

## Alternatives Development

### Planning Process

A multi- year transportation planning process for Arches National Park began in the fall of 2002. This comprehensive planning process involved extensive analysis of existing conditions, data collection, visitor surveys, and consideration of various ideas, options, and strategies for resolving transportation- related problems at the park. The following steps were completed during the planning process.

1. Review of past planning efforts and existing information and conditions at the park through field visits (Fall 2002 through Spring 2003)
2. Initial workshops with park staff and regional stakeholders and the general public; environmental scoping (February 2003)
3. Ongoing information gathering and data collection including visitor/travel surveys conducted at the park (Spring and Summer of 2003)
4. Development of initial transportation ideas, options, and strategies; and additional workshop sessions with park staff and the general public (Fall 2003 through Summer 2004)
5. Development of transportation plan alternatives and additional fieldwork and analysis; environmental screening and analysis (Summer 2004 through Spring 2005) and newsletter reporting on project status (Fall 2004)
6. Draft Transportation Implementation Plan and Environmental Assessment development and review process (Spring 2005 through Winter 2005/2006)
7. Transportation Implementation Plan and Environmental Assessment published (Summer 2006)

8. Public meetings to obtain comments on Transportation Implementation Plan and Environmental Assessment (Summer 2006)

### Overview of Public Involvement and Community Outreach Activities

Public involvement was an integral part of the development of potential transportation solutions. Project stakeholders, interested agencies, and the public- at- large were identified and notified at the beginning of the planning process and have been involved throughout the project. American Indian tribes were notified at the beginning of the project and were invited to participate in all public meetings. In addition to the National Park Service, key stakeholders involved in development of alternatives included the Bureau of Land Management (BLM), City of Moab, Grand County, and the Utah Department of Transportation (UDOT).

Two public workshop series were held during the project. In February 2003, the project team met with a diversity of stakeholders and community groups throughout the region to gather ideas and input that helped shape the range of transportation options to be considered. Workshop sessions were held during the day and general public meetings were held in the evenings. Another round of public meetings took place in November 2003, at which time the project team met with stakeholders and held an evening public meeting to present preliminary options, ideas, and strategies to the general public.

Participants in public workshop sessions offered a diversity of opinions and comments on a wide range of topics related to transportation within and surrounding Arches National Park. Participants were interested in making sure that plans at the park were coordinated with plans for the regional transportation system, including improvements to adjacent and nearby highways and the proposed expansion of the regional nonmotorized trail network. Participants also



were interested in a shuttle and/or motorized sightseeing/interpretive tour program within the park, as well as shuttle access to and from Moab. Existing tour providers wanted to ensure that new plans for a motorized sightseeing/interpretive tour would provide a different type of experience than their services offered, and as such would be targeted toward a different customer base. Overall, the public was interested in making some changes at Arches National Park that would improve the visitor experience, protect natural resources, and diversify the range of transportation options available to park visitors.

Various community involvement tools were implemented to outreach to the public during the planning process. Press releases, news articles, project information sheets, and a project newsletter have been distributed, published in newspapers, and posted on the park's website to keep the public informed.

A more detailed description of the stakeholder and public involvement process is provided in Chapter 5, Consultation and Coordination.

### **Planning Process Outcome: Transportation Implementation Plan**

A transportation implementation plan was one of the primary outcomes of the multi-year transportation planning process. The transportation implementation plan (Alternative B in this document) focuses on actions that can be realistically and reasonably accomplished within the next six years.

Other actions and alternatives with longer implementation timeframes were considered but dismissed. After initially considering a broader range of long-term transportation options for Arches National Park, the NPS Washington Office of Alternative Transportation Planning Program Management requested that the park create a transportation implementation plan with scaled back alternatives that could be implemented within a six year timeframe. The scaled-back planning effort discontinued consideration of a park-based alternative transportation system (shuttle bus), a multi-purpose trail system, bicycle improvements, and long-term Intelligent

Transportation System (ITS) strategies that would have supported the park-based shuttle system. Given the reduced scale of alternatives, the National Park Service determined that the appropriate level of analysis for the implementation plan was an Environmental Assessment.

The change in the plan's focus to consideration of shorter-term options was primarily due to concerns related to funding constraints, as well as inconsistencies with the current Arches National Park General Management Plan published in 1989. A new General Management Plan would have had to be developed, and as such, the National Park Service was concerned that the broader range of actions would take more time for further analysis, planning and design prior to implementation (beyond the six year timeframe identified in the project statement of purpose and need). Longer term actions to address transportation issues would involve substantial changes that potentially could have appreciable effects on visitor experience and park resources, staffing, and operations. As such, the plan was scaled back to focus on actions that could be implemented in the near term to begin to address traffic congestion and related effects to natural and cultural resource effects. Refer to "Actions and Alternatives Considered but Dismissed" later in this chapter for more discussion.

The transportation implementation plan was developed through extensive coordination with local, state, and federal agencies and an interactive, multi-phased public involvement process. Potential elements to be included in the implementation plan were evaluated in accordance with the following criteria:

- Consistency – with regional and park goals and policies
- Mobility – the ability to accommodate visitor access to park features, balanced with the need to enhance visitor experience and protect resources
- Capital, Maintenance and Operating Costs – of the proposed elements and considering



affordability and cost effectiveness to users, providers, and taxpayers in general

- Visitor Experience – a qualitative determination of whether a proposal provides for a range of experiences and a high quality park experience to a diversity of visitors
- Safety and Security – addressing a diversity of visitor needs
- Resource Protection and Environmental Impacts – determination of whether proposed elements have any clearly irresolvable environmental impacts and analysis of appropriate measures for mitigating impacts
- Regional Land Use and Visitation– potential effects on land use patterns and visitation, tourism and socioeconomic patterns that affect the park and the region
- Public Support – a determination as to whether or not a proposal has obvious or overwhelming support or opposition within the visiting public it is intended to serve

## Description of Alternatives

Two alternatives are presented in this chapter: the No Action Alternative, Alternative A, and the Transportation Implementation Plan, Alternative B, which is also the Preferred Alternative. The following elements are addressed under each alternative:

- Park Roads and Parking Areas
- Roadside Pull Off Areas
- Traffic Calming
- Motorized Interpretive Tours
- Intelligent Transportation Systems
- Ongoing Partnerships with Regional Interests
- Ongoing Visitor Experience and Resource Protection Monitoring
- Other Visitation and Congestion Management Strategies

In accordance with the National Environmental Policy Act, the alternatives and their effects are presented in a comparative format, along with a description of required mitigation measures. Rationale for the selection of the environmentally preferred alternative is also provided. A summary comparison of alternatives in tabular form is provided at the end of this chapter (Table 2.7), as well as a summary of environmental consequences (Table 2.8).

## Alternative A: No Action Alternative

Under Alternative A, the park would continue managing existing transportation facilities in their current condition. Only minor physical improvements would be implemented over the course of the next six years, as already planned through the park's General Management Plan (GMP) and through normal, ongoing park maintenance and operations. Specific aspects of the park's ongoing transportation system and facilities under the No Action Alternative are described in more detail below.

Evaluation of the No Action Alternative is required under the National Environmental Policy Act (NEPA) and allows for analysis of the environmental consequences related to management of ongoing congestion at park features, parking areas, and along park roads and the related affects on visitor experience, resource protection, and park operations. Evaluation of the No Action Alternative provides a baseline against which to compare the proposed action alternative – implementation of the transportation plan (Alternative B) and related environmental consequences.

## Park Roads and Parking Areas

The park's existing roadway system and parking areas would continue to operate as under current conditions, with minimal improvements over time on a case- by- case basis. For example, the shoulders of park roads would continue to be repaired and widened in some areas as part of annual maintenance projects. Minor improvements to roadway and parking areas, such



as the repaving, patching and sealing and the addition of signing, striping, or other treatments may also continue to occur as part of periodic maintenance.

No new parking areas would be constructed and no reconfiguration of parking would occur under Alternative A. Although the current GMP calls for the development of the Sand Dune Arch parking area, the park is proposing to construct the parking area in a different location and configuration than shown in the GMP. As such, a new conceptual plan for the Sand Dune Arch parking area has been created and is included as an element of the proposed transportation implementation plan, Alternative B.

### Roadside Pull Off Areas

For years, motorists have been repeatedly pulling off at roadside edges throughout Arches National Park (referred to as “social” pull off activity), resulting in disturbance and damage to roadside soils, soil crust, and vegetation from tires and vehicles. More than 200 social pull offs have been created in the park, and more are added each year. In addition, when visitors get out of their cars at these locations, they tend to create social paths out into the landscape, causing further intrusion to sensitive soils and habitats and natural and cultural resources in the park.

Under Alternative A, removal and rehabilitation of existing social pull off areas likely would be limited to one or two locations annually, completed on a case- by- case basis as part of normal maintenance and operations activities. This activity would be contingent upon the ability to allocate budget and resources for the work in balance with other needs for maintenance and operations funds. No formalization or improvement of pull off areas would occur under Alternative A.

Arches National Park staff has continually worked to reduce the negative effects of motor vehicles at popular attractions and along traveled roadways in the park by limiting parking capacity at popular trailheads (such as Delicate Arch Trailhead/Wolfe Ranch) and increasing the level of patrols along the road to discourage social pull off activity and

speeding in the park. There is an ongoing concern related to the potential lack of maintenance and operations funds that may be available to support the future needs of park lands. To meet recommendations of a 2006 Core Operations review, staffing levels at Arches National Park will be reduced by 3 full time equivalents (FTEs) over the next five years. This will reduce the park’s ability to keep up with increasing ongoing maintenance and resource protection needs.

### Traffic Calming

Traffic calming includes various physical treatments and management techniques aimed at reducing the speed of travel of vehicles without restricting access. Traffic calming measures can enhance safety for all travelers including motorists, bicyclists, and pedestrians.

Under Alternative A, current efforts related to traffic calming in the park would remain in effect. Current traffic calming efforts in the park are limited to the periodic installation of regulatory traffic signs directing travelers to use caution in certain areas, as well as patrols and ticketing of drivers traveling in excess of the posted speed limit.

### Motorized Interpretive Tours

A motorized sightseeing/interpretive tour experience targeted toward the general park visitor within a moderate price range and operating at a regular frequency is currently not available at Arches National Park.

There are some commercial tours utilizing frontcountry roads at Arches National Park operated by a number of tour companies based in Moab and at other locations around the country. At this time, these tours are not authorized by the National Park Service via concession contracts or commercial use authorizations, and as such, they are not regulated by or coordinated through the National Park Service. This policy may change in the future with the requirement that frontcountry tour companies obtain either a concession contract or a commercial use authorization. A final decision will be based on a new Commercial



Services Management Plan to be developed at a future date.

Under the No Action Alternative, Alternative A, no new frontcountry commercial tour programs would be developed or operated by entities under the provisions of a concession contract or commercial use authorization. The current state of unregulated frontcountry commercial tours would continue. Continued operation of the few specialized tour programs currently regulated through concessions contracts (e.g., guided adventure tours utilizing backcountry “four-wheel drive” roads) would continue at least through the terms of the existing concession contracts. Upon the expiration of these concession contracts, continuation of these tours would be contingent upon the ongoing interests of the park and the companies that hold these concession contracts that authorize them to provide these tours.

### Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) include the application of computers, communications, and sensor technology to multi-modal transportation systems and facilities. When integrated into the transportation system infrastructure, and in vehicles themselves, these technologies help to monitor and manage traffic flow, reduce congestion, provide alternate routes to travelers, enhance productivity, and save lives, time, and money.

Under Alternative A, No Action, existing Intelligent Transportation System (ITS) applications in the park and region would continue to operate as they do under current conditions. These include: self-guided audio tours, interactive informational kiosks, digital closed circuit television at the park entrance and visitor center, Internet-based reservation for the campground and information availability, automated fare collection, and highway advisory radio. No other additional ITS applications likely would occur under Alternative A, No Action, other than upgrades to current systems that might occur on a case-by-case basis depending on annual funding requests and budget allocations.

### Ongoing Partnerships with Regional Interests

Arches National Park is committed to developing and strengthening long-term partnerships with regional interests, including other federal land managers such as the Bureau of Land Management, as well as the State of Utah, Grand County, City of Moab, regional tourism organizations, and other stakeholders. Currently, the park is working diligently to outreach to regional partners and interests on a regular basis. These partnerships and the policies, programs and projects that result from partnership efforts would continue under Alternative A, No Action.

### Ongoing Visitor Experience and Resource Protection Monitoring

Visitor Experience and Resource Protection (VERP) monitoring has been funded and conducted annually at Arches National Park for several years. Ongoing VERP monitoring is an important and effective tool for measuring the potential effects of increased visitation on the quality of visitors' experiences and the health of natural resources.

The funding source for completing VERP monitoring annually is not guaranteed, and with continued budgetary limitations in the future, VERP monitoring may not continue. As such, it is not known if VERP monitoring would continue under the No Action Alternative since the availability of funding is not a given.

### Other Visitation and Congestion Management Strategies

A number of approaches for managing visitation and congestion at features are being implemented on an ongoing basis at Arches National Park, consistent with the objectives and provisions of the park's General Management Plan and Visitor Experience and Resource Protection Implementation Plan. These approaches and activities include the regular dissemination of information to park visitors, provision of staff to assist visitors with on-site trip planning, ranger-



guided tours by reservation at the Fiery Furnace, and other forms of guidance and management provided routinely to park visitors. These current management and visitor support activities would continue to be offered under Alternative A, No Action.

Figure 2.1 on page 2- 7 depicts the existing system of roadways and locations of parking areas in the park, which would continue to operate as under current conditions with the No Action Alternative, Alternative A. Figure 2.1 also provides an existing map of Arches National Park showing areas referenced in the description of Alternatives A and B. Figure 2.2 on page 2- 8 illustrates a current typical roadway cross section at an existing social pull off location in the park.

## Alternative B: Transportation Implementation Plan – Preferred Alternative

### Introduction and Implementation Timeframe

The proposed actions described below collectively comprise the “action alternative” analyzed in this document. After an extensive planning and public involvement effort, it was determined that the purpose and need for action (described in Chapter 1) would be accomplished through the proposed actions of the transportation implementation plan, Alternative B.

The transportation implementation plan focuses on actions that can be realistically and reasonably accomplished within the next six years. This timeframe for implementation is contingent upon the availability of funding for staffing and resources that may be needed.

### Park Roads and Parking Areas

This alternative would improve the function of the roadway system through implementation of roadside pull off and traffic calming improvements as described below. In addition, improvements are proposed at several parking

areas. Figure 2.3 on page 2- 13 illustrates the locations of proposed improvements in the transportation implementation plan, Alternative B.

In the past, Arches National Park has been able to improve conditions related to resource protection and visitor experience through “hardening” of existing parking areas throughout the park. The term “hardening” refers to improvements and delineation methods that contain parking areas to a maximum vehicle capacity, including curbing, striping, signing, fencing, placement of boulders, and other types of treatments. Implementation of hardening helps to ensure that park trails and features do not become overcrowded. Hardening also helps to ensure that parking areas can be more effectively managed to reduce negative effects to resources, in accordance with the park’s Visitor Experience and Resource Protection (VERP) plan goals.

Most all of the parking lots at Arches National Park have received hardening treatments and have been designed and developed according to the original intent of the 1989 General Management Plan (GMP) and the VERP Implementation Plan. However, there are still some areas at key attraction sites where visitors continue to park in spaces not delineated and striped for parking. This tends to create overcrowding on trails and degradation of natural resources. If too many people are on the trail system, the quality of the visitor experience is diminished and in some cases, people create social trails next to and near existing trails to travel around other visitors, or to get away from the crowded path.

In several locations (described below) parking would be slightly reconfigured and improvements added to help alleviate these problems and to improve overall operations, as well as visitor access and flow of travel. Proposed parking area improvements described below also would be needed to accommodate tour bus parking/staging at certain locations in the park. Implementation of these improvements would help to ensure that desired vehicle capacities are achieved.

