

Grand Canyon

National Park Service
U.S. Department of the Interior
Grand Canyon National Park



Environmental Assessment November 2007



Bright Angel Trailhead Area Design Plan

Grand Canyon National Park • Arizona

Environmental Assessment

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Summary

Grand Canyon National Park proposes to develop and implement a design plan for the Bright Angel Trailhead Area located in Grand Canyon Village on South Rim. Proposed actions include developing a plaza near the primary trailhead; separating vehicle parking and circulation areas from pedestrian zones; enhancing trail connections and wayfinding; and constructing a new restroom near the proposed plaza and existing mule corral. Future implementation phases, if additional funding becomes available, include hardening the parking area surface and delineating approximately 70- 80 parking spaces, creating an interpretive node at Kolb Garage and enhancing signage, revegetation and site amenities. The project's primary objectives include enhancing the area's wayfinding and site amenities (including signing, shade, seating, and restroom availability), improving paths and connecting trails, eliminating rim edge vehicle parking to provide enhanced pedestrian circulation, and creating a sense of place—an area visitors will immediately recognize as the Bright Angel Trailhead. This Environmental Assessment (EA) evaluates two alternatives for addressing the purpose and need for action (Alternatives B and C) and the potential impacts of taking no action at this time (Alternative A, No Action).

Public Comment

If you wish to comment on this Environmental Assessment, mail comments to the name and address below or post comments online at <http://parkplanning.nps.gov/grca>. This Environmental Assessment will be on public review for 30 days. Before including your address, phone number, Email address, or other personal identifying information in your comment, be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee we will be able to do so.

Please Address Comments to

Steven P. Martin, Superintendent, Grand Canyon National Park
Attention: Office of Planning and Compliance
P.O. Box 129/1 Village Loop
Grand Canyon, Arizona 86023

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Chapter 1 – Project Scope

INTRODUCTION

This document's purpose is to disclose expected effects to the human environment of implementing improvements to the Bright Angel Trailhead Area, an important component of the Grand Canyon Village National Historic Landmark District of Grand Canyon National Park's South Rim. The general planning area boundary includes National Park Service (NPS) land between the Hermit Road Transfer Shuttle Bus Stop on the west, Lookout Studio on the east, Village Loop Drive on the south, and the canyon rim on the north. Refer to Figure 1 for a map of the general vicinity and Figure 2 for a project area site map. The project area includes the Rim Trail, the Bright Angel Lodge Cabins and parking area, the mule corral, and both historic Bright Angel Trailheads; the original 1904 trailhead near Kolb Studio and the trailhead created in 1932 near the mule corral. The area encompasses approximately five acres, is generally open terrain with scattered pinyon and juniper trees, and is approximately 6,800 feet in elevation.

Human environment is defined as the natural and physical environment and the relationship of people with that environment.

PURPOSE OF AND NEED FOR ACTION

Existing Condition

Several thousand day and overnight hikers, mule and shuttle bus riders, and rim walkers pass through the Bright Angel Trailhead Area on a typical summer day. This visitor volume with their multiple and often competing uses creates congestion and confusion in this popular South Rim area of Grand Canyon National Park. The Trailhead Area has significant design, maintenance, and layout issues. Its existing facilities (parking, trailhead, paths, landscaping, and connections with Hermit and Village Route Shuttle Bus Transfers) are inadequate for current use. The area's two chemical toilets are not universally accessible and there are no park- provided public restroom facilities within a reasonable walking distance. Potable water is similarly unavailable. The trailhead layout does not provide a sense of arrival commensurate for a primary trailhead at a major national park, nor does it function effectively for visitors (Figure 3). Visitors have difficulty finding their way through the area, and visitor experience and information is compromised and inadequate.

Need for Action Need exists for a comprehensive landscape and area plan that considers

- parking requirements, vehicular and pedestrian flow and connections
- restroom and drinking water availability
- necessary site furnishings
- improved visitor orientation and wayfinding
- improved parking configurations, and determination of whether existing parking capacity is appropriate and/or adequate
- rehabilitated walkways and stone walls
- denuded area revegetation (with native species)

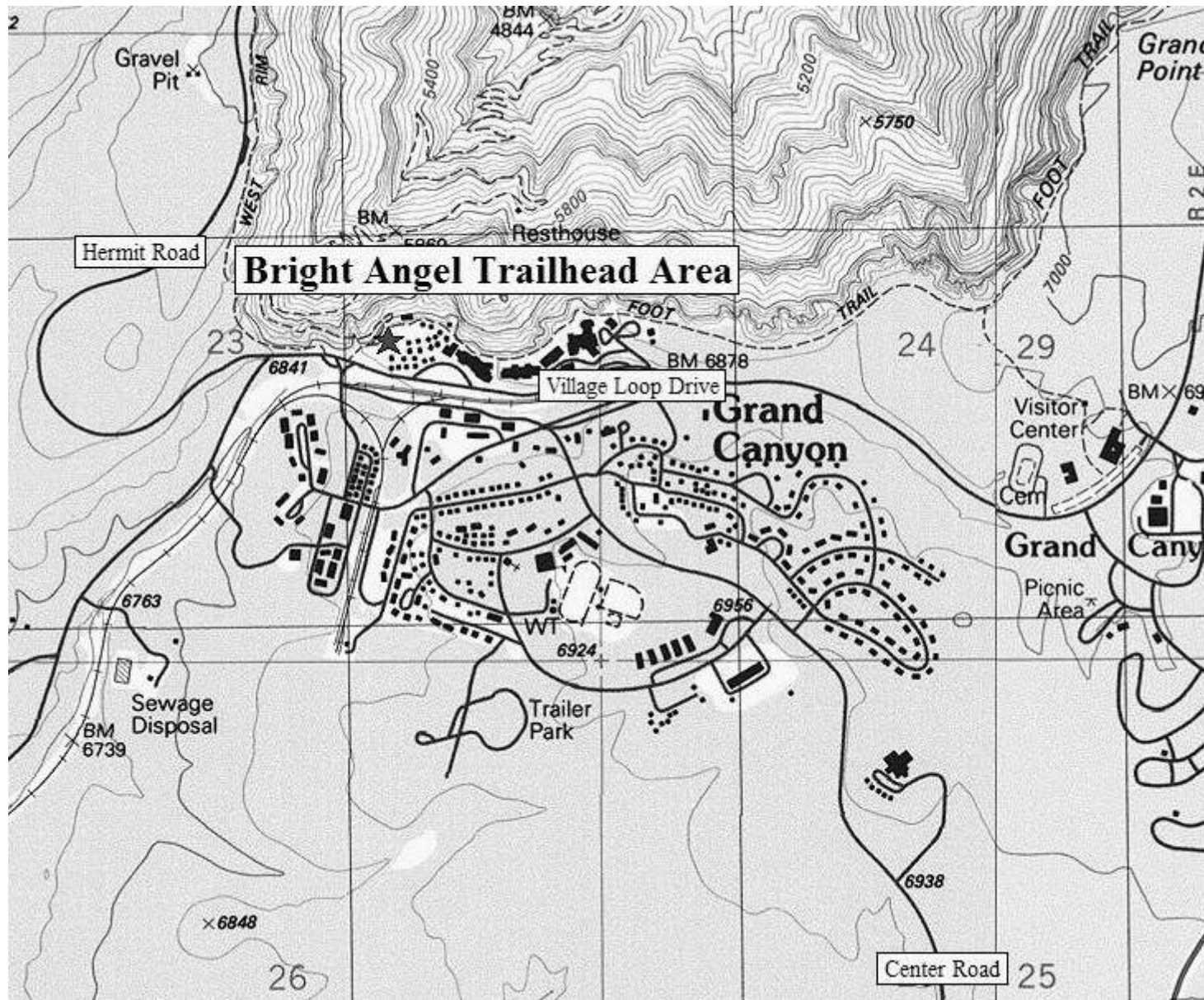


Figure 1 Project Vicinity

Grand Canyon National Park
Arizona

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Bright Angel Trailhead Area



Produced by Grand Canyon National Park GIS

0 62.5 125 250 Feet

December 2006



Figure 3 Existing Conditions - Bright Angel Trailhead Area (NPS Photo, October 2007)

- a sense of trailhead arrival for visitors
- enhanced trailhead interpretative information regarding hiker safety, low- impact hiking, and preventative search and rescue. This action is needed because
- visitors are confused by multiple and competing area uses
- visitors have difficulty finding the Bright Angel Trailhead from the Rim Trail, Bright Angel Lodge, or the Village Route Transfer Shuttle Bus Stop
- visitors are confused by the two Bright Angel Trail entrances
- the nearest public restroom is in Bright Angel Lodge, approximately 150 yards from the Trailhead near Kolb Studio, and 200 yards from the Trailhead near the mule corral
- existing temporary chemical toilets closer to the Trailhead are not adequate for current use
- area walkways, paths, and chemical toilets are not universally accessible
- the area lacks adequate lighting, seating, trash receptacles, and picnicking opportunities for existing use
- vehicles and pedestrians conflict in the dirt parking area near the cabins and Trailhead
- the Trailhead Area is in poor condition: lack of maintenance on the Rim Trail, other walkways, and stone walls threatens historic integrity
- the retaining wall near Kolb Studio failed and has not been repaired.

Objectives

1. Improve visitor experience in the Bright Angel Trailhead Area by
 - improving wayfinding opportunities in surrounding areas to reach the trailhead by foot, shuttle bus, or personal vehicle (including signing, brochures, maps, etc.)
 - improving ease of movement from Lookout Studio to the Hermit Route Transfer Shuttle Bus Stop
 - improving area interpretive opportunities by creating a wayside plan for additional appropriate signing, brochures, etc.
 - providing fully compliant restroom facilities, potable water, seating, shade, and gathering area(s) appropriate for a National Historic Landmark District and adequate for current visitor use
 - providing safe and universally accessible access, where feasible, for pedestrians to the Trailhead Area from Bright Angel Lodge and Cabins, the Rim Trail, and the Village Route Transfer Shuttle Bus Stop. Consider feasibility of providing universal access along the Rim Trail from Lookout Studio to the Hermits Rest Transfer Shuttle Bus Stop
 - providing a visitor waiting/gathering area and photo opportunity in view of the Trail
 - evaluating commercial hiker shuttle service and appropriate drop- off and pick- up area (large vans)
 - identifying the primary Bright Angel Trailhead and differentiating it from secondary access points, keeping in mind mule rider and hiker needs
2. Improve condition of historic stone walls and other area features by repairing them following the Secretary of the Interior's Standards for rehabilitation of historic properties (Weeks 1995)
3. Consider the project's location with the Grand Canyon Village National Historic Landmark (NHL) District and the cultural landscape, and preserve contributing features and patterns to the extent possible.
4. Improve condition of existing facilities, including the following:
 - improving condition and accessibility of existing walkways, trails, and stone walls, and considering standardizing surfaces to aid wayfinding
 - providing a maintenance- activity staging area, and differentiating this from mule-loading needs versus needs for hand- carried materials
 - separating vehicle and pedestrian access routes to the Rim Trail, Kolb Studio, and the Trailhead in the Bright Angel Lodge Cabin parking area
 - providing adequate all- season parking for Bright Angel Lodge overnight guests
 - providing adequate and appropriate parking for other uses
 - adaptively reusing historic structures to support area needs or functions as appropriate (e.g. Kolb Garage)
5. Provide for hiker safety, including Preventative Search and Rescue (PSAR), including
 - improving the emergency phone location
 - improving area PSAR messaging and improving information exchange with hikers
 - improving area availability of hiker drinking water
6. Improve utility systems within and through the area, for example, burying power lines within the cabin parking area.

Integral Design Criteria

As part of all action alternatives evaluated, the NPS developed the following criteria integral to implementing any project- area action

- Any new structures would be of small footprint and low profile and subordinate to the site, recognizing the proximity to the canyon rim
- carefully evaluate disturbance to natural and cultural environments and minimize impacts to park resources as much as possible
- rehabilitate areas damaged by social trailing and other impacts to the extent practical using native plant species
- maintain and enhance protection of existing vegetation
- minimize light intrusion on the night sky; protect night sky as a resource
- consider sustainability and long- term maintenance needs of any existing and proposed new facilities.

The proposal is an appropriate use for the park because it is suited to the exceptional natural and cultural resources found in the park and fosters an understanding of and appreciation for park resources and values (NPS 2006). The implementation of improvements at the Bright Angel Trailhead are further evaluated in this document for consistency with applicable regulatory measures, consistency with Grand Canyon National Park's 1995 General Management Plan, actual and potential effects to park resources and values, total project cost, and whether the public interest will be served. If unanticipated and unacceptable impacts transpire, the Superintendent will reevaluate the purpose and need to further manage, limit, or discontinue this use.

MANAGEMENT AND PLANNING HISTORY

National Park Service Management Policies (2006) is the guiding document for management of all national parks within the national park system. It is the basic NPS servicewide policy document and supersedes the 2001 edition. *Management Policies* is the highest of three levels of guidance documents in the NPS Directives System. As stated in the introduction, "It [NPS Directives System] is designed to provide NPS management and staff with clear and continuously updated information on NPS policy and required and/or recommended actions, as well as any other information that will help them manage parks and programs effectively" (NPS 2006). Among direction on all park management aspects, *Management Policies* direct each national park system unit to maintain an up- to- date General Management Plan (GMP). Chapter 5, Cultural Resource Management; Chapter 8, Use of the Parks; and Chapter 9, Park Facilities are most applicable to this project.

Grand Canyon National Park is currently operating under the direction of the 1995 General Management Plan and Environmental Impact Statement (GMP EIS). The GMP's primary purpose is to provide a foundation from which to protect park resources while providing for meaningful visitor experiences. The GMP provides fairly general and programmatic direction and guidance for resource management, visitor use, and general development for a period of 10 to 15 years. Applicable GMP management objectives and other pertinent direction are found in Appendix A. Of particular note are the following recommendations that pertain directly to the Bright Angel Trailhead Area

- Kolb Garage will be used for a Trailhead Area restroom (GMP, page 34)
- Remove Bright Angel parking areas when mass transit is implemented (GMP, page 33).

The initial intent to adaptively reuse the historic Kolb Garage as a restroom was explored in detail by the NPS prior to initiation of the Bright Angel Trailhead Area planning effort. As discussed in Chapter 2, use of the Garage for a restroom was evaluated in a Choosing By Advantages workshop in February 2001. Choosing by Advantages, part of Value Analysis, is a systematic approach to evaluating alternatives in context with the value of identified issues, concerns, and functions. Using Value Analysis and subsequent Choosing by Advantages protocol when evaluating merits of large projects, is a NPS mandate. The study ultimately recommended that the park not use the Garage as a restroom and to construct a new restroom, due in part to engineering difficulties (see page 25 of this document for reasons). The NPS revisited this recommendation during this planning process and came to the same conclusions.

Use of Kolb Studio does not directly pertain to the Bright Angel Trailhead planning effort. It is currently used as a Grand Canyon Association bookstore and gallery and canyon-viewing station. These current uses are consistent with the GMP direction for converting the building to a museum/interpretive/office facility (GMP page 30).

Removal of the parking area for the Bright Angel Cabins and Trailhead Area was initially considered when this Trailhead Area planning effort began. Upon careful consideration of 1) the South Rim Transportation Plan (currently evaluating South Rim transit operations), 2) the lack of a mandatory mass transit system, and 3) parking lot use by lodge guests and day hikers, parking area removal is not warranted at this time. As also discussed on page 28 of this document, parking area removal prior to exploration of other ways to accommodate Bright Angel Trailhead area users elsewhere would not be prudent (i.e., additional parking at Canyon View Information Plaza [CVIP] or near Tusayan where the shuttle service could be easily accessed). However, parking area use and capacity are being considered as part of the ongoing South Rim Transportation Plan, as are all other South Rim parking areas, for both overnight and day users. If changes in Bright Angel parking area use are deemed necessary in the upcoming Transportation Plan EA, implementation of proposed actions described in this document would not preclude implementation of future use changes. For example, the parking area could easily be closed to day users and open only to lodge guests with a gated entry or parking pass system. Analysis of the impacts of each alternative (Chapter 3, Park Operations) includes evaluation of the flexibility provided by proposed actions under this project would provide if future parking options/changes are proposed.

Internal Scoping

Preliminary internal scoping to identify NPS specialist concerns regarding a Bright Angel Trailhead Area design plan began formally in June 2005 with a park staff meeting. This meeting, or design charette, developed several preliminary issues and objectives for area improvements and helped define the project's scope. A project-specific interdisciplinary team was assigned in October 2005, and internal scoping began in earnest with team meetings in October and December 2005. An open house advertised to park and concessionaire employees and park partners took place in October 2005 to solicit early input, comments on the purpose and need for taking action, project objectives, and potential alternatives. Involvement of the parkwide interdisciplinary team (PIDT) was solicited in April and May 2006 with identification of relevant issues and impact topics, and again in August 2006 for input on a preliminary restroom design

concept. Discussions with both the project- specific interdisciplinary team (IDT) and the PIDT have been ongoing through development of the internal review draft EA. A Value Analysis and Choosing by Advantages Workshop was held 7- 8 March 2006 to begin identifying the agency preferred alternative (DHM Design and Andrews and Anderson Architects 2006b). An internal review of a preliminary draft EA was conducted in October 2006. Following revisions to the range of alternatives due to budgetary constraints and issues regarding the level of anticipated impact to cultural resources following this review, a second draft EA was distributed for internal comment in August/September 2007.

Public Scoping

The NPS began public scoping in January 2006 by distributing a general scoping letter describing the action's purpose and need, proposed objectives, and several preliminary options for the Bright Angel Trailhead Area. The letter was distributed to the park's approximately 280-person compliance mailing list including state and Federal agencies (such as the SHPO and Advisory Council), American Indian tribes, backcountry hiking groups, park and NPS Planning, Environmental and Public Comment (PEPC) websites, and a press release. Recipients were asked to respond with any issues or concerns they had with options described and if they wished to receive an EA copy when distributed for public review. Thirty letters, Emails, and website responses were received from

- 21 private individuals
- One NPS employee
- Brad Wallis, Grand Canyon Association
- Several from the National Association of Civilian Conservation Corps (CCC) Alumni
- David Chambers, Grand Canyon Railway
- Brad Dimock, Fretwater Press
- Marv Mason and Margaret Hodgkins, Marvelous Marv's Tours
- Roxane George, Sierra Club, Grand Canyon Chapter

Responses ranged from concerns regarding availability of shade, seating, and other site features, to trail mule use, parking availability and design, Kolb Garage use, how to implement the project over time, and the importance of maintaining the area's historic character. Comments received 1) are summarized in Appendix B, 2) were used to confirm issues analyzed in this document, and 3) to identify a reasonable range of alternatives.

EA Distribution

This EA has been distributed to those who responded to the January 2006 public scoping effort, pertinent agencies and tribes, and local libraries. EA availability for the 30- day public review was advertised via a press- release, publication on the park's website, and through the NPS PEPC website.

Agencies

At the time of public scoping, the NPS also contacted other pertinent agencies including the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, all affiliated American Indian tribes, and the U.S. Fish and Wildlife Service (USFWS), initiating informal consultation and soliciting issues or concerns. NPS methods for contacting these groups, and their responses, are detailed in Chapter 5, Appendix B, and are summarized below.

The park contacted the SHPO and invited participation in a project discussion and site visit in December 2005. The park contacted both the SHPO and the Advisory Council on Historic Preservation (ACHP) and requested comments on options under consideration and input on the consultation framework under Section 106 of the National Historic Preservation Act (NHPA) in January 2006. The SHPO participated in the Value Analysis Workshop held at the park in March 2006. In July and August 2006, the park's Historical Architect consulted the SHPO on preliminary designs for the restroom building. A Memorandum of Agreement (MOA) is being prepared for this project, separate from this EA, that details the project's expected impacts to cultural resources and the way in which future consultations between GRCA and SHPO, the Advisory Council, if interested, and any interested American Indian tribes will occur as this project proceeds into design and implementation. Information from the MOA (NPS 2007a) has been used in the preparation of sections of this Environmental Assessment. The MOA will be sent to the SHPO, the Advisory Council and any interested tribes for review and comment.

The park contacted all affiliated American Indian tribes and requested comments on preliminary options under consideration in January 2006. No responses were received. Park representatives met with Cameron Chapter of the Navajo Nation members in August 2006 to discuss any project concern onsite. The Cameron Chapter requested that the park consider including Navajo history as part of the project area's improved interpretive displays. In October 2006, park representatives held three meetings with tribal representatives to discuss this and other projects including a meeting with the Hualapai Historic Preservation Office, the Navajo Historic Preservation Department, and the Hopi Historic Preservation Office. The Navajo representative requested that the NPS consider not paving the parking lot and maintaining the area's rustic character. The Hopi representative requested that the NPS consider including prehistoric Hopi use of the Bright Angel Trail and traditional Hopi names for project-area plants in interpretive messages. NPS met with representatives from the Havasupai Tribe in April 2007 to discuss this and other on-going projects and plans. Tribal representatives expressed concern with construction of a new building (restroom) near the rim, its potential impacts to the sewer system, and asked that NPS consider accommodating this need into other existing buildings. A Pan-Tribal meeting took place in July 2007 and no concerns were raised but lighting needs were mentioned for new facilities.

The park contacted the USFWS requesting comments on preliminary options in January 2006. NPS met with USFWS in February, April, July 2006 and June 2007 to specifically discuss alternatives under consideration, pertinent Federally listed species, and any USFWS issues or concerns. NPS is preparing a Biological Assessment (BA) that forms the basis for Section 7 consultation with USFWS under the Endangered Species Act.

This EA incorporates by reference, and tiers to, the *General Management Plan Environmental Impact Statement* (NPS 1995a).

ISSUES AND IMPACT TOPICS

After public scoping, issues and concerns were distilled into distinct impact topics to facilitate analysis of environmental consequences. Such analysis allows for standardized comparison between alternatives based on the most relevant information. Issues may come from the public,

from within an agency or department, or from another agency (Freeman and Jenson 1998). For this project, the IDT identified issues with the preliminary project proposal as described as preliminary options in the January 2006 scoping letter. Internal, public, and other agency comments resulted in the following substantive issues

- the preliminary proposal results in an easier- to- find parking area through enhanced wayfinding, potentially creating a higher demand for area parking than currently exists. This would result in a crowded parking area with less than adequate space for all users.
- the preliminary proposal creates a more structured and urbanized parking area that may detract from the area's rustic feel and historic character.
- the preliminary proposal creates a relatively large restroom facility (restroom and shade) in open space between the corral and the Bright Angel Cabins. This would change the cultural landscape and could potentially result in an adverse impact to the surrounding NHL and cultural landscape.

