 21 feet to 30 feet. The wider sections of pavement include the paved ditch areas. The existing lane widths vary from nine to ten feet. The existing roadway shoulders vary from no paved shoulder to 11 foot paved ditches that act like shoulders. The proposed typical section for the Main Entrance Road consists of 11 foot lanes and one foot shoulders for a total paved width of 24 feet. The typical section starts just past the entrance station and continues to the beginning of Devils Garden Loop Road. The following figure shows the typical section for the Main Entrance Road. The sub-grade has failed in select locations. Sub-excavation would be used to mitigate the issues. For more information see the Pavements section of this report. Providing a consistent one foot shoulder would be safer for the recent increase in bicycle traffic. The roadway would be widened on the existing bench to accommodate the new typical section (Fig 3).

Figure 2: Proposed Construction to Travelway



To widen the roadway aggregate base would be placed on the edge of the existing roadway and would be pulverized with the existing pavement to meet the new paved width. The existing roadway bench would be able to accommodate the extra widening. The following figure shows a detail for roadway widening (Figure 3).

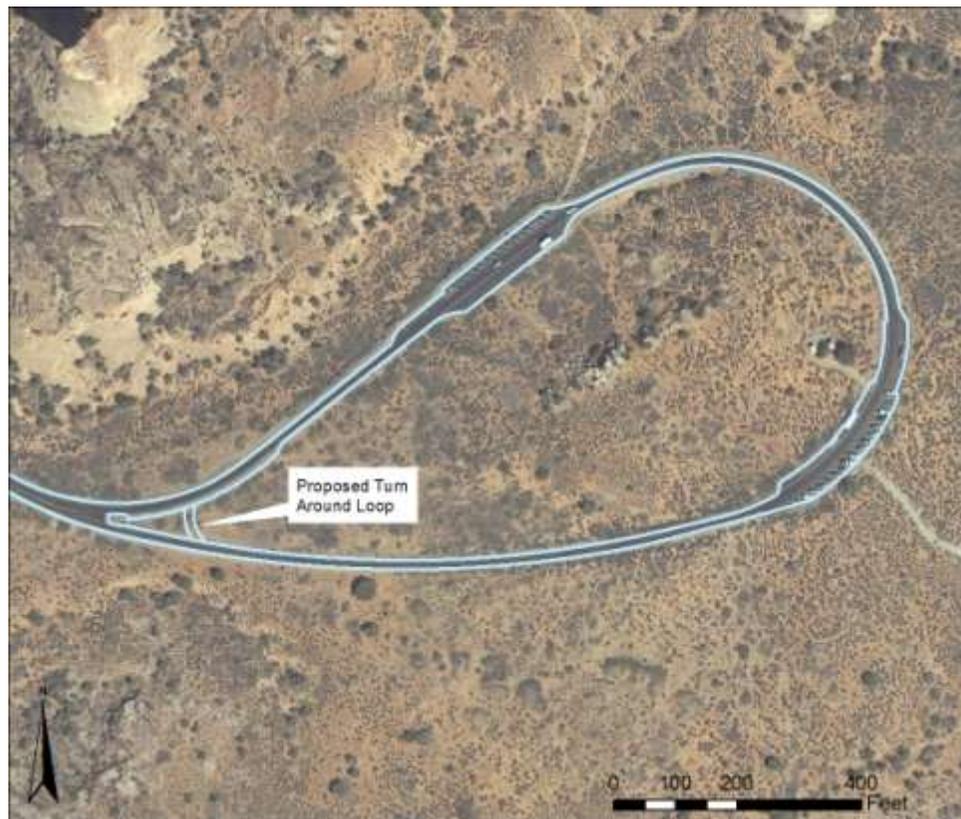
Figure 3: Detail of Shoulder Widening



Windows Road

The average existing paved width for Windows Road is 20 feet. The existing paved width varies from 19 feet to 31 feet. The wider sections of pavement include the paved ditches. The lane width varies from 8 to 10 feet. The proposed typical section for the Windows Road is 11 foot lanes and 1 foot shoulders for a total paved width of 24 feet. The roadway would be widened on the existing bench to accommodate the 24 feet of pavement similar to the Main Entrance Road. The existing roadway bench would be able to accommodate the extra widening. The vertical alignment would remain unchanged. Pulverizing and overlaying the road would raise the profile by three inches.

Figure 4: Windows Conceptual Diagram



This alternative proposed to construct and pave a turnaround loop at the entrance to the one way loop which would allow for vehicles to safely and expediently turn around in this area. Currently visitors who cannot find parking when looping through these areas **attempt to turn around on the 24' road bench. This maneuver is often a three-point turn** and causes unnecessary damage to the roadsides. Additionally this maneuver impedes the flow of traffic in highly congested areas. Larger vehicles cannot make this turn at all and drive extra distances to areas where they can safely turn around.

Delicate Arch Road

The average existing paved width for Delicate Arch Road is 26 feet. The proposed typical section is 12 foot lanes and one foot shoulders which will match the existing paved bench width. The existing pavement would not be pulverized. A two inch overlay would be

placed on top of the existing roadway. Delicate Arch Road is experiencing some sub-grade failures which are causing the road to rut. The sub-grade failure is occurring 0.7 miles from the intersection of Delicate Arch Road and the Main Entrance Road. Sub-grade failure would be addressed by using a type one pavement patch. Sub-excavation would be used to correct problem areas where rutting and sub-grade issues have been found. More information on the pavement structural section can be found in the *Pavement Design* section of this document.

La Sal Mountain View Road, Panorama Point Road, Salt Valley Overlook, and Fiery Furnace Road

La Sal Mountain View Road, Panorama Point Road, Salt Valley Overlook Road, and Fiery Furnace Road have the same typical section (Figure 2). The existing paved width is 20 feet. The existing lane width is 8 to 10 feet. The proposed typical section paved width is 24 feet. The roadway would be widened on the existing bench accommodate the 24 feet of pavement. Figure 3 shows the detail for roadway widening. The profile for all four roads would be raised by three inches because the existing asphalt would be pulverized and overlaid with 3 inches of new asphalt. All four roads have one way loop/parking areas that are included in this project.

Devils Garden Loop

The Devils Garden Loop Road is a one way loop that begins at the end of the Main Entrance Road and continues counter clockwise through the Devils Garden area and connects back to the Main Entrance Road. Devils Garden Loop has multiple parking areas. The roadway typical section would be a single 12 foot lane with one foot shoulders on either side. The existing paved width is 14 feet. Figure 2 shows a typical section for Devils Garden Loop Road. The profile would be raised by three inches due to the pulverization of the existing asphalt and three inches of new asphalt.

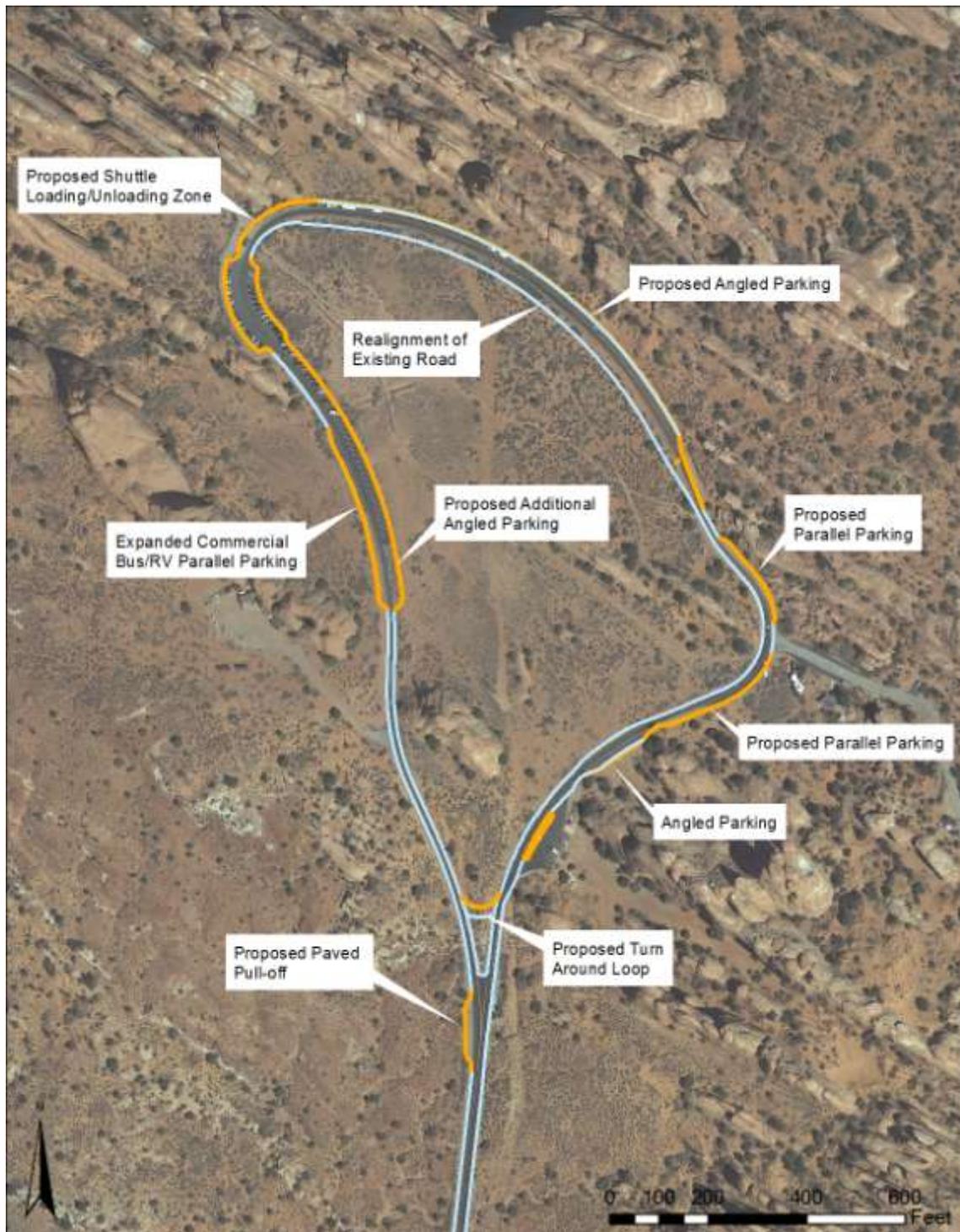
Parking would be expanded in the Devils Garden loop by increasing the total number of current parking spaces from 137 to 225 which increases parking capacity by 60%. Current parallel parking near the picnic area and along the east side of the loop would be expanded to facilitate a pull-in (angled) design. These changes are made to allow the park to provide parking for existing and future visitation.