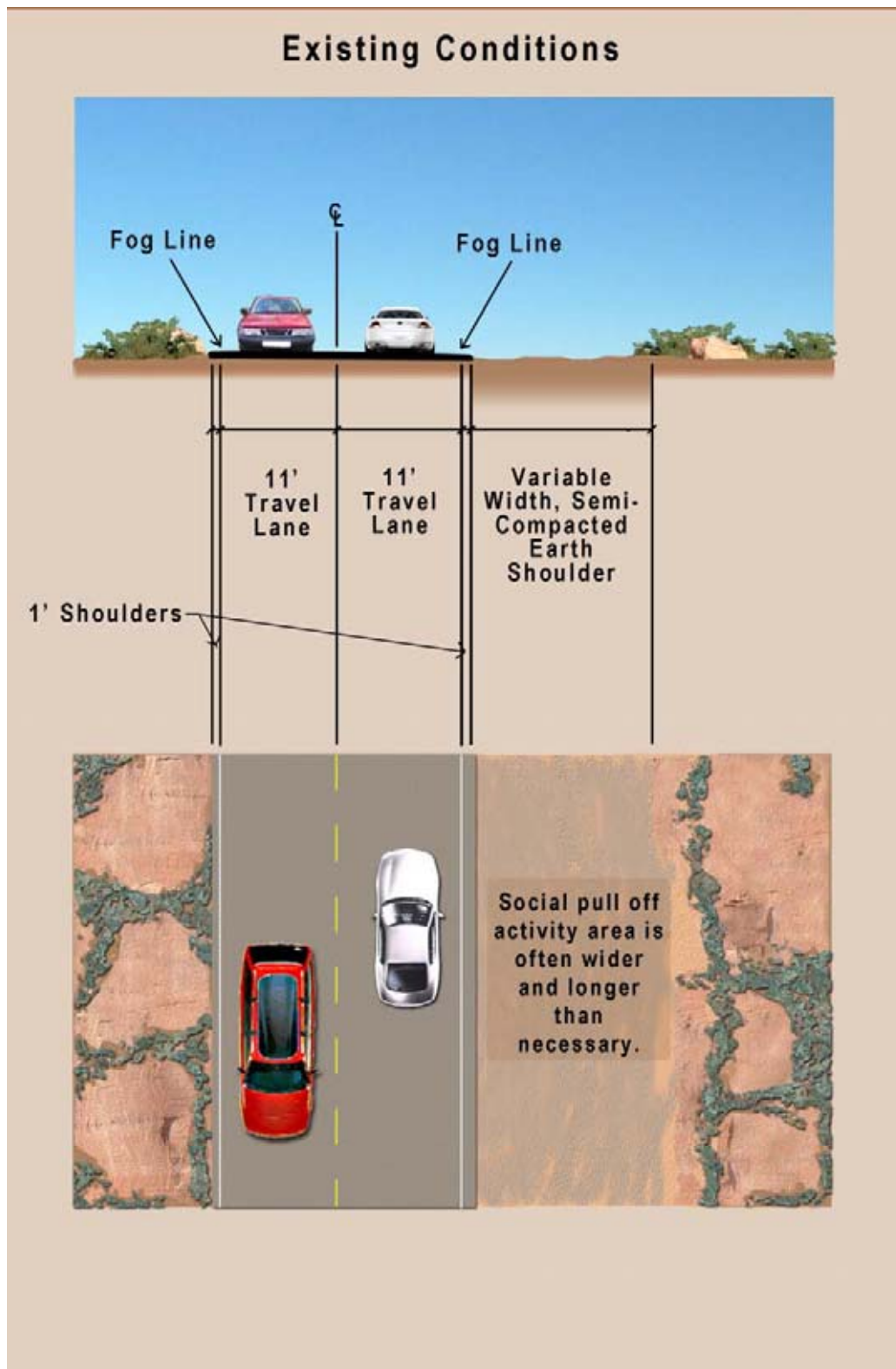








Figure 2.2 – Existing Roadway Section at “Social” Pull Off Location





Currently the parking capacity at trailheads tends to fluctuate because parking lots are not formally striped and some paved areas are wider than necessary for parallel parking. Visitors tend to park perpendicularly in parallel areas and overflow park off of paved surfaces and along road shoulders when parking areas get congested. Allocated parking capacities, established based on the park's GMP, VERP, and field evaluation provisions, are provided in Chapter 3, Affected Environment, under Transportation and Traffic.

During construction of parking area improvements, activities would be staged within the park with materials stored in existing developed areas, such as existing parking areas or in the park's internal storage and maintenance yard.

### The Windows and Double Arch

The Windows and Double Arch parking areas would be redelineated. Redelineation would include restriping of parking spaces and travel areas and removal of some areas of excess paving. The objective would be to stripe and configure the parking areas so that the maximum available parking capacity is consistent with that prescribed in the Visitor Experience and Resource Protection (VERP) Implementation Plan. The Windows parking area would accommodate 35 vehicles. The Double Arch parking area would accommodate 24 vehicles. One reason for the redelineation and removal of excess paving is that visitors are parking in a front- in configuration in the parallel stalls because they are excessively wide. As such, the number of vehicles parked in this area frequently exceeds the designated capacity. Restriping on the Windows side would provide 27 front- in, angled parking spaces, as well as parallel parking spaces for either 4 larger- sized recreational vehicles (RVs) or 8 standard vehicles.

The 16 front- in, angled parking spaces on the Double Arch side of the parking area would remain as currently configured with no new delineation. On the opposite side of the angled parking, a parallel parking area would be delineated to accommodate either 4 RVs or 8 standard vehicles. Excess pavement would be removed from the parallel parking area to deter

vehicles from parking in front- in configurations. Also, excess pavement south of 16 angled parking spaces would be removed to discourage additional parking in that area and contain the total capacity to 24 vehicles at Double Arch.

Restriping of the Windows and Double Arch parking areas would not result in additional paved areas or surface disturbance. If parking areas are redelineated as proposed, there would be an opportunity to return approximately 2,150 square feet of currently paved area to natural landscape. This would involve removal of pavement and environmental rehabilitation of the area through protection, raking, contouring and other treatments.

The Windows is a designated location for a potential sightseeing/ interpretive motorized tour stop. A parallel parking/pull off area just southeast of the restroom trail entrance would become the designated pull off stop for tour vehicles. This area is located in close proximity to the Windows trailhead, just across the parking area.

Restriping plans for the Windows area also include striping pedestrian access aisles in front of the Windows trail entrance, as well as in front of the trail between the Windows and Double Arch on the south side of the parking area.

Refer to Figure 2.4 on page 2- 14 for a conceptual plan of the proposed improvements at the Windows and Double Arch parking areas. A detailed design plan would be prepared for this area prior to implementation of the proposed improvements.

### Wolfe Ranch/Delicate Arch Trailhead

Hardening of the parking area at the Wolfe Ranch/Delicate Arch Trailhead has been completed and vehicle capacity is being maintained to the maximum level prescribed in the VERP Implementation Plan and 1989 GMP.

The Delicate Arch/Wolfe Ranch trailhead is a designated location for a potential sightseeing/ interpretive motorized tour stop (for the proposed program discussed later in this chapter). Because of the constrained area for parking and pull off, there is limited opportunity to create a



new, separate bus pull off/stop here. As such, a short-term tour bus drop-off/pick-up space would be delineated through striping and signing inside the existing paved surface of the parking area, in the travel lane and within walking distance of the trailhead. Tour buses using this drop-off/pick-up area would be expected to park (with engines turned off; not idling) in the nearby oversize vehicle lot or the Delicate Arch Viewpoint parking lot while the passengers are hiking. This provisional bus drop-off/pick-up area would accommodate use by motorized interpretive tours without requiring new pavement and improvements that would impact natural resources and add more costs for development.

### Delicate Arch Viewpoint

The Delicate Arch Viewpoint parking area operates at less than full capacity most of the time. Space at the west end of the parking lot would be converted to a staging area for motorized tour vehicles that have dropped tour groups off at nearby sites elsewhere in the park (i.e. Wolfe Ranch/Delicate Arch Trailhead, Fiery Furnace, Devils Garden or other locations) while drivers wait for their passengers to finish their hiking/interpretive experience. (Refer to the discussion later in this chapter for information about proposed motorized interpretive tours.)

In most cases, the interpretive tour groups would stay with the tour vehicles during brief stops at sites within the park. However, this would not be the case under the day-long tour scenario (discussed later in this chapter), which would include hiking experiences at Delicate Arch, Devils Garden, and/or other areas. The Delicate Arch Viewpoint parking area is a suitable location for staging of tour vehicles because it is centrally located in the park; there is capacity available without the need for additional paving and improvements; and vehicles parked there would not create visual intrusions or detract from visitor experience.

A portion of the west end of the Delicate Arch Viewpoint parking area also has the space to be converted to a picnic area. Picnic tables would be added here and visitors would be encouraged to

use this site for picnic lunches. This would help to draw more visitors to the underutilized parking area and away from more congested picnicking areas of the park. This proposed action also would provide a place for picnicking for tour groups and/or tour vehicle drivers. Use of this picnic area likely would be limited to spring and fall, when biting insects are less prevalent in this vicinity.

These improvements would be implemented with minimal to no disturbance to the adjacent natural landscape. For example, picnic facilities would be incorporated at the existing edges of the parking lot (either on existing sidewalk surfaces or in parking lot islands).

### Fiery Furnace

Park staff reports that overflow social parking at the Fiery Furnace is an ongoing problem affecting adjacent resources. Social pull off areas are proposed to be eliminated as discussed later in this chapter. Additional delineation within the existing developed parking area is proposed to formalize circulation and parking to protect resources from overflow and social parking and the potential creation of related social trails.

The Fiery Furnace has been identified as a potential sightseeing/interpretive motorized tour stop. As such, the parking area likely would need to be reconfigured to accommodate a tour stop, or similar to the approach at the Wolfe Ranch/Delicate Arch parking area, a tour bus drop-off/pick-up space could be delineated through striping and signing inside the existing paved surface, in the travel lane and within walking distance to the trailhead. Buses would then be expected to park in alternate location (potentially at the Delicate Arch oversize vehicle area or Delicate Arch Viewpoint parking lot until passengers are ready to be picked up again.

### Sand Dune Arch

The park's 1989 GMP proposed that the Sand Dune Arch Trailhead parking area be expanded. The GMP included a conceptual plan of the proposed parking improvements. The redesigned and expanded trailhead parking area is needed to



adequately serve the Lost Spring Canyon area and would enhance visitor access to Sand Dune Arch and Broken Arch. A new parking area would be developed near the vicinity of the existing roadside parking area, but in a slightly different location and configuration than shown in the 1989 GMP). The parking area would include 15 front-in, perpendicular spaces and parallel spaces to accommodate either 4 RVs or 8 standard vehicles. Development in this newly proposed area would minimize the amount new disturbance, grading and earthwork necessary for construction.

The same parking lot configuration as developed at the Balanced Rock area would be constructed at the Sand Dune Arch trailhead. Existing inbound and outbound parking/pull off areas at Sand Dune would be removed once the new parking area is constructed. In these areas the pavement would be removed and the landscape would be environmentally rehabilitated to enable its return to a more natural condition, resulting in approximately 5,250 square feet of rehabilitation opportunity.

Construction of the new parking area would result in new disturbance to approximately 12,650 square feet of existing natural landscape surface area (soils and vegetation).

The new parking area would be designed to fit sensitively into the natural setting and landscape, minimizing potential disturbance to soils and vegetation and avoiding intrusions on surrounding rock features. The design would strive to balance cut and fill earthwork and to minimize the overall extent of earthwork to the greatest extent possible. Placement of the parking area in the flatter area north of the existing pull off and trailhead would enable earthwork to be minimized.

Refer to Figure 2.5 on page 2- 15 for a conceptual plan of the proposed improvements at Sand Dune Arch. A detailed design plan would be prepared for this area prior to implementation of the proposed improvements.

### Skyline Arch Roadside Parking/Pull Off Area

The Skyline Arch roadside parking/pull off area would be improved as described later in this

chapter (refer to Table 2.3, Pull Off #16 on page 2-22). Five additional outbound parking spaces would be constructed at this location by shifting the centerline of the main road to the east. Also, existing inbound parallel parking would be redelineated/ restriped to discourage front- in perpendicular parking (currently a problem at this location). Three- foot- wide pedestrian paths would be provided adjacent to the paved parallel parking area (in a compacted crushed rock surface). A crosswalk would be located between the inbound and outbound parking areas to enhance pedestrian safety. The feasibility of a slight shifting of the highway centerline to the east to accommodate more parking on the outbound side would need to be further evaluated in final design.

These improvements would result in additional disturbance of approximately 900 square feet of soils and vegetation at the roadside, but at the same time approximately 250 square feet of currently disturbed area would be rehabilitated to return to a more natural condition, resulting in a net increase of 650 square feet of newly disturbed area. (These calculations are depicted in Table 2.3, Pull Off #16.)

Refer to Figure 2.6 on page 2- 16 for a conceptual plan of proposed improvements at the Skyline Arch parking/pull off area. A detailed design plan would be prepared for this area prior to implementation of the proposed improvements.

### Devils Garden

Several inbound and outbound wide spots and social pull off areas around the entrance to Devils Garden would be removed and treatments such as boulders, curbing, and/or fencing would be added to deter social roadside parking occurring in this area.

The designated parking capacity for Devils Garden is 150 stalls (including the Devils Garden picnic area). This number of parking spaces would be clearly delineated within the parking area and all other areas would be “hardened” and treated with curbing, boulders, fencing, and other elements so that the intended parking capacity can be maintained.





Signing would encourage RV drivers to continue to the end of the parking lot to parallel stalls, rather than to park in inbound pull off areas, taking up space that should be available for smaller vehicles. Excess pavement width at some of the parallel parking spaces would be removed to ensure that motorists are deterred from front-in parking, which creates more capacity than designated for this area.

Parking at the Devils Garden picnic area would remain as currently configured. Parallel parking areas to the northeast of the picnic area would be retained, but reduced in width to discourage front-in parking.

Redelineation of parking in the Devils Garden would not result in additional paved areas or surface disturbance. If parking improvements are implemented, there would be an opportunity to return approximately 6,200 square feet of currently paved area to natural landscape (pavement removed and area rehabilitated through protection, raking, contouring, and other treatments).

Refer Figure 2.7 on page 2- 17 for a conceptual plan of proposed improvements at Devils Garden. A detailed design plan would be prepared for this area prior to construction.

Table 2.1 on page 2- 18 depicts land area affects. Table 2.2 on page 2- 18 includes proposed parking capacities, at each of the parking locations proposed for improvements. Table 2.2 includes proposed parking if the parking lots are formally striped, enforced, and reconfigured. Proposed parking quantities are the same as the maximum parking capacities designated for these areas by the GMP, VERP, and more recent analysis. The table does not show existing capacities since the effective existing capacity is flexible depending on the number of vehicles that overflow and social park along the roadside and park in front-in configurations in spaces meant for parallel parking. As such, the existing parking capacity fluctuates on any given day in these areas of the park.