Other concerns and comments (as shown in Appendix B) included such things as

- importance of retaining existing vegetation
- which trailhead to designate as the primary trailhead
- reserving parking spaces for certain users (like lodge guests or backcountry hikers)
- the project's relationship with other transportation planning efforts
- providing parking spaces for commercial tour operators
- potential for impacts to the surrounding cultural landscape and nearby historic structures
- consolidating uses into existing buildings rather than constructing new buildings

Identified issues were used to formulate alternatives and mitigation measures. Impact topics were then selected for detailed analysis based on substantive issues, environmental statutes, regulations, executive orders, and *NPS Management Policies 2006*. A summary of some of these compliance- related laws and regulations is provided in Appendix C. A summary of impact topics and rationale for their selection or dismissal are given below.

Relevant Impact Topics

Historic Structures and Districts The 1966 National Historic Preservation Act, as amended; National Environmental Protection Act (NEPA); the 1916 NPS Organic Act; NPS Management Policies 2006; and other NPS guidelines require consideration of cultural resource impacts. This project is within the Grand Canyon Village Historic Landmark District and is nearby other historic structures. Therefore, this topic is discussed in Chapter 3.

Cultural Landscapes NHPA, NEPA, the 1916 NPS Organic Act, NPS Management Policies 2006, and other NPS guidelines require consideration of cultural resource impacts, including those to cultural landscapes. Proposed project components have potential to impact contributing features and patterns of the cultural landscape. Therefore, cultural landscapes are discussed in Chapter 3.

Visual/Scenic Quality NEPA, the 1916 NPS Organic Act, NPS Management Policies 2006, and other NPS guidelines require consideration of visual resources. Conserving national park scenery and providing visitor enjoyment are elemental purposes of the NPS according

to the 1916 Organic Act. Scenic resources are integrally tied to action objectives including maintaining project area canyon views, and are related to cultural resources such as preserving and rehabilitating cultural landscapes. Proposed project components have potential to impact the area's visual appearance and alter viewsheds. Therefore, visual/scenic resources are discussed in Chapter 3.

Special Status Species Federally listed Threatened and Endangered Species, species proposed for listing on the Endangered Species List, and species of particular concern to Grand Canyon National Park have potential to be affected by proposed actions. A Biological Assessment is being prepared for this project to facilitate USFWS consultation, and will detail potential effects to these species. Impacts to special status species are included in Chapter 3.

Vegetation While much of the project area is disturbed and lacks vegetation, trees exist in islands around the Bright Angel cabins, are scattered throughout the existing informal parking area and along the rim edge, and relatively dense vegetation occurs on the slope on the southern edge of the project area. While project components would not substantially alter existing vegetation and strive to protect it wherever feasible, some trees would require removal for parking area improvements under future phases of the action alternatives and for restroom construction under the first phase of all action alternatives. Impacts to vegetation are included in Chapter 3.

Visitor Experience The 1916 NPS Organic Act and *NPS Management Policies 2006* direct national parks to provide for public enjoyment. The Bright Angel Trailhead Area provides opportunities for many different kinds of visitors: overnight backcountry hikers, day hikers, rim walkers, visitors riding mules for day or overnight trips, Bright Angel Lodge guests, and visitors moving through the area to get to or from nearby shuttle stops. Primary foci of the project are to improve visitor experience in this area including improvements in visitor safety, accessibility, wayfinding, and to provide a variety of visitor needs such as shade, seating, restrooms, and drinking water. This topic is discussed in Chapter 3.

Park Operations Park operations including NPS shuttle bus operations through Paul Revere Transportation; NPS maintenance activities including trail repair and restroom servicing; NPS PSAR operations; concessionaire operations at Bright Angel Lodge by Xanterra Parks and Resorts; tour van and tour bus operations; and Kolb Studio operation by Grand Canyon Association all have potential to be affected by proposed actions. This topic is discussed in Chapter 3.

Impact Topics Dismissed from Further Analysis

Archeological and Ethnographic Resources Proposed activities would require project area ground disturbance and alteration of existing conditions. However, no known archeological sites or identified ethnographic resources are known in the project area. An archeological survey found no sites within the area of potential affect, or the geographic area or areas within which an undertaking may cause changes in the character or use of cultural resources (NPS 2000). Native American tribes were consulted regarding this project and site visits occurred. No areas of ethnographic importance with the potential to be affected by proposed actions were identified during these consultations. For these reasons, in addition

to mitigation measures listed at the end of Chapter 2, these topics were dismissed from further analysis.

Watershed Values (Soils and Water) Proposed activities, such as trail improvements, restroom construction, and parking- area improvements would require ground disturbance and changes to area soils. However, due to the area's heavily impacted nature, (the ground is already very compacted with little vegetation and is used for parking, pedestrian access, administrative vehicle access, and other service and visitor use) proposed improvements would not result in any substantial new ground disturbance. Any potential for soil movement, runoff, or erosion during implementation or resulting from new impervious hardened surfaces would be addressed in later design phases. For these reasons, watershed values were dismissed from detailed analysis.

General Wildlife Proposed activities such as trail improvements, restroom construction, and parking improvements would require ground disturbance and changes to area soils. However, due to the area's heavily impacted nature, (the ground is already very compacted with little vegetation and is used for parking, pedestrian access, administrative vehicle access, and other service and visitor use) the area does not provide high quality wildlife habitat. The area is disturbed, receives high visitor use, and is located within Grand Canyon Village's developed zone. For these reasons, general wildlife was dismissed from detailed analysis.

Soundscape The NPS is mandated to articulate park service operational policies that would require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. The project area is in Grand Canyon Village's developed zone and has relatively high ambient noise levels. Proposed project components would not result in increased area use or modes of transportation that would result in any substantial changes in the already high existing ambient sound levels. It is possible for short- term noise- level increases due to construction equipment, but these noise increases would last only the duration of construction. Therefore, soundscape was dismissed from detailed analysis.

Air Quality Clean, clear air is essential to preserve Grand Canyon National Park resources, as well as for visitors to appreciate those resources. Grand Canyon National Park is a Federally mandated Class I Area under the Clean Air Act. As such, park air receives the most stringent protection against air pollution increases and further degradation of air quality-related values. The Act sets a further goal of natural visibility conditions, free of human-caused haze. Park air quality is generally quite good. Park pollution levels fall below levels established by the Environmental Protection Agency (EPA) to protect human health and welfare. However, visibility is usually well below natural levels because of air pollution. Most of this pollution originates far outside park boundaries, and arrives as a well- mixed regional haze, rather than as distinct plumes.

Section 118 of the Clean Air Act requires all Federal facilities to comply with existing Federal, state, and local air pollution control laws and regulations. The park Air Quality Specialist has determined that this project, due to its limited scope, would not require NPS consultation with the State of Arizona regarding air quality.

Trenching and other onsite work would increase dust and combustion- related emissions. Dust raised during ground disturbance would be limited by project size and equipment used. By clearly marking project boundaries, unnecessary soil disturbance and consequent dust generation would be avoided. Water sprinkling can control fugitive dust emissions from light traffic in the project area. Construction equipment can adversely affect air quality by exhaust emissions. Minimizing construction equipment idling would help reduce emissions and construction noise impacts. Indirect routine, daily, air- quality impacts from visitors, employees, and official business vehicle emissions would be unchanged.

Therefore, local air quality may be temporarily degraded by dust generated from construction activities and construction equipment emissions under implementation of the alternatives. This degradation would result in an overall negligible air- quality impact, and would last only as long as project activities occurred. Impacts to overall park or regional air quality are not expected. Therefore, air quality was dismissed from further analysis

Floodplains and Wetlands Executive Order 11988 (Floodplains) and Executive Order 11990 (Wetlands) require Federal agencies to examine potential impacts of actions on floodplains and wetlands, and were reviewed for applicability. Because the project is not in or near a floodplain or wetland, and would not affect this resource, floodplains and wetlands were dismissed from further analysis.

Environmental Justice Executive Order 12898 requires consideration of impacts to minority and low- income populations to ensure these populations do not receive a disproportionately high number of adverse or human- health impacts. This issue was dismissed from further analysis because each alternative would affect everyone equally and would not disproportionately impact minority or low- income populations.

Prime and Unique Farmland The Farmland Protection Policy Act of 1981, as amended, requires Federal agencies to consider adverse effects to prime and unique farmlands that would result in conversion of these lands to non- agricultural uses. Prime or unique farmland is defined as soil that particularly produces general crops as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. This proposed project's locations and surrounding lands have been evaluated by appropriate park and Natural Resources Conservation Service (NRCS) specialists. Based on their observations, the project area is not considered prime or unique farmland (Camp, pers. comm. 2002). Therefore, this topic was dismissed from further analysis.

Socioeconomic Environment Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and park concessions. The local economy and most business in neighboring communities are based on construction, recreation, transportation, tourist sales, services, and educational research; the regional economy is strongly influenced by tourist activity. The GMP EIS discussed socioeconomic environment and impacts extensively. There may be short- term benefits to the local and regional economy resulting from construction- related expenditures and employment under implementation. Local and regional businesses would be negligibly affected in the long- term. Because this project would not result in changes in tours, lodging, or dining opportunities, would not restrict area access, and would not result in expected substantial

changes to the local economy or concessions operations, socioeconomic values were dismissed from further analysis.

Wilderness Most of the park has been recommended for wilderness designation. Until Congress formally acts on this recommendation, NPS Management Policies 2006 require that these areas be managed under provisions of the Wilderness Act. However, while the Bright Angel Trail is a primary access route for backcountry visitors accessing recommended wilderness below the canyon rim, the trailhead project area is above the rim, is part of the Development Zone as defined in the GMP, and is outside recommended wilderness. Proposed actions would not occur in recommended wilderness and would not directly affect wilderness character or values. For these reasons, wilderness was dismissed from further detailed analysis.

ADDITIONAL NEPA ANALYSIS

The alternatives include all reasonably foreseeable connected actions. Environmental effects estimated for this project consider the site- specific effects of all foreseeable actions and mitigation measures. This EA evaluates each action based on reasonable estimation of impacts from preliminary site plans and proposed action descriptions, including those from connected actions.

Monitoring during and following project implementation would occur to verify mitigation measure effectiveness and impact predictions. This EA will guide any subsequent project implementation. If new information or unforeseen and unanalyzed actions become necessary as further detailed design occurs, additional site- specific environmental analysis will be conducted before implementation, as appropriate.

Chapter 2 – Alternatives

INTRODUCTION

The NPS adopted the sustainable design concept as a guiding principle of facility planning and development (DO- 13, Environmental Management Systems, and NPS Management Policies 2006). Sustainability objectives include designing park facilities to minimize adverse effects on natural and cultural values, reflect their environmental setting and maintain and encourage biodiversity; construct and retrofit facilities using energy- efficient materials and building techniques; operate and maintain facilities to promote their sustainability; and illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. The action alternative subscribes to and supports sustainable planning, design, and use of the park's developed areas with their associated public and administrative facilities.

This document analyzes a No- Action Alternative and two action alternatives. Analysis of the No- Action Alternative is required under NEPA (40 CFR 1502.14(d)). The No Action Alternative provides a baseline for assessing potential impacts of action alternatives. In developing alternatives for this project many actions were considered and subsequently dismissed. A description of alternatives considered but dismissed from detailed study is included in this chapter. Summary tables comparing alternative components (Table 1) and environmental impacts (Table 2) are also presented at the end of this chapter.

Action alternatives are based on preliminary designs and best information available at the time of writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are not consistent with the intent and effects of the selected alternative, additional environmental compliance would be conducted as appropriate.

ALTERNATIVE DEVELOPMENT

As described in the Management and Planning History Section of Chapter 1, multiple meetings and discussions took place with NPS staff regarding this project. Alternative development began with meetings in October 2005 between park staff and the contracted design team regarding the need to develop an area design plan, consider the area's historic character, and understand the variety of ongoing uses. Preliminary options developed to address the need for action were described in a scoping letter to interested and affected agencies and the public in January 2006. Using public comments received, the results of the internal scoping open house, and other comments from NPS staff, six preliminary schematic design options were developed by the design team and reviewed by the park. Based on input from key project team members, these were narrowed to three preliminary alternatives. These three alternatives were evaluated in a Value Analysis/Choosing by Advantages Workshop held in March 2006 to weigh their merits in

achieving objectives against cost (DHM design and Andrews and Anderson Architects 2006a). Workshop results and subsequent park management discussion resulted in selection of an agency preferred alternative. This alternative was further revised based on subsequent discussions with park management and interdisciplinary team members regarding anticipated budget considerations, the potential for cultural resource impacts and the potential for phasing project implementation. This alternative, Alternative B, Preferred, is described in detail below.

ALTERNATIVE DESCRIPTION

Alternatives are described below. Table 1 summarizes each alternative's primary components, and Table 2 summarizes expected impacts from alternatives implementation.

ALTERNATIVE A, NO ACTION (Figure 4)

No improvements would be made to the Bright Angel Trailhead Area under Alternative A. Existing trails, parking areas, and facilities would remain in their current location and configuration. Existing portable chemical toilets would remain onsite and no new restroom facility would be constructed. Existing signing would remain, and no wayfinding improvements would be made. Visitors would continue to have difficulty finding their way through the area and finding adequate amenities such as seating, shade, drinking water, and restrooms. Much of the area would continue to lack universal accessibility and a sense of place.

The parking area would remain undefined with an approximate capacity of 100- 120 vehicles. Parking would continue in the area bounded by the Rim Trail, Bright Angel Cabins, and a drainage swale on the mule corral's east side.

This alternative does not meet the action's purpose and need. The No Action Alternative provides a basis for comparing the action alternatives' management direction and environmental consequences. If the No Action Alternative was selected, NPS would respond to future Bright Angel Trailhead Area needs without major action or course changes.

ALTERNATIVE B, PREFERRED (Figure 5)

Phase 1

The parking area would be graded but the surface would remain rock and packed dirt. The outer boundaries of the parking area would be delineated using boulders or native stone. A drop-off (loading/unloading) area would be created at the northern end near the Rim Trail, so that smaller tour vans and personal vehicles can drop off and pick up passengers in the area. The extent of the parking area would be reduced from the existing configuration by approximately 25%. Cars would no longer be able to park so close to the rim edge allowing this area to be reclaimed for use as pedestrian zones. No individual parking spaces would be delineated; the resulting parking area capacity would be approximately 70- 90 vehicles. This reduction over existing capacity would be due to removal of parking from the rim edge and some small reductions in parking adjacent to cabins from creation of vegetation islands and protecting existing vegetation.

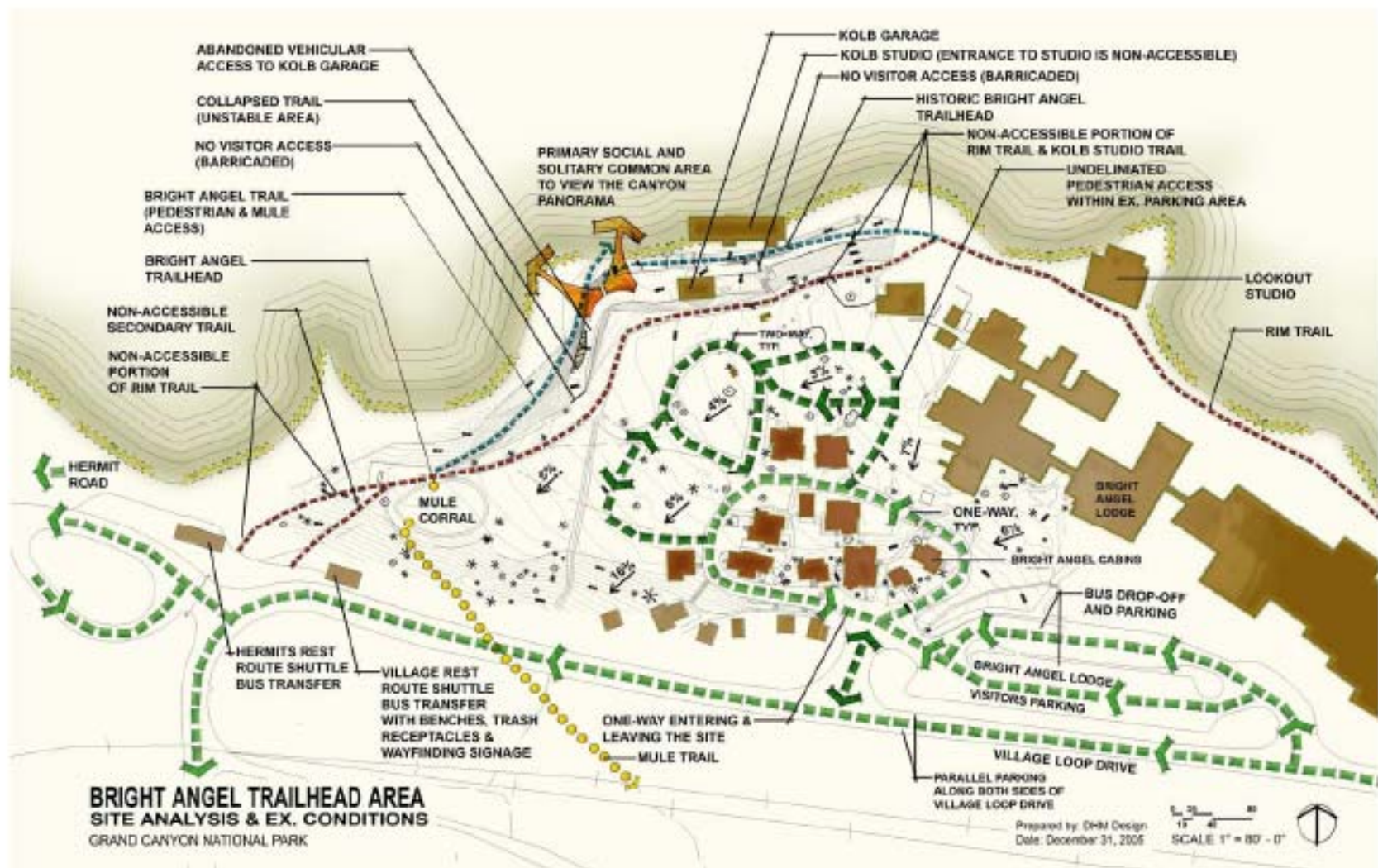
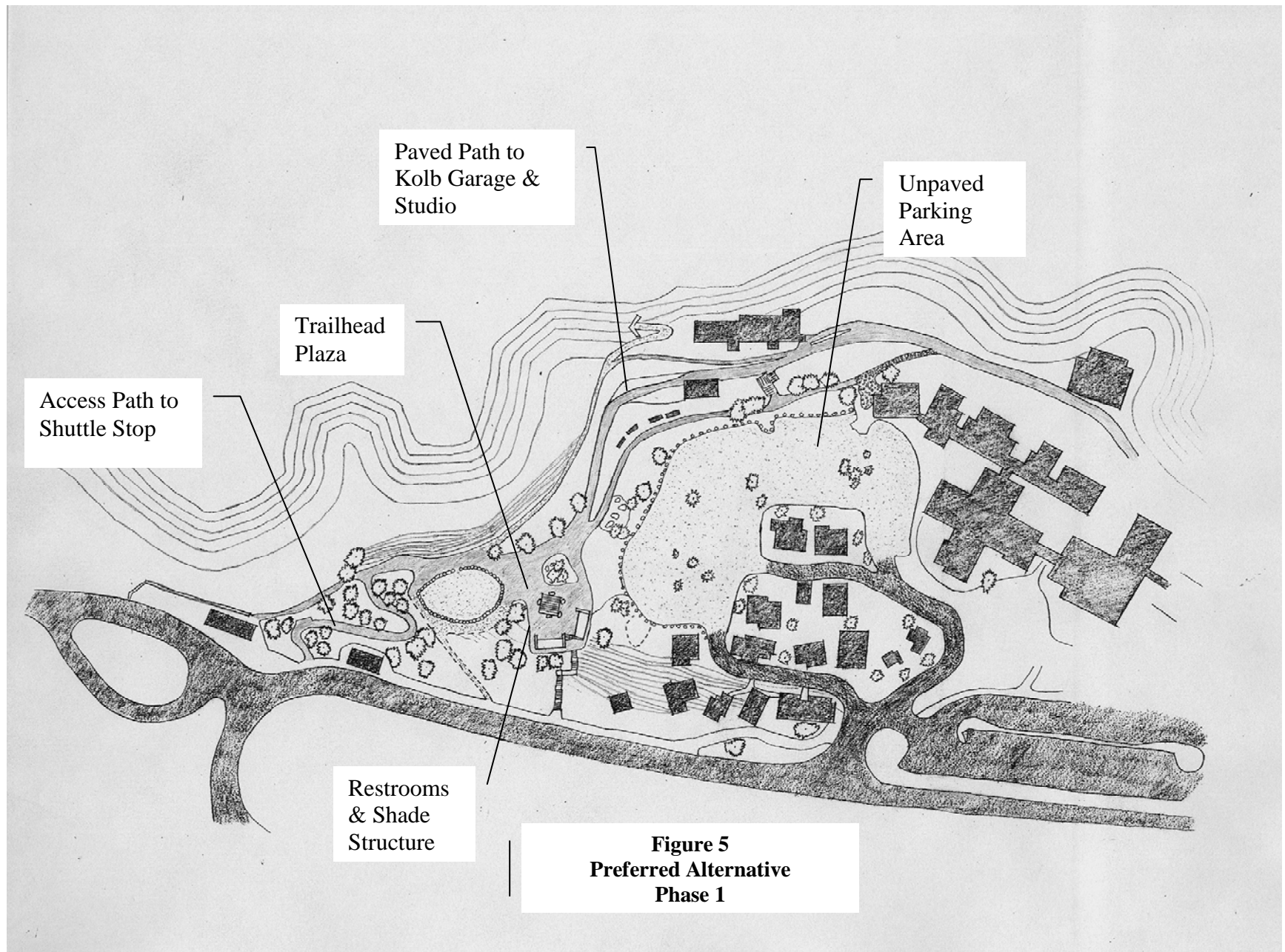


Figure 4 Existing Conditions, Bright Angel Trailhead Area



Plaza Area and Restroom

The Bright Angel Trailhead Area would be redesigned so as to create a plaza (named Bright Angel Trailhead Plaza, or something similar) near the primary trailhead entrance, just east of the existing mule corral. A new restroom and shade structure would be constructed directly behind the plaza. The plaza's surface would be concrete or of a similar hardened surface and would provide for hiker staging, mule rider orientation, and a visitor meeting and resting area, in view of the Bright Angel Trailhead nearest the mule corral. The plaza area would connect the mule corral area with the parking area, Rim Trail and the trailhead itself and would be informal and rustic in character but designed for high levels of visitor use.