In addition, a five foot wide sidewalk would be constructed from the trail head to the east along the edge of the new angled spaces. This sidewalk would also extend around the edges of the west-side parking spaces to the expanded commercial bus/RV parallel parking area. This sidewalk would allow visitors to safely access the trailhead and their vehicles.

Signing would be updated encourage RV drivers to continue to pull-in stalls, rather than to park in inbound pull off areas, taking up space that should be available for smaller vehicles. Signs to encourage commercial tour buses to continue to the end of the parking lot to parallel stalls would also be installed.

This alternative would propose to construct and pave one turnaround loop at the south end of the parking loop which would allow for vehicles to safely and expediently turn around in this area. Currently visitors who cannot find parking when looping through the **parking area attempt to turn around on the 24' road bench. This maneuver is often a three-point turn and causes unnecessary damage to the roadside. Additionally this maneuver impedes the flow of traffic in highly congested areas. Larger vehicles cannot make this turn at all and drive extra distances to areas where they can safely turn around.**

Figure 5: Devils Garden Conceptual Diagram



Pavement Design

Pavement recommendations took into consideration no bus service, the condition of the existing asphalt, the availability of materials, and the haul distance for waste. With these considerations the following is the recommended pavement section.

- 6" Full Depth Reclamation (FDR) (existing asphalt pulverized & blended with the native soil and compacted in place as base)
- 4" of Hot Asphalt Cement Pavement (HACP) overlay on the Main Entrance Road, Devils Garden Loop Road, Devils Garden Bypass Road, La Sal Mountain View Road, Panorama Point Overlook Road, Salt Valley Overlook Road, and Fiery Furnace Road.
- 4.5" of HACP overlay on Windows Road and Windows Loop Road.
- Delicate Arch Road would not be pulverized. A 4.5" HACP overlay would be placed on top of the existing asphalt. Sub-excavation would consist of eight inches of sub-excavation with geogrid and filter fabric placed at the bottom. With eight inches of aggregate base and six inch overlay of HACP. Under-drain would also be used in this area on the cut slopes. Sub-excavation would be used to correct problem areas.
- Colored concrete curb would be used in the loop/parking areas and pullouts.
- Asphalt curb would be used at paved ditch locations

Drainage

Road widening also would require upgrades to roadside ditches at select locations. Three types of ditches may be used depending on the site-specific conditions and the space available. The options include a paved ditch with a curb, a paved curved ditch, or a V-shaped paved ditch. The extent and width of the ditch would vary with location. Certain paved ditch locations would have the asphalt continue to the face of the rock cuts.

This alternative proposes to correct the long term maintenance problem at two culverts near the entrance station (See Figure 6) by:

1. Regrading the drainage between the two culverts to achieve a straight grade from **the downstream culvert's inlet to the upstream culvert's outlet.**
2. Replacing the downstream culvert with a 48 inch CMP culvert complete with headwalls on the inlet and outlet.
3. Grading the channel section near the park housing and slope back the bank nearest to the park housing at a minimum of 2H: 1 V and place revetment protection up to the channel crest (approximately five feet in depth).
4. Construct headwalls up and downstream of the existing culvert under the maintenance road.

A stream channel alteration permit would be obtained and approved prior to construction.

To increase capacity at two locations that have a history of backwater and overtopping of the roadway, the project would add 36 inch culverts adjacent to the existing culverts and would place the culverts adjacent to the existing culverts and use existing stones to create stacked headwalls similar to the headwalls at the existing culverts.

Bridge Design

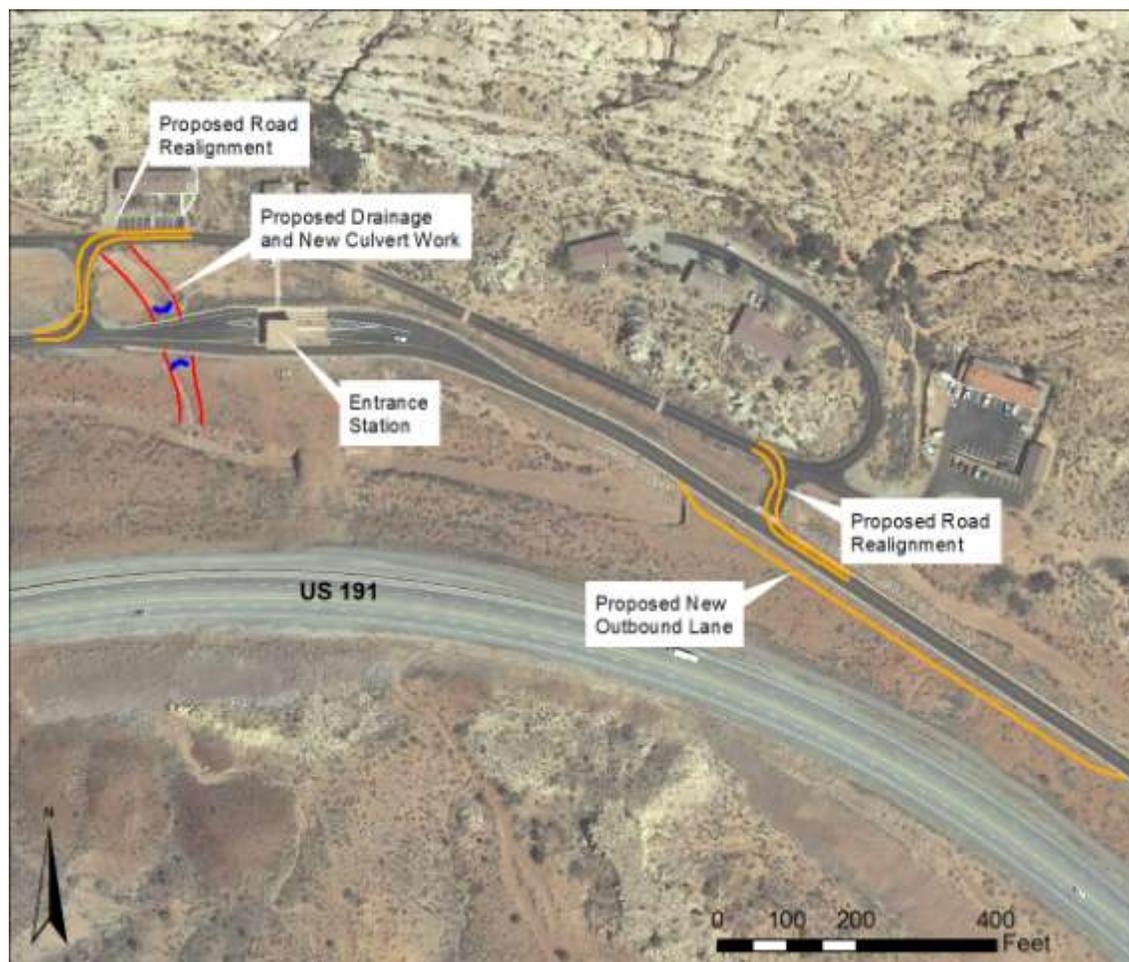
The Courthouse Wash Bridge would receive expansion joint repair and the existing bridge rail would be removed and replaced with new two tube curb mounted steel railing. Structural transition railing would also be added to each end to meet current crash standards. The new bridge design would be as close as possible to the existing bridge design.

Entrance Lane

This alternative adds a new outbound lane (length ~800 ft) to the entrance road. The existing inbound lane would be designated for shuttle buses only while the current outbound lane would become the inbound lane. At the maintenance road turnoff, shuttles would turn and use this for entrance into the park.

Refer to Figure 6 for a conceptual plan of proposed improvements at the entrance road. A detailed design plan would be prepared for this area prior to construction.

Figure 6: Entrance Road Conceptual Diagram



Roadside Pull off Areas

This alternative proposes to formally pave to an appropriate length and width approximately 42 pulloffs and close approximately 110 other locations using a variety of treatments such as boulders and ditch, curbing, and bollards. The decision to formalize certain areas took into consideration the existing condition of the pulloff, sight distance and other safety, impacts to the vegetation, and the need and location of pulloffs. The

decision to close certain areas took into consideration primarily sight distance and safety at these existing locations.

In part, the need to formally pave more areas along the road stems from the increase in vehicle traffic. Popular existing pull-off areas would be lengthened to accommodate more vehicles at that particular area.

Safety

The existing signs have been replaced in recent years and are in good shape so they are proposed to remain. If funding does not become available for many years, the signs would be reviewed prior to advertisement and a determination would be made at that time whether they need replacement or not. Supplementary speed plaques would be added to existing curve warning signs. Pedestrian crossing signs have been added to all cross walk locations. To meet signage standards stop signs would be relocated closer to the intersection with the Main Entrance Road and Windows Road, Delicate Arch Road, La Sal Mountain View Road, Panorama Point Overlook Road, Salt Valley Overlook Road, and Fiery Furnace Road. All roads would be restriped (centerline and edge stripes) to match the existing layout. Parking areas that are being reconstructed would be restriped to match the existing layout. Four inch width, Type B (waterborne) pavement markings would be used on this project.