Figure 2.3 – Alternative B – Proposed Transportation Implementation Plan

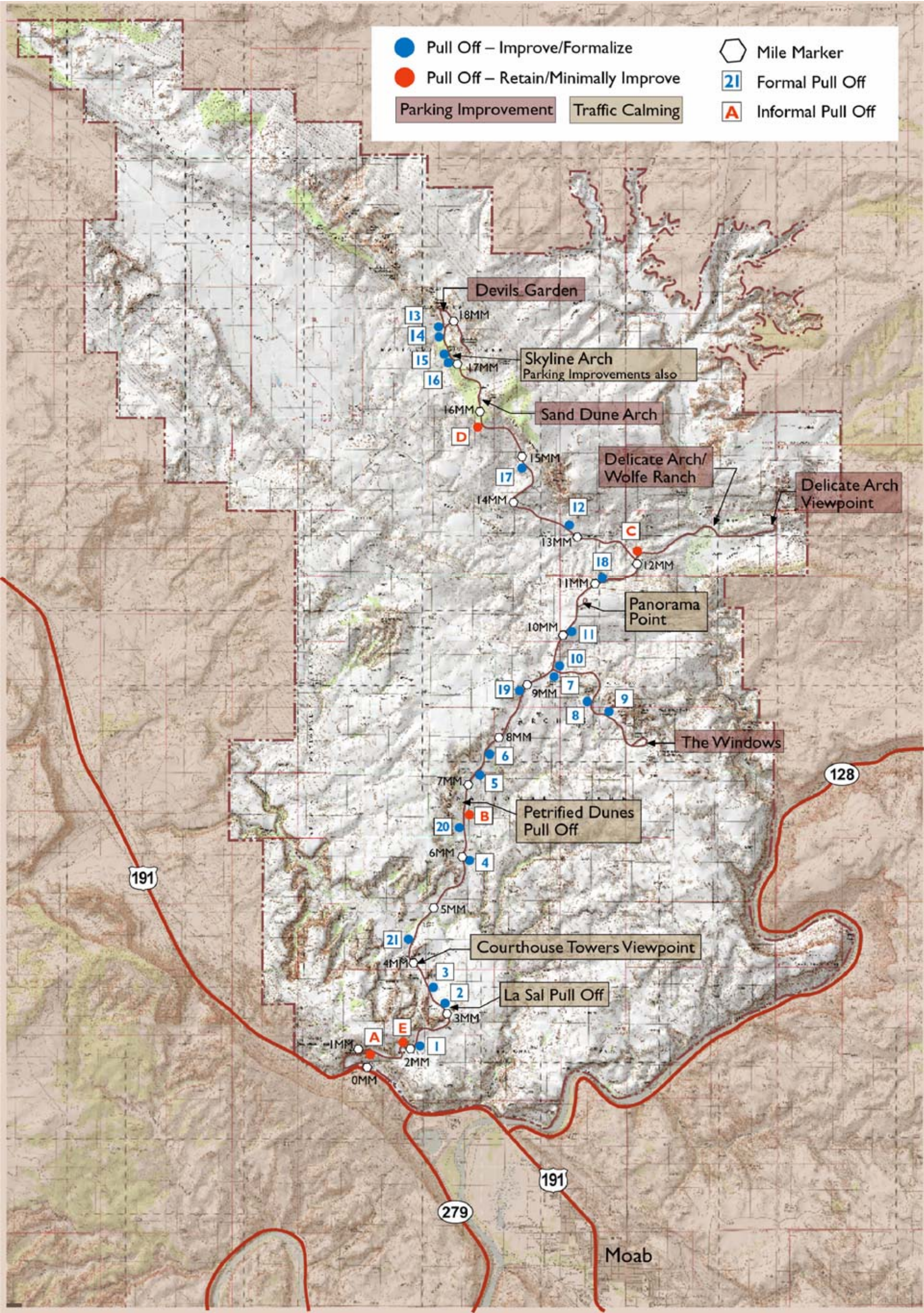




Figure 2.4- Proposed Improvements to the Devil's Garden Parking Area

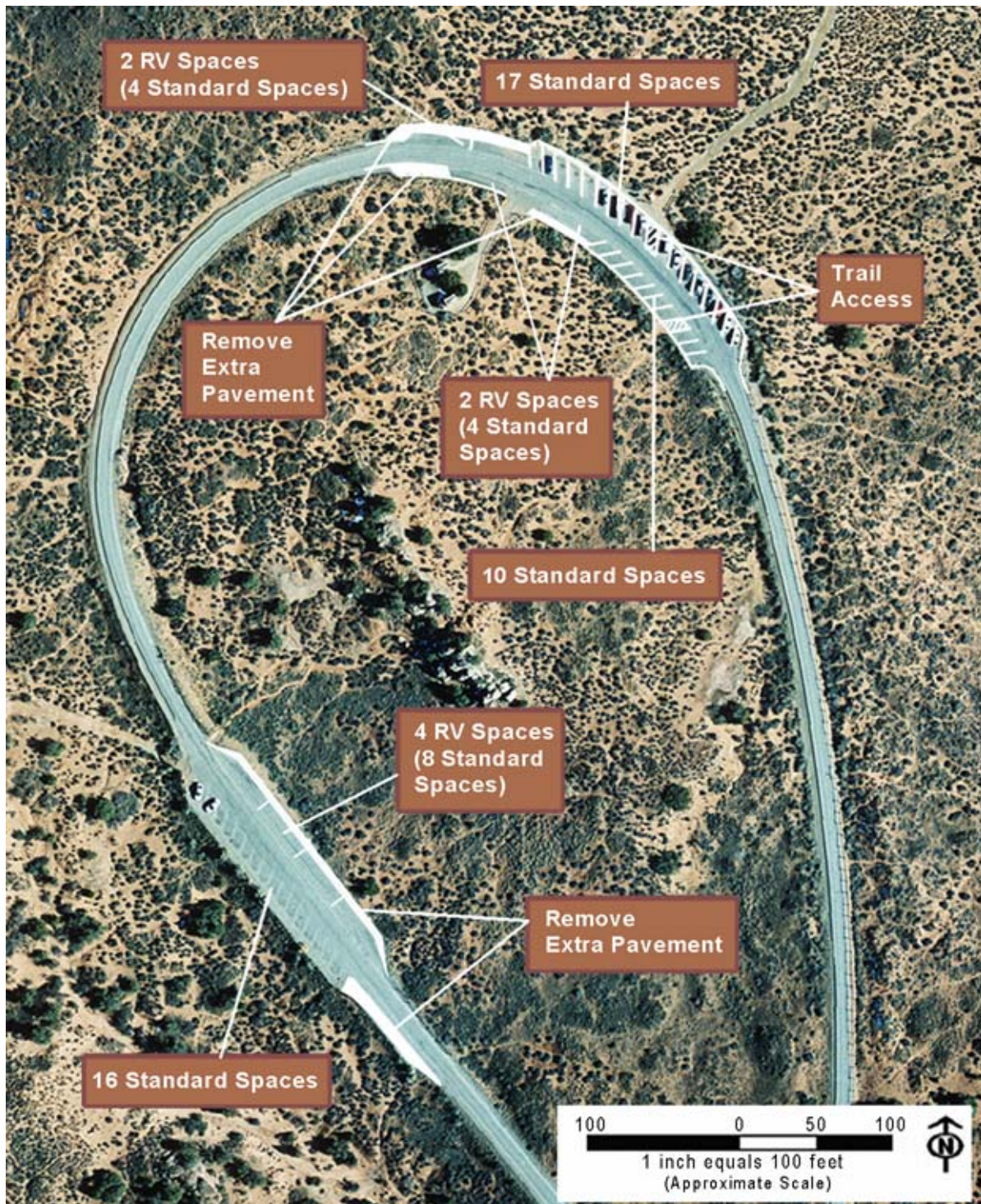




Figure 2.5– Proposed Improvements to the Sand Dune Arch Parking Area





Figure 2.6 – Proposed Improvements to the Skyline Arch Pull Off/Parking Area

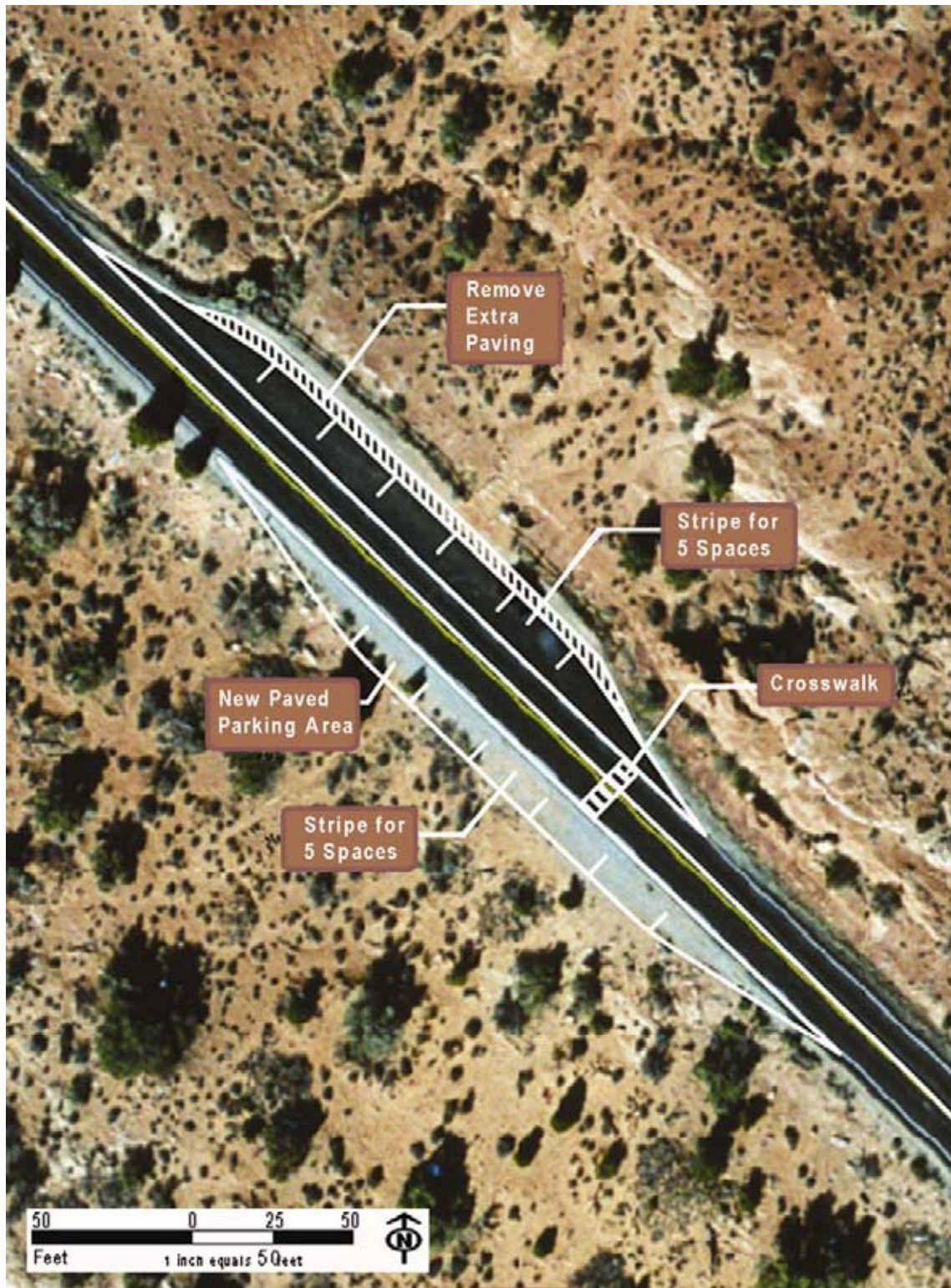




Figure 2.7 – Proposed Improvements to the Devils Garden Parking Area



Note: No new striping is proposed. White lines are shown to quantify parking capacity assumptions.







**Table 2.1 – Calculations of Land Area Disturbance and Rehabilitation at Existing and New Parking Areas**

Parking Areas	Proposed Sq. Footage for Rehabilitation	Proposed Sq. Footage of Additional Disturbance
The Windows/ Double Arch	2,150	0
Wolfe Ranch/ Delicate Arch Trailhead	0	0
Delicate Arch Viewpoint	0	0
Sand Dune Arch Trailhead	5,250	12,650
Devils Garden	6,200	0
Totals	13,600	12,650

**Table 2.2 – Parking Area Capacities**

Parking Areas	Parking Spaces:			Total Spaces
	Standard	Oversized*	Accessible	
The Windows	27	4 X 2		35
Double Arch	16	4 X 2		24
Wolfe Ranch/ Delicate Arch Trailhead	53	11 X 2	2	77
Delicate Arch Viewpoint	26	17 X 2	3	63
Devils Garden Picnic	14		1	15
Devils Garden	101	15 X 2	4	135

\* Oversize spaces account for one RV or 2 vehicles. Maximum capacities of parking lots are sized with the assumption that the RV spaces may be occupied by two vehicles.

## Roadside Pull Off Areas

### Pull Offs to be Retained and Improved

The updated analysis of existing formal and social roadside pull off areas completed in 2004 for Arches National Park proposed that 26 pull offs be retained of the over 200 locations being used as social pull off areas in the park. Of these, 21 would be formally improved with paving, extruded concrete curbing, fencing and rocks placed at outside edges of pavement in some cases, and advanced signing.

The proposed vehicle capacity of each pull off to be formalized, as described in Table 2.3, was established based on original recommendations in the 2001 pull off study and later field review with park rangers as part of the 2004 updated study. Factors considered in establishing recommended pull off sizes included:

- the effective space currently being used as social pull- off space;
- physical limitations (slopes and topography) of the area and proximity of natural resources; and
- the need to minimize or maximize the pull off area to serve the related visitor use and/or to preserve and protect adjacent resources.

Pull off areas proposed to be formalized also would include a three- foot wide pedestrian area of compacted crushed rock adjacent to the outside edge of the extruded curb. This area would provide space for visitors to get out of their vehicles to enjoy scenic views and take photographs.

The other five pull off areas would be retained as unpaved, informal pull offs. These five informal pull off locations would remain in their current condition with minimal improvements (only minor regrading at some locations). The other



locations would be removed from use as social pull offs through treatments at the roadside and environmental rehabilitation. Also, because many of the areas disturbed by social pull off activities are much wider and longer than the area needed to accommodate the proposed pull off improvements, these existing disturbed areas adjacent to areas proposed for formal improvements would be environmentally rehabilitated.

Proposed roadside pull off locations throughout the park to be either formally improved and paved or to be retained as unpaved areas for informal use are depicted in Figure 2.3. The proposed roadway cross section at a formalized pull off area is shown in Figure 2.8 on page 2- 29 and typical pull off configurations are shown in Figure 2.9 on page 2- 30. A photo simulation of pull off improvements is shown in Figure 2.10 on page 2- 31. Additional aerial map graphics have been created for each of the pull off locations showing the proposed area of improvement and the potential area of new disturbance (including proposed pavement to formalize the pull off area, as well as a five- foot work zone around the pull off).

Table 2.3 includes descriptions of existing conditions and proposed improvements related to each of the 21 pull off locations proposed for improvement, beginning in the inbound/ northbound direction of the park road system. Table 2.4 on page 2- 28 provides descriptions of the 5 pull off locations to be retained for informal use.

### **Pull Offs to be Removed and Environmentally Rehabilitated**

Under Alternative B, the proposed transportation implementation plan, it is proposed that over 170 of the existing social pull off areas in the park be removed and the following treatments implemented.

- Physical barriers, extruded concrete curbing, and in some cases, ditching, placement of large boulders, and fencing; treatments would vary per location depending on existing conditions

- Signing and pavement markings indicating “no parking” at selected location (to minimize visual intrusion, the addition of signing would be a last resort and signs would be minimal in size and quantity)
- Broadening of public awareness of the problems associated with social pull offs through campaigns in park newsletters, website postings, word- of- mouth (through rangers), and other methods as appropriate and feasible given the level of available resources and staffing
- Enhanced staff monitoring and patrolling during the rehabilitation period (contingent upon the allocation of additional funding for staff time; some monitoring would be handled through volunteer efforts if appropriate and available)

Areas disturbed by social parking and pull off activity would be environmentally rehabilitated through various treatments. National Park Service resource specialists would be engaged in the development of specific treatment and recovery methods on a case- by- case basis as social pull off areas are rehabilitated.

Revegetation would only be considered where appropriate based on park natural resource specialists’ recommendations. Probable methods of rehabilitation and treatment would include protection from further disturbance, as well as scarifying, raking, and contouring of compacted soils to aid the process of natural recovery. The length of time of recovery would vary depending on conditions, but in some cases, it could take several seasons of growth for soils and vegetation to return to more natural conditions in these areas.

Overall, factoring in the areas to be paved and formalized, as well as areas to be rehabilitated at the pull off locations proposed for improvement, there would be a net area of disturbance of approximately 1,875 square feet. 11,900 square feet of already disturbed area that would be improved for pull off use, offset by 10,025 square feet of already disturbed area that would be rehabilitated at these locations.





Calculations for each proposed pull off improvement location are shown in Table 2.3. In addition, approximately 191,664 square feet (or 4.4 acres) of disturbed area would be rehabilitated at the more than 170 existing social pull off locations throughout the park to be removed and treated, for a total net rehabilitation of 189,789 square feet.

It is anticipated that pull off improvements and rehabilitation efforts would be implemented within the next six years including areas to be improved as well as areas to be treated and rehabilitated. Implementation of this work would be contingent upon the availability of funding for construction work, as well as staff time to direct improvements and rehabilitation efforts and to monitor effectiveness through continued patrols during the rehabilitation period.

### Focus Areas for Initial Rehabilitation and Ongoing Monitoring

The park's goal would be to implement full closure of all social pull off locations within the next six years. However, limitations on funding, staffing, and other resources could require this work to be accomplished over a longer timeframe. With this in mind, the park has identified the following focus areas for initial rehabilitation efforts. Efforts would be focused in these areas initially and then the park would move on to rehabilitate the other areas. Also since these areas currently receive the majority of social pull off activity in the park, they would be continually monitored to assess the effectiveness of the rehabilitation treatments and the need for additional treatments.

**The Windows:** All social pull offs around the Windows intersection would be closed and treated. This area is a high priority for treatment due to the level of social pull off activity that occurs here and the level of degradation that has resulted from this activity. The area would be monitored closely for continued social pull off activity. If initial treatment methods do not deter social pull off activity, additional treatments would be needed to control this activity, including possible fencing.

**Milepost 16 and 17:** Treatments would be implemented throughout the area between Mileposts 16 and 17 to remove existing social pull off locations and deter this ongoing activity.

**Fiery Furnace:** All social pull off areas concentrated around the Main Road/Fiery Furnace Road intersection would be removed and treated. This is an area that would be more aggressively patrolled and monitored by the park to prevent further pull offs from being created.

### Advanced Signing

For safety and sight distance purposes, advanced signing is proposed at eleven of the pull off locations proposed for formal improvements and two of the locations where pull offs would be retained in an unpaved condition (see Table 2.1). Four additional signs are proposed for existing pull off areas (refer to the Traffic Calming discussion). One sign located in advance of each of these pull off locations is proposed. Signing would include words such as "Scenic Pull Off (or Viewpoint) Ahead" and/or the universal camera symbol sign. In accordance with the Manual on Uniform Traffic Control Devices (MUTCD) guidelines, advancing notice signs would be placed approximately 500 feet in advance of pull off areas along the roadway.

The placement and design of signing would be context sensitive and cohesive with the natural setting, as well as responsive to the scenic values of the Arches National Park experience. For example, backs of signs would be painted with a color that blends with the natural environment. Signs would be placed in locations that do not interfere with important views. The number of signs installed and the sizes of signs would be kept to the absolute minimum necessary, and sign clutter would be avoided. Prior to installation of additional signs at the park, a sign plan would be developed to provide an opportunity to confirm the number of signs needed and analyze appropriate locations for placement. The sign plan would be prepared as part of construction contract documents for pull off improvements. The sign plan would be reviewed and approved by National Park Service



staff, along with the other construction plans and documents.

### Promoting Pull Off Activity in Designated Areas

Continuing to promote the use of specific pull off locations by identifying them in existing park maps, brochures, and on the website would help to encourage visitors to plan in advance where they intend to stop for viewpoints, trailheads, and photo opportunities. Promotional efforts could also help to encourage use of lesser-known and less congested pull offs and help to divert use away from pull offs that are used more intensively. This may include designating place names for some of the newly formalized pull offs, if determined appropriate on a case-by-case basis by park staff.

### Monitoring

The park would continue to monitor all roadside areas in the park to identify new social pull off problems as they arise during the rehabilitation period. Areas across the road from formalized pull offs in particular would be

monitored regularly once improvements are made and during the period of rehabilitation. Motorists tend to stop when they see a pull off on the opposite side of the road, with the perception that the location is a good place to stop for various purposes. These areas may need treatment if areas are expanding or social pull offs are occurring in the future. Ultimately, it is anticipated that less monitoring and patrols would be needed than under current conditions once proposed improvements are implemented and rehabilitation efforts have taken effect.

Given that staffing and resources at the park are already limited, and it is anticipated that staffing may need to be further reduced in the future based on current federal budget trends, additional funding likely would be necessary for an effective pull off monitoring program. A variety of potential funding options may be available to support these proposed actions, including funding for increased staffing and resources. Refer to the discussion later in this section for more information.