The restroom would consist of two separate buildings with a total of ten single- use toilet rooms (Figure 6). No lavatories would be provided in the individual toilet rooms; they would be provided with waterless hand sanitizer dispensers. Drinking water would be provided at an outside water station as well as a hand- washing sink, as described below under Site Amenities. Both buildings combined would be approximately 600 square feet. An extended covered- roof area for shade may be included as part of the restroom buildings, or a separate shade structure constructed between the restroom and the plaza. The specific design and selection of exterior finishes for the building shade structure and plaza would be determined during later design phases for the project and in consultation with the SHPO to ensure its compatibility with the surrounding National Historic Landmark District. The restrooms would employ energy- efficient building design principles as much as possible, which may include solar power for heating and lighting, skylights, low- flow flush toilets and careful selection of building materials.

Trails and Walkways

The Rim Trail would provide connections between the shuttle bus stops on the west end of the project area and Bright Angel Lodge and Lookout Studio on the east end. A new accessible paved trail would be constructed on the west end (the existing historic Rim Trail in this area would remain) and would connect with the Rim Trail near the corral. All historic segments of the Rim Trail in the project area would be resurfaced in kind and would remain at their current width (approximately five feet). Any new trail sections necessary to complete the Rim Trail in the project area would generally be eight- feet wide, including the alignment along the former Kolb Garage access road (an area now closed due to retaining wall collapse) and would be accessible down to Kolb Garage and Kolb Studio, near the original (secondary) Bright Angel Trailhead. This would require reconstruction of the failed wall above the Bright Angel Trail. Due to the topography and grades, the Rim Trail from Kolb Studio to Lookout Studio would not meet the necessary gentle grades for Americans with Disabilities Act (ADA) standards. At the upper end of this reconstructed section near the plaza area, the Rim Trail would connect with the existing Rim Trail and would provide access to Bright Angel Lodge and viewpoints and seating opportunities as pedestrians travel east.

Secondary trails would generally be no wider than five- feet wide (but meeting the minimum width requirements to achieve accessibility) and would be differentiated from the paved Rim Trail. The existing historic flagstone trail section near the rim cabins would be repaired but would remain in its current width and configuration. The concrete stairway leading from the Rim Trail in this area down to Kolb Studio would remain. A non- hardened path would be

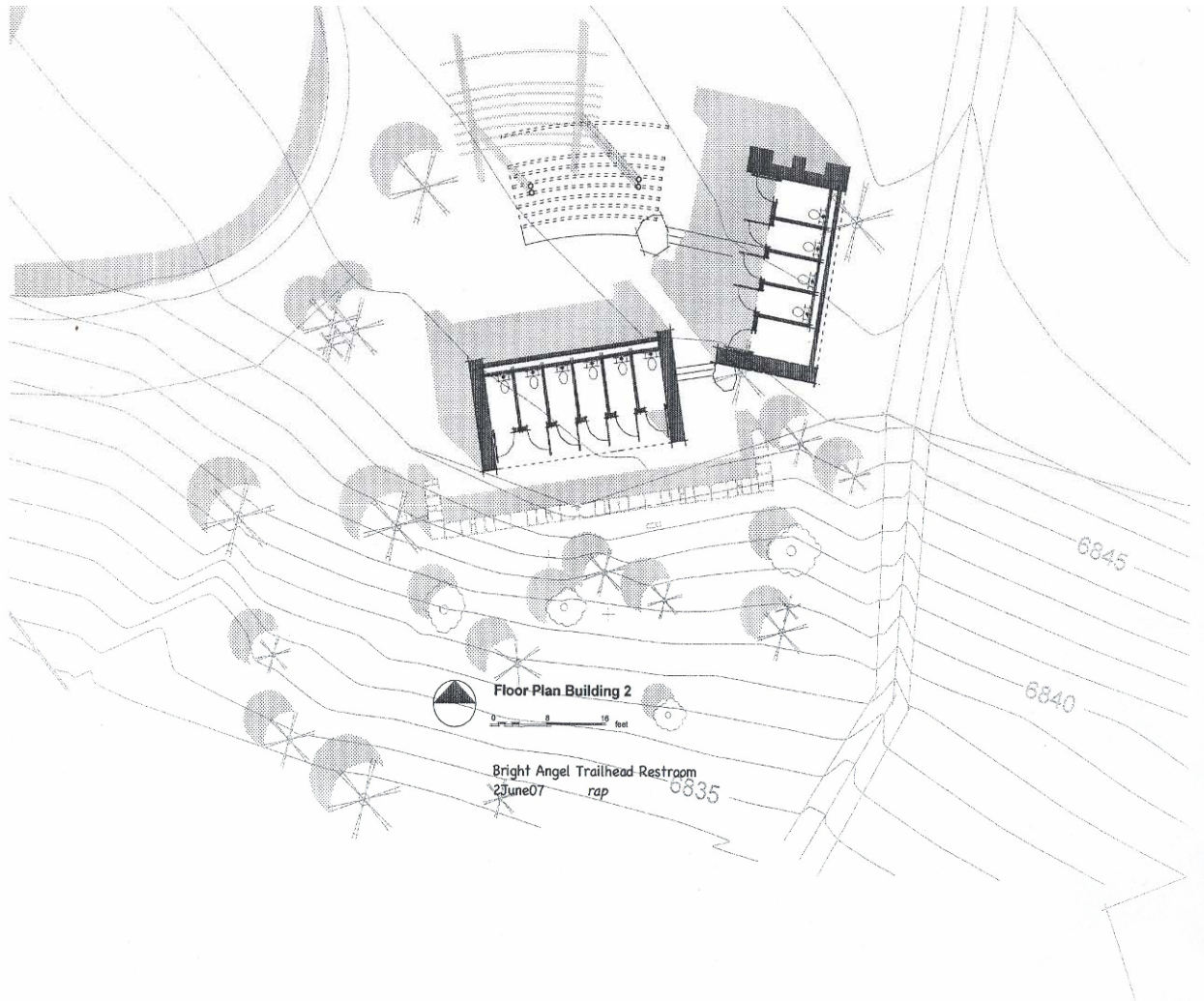


Figure 6 Preliminary Restroom Site Plan

created around the mule corral to allow visitors without accessibility needs to maneuver behind the corral and make more direct connection to the plaza area, particularly during busy times when congestion occurs at the north end of the corral nearest the trailhead. A new secondary informal path would also be created between the restroom and Village Loop Drive to provide more direct access to the restroom from the road and the shuttle bus stops. The entry point to the primary Bright Angel Trailhead near the mule corral would be emphasized, through design, as the threshold to the backcountry; differentiated in a subtle way from the Village developed area, so as to enforce a safety message about venturing into the backcountry (and how to be sufficiently prepared) and to enhance visitor understanding of the area.

The end result of improvements to trails and walkways in the Bright Angel Trailhead Area would be a fully accessible pedestrian Rim Trail connection from Village Loop Drive and both the Hermit Road and Village Loop shuttle bus transfers to the Bright Angel Trailhead, the plaza area, restrooms, canyon and trail views, the Bright Angel cabin area and Kolb Garage and Kolb

Studio. Universally accessible access would not be provided farther east than Kolb Studio due to excessive grades. For pedestrians coming from the Lookout Studio area, the Rim Trail connections would provide improved access to the Kolb Garage area and the historic Bright Angel Trailhead.

Wayfinding Signage and Site Amenities

The original Bright Angel Trailhead near Kolb Studio would remain and would be identified and interpreted as the original trail alignment. NPS would explore the need for changing the signage at the trailhead nearest the corral to better differentiate between the two trailheads. The existing interpretive kiosk located just north of the corral and west of the trailhead would be removed; a new interpretive kiosk would be designed and constructed, and located in a more appropriate location within the Bright Angel Plaza area. As funding allows, a system of wayfinding, regulatory/safety and interpretive information would be presented at logical locations throughout the project area, using kiosks, sign panels and/or wayside displays to clarify, simplify and enhance visitor safety and the quality of visitor experience.

The specific information necessary for any additional signage would be developed as part of a comprehensive area sign plan and would address those factors specifically identified as part of the project objectives. The interpretation of the Native American history of the trailhead area would be considered as part of the plaza area interpretive plan. The quantity, location, and style of any new signs would be carefully evaluated for appropriateness within the cultural landscape and surrounding NHL district.

The first phase of implementation of the preferred alternative would include minimum signage necessary for visitors to find their way through the project area; additional signage above the minimum would be provided in a future phase if additional funds become available, as described below under Phase 2.

In addition to an improved system of signs, other minimal site amenities for the project area would be added. Drinking water would be provided outside the restrooms to include the ability to fill up water bottles, get a drink, or splash off after coming off the trail. The existing emergency phone would be relocated to the plaza area and bike racks and seating, either as informal seat walls, separate benches and/or flat-topped rocks would be added. Opportunities for taking photos would be identified, considering views of the trail and trail identification signs. Lighting needs would be evaluated, with the intent of providing the minimum necessary in appropriate locations with appropriate fixtures, adhering to the park's policy on night-sky protection.

Utilities

Trenching would be necessary for utilities such as sanitary sewer, water and electrical lines primarily for the new restroom. Any new utility lines would be underground and any existing overhead lines would be buried wherever possible. As appropriate, these trenches, or other trenches if necessary, would be dug to house other utility services necessary for the Bright Angel cabins, such as propane gas lines. When trenches are used for propane gas, they would be vented and sleeved. Vents would be located within vegetated islands as much as is possible to keep them

from view. A new gas log insert for the Red Horse Cabin would be fueled by a small, screened tank in the vicinity of this cabin and would require some minor trenching. Due to the existence of bedrock in much of the project area, any trenching would likely be by rock saw.

Phase 2 (Figure 7)

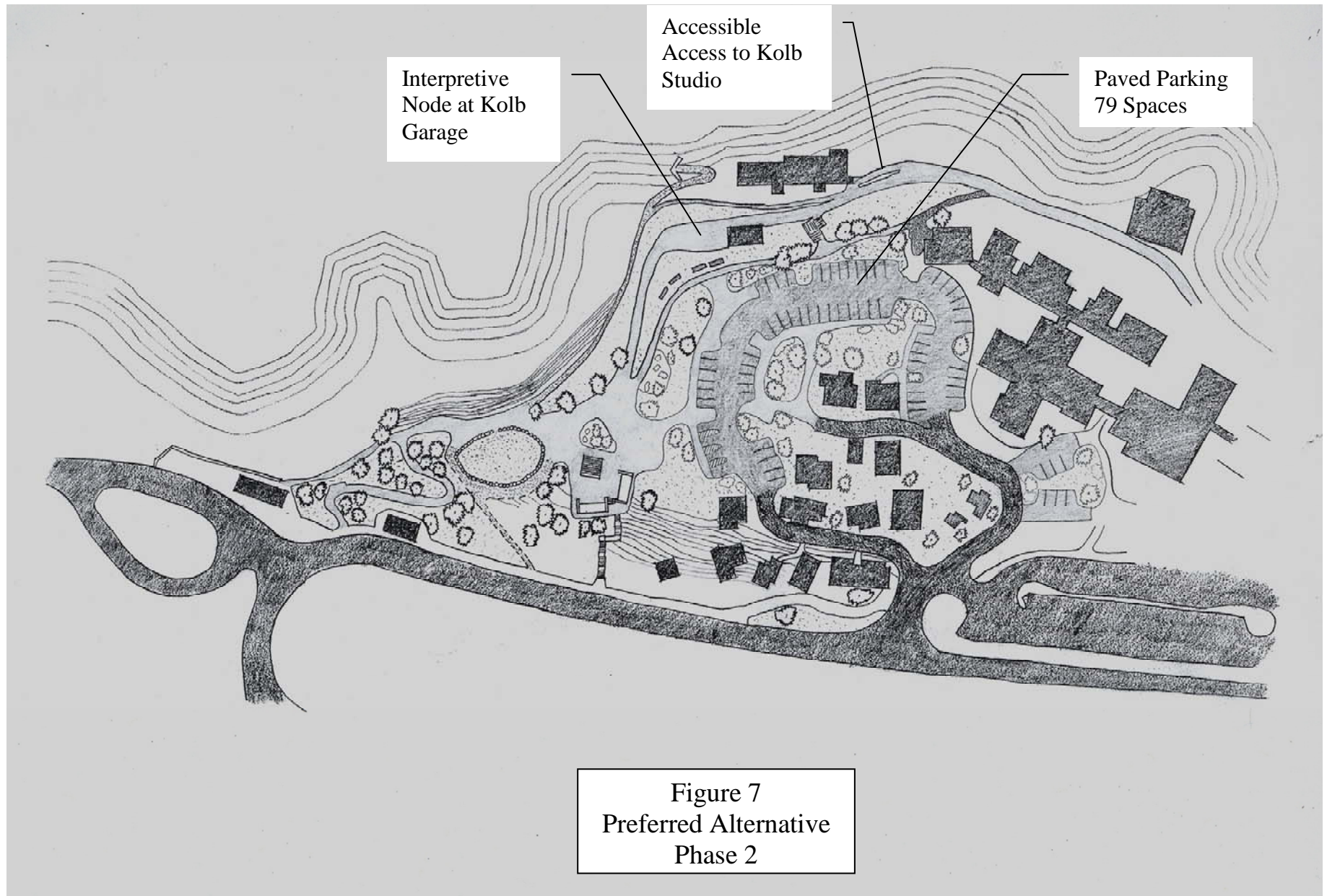
Phase 1 proposed actions described above are considered the most critical aspects of the design plan that would meet the most pressing needs in the project area and for which NPS currently has funding. Funding, however, is not currently available to implement all necessary actions that would address all project objectives. NPS intends to solicit additional funding over time to implement other important project components; these additional actions are described below. These actions are considered part of the preferred alternative.

Landscaping and Revegetation Additional landscaping and revegetation would occur throughout the project area where needed to restore denuded areas and provide vegetated islands. Tree roots would be covered with soil and protected. Native species would be used and all efforts would be guided by the project's landscape architect and the park Vegetation Program Manager.

Additional Site Amenities Minimal signage and site furnishings would be provided during the first phase. As additional funds become available, additional small- scale features would be added as needed, to include such things as flat- topped rocks for picnicking, benches, additional trash and recycling receptacles, bike racks, and additional wayfinding and/or interpretive signage. Any additional small- scale features would be carefully considered and sensitively designed to be appropriate for their location within a National Historic Landmark District.

Accessible Access into Kolb Studio The entrance to Kolb Studio is not universally accessible. To make it so, modifications to the existing walkway in front of the building (eliminating access barriers like steps) would occur under a future phase.

79- Stall Parking Area with Hardened Surface The packed dirt parking area with the outer boundaries delineated under Phase 1 would be replaced with an all- weather, hardened surface similar to a chip- seal; the parking area would not be standard asphalt and would be of a color and surface consistent with the surrounding National Historic Landmark District. Individual parking spaces would be delineated to provide an estimated total capacity of approximately 70- 80 cars. The outer boundaries would remain the same as those identified in the first phase of implementation. The parking area would be redesigned as a one- way loop around the cabins. The layout would eliminate the east/west drive that currently exists through the center of the cabins to provide a pedestrian walkway for people wanting more direct access to the cabins and the lodge without having to use the rim trail. This walkway would also double as a service access road to the cabins. The design would create a vegetated island inside the parking loop in proximity to the cabins and would provide enhanced protection of vegetation, more separation of pedestrians and vehicles and more privacy for cabin guests. A drainage feature would likely be necessary with this hardened surface and would be developed in the vegetated area near the restroom, for the purpose of retaining any additional runoff from the hardened surface parking area.



Interpretive Node at the Kolb Garage In the area of Kolb Garage, near the original Bright Angel Trailhead, a small interpretive node, or gathering area, would be created to enhance the use of this location for ongoing interpretive programs, where spectacular canyon views are offered. To achieve this goal, the historic Garage would be rehabilitated and reused for interpretive functions. Potential uses include interpretation of the history of the Bright Angel Trail, the Kolb brothers, and Native American traditional use of the trail and surrounding areas. The building would also retain some of its existing use as needed storage for Kolb Studio and NPS needs. Some additional seating, via flat- topped rocks or something similar, would also be considered in the open area near Kolb Garage to enhance its use for interpretive talks. How the historic Kolb Garage is rehabilitated and reused would be carefully evaluated by cultural resources staff and the SHPO, as part of the larger consultation effort for this project.

ALTERNATIVE C, MAXIMIZED, HARDENED SURFACE PARKING (Figure 8)

Alternative C includes all aspects of Alternative B above except it includes, as a future phase, a larger- capacity parking area, with an all- weather, hardened surface. Descriptions of the plaza area and restroom, trails and walkways, wayfinding, and site amenities are the same as those described for Alternative B, including project implementation in phases. If additional funds come available in the future, and Alternative C is selected for implementation, the funds would be used to implement all aspects of Phase 2 components as described above for Alternative B, but a larger, hardened- surface parking area would be created instead of the 70- to 80- stall parking area as identified in Alternative B.

Under Alternative C, Phase 2 the parking area would have a capacity of approximately 104 cars, as shown in Figure 8. The parking area would have a one- way loop around the outer perimeter of the Bright Angel Cabins and would create both single- loaded and double- loaded bays to achieve the highest number of parking spaces. A double- loaded bay is one in which parking spaces are accommodated between two drive lanes and on either side of a drive lane. The existing drive, and parking between cabins, would be converted to a pedestrian path with service- vehicle access.

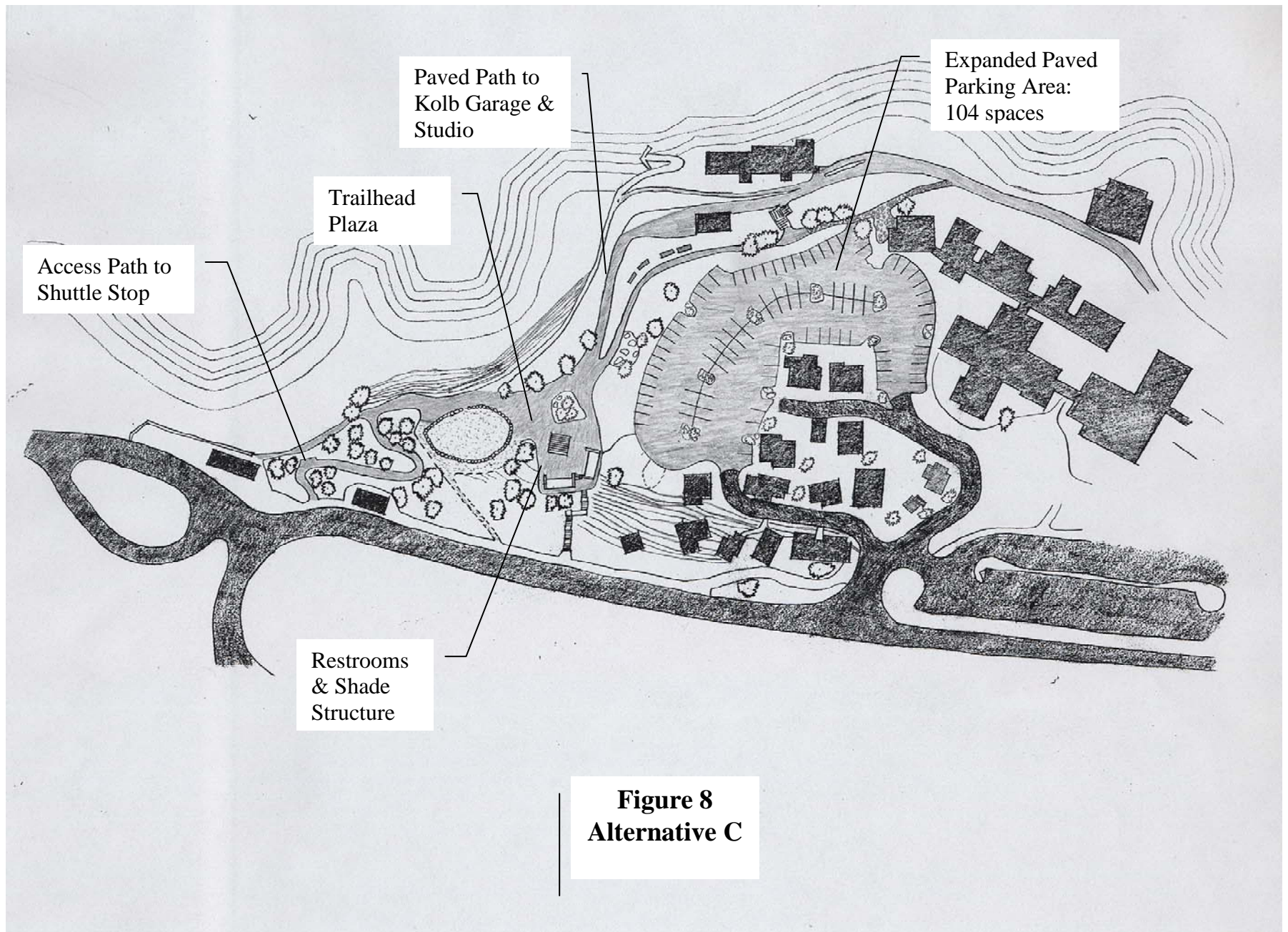
To accommodate the larger parking area, pedestrian zones and native landscaping areas would be somewhat reduced on the western end nearest the plaza area. There would be no landscaped buffer zone between the parking area and the Rim Trail on this western end and smaller landscaped zones around the Bright Angel cabins. All other aspects of Alternative C are the same as described for Alternative B.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED STUDY

As part of alternative development and internal and external scoping, several preliminary alternatives and components of alternatives were dismissed from further detailed study.