Traffic Control and Scheduling

Although every effort would be made to minimize disruption during construction, there would be delays and closures required for work. To the extent practical, work would be scheduled to avoid construction activity and construction related delays during peak visitation times. No holiday or night time work would be allowed. Work would start a half hour after sunrise and end a half hour before sunset. Weekend work (Friday through Sunday) would not be allowed unless authorized in writing by the park superintendent. Construction-related traffic delays resultant from work at pull-offs, parking area and along the road would be limited to a maximum of 30 minutes in each direction.

It is anticipated that much of the pulverizing and paving of the Main Entrance Road and Delicate Arch Road can be accomplished with single lane closures with flaggers and a pilot car. There would be specific areas where full closures would be required to complete the construction including culvert replacements and sub-excavation areas. The Windows Road, Windows Loop Road, Devils Garden Loop Road, La Sal Mountain View Road, Panorama Point Overlook Road, Salt Valley Overlook Road, and Fiery Furnace Road would be closed while construction activities occur in those areas.

A construction schedule would be developed based on the entire project being built under the same contract to determine an approximate overall time required for construction.

Revegetation

The majority of this project includes only minor disturbance of the areas adjacent to the roadway and behind curbs. The contract would specify that the existing shoulder material be windrowed during widening and pulverizing operations. After pavement is placed, the existing shoulder material would be placed to the approximate original position and supplemented with imported shoulder material as required. Other areas with more disturbances (culvert work, new lane near entrance station, and turnaround lanes) would be treated for exotics and revegetated by the Park after construction and in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Closing off

informal pulloffs would require treatment for exotics and restoration work and potentially the installation of temporary barriers to ensure areas become fully rehabilitated. A restoration plan would be prepared and implemented as part of the project.

This alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the described alternative, then additional compliance would be completed, as appropriate.

Sustainability

The Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design park facilities to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to maintain and encourage native biodiversity; to construct and retrofit facilities using energy-efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. This alternative subscribes to and supports the practice of sustainable planning, design, and use of park roads by limiting and mitigating resource impacts and promoting conservation principles by recycling pavement materials.

Mitigation Measures

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

General

- All resource protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone identified by the CFHWA and park. Disturbances would be limited to roadsides, culvert areas, and other areas inside the designated construction limits. No machinery or equipment would access areas outside the construction limits.
- A pre-construction meeting would be held to inform construction contractors about sensitive areas, including natural and cultural resource concerns of the park.
- Construction related offices or laboratories would be located outside park boundaries.
- Temporary staging areas for equipment and supplies during construction would use previously disturbed sites, such as pullouts or maintenance boneyards. Trailhead parking areas may be used as construction staging areas in closed areas only.
- Contractors would be required to properly maintain construction equipment (i.e., mufflers and brakes) to minimize noise. Construction vehicle engines would not be allowed to idle for extended periods.
- All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion.

Soil, Vegetation, and Water Resources

- A soil treatment and revegetation plan would be developed to rehabilitate disturbed areas.
- Before construction begins, construction limits would be surveyed and staked and may be marked with construction fencing, tape, flagging, snow fencing, or some similar material, as necessary.
- The contractor would prevent or minimize establishment and spread of non-native vegetation and noxious weeds by:
 - Minimizing soil disturbance
 - Pressure washing of vehicles
 - Covering of haul vehicles
 - Limiting vehicle and equipment parking to within construction limits
 - Obtaining all fill, rock, or additional topsoil from the project area or obtaining weed-free material from approved sources outside the park
 - Initiating rehabilitation of disturbed areas within 14 days of the last construction
- Reclaimed areas would be monitored by the NPS annually after construction to determine if reclamation and revegetation efforts are successful.
- The contractor would control dust within the construction limits, including active haul roads, pits and staging areas, at all hours. Water would be applied at the locations, rates, and frequencies ordered by the contracting officer.
- Erosion-control best management practices for drainage and sediment control, as identified and used by the CFHWA, contractor, and National Park Service, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. These practices may include, but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. The placement and specific measures used would be dictated to a large degree by the steep topography immediately adjacent to the road in some portions of the project. Silt fencing fabric would be inspected daily during project work and weekly after project completion, until removed. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into any flowing water bodies.
- Regular site inspections would be conducted to ensure that erosion-control measures are properly installed and functioning effectively. Erosion-control measures would be left in place at the completion of construction, after which time the park would be responsible for maintenance and removal once vegetation is established.
- Paved ditches would be designed and constructed with permanent features that dissipate flow energy and reduce erosion caused by water runoff.
- Where work is conducted in proximity to the wetland associated with Salt Wash at Wolfe Ranch, best management practices will be implemented to prevent pollutant discharges or other project-related activities from adversely impacting the wetland.

Wildlife

- No construction activities would occur at night or during the dawn to dusk periods to minimize impacts to wildlife that are most active during these times. The specific

hours designated for roadwork would be adjusted by the park biologist seasonally for varying day lengths, but would typically be between 7 a.m. and 7 p.m.

- The construction contractor would be required to keep all garbage and food waste contained and removed daily from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and to not feed or approach wildlife.

Cultural Resources

- Archeological resources in the vicinity of the project area would be identified and delineated for avoidance prior to project work.
- The park would continue to coordinate with the state historic preservation office (SHPO) throughout the course of the project if unknown cultural resources are discovered by the actions of the preferred alternative.
- An archeological monitor is required to be onsite during work of turn-around loop at Devils Garden.
- Should any archeological resources be uncovered during construction, work would be halted in the area and the park archeologist, SHPO, and appropriate American Indian tribes would be contacted for further consultation.
- The Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction.
- In the event that human remains are discovered during construction activities, all work on the project must stop and the park archeologist contacted immediately. As required by law, the coroner will be notified first. All provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.

Visitor Use and Experience and Park Operations

- Visitors would be informed in advance of construction activities via a number of outlets including the park website, newspaper, radio, at entrance stations, variable message signs, visitor centers, kiosks, shuttle drivers, and at other nearby national parks and other public lands. In addition, information on construction would be publicized in news releases, local newspapers, media outlets, postings in local businesses, visitor bureaus, chambers of commerce, and travel- and tourism-related businesses.
- To the extent practical, work would be scheduled to avoid construction activity and construction related delays during peak visitation times. No holiday or night time work would be allowed without written approval from Superintendent.
- Construction-related traffic delays resultant from work at pull-offs, some parking areas, and along the road would be limited to a maximum of 30 minutes in each direction.
- Full closures of the Devils Garden and Windows parking areas would be limited to 5 weeks maximum but may be shortened due to expedited work schedules.
- Roadwork would generally be limited to Monday through Thursday to minimize impacts to visitors. Modification of work days or hours could be made with prior Park approval. Traffic delays during construction would be kept to a minimum, but travel would be subject to alternating one-way traffic with delays up to 30 minutes between 7 a.m. and 7 p.m.

- To facilitate visitor planning, the status of roadwork and traffic delays would be posted two weeks in advance and would be updated daily.
- The public information officer would coordinate with the contracting officer on the construction schedule and update visitors and information sources periodically on construction work to inform visitors of project status and access.
- Provisions for emergency vehicle access through construction zones would be developed.

Alternatives Considered and Dismissed

The following four alternatives were considered as part of the project implementation, but were ultimately dismissed from further analysis. Reasons for their dismissal are provided in the following alternative descriptions.

Resurface Existing Road

Minor improvements to the surface of the road, such as milling and overlay or chip and seal, would not address the underlying structural, geotechnical, and drainage issues contributing to the deteriorating condition of the road. Maintenance costs would increase in the long term if structural and drainage deficiencies are not corrected. Resurfacing would not address the need to widen sections of the road to improve safety. Resurfacing options were eliminated because they would not meet the project purpose and need. For these reasons, this alternative was excluded from further consideration in this document.

Construction of a Bypass Lane in Devils Garden.

This alternative proposed constructing a one way 695 feet long bypass lane through the center of Devils Garden loop to help alleviate congestion at the trailhead and to provide an option for visitors and staff to bypass the entire parking lot if they did not need to access the trailhead. It was determined by the park IDT that this bypass would only be used mostly by park staff. The majority of park visitors are first time visitors who want to see the **park's features up close and** would most likely want to access the trailhead. To disturb a large area of park resources for a minimum number of visitors and park staff was determined to be an impractical alternative. For these reasons, this alternative was excluded from further consideration in this document.

Addition of a Bike Lane

Options were considered for improving and enhancing access, safety and mobility for bicyclists within the park including potential shoulder widening for bicycling on park roads. It was determined there is insufficient space within the existing road bench to widen the road to accommodate a 5 foot wide bike lane along the entire park road. Substantial environmental constraints, retaining walls, bridges and adverse impacts to natural and cultural resources would be required to construct a standard bike lane. It was also determined that such actions would be in conflict **with the park's current GMP**. For these reasons, this alternative was excluded from further consideration in this document.

Paving Willow Springs Road and Salt Valley Road

This alternative proposed paving the existing dirt roads; Willow Springs road, the original entrance road into the park and the Salt Valley Road which accesses the north side of the park to spread visitor use in other areas of the park. It was determined that the park IDT felt the current paved roads were sufficient to meet the existing visitor demand and in

keeping these roads unpaved provides an off road experience to those visitors' who are seeking more remote and quieter areas of the park. For these reasons, this alternative was excluded from further consideration in this document.