Table 2.3 – Pull Offs to be Improved for Formal Use

Pull Off	Description	Newly Disturbed Area (SF)	Proposed Rehabilitation Area (SF)
1	This pull off location would be formalized to accommodate two to three vehicles. The existing width of disturbed area would be sufficient for the needed pull off space. This pull off area is located at the end of a horizontal curve on the outside. The estimated sight distance approaching this pull off is less than the guideline distance recommended by AASHTO. Therefore, advance signing (one sign labeled with “Scenic Pull off (or Viewpoint) Ahead” and/or the camera symbol) would be installed at the inbound approach to this location. This location provides a good view of La Sal Mountains.	0	300
2	This pull off location would be formalized to accommodate two to three vehicles. This pull off is located on the outside of a horizontal curve. However, the curve is flat enough to provide the required sight distance. Some regrading and minimal fill (approximately 25 cubic yards or less) would be required in the existing ditch to provide a level pull off area. This fill would be placed over the top of already disturbed and compacted soils (from previous social pull off activities). This location provides a good view of the La Sal Mountains and the Courthouse Towers area.	0	2,500
3	This pull off location would be formalized to accommodate two to three vehicles. This pull off is located on the outside of a flat curve with adequate sight distance. The existing surface, width, and length are adequate, and no new disturbance would occur. This location provides a good view of the Tower of Babel, Three Gossips, Sheep Rock, and other features.	0	200
4	This pull off location would be formalized to accommodate two to three vehicles. The pull off was created when the road washed out and motorists starting using it as a space for parking. This pull off is used for day hiking, canyoneering trips, and overnight backpacking into the Petrified Dunes area. The pull off is located on the inside of a horizontal curve. Existing width and length are more than adequate to accommodate the pull off area needed. Erosion protection and drainage treatments are proposed to prevent future wash outs. This location, at Milepost 6, provides a good view of the Petrified Dunes, La Sal Mountains and the Great Wall.	0	1,250



Pull Off	Description	Newly Disturbed Area (SF)	Proposed Rehabilitation Area (SF)
5	This pull off location would be formalized to accommodate two to three vehicles. The previous study proposed moving this pull off 400 feet to the south. However, sight distance and vegetation disturbance would worsen, so it is now proposed that the pull off remain in its current location. This location provides a good view of Bean Pot Arch, Petrified Dunes, the Great Wall and the La Sal Mountains.	1,000	0
6	This pull off location would be formalized to accommodate two to three vehicles. There is more than adequate width and length present. Sight distance is affected by vegetation at the south end of the pull off, and as such, minimal trimming of the vegetation and advanced signing (one sign in the inbound direction) are proposed. The previous study proposed moving this pull off 200 feet south, but this would create additional new disturbed area. As such, it is proposed that this pull off be retained in its current location. This location provides a good view of the Petrified Dunes, Great Wall and the La Sal Mountains.	0	350
7	This pull off location would be formalized to accommodate two to three vehicles. Ideally, pull off areas should be located a minimum of 100 feet from intersections. However, in this case, traffic is moving slowly as it approaches the intersection, and moving the pull off location would result in more disturbance to soils and vegetation. Also the existing social pull offs in these locations seem to be operating effectively with no reports of traffic incidents. As such, it is proposed that context sensitive traffic calming treatments (colored paving, pavement markings, rumble strips, rocks at the edges of the road, etc.) and advanced signing (one sign in advance of the pull off) be incorporated into the design of this pull off and the intersection area. Such treatments likely would help to minimize confusion and congestion occurring in the vicinity of the intersection.	300	0
8	This pull off location would be formalized to accommodate five to seven vehicles. The pull off is located on the outside of a curve, and sight distance is adequate. Some widening would be needed resulting in new disturbance to vegetation and soils. Minimal grading and import of fill (approximately 25 cubic yards or less) would be needed to provide a more level area for the pull off. This fill would be placed over the top of already disturbed and compacted soils. This location has a good view of Balanced Rock and the Windows section with the La Sal Mountains in the back- round. It is also a popular location for sunset photography.	1,150	0



Pull Off	Description	Newly Disturbed Area (SF)	Proposed Rehabilitation Area (SF)
9	This pull off location would be formalized to accommodate two to three vehicles. Sight distance does not appear to meet the recommended distance. Therefore, advance signing (one sign in the inbound direction) and traffic calming techniques are proposed. This pull off location may be an appropriate place for some interpretation. There is an opportunity to interpret/educate visitors about the adjacent geology (cross- bedding in geologic formations).	1,000	200
10	This pull off location would be formalized to accommodate two to three vehicles. Some minimal widening would be needed. It is proposed that this pull off be moved slightly to the east to better align with the pull off on the opposite side of the road. This also would shift traffic movements into and out of the pull off away from the intersection. This location is a decision- making point for motorists who stop for orientation and/or to read the park map. Ideally, pull off locations should be located a minimum of 100 feet from intersections. However, in this case, traffic is moving slowly as it approaches the intersection, and moving the pull off location would result in additional disturbance to soils and vegetation. Also the existing social pull offs in these locations seem to be operating effectively with no reports of traffic incidents. As such, it is proposed that context sensitive traffic calming treatments (colored paving, pavement markings, rumble strips, rocks at the edges of the road, etc.) and advanced signing (one sign in advance of the pull off) be incorporated into the design of this pull off and the intersection area. Such treatments likely would help to minimize confusion and congestion in the vicinity of the intersection.	200	600
11	This pull off location would be formalized to include space for two to three vehicles. This pull off is located on the inside of a flat curve. The existing width is adequate, but the pull off would need to be lengthened beyond its current extent. Sight distance is limited, therefore advanced signing (one sign in advance of the pull off) is proposed. This location provides a good view of Balanced Rock, the Windows section, Salt Valley and Klondike Bluffs. This is also a popular location for sunset photography.	600	200
12	This pull off location would be formalized to accommodate two to three vehicles. This pull off is located on the outside of a flat curve. Sight distance is adequate. The width and length would need to be slightly expanded. This location may be an appropriate place to interpret geology in the park and information about the factors that have contributed to creating the green color of surrounding formations and lower Fiery Furnace.	450	100





Pull Off	Description	Newly Disturbed Area (SF)	Proposed Rehabilitation Area (SF)
13	This pull off would be formalized to provide space for two to three vehicles. Although the existing width is adequate, this location would need to be lengthened (minimally). This pull off is located on the inside of curve at the terminus of the Devils Garden loop. Therefore, sight distance is limited and advance warning sign (one sign in advance of the pull off) would be needed. Traffic calming techniques would be appropriate due to the traffic congestion that frequently occurs here, and also because motorists tend to travel at faster speeds than appropriate in this area. This area is a decision- making point for motorists stopping for orientation and/or to read the park map.	500	375
14	This pull off location would be formalized to provide space for two to three vehicles. This pull off is located at the outside of the beginning of a curve. Sight distance is adequate. The length of this area appears to be adequate to accommodate a pull off of the proposed size, but some minimal widening would be needed. This is a location where fencing and/or placement of large boulders would help to manage pedestrian access and contain damage to the soils/landscape. This location offers a good view of Salt Valley and is a popular sunset area.	875	0
15	This pull off location would be formalized to accommodate two to three vehicles. Existing width and length are adequate. This pull off is located on the outside of a curve. Sight distance is limited, therefore advance warning signing (one sign in advance of the pull off) is proposed. This is another location where fencing and/or placement of large boulders would help to direct visitors stopping at this viewpoint and contain damage to the soils and landscape. There is a lot of opportunity in this area to focus and contain vehicular and pedestrian activity in this area and to treat existing already disturbed area to help facilitate recovery to a more natural condition.	225	1,500
16	This pull off location would be formalized to accommodate five to seven vehicles. Traffic calming and advance warning signing (one sign in advance of the pull off) would be needed due to the limited sight distance. Some minimal grading also would be needed to expand the pull off area. This area is mainly used for overflow parking at the Skyline Arch trailhead. It is also a popular sunset location with views of Salt Valley and Klondike Bluffs. This would also be an appropriate location for a crosswalk to the trailhead.	900	250



Pull Off	Description	Newly Disturbed Area (SF)	Proposed Rehabilitation Area (SF)
17	This pull off location would be formalized to accommodate two to three vehicles. The area would need to be widened and lengthened to meet pull off safety design guidelines. The space to expand is limited due to existing topography. Sight distance at this location is adequate. This location provides good views of Salt Valley, Klondike Bluffs, the Upper Fiery Furnace and Windows area. It is also a popular sunset photography point.	1,500	0
18	This pull off location would be formalized to accommodate two to three vehicles. The existing width is adequate, but this location would need to be lengthened. This pull off is located on the outside end of a curve. Sight distance is adequate. Some minimal grading may be needed, but likely would result in minimal vegetation disturbance. This location would provide another opportunity to treat a fairly large area of previously disturbed landscape. This location provides a good view of the Salt Valley, Klondike Bluffs and the Fiery Furnace. It is also a popular location for sunset photography.	100	1,200
19	This pull off location would be formalized to provide space for two to three vehicles. Some minimal grading would be needed. The width appears to be adequate. This pull off is located on the outside of a curve. Sight distance is limited, therefore advanced signing (one sign in advance of the pull off) is proposed.	800	500
20	This pull off location would be formalized to accommodate two to three vehicles. The existing pull off area is very small and would need to be widened and lengthened. Sight distance is adequate. This location provides a good view of the Petrified Dunes, La Sal Mountains and Great Wall.	1,100	500
21	This location would be formalized to accommodate two to three vehicles. The existing area, located on the inside of a curve, is small and would need to be widened and lengthened. Sight distance is limited. Therefore, advanced warning signing (one sign in advance of the pull off) is proposed. This location provides a good view of Sheep Rock, the Tower of Babel, Baby Arch and Courthouse Wash.	1,200	0
Total Area =		11,900	10,025
Net Disturbed Area =		1,875* Square Feet	

*\*In addition, approximately 191,664 square feet (or 4.4 acres) of disturbed areas would be rehabilitated at existing social pull off locations throughout the park to be removed and treated, for a total net rehabilitation of 189,789 square feet.*



Table 2.4 – Pull Off Areas to be Retained for Ongoing Informal Use

Pull Off	Description
A	This pull off location would be retained in its current condition with no additional improvements. This informal pull off is functioning adequately for its use, mainly for rescue training by park staff and for use by rock climbers.
B	This location would be kept in its current condition without creating additional disturbance. This pull off is mainly used for the collection of plant resources, an important cultural activity by American Indians. Park staff would monitor this location to confirm that it continues to function effectively for this purpose. The size of this pull off likely would not accommodate more than two vehicles. Also, sight distance is somewhat limited here. Although it is desirable to minimize attention called to this location, installation of one advance warning sign would be proposed.
C	This location would be retained in its current condition with no additional disturbance. The area outside of this informal pull off would be protected from further disturbance through placement of large boulders. This would help contain the pull off to its existing configuration and size.
D	This existing pull off location would be retained as is and monitored closely over the near term to confirm its need. Since sight distance is limited at this location, potential removal and treatment may be desirable. There is a possibility for increased disturbance to soils and vegetation if this area is kept as an informal pull off. The installation of guardrail, fencing, large boulders, and/or other more “heavy” containment treatments may be needed to discourage use.
E	This location would be maintained in its current informal condition, although some minimal grading would be needed to retain a level surface for optimum use. This area is used by rock climbers and for search and rescue training.



Figure 2.8 ... Proposed Roadway Section at Formalized Pull Off Location

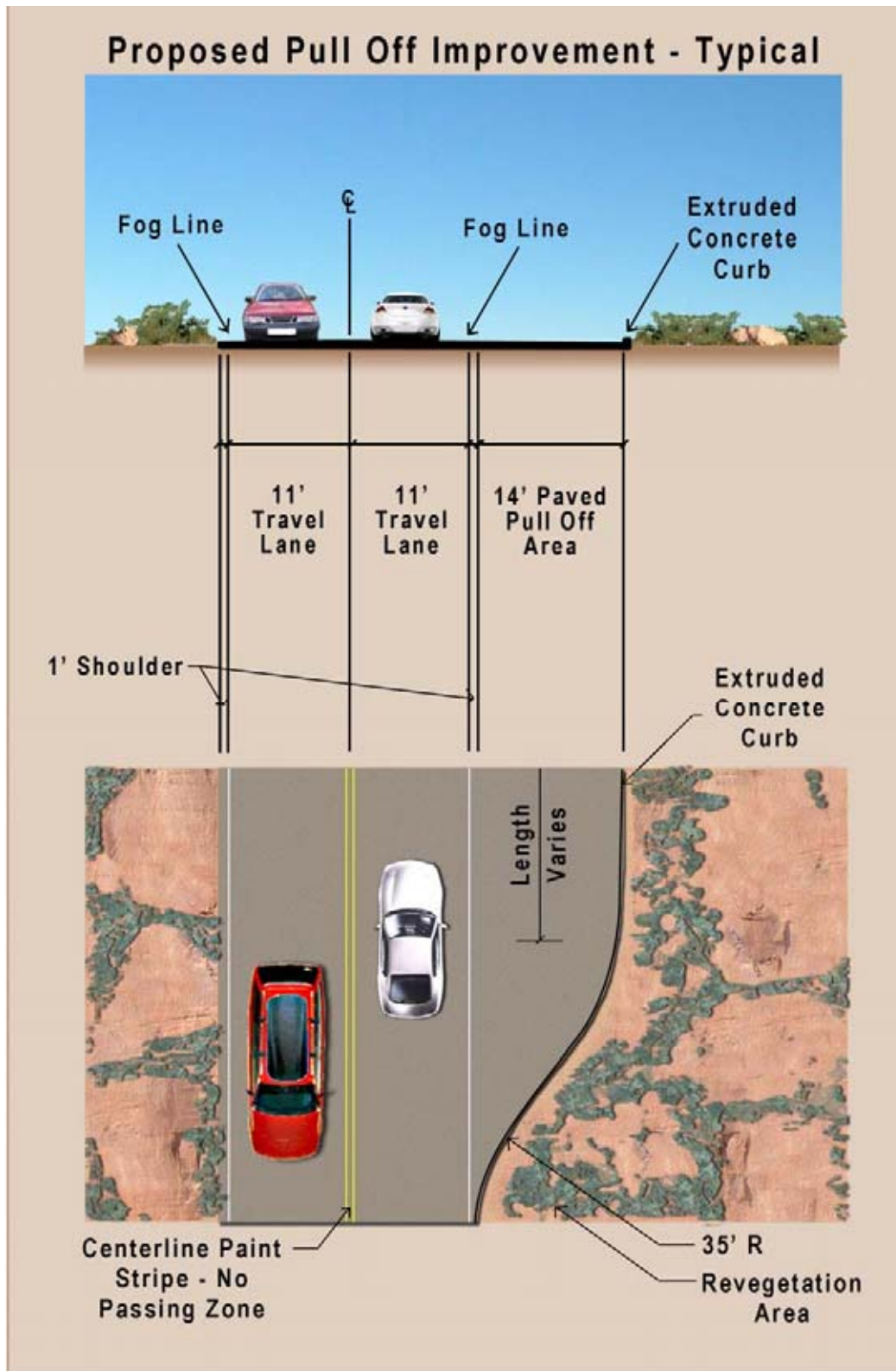




Figure 2.9 ... Typical Plan View of Improvements at Formalized Roadside Pull Off

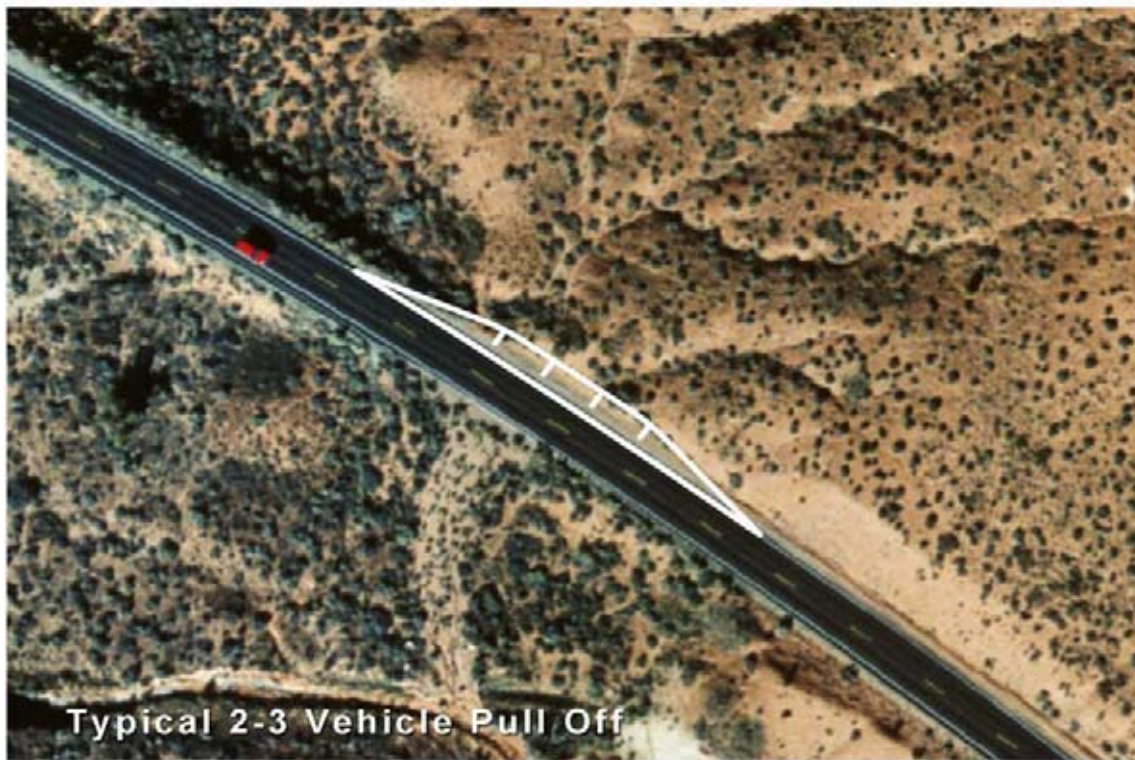




Figure 2.10 ... Pull Off Photo Simulation



Existing Condition





## Traffic Calming

Traffic calming measures would be implemented through various strategies and physical improvements to reduce the traveled speed on roadways while maintaining vehicular capacity in Arches National Park. The most appropriate locations for physical improvements to implement traffic calming at the park are in advance of and at intersections, roadside pull offs, pedestrian crossings, and trailhead areas. Traffic calming applications would include elements such as recessed pavement texturing (rumble strips) and/or pavement markings in advance of areas. Changes in pavement coloring (different from the asphalt concrete surfaces of the park's existing roadways) in advance of these areas and at pedestrian crossings also would be an effective traffic calming tool.