Restroom Location and Size

The 1995 GMP, as described in Chapter 1, identified need for a restroom in the Bright Angel Trailhead Area and stated it would be located within the historic Kolb Garage. As part of



another project to rehabilitate existing, and construct new, restrooms throughout the park, use of Kolb Garage was evaluated in a Value Analysis in February 2001. The study team ultimately recommended that the park not use Kolb Garage as a restroom and construct a new restroom in the area instead, even though use of the Garage had merit. This was due in part to engineering difficulties getting a sewage lift station near the site (and its long- term maintenance and operational costs), accessibility issues, the extensive amount of work that would be necessary to this historic building to rehabilitate it for use as a modern restroom, and the exorbitant cost associated with improvements necessary to make this location work. Park management asked that this site again be considered during the planning process for the Bright Angel Trailhead Area. The Bright Angel IDT concluded that Kolb Garage was not feasible for the same reasons cited by the 2001 committee, but also due to the Garage's small size and the need for a larger restroom facility to meet current visitor demand in this popular South Rim area.

Accommodating restroom needs within existing buildings near the project area was considered in order to avoid construction of a new building near the rim and within the NHL district. Restrooms are currently provided by Xanterra Parks and Resorts, the park's current hospitality concessionaire, in the Bright Angel Lodge for lodge guests. These restrooms are not located on an accessible route of travel due to obstructions from excessive changes in level. In discussions with the Arizona SHPO, no viable means of correction presents itself that would not adversely affect the building's historic character. The restrooms were originally designed for the expected capacity necessary for Lodge guests, not all park visitors in the Bright Angel Trailhead area. Current rehabilitation plans for the Lodge do not include increasing the accessibility of existing restrooms for reasons described above. Additionally, the Bright Angel Lodge restrooms are not in proximity to the trailhead being nearly 1/4 mile from it. These restrooms are used frequently by lodge guests and other park visitors, with long lines often forming in peak season since this is the only flush toilet facility in the area. The Arizona Room has a restroom for restaurant guests but is only open for dinner. The sole accessible public restroom at the El Tovar hotel is over 1/2 mile from the BA trailhead making it even more inconvenient for visitors.

A restroom located at the Village Loop Shuttle Bus Stop was also considered to address concerns about new rim construction and within the NHL District. Restroom construction near the roadway, in conjunction with a new shuttle stop shelter would serve many visitors, could be constructed near the existing slope, and tucked into the hillside. This alternative was dismissed from detailed analysis because it did not address the needs of all users, and would likely obscure canyon views from Village Loop Drive. While this location would be convenient for shuttle bus users, it would not be convenient for mule riders, hikers, or other project- area day users. Further, the structure would not provide additional shade in the staging area where shade is most needed.

A split restroom was also considered: two smaller restrooms, one by the Village Loop Shuttle Stop (as described above) and one by the corral. This would provide convenient facilities for all area users at two locations and build smaller, less conspicuous structures in these sensitive areas. This alternative was dismissed from detailed analysis because it would require additional daily maintenance, cleaning, long- term facility maintenance (two buildings in different locations to

maintain instead of one), and would increase infrastructure (water, sewer, electrical to two sites instead of one), increase short- term construction costs, and long- term life- cycle costs.

A restroom within the Bright Angel Lodge Cabin area and closer to the rim was dismissed from further consideration due to its rim prominence, visibility from other South Rim areas, and concern over introducing a new building so close to the cluster of Mary Jane Colter- designed NHL structures, the Bright Angel Lodge Cabins.

Restrooms of varying capacities were also considered. A large restroom that would accommodate projected use levels (17 women's stalls, four men's stalls and five men's urinals) were considered but ultimately dismissed due to the building's large footprint, the ground disturbance necessary, and the difficulty in accommodating a building of this scale into the NHL District. Smaller sizes were carried forward and determined by NPS and the design team to be sufficient to address need while being suitable within the historic district.

Restrooms with sinks were considered since this is a front- country restroom near existing water lines and located at a busy trailhead; providing water in sinks in each restroom would provide an area for visitors to wash hands and rinse off after coming off the trail. The NPS ultimately dismissed this option from further consideration due to the confirmation that a water station could be accommodated on the outside of the facility to meet this need; to do so would reduce the necessary square footage of the building and would be more energy/resource- efficient.

Shade

Several, smaller independent shade structures, separate from the restroom building, were initially considered but dismissed due to the impact they would have on the cultural landscape and visual quality when scattered throughout the project area. The planning team determined that new area construction should be limited, and that incorporating all needs into one plaza area would consolidate, and therefore minimize, intrusions into the historic setting and scenic views. Independent smaller shade structures would not sufficiently accommodate the level of use.

A larger shade structure incorporated into the restroom building design was initially considered to meet the needs of the high visitor numbers in this area in the summer. This option was dismissed so that the scale and massing of the restroom structure would be more compatible with the surrounding cultural landscape and nearby features. The preferred alternative includes both shade and a restroom facility that are expected to meet visitor needs while also minimizing the impact of this new structure on the area's setting.

A small shade structure at the viewpoint overlooking the Bright Angel Trail near Kolb Garage was dismissed from further consideration. While shade in this location at the proposed interpretive node would provide for interpretive talks on the rim, it would also result in view impacts from above, and result in a more prominent structure in the landscape from several vantage points. This would result in an adverse impact to visual resources and cultural landscapes.

Use of native vegetation for shade was considered. There are approximately 50 mature trees scattered throughout the project area. Those that provide some shade occur within the informal parking area surrounding the cabins. The proposal includes protecting as many of these as possible during project implementation and planting additional native vegetation in suitable areas to rehabilitate denuded areas and provide needed cabin buffers, under future phases of implementation. As these trees or shrubs mature, they will provide shade. However, the planning team determined that trees large enough to provide immediate shade would probably not survive in the arid climate, and attempted planting would require intensive management. For these reasons, shade options other than those described as part of the preferred alternative were dismissed from further analysis.

Parking

A parking configuration was initially developed that would maintain vehicle access between the cabins and the existing historic drive path. This alternative was ultimately dismissed from detailed analysis because it did not provide a consolidated landscape, only provided four parking spaces over the preferred capacity of 79 vehicles (as described in the preferred alternative), would not allow a walking path through the cabins for hikers wanting to access Bright Angel Lodge from the shuttle stop or Trailhead Area, and would result in more complicated snow removal due to several area roadways.

The removal of day- use parking in the project area was initially considered. The 1995 GMP EIS identified that all day- use parking in Grand Canyon Village would be removed when certain visitation levels were reached and mass transit was in place. The South Rim Transportation Plan is currently evaluating visitation forecasts and the most pressing transportation needs, including use of all existing parking areas in Grand Canyon Village. An EA will fully evaluate alternatives for addressing these needs. Currently, the NPS does not feel visitation levels warrant removal of all day- use parking or a mandatory mass transit system. For these reasons, day- use parking would not be eliminated in the Bright Angel Trailhead Area under this project, and the parking area would continue to serve both overnight Bright Angel Lodge guests and day- users. However, the parking proposal described in this document's alternatives would not preclude keeping it open for Bright Angel Lodge guests, but closing it to day- users or some other similar scenario at a future time if necessary based on increased visitation or and/or enhanced mass transit systems. Alternative analysis in Chapter 3, Park Operations, includes evaluation of how well proposed parking alternatives could accommodate potential future changes, in terms of cost and infrastructure.

Universal Accessibility

An initial project goal was to achieve universal accessibility for all primary access routes into and through the project area. However, due to excessive grades (particularly between Lookout Studio and Kolb Studio, and between the Rim Trail near Kolb Studio and the rim cabins) it was determined not feasible, considering the extensive changes necessary to historic features. An accessible path would be created, as part of all action alternatives, from Village Loop Drive and the Hermit Road Interchange on the project area's west end up to the mule corral and Trailhead. Main access routes would be resurfaced and widened and the Rim Trail rebuilt to accessible standards from the Trailhead Area to Kolb Garage.

IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying criteria suggested in the National Environmental Policy Act of 1969 which guides the Council on Environmental Quality (CEQ). CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA Section

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1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations 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, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will 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.”

Through the internal and public scoping process, the environmentally preferred alternative selected is Alternative B. Alternative B best meets the action’s purpose and need and best addresses overall park service objectives and evaluation factors. Alternative B would result in changes to the cultural landscape, but these would be minimized through careful design and selection of appropriate surfaces, finishes, and site amenities. Due to the area’s highly disturbed nature, impacts to natural resources would be relatively minimal but would require implementation of some mitigation measures to ensure impacts are reduced. Visitors would benefit from improved facilities and a more appropriate area design that minimizes the parking area footprint while enhancing gathering areas, canyon- viewing opportunities, and pedestrian use. Alternative C shares many aspects of Alternative B and therefore is similar in result, but the larger parking area would result in more impact to the cultural landscape and historic structures, and does not then meet objectives 1 and 4 as well as Alternative B. Alternative B achieves the best balance between resource protection and visitor enjoyment.

MITIGATION MEASURES

To minimize resource impacts, the integral design features (i.e., mitigation measures) below are common to all action alternatives, would be followed during implementation, and are analyzed as part of the action alternatives. If there are integral design features necessary for an individual alternative, these are listed in that alternative’s description. These design features were developed to lessen the action alternatives’ adverse effects, in combination with foreseeable

future actions, and have proven very effective in reducing environmental impacts on previous projects.

Contractor Orientation Contractors working in the park are given proper conduct orientation both in writing and verbally at a preconstruction meeting. Orientation would include, but not be limited to

- Wildlife should not be approached or fed
- Collecting any park resources, including plants, animals, and historic or prehistoric materials is prohibited
- Contractor must have a safety policy and a vehicle fuel spill and leakage policy
- Other environmental concerns and requirements discussed elsewhere in this EA would be addressed, including relevant mitigation measures listed below.

Limitation of Area Affected The following mitigation measures would be implemented to minimize the area affected by construction activities

- Staging areas for construction office (a trailer), construction equipment, and material storage would either be located in previously disturbed areas within the project site or in other disturbed areas that best meet project needs and minimize new ground disturbance. All staging areas would be returned to pre- construction conditions or better once construction is complete. Standards for this, and methods for determining when standards are met, would be developed in consultation with the park's Vegetation Program Manager
- Construction zones would be fenced with construction tape, snow fencing, or similar material before construction activity. Green or brown- colored fencing would define the construction zone and confine activity to the minimum construction area required. All protection measures would be clearly stated in construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone defined by fencing

Soil Erosion To minimize soil erosion, the following mitigation measures would be incorporated into the action alternatives

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods would be used to minimize any potential soil erosion
- Trenching operations would be by rock saw, backhoe, track hoe, Pionjar, ditch digger and/or trencher, with excavated material side- cast for storage. After trenching is complete, bedding material would be placed and compacted in the trench bottom. Backfilling and compaction would begin immediately after trenching, and the trench surface would be returned to pre- construction contours. All trenching restoration operations would follow guidelines approved by park staff. Compacted soils would be scarified, and original contours reestablished.
- A landscaping plan would be developed by the project Landscape Architect in consultation with the Vegetation Program Manager and would be used as part of implementation of future phases of the action alternatives, as funds allow. Any revegetation efforts would use site- adapted native species and/or site- adapted

native seed, and park policies regarding revegetation and site restoration would be incorporated. The plan would consider, among other things, use of native species, plant salvage potential, exotic vegetation, and pedestrian barriers. Policy related to revegetation would be referenced from NPS Management Policies (NPS 2006; Chapter 9).

Vegetation To minimize vegetation impacts, prevent exotic vegetation introduction, and minimize spread of noxious weeds, the following mitigation measures would be incorporated into the action alternatives

- Inventories for existing populations of exotic vegetation at construction sites have already occurred in the primary proposed disturbance areas. As design plans develop, these would be cross-referenced with existing vegetation survey information to insure that no new survey is necessary prior to start of work
- All construction equipment that would leave the road (e.g., bulldozers and backhoes) would be pressure-washed prior to entering the park. The location selected for vehicle washing, in addition to that selected for the batch plant, would be approved by a supervisory biologist.
- Staging area location for construction equipment would be park-approved, and need for treatment of exotic vegetation would be considered
- Vehicle parking would be limited to existing roads or the staging area
- Pruning necessary for this project and for any future periodic maintenance adjacent to overlooks and trails would adhere to the park's tree pruning guidelines with the goal of retaining health and integrity of trees and shrubs treated. Damage to trees or roots in or adjacent to project areas during construction would be avoided as much as possible
- Any fill, rock, or additional topsoil needed would be obtained from a park-approved source. Topsoil from the project area would be retained whenever feasible

Water Quality and Floodplains To minimize potential water quality impacts, the following mitigation measures would be incorporated into the action alternatives

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods would be used to minimize any potential sediment delivery to streams
- The park Hydrologist would be consulted on the specific size, location, and layout of any new culverts or any water retention areas to ensure impacts are minimized

Special Status Species To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract would include provisions for discovery of such. These provisions would require cessation of construction activities until park staff evaluated the impact, and would allow contract modification for any measures determined necessary to protect the discovery. Mitigation measures for known special status species are

California Condor

- Prior to a construction project's start, the park would contact personnel monitoring California condor locations and movement to determine condor status in or near the project. *No previously- used condor nests (pre- 2007 breeding season) are within 0.5 miles of the project area, but efforts will be needed to verify any new condor nesting locations prior to the start of construction*
- If a condor occurs at the construction site, construction would cease until it leaves on its own or until permitted personnel employ techniques resulting in the condor leaving. *The need for hazing may be more intensive for this project than others due to its proximity to Kolb Studio and frequently- used condor roosting sites.*
- Construction workers and supervisors would be instructed to avoid interaction with condors and to contact the appropriate park or Peregrine Fund personnel immediately if and when condor(s) occur at a construction site
- The construction site would be cleaned up at the end of each work day (i.e., trash disposed, scrap materials picked up) to minimize the likelihood of condors visiting the site. Park condor staff would complete a site visit to ensure adequate clean- up measures
- To prevent water contamination and potential condor poisoning, the park- approved vehicle fluid- leakage and spill plan would be adhered to. This plan would be reviewed by the park Biologist for adequacy in addressing condors
- If non- nesting condors occur within one mile of the project area, blasting would be postponed until condors leave or are hazed by permitted personnel

Mexican Spotted Owl (MSO)

- A Protected Activity Center (PAC) has been delineated below the rim near the project area. The delineated core area boundary is greater than 0.25 miles from the project area, but some portions of the project area are within 0.5 miles of the core area boundary. Heavy construction, as defined in the Batch Consultation (NPS 2002a) would be restricted to the non- breeding season (September 1 through February 28) in these areas. This includes rock excavation including trenching, when these activities require use of hoe- rams, rock saws, hammer hoes, rippers on bulldozers, or track hoes with hydraulic hammers. Light construction activity (as defined in the Batch Consultation [NPS 2002a] and including essentially all other types of typical construction actions) can proceed with no breeding- season restrictions because the project area is greater than 0.25 miles from the core area boundary
- If blasting is necessary for this project, it would be restricted to the non- breeding season (September 1 through February 28)
- Prior to the project's start, the park Wildlife Program Manager would be contacted for any new information related to MSO or their status near the project area

Deer Golden Bush

- Deer golden bush is known to occur adjacent to the project area, based on a cursory walk- through in September 2007. A thorough survey of the project area for this species would be conducted prior to implementation. Any individuals located would be

protected from construction impacts, in consultation with the park's Vegetation Program Manager

Soundscapes and Wilderness To minimize construction impacts on soundscapes and wilderness, the following mitigation measures would be incorporated into the action alternatives

- While construction activities are not likely to directly impact wilderness values, potential indirect effects to visitors accessing backcountry wilderness from the Bright Angel Trail would be mitigated through information contained in the Backcountry Permit package regarding construction activities. The park would explore this option and implement it, as feasible, to inform backcountry permit holders of construction activities at the Trailhead. Refer to the visitor experience section of these mitigation measures for more information related to wilderness and backcountry visitors
- As time and funding allow, information regarding project implementation and other foreseeable future projects would be shared with the public through park publications and other means (*this measure is also repeated under Visitor Experience*)
- To reduce noise, construction equipment would not be left idling any longer than is necessary for safety and mechanical reasons, and no construction would occur at night

Cultural Resources To minimize construction impacts on cultural resources, the following mitigation measures would be incorporated into action alternatives

- If previously unknown archeological resources are discovered during the project, a park cultural resource specialist would be contacted immediately. All work in the immediate vicinity of the discovery would halt until the resources could be identified and documented, and an appropriate mitigation strategy developed, if necessary, in accordance with the stipulations of the 1995 Programmatic Agreement among the National Park Service, the Arizona SHPO and the Advisory Council on Historic Preservation regarding the GMP EIS, Grand Canyon National Park, Arizona (NPS 1995c)
- All workers would be informed of the penalties of illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would also be informed of correct procedures if previously unknown resources were uncovered during construction activities
- Areas selected for equipment and materials staging are expected to be in existing disturbed areas where there is no potential for archeological resource disturbance. If the sites selected for these activities change during later design phases for implementation of any of the alternatives, the park Archeologist would be notified to ensure no new archeological surveys would be necessary
- All work proposed for historic stone walls is intended to protect and restore structure integrity. Resetting and repointing would be done with the mortar mix and technique that closely imitates but not exactly duplicates historic materials and

techniques. Repointing would be done only where the original mortar is failing, and care would be taken not to chip original stone

- The park Historical Architect, Landscape Architect, and Cultural Resources Branch Chief would be consulted throughout the design process to ensure that historic structures, visual resources, and cultural landscape issues are considered. Initial design parameters include
 - Using materials that give the suggestion of unpaved paths in some areas and using a variety of materials to retain more of a less- developed character
 - Minimizing number of signs, trash cans, and other small- scale features to only those deemed essential, to retain a less- developed character
 - Ensuring design of small- scale features (signs, benches, trash cans, etc.) is compatible with the NHL District and cultural landscape, using the Cultural Landscape Report (Milner 2004) for guidance
- Excavations required for project implementation, such as trenching for powerlines or utilities, would be monitored by an archeologist, if trenching would be through soil
- The Secretary of the Interior' Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (NPS 1996) and Director's Order 28, Cultural Resources Management, would be followed as part of this project
- All mitigation measures developed as part of the Memorandum of Agreement with the State Historic Preservation Office to guide project implementation would be followed
- The overall cumulative impact of varied past, present and foreseeable future actions within the Grand Canyon Village National Historic Landmark District has been raised as a concern. While the expected cumulative impact of this project combined with past, present, and future projects is considered moderate and adverse (see Chapter 3) for cultural resources, NPS will continue discussions with the SHPO and others as appropriate (Advisory Council, other NPS regional and Washington office) as new projects are anticipated for the NHL district to ensure that adverse impacts from future projects are minimized and the integrity of the NHL district and cultural landscape maintains its high degree. This stipulation is also a part of the Memorandum of Agreement with the SHPO for this project

Visual Resources To minimize visual impacts, mitigation measures would include

- Natural, muted colors that replicate existing location hues would be used to blend any built materials into the landscape. Materials and their colors would be carefully evaluated to ensure they are appropriate and consistent with the cultural landscape
 - Of special note is restroom roof color. Roof color would be carefully evaluated to blend into the surrounding area, particularly from Hermit Road vantage points
- Design plans would be reviewed by the park's Landscape Architect as they are prepared
- The project Landscape Architect would coordinate with the Vegetation Program Manager on development of an area landscaping plan as an integral part of the

overall design plan for this project. This would be initiated prior to the first phase of implementation in order to support necessary actions in the second phase, such as critical exotic species control and some plant salvage

Night Sky The following mitigation measures would be incorporated into the action alternatives to minimize impacts on the night sky resource

- All existing lighting in the project area would be evaluated to determine if it is necessary and meets the park's policy on lighting to protect night sky (NPS 2004). Any new lighting deemed necessary (at the restroom and plaza location, for instance) would be the minimum necessary and selected fixtures would meet criteria identified in the park's lighting policy, and would be compatible with the surrounding NHL district

Visitor Experience The following mitigation measures would be incorporated into the action alternatives to minimize construction impacts on visitor experience

- Backcountry visitors with permits that include access to or egress from the Bright Angel Trailhead would be notified of project implementation through the Backcountry Permits Office. Close coordination would occur with the office to reduce impacts to hikers during project implementation
- Unless otherwise approved by the park, operation of heavy construction equipment would be restricted to 8 a.m. to 6 p.m. year- round to reduce impacts to visitors, including lodge guests, in the evening
- Bright Angel cabin guests would be notified of project implementation through the Xanterra Hotel Reservations Office. Close coordination would occur with Xanterra to reduce impacts to hotel and cabin guests during project implementation
- As time and funds allow, information regarding project implementation and other foreseeable future projects would be shared with the public through park publications (such as *The Guide*) and other appropriate means during construction periods. This may take the form of an informational brochure or flyer distributed at the gate and sent to those with reservations at park facilities, postings on the park's website, press releases, and/or other methods. The purpose would be to minimize potential for negative impacts to visitor experience during project implementation and other planned projects during the same construction season

Park Operations and Safety The following mitigation measures would be incorporated into action alternatives to minimize construction impacts on park operations and safety risks to employees and visitors

- NPS, concessionaires, and other park employees and residents would receive public notification on project implementation and road delays or road closures, as appropriate
- The public would be notified through park publications and other appropriate means during construction periods to minimize potential for negative impacts to visitor safety during project implementation

- While some closures of portions of the project may be periodically necessary during construction, Preventative Search and Rescue access would be available at all times and Bright Angel Trail access would be available at all times

Air Quality Air quality impacts of action alternatives are expected to be temporary and localized. To minimize these impacts, the following actions would be taken

- To reduce entrainment of fine particles from hauling material, sufficient freeboard would be maintained, and loose material loads (aggregate, soils, etc.) would be tarped
- To reduce tailpipe emissions, construction equipment would not be left idling any longer than necessary for safety and mechanical reasons
- To reduce construction dust in the short term, water would be applied to problem areas. Equipment would be limited to the fenced project area to minimize soil disturbance and consequent dust generation
- Landscaping and revegetation would control long- term soil dust production. Mulch and plants would stabilize soil and reduce wind speed/shear against the ground surface

Alternatives and Project Objectives

Project objectives are described in Chapter 1 and listed here. The proposed Bright Angel Trailhead Area Design Plan is guided by the GMP vision for this area and the purpose and need for action developed specifically for this project. Specific objectives for the planning effort include

1. Improve visitor experience in the Bright Angel Trailhead Area by
 - improving wayfinding opportunities in surrounding areas to reach the trailhead by foot, shuttle bus, or personal vehicle (including signing, brochures, maps, etc.)
 - improving ease of movement from Lookout Studio to the Hermit Route Transfer Shuttle Bus Stop
 - improving area interpretive opportunities by creating a wayside plan for additional appropriate signing, brochures, etc.
 - providing fully compliant restroom facilities, potable water, seating, shade, and gathering area(s) appropriate for a National Historic Landmark District and adequate for current visitor use
 - providing safe and universally accessible access, where feasible, for pedestrians to the Trailhead Area from Bright Angel Lodge and Cabins, the Rim Trail, and the Village Route Transfer Shuttle Bus Stop. Consider feasibility of providing universal access along the Rim Trail from Lookout Studio to the Hermits Rest Transfer Shuttle Bus Stop
 - providing a visitor waiting/gathering area and photo opportunity in view of the Trail
 - evaluating commercial hiker shuttle service and appropriate drop- off and pick- up area (large vans)
 - identifying the primary Bright Angel Trailhead and differentiating it from secondary access points, keeping in mind mule rider and hiker needs

2. Improve condition of historic stone walls and other area features by repairing them following the Secretary of the Interior’s Standards for rehabilitation of historic properties (Weeks 1995)
3. Consider the project’s location with the Grand Canyon Village NHL and the cultural landscape, and preserve contributing features and patterns to the extent possible.
4. Improve condition of existing facilities, including the following
 - improving condition and accessibility of existing walkways, trails, and stone walls, and considering standardizing surfaces to aid wayfinding
 - providing a maintenance- activity staging area, and differentiating this from mule-loading needs versus needs for hand- carried materials
 - separating vehicle and pedestrian access routes to the Rim Trail, Kolb Studio, and the Trailhead in the Bright Angel Lodge Cabin parking area
 - providing adequate all- season parking for Bright Angel Lodge overnight guests
 - providing adequate and appropriate parking for other uses
 - adaptively reusing historic structures to support area needs or functions as appropriate (e.g. Kolb Garage)
5. Provide for hiker safety, including Preventative Search and Rescue including
 - improving the emergency phone location
 - improving area PSAR messaging and improving information exchange with hikers
 - improving area availability of hiker drinking water
6. Improve utility systems within and through the area, for example, burying power lines within the cabin parking area

The preferred alternative clearly addresses each objective. Alternatives that were considered but dismissed from further analysis were dismissed in part because they did not sufficiently address one or all of these objectives. Table 1 displays alternative components, and compares the ability of the alternatives to meet project objectives.