Alternative Summaries

Table 1 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

Table 1: Summary of Alternatives and How Each Alternative Meets Project Objectives

Alternative Elements	Alternative A – No Action	Alternative B – Park Road Improvements
Resurfacing, restoration, rehabilitation existing paved roads	Under the no action alternative, the park would not implement road rehabilitation or improvements. Routine road maintenance would continue, but the road pavement and structural integrity would continue to deteriorate. There would be no improvements to the width of the road, surface pavement, sub-grade, or drainage.	Under Alternative B, the park would implement the rehabilitation repairs and improvements necessary to restore the condition of the road. The proposed improvements would repair damaged areas of road sub-grade, widen select sections of the road and curves, improve drainage, and repave the entire road.
Parking Areas	Under the no action alternative, there would be no modification or expansion of parking areas.	Under Alternative B, some parking areas would be modified to accommodate more parking and to improve safety.
Pulloffs	Under the no action alternative, 21 pulloffs were proposed in the 2006 Transportation Plan for formalization. This alternative doesn't address the expansion of additional pulloffs.	Under Alternative B, 41 informal pulloffs would be paved and formalized. All other informal pulloffs would be closed off with temporary barriers and revegetated.
Entrance Lane	Under the no action alternative, no new entrance lane would be constructed. There would be no bypass for construction vehicles, or future shuttle operators or pass holders at the entrance station.	Under Alternative B, a new entrance lane would be constructed as a bypass for construction vehicles, future shuttle operators and pass holders.
Safety	Under the no action alternative, existing signs and road markings	Under Alternative B, new signs or road markings would be

	would remain.	established or relocated to meet current safety standards.
Revegetation	Under the no action alternative, no work outside the existing road corridor would occur; therefore no revegetation work would be needed.	Under Alternative B a revegetation plan would be developed and disturbed areas would be treated for exotics and revegetated by the Park after construction.
Project Objectives	Meets Project Objectives?	Meets Project Objectives?
Protect park resources	No. Park natural and cultural resources and the scenic quality of the road would be compromised by deteriorating road conditions.	Yes. Park natural and cultural resources would be protected by drainage improvements and other structural repairs. Road repairs and improvements would be implemented in a manner to minimize adverse effects on plants and soils and to protect cultural resource values.
Provide for visitor enjoyment and safety	No. Visitor enjoyment and safety concerns would not be addressed because problems associated with narrow sections of road, the condition of the road surface, drainage, and pullouts would not be addressed. Parking areas would not be expanded to relieve congestion. Travel safety concerns would remain.	Yes. Visitor enjoyment and safety would benefit from measures to improve the condition of the road surface and widen narrow sections. Road upgrades would make travel by vehicles easier and safer. More available parking would reduce congestion issues.
Improve the efficiency of park operations	No. The efficiency of park operations would not be improved and maintenance requirements and costs would increase.	Yes. The efficiency and cost of park operations would improve from better road and drainage conditions to reduced maintenance requirements and more available parking areas.

Table 2 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 2: Environmental Impact Summary by Alternative

Impact Topic	Alternative A – No Action	Alternative B – Preferred Alternative
Soil Resources	Vehicles would continue to drive and park on unpaved roadside areas in some locations, which would continue to result in soil destabilization and compaction. Visitors would continue to trample and destabilize soils in proximity to unpaved, informal pullouts. These continued effects on soil resources would be local, long-term, minor, and adverse.	Under the preferred alternative, soils disturbed and exposed during construction would be subject to erosion until stabilized or revegetated. Impacts to soils during construction would be local, primarily short-term, minor, and adverse. Proposed drainage improvements and correction of deteriorating road edges would reduce the potential for long-term erosion and soil loss. Repairing existing road conditions that currently generate erosion would result in a local long-term minor beneficial effect on soil resources.
Vegetation Resources	Vehicles would continue to drive and park on unpaved roadside areas in some locations, directly impacting vegetation by crushing and indirectly impacting vegetation through compaction of roadside soils. These continued effects on soil resources would be local, long-term, minor, and adverse.	Under the preferred alternative, actions would include road and parking lot widening, grading, paving, implementation of drainage improvements, construction of new road segments, and closing and rehabilitating of 110 pullouts would have net effects on vegetation that would be local, long-term, minor, and beneficial.
Archeological Resources	Vehicles would continue to drive and park on unpaved roadside areas in some locations but would not affect archeological resources under this alternative.	The preferred alternative proposes to construct and pave one turnaround loop at the south end of the parking loop at Devils Garden. One archeological site is within the boundary of this proposed activity and cannot be avoided. However, mitigation would be implemented to reduce the effect of impacts to archeological resources in the vicinity of the project area and would be identified and delineated for avoidance prior to project work. Park cultural resources staff would be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction. Impacts would be local, long-term, minor and adverse.
Visitor Use and Experience	Ongoing deterioration of the road and structural features as well as continued congestion issues that contribute to the quality of the visitor experience and that provide access to recreation resources. The no action alternative would have local, long-term, minor, adverse effects on visitor use and experience	Traffic delays and closures would inconvenience visitors traveling along the road during construction. The park would inform visitors in advance of construction via a number of sources so they can best plan their schedule and activities and minimize impacts. The effect on visitor use and recreation experience would be short-term, moderate, and adverse at the local and parkwide level during construction. However, the preferred alternative would provide long-term moderate beneficial effects on the quality of the visitor experience following construction by improving the quality and condition of the road and parking areas.

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative **“that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative.”**

Alternative B, is the environmentally preferable alternative for several reasons: 1) it would best preserve the natural and cultural features along the road because it implements structural improvements that would provide long-term protection of natural resources adjacent to the road; 2) drainage improvements would reduce the potential for erosion and impacts to water quality and cultural resources; 3) it supports sustainable design concepts and energy efficiency by providing for the reuse of existing asphalt. For these reasons, the preferred alternative causes the least damage to the biological and physical environment and best protects, preserves **for the long term the park’s cultural** and natural resources, thereby making it the environmentally preferable alternative.

The no action alternative is not the environmentally preferable alternative because, although there would be no construction or ground disturbing activities that would damage previously undisturbed elements of the biological and physical environment 1) it would not protect park natural and cultural resources, as the road would continue to deteriorate without rehabilitation; 2) inadequate drainage could lead to erosion and impacts to water quality and natural resources; and 3) continued high maintenance requirements would not be energy efficient.

Preferred Alternative

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Alternative B is the environmentally preferable alternative and better meets the project objectives; therefore, it is also considered the NPS preferred alternative. For the remainder of the document, Alternative B will be referred to as the preferred alternative

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing setting or baseline conditions) and analyzes the potential environmental consequences (impacts or effects) that would occur as a result of implementing the proposed project. Direct, indirect, and cumulative effects are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
 - *Beneficial*: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
 - *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
 - *Direct*: An effect that is caused by an action and occurs in the same time and place.
 - *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- **Context** describes the area or location in which the impact would occur. Effects may be site-specific, local, regional, or even broader.
- **Duration** describes the length of time an effect would occur, either short-term or long-term:
 - *Short-term* impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
 - *Long-term* impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

Cumulative Impact Scenario

The CEQ regulations which implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no action and preferred alternatives.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Arches National Park and, if applicable, the surrounding region. The geographic scope for this **analysis includes elements mostly within the park's boundaries but has the potential** to be regional for certain impact topics. The temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

- **Agricultural Practices:** Grazing of livestock, farming and irrigation have occurred within park boundaries in the past. Today, these practices no longer take place in the park but still occur on neighboring lands. Resource impacts attributable to past livestock grazing and grazing-management activities persist in some areas of the park.
- **Oil, Gas, and Potash Exploration and Development:** Extensive lands managed by the Bureau of Land Management (BLM) and the State of Utah west and north of the park may be leased and permitted for future exploration and development of oil, gas, and/or potash resources.
- **Park Infrastructure:** To facilitate park management and visitation by the public, NPS has constructed buildings, parking lots, roads, trails, and other facilities. Collectively, these cover 232.76 acres which is .3% the total area of the park.
- **Atlas Mine Tailings Site:** The US Department of Energy (DOE) is in the process of relocating contaminated uranium-ore surface material to a disposal site 30 miles north of Moab, UT via railroad line along HWY 191 just west of the park.
- **Williams Northwest Pipeline:** A buried natural gas pipeline that is owned and operated by Williams Northwest Pipeline Company traverses the park from northeast to southwest. Recurring maintenance of the pipeline has been ongoing since the pipeline was installed in the 1950s, and these repeated maintenance activities have the potential to impact the **park's natural and cultural resources**.
- **Exotic Vegetation Management:** NPS manages an extensive program to control invasive exotic plants throughout the park primarily through the use of handsaws, chainsaws, and herbicide. Resulting piles of dead herbaceous and woody biomass often are burned under controlled conditions as a means of reducing hazardous fuel accumulations.
- **Recreation:** Recreation within the park occurs year-round and includes hiking, sightseeing, and backcountry camping. Over one million people visit Arches National Park a year. An average of 2.5 million people visit the Moab area to participate in various recreational opportunities that occur on public lands.
- **Transportation Planning Efforts:** Arches is currently implementing near-term strategies to alleviate traffic concerns and congestion issues that were outlined in the 2006 Transportation Implementation Plan and in a 2012 Alternative Transportation and Congestion Management Feasibility Study. Foreseeable actions that may occur within the next 5-10 years include expansion and/or reconfiguration of some existing parking lots and limited reconfiguration of some existing road segments.

Soil Resources

Affected Environment

For the purposes of this document, soil is defined as a surficial deposit of fine, unconsolidated material composed primarily of minerals weathered from rock, but also including organic matter and soil organisms. The concept of soil resources includes these components as well as mineral nutrients, soil moisture, associated natural processes such as nutrient cycling and water infiltration, and the soil properties necessary for sustaining these processes. NPS policy is to strive to understand and preserve soil resources of parks, and to prevent or minimize accelerated erosion or other impacts that degrade soil functions and contributions to park natural systems (NPS 2006).

A recent inventory documented the occurrence of 23 distinct types of soil in the park (Scott 2009). These soils differ from one another in numerous properties that affect soil functioning, soil capacity to support different types and amounts of vegetation, and soil responses to surface disturbance and management. Some of these properties include depth, mineral composition, and texture (particle size). Soils in the park can be grouped into three broad categories: aeolian (derived from wind-blown sediment), alluvial (derived from water-borne sediment), and residual (weathered in place; Scott 2009). The proposed project area includes all three categories of soil. Aeolian soils often occur as dune features that range in depth from very shallow (Arches soil series) to very deep (Mido soil series). Residual soils are shallow or very shallow deposits on bedrock (Rizno soil series). Alluvial soils typically are associated with drainage ways and are very deep (Bowington soil series).