Other possible treatments include signs directing drivers to “slow,” crosswalk stripes, and other elements that would attract drivers’ attention. Advance warning signs placed before pull off areas and pedestrian crossing areas are also effective for traffic calming. These treatments would be designed to be sensitive to the park context and placed to avoid intrusion on the scenic values of the park.

Traffic calming improvements are proposed for the following locations (listed from south to north), as described. Figure 2.3 depicts these locations. Detailed designs would be developed prior to construction.

### La Sal

Advance signing is proposed to optimize use of this existing pull off area. One sign located in the inbound direction in advance of this pull off is proposed. More people likely would use this pull off rather than other social pull offs just to the north if advance signing is provided. The sign would indicate “Courthouse Towers Viewpoint” with a camera symbol – the universal symbol being used in national parks for a photo stop.

## Courthouse Wash

Because motorists tend to travel at higher speeds through this area (including those headed downhill in the outbound direction) traffic calming treatments are proposed for the Courthouse Wash area. A combination of signs cautioning motorists to “slow” and context sensitive treatments to the pavement, such as texturing, rumble strips, and/or change in color at the Courthouse Wash area are suggested. Signs would be placed in advance of the area in both the inbound and outbound direction (one in each direction; two total).

## Petrified Dunes

Advanced signing is proposed to alert drivers of the upcoming pull off, particularly since this is on a stretch of the road where drivers travel at higher speeds. One sign, located in the inbound direction approaching the pull off is proposed. Traffic calming treatments such as pavement texturing and/or a change in pavement color at the pull off area would also help to slow drivers upon their approach to the area.

## Panorama Point

The existing sign located in advance of this pull off would be moved further back. Motorists do not have enough warning to provide adequate time to pull off in advance of this location. Moving the sign further back would prevent some social pull offs from occurring after this location, due to people passing by the pull off too quickly and turning around in that area.

## Skyline Arch

In addition to the two advance warning signs proposed for this pull off (one inbound and one outbound, both located in advance of the pull off), traffic calming such as context sensitive pavement texturing, rumble strips, and/or changes in pavement color in this vicinity would help to slow traffic down in this area, where pedestrians are constantly crossing the main park road.





## Motorized Interpretive Tours

### Overview of Proposed Program

Motorized interpretive and sightseeing tours would encourage expanded visitor experiences and visitation to certain areas in the park while at the same time reducing congestion at some of the more crowded features. Tours would offer visitors another way to experience and travel through the park other than by private vehicle.

Arches National Park proposes to implement a motorized interpretive tour program that would be supported by the park, but operated by a private sector entity. It is envisioned that tour operations would be closely and cooperatively coordinated with the park. It is also envisioned that the tours would originate in and operate from a base in Moab, with intermediate stops between Moab and Arches such as Lions Park. The tour provider would be responsible for tour operations, vehicle maintenance, general marketing and advertising, and other activities. The park would provide support and partnership to the program in a number of ways, summarized later in this section.

It is envisioned that motorized interpretive tours would occur concurrently with general park visitation and park features would continue to remain open to the general public during tours (except Fiery Furnace where access is already limited to guided tours only). More information about managing tour group sizes is provided later in this section.

### The Need for a Motorized Interpretive Tour Program

Currently, no general motorized sightseeing/interpretive tours on Arches National Park frontcountry roads are authorized by the National Park Service through the use of concession contracts or commercial use authorizations. Various types of commercial tours are offered by a number of companies that are not regulated or coordinated through the National Park Service at this time. Most of these tour services are tailored to specific clientele interested in a fully catered experience. The

majority of current tours that include a visit to Arches National Park are focused on guiding visitors to remote areas of the park. Most private tours in the region focus on providing access to Canyonlands National Park and river rafting on the Colorado River. The existing types of tour services offered are typically marketed in association with another type of activity, such as hiking, four-wheeling, and river rafting. The existing tours are tailored and marketed more towards “adventure seekers” and less toward the general population.

There is not a general motorized sightseeing/interpretive tour program focused on providing access to and interpretive information related to a variety of features within Arches National Park that operates on a regular basis (at least during peak visitation periods) or that offers tours at a moderate price range targeted toward and affordable by the general public. The park does provide guided interpretive tours of the Fiery Furnace; however, these tours are conducted on-foot (tour guides meet visitors at Fiery Furnace parking lot) from late March through October. Park staff and volunteers also provide one-hour interpretive walks each day at different locations throughout the park. Although these tours greatly enhance the visitor experience at Arches, a broader motorized interpretive tour program is proposed to provide an alternative to private vehicle access and travel through the park and to further enhance the visitor experience. The proposed tours would enable visitors to enjoy “car free” experience to, from and within the park. Many participants in public meetings were supportive of the idea of guided tours.

The proposed motorized interpretive tours would be provided at price packages marketable to a broad spectrum of the public, based on analysis of comparable tour experiences offered at other national parks and other non-Arches, Moab-based tour offerings. Discounted rates for students, children, seniors, and groups would be factored into the pricing structure.



## Tour Management Structures and the Role of the NPS and Arches National Park

Motorized sightseeing/interpretive tours in the Arches National Park frontcountry would be implemented through a contractual agreement between the National Park Service and a private tour operator through the use of a concession contract. At this time, no such contractual agreement between the National Park Service and private tour operators exists for the provision of frontcountry motorized tours.

The National Park Service has issued a few concession contracts to private tour companies that provide guided tours on backcountry, four-wheel drive roads. Some travel on frontcountry roads is incidental to the conduct of those backcountry vehicle tours, but there are no specific concession contracts with tour providers focusing on frontcountry interpretive/sightseeing experiences at this time.

The best approach for the management structure of the motorized interpretive tour program at Arches would be determined as part of implementation if the NPS proceeds with initiating a motorized interpretive tour program. The NPS would evaluate options and come to a conclusion about the most appropriate and desirable type of permitting or contract method for motorized interpretive tours. The type of management structure implemented would also depend upon the availability of funding for the program to support involvement of Arches National Park staff and resources.

Depending on the selected permitting or contracting structure for motorized interpretive tours, it is anticipated that the NPS and Arches National Park staff and/or volunteers would be involved in the tour program in a number of ways as described below.

- Tour information would be made available at the park visitor center, Moab Information Center and/or other locations throughout Moab.
- Tour promotions, bookings, and fee collection would be handled as part of the operator's

contract. Park entrance fees would remain separate from the fees for the optional commercial tours.

- The park would provide designated parking areas at selected pull offs in the park, where the tour bus would stop to provide a brief interpretive overview and photography opportunities.
- Park staff would maintain control over the content and level of interpretation and possibly the provision of interpretive staff.
- The park would continue partnerships with the City of Moab, Grand County, and the Bureau of Land Management to identify tour stops that benefit regional visitors (e.g. Lion's Park bike path connector).
- Park staff would participate in decision-making related to tour origination points, routes, itineraries, durations, and scheduling.

After determining the specific parameters of the motorized interpretive tour program, Arches National Park would prepare a prospectus that outlines the requirements for operating the business. Interested businesses would then be able to apply by submitting written proposals that respond to established criteria. Primary factors for evaluating proposals include managerial competence, conformance to the terms of the prospectus and financial ability.

## Motorized Interpretive Tour Vehicles and Facilities

### Vehicle Options

National parks around the country are using various types of vehicles in a variety of settings to support a diversity of transportation and visitor needs and interests, everything from inter-city buses and touring coaches to old-style trolleys and other customized vehicles.

The type of vehicle chosen for tours of Arches National Park would include characteristics that encourage ridership, while also minimizing maintenance and operational costs.



Important desirable features of the potential tour vehicles in Arches National Park include the following.

- Character and size that fits the context – appropriate to the Arches National Park setting
- Good ride quality/orientation to visitor experience (air suspension springing, oversize shock absorbers, forward facing seats, large windows and good views to the outdoors, sightseeing roofs, etc.)
- Accessibility accommodations
- Ultra- low emissions, fuel efficiency, and high performance
- Alternative fuel options (as feasible and appropriate to the setting)
- Cargo carrying capabilities (ability to carry hiking, backpacking, cameras, and other equipment in a convenient manner)
- Air conditioning and/or, as feasible, open- air capabilities
- Good quality communications system
- Opportunities for interior interpretation (good audio and/or visual system)
- Vehicle capacity that could accommodate approximately 24 to 28 people, with the size and character of the selected vehicle being in scale with the context of the park and tour pull off areas

#### Visitor Supportive Services and Facilities Onboard

Since no new facilities such as drinking fountains, permanent shade structures, outdoor interpretive and information kiosks, or waiting platforms would be constructed in the near term inside the park, tour vehicles would need to be self sufficient in serving visitors' needs. The vehicles would need to be equipped with air conditioning to serve year- round visitors. Drinking water, interpretive and orientation information, and other services should be provided onboard. Tour operators would be

required to collect trash associated with drinking water (e.g. cups or plastic bottles) while onboard tour vehicles and would be required to dispose of the trash at a suitable, legal location outside the park. Tour vehicles likely would not need to include restrooms. Tour passengers would have opportunities to use restrooms at the visitor center and other locations (such as pick- up points in Moab, Devils Garden, etc.), so onboard restrooms would not be a necessity.

#### Fuel and Propulsion Options

The National Park Service is committed to the use of alternative fuels when feasible, due to environmental benefits associated with their cleaner burning characteristics and other factors.

The use of alternative fuels is expanding and alternative fuel technology is advancing all the time. About 30 percent of transit vehicles being built in the US use alternative fuel and propulsion systems, primarily compressed natural gas (CNG). The evaluation of fuel and propulsion technologies needs to consider the vehicle size and requirements, available resources, necessary power for the terrain traveled, performance, reliability, cost, and environmental conditions.

Preliminary research on availability of alternative fuels in the park region was completed during development of the transportation implementation plan. According to the US Department of Energy's Alternative Fuels Data Center, there are several alternative fueling stations for CNG, propane, biodiesel, and ethanol in Utah. Both CNG and propane would be readily available in the Moab area. Questar, a natural gas company, operates a natural gas compressor in Moab. Mountain States LP Gas has a large storage facility in Moab where a privately used propane tank could be placed on site.

Bio- diesel is becoming a more readily available fuel source, but more study would be needed to determine the feasibility of using this source for motorized interpretive tour vehicles at Arches National Park (given that manufacture of





necessary levels of the fuel would need to occur locally).

With the use electric and hybrid vehicles, there would be a need for special storage, maintenance, and disposal facilities related to electrical charging units and equipment. These facilities would be part of the tour operations and maintenance facility in the Moab vicinity outside the park, if the tour program is implemented.

Although alternative- fueled vehicles are typically more expensive than conventional internal combustion vehicles, grants and funding may be available to cover these costs due to the environmental benefits they provide. Overall, the strong environmental benefits that can be realized through the use of alternative fuels warrant the serious consideration of viable options for the area when selecting a specific vehicle type for use at Arches National Park.

For more description of the characteristics and benefits associated with various fuel and propulsion options, refer to the Motorized Interpretive Tour Feasibility Analysis.

### Facilities to Support Motorized Interpretive Services

The motorized interpretive tours would need to be supported by a system of facilities and services, including facilities outside the park, based at a potential tour operations headquarters in Moab or other nearby location, as well as facilities inside the park. There is no developed space available for tour facilities inside the park, other than for tour bus drop-off/pick- up and staging in already paved areas. A strong benefit of establishing a partnership for motorized interpretive tours with another entity is that vehicles would be stored and maintained off- site at the tour operator's facility. Also, visitor facilities (such as ticketing) would be based in Moab under the responsibility of the tour operator.

### Facilities and Services Outside the Park

It is envisioned that motorized interpretive tours maintenance and operations facilities would be

located at a Moab headquarters site associated with the private tour operator's business. Necessary maintenance and operations facilities to support a motorized tour service could include the following.

- Tour bus/vehicle storage area (could be indoor or outdoor)
- Tour bus/vehicle maintenance facility with washing station, equipment and parts storage area, and bus "barn" for repairs
- Management and operations offices and facilities (i.e. work spaces, dispatch facilities, drivers' lockers, lunch room, restrooms, etc.)
- Fueling station and fuel storage area
- Ticketing facilities (could be multiple sites and could include availability at visitor centers, hotels, and other sites tied together through Internet communications)
- Park- and- ride facilities (could be multiple sites and could include partnerships with local hotels, employers, etc. to use available parking areas in Moab as "park- and- ride"/ tour bus drop- off and pick- up locations)

### Facilities and Services Inside the Park

Tour vehicles would be able to use existing pull off configurations and parking areas for tour passenger loading and unloading and no new facilities or paving areas would be constructed specifically for tour use. Proposed parking and pull off improvements are described previously in this chapter.

As such, facility needs inside Arches National Park would be limited to parking/staging areas (with time- limited spaces for visitor drop- off and pick- up) within *existing* paved parking areas at the following sites within the park, as well as designated pedestrian waiting areas within existing sidewalk and pathway spaces at these locations.

- Visitor Center
- Moab Fault Pull Off (existing interpretive sign – would be a quick stop/photo opportunity)



- Park Avenue Trailhead
- La Sal Viewpoint
- Courthouse Towers
- Petrified Dunes
- Balanced Rock
- The Windows/Double Arch
- Panorama Point
- Delicate Arch Viewpoint
- Fiery Furnace (brief photo stop only)
- Sand Dune Arch
- Devils Garden

At these locations, the tour stop would provide visitors with opportunities to get off the bus and visit the attraction, take a few photos, and then board the bus again to depart to the next location. Visitors would be expected to arrive and depart when the tour vehicle arrives and departs. Interpretive programs would be disseminated by the tour guide and/or by audio programs onboard and printed materials.

The use of the sites listed on this page for tour bus staging/parking during visitor drop-off and pick-up would depend on the tour itinerary option(s) in operation (see below and next page) and may vary throughout the year depending on seasonal demands and management decisions.

In order to accommodate tour vehicle pick-up and drop-off at these locations, some minor configurations of pavement striping and marking within existing parking and pull off areas may be needed. No new pavement or improvements outside areas already developed would be needed. Small, discreet signs or cues in the pavement would be provided to indicate the locations of tour vehicle boarding/deboarding areas to tour passengers. An added benefit of a specific staging/parking area at the visitor center and other locations in the park would be increased visibility of the tour buses and corresponding marketing benefits.

## Options for Tour Scheduling, Routing, Frequency and Durations

### Strategic Scheduling

Tours would be strategically scheduled to reduce traffic and parking congestion (and potential crowding at park attractions) in accordance with these objectives:

- Focus some tours around the off-peak hours to spread visitation through the entire day and reduce the peak demand for parking and access; and
- Focus some tours around peak visitation hours to reduce private vehicle congestion (visitors experience the park via the tour service, leaving their private vehicles in Moab).

As such, tours scheduled throughout the day, covering both peak and off-peak periods, would be the most effective means to reduce traffic and parking congestion, with a number of different touring options available to reach the broadest possible spectrum of visitors. Additionally, the financial feasibility of the tour program would depend on its broad availability. Tours would need to be convenient to use with multiple options for scheduling to appeal to the diverse needs and interests of park visitors. Flexibility and adaptability to visitor needs, balanced with reliability and consistency in tour scheduling would help to ensure a successful tour program.

The targeted audiences for tours and seasonal activities also could shape the itineraries developed for the tour program. Tour audiences may be interested in various experiences such as:

- Interpretive, informational, and educational;
- Scenic/sightseeing/photography (including sunrise and sunset groups); and/or
- Recreation/leisure hiking (timed to avoid the heat of the day in summer).

Providing variety in the tour timing, itineraries, and attractions visited would help to sustain participation and tour vehicle ridership over the long term. Multiple-time park visitors would have the ability to choose different tours and



experience the park differently each time they come.

### Example Tour Itineraries

Example tour itineraries presented below are based on Arches National Park visitor interests and park staff's insights into visitation patterns and typical lengths of visits at various features.

#### *Two- Hour Tour of Arches National Park*

The two- hour park tour would actually be three hours roundtrip, originating at a pick- up location in Moab and ending at the same location in Moab for drop- off. Within a typical twelve hour day from approximately 7:00 am to 7:00 pm, four three- hour trips could be completed using the same vehicle (including time for boarding and deboarding of each group and driver breaks). In the winter, a typical day of tours would shorten, but could lengthen in the summer depending on demand. The two- hour park tour would include:

- Initial pick- up in Moab
- Start of park tour at Visitor Center – park orientation, opportunity to visit bookstore
- Drive to the Windows and Double Arch – brief stop / photo opportunities
- Drive to Delicate Arch viewpoint – short walk to the viewpoint
- The entire trip would be mostly driving/sightseeing from the tour vehicle and could involve additional quick stops at La Sal Viewpoint and Park Avenue depending on scheduling
- Possible stop at Visitor Center on the way back to Moab
- Drop- off in Moab

#### *Half- day Tour of Arches National Park*

The half- day park tour would actually be five hours roundtrip, originating at a pick- up location in Moab and ending at the same location in Moab for drop- off. Within a typical day, two five- hour trips could be completed using the same vehicle (including time for

boarding and deboarding of each group and driver breaks). The tour would include:

- Initial pick- up in Moab
- Start of park tour at Visitor Center – park orientation, opportunity to visit bookstore
- Balanced Rock – short hike of the trail
- Proceed to Windows for a short hike/ photo opportunity
- Picnic lunch at Devils Garden
- Full park drive; stop at a couple of scenic pull offs
- Delicate Arch Viewpoint – short walk to the viewpoint

#### *Full- day Tour of Arches National Park*

The full- day park tour would actually be seven hours roundtrip, originating at a pick- up location in Moab and ending at the same location in Moab for drop- off. Within a typical day, one trip could be completed using the same vehicle (including time for boarding and deboarding of each group). This “full day” tour would be geared more towards recreationists and hikers seeking a longer duration experience in a targeted area of the park, rather than sightseers looking for a general tour. The tour would include:

- All or portion of the half- day activities plus guided hikes to Fiery Furnace and/or Delicate Arch (or other locations) for total duration of six hours in the park

### Proposed Pilot Program

Based on research of tours and shuttle programs implemented at other national parks and attractions, it is proposed that the motorized interpretive tour services at Arches National Park start with a pilot program. This program would initiate with a smaller initial number of vehicles in the fleet during the first one to two years of operation. Three tour vehicles would be procured for the initial pilot program. The pilot program would go through a period of testing of the itineraries proposed and other various





touring scenarios. The initial program could operate the three vehicles on the three different tour itineraries (2- hour, half day, full day) and monitor tour participation, visitor interests, and scheduling conditions. If one type of tour seems to be in higher demand, the tour provider could adjust the scheduling and pricing to provide more tours on that schedule.