Table 1 Summary of Alternative Components, Bright Angel Trailhead Area Design Plan, Grand Canyon National Park

Components	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
First Phase of Implementation			
Parking Capacity	No change Existing capacity (estimated at approximately 100- 120 spaces) would remain	An approximate capacity of 70-90 parking spaces would be provided, but individual spaces would not be delineated	Same as Alternative B
Parking Surface	No change Surface would remain packed dirt with no delineated parking spaces or boundaries	Unpaved (packed dirt) with delineated outer boundaries	Same as Alternative B
New Trail Construction	No change	New accessible trail on west end from shuttle stops to corral; existing driveway from Kolb Garage up to plaza area repaired and surfaced to be part of rim trail	Same as Alternative B
Trail Improvements	No change	Historic Rim Trail resurfaced, retaining original width; secondary paths surfaced and widened up to five feet	Same as Alternative B
Restrooms	No change Existing two portable chemical toilets would remain in place	Chemical toilets removed and replaced with new facility (two buildings with shade structure at plaza location (approximately 600 square feet)	Same as Alternative B
Plaza Area	No Change Area would remain undeveloped; some of the area now used as informal parking, trail crew staging, mule rider staging, and visitor viewing	Plaza area (approximately 1,500 square feet) created near mule corral; hardened surface near restrooms with site amenities	Same as Alternative B

Components	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
Site Amenities and Signing	No Change	Minimal signage and site amenities to include some additional seating and flat-topped rocks for picnicking, year- round drinking water; minimal wayfinding, safety and interpretive signing; removal of trailhead kiosk and replacement with new at the plaza area	Same as Alternative B
Shade	No Change Lack of shade throughout the area would remain	Shade structure as part of restroom and plaza area near corral	Same as Alternative B
Future Phases of Implementation			
Landscaping and Revegetation	None	Used where needed to restore denuded areas and create vegetated islands	Same as Alternative B
Additional Site Amenities	None	Additional flat- topped rocks for picnicking and seating, benches, additional trash and recycling receptacles, additional wayfinding and interpretive signage	Same as Alternative B, except that there would be fewer designated areas for picnicking
Accessible Ramp at Kolb Studio	None	Modifications to entrance to make it universally accessible	Same as Alternative B
Parking	None	The parking area as described under Phase I would be replaced with an all- weather, hardened surface with individual parking spaces. The area would be redesigned as a one- way loop; total capacity would be approximately 70- 80 cars; pedestrian path would be delineated through parking area and cabins; more vegetated areas	The parking area as described under Phase I would be replaced with an all- weather, hardened surface with individual parking spaces. The area would be redesigned as a one- way loop; total capacity would be approximately 104 cars, double- and single- loaded parking bays. A drainage feature would likely be necessary

Components	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
		created around cabins. A drainage feature would likely be necessary	
Interpretive Node at Kolb Garage	None	The historic Kolb Garage would be renovated (adaptive reuse) for use as an interpretive facility and storage. Some additional outdoor seating may be added.	Same as Alternative B
How Alternatives Meet Project Objectives			
Objective 1: Improve visitor experience by improving wayfinding and ease of movement through area, improving interpretive information, providing restrooms, water, shade and gathering areas, improving accessibility for visitors with disabilities, evaluating drop off and pick up areas for shuttle services, and differentiating the primary trailhead from secondary access.	Does not meet Objective 1	Full implementation of both Phase 1 and 2 would fully meet Objective 1. Phase 1 meets the need for a restroom, water, shade, improved accessibility and differentiating the primary trailhead from secondary access. Phase 2 meets the need for enhanced wayfinding, interpretive information and drop off and pick up areas.	Same as Alternative B
Objective 2: Improve condition of historic stone walls and other area features by repairing them following the Secretary of the Interior's Standards for rehabilitation of historic properties	Does not meet Objective 2	Phase 1 implementation meets Objective 2 by repair of the collapsed wall above Bright Angel Trail. Walls associated with Kolb Garage would be repaired under Phase 2	Same as Alternative B
Objective 3: Consider the project's location with the Grand Canyon Village NHL and the cultural landscape, and preserve contributing features and patterns to the extent possible.	No changes would be made to the cultural landscape or the NHL district so that Objective 3 is met.	Phase 1 and 2 meet Objective 3.	Contributing features and patterns would be affected to a greater extent under Alternative C than under Alternative B.
Objective 4: Improve condition and accessibility of existing facilities including walkways, trails and stone	Does not meet Objective 4	Full implementation of both Phase 1 and 2 would fully meet Objective 4. Phase 1 provides	Similar to Alternative B, except that Alternative C provides more parking for all users.

Components	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
walls, staging area for park maintenance, separating pedestrians from vehicles in the cabin area, providing adequate parking for all users, and adaptively reusing historic structures to support area needs		improved condition, accessibility and staging. Phase 2 provides better separation of pedestrians and vehicles, adequate parking and adaptive reuse.	
Objective 5: Provide for hiker safety, including Preventative Search and Rescue (PSAR), including improving the emergency phone location, PSAR message and availability of drinking water	Does not meet Objective 5	Full implementation of both Phase 1 and 2 would fully meet Objective 5. Phase 1 provides improved PSAR signage, relocation of the phone, and drinking water. Phase 2 provides full implementation of additional signage	Same as Alternative B
Objective 6: Improve utility systems within and through the area	Does not meet Objective 6	Meets Objective 6	Same as Alternative B

Table 2. Comparative Summary of Environmental Impacts

Impact Topics	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
Historic Structures and Districts	Negligible to minor direct/indirect, adverse, long- term impact. Cumulative impacts would be moderate, adverse and long- term.	Minor direct/indirect, adverse long- term impact due to construction of new structures near historic structures. Benefits would be realized in rehabilitation and repair of historic structures. Cumulative impacts would be moderate, adverse and long- term.	Minor to moderate, direct/indirect, adverse long- term impact due to construction of new structures near historic structures and larger parking area. Benefits would be realized in rehabilitation and repair of historic structures. Cumulative impacts would be moderate, adverse and long- term.
Cultural Landscapes	Negligible to minor direct/indirect, adverse, long- term impact due to lack of maintenance. Cumulative impacts would be minor, adverse and long- term.	Minor to moderate, direct/indirect, long- term adverse impact due to impacts to contributing landscape features and the addition of modern, non- contributing features. Cumulative impacts would be moderate, adverse and long- term.	Moderate, direct/indirect, long- term adverse impact due to impacts to contributing landscape features and the addition of modern, non- contributing features, including a larger parking area. Cumulative impacts would be moderate, adverse and long- term.
Visual/Scenic Resources	Negligible to minor, direct/indirect adverse impact. Cumulative impacts would be minor, adverse and long- term.	Minor direct/indirect, long- term adverse impact due to new facilities in a relatively undeveloped area. Cumulative impacts would be moderate, adverse and long- term.	Minor direct/indirect, long- term adverse impact due to new facilities in a relatively undeveloped area. Cumulative impacts would be moderate, adverse and long- term.
Special Status Species	No known impacts	Negligible to minor short- term adverse impact during construction period	Negligible to minor short- term adverse impact during construction period
Visitor Experience	Negligible, adverse long- term impact due to continued lack of wayfinding, facilities, and accessible trails through the	Moderate, direct/indirect, long- term beneficial impacts due to improvements in visitor facilities and wayfinding. Short- term	Moderate, direct/indirect, long- term beneficial impacts due to improvements in visitor facilities and wayfinding. Short- term

Impact Topics	Alternative A No Action	Alternative B Preferred	Alternative C Expanded Parking
	project area. Cumulative impacts would be minor, long- term and beneficial.	minor adverse impacts during the construction period. Cumulative impacts would be moderate and beneficial.	minor adverse impacts during the construction period. Cumulative impacts would be moderate and beneficial.
Park Operations	Negligible to minor long- term impact due to lack of maintenance of park facilities. Cumulative impacts would be minor, long- term and beneficial.	Minor, direct/indirect, long- term benefit through increased operational efficiency. Cumulative impacts would be minor, long- term and beneficial.	Minor to moderate direct/indirect long- term beneficial impact through increased operational efficiency. Cumulative impacts would be minor, long- term and beneficial.

Chapter 3 Affected Environment and Environmental Consequences

INTRODUCTION

This chapter describes the present condition (i.e., affected environment) within the project area and the changes (i.e., environmental consequences) expected from implementing action alternatives or taking no action. The No Action Alternative sets the environmental baseline for comparing effects of other alternatives. The impact topics (see Chapter 1) define this project's scope of environmental concern. Environmental effects, or changes from present baseline condition, described in this chapter reflect the identified relevant impact topics, include the action's intensity and duration, mitigation measures, and cumulative effects.

The National Environmental Policy Act requires that environmental documents disclose the environmental impacts of a proposed Federal action, reasonable alternatives to that action and any adverse environmental effects that cannot be avoided should the proposed action be implemented.

Grand Canyon National Park encompasses approximately 1.2 million acres in northern Arizona. The project is located in the developed area within South Rim's Grand Canyon Village.

METHODOLOGY

The impact analysis and conclusions contained in this chapter were based on staff knowledge of the resources and site; review of existing literature and park studies; information provided by NPS and other- agency specialists; and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP EIS was specifically referenced for information on affected resources in the project area.

Potential impacts in this chapter are described in terms of type (are effects beneficial or adverse?), context (are effects site- specific, local, or even regional?), duration (are effects short-term or long- term?), and intensity (negligible, minor, moderate, or major). Because definitions of intensity can vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

Cumulative Impacts

Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). Therefore, it is necessary to identify other ongoing or foreseeable future actions within the

Cumulative impact is defined as the environmental impact resulting from the action's incremental impacts when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

vicinity of the project area.

The areas of cumulative impact for various resources were chosen as follows

- Historic structures and cultural landscapes
 - Grand Canyon Village Historic Landmark District, particularly the Rim Zone of the cultural landscape, as defined in the cultural landscape report (Milner and Associates 2004).
- Visual Resources
 - Views of the canyon from the project area
 - Views of the project area from prominent view points along Hermit Road
 - Views of the project area from shuttle bus stops and Village Loop Drive
- Vegetation
 - Existing old pinyon and juniper trees within the Bright Angel cabins area that would be disturbed by new parking lot
- Special Status Species
 - Known park populations of Mexican spotted owls, California condors and Deer goldenbush and their known habitats
- Visitor Experience
 - Visitors using South Rim (including those that would likely use the project area, such as backcountry hikers, Bright Angel Lodge guests, and those accessing the area via tours, shuttle buses, or private vehicles
- Park Operations
 - The South Rim Unit

Past activities that have affected the Bright Angel Trailhead project area include removal of some buildings from the cabin complex; installation of bus stops and shelters at Village Loop Drive and Hermit Road Interchange; and collapse of the retaining wall above the Kolb driveway (and its subsequent closure to visitors). Changes specifically related to the cultural landscape are discussed in later in this chapter.

For this analysis, recently implemented, in-progress, and foreseeable future actions were evaluated (See Appendix E.)

A cumulative impact analysis was conducted for full GMP implementation and is documented in that EIS. Because the GMP was a general concept plan and because it required that site-specific analyses be

conducted for identified projects, a cumulative effects analysis that is more specific to impact topics pertaining to the Bright Angel Trailhead Area is presented below.

Foreseeable future actions are actions that currently have funding or for which funds are being sought and that could occur within the next five years. Five years was selected as the period for foreseeable future actions because many GMP actions are likely to be either planned or implemented by that time.

Impairment

In addition to determining environmental consequences of implementing alternatives, NPS policy (Management Policies 2006, Director's Order- 12) requires analysis of potential effects to determine whether actions would impair park resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill park purposes, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the park's establishing legislation or proclamation;
- key to the park's natural or cultural integrity; or
- a goal in the park's GMP or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Direct, indirect, and cumulative impacts to all relevant impact topics analyzed in this chapter were reviewed in context with the impairment criteria above to determine if the potential for impairment exists. Because impacts as described in this chapter range from minor to moderate, and there would be no major adverse impacts (defined by thresholds for each impact topic) to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in Grand Canyon National Park's establishing legislation or proclamation; (2) key to the park's natural or cultural integrity; or (3) identified as a goal in the park's GMP or other relevant NPS planning documents, there would be no impairment of Grand Canyon National Park's natural or cultural resources. The result of this evaluation is given in the conclusion statement for each impact topic for each alternative.

Unacceptable Impacts

In addition to impairment, unacceptable impacts are also considered when evaluating alternatives. Although an action may not result in impairment, it could be determined unacceptable within the park's environment (NPS 2006). Park managers are tasked with determining whether the associated impacts of a project on park resources and values are acceptable. In its role as steward of park resources, NPS must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values.

Unacceptable impacts are impacts that, individually or cumulatively, would

- be inconsistent with a park's purposes or values, or

- impede the attainment of park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- create an unsafe or unhealthful environment for visitors or employees, or
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by, park resources or values, or
- unreasonably interfere with park programs or activities, or an appropriate use, or the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park, NPS concessioner or contractor operations or services.

Unacceptable impacts may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Direct, indirect, and cumulative impacts to all relevant impact topics analyzed in this chapter were reviewed in context with the criteria of unacceptable impacts above to determine if the potential for unacceptable impact exists. Because there would be no adverse impacts that are inconsistent with park purposes or values or that would prevent attainment of desired future conditions for park resources, create an unsafe or unhealthful environment, diminish opportunities for current or future enjoyment of the park, or unreasonably interfere with park programs or activities, concessioner or contractor operations, there would be no unacceptable impacts to park resources or values. The result of this evaluation is given in the conclusion statement for each impact topic for each alternative.

HISTORIC STRUCTURES AND DISTRICTS

Affected Environment

Grand Canyon Village National Historic Landmark District

The Grand Canyon Village National Historic District (Figure 8) is one of two South Rim National Historic Landmark Districts. The latest 1997 nomination of the district to the National Register included 269 contributing buildings and structures (Page and Turnbull, Inc. 2005), four of which have been designated individually as National Historic Landmarks. These include El Tovar Hotel, Grand Canyon Powerhouse, Grand Canyon Railroad Station (depot), and Grand Canyon Park Operations (Ranger Operations) Building. The District encompasses the majority of the original village site. Its establishment and development are directly related to South Rim tourist activities and subsequent expansion in accordance with the park's original Master Plan. The historic village is dominated by the canyon edge and surrounding topography, with ponderosa pine, pinyon, and juniper forests (NPS 1995a). Grand Canyon Village was first established in the 1890s as a stop serviced by horse-drawn stagecoaches and, over time, developed into a natural focal point for visitors. Rugged and rustic, the District retains a cohesive architectural character consistent with the park's early twentieth century establishment (ARG 2000). Most buildings were designed in the rustic style using native stone and wood. The period of significance began in the 1890s, specifically with construction of the Buckey O'Neil Lodge in 1897, the District's oldest structure (which is now part of the Bright Angel Lodge and Cabin complex). The period of significance ends in 1942 when the Civilian Conservation Corps was discontinued, by which time the village was largely complete (Scott et al. 1996). District

structures and buildings that contribute to significance within the project area, and would be affected by proposed actions are listed in Table 3. While there are many contributing historic resources to the District, that are described in more detail in the associated MOA for this project (NPS 2007a) only those that would be affected by proposed actions are listed in Table 3. Contributing features to the Cultural Landscape Report (Milner and Associates, Inc. 2004) are discussed in the Cultural Landscapes section later in this chapter. The Grand Canyon Village NHL retains a high level of integrity in design, materials and workmanship based on the seven aspects of historic integrity (L. Schuster, pers. comm. 2007).

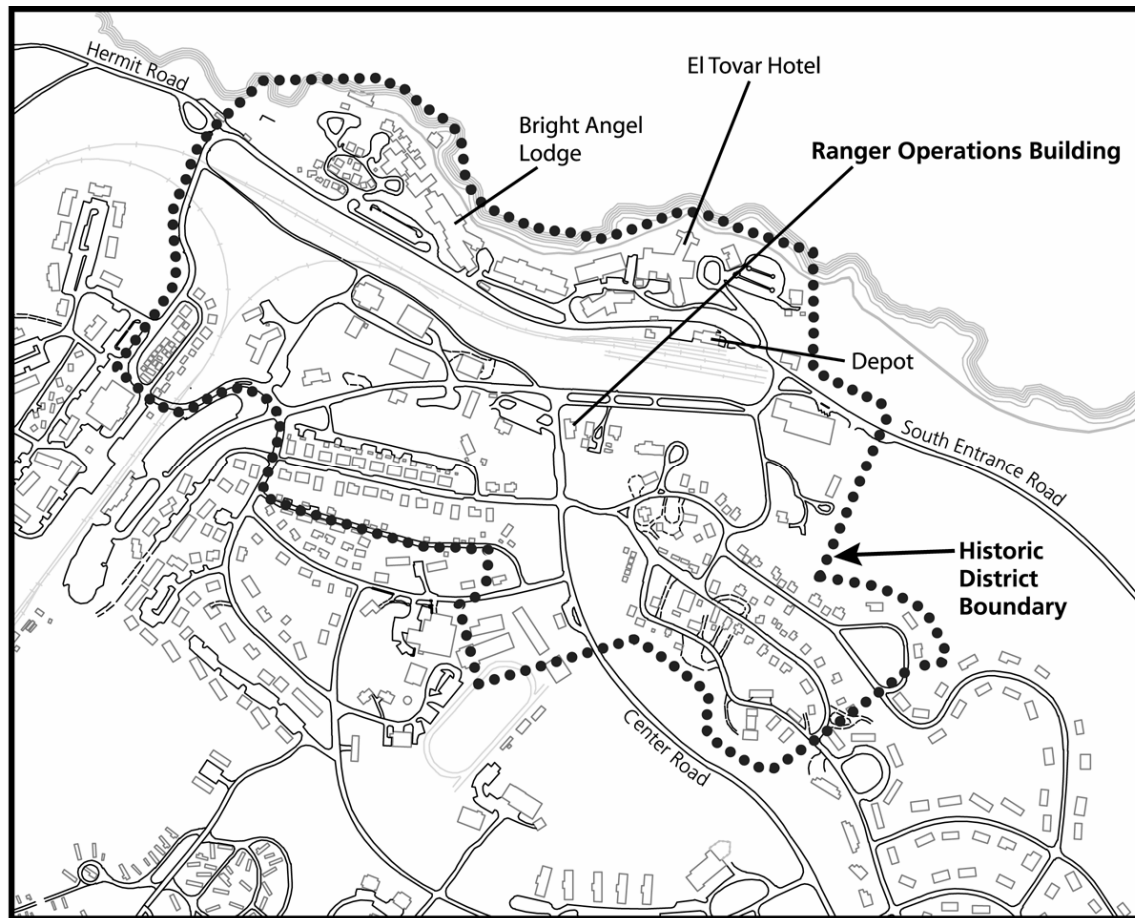


Figure 9 Grand Canyon Village National Historic Landmark District

Bright Angel Trailhead

The earliest location of the Bright Angel Trailhead is unknown, but the trail probably emerged at the rim near a prehistoric pictograph panel (below today's Village Loop interchange with Hermit Road). This alignment is one of many paths in Grand Canyon used by the Havasupai to access inner canyon resources from South Rim (Anderson and Sutphen 1992). The Bright Angel Trail began in 1890 as the Cameron Trail and provided access to inner-canyon mining claims. The Trail's alignment followed prehistoric paths to Indian Gardens. In the early 1900s, Bright

Angel Trail mule- ride excursions were initiated and have continued since. In 1903 Ralph Cameron operated the Bright Angel Trail as a toll road and, in 1904, shifted the trail to its present location near Kolb Studio (referred to in this document as the historic trailhead). Although its history is somewhat vague, the Trailhead Area likely changed little from its 1904 configuration through the early 1920s. The alternate trailhead leading to the present mule corral (referred to in this document as the primary trailhead) was constructed in 1932. The mule corral was built by the CCC in 1937 (Zeman, Anderson and Quinn 2006). As stated in Anderson and Sutphen (1992), the Bright Angel Trail resembles little of that constructed in 1890- 91 and 1898- 99. The Trail's later version, completed in the 1930s, is the one nominated for the National Register.