Important aspects of many soils in the park are the presence, composition, and structure of biological soil crust (biological crust hereafter). Biological crusts are soil-surface assemblages of cyanobacteria, mosses, and lichens that are functionally significant for soil stabilization (Warren 2003), nutrient cycling (Evans and Lange 2003), hydrologic processes (Warren 2003), and mediation of vascular plant establishment (Belnap et al. 2003). Well-developed biological crusts characterized by a high degree of surface roughness and high cyanobacterial biomass confer greater soil stability than weakly developed biological crusts with less surface roughness and biomass (Belnap et al. 2008). Degree of development increases with duration of surface stability and also is affected by soil properties and site conditions. The functional significance of biological crust is countered by its high vulnerability to damage from surface disturbances that can result in long-term reductions of crust structure and functionality (Belnap and Eldridge 2003). In sparsely vegetated landscapes such as those found in the park, disturbance-induced declines in biological crust often are accompanied by accelerated soil erosion and persistent, long-term reductions in surface roughness and associated functions (Miller et al. 2011). Where well-developed biological crusts are lacking due to surface disturbance or other factors, soils may be stabilized by weakly developed biological crusts or by physical crusts.

Environmental Consequences

Methodology

Information on soil resources was compiled from published literature and map products (e.g., Brady and Weil 1996, Belnap and Lange 2003, Blanco and Lal 2008, Scott 2009). Predictions concerning short- and long-term impacts to soil resources were based on **published literature, field observations of existing impacts, and on park staff's professional**

experience and knowledge of soil resources. Levels of intensity for impacts to soil resources are defined below.

Intensity Level Definitions

Negligible: Any effects to soils, either beneficial or adverse, would be below or at the lower levels of detection. Any effects on productivity or erosion potential would be slight.

Minor: Adverse: The effects to soils would be detectable. Effects would be slight, the area affected would be relatively small, but would not appreciably increase the potential for additional erosion. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Beneficial: The action would noticeably improve soil conditions, productivity, or reduce erosion.

Moderate: Adverse: The effects to soils would be readily apparent and detectable, and would result in a change to soil conditions, productivity, and/or erosion potential over a relatively localized area. Mitigation measures would probably be necessary to offset adverse impacts and would likely be successful.

Beneficial: The action would substantially improve soil conditions, productivity, or reduce erosion.

Major: Adverse: The effects to soils would be readily apparent and detectable, and would result in a change to soil conditions, productivity, and/or erosion potential over a relatively large area. Mitigation measures to offset adverse impacts would be necessary, extensive, and their success could not be guaranteed.

Beneficial: The action would exceptionally improve soil conditions, productivity, or reduce erosion.

Duration: Short-term refers to a transitory effect, one that largely disappears over a period of days, months, or up to five years. Long-term refers to a period greater than five years.

Impacts of Alternative A – No Action

Visitor driving and parking on unpaved areas along roadsides has resulted in several general types of impacts to soil resources. Periodic driving and trampling by visitors results in disturbance to physical and biological crusts, destabilizes soils, and has the potential to facilitate soil erosion. The long-term consequence of repeated driving and parking on unpaved roadside areas is soil compaction, which can impede water infiltration, accelerate runoff and water-driven erosion, and diminish soil capacity to support plant establishment and growth (Brady and Weil 1996). Repeated maintenance of deteriorating edges of roads has resulted in similar disturbances and impacts to soil resources. Secondary effects of soil disturbance and destabilization can occur due to off-site transport of destabilized soil by wind and water. Wind-blown sand has the potential to abrade and damage undisturbed soil surfaces, biological crust components, and plant tissues; and to cause detachment and erosion of soil particles far downwind from the location of the original surface disturbance (Blanco and Lal 2008). Where destabilized soils are deposited by wind or water on top of

intact biological crusts, long-term burial can result in death of photosynthetic components such as cyanobacteria and mosses (Belnap 2003).

No disturbance to soil resources would occur as a consequence of construction-related actions. Deterioration of the pavement edges and erosion of the road shoulder or fill slopes in some locations would continue, which would result in erosion and soil loss. Vehicles would continue to drive and park on unpaved roadside areas in some locations, which would continue to result in soil destabilization and compaction. Visitors would continue to trample and destabilize soils in proximity to unpaved, informal pullouts. These continued effects on soil resources would be local, long-term, minor, and adverse.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the **Williams'** gas pipeline and other utility corridors; and livestock grazing have had adverse effects on soil resources. In addition, ongoing recreational use and off-trail hiking has localized effects on soil resources. The combined effects of past, present, and reasonably foreseeable actions on soil resources would be local, long-term, moderate or less, and adverse. The overall cumulative effects to soil resources from the no action alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate or less, and adverse, with a relatively small adverse contribution from the no action alternative.

Conclusion: The no action alternative would have local, long-term, minor, adverse effects on soil resources from deterioration of road edges and continued driving and parking on unpaved roadsides. Cumulative effects would be local, long-term, moderate or less, and adverse.

Impacts of Alternative B – Park Road Improvements (Preferred Alternative)

This alternative involves new construction of three short road segments in areas where existing soils are relatively undisturbed. The new exit lane near the park entrance is proposed to occur on a deep, sandy alluvial soil classified as being in the Livan family of soils (Scott 2009). The short return loop at the Windows is proposed to occur on the deep aeolian Mido soil, and the return loop at Devils Garden is proposed to occur on the shallow residual Crosscan soil (Scott 2009). All three soils are relatively undeveloped and support biological soil crusts at the surface, with the biological crusts on the Mido and Crosscan soils being the best developed. Biological crust on the Livan family soil tends to be less well developed. Activities associated with proposed road improvements including road and parking lot widening, grading, and paving primarily would occur within areas of existing disturbance. Drainage improvements and culvert placements would result in disturbances to soils in ditches and embankments.

Project-related disturbance outside of the existing paved surface would be limited to about 13 acres, of which approximately 9 acres would be new pavement and 4 acres would be temporarily disturbed during construction. This includes approximately 2 acres of new pavement and 2 acres of temporarily disturbed fill slopes associated with construction of new road segments on relatively undisturbed soils near the main park entrance, at Devils Garden, and near the Windows. Soils disturbed and exposed during construction would be subject to erosion until stabilized or revegetated. Impacts to soils during construction would be local, primarily short-term, minor, and adverse. Impacts to soils attributable to new road segments near the park entrance, at Devils Garden, and the Windows would be local, long-term, minor, and adverse. Planned use of temporary and permanent mitigation measures for erosion control, dust abatement, and revegetation of disturbed areas would

reduce the short- and long-term potential for soil erosion and loss. Proposed drainage improvements and correction of deteriorating road edges would reduce the potential for long-term erosion and soil loss. Repairing existing road conditions that currently generate erosion would result in a local long-term minor beneficial effect on soil resources. Closing (or reducing the size) and revegetating approximately 110 informal pullouts totaling approximately 2 acres along the road would reduce the potential for future erosion, restore soil productivity, and result in effects that would be local, long-term, minor, and beneficial. Overall, net effects of the preferred alternative on soil resources would be local, long-term, minor or less, and adverse.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the **Williams'** gas pipeline and other utility corridors; and livestock grazing have had adverse effects on soil resources. In addition, ongoing recreational use and off-trail hiking has local adverse effects on soil resources. The combined effects of past, present, and reasonably foreseeable actions on soil resources would be local, long-term, moderate or less, and adverse. The overall cumulative effects to soil resources from the preferred alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate or less, and adverse, with a minor long-term beneficial contribution from the preferred alternative.

Conclusion: The preferred alternative would have local short-term minor adverse effects on soil resources from soil disturbances attributable to road and parking lot widening, grading, paving, and implementation of drainage improvements. The proposed construction of new road segments would have local long-term minor adverse effects on soil resources. Proposed rehabilitation work would have local long-term minor beneficial effects on soil resources by repairing existing road conditions that currently generate erosion and by closing and revegetating 110 pullouts. Cumulative effects would be local, long-term, moderate or less, and adverse, with a long-term adverse contribution from the preferred alternative that would be minor or less.

Vegetation Resources

Affected Environment

Vegetation communities in the park consist of varying assemblages of annual and perennial herbs including grasses and broad-leaved plants, numerous types of drought-tolerant shrubs and succulents, and dwarf trees. A recent inventory and mapping project identified 75 distinct vegetation types in the park (Coles et al. 2009). Here as elsewhere on the Colorado Plateau, patterns in the distribution, composition, and productivity of vegetation communities are strongly controlled by soil properties, long-term climatic conditions, short-term weather fluctuations, and disturbances attributable to human activities or other factors. Vegetation of disturbed roadside areas in the park typically consists of short-lived perennial plants as well as native and exotic annuals that are tolerant of or facilitated by frequent surface disturbance. Common exotic plants in roadside areas include cheatgrass (*Bromus tectorum*) and tumbleweed (*Salsola* spp.). Whether exotic or native, roadside vegetation often is more productive and vigorous than other nearby vegetation because its growth is enhanced by water runoff from impervious road surfaces. Because of repeated disturbance, greater soil moisture availability from runoff, and transport of propagules by vehicles, roads can act as favored establishment sites

and dispersal corridors for new exotic plants, facilitating their spread to other settings in the park.

Environmental Consequences

Methodology

Information on park vegetation was compiled from existing reports and map products (e.g., Coles et al. 2009, Scott 2009). Predictions concerning short- and long-term effects on **vegetation were based on field observations of existing impacts, and on park staff's** professional experience and knowledge of vegetation. Levels of intensity for effects on vegetation are defined below.

Intensity Level Definitions

Negligible: Effects on vegetation, either beneficial or adverse, (individuals, populations, or communities) would not be measurable. The condition, abundance, or distribution of vegetation would not be affected or would be slightly affected in a small area. Ecological processes and biological productivity would not be affected or would be slightly affected in a small area.

Minor: Adverse: The effects on vegetation would be detectable, but effects would be slight, the area affected would be relatively small, and the action would not affect the viability of local or regional populations or communities. Mitigation to offset adverse effects might be needed but would be relatively simple to implement and would likely be successful.