Implementation of a pilot program would provide an opportunity to “test” the market and level of interest in interpretive/sightseeing tours at Arches, as well as to “fine tune” the capacity of the tours if needed during peak visitation periods to manage visitation within accepted VERP levels at park features. After a period of one year, the performance of the tour program would be measured against specific goals, objectives and criteria established at the beginning of the pilot program.

With the operation of 24 to 28 passenger vehicles, the pilot tour program would have the capacity to accommodate 168 to 196 people per day. This represents roughly 8 to 10 percent of the daily average visitation at the park, and would take approximately 70 to 80 cars per day off of park roads, assuming that tour passengers would otherwise be coming to the park in their private vehicles (at 2.4 people per car).

### Formal Tour Program Operation

If the pilot program has been successful, additional vehicles could be procured, expanding the fleet and the number of tours offered. Market demand would help to determine the ultimate capacity of the tour program, but this demand would need to be balanced with the VERP goals for visitor capacity at features throughout the park. The initial expansion beyond the pilot program could involve doubling the numbers of tours provided and procuring an additional three tour vehicles plus a spare to serve the program, for a total fleet size of seven vehicles as the starting base of formal tour operations.

With multiple itineraries of tours operating at the same time in the park, the tour program managers would be able to vary tour routing so

that there would never be more than one tour vehicle at any given time in a pull off or parking area. Given the proposed capacity of the tour vehicles, the length of the park’s roadway system, and the proposed limitation of only one tour vehicle at one time in pull off and parking areas, it is not likely that the tours would contribute to overcrowding or congestion, particularly if tour sizes and visitation levels at sensitive park features are carefully managed during the peak visitation periods.

VERP monitoring during the pilot program and during ongoing formal tour operations would be an important tool in aiding management of visitation levels (including tour sizes, frequencies, and durations) at park features.

With the formal tour program operation, assuming 24 to 28 passenger vehicles, the program could accommodate 336 to 392 people per day under the initial base operation scenario (with the seven- vehicle fleet). This represents 16 to 20 percent of the daily average visitation at the park and would take approximately 140 to 160 cars per day off park roads.

### Level of Public Interest/Market Demand

Based on analysis of existing tour services at Arches National Park and the results of travel surveys conducted in 2003, there appears to be a solid interest and therefore an unmet market demand for motorized interpretive tours. Particularly since comprehensive park tours geared toward the general population (and less toward adventure seekers and sports enthusiasts) are not currently being offered at Arches National Park, the demand for this new type of “car free” experience likely would be high.

The results of visitor surveys conducted in 2003 indicate there is public interest in guided bus tours at Arches National Park. Of the 52 percent of respondents who indicated an interest in shuttling services at the park, over 50 percent were interested in having guides and information on the shuttles. Of the 48 percent of the respondents not interested in shuttling services, 65 percent expressed that they would



be more interested in using a shuttling services if a guide was provided.

Many survey respondents specifically expressed an interest in tours and shuttling based on their positive experiences at other national parks in the region (particularly Zion National Park in southern Utah). Also, Arches National Park is frequented by higher proportions of international visitors, who are typically more familiar with and interested in touring and shuttling experiences. Given the survey results and information above, tour participation levels of 8 to 10 percent of overall park visitation during the pilot period and 16 to 20 percent of overall park visitation during formal tour operation do not seem unrealistic. Implementation of the proposed pilot program would provide the opportunity to test the market demand and visitor interest in tours, as well as these anticipated participation levels. Many participants in public meetings were supportive of the idea of guided tours.

### Tour Pricing and Operational Cost Analysis

In a review of comparative touring experiences at other national parks, it appears that visitors are willing to pay a wide range of prices for interpretive tours commensurate with the length of the tour and the quality of the experience. Shorter duration tours (from one to two hours) typically range from around \$10.00 to \$20.00 or higher in average price per person. Longer half-day and full-day tours typically range from \$25.00 to \$50.00 or more per person. Tour prices vary depending on attractions visited, services provided, the availability of snacks or meals, and other factors.

This research on tour pricing at other national parks and attractions was conducted to determine potential pricing structure scenarios for the motorized interpretive tour program at Arches National Park. This analysis, coupled with the projected estimates of tour participation during the pilot program and later during formal operation, provides insight into a possible financial plan for the tour program as a sustainable private business venture.

The feasibility analysis completed for the tour program estimated potential operational and maintenance costs associated with a motorized tour service. Various operational scenarios were evaluated.

- Lowest- cost scenario: tour bus driver serves as interpretive guide (or audio program is used, or park provides volunteers or staff support for tours); minimal budget for marketing/promotions and visitor amenities onboard.
- Mid- range cost scenario: tour bus driver and separate interpretive guide provided by tour provider; mid- range budget for marketing/promotions and visitor amenities onboard.
- Higher cost scenario: tour bus driver and separate interpretive guide provided by tour provider; higher budget available for marketing/promotions, and amenities onboard (such as snacks, sack lunches, water, etc.)

The feasibility analysis also suggested potential strategies and incentives for sustaining tour participation over the long term and for discounts and package pricing. The analysis confirmed that a motorized interpretive tour program at Arches National Park has the potential to become an economically sustainable venture depending on pricing, tour schedules and itineraries offered.

### Tour- Related Interpretive Services: Options for Arches National Park Involvement

If motorized interpretive tours are provided through a service or concession contract, Arches National Park would be able to partner with the tour providers to help shape the character and quality of the interpretive program conveyed to visitors aboard buses. Discussions with park staff have indicated a strong interest in ensuring that interpretation is accurate, encourages stewardship, and enhances the visitor experience. Involvement of Arches National Park staff in the development of a bus tour



interpretive program would be one way to ensure these goals are accomplished. Additional park operations funding would be needed to dedicate staff time to this effort. There are a number of ways park staff could assist with interpretive programs as part of motorized tours.

- Park staff could provide interpretive text for tour operators (if time can be budgeted and allocated for this effort).
- Park staff could provide interpretation training/education/auditing for private tour operators/guides and/or volunteer tour guides (if additional staffing is funded for such services).
- The park could provide automated audio/visual tour materials (or assist with development and direction of such materials) for use during park tours (if additional funding is provided for such services).
- Park staff could oversee development of printed materials and displays to be distributed to tour participants and displayed on buses and at tour stops (if additional staff time would be funded/allocated).

Another option would be for the NPS to provide staff and/or volunteers as tour guides and interpreters. One benefit of this strategy would be the opportunity to enhance visitor experience and resource protection through the level of and quality of interpretation provided. There may also be an opportunity to integrate VERP monitoring activities with the tour program (visitor surveys administered as part of interpretive tours). Contribution of these services (funded through the National Park Service) also would help to get the private tour program started and established, particularly if qualified personnel from the private sector are not readily available to guide the tours and provide interpretation. Additional funding for staffing and operations also would ensure ongoing monitoring of resource conditions at popular park features once the tour program is established.

## Marketing and Promoting the Tour Program

Arches National Park staff would review materials developed by the tour operator. Park staff also would coordinate with regional partners and tourism organizations to develop appropriate messages to be reflected in the marketing, advertising and promotional materials developed by the commercial tour provider. A commitment to an effective marketing and advertising campaign would help to ensure the success of the tour program. A key area of emphasis of the campaign would be to encourage visitors to leave their vehicles in Moab and visit the park via the motorized interpretive tour options. This would decrease the amount of traffic on park roads and regional roads, and help increase economic activity in Moab.

Tour information would be integrated into Internet- based programs of the region, including tourism websites and the park's website. Multiple locations in Moab would become venues for tour booking, as well as for marketing and promoting the tours. Information displayed in the visitor center about congested conditions would provide an incentive for visitors to use the tour services. Lastly, designated parking for tour buses in visible and conveniently accessible locations at the visitor centers would provide direct marketing exposure for the tours.

## Managing Tours in Consideration of Visitor Experience and Resource Protection (VERP) Implementation Plan Thresholds

For those attractions where visitation levels sometimes exceed thresholds prescribed in the park's Visitor Experience and Resource Protection (VERP) Implementation Plan, it would be desirable to monitor the affects of tours, and if necessary, limit the numbers of visitors arriving and departing these locations in tour groups. This would be of particular importance during times of peak visitation (seasonally and daily). Management of tour





group size would be handled in a number of ways. One of the simplest approaches would be to either discontinue tours in the sensitive locations (rerouting to other areas of the park) or to allow only tours and prohibit access by private vehicles during peak visitation periods when VERP thresholds are likely to be exceeded. Also tours could be timed to avoid periods of congestion and to spread out visitation at these features. The park would work with the tour operator to manage scheduling, frequency, and duration of tours and to make adjustments during peak visitation periods as needed to ensure that visitation levels at sensitive attractions are maintained within acceptable VERP thresholds.

### Intelligent Transportation Systems

The proposed actions for ITS improvements in Arches National Park are focused on improving and utilizing regional and park systems already in place. Proposed actions that would be implemented within the next six years include the following.

- Integrate Arches visitor information with Utah's statewide 511 system.
- Enhance the existing Highway Advisory Radio (HAR) system.
- Enhance the utilization of Closed Circuit Television (CCTV) real-time footage of the entrance station for in-park monitoring, security, and traffic counting (by connecting CCTV cameras to the park network and adding vehicle counting software – computer upgrades and software additions would be added to the park's current system being used for security monitoring via CCTV, inside one of the existing park buildings). These improvements would preclude the need for inductor loops at the entrance station and would automate the vehicle counting process and provide counts in an effective electronic format for use in later transportation planning and analysis.
- Distribute the Arches ITS study to regional stakeholders.
- Enhance the use of the Arches National Park website information to broaden awareness about travel and parking conditions inside the park and to distribute visitation to off peak times and/or to less congested areas of the park.

In addition, as Internet communications of the National Park Service and region continue to evolve in the coming years, the availability of real-time information over the park's website would become an even more useful tool to visitors planning their trip to the park.

Additional real-time information indicating typical conditions at the park, orientation to parking areas and capacities could be posted on the website. Electronic kiosks potentially could be installed in Moab and at the visitor center at the park to help guide visitors and manage visitation levels at key features.

In the near term, information would be posted online based on staff knowledge of current park conditions. Over the long term, there may be an opportunity for loop sensors and remote video in parking areas throughout the park to provide immediate surveillance and reporting of parking conditions back to the system. Currently, the lack of available electrical power throughout the park and the difficulty in maintaining these types of systems with limited staff and resources present challenges that need to be studied further before implementation can occur.

Figure 2.11 on page 2-45 shows a conceptual illustration of an information kiosk that could be placed at the visitor center at the park or in Moab. In the near term this information kiosk could contain a static display of the parking areas and capacities at the park. Over the long-term it could be converted with electronic capabilities to display real-time parking conditions in the park.

### Continuing Partnerships with Regional Interests

Continued partnerships between Arches National Park, other federal agencies such as the Bureau of Land Management (BLM), state agencies such as Utah Department of



Transportation (UDOT) and Utah State Parks, and local and regional interests such as the City of Moab and Grand County, would help to ensure ongoing effective management of tourism and visitation patterns and characteristics of the regional transportation system over the long term.

Partnerships with the BLM and state, regional, and local agencies would help to ensure that the visitation and congestion management strategies listed below can effectively be implemented.

### **Ongoing Visitor Experience and Resource Protection Monitoring**

Monitoring of visitor experience and resource protection indicators and standards at key features within the park is an important tool for park staff in managing visitation and congestion at Arches National Park. The ability for park staff to determine if standards are being met can only occur through monitoring. Analysis of the results of annual monitoring assists park staff in making sound decisions related to future visitor use and transportation management strategies and actions.

As such, the transportation implementation plan proposes that VERP monitoring continue at Arches National Park. Ongoing monitoring would require continued annual operations funding for the park to support the program.

### **Other Visitation and Congestion Management Strategies**

If park visitation continues to increase and individual features continue to experience overcrowding during peak visitation periods, various visitation management strategies would help to ease congestion.

The various strategies described below would not require physical improvements in the park, but would likely require additional staff time and operational resources to ensure effective program implementation. A variety of potential funding options may be available to support these proposed actions, including funding for increased staffing and resources. Refer to the

discussion later in this section for more information.

There is flexibility in how any or all of these strategies would be implemented. The park likely would try some different approaches on a trial basis to test their effectiveness before making more permanent changes.

### **Disperse Regional Visitation and Promote Off- Peak Visitation**

This strategy would involve continued coordination between Arches National Park and partnering agencies (such as the BLM and state parks) to develop and implement strategies for dispersing visitation throughout the region. In addition, the park would continue to work with regional tourism interests in an effort to shift visitation from the peak season to shoulder seasons and improve year- round economic development opportunities for the region. The park would also explore opportunities to encourage visitation at different times of the day (dispersing visitation throughout the day, helping to relieve congestion during peak periods).

Promotional material and websites would advertise shoulder season tourism opportunities to help disperse visitation throughout the year. Additionally, visitors coming during the peak season would be encouraged to visit the park during off- peak times of the day, such as in the morning or early evening, and to visit other areas in the region during the middle of the day. Tourism promotional materials would continue to place an emphasis on the diversity of opportunities for visitors to the region, including mountain biking areas, hiking and camping opportunities on BLM lands, rafting trips down the Colorado River, and other activities.

### **Communication and Outreach Strategies/ Advanced Trip Planning**

This strategy would focus on public information and education related to advanced trip planning. These communications would provide another opportunity to encourage visitors to enjoy the park during off- peak periods and to disperse



visitation throughout the region. If visitors are aware of the most congested times in the park in advance, they may choose to plan their trips differently. They may be willing to come to the park earlier or arrive at a later time. Advanced trip planning information would be available via the park website, at the Moab Information Center, at hotels, and other visitor centers around Utah. Visitors would also have access to information about park tours before coming to the park. If advanced information is provided, visitors may choose to experience Arches National Park via the motorized interpretive tour.

### Key Feature Management

The park currently limits visitor access to Fiery Furnace through a permit system with daily limits on the total numbers of visitors, or the option of a limited number of ranger- guided tours. During peak visitation periods in future years, as visitation increases, it may be desirable to manage visitation to other key features through a similar approach. Implementation of this program would only be needed if conditions at particular features were failing to meet standards, and in this case, managed access likely would only be needed during peak visitation periods.

The Delicate Arch trail could potentially be a candidate for a permit system or “guided tours” program during peak visitation periods. A pilot program could be implemented for Delicate Arch during a season of high visitation to determine the effectiveness of this strategy. The purpose of this program would be to manage access and disperse visitation so that people could have a higher quality experience at Delicate Arch, but not to restrict access. If the program is effective, visitors would not be denied a trip to the arch. Rather, scheduling through the permit system or a guided tour may mean that they would need to visit at a specific time rather than spontaneously. If a permit or guided tour wasn’t available at their first choice of times, they would be encouraged to reschedule to another time of day or to another day during their length of stay in the area.

The motorized interpretive tour program also would provide some opportunities to manage visitation and crowding at key features. The various tours could be scheduled to create a sequencing of visitation that takes the pressure off the most highly visited areas (Windows, Delicate Arch, Devils Garden) during peak visitation periods.

Park information distributed to visitors also would encourage certain patterns of visitation. For example, visitors entering the park in the morning could receive a “suggested tour route” handout that explains how they could proceed through the park. Visitors arriving in the afternoon, could receive a different “suggested tour route.”

### Expanded Visitor Recreation and Interpretation Opportunities

Expanding visitor recreation opportunities into areas of Arches National Park that experience less congestion would help to distribute visitors away from key features that tend to experience more intensive visitation. For example, picnic tables are proposed for the Delicate Arch Viewpoint parking area and Park Avenue parking lot to provide expanded picnicking opportunities and disperse that activity from other areas.

Additionally, because the existing Balanced Rock picnic facility is adequate in size and space, but not signed properly, it is proposed that additional signs showing the universal symbol for picnic facilities be located prior to the turn-off (one sign in inbound and one sign in outbound direction). These signs would be consolidated on existing posts identifying the pull off area. Signing would help to encourage more use of the Balanced Rock area.

Seasonal/temporary shade- providing elements at these locations would help to encourage more picnicking activity. The design and placement of these shade canopies would need to be fully sensitive to the surrounding visual context. Light- weight, low- profile, airy, tensile covered “lean- tos”, built to withstand the sun and heat could be erected during peak visitation times in



summer and then removed and stored during other seasons.

Additional interpretive signs would be placed at a few pull off areas to enhance the motorized tour experience. Refer to the roadside pull off discussion under Alternative B.