Table 3 Features and Buildings Contributing to the Grand Canyon NHL District Affected by Proposed Actions

Contributing Features to the National Historic Landmark District	Aspect of Potential Affect
Bright Angel Lodge Cabins	While none of the cabins would be directly affected, proposed actions include some changes to the parking area around the cabins and to the islands created around the cabins within the parking area
Bright Angel Cabins flagstone walkways	The flagstone walkway in front of the Rim Cabins is located within the project area, however, all alternatives maintain this walkway as is, with minor in- kind repair proposed.
Kolb Studio concrete sidewalk, arch and stone walls (1930s)	A future phase of either action alternative proposes to create an accessible path into Kolb Studio. This would require some modifications to the original concrete sidewalk
Kolb Garage east and west stone retaining wall	A future phase of either action alternative proposes to rehabilitate Kolb Garage for creation of an interpretive node in this area. The historic retaining walls would be retained as part of this future phase. The need for repair or rehabilitation would be considered
Grand Canyon Village streetlamps	All historic lamps would be retained, but would be rewired for new fixtures. A lighting plan would be developed as part of this project, that would meet the criteria for night- sky protection
Rim Trail	Action alternatives propose retention of the historic Rim Trail through the project area in its current width (approximately five feet); replacement- in- kind of paved surface would occur as part of the first phase of implementation
Stone drinking fountain near Bright Angel Cabins (1930s)	Action alternatives propose retention of this feature, provided it can be accommodated without seriously compromising the parking area size or function under future phases. Retention or removal of this feature would be included as part of the MOA with the SHPO, as future design details are developed
Mule Corral (1930s)	All action alternatives include construction of a restroom and plaza area near the corral, a new accessible path from the shuttle stops on the corral's west side, and designation of a dirt path around the corral's south side for pedestrians.

Contributing Features to the National Historic Landmark District	Aspect of Potential Affect
	The mule corral itself would not be altered as a result of actions proposed under either alternative
Kolb Studio Garage	A future phase of either action alternative includes adaptive reuse of this structure for use as an interpretive facility
Woodsheds (1935)	Action alternatives propose retention of these two features in Phase 1. In Phase 2 it is likely they would need to be removed or relocated so that the parking area size and function is not compromised. Retention or removal of these buildings would be included as part of the MOA with the SHPO, as future design details are developed

The Bright Angel Trail was nominated to the National Register of Historic Places as part of the Cross Canyon Corridor Historic District in 1980 (Johnson and Crosby 1980) and, in 1992, as its own property (Anderson and Sutphen 1992). The Bright Angel Trail was determined eligible for listing on the National Register by the Arizona SHPO in 1997. The Cross Canyon Corridor District includes 44 buildings and structures and the Bright Angel, South Kaibab, North Kaibab, and connecting River Trails. Some of the District's principal structures include four trailside rock shelters along the Bright Angel Trail and the Phantom Ranch complex at the bottom of Grand Canyon.

Bright Angel Lodge and Cabins

Bright Angel Lodge, constructed in 1935 and considered a contributing building to the NHL district, possesses regional significance as a structure complex associated with Mary Jane Elizabeth Colter. Colter was a significant architect in the history of the American Southwest and one of only a few women to enter the field during the early twentieth century. Bright Angel Lodge is also regionally significant because it embodies distinct characteristics of a type, period, and method of construction: rustic architecture of the Depression Era. Bright Angel Lodge incorporates two cabins that served as earlier hotels: The Buckey O- Neill Cabin and Red Horse Cabin, also known as the Cameron Hotel (Zeman, Anderson and Quinn 2006). Bright Angel Lodge includes a registration desk and lobby, a restaurant and lounge, gift shop, museum, and restrooms.

The Bright Angel Lodge complex consists of the Lodge itself, Powell Lodge, Buckey O'Neill Cabin/Lodge, and five rim cabins. These buildings are attached by breezeways or covered walks and serve as visitor lodging and food service. The Bright Angel Cabins are located south and west of the Lodge Complex and include a cluster of 16 residential and utilitarian buildings that are terra- cotta colored, peeled- log buildings organized around a circular drive (Milner and Associates 2004). This group of 16 cabins includes the Red Horse Cabin originally reconstructed on this site with an added second story for use as a hotel from 1903- 1907, used from 1907- 1935 as a post office and then, with the second story removed, became a cabin in the lodge complex.

The Bright Angel Cabins serve as visitor lodging and are similar in construction and design. All cabins are wood construction, either board- and- batten siding, clapboard, or chinked log, with wood- shingled gabled roofs. The square and rectangular windows have brightly- colored blue or green trim.

A separate Memorandum of Agreement has been drafted for this project (NPS 2007a) and describes in detail the cultural resources potentially affected by proposed undertakings and the methods for continued consultation with the SHPO and interested tribes, as the project moves forward into design and implementation.

Environmental Consequences

Methodology

The baseline information used to assess impacts to historic structures and districts is described in the methodology section at the beginning of this chapter and includes staff knowledge of the resources and site; review of existing literature and park studies; information provided by NPS and other agency specialists, and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP EIS was specifically referenced for information on affected resources in the project area. Additional information sources on historic structures and districts used for this evaluation are described above in the affected environment section.

The thresholds of change for the intensity of an impact on historic structures and districts are defined as

Negligible Impacts would be at the lowest levels of detection with neither adverse nor beneficial consequences; historic properties would receive no change to diagnostic artifacts, defining features, or characteristics that contribute to National Register of Historic Places eligibility. Negligible impacts are barely perceptible and alter neither resource condition, such as traditional access and site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. The determination of effect for Section 106 would be "no historic properties affected."

Minor

Adverse Impacts would be detectable but would not diminish the overall integrity of the resource. Impacts such as feature degradation or displacement could occur and would be measurable, but would be localized and would not result in changes to defining elements. They would not affect or jeopardize defining features or characteristics of a historic resource listed in or eligible for listing on the Register or aspects of integrity that contribute to eligibility for the National Register of Historic Places (National Register). The determination of effect for Section 106 would be "no historic properties affected."

Beneficial Historic structures and features will be stabilized and preserved in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For purposes of Section 106, the determination of effect would be "no historic properties affected."

Moderate

Adverse Disturbance of a site or sites would result in the loss of overall integrity and detection of measurable changes to character- defining elements and would contribute to increased instability of historic structures and features. Moderate effects would jeopardize a structure's National Register eligibility. The determination of effect for Section 106 would be "historic properties affected." It may be necessary to execute a Memorandum of Agreement among the NPS and the applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts would reduce the intensity of impact under NEPA from moderate to minor.

Beneficial Beneficial effects would include increasing the stability of a structure or historic feature, maintaining the setting of the structure, or rehabilitating a landscape or its patterns or features. A structure, historic feature or landscape will be maintained and restored in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the treatment of cultural landscapes. The determination of effect for Section 106 would be "no historic properties affected."

Major

Adverse Disturbance of a site would result in the loss of overall integrity and significant change to character- defining elements to the extent that it would no longer be eligible to be listed on the National Register. Impacts would include destabilization of structures or cultural contexts, and an increase in exposure or vulnerability to natural elements (e.g. fire, flood, wind). The determination of effect for Section 106 would be "historic properties affected." In the event of a determination of adverse effect, a MOA would be executed between the NPS and the applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts would reduce the intensity of impact under NEPA from major to moderate or minor.

Beneficial An historic structure or feature will be maintained and restored in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The determination of effect for Section 106 would be "no historic properties affected."

Duration

Short- term Impact An effect that, within five years, would no longer be detectable as the resource was returned to its predisturbance condition or appearance (e.g. trash and other items that could be removed, or trampled but not denuded vegetation).

Long- term Impact A change in a resource or its condition that would not return the resource to predisturbance condition or appearance and for all practical purposes would be considered permanent (e.g., damage to elements or removal of artifacts).

Alternative A, No Action

Direct/Indirect Impacts No changes would occur to historic structures and districts in the project area as a result of taking no action. Existing structures and features would remain in their current condition and location. However, no improvements would occur to historic trails, stone walls, or other features where rehabilitation is needed. The Bright Angel Cabins would continue

to lack any landscaped buffer from vehicles. The historic Rim Trail between Kolb Garage and the upper rim near the mule corral would remain closed due to the collapsed wall. Incompatible features such as the chemical toilets, dumpsters, and utility boxes would remain. While this would not result in an immediate direct adverse impact to these historic structures and districts, lack of maintenance and repair over time has potential to degrade their condition and character- defining features.

For these reasons, Alternative A implementation would keep historic structures and districts in their current condition, and therefore would result in a long- term negligible to minor adverse impact due to the continued resource deterioration.

Cumulative Impacts Grand Canyon Village NHL District and the historic structures within it have sustained previous impacts resulting from modifications to individual buildings and structures over time. Modern buildings have intruded on the historic setting and adversely impacted structures. Furthermore, previous deterioration of some buildings as a result of natural weathering and use has compromised defining architectural characteristics. These past impacts are moderate, adverse, local, and long- term. Most of the recently implemented, in-progress, and foreseeable future projects that have potential to affect historic structures and districts have been discussed with the SHPO on a case- by- case basis as individual projects are planned and implemented. Consultation between the park's cultural resource staff, Historical Architect, and SHPO as a basis for future projects would ensure that any adverse effects of future projects on historic structures and districts would not result in cumulative impacts greater than moderate. Therefore, adverse cumulative effects as a result of taking no action in the Bright Angel project area would be moderate, local, and long- term.

Conclusion Implementing the No Action Alternative would result in negligible to minor, adverse, direct and indirect impacts to historic structures and districts, and cumulative impacts that would be adverse and moderate. No impairment of or unacceptable impacts to historic structures or districts would result.

Alternative B, Preferred

Direct/Indirect Impacts – First Phase Implementation of the first phase of the preferred alternative would result in obvious changes to the project area. However, few historic resources that contribute to the NHL District would be directly affected (Table 3). Those that would include the flagstone paths, Rim Trail, streetlamps, and possibly the stone drinking fountain and two historic sheds. While the mule corral and Bright Angel cabins are listed in Table 3 because actions are proposed around them, neither would be directly impacted by the design plan. Actions under Phase I include replacement- in- kind of pavement on the Rim Trail and routine maintenance needs (surface repair, stone edging repair, etc.) of the Rim Trail and flagstone walks, but these actions would be conducted according to the Secretary of the Interior's standards for the treatment of historic properties (Weeks and Grimmer 1995). The failed stone retaining wall associated with Kolb Drive and above the Bright Angel Trail would be reconstructed under Phase I for use as the rim trail; this feature is considered a non-contributing feature of the NHL district (NPS 2007a). The work, would, however, be done according to the Secretary's Standards and would meet the intent of repair and rehabilitation of

historic features. The historic stone drinking fountain and the two sheds would remain in their current location under Phase 1.

Indirect effects to historic resources within the NHL district are possible with Phase 1. The construction of an accessible path on the west side of the project area, connecting to the historic Rim Trail, would require vegetation removal and ground disturbing activities in this area. While the historic Rim Trail would not be directly altered, the new path would be noticeable from the Rim Trail and would require a trail junction with the historic trail near the mule corral. Some secondary paths between the parking area and Rim Trail and between the proposed plaza area and other pedestrian zones would be created and would require connections with the historic Rim Trail. The site selected for construction of a new restroom, shade, and plaza area would indirectly impact the setting of the mule corral and to a lesser extent, the Bright Angel Cabins. However, the site selected was one that would result in the least impact of those initially considered, while still meeting the intent of the project. The size and scale of the restroom was chosen to minimize the potential for adverse impacts (see Alternatives Considered But Dismissed section of Chapter 2) while still meeting the anticipated needs. The site near the mule corral provides separation from the historic cabins while also using existing topography and vegetation to create a structure subordinate to the site. The use of two buildings constructed partially on the downward slope minimizes the structure's profile and its potential for impacting the historic cabins, corral, and surrounding landscape. Impacts to the cultural landscape, of which the mule corral and the cabins are a part, is discussed more fully in the Cultural Landscape section later in this chapter.

The surfaces and finishes used for any new features (such as the restroom and plaza) would be carefully selected to maintain a rustic and relatively informal developed landscape, while also being functional for large numbers of people. Any surfaces would be natural, muted colors and would include native stone and wood; if funds are provided for landscaping, only native- species would be used.

Defining the parking area's outer boundaries, but retaining the current dirt surface would retain the parking area's existing character and would not result in an obvious change in appearance. This would retain the area's informal nature, would generally maintain the parking area's existing circulation patterns and would not change the setting or character of the Bright Angel Cabins that are surrounded by the parking area. However, not hardening the parking area surface and not creating vegetated islands around the cabins to restrict vehicle proximity to each would result in continued dust generation. Dust, over time, creates higher maintenance needs for cabins, both interior and exterior.

For these reasons, implementation of Alternative B, Phase 1 would result in an overall, minor adverse, short- and long- term impact to historic structures and the NHL District. However, benefits would be realized due to upkeep and repair to historic features (Rim Trail and stone retaining walls), removal of non- contributing features (chemical toilets and trailhead kiosk) and the reduction in social trailing with the formalization of primary and secondary trails throughout the project area.

Direct/Indirect Impacts – Second Phase Implementation of the second phase of the preferred alternative would occur over time if funds become available. This would include additional

landscaping and revegetation, additional site amenities, accessibility improvements for access to Kolb Studio, and most notably, creation of a hardened- surface parking area and an interpretive node at Kolb Garage. Additional landscaping, revegetation and site amenities (such as seating and signage) within the project area have potential to affect the informal and rustic character of the area and could result in indirect adverse impacts to nearby historic buildings and structures. This would be minimized through implementation of mitigation measures (Chapter 2) that require careful selection of appropriate materials and styles appropriate for their location within an NHL district, only adding the minimum necessary to meet project goals, and continued consultation with the SHPO through the MOA as these site features are developed as part of the larger design. Minor modifications necessary at the entrance to Kolb Studio to meet accessibility requirements would result in some changes to the existing concrete stairs and walkway. These changes would occur in accordance with the Secretary's Standards so that any modifications to historic fabric and materials would be the minimum necessary. Making historic buildings (like Kolb Studio) universally accessible is a goal of the Secretary's Standards if it can be done while minimizing adverse impacts; the intent of this aspect of the project.

Replacing the parking area with an all- weather hardened surface and delineating individual parking spaces would result in a more noticeable change to the project area over Phase 1. This would create a change from the current relatively shapeless, informal parking area that currently exists (and would generally be retained under Phase 1) to a more clearly defined, formalized parking area. The specific material and color selected for the surface would be carefully evaluated to minimize the impact to the rustic character of the area. This action would lessen generation of dust and provide for enhanced protection of the cabins by creating buffers around them. While the drinking fountain can likely be retained without impact to the parking area, the two historic sheds would likely require removal or relocation, in consultation with the SHPO through the MOA for this project. Indirect impacts to the character of the area surrounding the cabins would also result from Phase 2. How Phase 2 is implemented (selection of surface materials and colors, how spaces are delineated, how buffers are outlined) in order to maintain the relatively undeveloped feel of the area is important. These design details will be part of the continued consultation with the SHPO through the implementation of the MOA to ensure adverse impacts are minimized as much as possible while still meeting the intent of the project.

Renovation, or adaptive reuse, of Kolb Garage is in keeping with the intent of the Secretary's Standards by providing a new use for a historic structure (a positive change from its current use as storage) to meet current needs. How the building is renovated would be carefully evaluated through implementation of the MOA with the SHPO as further design details are developed. Retention of historic fabric and existing materials would be paramount while still meeting the needs of the future use as an interpretive facility. The site uses an open area with a panoramic canyon view, ideal for interpretive talks. Enhancing seating and gathering areas, ensuring compatibility with the site and the adjacent historic Garage, provides upgraded visitor facilities.

Cumulative Impacts Grand Canyon Village NHL District and the historic structures within it have sustained previous impacts resulting from modifications to individual buildings and structures over time. Modern buildings have intruded on the historic setting and adversely impacted structures. Furthermore, previous deterioration of some buildings as a result of natural weathering and use has compromised defining architectural characteristics. These past impacts are moderate, adverse, local,

and long- term. Most of the recently implemented, in- progress, and foreseeable future projects that have potential to affect historic structures and districts in the NHL district (Appendix E) have been discussed with the SHPO on a case- by- case basis as individual projects are planned and implemented. Consultation between the park's cultural resource staff, Historical Architect, and SHPO as a basis for future projects would ensure that any adverse effects of future projects on historic structures and districts would not result in cumulative impacts greater than moderate. A mitigation measure is included in Chapter 2 that calls for a team of NPS, SHPO and other groups or agencies as appropriate to evaluate all future projects planned within the NHL district to ensure that cumulative impacts over time are minimized. Therefore, combining these effects with the implementation of Alternative B would result in adverse cumulative effects that would be moderate, local, and long- term.

Conclusion Implementing the preferred alternative would result in minor, adverse, direct, and indirect impacts to historic structures and districts, and cumulative impacts that would be adverse and moderate. No impairment of park resources would result. Benefits would also be realized due to upkeep and repair to historic features (Rim Trail and historic stone walls) and reduction in maintenance needs and upkeep of the Bright Angel cabins due to creation of vegetation islands and hardening the parking area surface, removal of non- contributing features (chemical toilets and trailhead kiosk) and the reduction in social trailing with the formalization of primary and secondary trails throughout the project area. No impairment of or unacceptable impacts to historic structures or districts would result.

Alternative C, Maximized Parking Area

Direct/Indirect Impacts The first phase of implementation for Alternative C would be the same as that described above for the first phase of Alternative B and would result in an overall, negligible to minor adverse, short- and long- term impact to historic structures and the NHL District. However, benefits would be realized due to upkeep and repair to historic features (Rim Trail and stone retaining walls), removal of non- contributing features (chemical toilets and trailhead kiosk) and reduction in social trailing with formalization of primary and secondary trails throughout the project area.

Implementation of the second phase of Alternative C would include additional landscaping and revegetation, additional site amenities, accessibility improvements for access to Kolb Studio, creation of an interpretive node at Kolb Garage, and the creation of an approximately 104- stall hardened surface parking area. Potential for impacts to historic structures from these actions are the same as those described above except for the parking area. The only measurable difference between Alternative B and C is in the creation of a larger and more complex parking area.

Defining the parking area's outer boundaries, hardening the surface, and providing for maximum vehicle numbers would result in a more dramatic change to the historic landscape than Alternative B. To maximize parking, double bays would be required in some areas to accommodate the maximum number of cars. This would result in a more urbanized area and a noticeable change to the Bright Angel Cabins. While landscaped zones would still be created around some cabins, zones would not be created in as many areas as in Alternative B. As in Alternative B, the parking area surface would be carefully selected (color and materials) to blend into the surrounding landscape. Vehicle circulation would be similar to the historic pattern, but

not as much as in Alternative B due to creation of double parking bays. However, surface hardening would result in dust abatement over time and reduction in short- and long- term cabin maintenance needs.

For these reasons, implementation of Alternative C would result in an overall minor to moderate, adverse, short- and long- term impact to historic structures and districts. However, benefits would be realized due to upkeep and repair to historic buildings and features.

Cumulative Impacts Combining impacts of past, present, and reasonably foreseeable future actions with the implementation of Alternative C would result in cumulative impacts to the NHL district that are adverse, moderate, and long- term, the same as described for Alternative A and B due to the similarities between these two alternatives, taken in context with the entire NHL district. A mitigation measure is included in Chapter 2 that calls for a team of NPS, SHPO, and other groups or agencies as appropriate to evaluate all future projects planned within the NHL district to ensure that cumulative impacts over time are minimized.

Conclusion Implementing Alternative C would result in moderate, adverse, direct and indirect impacts to historic structures and districts, and cumulative impacts that would be adverse and moderate. No impairment of or unacceptable impacts to historic structures or districts would result.

CULTURAL LANDSCAPES

Affected Environment

The Cultural Landscapes Inventory Professional Procedures Guide (Page 2001) prepared by the NPS defines cultural landscapes as

...settings that human beings have created in the natural world. They reveal fundamental ties between people and land—ties based on our need to grow food, give form to our settlements, meet requirements for recreation, and find suitable places to bury our dead. Cultural landscapes are intertwined patterns of things both natural and constructed—plants and fences, watercourses, and buildings. They range from formal gardens to cattle ranches, from cemeteries and pilgrimage routes to village squares. They are special places—expressions of human manipulation and adaptation of the land.

A Cultural Landscape Report (CLR) was prepared for the Grand Canyon Village National Historic Landmark District (Milner and Associates 2004). The purpose of this document was to identify, document, analyze, and evaluate contributing and non- contributing cultural- landscape characteristics within the National Historic Landmark District, and provide specific recommendations and a comprehensive vision for the landscape to guide long- term management. The Bright Angel Trailhead Area falls within the Rim Area, one of several CLR landscape character areas that include the landscape between Village Loop Drive to the south, the rim on the north, Hermit Road shuttle bus stop on the west and Verkamps Curios on the west (Figure 8; that area north of Village Loop Drive at the upper portion of the drawing). The CLR serves as a supporting document for GMP implementation and for taking actions to design the Bright Angel Trailhead.