Beneficial: The action would noticeably improve the condition, abundance, or distribution of vegetation in the project area.

Moderate: Adverse: The action would result in effects on the condition, abundance, or distribution of vegetation over a relatively large area. Mitigation measures would be necessary to offset adverse effects and would likely be successful.

Beneficial: The action would substantially improve the condition, abundance, or distribution of vegetation in the project area.

Major: Adverse: The action would have considerable effects on native vegetation and would affect a relatively large area within and outside the park. Extensive mitigation measures to offset the adverse effects would be required and success would not be guaranteed.

Beneficial: The action would exceptionally improve the condition, abundance, or distribution of vegetation in the project area.

Duration: Short-term refers to a transitory effect, one that largely disappears over a period of days, months, or up to two years. Long-term refers to a period greater than two years.

Impacts of Alternative A – No Action

Visitor driving and parking on unpaved areas along roadsides can directly damage or kill plants that are crushed by vehicles. Indirect damage to vegetation can occur as a consequence of soil compaction and associated adverse effects on soil hydrologic processes. Likewise, repeated maintenance of road edges can have similar effects on vegetation.

There would be no project-related disturbance that would directly or indirectly affect vegetation. Vehicles would continue to drive and park on unpaved roadside areas in some locations, directly impacting vegetation by crushing and indirectly impacting vegetation through compaction of roadside soils. These continued effects on soil resources would be local, long-term, minor, and adverse.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the **Williams'** gas pipeline and other utility corridors; and livestock grazing have had adverse effects on vegetation. Ongoing recreational use and off-trail hiking also has local effects on vegetation. The combined effects of past, present, and reasonably foreseeable actions on vegetation would be local, long-term, moderate or less, and adverse. The overall cumulative effects to vegetation from the no action alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate or less, and adverse, with a relatively small adverse contribution from the no action alternative.

Conclusion: The no action alternative would have local long-term minor adverse effects on vegetation from continued driving and parking on unpaved roadsides. Cumulative effects would be local, long-term, moderate or less, and adverse.

Impacts of Alternative B – Park Road Improvements (Preferred Alternative)

In addition to modifications of existing roadsides with disturbed vegetation, this project involves new construction of three short road segments in areas where existing vegetation is relatively undisturbed. The new exit lane near the park entrance is proposed to occur in an area vegetated by sand sage (*Artemisia filifolia*) and a mixture of various other shrubs, perennial grasses, and forbs that are characteristic of deep sandy soils. The short return loop at the Windows is proposed to occur in a deep sandy area vegetated primarily by Mormon tea (*Ephedra viridis*), and the return loop at Devils Garden is proposed to occur on a shallow soil vegetated primarily by blackbrush (*Coleogyne ramosissima*).

Road rehabilitation and improvements would occur primarily within the existing road bench, but incidental effects on vegetation adjacent to the road cut and fill slopes would occur from road and parking lot widening and from installing culverts and drainage improvements. Road improvements outside of the existing paved surface would be limited to about 13 acres, of which approximately 7 acres would be new pavement and 2 acres would be new cut and fill slopes that would displace vegetation currently growing in disturbed settings adjacent to existing roads and parking lots. The remaining 4 acres of disturbance includes approximately 2 acres of new pavement and 2 acres of new cut and fill slopes associated with construction of new road segments in relatively undisturbed native perennial vegetation near the main park entrance, at Devils Garden, and near the Windows. Construction activities would be confined to the smallest area necessary to complete the work and all unpaved areas of disturbed vegetation would be reseeded with native vegetation following construction. Of 152 pullouts along the road, 110 (2 acres total) would be removed, blocked off, and revegetated. Project-related surface disturbance could facilitate the establishment and spread of invasive exotic plants, but several mitigation measures would be implemented to minimize the potential for exotic plant establishment and spread. Revegetation of disturbed areas is expected to take more than one year due to effects of variable seed dormancy and precipitation conditions. Overall, the preferred alternative would result in net effects on vegetation that would be local, long-term, minor or less, and adverse.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the **Williams'** gas pipeline and other utility corridors; and livestock grazing have had adverse effects on vegetation. Ongoing recreational use and off-trail hiking also has local effects on vegetation. The combined effects of past, present, and reasonably foreseeable actions on vegetation would be local, long-term, moderate or less, and adverse. The overall cumulative effects to vegetation from the preferred alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate or less, and adverse, with a relatively small adverse contribution from the preferred alternative.

Conclusion: Under the preferred alternative, actions including road and parking lot widening, grading, paving, implementation of drainage improvements, construction of new road segments, and closing and rehabilitating of 110 pullouts would have net effects on vegetation that would be local, long-term, minor or less and adverse. The overall cumulative effects to vegetation from the preferred alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, moderate or less, and adverse, with a relatively small adverse contribution from the preferred alternative.

Archeological Resources

Affected Environment

The National Park Service (NPS), as a steward of many of America's most important cultural resources, is charged with preserving archeological resources for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. The NPS is tasked with protecting and managing archeological resources in its custody through effective research, planning, and stewardship, and in accordance with Sections 106 and 110 of the National Historic Preservation Act (NHPA) as well as the policies and principles contained in the 2006 *Management Policies* (NPS 2006).

In addition to the NHPA and the NPS *2006 Management Policies*, the NPS's Director's Order 28A *Archeology* affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the NPS is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park System reflect a commitment to the conservation of archeological resources as elements of our national heritage.

To date, all Areas of Potential Effect (APE) related to this proposed undertaking have been surveyed in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (PL 91-852), the National Environmental Policy Act of 1969 (PL 91-852), the Archaeological Resources Protection Act of 1979 (PL 96-95), and Executive Order 11593.

During the surveys, one site, 42GR01533, was located within the APE of the proposed vehicle turn-around in the Devils Garden area. Following documentation, a formal Determination of Eligibility, subsurface testing, and consultation with and concurrence

from the Utah State Historic Preservation Officer (SHPO) and potentially affiliated tribes occurred. The site was determined Eligible and a No Adverse Effect determination was made for this site (See Appendix A for Utah SHPO concurrence letter dated April 22, 2013 for additional details).

Environmental Consequences

Methodology

In order to be eligible for listing on the National Register of Historic Places, an archeological resource must meet one or more of the following criteria of significance: A) associated with events that have made a significant contribution to the broad patterns of our history; B) associated with the lives of persons significant in our past; C) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; D) have yielded, or may be likely to yield, information important in prehistory or history.

Intensity Level Definitions

For purposes of analyzing impacts to archeological resources either listed or eligible to be listed on the National Register, the thresholds of change for intensity of an impact are defined below:

- Negligible:** Impacts to archeological resources either beneficial or adverse are at the lowest levels of detection, barely perceptible and not measurable.
- Minor:** Adverse: disturbance of an archeological resource results in little, if any, loss of significance or integrity and the National Register eligibility of the archeological resource is unaffected.
Beneficial: maintenance or preservation of an archeological resource.
- Moderate:** Adverse: disturbance of an archeological resource that does not diminish the significance or integrity of the sites to the extent that its National Register eligibility is jeopardized.
Beneficial: stabilization of the archeological resource.
- Major:** Adverse: disturbance of an archeological resource diminishes the significance and integrity of the resource to the extent that it is no longer eligible to be listed on the National Register.
Beneficial: stabilization of the archeological resource.
- Duration:** Short-term refers to a transitory effect, one that largely disappears over a period of days, months, or up to five years. Long-term refers to a period greater than five years.

Impacts of Alternative A – No Action

Visitor driving and parking on unpaved areas along roadsides can directly damage cultural resources that are crushed by vehicles. Indirect damage to cultural resources can occur as a consequence of soil compaction and associated adverse effects from soil erosion from road runoff. There would be no project-related disturbance that would directly or indirectly affect known archeological sites within the APE. Site 42GR01533 would not be impacted

by this alternative. Vehicles would continue to drive and park on unpaved roadside areas in some locations but would not affect archeological resources.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the Williams gas pipeline and other utility corridors; and livestock grazing have had adverse effects on archeological resources. Previous road construction and maintenance activities have impacted site 42GR01533. This alternative would not impact archeological sites; ongoing maintenance activities would have a negligible effect on archeological sites since any effect to archeological resources has already occurred. The combined effects of past, present, and reasonably foreseeable actions would have negligible effect on archeological resources.

Conclusion: Archeological resources would not be affected under the no action alternative and there would be no cumulative impacts.

Impacts of Alternative B – Park Road Improvements (Preferred Alternative)

The preferred alternative proposes to construct and pave one turnaround loop at the south end of the parking loop at Devils Garden, which would allow for vehicles to safely and expediently turn around in this area. This one action would affect site, 42GR01533, which is within the APE of this proposed activity and cannot be avoided. However, mitigation measures would be implemented to reduce the effect of construction impacts to this site in the vicinity of the project area by identifying and delineating for avoidance prior to project work to ensure avoidance. Park cultural resources staff would also be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction. Impacts would be local, long-term, minor and adverse.

Cumulative Effects: Past actions such as construction of roads, trails, and other facilities; excavation and maintenance of the **Williams'** gas pipeline and other utility corridors; and livestock grazing have had adverse effects on archeological resources. Previous road construction and maintenance activities have impacted site 42GR01533. The overall cumulative effects to archeological resources from the preferred alternative in combination with past, present, and reasonably foreseeable actions would be local, long-term, minor and adverse effect on archeological resources with a relatively small adverse contribution from the preferred alternative.

Conclusion: Implementation of the preferred alternative would have a local, long-term, minor and adverse effect on archeological resources. Cumulative effects would be local, long-term, minor and adverse. Consultation with the Utah State Historic Preservation Office and potentially affiliated tribes has been completed and a *No Adverse Effect* determination was made. Planned use of proposed mitigation measures for detecting new archeological resources would reduce the potential for greater impacts to these resources.