Visitor information materials would continue to be updated to promote new picnicking locations and interpretive opportunities. Information materials would also encourage visitors to try some of the lesser known recreational experiences and trails in the park, dispersing visitation away from the more popular features that experience congestion.

### Estimated Costs of Implementing Alternative B and Potential Funding Sources

The estimated capital costs (to the National Park Service) of implementing the proposed action, Alternative B, are depicted in Table 2.5 on page 2- 49. Anticipated Arches National Park staffing needs to support implementation of Alternative B are shown in Table 2.6 on page 2- 50.

Various funding opportunities may be available to support the proposed transportation implementation plan actions. The NPS Transportation Management Program or Federal Lands Highways Program, Category III program may be direct funding sources for congestion management measures. FLHP Category I, NPS Fee Demonstration or Line Item Construction programs could potentially fund road and parking improvements. Other funding possibilities that could be explored for various parts of the recommendations include private or cooperating association fund raising, Federal Transit Authority section 53U program, State Scenic Byway programs, or transportation improvements that are a component of a park commercial services contract.





Figure 2.11 ... Parking Information Kiosk Concept





Table 2.5 – Estimated Costs of Implementing Alternative B

Proposed Element / Description	E Estimated Capital Cost Range		
Redelineation, pavement removal and rehabilitation improvements at Devils Garden (includes additional signing and edge treatments such as fencing, boulders, etc.)	\$ 95,000	to	\$125,000
New parking area development, trail connection and pavement removal and rehabilitation of old pull off areas at Sand Dune Arch	\$300,000	to	\$340,000
Signing/stripping for a temporary tour bus stop at Delicate Arch Trailhead/Wolfe Ranch Parking Area	\$3,000	to	\$5,000
Add picnic tables to at west end of Delicate Arch Viewpoint Parking Area and Park Avenue Trailhead area	\$5,000	to	\$10,000
Redelineation, pavement removal, and rehabilitation improvements at the Windows/Double Arch (includes additional signing and edge treatments such as fencing, boulders, etc.)	\$65,000	to	\$90,000
Traffic calming improvements	\$75,000	to	\$150,000
Roadside pull off improvements – new pavement and curbing and rehabilitation of disturbed areas (includes development of sign plan, installation of signing, and edge treatments where necessary, such as boulders and fencing)	\$600,000	to	\$675,000
Rehabilitation of social pull off areas (approx. 175 locations)	\$1,150,000	to	\$1,260,000
Intelligent Transportation Systems	\$30,000	to	\$60,000
Other Congestion and Visitor Management Strategies	\$40,000	to	\$50,000
<b>Total Estimated Capital Costs of Alternative B:</b>	<b>\$2,363,000.00</b>	<b>to</b>	<b>\$2,765,000.00</b>

*Note: Capital and operating costs associated with the proposed sightseeing/interpretive motorized tour program would be the responsibility of the private tour provider. One exception would be if the National Park Service provides funding for interpretive guides (as an optional element of the program). Estimated staffing needs and associated salary costs are depicted in Table 2.6 on the next page.*



Table 2.6 – Estimated Staffing Needs to Support Implementation of Alternative B

Staffing Needs / Responsibilities	Estimated Salary Range		
1 Full Time Equivalent (FTE) park planner or capital project manager with expertise in transportation; could be a limited time position during implementation of transportation plan (GS 9 to GS 11)	\$66,200 (1)	to	\$72,000 (1)
1 to 1/2 FTE interpretive planner to assist with programming of motorized interpretive tour program; these duties would only be needed for a temporary period of time; then it is assumed existing interpretive staff could provide periodic support to motorized interpretive tour program as needed (to update interpretive information, monitor program effectiveness, etc.) (GS 9 to GS 11)	<i>1 FTE:</i> \$66,200 (1)	to	\$72,000 (1)
4 FTE tour/interpretive guides during the pilot period and 7 FTE tour guides for full tour program implementation (GS 5 to GS 6)  <i>Not: this is only one potential scenario under lowest cost operating scenario for the tour provider; under mid- range and highest cost operating scenario, park staff would not act as tour guides/interpreters so the cost would be 0; there is also the possibility that some or all of these positions could be filled by park volunteers or docents; there likely would be some seasonal fluctuations in demand for these services</i>  ( ) = number of positions	<i>Pilot:</i> \$180,000 (4)	to	\$220,000 (4)
	<i>Full Program:</i> \$315,000 (7)	to	\$385,000 (7)

*Note: Estimated salary ranges for positions shown are approximated, based on 2006 salary information provided by the National Park Service.*





## Mitigation Measures for Alternative B

Proposed mitigation measures and best management practices are described below for Alternative B. These measures would be implemented to reduce potential effects on natural resources, cultural resources, visual resources, visitor use and experience, traffic and transportation, and other elements. In addition to the measures identified below, mitigation measures identified in the *Arches National Park General Management Plan/Development Concept Plan and Environmental Assessment* (USDI National Park Service 1989) are incorporated by reference and would continue to be implemented throughout the park.

### General Measures during Construction

- Best management practices would be used for all phases of construction activity, including pre- construction, actual construction, and post- construction.
- A pre- construction meeting would be held to inform construction contractors about sensitive areas, including natural and cultural resource concerns of the park.
- 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 construction limits would identify and limit the area of construction activity. Protective fencing and barricades around construction sites would be provided for safety and to preserve natural and cultural resources adjacent to construction areas. The contractor would be responsible for ensuring that all work stays inside approved construction limits. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction limits. This does not exclude necessary temporary structures such as erosion control fencing.
- The project engineer would ensure that the project remains confined within the parameters established in the construction contract documents and that mitigation measures are properly implemented.
- Ground disturbance and site management would be carefully controlled to prevent undue damage to vegetation and soils and to minimize air, water, soil, and noise pollution.
- Equipment and material staging and storage, as well as vehicle turnarounds, would be confined to designated areas that would include existing disturbed areas along park roadways and within parking areas for construction activities inside the park. Construction related offices or laboratories would be located outside park boundaries.
- All demolition debris, including visible concrete and metal pieces, would be hauled from the park to an approved disposal location. All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion. Any asphalt surfaces damaged due to work on the project would be repaired to original condition.
- Transportation Implementation Plan actions undertaken in Moab (if necessary) would comply with applicable regulations and policies including local grading and stormwater regulations, local policies and regulations governing the protection of natural resources, and local and state noise regulations.

## Natural Resources

### Conservation of Soils and Vegetation and Revegetation Measures:

- A soils treatment and revegetation plan would be developed to rehabilitate disturbed areas. Appropriate methods of rehabilitation and treatment of disturbed areas would be evaluated on a case- by- case basis and may



involve protection, raking, and contouring in some areas depending on park natural resource specialists' recommendations.

- Measures to mitigate the loss of biological soil crusts at the Sand Dune Arch Trailhead parking site would be identified and finalized during the detailed design phase. Measures may include (but would not be limited to) restoration of a partially- disturbed soil crust area in another part of the park to compensate for the on- site loss using crust “mined”(excavated and removed) from the development site.
- Ground surface treatment would include grading to natural contours, topsoil and topsoil mantle replacement, seeding, and planting. This work would occur as soon after the completion of construction as possible.
- In an effort to avoid introduction of non-native/noxious plant species, no imported hay bales or untreated straw would be used during construction. On a case- by- case basis, the following materials may be used for any erosion control dams that may be necessary: certified weed- free rice straw, cereal grain straw that has been fumigated to kill weed seed, wood excelsior bales, or rice straw or excelsior sediment control logs.
- Salvage topsoil mantle and topsoil separately, as well as incidental native vegetation (as feasible), from construction areas for reuse during rehabilitation of disturbed areas.
- Topsoil mantle (top 3”) would be removed from areas of construction and stored in stockpiles no more than three feet high at the outer portion of the construction limits. Then remainder of topsoil would be salvaged and stored in similar stockpiles. The sub- mantle topsoil would be respread to a minimum of 2 inches in as near the original location as possible and covered by a 2 inch minimum thick layer of the topsoil mantle supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area as deemed appropriate by National Park Service natural resources specialists. Any excavated fill would be reapplied thus restoring the soil disturbed construction and stockpiling. Construction areas would be returned to preconstruction conditions, stabilized, and planted with native species. Workers would be instructed to refrain from driving on, parking on, or compacting respread soil.
- Disturbance to existing native vegetation would primarily be contained in previously disturbed areas or within narrow construction limits. Whenever practicable, soils and plants affected by construction would be salvaged for reuse in site restoration.
- Revegetation, when implemented, would use salvaged plants and/or seeds or propagules from native species (genetic stocks originating in the project area) to the maximum extent feasible. Any revegetation plantings would strive to reconstruct the natural spacing, abundance, and diversity of native plant species.
- Undesirable plant species would be monitored and controlled, as necessary. To prevent the introduction of, and minimize the spread of non- native vegetation and noxious weeds, the following measures would be implemented during construction.
  - *Minimize soil disturbance.*
  - *Pressure wash and/or steam clean all construction and seeding/mulching equipment before entering the park to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed- free before entering the park.*
  - *Pressure wash hauling vehicles before entering the park for the first time; subsequent entries would not require pressure washing unless the vehicle shows signs of mud, plant material, or other substances that could be considered harmful.*
  - *Cover all haul trucks bringing construction materials from outside the park to prevent seed transport.*



- *Where possible, limit vehicle and equipment parking to within construction limits, existing roadways, parking lots, or the access routes.*
- *Obtain all fill, rock, or additional topsoil from the project area, if possible. If not possible, then obtain weed-free fill, rock, or additional topsoil from approved sources outside the park. Some material may not be required to be weed free, such as asphalt pavement and roadway aggregate used to formalize pull offs and parking areas. The weed-free condition of the material from sources outside the park would be approved by the park resource management staff. If material from an outside source is not weed free, then the park may either reject use of material from that source or approve use if appropriate measures are taken to treat the material.*
- *Initiate rehabilitation of a disturbed area within 14 days of the last disturbance of the area when possible, with the exception of areas that would be disturbed again in 21 days.*

### Water Quality, Stormwater Management, and Erosion Control:

- Best management practices for storm water management and sediment control measures in desert areas that apply specifically to the construction sites would be implemented, and appropriate erosion and sediment control measures would be in place at all times. An erosion and sedimentation control plan would be required as part of the construction contract documents associated with parking and pull off area improvement projects. The purpose of the plan and its recommended best practices would be to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation due to construction activities.
- Reconfigured and new parking facilities would be designed to minimize long-term effects on water quality through the use of best

management practices for runoff control. Possible best management practices such as the use of curbing to control and direct stormwater to detention facilities, the use of filter strips for water quality control would be implemented.

- Although selection and implementation of the preferred alternative would require soil recontouring and pavement removal and replacement, silt screens or other methods of erosion and sedimentation control, including best management practices, would diminish any impact to water quality. In desert areas, installation of silt fencing that rests on the desert surface and is secured by stakes, weights, or boulders, may cause less damage then actually disturbing the soil surface to install/bury the fence.
- Sediment traps would be inspected weekly or immediately following rain and silt would be removed when the traps are 75 percent full.
- During periods of heavy rainfall, the NPS field supervisor could issue a temporary stop order and work would be halted. During these work stoppage periods, project personnel would continue to check the silt fences and check dams, maintain the silt fences in effective condition, and remove accumulated sediment, as necessary, to ensure stabilization is maintained.

### Wildlife:

- Construction and staging areas would be fenced to prevent access by wildlife, and to help prevent wildlife from consuming possible equipment fluid leaks such as antifreeze.
- Contractor would be required to maintain strict garbage control to prevent scavengers from being attracted to the project area. No food scraps would be discarded or fed to wildlife.

### Special Status Species:

- Before construction, the NPS would conduct additional surveys for rare and special status species before taking any action that might



cause harm. In consultation with the USFWS and the state of Utah, the NPS would take measures to protect any sensitive species, whether they were identified through surveys or presumed to be present. Construction would be scheduled during the calendar year to avoid impacting special status species

### Monitoring after Construction:

- Reclaimed areas would be monitored annually after construction (for a time period to be determined by NPS natural resource specialists) to determine if reclamation and revegetation efforts are successful or if additional remedial actions are necessary. Monitoring should identify and take steps to control noxious weeds or non- native vegetation. Monitoring techniques currently in use by NPS resource staff at Arches (including evaluation of aerial photo changes annually and in- the- field visual inspection) would be implemented in these areas. Remedial actions could include installation of erosion control structures, reseeding, and/or replanting the area, and other measures for controlling non- native plant species in accordance with NPS- 13 *Integrated Pest Management Guidelines*.

### Cultural Resources

- In the event that archaeological resources are discovered during construction, the National Park Service archaeologist responsible for monitoring during construction would immediately notify the NPS field supervisor, who would halt work or redirect it to another area of the project until the finds can be documented, their significance assessed, and appropriate mitigation strategies developed in consultation with the Utah State Historic Preservation Officer. In the unlikely event that human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered, work would be stopped in the area of the find, and the appropriate provisions of NAGPRA implementing regulations (43 CFR Part 10) would be followed.

- Pre- construction surveys for archaeological resources and onsite monitoring of all subsurface excavation would be undertaken if necessary at construction sites located in Moab.
- If, through further tribal consultation, the Ute or other consulted tribes subsequently identify the presence of ethnographic resources, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of ethnographic sites would not be made public. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

### Paleontological Resources:

- If unknown paleontological resources are discovered during construction, work in that location would be stopped until the resources could be properly recorded and evaluated. Measures would be taken to avoid further resource impacts or to mitigate their loss or disturbance

### Visual Resources

- To minimize intrusions on visual resources, final design and placement of all new construction would be sensitive to the context of the desert landscape and compatible with the scenic characteristics of the Arches National Park experience.
- A signing plan would be developed as part of the construction contract documents. The contractor would provide the plan to the park superintendent for review and approval prior to implementation. The plan would address appropriate placement and design of new signs, including proper locations for traffic safety and preferred design treatments for visual compatibility and cohesion. The signing plan would address proposed new wayfinding/orientation, interpretive, and regulatory signs.





- Fencing and other edge treatments (lines of boulders) would be designed and constructed to be compatible with the desert landscape and consistent with other types of fencing and edge treatments already in place at the park (such as the post and rail fencing common at trailheads).

## Visitor Use, Experience and Recreation

- 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. Weekend work (Friday through Sunday) would not be allowed unless authorized in writing by the park superintendent.
- A public information program to warn of temporary closures, delays, and road hazards during construction would be implemented. This program would help convey appropriate messages to the public and aid in mitigating potential impacts on visitors' expectations and experiences.
- Announcement through public release to radio stations, press, publications, other public information outlets, and web sites, as appropriate, would be utilized as needed. The contractor would also provide daily delay schedules, variable message boards, coordinated with the project engineer, and temporary construction signs in and outside the park.
- Temporary short- term full closure of parking areas may be necessary on limited occasions. Such full closures would be for the minimal time required to complete the work activity or correct the problem.
- The contractor would provide a weekly delay schedule with daily updates to the NPS field supervisor to assist the park in management of visitation and park operations during construction.

- After construction, information would be distributed at the visitor center and within the park newsletter to inform the public about actions that have been implemented, to reinforce visitation and congestion management activities, to discourage ongoing social pull offs and trails activities, and to encourage long- term stewardship and resource protection.

## Traffic and Transportation

- Traffic signs and pavement markings on park roads would be consistent with the standards contained in the Manual on Uniform Traffic Control Devices, as supplemented by the National Park Service Sign Manual (USDI National Park Service 1988). Special traffic calming devices and signs not yet recognized in these manuals may be installed with FHWA approval.
- A Traffic Control Plan would be developed in conjunction with the construction documents for use during the construction period(s) associated with roadside pull offs and parking area improvements. The plan would be provided by the contractor to the park superintendent for review and approval prior to implementation. This plan would include: proposed areas of construction and anticipated delays, safety considerations, estimated lengths of delay, and estimated number of vehicles stopped at any one point, as applicable to the construction. Construction- related traffic delays resultant from work at pull offs and parking areas would be limited to a maximum of 20 minutes in each direction. Flaggers would record delay times at stopping points and the results would be reported to the project engineer. Immediate access would be provided to any emergency vehicles.

If required, flaggers, pilot cars, signing, variable message signs and/or the newest technology, as appropriate, would be used to manage traffic around work at pull offs and parking areas.



## Air Quality

- Fugitive dust would be controlled by periodic application of water to the construction areas. Water used for dust control would be obtained from approved sources outside the park.
- Construction equipment would be in satisfactory operating condition (i.e., it would be equipped with required safety components, and would not be leaking hazardous liquids or emitting hazardous or undesirable fumes above allowable local air quality legal limits).
- Construction vehicle engines would not be allowed to idle for extended periods of time (exact time would be determined in consultation between park resource staff and project engineer). Visitors stopped due to construction delays would be encouraged to turn off their engines.

## The Environmentally Preferred Alternative

After careful review of potential resource and visitor impacts, and identification of proposed measures to mitigate impacts to natural and cultural resources, the National Park Service has determined that the environmentally preferred alternative is Alternative B. While some specific actions under Alternative A may achieve similar levels of protection for specific cultural resources, natural resources, and/or visitor experience to Alternative B, in aggregate, Alternative B best achieves the full range of national environmental policy goals as stated in Section 101 of the National Environmental Policy Act.

In accordance with *Director's Order (Do) 12*, the NPS is required to identify the "environmentally preferred alternative" in all environmental documents, including environmental assessments. The environmentally preferred alternative is determined by applying the six goals listed in the National Environmental Policy Act (NEPA) Section 101(b), which is guided by the Council on Environmental Quality

(CEQ). The CEQ provides that "[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources" (Federal Register 1981). NEPA Section 101(b) states that, "...it is the continuing responsibility of the Federal Government to...:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, whenever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

## Alternative A

Alternative A, the No Action alternative, represents the current management direction for Arches National Park. The existing use and development of the park is based on planning initiated and implemented through the *Arches National Park General Management Plan and Development Concept Plan* (USDI National Park Service 1989) and the *Visitor Experience and Resource Protection Implementation Plan* (USDI National Park Service 1995a).