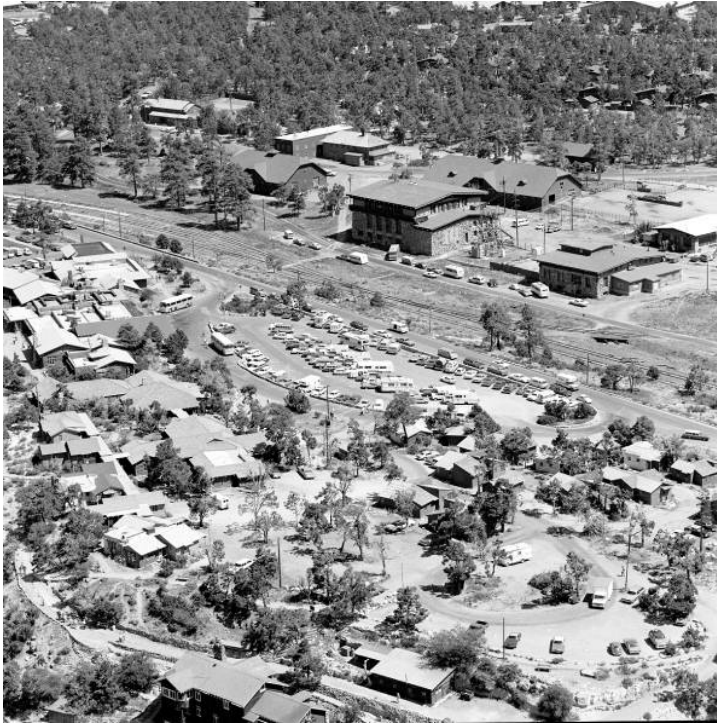
Bright Angel Lodge opened to the public in 1935 and the complex was completed in 1936. While plans for the cabins and surrounding landscape differed in some respects from what was actually constructed, and it is difficult to determine changes that have occurred over time, it appears that roads and parking were limited in the area and were generally informal in design (although plans existed for a larger and more formalized complex of roads with street names, they were not implemented, nor was a comfort station with showers and dressing rooms). As described in Zeman, Anderson and Quinn 2006, and Cowley 2006, the project area has consistently been an informal area, lacking structured design, even though various plans were developed for more formal designs as described under the historic structures and districts section. Figures 10 and 11 show the informal area and its notable features. The reference for character- defining features is the period of significance, or up until 1942. In 1942, the project area was open and undeveloped with informal cabin and parking area arrangements. Notable aspects of the Rim Area include its natural systems and features, spatial organization, land use, circulation, vegetation, buildings and structures, and small scale features. Aspects with the potential to be affected by proposed actions include spatial organization, circulation, buildings and structures, and small- scale features.

Spatial organization in the Rim Area is characterized by two clusters of buildings – the western cluster of buildings (now occupied by the Bright Angel Lodge and Cabins) and the eastern El Tovar cluster and linear corridors of space between buildings and rim and between buildings and Village Loop Drive. While these patterns of spatial organization would not be affected by proposed actions, the characterization of the western edge of the rim area as undeveloped would be affected by proposed actions in this area. The mule corral node acts as a gathering space for mule riders and wranglers as they prepare to ride down the Bright Angel Trail (Milner and Associates, page III- 9). While the mule corral node has not been determined a contributing feature to the cultural landscape, it does represent the western edge of the Rim Area as “an undeveloped wooded area” (Milner and Associates, page IV- 9 and A- 1) and is considered a contributing feature for purposes of this analysis.

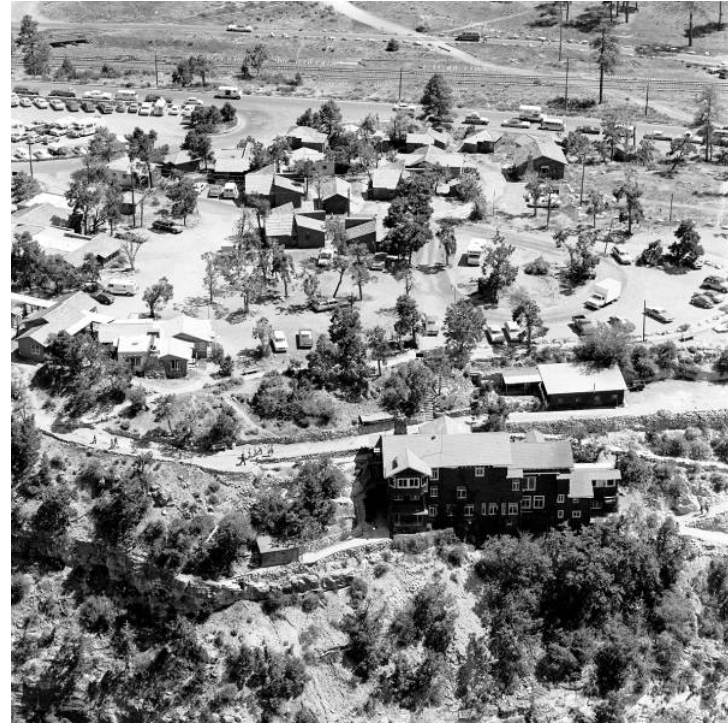
Circulation patterns within the Rim Zone are also important. This character area currently retains many of the same circulation patterns as during the period of significance but has undergone changes related to formalizing and paving roads and paths and construction of new roads and parking (Milner and Associates, page IV- 9). Interior Rim Area sidewalks and paths continue to form a semi- planned network of pedestrian circulation as they did during the period of significance. As noted below, the Rim Trail and the circular road within the Bright Angel cabins parking area are contributing features to the landscape.

Buildings and structures in this area have always supported visitor services. Over time several features from the period of significance have been removed while several new features have been added since 1942.

Specific landscape features of the Rim Area affected by proposed actions and specifically identified as contributing to the Grand Canyon Village Historic Landmark Cultural Landscape are included in Table 4. Other features of the Rim Area defined in the CLR as character-



1976 aerial photo facing southeast to industrial area in back



1976 aerial photograph facing south, Kolb Studio in front

Figure 10 Project Area in 1976. Area has changed little in the last 30 years (Zeman, Anderson and Quinn 2006).



Figure 11 Notable Cultural Landscape Features of the Bright Angel Trailhead Area

defining either do not occur in the project area, would not be affected by proposed actions, or were previously analyzed under the Historic Structures and Districts section. Other features may be listed in the CLR as non-contributing (earthen paths) or undetermined (mule path, boulders, and wood benches). Earthen paths, if not in appropriate locations would be revegetated, and alternate pedestrian paths would be enhanced. Boulders and log benches would be retained but may be repositioned to accommodate pedestrian circulation, gathering areas and needed seating. Considering treatment recommendations for the Rim Area and specific recommendations for the Bright Angel Trailhead Area from the CLR (Table 5) is a useful tool for project planning. These are recommendations only and not specific design criteria, but, when combined with the evaluation of how contributing features would be altered by proposed actions, provides a useful basis for evaluation of alternative components.

Table 4 Contributing cultural landscape features affected by proposed actions (Milner and Associates 2004, NPS 2007a)

Landscape Feature with the Potential to be Affected by Proposed Actions
Native vegetation near the mule corral and between the project area and Village Loop Drive
Ornamental native vegetation in plantings around Bright Angel Lodge and cabins
Bright Angel Cabin interstitial spaces
Circular road within the Bright Angel Cabins
Rim Cabin parking (parking areas closest to the Rim Cabins and above Kolb Garage)
Bright Angel Lodge circular drop-off near the O'Neil cabin complex (area closest to the O'Neil cabin complex, now used as parking)
Log benches
Mule corral node – an undeveloped wooded area

Table 5 Treatment Recommendations from the Grand Canyon Village Cultural Landscape Report (Milner and Associates 2004)

Treatment Recommendations for the Rim Area and Specific Recommendations for the Bright Angel Trailhead Area, as described in the 2004 Cultural Landscape Report
Rim Area General
Revegetate areas, disturbed through construction or vegetation removal, with native species or historically appropriate non-disruptive nonnative species. Use plants native to the Village Historic District and South Rim region when designing and installing new plantings.
Implement planting designs that are informal and organic in character. Avoid rigid geometry or highly stylized designs, such as formal gardens or planting beds, and clipped or trimmed foundation plantings.
Retain all contributing buildings and structures. Avoid removing or relocating these structures.
Design new buildings and structures to reflect the character of existing historic structures; two stories

Treatment Recommendations for the Rim Area and Specific Recommendations for the Bright Angel Trailhead Area, as described in the 2004 Cultural Landscape Report
or lower, constructed primarily of wood and stone, and using muted earth- tone colors.
Limit construction of new buildings or structures in the rim area. If necessary, new features should be located within existing development clusters, at the eastern and western edges of the character area. They should be sited, if possible, in the location of missing buildings and structures.
Design new small- scale features to reflect the character of existing, historic, small- scale features by using appropriate materials and style.
Minimize visual and spatial intrusions by incompatible features such as utility boxes and dumpsters, through selective siting and screening techniques. Remove or screen non- contributing small- scale features that are no longer in use, necessary, or that detract from the area's historic character.
Bright Angel Trailhead Specific
Retain contributing vehicular circulation patterns, particularly the loop south of Kolb Garage and west of the Bright Angel Cabins.
Retain the Bright Angel Trailhead's informal character. Avoid constructing a formal plaza space, decorative elements such as ornate posts, fences, or walls, installing lights, or otherwise overdeveloping the trailhead.
Retain loose gravel and earth parking surfaces. Avoid paving parking areas with asphalt or concrete. Consider instead resurfacing parking with additional gravel. Ensure new pavement matches the existing surface color.
Retain as much of the existing native and non- hazardous vegetation as possible. This vegetation not only provides shade for visitors and hikers, but is aesthetically pleasing. Protect parking area vegetation from vehicle damage.
Evaluate pedestrian circulation around the trailhead, including how visitors circulate around the parking areas, between parking and the trailhead, and at the trailhead...assess the need for better defined paths with stone edging, the affect random pedestrian circulation has on existing vegetation, and the need for additional paths or trails.

Environmental Consequences

Methodology

Baseline information used to assess impacts to cultural landscapes is described in the methodology section at the beginning of this chapter and includes staff knowledge of the resources and site; review of existing literature and park studies; information provided by NPS and other agency specialists, and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP EIS was specifically referenced for information on affected resources in the project area. Additional information sources on cultural landscapes used for this evaluation are described above in the affected environment section.

Proposed activities have potential to impact cultural landscape resources through alteration of landscape character and alteration of character- defining features and patterns from the period of significance. Magnitude is based on the amount of change to these elements and their relative value.

Thresholds of change for intensity of an impact on cultural landscapes are defined as

Negligible Impacts would retain the landscape character; impacts at the lowest levels of detection with neither adverse nor beneficial consequences; cultural landscapes would receive no change to defining features or characteristics that contribute to National Register of Historic Places eligibility. Negligible impacts are barely perceptible and alter neither resource condition, such as traditional access and site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. The determination of effect for Section 106 would be "no historic properties affected."

Minor

Adverse Most of the original landscape character is retained with some small elements altered. Impacts detectable but do not diminish overall resource integrity. Impacts such as feature degradation or displacement could occur and would be measurable, but would be localized and would not result in changes to defining elements. They would not affect or jeopardize a character- defining pattern or feature of a landscape listed in or eligible for listing on the Register or aspects of integrity that contribute to eligibility for the National Register of Historic Places (National Register). The determination of effect for Section 106 would be "no historic properties affected."

Beneficial Original landscape character is retained and/or enhanced. Preservation of landscape patterns and features is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For purposes of Section 106, the determination of effect would be "no historic properties affected."

Moderate

Adverse Some modification of the original landscape character is evident. Impacts alter a character- defining pattern(s) or feature(s) of the cultural landscape, but do not diminish the landscape's integrity to the extent that its National Register eligibility was jeopardized. Determination of effect for Section 106 would be "historic properties affected." It may be necessary to execute a Memorandum of Agreement among the NPS and the applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts would reduce the intensity of impact under NEPA from moderate to minor.

Beneficial Original landscape character is retained and/or enhanced. Beneficial effects include rehabilitating a landscape or its patterns or features. A landscape will be maintained and restored in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with guidelines for the treatment of cultural landscapes. Determination of effect for Section 106 would be "no historic properties affected."

Major

Adverse Modifies the original landscape character to a degree where no retention is achieved. Disturbance of a site would alter a character- defining pattern or feature of a landscape (including the proliferation of nonnative plant species that may threaten the integrity of setting and traditional vegetative resources) to the extent that it would no longer be eligible to be listed on the National Register. Impacts would include destabilization of structures or cultural contexts, and an increase in exposure or vulnerability to natural elements (e.g. fire, flood, wind). Determination of effect for Section 106 would be “historic properties affected.” In the event of a determination of adverse effect, a MOA would be executed between the NPS and the applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts would reduce the intensity of impact under NEPA from major to moderate or minor.

Beneficial Original landscape character is retained and/or enhanced. A landscape’s patterns or features will be maintained and restored in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. Beneficial effects could include maintaining native or culturally significant vegetation. The determination of effect for Section 106 would be “no historic properties affected.”

Duration

Short- term Impact An effect that, within five years, would no longer be detectable as the resource was returned to its pre- disturbance condition or appearance (e.g. trash and other items that could be removed or trampled but not denuded vegetation).

Long- term Impact A change in a resource or its condition that would not return the resource to pre- disturbance condition or appearance and for all practical purposes would be considered permanent (e.g., damage to elements or removal of artifacts).

Alternative A, No Action

Direct/Indirect Alternative A implementation would not result in any direct effect on identified cultural landscapes. Contributing cultural landscape features would not change from their current condition. The cultural landscape would be protected to the greatest extent possible under existing NPS policies and the availability of park staff and other support personnel to carry out maintenance of historic structures, facilities, and grounds. However, the No Action Alternative has the potential to affect Grand Canyon Village NHL landscape features indirectly. Specifically, failure to implement improvements to existing features (such as historic trails and walls) and failure to adaptively reuse the vacant Kolb Garage would result in adverse impacts to landscapes. Taking no action in the project area at this time would retain the existing landscape character. For these reasons, implementation of Alternative A would result in negligible to minor adverse impacts to cultural landscapes.

Cumulative The Grand Canyon Village cultural landscape has sustained previous impacts from modifications to some historic buildings and settings. Buildings, roads and trails, and other facilities have removed native vegetation. Modern buildings and other features have also intruded on the cultural landscape’s historic setting. Signs, paths, bus stops, trash receptacles

and many other small- scale features have been added over time. Furthermore, previous deteriorations of some buildings from natural weathering and use have compromised defining architectural characteristics. These past impacts are minor, adverse, local, and long- term. Most of the recently implemented, in- progress, and foreseeable future projects with potential to affect cultural resources have been discussed with the SHPO. Using CLR treatment recommendations (Milner and Associates 2004) as the basis for future projects provides a useful tool in minimizing the potential for adverse effects from future projects on cultural landscapes. A mitigation measure is included in Chapter 2 that calls for a team of NPS, SHPO, and other groups or agencies as appropriate to evaluate all future projects planned within the NHL district to ensure that cumulative impacts over time are minimized. Therefore, adverse cumulative effects would be minor, local, and long- term.

Conclusion Alternative A implementation would result in negligible to minor, adverse, direct, and indirect impacts to cultural landscapes and cumulative impacts that would be adverse and minor. No impairment of or unacceptable impacts to cultural landscapes would result.

Alternative B, Preferred

Direct/Indirect – First Phase Implementation of Phase would result in obvious changes to the project area’s cultural landscape, the northwest corner of the Grand Canyon Village NHL. While plans were made in the past to develop the Bright Angel Trailhead Area more formally (as discussed in the affected environment section above) these were never implemented and the area has remained relatively undeveloped, lacking structured design. Implementation of the first phase of Alternative B would result in a more formalized design for the area changing the existing landscape character through changes in its spatial organization. This would result primarily from construction of a restroom and shade facility, plaza area and trail improvements.

The parking area would be reduced in extent by approximately 25%. This would allow space for pedestrian walkways, gathering areas, and circulation while continuing to provide some vehicle parking. The outer boundaries of the parking area were not delineated historically, as far as is known but this change would not directly alter any character- defining feature, as shown in Table 6 below. The rim cabin parking feature may be altered somewhat by removal of parking nearest the rim, but the location of this feature seems to be closest to the rim cabins and in an area that would be retained within the new boundaries of the parking area when comparing Figure 4 to the maps contained within the CLR (Milner and Associates 2004). While the parking area boundaries would be delineated, the surface would remain dirt or gravel and the current circulation through the area would remain.

The only contributing cultural landscape feature (Table 6) that would be directly affected is the native vegetation near the mule corral and between the project area and Village Loop Drive. While vegetation removal in this area would be minimized as much as possible, some trees (estimated between three to eight small trees) and shrubs would need to be removed to accommodate the restroom. This would remove a portion of the area existing vegetation and still provide a vegetated buffer between the restroom and Village Loop Drive. Rim cabin parking and Bright Angel Lodge circular drop- off are subcomponents of the existing amorphous parking area and are not easily differentiated from the rest of the dirt parking area. Both areas

are currently used for parking and would continue to be used for parking under Phase 1. While no changes would be made to the cabins, their location, or appearance, the creation of larger landscaped zones around the cabins would alter indirectly the appearance of the space in-between the cabins (interstitial space) by removing adjacent vehicles and creating more of a buffer zone around the cabin clusters. The circular road within the Bright Angel cabin area would not be measurably changed either; the delineation of the parking area's outer boundaries would not alter the way vehicles circulate through the parking area. Circulation would continue to be with a series of loops around the cabins, and would continue to be relatively informal and haphazard. Because no changes would be made to cabin location or setting, interstitial spaces between Bright Angel Cabins would remain, as would the ornamental native vegetation in plantings around the cabins. All log benches in the area would be retained onsite; it is possible that they may be repositioned within the general area to accommodate current visitor needs of visitors, but they would remain in their existing setting.

Table 6 How contributing cultural landscape features would be affected by implementation of Alternative B

Landscape Feature	Anticipated Impacts from Alternative B (first and second phases)
Native Vegetation near the mule corral and between the project area and Village Loop Drive	While all efforts would be made to avoid vegetation removal, it is expected that a several trees would be removed near the mule corral for restroom construction
Ornamental Native Vegetation in plantings around Bright Angel Lodge and cabins	Any ornamental vegetation surrounding the Bright Angel cabins would be retained; in some areas the planting areas would be increased in size under Phase 2 to provide buffer between vehicles and cabins
Bright Angel Cabins interstitial spaces	The relationship between the buildings, the landscape, and circulation would be altered by creation of larger landscaped zones around the cabins and parking area changes
Circular Road in the Bright Angel Cabin area	Existing circulation patterns through the cabin area would not change as a result of Phase 1. Under Phase 2, the general circular pattern would be emphasized by creation of a one- way loop around the perimeter of all cabins; road between cabins would be retained as a pedestrian corridor; secondary informal parking loops would be eliminated
Rim Cabin Parking	Parking would be somewhat more consolidated and spaces nearest the rim would be eliminated in favor of pedestrian circulation nearest the rim and between the parking and the rim

Landscape Feature	Anticipated Impacts from Alternative B (first and second phases)
Bright Angel Lodge Circular Drop- off	This area would be incorporated into the parking area under Phase 1; no change from existing condition
Log Benches	Retained onsite; may be repositioned if needed to enhance visitor experience

Treatment recommendations (Table 5) were used in development of Alternative B, and Rim Area recommendations are incorporated into the alternative. For example, native species would be used in revegetation efforts, the overall area design is intended to be relatively informal and organic in character without use of highly stylized designs, and materials selection and design details used in any new construction would reflect existing character with the intent of also being differentiated from historic buildings. The historic drinking fountain and wood sheds, as described under Historic Structures and Districts, would be retained in their current location under Phase 1. The restroom design is low- profile, simple, and would use colors and materials appropriate for the area, selected as part of continued SHPO consultation as design details are developed. Non- contributing elements/features that would be added to the area under Phase 1 would be only the minimum necessary such as wayfinding signage, trash receptacles and some interpretive signing. The color, materials, location, and style of these new features would be carefully selected to be appropriate for the surrounding landscape, as described in mitigation measures (Chapter 2). The dirt/gravel parking area surface would remain as recommended. Existing vegetation would remain in all areas, except that necessary for restroom construction, as discussed above. Pedestrian circulation in the Trailhead Area would be improved, through improvements to the Rim Trail, enhanced accessibility, and designated secondary paths, with social trails removed where necessary. In addition, some non- contributing existing features (chemical toilets for instance) would be removed under Phase 1.

Therefore, the primary potential for adverse impacts to the Grand Canyon Village NHL through implementation of Phase 1 is in the delineation and construction of a plaza area with a restroom and shade structure. The addition of these features would formalize an area that is now primarily informal in a location between the mule corral and the cabins that is currently an undeveloped node within the Rim Area of the Grand Canyon Village NHL cultural landscape. This would result in changes to spatial organization. The envisioned Trailhead Plaza Area would be an informal meeting space with non- architectural elements that would create a sense of place, an area for visitors to orient to the Trailhead. Decorative elements would be avoided; native landscaping would avoid urbanized planters and other design details indicative of urban settings. The plaza surface would be hardened, and site features added, though, necessary to meet other project objectives.

The restroom/shade site was selected in part so existing topography would minimize the building's height. Two separate buildings were selected to minimize the building's massing, and the site is separated from the historic cabins so as not to compete with existing architecture. The restroom's proximity to the historic mule corral, identified as an "undeveloped wooded area" in

the CLR (Milner and Associates 2004) would result in a spatial landscape change. Following restroom, shade and plaza area construction, the mule corral would no longer be the solitary structure in the Trailhead Area.

It is important to note that implementation of Phase 1 would include the addition of many modern, small- scale, non- contributing features to the landscape including signs, seating and benches, hardened surfaces, new walls for accessible path from shuttle bus stop, lighting fixtures, trash cans, secondary trails and new propane tanks. The addition of these small- scale features and landscape elements that post- date the period of significance (1897- 1942) have an adverse impact on the Grand Canyon Village NHL cultural landscape.

The intensity of the adverse impact from these changes would be reduced by implementation of mitigation measures (Chapter 2) and continued consultation with the SHPO through the MOA so design and materials selected for the plaza, restroom, and shade structure are carefully chosen and would maintain a rustic and informal character. Nonetheless, these would be new features added to the Grand Canyon Village NHL district. Effects to cultural landscape features are summarized in Table 6, considering implementation of Phase 1 and Phase 2.

Direct/Indirect – Phase 2 Implementation of future phases (Phase 2) would occur if funding becomes available. This includes enhanced revegetation and landscaping, additional site amenities (signs, benches, etc.), accessible access to Kolb Studio, a hardened- surface 79- stall parking area, and creation of an interpretive node or gathering area at Kolb Garage. Improvements in landscaping and site amenities have potential to affect the cultural landscape if they result in a more formalized or more urban setting to this area of the Grand Canyon Village NHL district. Implementation of mitigation measures (Chapter 2) and implementation of the MOA with the SHPO to ensure compatible designs and locations are chosen for these features would minimize potential for adverse impacts. However, any formalized landscaping beds and additional signs and other site amenities would be add non- contributing features to the landscape. Impacts of creating accessible access to Kolb Studio would not affect the cultural landscape and has been evaluated in the Historic Structures and Districts section.