Visitor Use and Experience

Affected Environment

Arches National Park is a popular year-round destination for people around the world. The park offers a variety of recreational experience including sightseeing, hiking, interpretation, picnicking, special tours (Fiery Furnace and others, camping, rock climbing, canyoneering, bicycling (on established park roads), plus viewpoints/photo stops and access

to the backcountry. The visitors are able to enjoy many of the park's arches and features while driving along park roadways.

The park is surrounded by public lands managed by the Bureau of Land Management (BLM) and State of Utah where additional hiking, mountain biking, camping, rock climbing, canyoneering, four-wheel driving, and sightseeing opportunities can be enjoyed by visitors.

There is regional interest in increasing visitation to the region overall, as well as interest in spreading visitation throughout the year, beyond peak periods and into off-peak seasons. Arches National Park has been working with tourism interests, including the Grand County Travel Council and the Utah Tourism Council, to develop strategies for promoting regional tourism experiences that would bring visitors to the park during off-peak periods as well as to other agencies lands to experience their exceptional resources.

Arches, in the past three years, has hosted more than one million visitors annually. There has been rapid growth to park visitation in the past ten years as the number of visitors to the park has increased an average of 3% each year. The number of tour buses coming to the park in the same time span has increased an average of 7% annually, effectively tripling the number of large vehicles (> 35') present on park roads from 2000 levels (NPS 2012a). According to vehicle entrance data compiled from 2000 to 2011, an average of **1,000 vehicles enters the park on a daily basis. During the park's relatively long peak season from March through September an average of 1435 vehicles entered the park daily. Weekends during this period averaged 1574 vehicles a day (Johnson 2012).**

The most popular attractions visitors come to the park to see, according to a 2003 Visitor Survey (in order of most mentioned to least mentioned) were: Windows, Balanced Rock, Devils Garden, Delicate Arch (viewpoint and Wolfe Ranch) and Courthouse Towers/Park Avenue (NPS 2003).

Park staff has reported many problems and challenges associated with managing parking, traffic congestion, and visitor experience each year. These problems include crowding at popular attractions, congestion on park roads and in parking areas, safety concerns with large vehicles, and damage to soils and vegetation from social pull-off and roadside parking.

Environmental Consequences

Methodology

Information on parks visitation was compiled from existing transportation and visitor use reports. Predictions concerning short- and long-term impacts to visitor use and experience were based on entrance station data collected over the last ten years, staff observations of **visitation patterns, public scoping comments, and staff's professional experience and knowledge of visitor use patterns.** Levels of intensity for impacts to visitor use and experience are defined below.

Intensity Level Definitions

Negligible: The visitor would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

- Minor:** Adverse: Changes in visitor use and/or experience would be slight, but detectable. Changes would not appreciably alter critical characteristics of the visitor experience. Visitor satisfaction would generally remain unchanged.
- Beneficial: The action would slightly improve a **visitor's use and/or** experience in the park.
- Moderate:** Adverse: Many visitors to the park would be aware of the effects of associated changes. Visitor satisfaction would begin to change and visitors would likely be able to express an opinion about the changes.
- Beneficial: The action would noticeably improve a **visitor's use and/or** experience in the park.
- Major:** Adverse: Changes in visitor use and/or experience would be apparent to many visitors to the parks, and/or the number of visitors to the park would be greatly reduced or increased. Visitors would be aware of the effects associated with the alternative, visitor satisfaction would markedly decline or increase and many would likely express strong opinions about the changes.
- Beneficial: The action would substantially improve a **visitor's use and/or** experience in the park.
- Duration:** Short-term refers to a transitory effect, one that largely disappears over a period of days, months, or up to five years. Long-term refers to a period greater than five years.

Impacts of Alternative A – No Action

There would be no change in the fundamental nature and quality of the visitor experience or recreational opportunities along the road under the no action alternative. The road would remain open and visitors would continue to have access to park resources. As road conditions continue to deteriorate, periodic maintenance projects would require traffic delays at random times and locations, which would inconvenience visitors. Road conditions would deteriorate to the point that the quality of the visitor experience is diminished by a visibly damaged road or deterioration of other structural features. The potential for road closures would increase. Congestion and safety issues in parking areas would continue to occur due to lack of additional parking spaces and inefficient turning options. Effects on visitor use and recreation experience under the no action alternative would be local, long-term, minor to moderate, and adverse.

Cumulative Effects: Projects such as road improvements, construction, continued maintenance of the **Williams'** gas pipeline and exotic vegetation management, have had or could have an adverse effect on visitor use and experience because of the inconvenience of possible off-limit areas, construction noise and dust. The foreseeable future actions related to park transportation management could have an adverse effect on visitor use. Ultimately, however, these actions would have a beneficial effect on visitor use and experience because of long-term improvements to the human health and safety aspects of the park; the visual and natural environment; and functionality of the park. Potential improvements to the park road would also have a beneficial effect on visitor use and experience. Under the no action alternative, although visitors may, in the future, experience some short-term delays and closures due to construction, visitor functions in the park are not expected to change for the long term, and past actions have had

beneficial impacts on visitor use and experience. The overall cumulative effects to visitor use and experience from the preferred alternative in combination with past, present, and reasonably foreseeable actions would be local, long-term, negligible and adverse effect. Therefore, cumulatively, visitor use and experience would not appreciably change when considered with other past, present, and reasonably foreseeable future actions.

Conclusion: The no action alternative would have local, long-term minor and adverse effects on visitor use and recreation experience from ongoing deterioration of the road and structural features as well as continued congestion that contribute to the quality of the visitor experience and that provide access to recreation resources. Although the road would remain open to visitor access, as road conditions deteriorate, periodic maintenance projects would require traffic delays at random times and locations, which would inconvenience visitors. Inadequate parking design in some parking areas would continue to contribute to congestion and safety issues. Cumulatively, the no action alternative would have no effect on visitor use and experience when considered with other past, present, and reasonably foreseeable future actions.

Impacts of Alternative B – Park Road Improvements (Preferred Alternative)

The visitor experience and access to recreation resources would be impacted by construction activities required to rehabilitate the road. At times, traffic delays as well as full closures would inconvenience visitors traveling along the road, but road improvements would also improve the quality of the visitor experience over the long term.

Planned roadwork in the park is programmed for 2018, if funding is available. Construction work would occur primarily between March and October because of snow conditions in the winter. During this period, temporary traffic delays of up to 30 minutes would occur from 7 a.m. to 7 p.m. Full closures of Devils Garden and Windows loop roads, Panorama Point, Salt Valley Overlook, and La Sal Mountain Overlook would occur in July and August when visitation is lower.

Construction work would cause some visitors to avoid traveling into the park during periods when traffic is suspended. Day use visitors in Arches may choose to visit other areas of the park, where closures and delays are not occurring, which may result in increased visitor use and crowding at these other locations.

As described in the mitigation section, the park would implement a number of measures to reduce visitor impacts and maintain the quality of the visitor experience and access to recreation resources during construction. Visitors would be informed in advance of construction via a number of sources (i.e. park website, newspaper, radio, at entrance stations, variable message signs, visitor center and, kiosks) so they can best plan their schedule and activities. Traffic delays would be kept to a minimum. Improvements to the pullouts throughout the park would give visitors additional safe parking and access to the backcountry. Turn-around lanes would help facilitate visitors safely turning into the flow of traffic. Additional parking improvements would provide for more parking for cars, large Recreational Vehicles (RVs) and commercial buses.

Short-term moderate adverse effects on the quality of the visitor experience would occur at the local and parkwide level during periods of construction. While construction activities and traffic delays would temporarily inconvenience visitors, substantial changes in the number of visitors to the park are not expected. Over the long term, the proposed improvements to the condition of the road would provide a moderate beneficial effect on

the quality of the visitor experience and ensure protection of the road's structural features for visitor enjoyment and safe travel for many years.

Cumulative Effects: As described under the no action alternative, any construction activities have the potential to affect visitor use and experience. Projects such as road improvements, construction, continued maintenance of the **Williams'** gas pipeline and exotic vegetation management, have had or could have an adverse effect on visitor use and experience because of the inconvenience of possible off-limit areas, construction noise and dust. The foreseeable future actions related to park transportation management could have an adverse effect on visitor use. Ultimately, however, these actions would have a beneficial effect on visitor use and experience because of long-term improvements to the human health and safety aspects of the park; the visual and natural environment; interpretive opportunities; and functionality of the park. Potential improvements to the park road and parking areas would also have a beneficial effect on visitor use and experience. Considering these past, present, and reasonably foreseeable future actions, the minor-to-moderate beneficial effects of constructing new road and parking area improvements would have a minor cumulative benefit to the overall visitor use and experience at Arches.

Conclusion: Traffic delays and closures would inconvenience visitors traveling along the road during construction. In response to construction activities, some visitors may avoid the park, visit other portions of the park, or choose an alternate route for travel when traffic is delayed along the road or when parking areas are closed. The park would inform visitors in advance of construction and full closures via a number of sources so they can best plan their schedule and activities and minimize impacts. The park would work with the Travel Council to develop strategies for promoting regional tourism experiences that would promote other public lands for visitors to access during construction times which would provide a regional benefit. The effect on visitor use and recreation experience would be short-term, moderate, and adverse at the local and parkwide level during construction. However, the preferred alternative would provide short-term beneficial effects to the region during construction. Overall this alternative would provide long-term moderate beneficial effects on the quality of the visitor experience following construction by improving the quality and condition of the road and parking areas. Cumulative impacts would be local to parkwide, long-term, minor, and beneficial.

CHAPTER 4: CONSULTATION AND COORDINATION

Internal Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Internal scoping was conducted by an interdisciplinary team of professionals from the park, CFLHD and Denver Service Center (DSC). Interdisciplinary team members met to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed road and parking area work. The results of the various site visits and meetings are documented in this EA.

External Scoping

External scoping was conducted to inform the public about the proposal to construct various improvements along the parks paved roads and parking areas and to generate input on the preparation of this EA. This effort was initiated with the distribution of a scoping letter, which was mailed to over 100 residents, county and city officials in the city of Moab or in Grand County as well as neighboring agencies. In addition, the scoping letter was posted on the NPS Planning, Environment, and Public Comment (PEPC) website. A press release was also sent to local news organizations. The public was given 30 days to comment on the project.