Alternative A does not provide as much resource protection as Alternative B — resource impacts would be expected to increase with increasing use levels. Under Alternative A, current congestion and overcrowded conditions at pull offs, parking lots, and trailheads likely would continue to cumulatively impact natural and cultural resources in the long term. Visitor experience impacts also would likely increase under this alternative. This alternative also would not adequately address visitor safety issues associated with overflow parking and traffic congestion nor would it address the National Park Service’s goal of enhancing the quality of renewable resources. Therefore, when compared to Alternative B, Alternative A would not be as successful in satisfying NEPA goals 3 (attain the widest range of beneficial uses of the environment without degradation), 4 (preserve important natural aspects and maintain an environment that supports diversity and variety of individual choice), 5 (achieve a balance between population and resource use), and 6 (enhance the quality of renewable resources).

## Alternative B

Compared to Alternative A, Alternative B would provide a higher level of natural and cultural resource protection while concurrently providing for a wider range of beneficial uses of the environment. For example, this alternative would improve public safety and ensure pleasing surroundings throughout the park by reducing traffic congestion and crowding at existing pull offs, parking areas, and trailheads, thus more successfully complying with NEPA goals 2 (ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings) and 3 (attain the widest range of beneficial uses of the environment without degradation).

Alternative B would also provide substantial cultural and natural resource benefits in accordance with NEPA goal 4 (preserve important natural aspects and maintain an environment that supports diversity and variety of individual choice) by formalizing pull off locations throughout the park, and thereby

discouraging spontaneous stopping and social pull offs that have resulted in disturbance to cultural resources and natural vegetation and soils. Implementation of this alternative would result in a disturbance of approximately 11,900 square feet of parkland for proposed improvements to pull offs and 15,000 square feet for parking areas. However, this alternative would have a long-term beneficial effect on cultural and natural resources by reclaiming approximately 201,689 square feet of currently disturbed areas at more than 170 social pull off locations and 18,095 square feet of disturbed landscape at parking areas, resulting in a net benefit of rehabilitated areas of 189,789 square feet and 3,095 square feet respectively.

Alternative B would more successfully promote the conservation of renewable resources compared to Alternative A by reducing vehicle fuel consumption. Increased use of public motorized interpretive tours would reduce fuel consumption by eliminating some private vehicle trips entering the park, particularly during peak periods. The type of vehicle proposed for motorized interpretive tours in Arches National Park would be highly fuel efficient with ultra low emissions and may run on alternative fuel (such as propane or bio-diesel). Therefore, Alternative B would be more effective in achieving goal 6 (enhance the quality of renewable resources).

## Actions and Alternatives Considered but Dismissed

During the course of developing a transportation plan for Arches National Park, various potential actions and alternatives were considered but dismissed primarily because they could not be implemented within the next six years, an objective identified as important in the transportation implementation plan’s statement of purpose and need. Longer term actions that would require more time for analysis, planning, design, and implementation would not meet this objective. Actions and alternatives also were dismissed due to inconsistencies with the Arches



National Park General Management Plan and technical infeasibility.

Some actions and alternatives considered, such as a park- based shuttle system or implementation of a park reservations and ticketing system for key features, could not reasonably be implemented within the next six years. These actions would involve substantial changes that could have an appreciable effect on visitor experience, park resources, staffing and operations. As such, it was determined that the implementation planning effort should focus on other actions that could be achieved in the near term to begin to address traffic congestion and related impacts.

When it was determined that several of the actions and alternatives being considered were not consistent with the park's adopted General Management Plan, the NPS determined that the GMP would need to be updated before such actions could move forward (such as the addition of facilities inside the park to support an alternative transportation system or the development of new multi- use pathways between park features). These actions would need more detailed study and analysis prior to implementation, likely through a NEPA-compliant, General Management Plan update process initiated in the future by the National Park Service. This future planning effort would include detailed environmental analysis as well as additional public involvement.

Actions and alternatives previously considered during the planning process but dismissed because they were out of alignment with the stated purpose and need for action, inconsistent with the park's General Management Plan, and/or deemed technically infeasible included the following.

- *Phased, Park- based Shuttle System and Shuttle- based Visitor Management Solutions*

Potential options for a phased, park- based shuttle system and related shuttle- based visitor management solutions were considered as part of the overall transportation planning

process for Arches National Park. Considerations included the potential for certain routes of the shuttle system to be mandatory during peak visitation periods (similar to the system in place at Zion National Park). Because this action would have an appreciable effect on visitor experience and would take long than six years to implement, it was dismissed. It was determined that motorized interpretive tours should be evaluated as a potential near term option for providing another means of access and travel through the park. Visitor survey data, public comments, and other information were collected and initial analysis was completed related to the potential for a park- based shuttle system in the earlier stages of the transportation planning process.

- *In- park Improvements to Support a Park- based Shuttle System*

Implementation of a park- based shuttle would require construction of improvements inside the park to support operations, and further analysis, planning, design, and implementation likely would take longer than the six- year planning horizon identified for the transportation implementation plan. In addition, such improvements would be in conflict with the park's adopted GMP.

Physical improvements associated with a shuttle system could include modifications to roadways (shoulder widening), reconfigured parking areas, and the potential creation of new shuttle stops with bus platforms (thickened pavement), shade structures/shelters, benches, potable water, information and interpretation signs, bicycle racks, lean posts, and other elements. The potential implementation of these elements would need to be analyzed in further detail for possible environmental impacts, including potential impacts to visual qualities, visitor experience, and natural resources. Detailed plans would be needed to further assess site conditions and potential environmental impacts associated with these types of improvements. Because of the need for further





analysis, planning, and design efforts, these physical improvements likely could not be constructed within the desired six- year implementation timeframe. As such, these actions were dismissed.

- *Mandatory Reservations and Ticketing Options*

Options considered for introducing a park-wide reservations and ticketing program for management of congestion at key features during peak visitation periods were dismissed due to concerns such systems would be technically infeasible to implement and could not be implemented within the next six years.

- *Improvements for Bicyclists and Pedestrians*

Options considered for improving and enhancing access, safety, and mobility for bicyclists and pedestrians within the park included potential shoulder widening for bicycling on park roadways and multi- use pathways between key features and trailheads (where appropriate in consideration of various environmental conditions). It was determined that such actions would be inconsistent with the park's adopted GMP and could not be implemented within the next six years, so these were dismissed from further consideration.

- *Long- term ITS Applications*

Several potential long- term ITS applications were considered for Arches National Park, such as a parking management system with indicator loops and/or video monitoring installed at selected parking areas providing information that could be distributed to other areas of the park via monitors or variable message signs. Other potential long- term ITS actions included applications that might be developed in association with a park- based shuttle system. These long- term ITS actions were dismissed from further consideration because they could not be implemented within the six- year timeframe and also because some actions would not be technically feasible at this time due to the current status of technology in the region and at the park.



Table 2.7 – Comparison of Alternatives and Extent to Which Each Alternative Meets the Project Objectives

Objective	Alternative A – No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
<p>Protect the park's natural and cultural resources from potential impacts attributable to vehicles and visitor use, including in appropriate parking along roadways and parking lot edges.</p>	<p>The existing park road system and social pull offs would continue to operate in their current condition, with minor improvements on an annual basis. Pull off areas would not be formalized and paved; disturbed areas resulting from social pull off activity would be not be rehabilitated park- wide, but some rehabilitation would occur on an annual, incremental basis contingent upon available maintenance and operations funding.</p> <p>Social parking activities would continue in existing areas already affected by these activities, and potentially in new areas yet undisturbed. Broad-scale rehabilitation of areas that have been disturbed as a result of social parking and social trails would not occur.</p>	<p>21 pull off areas would be paved and improved and 5 additional pull off areas would remain unpaved and continue in informal operation.</p> <p>Over 170 existing social pull off locations would be removed with the disturbed areas being rehabilitated through protection, raking, contouring, soil amendments, and other treatments.</p> <p>The proposed parking area and pull off improvements would help to protect the park's cultural and natural resources from further damage due to social parking along roadsides and the related creation of social trails. Broad- scale rehabilitation of areas that have been disturbed by these activities would be implemented. Formalized pull off improvements with adjacent well- defined pedestrian areas would provide an area for visitors to stand to view the scenery and take photos, minimizing the level of social trails activity and related damage to resources.</p> <p>Although some new disturbance would result from construction of the proposed Sand Dune Arch parking area, this would be offset by removal of pavement and rehabilitation in several parking areas, as well as rehabilitation of areas of compacted, disturbed soils in parking areas and along the roadway.</p>



Objective	Alternative A – No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
Improve the visitor experience, including enhancement of access and travel mode choices to and within the park.	Only minimal parking area improvements would occur on an annual basis through maintenance and operations activities contingent upon available funding. Sand Dune Arch and Skyline Arch parking area improvements would not be constructed.	<p>Parking improvements, including a new parking area at Sand Dune Arch and enhancements at Skyline Arch would be constructed, enhancing access to park features. Redelineation of parking at the Windows/ Double Arch and Devils Garden would occur.</p> <p>Enhancement of access and travel mode choices to and within the park would be realized through implementation of the sightseeing/interpretive motorized tour program.</p>
Continue to accommodate the private automobile in the park and to enhance the experience of sightseeing and scenic driving.	<p>The park driving experience would continue as under existing conditions. Social pull off activities would continue at the current level and potentially increase. These activities cause disturbance to the natural resources at and beyond the roadside and create traffic hazards related to spontaneous stopping, and pulling off and pulling on to the roadway.</p> <p>No motorized sightseeing/interpretive tour programs would be implemented.</p>	<p>The park driving experience would be preserved and enhanced through proposed parking and roadside pull off improvements, as well as other proposed safety improvements.</p> <p>Motorized interpretive/sightseeing tours would expand visitor access and travel mode choice opportunities while at the same time enhancing visitor experience.</p>



Objective	Alternative A – No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
<p>Improve traveler safety.</p>	<p>No traffic calming treatments would be implemented, other than routine patrols and possibly some additional signs and visitor education/outreach.</p> <p>Existing social pull off activity would continue at the current level, continuing to create traffic hazards as described above.</p>	<p>Various traffic calming treatments would be implemented, including context sensitive pavement color and texture changes, (rumble strips), advance signing, and pedestrian crosswalks. Traffic calming improvements would improve traveler safety by serving to slow traffic in congested areas and areas of high pedestrian activity.</p> <p>Roadside pull off improvements and closure of existing social pull off areas would enhance traveler safety by eliminating motorists spontaneously pulling off and on the roadway in these areas. Proposed parking area and Intelligent Transportation Systems (ITS) improvements also would improve traveler safety thereby enhancing the visitor experience.</p>
<p>Integrate park transportation plans with regional transportation planning activities.</p>	<p>Ongoing coordination and partnerships with regional interests would continue.</p>	<p>Ongoing coordination and partnerships with regional interests would continue and become strengthened through project and program implementation processes. If additional staffing and resources are committed to the park's transportation system, as proposed by the transportation implementation plan, a greater level of regional coordination would be realized.</p>
<p>Summary – Overall, does the alternative meet project objectives?</p>	<p>No</p> <p>Social pull off activity would continue to occur and additional pull off areas would be created potentially causing impacts to natural and cultural resources. Traffic calming/safety improvements would not be implemented. Visitors would not be provided with an alternative means for accessing and traveling through the park other than by private vehicle.</p>	<p>Yes</p> <p>Traffic congestion overall would be reduced and transportation safety in general would be improved throughout the park. Proposed pull off improvements would reduce the potential for impacts to natural and cultural resources along park roads. Park visitors would have expanded opportunities for travel through the park through the motorized interpretive tour program.</p>



Table 2.8 – Summary of Environmental Consequences

Impact Topic	Alternative A - No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
Biological Soils Crusts	Under Alternative A, the No Action Alternative, there would be minor to moderate, short- and long- term adverse impacts on biological soil crusts, primarily as a result of existing and ongoing social pull off, parking, and pedestrian activities. Overall, short- and long- term, cumulative impacts would be minor to moderate and adverse. There would be no impairment of park resources or values related to biological soil crusts.	<p>Under Alternative B, there would be moderate, short- term and long- term, adverse effects on biological soil crusts inside the park, primarily as a result of construction of the Sand Dune Arch parking area. However, formalizing pull off areas and adjacent pedestrian paths would reduce impacts on biological soil crusts by keeping visitors and vehicles in defined areas.</p> <p>There would also be the potential for adverse effects on biological soil crusts outside the park with the new centralized operation and maintenance facility in Moab to support motorized tours. However, since the site location is unknown, the potential intensity and duration of these effects is not known at this time, and the location of this facility outside the park would result in beneficial effects inside the park. Other long- term beneficial effects would occur as a result of proposed actions of Alternative B. Overall, short- and long- term, cumulative impacts would be moderate and adverse. There would be no impairment of park resources or values related to biological soil crusts.</p>
Visual Resources	Under Alternative A, No Action, there would be negligible to minor, long- term adverse impacts on the park's visual character and resources, including night skies. Overall, short- and long- term, cumulative impacts would be negligible to minor and adverse. There would be no impairment of park resources or values related to visual quality.	Under Alternative B, there would be negligible to minor short- term and negligible to moderate long- term adverse impacts on visual quality both within and outside the park. Some long- term beneficial effects would occur. Overall, short- and long- term, cumulative impacts would be minor to moderate and adverse. There would be no impairment of park resources or values related to visual quality.





Impact Topic	Alternative A - No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
Visitor Use, Visitor Experience, and Recreational Resources	Alternative A would result in minor to moderate, long- term adverse impacts to visitor use, visitor experience and recreational resources. The level of impact would be expected to become more intensive as the level of visitation increases and conditions at key features and along the park roadways become more congested. Overall, short- and long- term, cumulative impacts would be minor to moderate and adverse, although some beneficial effects have resulted from past, present and reasonably foreseeable cumulative actions. The National Park Service does not analyze visitor use, visitor experience, or recreational values for impairment.	Alternative B would result overall in short- term, minor to moderate adverse effects during construction of proposed improvements that would be mitigated. Proposed visitor access management would result in long- term, minor to moderate, adverse effects to some visitors at localized areas of the park during peak visitation periods. These adverse effects would be offset by substantial long- term beneficial effects to all park visitors and visitor experience, as well as park resources. Overall, short- and long- term, cumulative impacts would be minor to moderate and adverse, although beneficial effects would continue to be realized from past, present and reasonably foreseeable actions combined with Alternative B. The National Park Service does not analyze visitor use, visitor experience, or recreational values for impairment.
Transportation and Traffic Conditions	Alternative A would result in minor to moderate, long- term, adverse impacts related to traffic and transportation, with the level of effect depending on future visitation and congestion levels and conditions at key features and throughout the park. Overall, short- and long- term, cumulative impacts would be minor to moderate and adverse (although some localized beneficial effects have resulted from recent improvements at the park entrance and past park improvements). There would be no impairment to park resources or values related to transportation and traffic conditions.	Long- term beneficial effects related to transportation conditions and traffic flows and safety would occur under Alternative B. These effects would be expected as a result of reduced traffic congestion in parking areas, improved safety on the park roadways from pull off and traffic calming improvements, and improved operations of the park's overall transportation system. Minor to moderate, short- term adverse effects would occur during construction, but would be mitigated. Overall, short- term, cumulative impacts would be minor to moderate and adverse, offset by long- term beneficial impacts resulting from recent past and improvements at the park and proposed actions of Alternative B. There would be no impairment of park resources or values.



Impact Topic	Alternative A - No Action Alternative	Alternative B – Transportation Implementation Plan – Preferred Alternative
Park Operations	Under Alternative A, there would be long- term, minor to moderate adverse impacts to park operations that would need to be mitigated through additional staffing and resources. Overall, long- term cumulative impacts would be minor to moderate and adverse. The National Park Service does not analyze park operations for impairment.	Under Alternative B, beneficial, long-term effects on park operations would occur, resulting from reduced overall demand for park staffing and resources focused on transportation and traffic management. Additional staffing and resources would be needed to mitigate short- term, minor to moderate, adverse effects during the implementation period. Overall, short- term, cumulative impacts would be minor to moderate and adverse, offset by mitigation, as well as long- term beneficial impacts resulting from recent improvements at the park entrance and the proposed actions of Alternative B. The National Park Service does not analyze park operations for impairment.
Socioeconomics	No beneficial or adverse, short-term or long- term impacts to socioeconomic conditions would be expected under Alternative A and current trends in economic growth and development would be expected to continue. Overall, no beneficial or adverse, short- term or long- term cumulative impacts would be expected. The National Park Service does not analyze socioeconomic values for impairment.	Implementation of Alternative B would be expected to create long- term beneficial effects on socioeconomic conditions in the region. The proposed motorized interpretive tour would be an important contributor to the anticipated beneficial effect. Short- term beneficial socioeconomic effects likely would occur during the construction period of proposed improvements. Overall, long-term and short- term, beneficial cumulative impacts would occur. The National Park Service does not analyze socioeconomic values for impairment.
Land Use	Under the No Action alternative, there would be either no or negligible, long- term, adverse impacts on land use in the park. Overall, long- term, cumulative impacts would be negligible to minor and adverse in the park and surrounding vicinity. There would be no impairment of park resources or values related to land use.	Alternative B would result in long- term, minor to moderate, adverse effects, as well as long- term beneficial effects on land use. Short- term adverse impacts to land use during construction would range from negligible to minor. Overall, long-term, cumulative impacts would be minor to moderate and adverse. There would be no impairment of park resources or values related to land use.