During the external scoping period, approximately 30 pieces of correspondence were received from the public through postings on the PEPC website. The many respondents were in favor of road improvements as long as the park was sensitive to the park resources and not building to accommodate current visitation. The remaining responses included some in favor of constructing a bike lane to improve safety and reduce vehicle traffic and some were opposed to the project.

Agency Consultation

In accordance with the Endangered Species Act, NPS contacted the U.S. Fish and Wildlife Service with regards to federally listed special status species. The result of this consultation is described in the *Special Status Species* section in the *Purpose and Need* chapter.

In accordance with §106 of the National Historic Preservation Act, the NPS provided the Utah State Historic Preservation Officer (SHPO) an opportunity to comment on the effects of this project. A letter from the SHPO, dated April 22, 2013, confirmed NPS's "No Adverse Effect" determination under §106 of the National Historic Preservation Act.

Native American Consultation

Twenty-nine Native American tribes were contacted at the beginning of this project to determine if there were any ethnographic resources in the project area and if they wanted to be involved in the environmental compliance process. These tribes included:

Hopi Tribal Council
Jicarilla Apache Nation
Kaibab-Paiute Tribal Council
Navajo Nation
Paiute Indian Tribe
Pueblo of Acoma
Pueblo of Cochiti
Pueblo of Isleta
Pueblo of Jemez
Pueblo of Laguna
Pueblo of Nambe
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of San Clara
Pueblo of San Ildefonso
Pueblo of Santo Domingo
Pueblo of Taos
Pueblo of Tesuque
Pueblo of Zia
San Felipe Pueblo
San Juan Pueblo
Sandia Pueblo
Santa Ana Pueblo
Southern Ute Tribe
Ute Indian Tribe
Ute Mountain Tribe
White Mesa Ute
Ysleta Del Sur Pueblo
Zuni Tribal Council

One of these tribes responded; the Hopi Tribal Council. This tribe **concurred with the NPS's** determination of No Adverse Effect. They had no objection to the proposed project and requested to be notified if any cultural deposits are encountered during construction.

Environmental Assessment Review and List of Recipients

The EA is subject to a 30-day public comment period. To inform the public of the availability of the EA, NPS will publish and distribute a letter to various agencies, tribes, and the 100-person mailing list, as well as place a notice in the local newspaper. The document will be available for review on the PEPC website at <http://parkplanning.nps.gov/arch> and at the Park's visitor center. Copies of the EA will be provided to interested individuals, upon request.

During the 30-day public review period, the public is encouraged to submit their written comments to NPS, as described in the instructions at the beginning of this document.

Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The National Park Service will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA, as needed.

List of Preparers

The following persons assisted with the preparation of the EA. All are employees of NPS and/or the Southeast Utah Group Parks:

Name/Title	Contribution
Kate Cannon, Superintendent	Reviewed EA
Sabrina Henry, Environmental Protection Specialist	Prepared EA and Visitor Use and Experience sections
Todd Johnson, Transportation Scholar	Reviewed EA
John Lewis, Chief of Facility Maintenance	Reviewed EA
Mike Henry, Supervisory LE Ranger	Reviewed EA
Mark Miller, Chief of Resource Science and Stewardship	Prepared Natural Resource Sections.
Chris Goetze, Cultural Resource Program Manager	Prepared Cultural Resource Sections, Consultation with SHPO and Tribes
Vicki Webster, Museum Curator	Edited EA
Cam Hugie, DSC Landscape Architect	Reviewed EA
Richard Boston, DSC Cultural Resources Compliance Specialist/Archaeologist	Reviewed EA
Chris Longley, Project Manager, FHWA-Central Federal Lands	Reviewed EA

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State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of Heritage and Arts

Julie Fisher
Executive Director

State History

Wilson G. Martin
Director

RECEIVED
2013 APR 26 AM 10:24
NATIONAL PARK SERVICE
SOUTHEAST UTAH GROUP

April 22, 2013

Kate Cannon, Superintendent
Canyonlands National Park
2282 S. West Resource Boulevard
Moab Utah 84532-3298

RE: Determination of Eligibility for Site 42GR01533 and Vehicle Turn-Around in Devils Garden Area, Arches National Park, Grand County, Utah

For future correspondence, please reference Case No. 13-0288

Dear Ms. Cannon:

The Utah State Historic Preservation Office received your request for our comment on the above-referenced undertaking on April 16, 2013.

We concur with your determinations of eligibility and effect for this undertaking.

This letter serves as our comment on the determinations you have made, within the consultation process specified in §36CFR800.4. If you have questions, please contact me at 801-245-7263.

Sincerely,

Chris Merritt, Ph.D.
Senior Preservation Specialist



United States Department of the Interior

NATIONAL PARK SERVICE
Southeast Utah Group
Arches and Canyonlands National Parks
Hovenweep and Natural Bridges National Monuments
2282 S. West Resource Boulevard
Moab, Utah 84532-3298

IN REPLY REFER TO:

H3015 (SEUG-RM)

April 16, 2013

Wilson Martin
State Historic Preservation Officer
Division of State History, Antiquities Section
300 South Rio Grande St.
Salt Lake City, UT 84101-1182

Reference: Case No. 13-0288; Consensus Determination of Eligibility for Site 42GR01533, and §106 Compliance: Construct Vehicle Turn-Around in Devils Garden Area, Arches National Park, Grand County, Utah.

Dear Mr. Wilson:

The purpose of this letter is two-fold. We are seeking a consensus determination of eligibility for site 42GR01533, Arches National Park, Grand County, Utah, that has the potential to be adversely affected by a proposed project, detailed below.

In addition, and in accordance with §106 of the National Historic Preservation Act of 1966, amended, and the Council's regulations, 36 CFR Part 800, we are seeking your review and comment regarding a proposed undertaking to construct a vehicle turn-around in the Devils Garden area of Arches National Park, Grand County, Utah. The turn-around will facilitate visitor re-entry into the Devils Garden area without having to make the sharp and dangerous turn currently required. Arches National Park receives over one million visitors a year and a consequence of that visitation is an increased number of vehicle accidents, in part because of outdated and obsolete roads never meant to handle the large influx of traffic. This project proposes to fix one particularly dangerous location.

The Area of Potential Effect (APE) for the proposed project lies within the southern part of site 42GR01533, a diffuse lithic scatter that was originally documented in 1982, and at the time recommended as Not Eligible. The history of that original documentation effort, along with subsurface testing and surface collection results, is described in the

accompanying Assessment of Effect form. The original IMACS form (Hartley 1982), site map, test unit photos, and the resulting report (Griffin 1985) is also included for your information.

Per your recommendation in a letter dated March 20, 2013 (Case number 13-0288), the site was revisited, site documentation was updated to include an adjusted site boundary, and additional auger testing was conducted to further clarify the potential for subsurface cultural remains. Four of the five auger probes produced negative results, including the two that were placed within the APE. The fifth auger probe, placed in the northern part of the site and away from the APE, contained a small piece of charcoal located approximately 29cm below present ground surface. While not conclusive, it does suggest the possibility of subsurface cultural remains within that part of the site, therefore, we are recommending that the site be determined ELIGIBLE for listing on the National Register under Criterion D. The updated IMACS form and additional documentation is attached.

We are also enclosing a map of the project area showing the location of site 42GR01533 relative to the proposed vehicle turn-around, along with a completed Assessment of Effect form. To summarize our thinking:

- The surface manifestation of site 42GR01533 has been thoroughly documented, once in 1982 and again in April of 2013. During the 2013 re-documentation, site boundaries were redefined, additional lithic concentrations identified, and additional disturbances noted.
- Within the APE of the proposed project, two test units placed in 1982 resulted in the recovery of five flakes within 15cm of the present ground surface. Two additional auger holes excavated in 2013 to depths of 50 and 64cm BMGS had negative results. This suggests that, at least within the APE of the site, there is a low probability that additional subsurface material is present.
- Within or adjacent to the APE (perhaps to the southeast), 115 surface artifacts were collected in 1982. These were analyzed based on research questions proposed at the time. The material is still available to qualified researchers who might wish to address additional research questions in the future.
- The total size of the APE (.05 acres) compared to the total size of the entire site (.5 acres) indicates that only 10% of the site will be impacted by the proposed project. This leaves 90% of the site intact, including the middle, stabilized section of dune that potentially contains at least one buried cultural horizon based on the results of a single auger hole.

Given that the surface manifestation of the site has been thoroughly documented, that there were negative results of subsurface testing within the APE, that previous artifact collections were made and analyzed, that the material remains available for further study, and that there is a small amount of disturbance relative to the overall size of the site, construction of the proposed vehicle turn-around through site 42GR01533 will minimally impact the qualities of the site for which it is recommended eligible to the NRHP. Cultural materials with data recovery potential will remain intact outside the APE, and there is a low probability that buried features or artifact concentrations will be found

within the APE that warrant further archeological investigation to mitigate damage. We conclude that no cultural material will be adversely affected from activities associated with this proposed project, and therefore are making a recommendation of No Adverse Effect to site 42GR01533.

We are also proposing several mitigations measures to ensure that the project will not impact ANY potentially buried cultural horizons associated with site 42GR01533. These include having an archeological monitor on-site at all times during construction activities. These measures are detailed in the enclosed AEF.

If you concur with our recommendation of Eligible for site 42GR01533, and our recommendation of No Adverse Effect on the site as a result of the proposed vehicle turn-around project, please sign the concurrence line below and return a copy to our office. If you have further questions or need additional information, please contact Chris Goetze, Southeast Utah Group Cultural Resource Program Manager, at 435-719-2134, or Chris_Goetze@nps.gov.

Sincerely,



Kate Cannon
Superintendent
Canyonlands National Park

Enclosures

I Concur _____ Date _____
Utah State Historic Preservation Officer