Paving the parking area surface and delineating parking spaces would result in a more formal and urbanized setting to the area. To do this, some changes would be made to the current relatively shapeless parking area around the cabins; while the vehicle circulation would remain a circular loop (a one- way loop with the east/west drive in the center of the cabins closed for use as a pedestrian path and service vehicle access), the smaller secondary loops (Figure 3) would be eliminated. Buffers would be enhanced around the cabins. These changes would facilitate better separation between pedestrians and vehicles and would provide for more privacy for lodge guests. Adverse impacts from this change would be minimized through careful selection of materials and colors (hardened surface would not be standard asphalt) and the use of appropriate features, such as rock edging, etc. that would continue to adhere to a less- urban and more rustic character of this area. While the historic drinking fountain can likely be retained in its current location, the two woodsheds would likely require removal or relocation under Phase 2.

Creation of an interpretive node at Kolb Garage would use an existing historic building for a new, current use and would take advantage of canyon vistas and flat terrain in this area for visitor gathering and interpretive information and talks. Changes to the landscape would be minimal, consisting of the addition of appropriate seating and interpretive panels outside the Garage. The building would be renovated according to the Secretary's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995), as discussed in the Historic Buildings and Districts section. This area has always been a high- use visitor area until the retaining wall collapse of the Kolb driveway, when the area was closed for safety reasons. Restoration of this Rim Trail connection and use as a gathering area is consistent with the landscape. However, as in the other alternative components, selection of the most appropriate materials for site amenities and surfaces to maintain a more rustic feel and a less- urbanized character is paramount.

All of these changes would result in an obvious change to the landscape's existing character. Direct adverse impacts to the cultural landscape are unavoidable from Alternative B implementation and are expected to result in a minor to moderate, adverse impact to the Bright Angel Trailhead Area cultural landscape, but would not diminish landscape integrity to the extent that National Register eligibility would be jeopardized. These adverse impacts are lessened when the Grand Canyon Village cultural landscape is considered as a whole. The trailhead's spatial organization would change as a result of the preferred alternative and introduction of new structures into the landscape near the mule corral. Defining walkways, parking areas, and landscape islands with natural- appearing architectural materials would result in minor to moderate adverse impacts that are direct and long- term, but localized. Impacts of these changes would be minimized by appropriate color and material selection; natural hues will be used in parking area and plaza surfaces, and uniformity, compatible with historic trails and other features, would be created in the trail system. Some benefits would also be realized by removal of non- contributing features (chemical toilets, some dumpsters, and Trailhead kiosk), consolidation of some small- scale features at appropriate places (emergency phone, signage, restrooms and water) and repair and upkeep of historic features (Rim Trail, stone retaining walls, and flagstone paths).

Cumulative The Grand Canyon Village NHL cultural landscape has sustained previous impacts as a result of modifications to some historic buildings and settings. Non- contributing features have been added, particularly small- scale features such as signs, trash cans, dumpsters, light fixtures, bus shelters and non- native vegetation. Buildings, roads, and trails, and other facilities have removed native vegetation. Non- contributing modern buildings and other features have also intruded on the cultural landscape's historic setting. Furthermore, previous deteriorations of some buildings from natural weathering and use have compromised defining architectural characteristics. These past impacts are moderate, adverse, local, and long- term. Most of the recently implemented, in- progress, and foreseeable future projects with potential to affect cultural resources have been discussed with the SHPO. Future actions would be reviewed by the park's Landscape Architect, Historic Architect, Cultural Resources Staff, the SHPO and the Advisory Council as appropriate to ensure compatibility with the NHL. Using CLR treatment recommendations (Milner and Associates 2004) and the consideration of character- defining contributing features of the landscape as the basis for future projects would ensure adverse

effects of future projects on cultural landscapes would be negligible to minor. A mitigation measure is included in Chapter 2 that calls for a team of NPS, SHPO and other groups or agencies as appropriate to evaluate all future projects planned within the NHL district to ensure that cumulative impacts over time are minimized. Combining changes expected as a result of the preferred alternative with these past and future actions would result in cumulative effects that would be moderate, local, and long- term.

Conclusion Implementing Alternative B would result in minor to moderate, adverse, direct, and indirect impacts to cultural landscapes and cumulative impacts that would be adverse and moderate. No impairment of or unacceptable impacts to cultural landscapes would result.

Alternative C, Expanded Parking

Direct/Indirect Alternative C, Phase 1 would be the same as that described above for Alternative B, Phase 1 and would result in an overall minor to moderate, adverse, direct and indirect impact to the Grand Canyon Village NHL cultural landscape. Some benefits would also be realized by removal of non- contributing features (chemical toilets, some dumpsters, and Trailhead kiosk), consolidation of some small- scale features at appropriate places (emergency phone, signage, restrooms and water) and repair and upkeep of historic features (Rim Trail, stone retaining walls, and flagstone paths).

Implementation of future phases (Phase 2) of Alternative C would include additional landscaping and revegetation, additional site amenities, accessibility improvements for Kolb Studio access, creation of an interpretive node at Kolb Garage, and an approximately 104- stall hardened- surface parking area. Potential for impacts to cultural landscapes from these actions proposed in Phase 2 are the same as those described for Alternative B, Phase 2 for all actions except the creation of a larger and more complex parking area.

To accommodate the maximum number of parking spaces Alternative C creates a larger parking area by reducing the size of landscaped zones around cabins and between the parking area and pedestrian zones near the plaza area and the Rim Trail. Vehicle circulation is the same as in Alternative B, Phase 2 (one- way loop), but creates a somewhat more complicated pattern due to the creation of double bays for parking. Due to the larger size and need to maximize capacity, the surface would be hardened with an all- weather surface and individual spaces would be marked. The parking area's outer boundaries would be proximal to the plaza area, restroom, and both the rim cabins and lodge cabins, so that little separation of user groups would be achieved with this alternative. Vehicle circulation would be similar to the historic pattern, but not as much as in Alternative B due to creation of double parking bays. While efforts would be made to carefully select the parking- area substrate and to use natural colors, the parking area would resemble a more urbanized situation, emphasized by creation of double bays and smaller landscaped areas within and on the parking- area boundaries.

Alternative C results in greatest deviation from CLR recommendations when compared to Alternative B and would result in direct, long- term, moderate adverse impacts to the Grand Canyon Village NHL district cultural landscape. While the expected adverse impacts are greater

than Alternative B, landscape integrity would not be diminished to the extent that National Register eligibility would be jeopardized.

Cumulative Due to similarities between Alternative B and C, Alternative C would result in cumulative impacts the same as described for Alternative B and focus on incremental impact of changes to the Grand Canyon Village NHL cultural landscape over time, the addition of non-contributing small scale features and buildings, and creation of more development in an otherwise relatively undeveloped node at the Bright Angel Trailhead area of the NHL landscape. Combining impacts of past, present, and reasonably foreseeable future actions with implementation of Alternative C would result in cumulative impacts to the NHL district that are adverse, moderate, and long- term. A mitigation measure is included in Chapter 2 that calls for a team of NPS, SHPO, and other groups or agencies as appropriate to evaluate all future projects planned within the NHL district to ensure that cumulative impacts over time are minimized.

Conclusion Implementing Alternative C would result in moderate, adverse, direct, and indirect impacts to cultural landscapes and cumulative impacts that would be adverse and moderate. Direct adverse impacts to both the Bright Angel Trailhead Area and the Grand Canyon Village NHL district cultural landscape would be greater under Alternative C than under Alternative B. No impairment of or unacceptable impacts to cultural landscapes would result.

VISUAL RESOURCES

Affected Environment

Conserving national park scenery and providing for visitor enjoyment are elemental NPS purposes according to the 1916 Organic Act. Grand Canyon was designated a national park in 1919 and a World Heritage Site in 1979, in large part because of its “exceptional natural beauty” and its “aesthetic importance.” Best known of the park’s scenic qualities are the expansive Grand Canyon views from the rims. On clear days, a deeply eroded landscape of canyons, buttes, and cliffs may be visible for 160 miles or more from many overlooks on both North and South Rims. The Colorado River, flowing a mile below in the Inner Gorge, can be glimpsed from vantage points. For visitors on South Rim looking directly across canyon, the high, forested Kaibab Plateau can be seen on North Rim, over ten miles away.

Landscape character to the north of the project area provides canyon views and thus more visual and scenic interest than landscape character to the south. Actions associated with the landscape on the south will have less visual and scenic impact than actions proposed on the north. Actions on the north that could impede views or access to views will result in the greatest impact to visual and scenic area quality. Views and vistas (panoramic views toward the canyon and panoramic vistas of the canyon) are identified as contributing rim- area landscape features in the CLR. Figure 11 depicts visitors enjoying a typical panoramic view from the project area.



Figure 12 Typical Panoramic Canyon View from the Bright Angel Trailhead Area

Environmental Consequences

Methodology

Baseline information used to assess visual resources impacts is described in the methodology section at the chapter's beginning and includes staff knowledge of the resources and site; review of existing literature and park studies, information provided by NPS and other agency specialists, and professional judgment. Detailed information on Grand Canyon National Park visual resources summarized in the 1995 GMP EIS was specifically referenced for information on project area affected resources. Additional visual resources information sources used for this evaluation are described above in the affected environment section.

Thresholds of change for intensity of an impact on visual resources are defined as

Negligible Impacts would retain adjacent views; impacts would be at the lowest levels of detection with neither adverse nor beneficial consequences.

Minor Most of the original landscape character is retained with some small elements altered. Adjacent views are generally retained with a few views partially retained.

Moderate Some modification of the original landscape character is evident. Most of the adjacent views have been altered; however, most partially retain the original views.

Major Modifies the original landscape character to a degree where no retention is achieved and most of the original adjacent views are not maintained.

Duration

Short- term Impact An effect that, within five years, would no longer be detectable as the resource was returned to its pre- disturbance condition or appearance

Long- term Impact A change in a resource or its condition that would not return the resource to pre- disturbance condition or appearance and for all practical purposes would be considered permanent

Proposed activities have the potential to impact visual/scenic resources primarily through project- area changes apparent from prominent viewpoints along Hermit Road (Trailview Overlook I and II, for example) and to a lesser extent, canyon- views changes from the project area and changes in the project area from views along Village Loop Drive and from the Hermits Rest interchange shuttle bus stop.

Alternative A, No Action

Direct/Indirect Taking no action in the project area at this time would retain the existing landscape character and adjacent views. Most importantly, views of the project area from prominent viewpoints along Hermit Road would remain. In addition, existing canyon views from the project area would not change, and views of the project area from the Hermits Rest bus stop or from Village Loop Road would not change. For these reasons, implementation of Alternative A would result in negligible adverse impacts to visual resources.

Cumulative South Rim's scenic quality has sustained previous impacts from modifications to some historic buildings and settings. Buildings, roads, trails, and other facilities have removed native vegetation and, in some cases, such as the construction of Kolb Studio, impeded canyon views and vistas. Future actions would be reviewed by the park's Landscape Architect to ensure compatibility with visual and scenic resource protection. Using CLR treatment recommendations (Milner and Associates 2004) as the basis for future projects within Grand Canyon Village would ensure adverse effects of future projects on visual resources would be minor. Therefore, adverse cumulative effects would be minor, local, and long- term.

Conclusion Alternative A implementation would result in negligible to minor, adverse, direct, and indirect impacts to visual resources, and cumulative impacts that would be adverse and minor. No impairment of or unacceptable impacts to visual resources would result.

Alternative B, Preferred

Direct/Indirect – Phase I Implementation of Phase I of the preferred alternative includes creation of the Bright Angel Trailhead plaza with a restroom and shade, improvements to trails, delineation of the parking area's outer boundaries, minimal revegetation and landscaping and addition of minimal signage and site amenities. The preferred alternative recognizes the importance of canyon panoramic views and vistas and proposes enhancing viewing

opportunities through additional informal seating and viewing areas, picnicking opportunities, and development of the Kolb Garage interpretive area. No aspects of the proposal would result in any direct effect to canyon views, as no views would be impeded by any project components.

The site selected for the restroom and shade structure, incorporated into the plaza, was selected so that existing topography could minimize the building's height. Two separate buildings were specified to minimize the building's massing, and the site is separated from the historic cabins so as not to compete with existing architecture. While these measures have been taken to protect existing architecture, the restroom's location adjacent to the historic mule corral would create a spatial landscape change, as described above in the Cultural Landscape section. Following restroom construction, the mule corral would no longer be the solitary structure in the Trailhead Area. This would result in an apparent change in the project area, as viewed from important vantage points along Hermit Road (Trailview I and II as examples). Materials and colors selected for the shade structure and building's exterior (particularly the roof) would be developed in consultation with the park's Historical Architect, cultural resources staff, Landscape Architect, and SHPO to minimize impacts to the cultural landscape, but also to ensure that adverse impacts to the view of the project area from important vantage points are minimized.

Parking area changes, trail improvements and other aspects of Phase 1 would not measurably affect views from important vantage points or canyon vistas. Delineation of the parking area's outer boundaries would not require any tree removal and would generally provide a similar appearance as the existing condition, since the surface and size are generally kept the same. Added site amenities would not be noticeable from important vantage points and none would be placed in areas that would impede canyon views.

While some changes in the project area may be noticeable from Village Loop Drive and the Hermits Rest interchange bus stop (such as creation of the accessible path on the west end of the project area and the restroom near the corral) these views are less important than canyon panoramic views or views from Hermit Road and would be adverse and minor.

Since the preferred alternative would not alter canyon views, impacts to visual resources are minimized. Views of the project area would change from vantage points on Hermit Road primarily due to restroom construction but these impacts are lessened due to the distance at which the project area is viewed from these vantage points. In other words, any changes proposed under this alternative would result in minor visible changes when seen from these vantage points, since larger structures like Kolb Studio and Bright Angel Lodge would still be most prominent, and changes in smaller landscape features hard to discern from this distance. Impacts to visual resources from Alternative B, Phase 1 implementation would, therefore, be adverse, long-term, and minor.

Direct/Indirect – Phase 2 Implementation of Phase 2 of the preferred alternative includes more landscaping and revegetation, additional site amenities, improved Kolb Studio access, creation of an interpretive area at Kolb Garage and of a more formal, 79- stall parking area with a hardened surface. The only aspect of Phase 2 with potential for impacts to visual resources is the

parking area. Other components would be designed so that no canyon views would be impeded and, as described under Cultural Landscapes, would be compatible with the surrounding cultural landscape. An enhanced interpretive area at Kolb Garage would improve area use for canyon viewing and all improvements would have this goal in mind. To harden the parking area surface, delineate parking spaces and create a one- way loop, some trees may need to be removed. There is little existing vegetation within the parking area, and most is associated with small islands around the cabins. However, some pockets of larger trees do occur and some individual trees and shrubs are scattered throughout the parking area. While all efforts would be made to retain as much of this existing vegetation as possible, it is likely that some removal of trees and shrubs would be unavoidable to create a more efficient parking area. This could result in loss of some vegetative screening of the parking area from important vantage points along Hermit Road. This impact is expected, but is considered minor, proportionate to the overall landscape.

Short- term adverse, negligible to minor impacts to visual resources would occur when construction is taking place through the presence of onsite construction equipment, fencing and other signs of activity and disturbance in the area.

For these reasons, implementation of all phases of Alternative B would result in adverse impacts to visual resources that would be negligible to minor, direct and indirect and both short- and long- term.

Cumulative South Rim's scenic quality has sustained previous impacts from modifications to some historic buildings and settings. Buildings, roads, trails, and other facilities have removed native vegetation and, in some cases, such as Kolb Studio construction, impeded canyon views and vistas. Future actions would be reviewed by the park's Landscape Architect to ensure compatibility with visual and scenic resource protection. Using CLR treatment recommendations (Milner and Associates 2004), future projects would ensure adverse effects on cultural landscapes and visual resources would be negligible to minor. Combining changes expected as a result of the preferred alternative with these past and future actions would result in cumulative effects that would be moderate, local, and long- term.

Conclusion Implementing Alternative B would result in minor, adverse, direct, and indirect impacts to visual resources, negligible to minor adverse short- term impacts, and cumulative impacts that would be adverse and moderate. No impairment of or unacceptable impacts to visual resources would result.

Alternative C, Maximized Parking

Direct/Indirect The first phase of implementation of Alternative C would be the same as Phase 1 of Alternative B and would result in an overall minor, adverse, short- and long- term impact to visual resources.

The potential for impacts to visual resources from Alternative C, Phase 2 actions (additional landscaping and revegetation, site amenities, accessibility improvements at Kolb Studio, development of interpretive node at Kolb Garage, and creation of a 104- space hardened-

surface parking area) are the same as Alternative B, Phase 2 except for the parking area. To accommodate the maximum number of parking spaces while achieving other project objectives, Alternative C creates a somewhat larger parking area by reducing the size of landscaped zones around cabins and between the parking area and pedestrian zones near the plaza area and Rim Trail. Vehicle circulation is similar to Alternative B, Phase 2 (one- way loop), but creates a somewhat more complicated pattern due to creation of double bays for parking. The parking area's outer extent would be similar to the existing condition except nearest the rim, above Kolb Garage, where parking would be removed from the rim edge to provide space for the Rim Trail and pedestrian zones, as in Alternative B. The visual impact of this more urbanized parking area is limited to the view of this parking area, in combination with other Phase 1 components, and how obvious the change is from vantage points along Hermit Road. Effects of the parking area would be similar to Alternative B, Phase 2 except more trees may be removed to accommodate the larger area, and there would be even less flexibility during design to accommodate existing vegetation in islands throughout the parking area so the maximum number of parking spaces can be accommodated. As in Alternative B, Phase 2, all efforts would be made to retain as much existing vegetation as possible to provide screening and shade, but removal is expected and may be somewhat greater under Alternative C than under Alternative B. For this reason, the parking area may be slightly more noticeable from vantage points along Hermit Road under Alternative C than under the preferred alternative.

Short- term adverse, negligible to minor impacts to visual resources would occur when construction is taking place through the onsite presence of construction equipment, fencing, and other signs of activity and disturbance in the area.

For these reasons, implementation of Alternative C would result in long- term adverse impacts to visual resources that would be minor, direct and indirect, and short- term impacts that would be negligible to minor and adverse.

Cumulative Due to the similarities between Alternative B and C, Alternative C would result in cumulative impacts the same as described for Alternative B.

Conclusion Implementing Alternative C would result in long- term minor, adverse, direct, and indirect impacts to visual resources, short- term adverse impacts that would be negligible to minor and cumulative impacts that would be adverse and moderate. No impairment of or unacceptable impacts to visual resources would result.

SPECIAL STATUS SPECIES

Affected Environment

Table 7 includes a list of threatened, endangered, proposed species, and species of concern pertinent to the Bright Angel Trailhead Area project, based on known occurrences or habitat preferences. In- depth discussion of Federally listed species issues in the analysis area is the subject of a separate Biological Assessment. Of the ten Federally listed wildlife and plant species known or likely to occur in Grand Canyon National Park, two occur in or near the project area. Occurrence potential for these species in the project area is included in Table 7 below. Detailed

descriptions of special status species, including a brief species description, habitat requirements, legal status, and data sources used for analysis are included in Appendix D.

The list in Table 7 was developed from personal knowledge by park biologists, park records, the Arizona Game and Fish Department (AGFD) Heritage Non- game Data Management System database (2003), and AGFD and USFWS biologists.

Table 7 Special Status Species in the Vicinity of the Bright Angel Trailhead Area

Species	Scientific Name	Status	Occurrence in Project Area
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T, WC ¹	Protected activity center established below the rim near the project area
California Condor	<i>Gymnogyps californicus</i>	T*, WC	Foraging and roosting potential; no previously used nest sites within 0.5 miles of project area
Deer Goldenbush	<i>Ericameria arizonica</i>	SC	Known to occur in the general vicinity of the project along the rim edge

Environmental Consequences

Methodology

Baseline information used to assess impacts to special status species is described in the methodology section at the beginning of this chapter and includes staff knowledge of the resources and site; review of existing literature and park studies; information provided by NPS and other agency specialists and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park is summarized in the 1995 GMP EIS was specifically referenced for information on project area affected resources. Additional special status species information sources used for this evaluation are described in the affected environment section.

Thresholds of change for the intensity of an impact on special status species are defined as

Negligible Special status species not affected, or effects at or below level of detection. A negligible effect would equate with a “no effect” determination under section 7 of the Endangered Species Act regulations for threatened or endangered species.

¹ **Key:** T=Federally listed as threatened under the Endangered Species Act (ESA); T*=Federally listed as an experimental non- essential population in Arizona, but in national parks the species is considered Federally listed as threatened under ESA; E=Federally listed as endangered under the ESA; WC=Wildlife species of special concern in Arizona (AFGD, 1996); SC=Species of Concern, some information showing vulnerability or threat, but not enough to support listing under ESA. These species are former USFWS Category 1, 2, and 3 species (Note: the Southwest Region of the USFWS no longer maintains a list of Category 1, 2, and 3 species).

Minor Impacts to special status species perceptible or measurable, but severity and timing of changes to parameter measurements are not expected to be outside natural variability and are not expected to have effects on populations of special status species. Impacts outside critical periods. A minor effect would equate with a determination of “likely to adversely affect” or “not likely to adversely affect” under section 7 of the Endangered Species Act regulations for threatened or endangered species.

Moderate Impacts to special status species perceptible and measurable, and severity and timing of changes to parameter measurements are sometimes outside natural variability, and changes within natural variability might be long term. Populations of special status species might have small to moderate declines, but are expected to rebound to pre- impact numbers. No species at risk of being extirpated from the park. Some impacts might occur during key time periods. A moderate effect would in most cases equate with a determination of “likely to adversely effect” under section 7 of the Endangered Species Act regulations for threatened or endangered species.

Major Impacts to special status species measurable, and the severity and timing of changes to parameter measurements are outside natural variability for long periods of time or even be permanent; changes within natural variability might be long term or permanent. Populations of special status species might have large declines, with population numbers significantly depressed. In extreme cases, a species might be at risk of being extirpated from the park, key ecosystem processes like nutrient cycling might be disrupted, or habitat for any species might be rendered not functional. Substantive impacts occur during key time periods. Impacts would be long term to permanent. A major effect would equate with an “adverse affect with/without a jeopardy opinion” under section 7 of the Endangered Species Act regulations.

Nature of the Impact

Adverse impacts result from those actions that increase possibility for take under ESA (harm, harass, etc.) for listed species, result in habitat loss, mortality, displacement of individuals due to human- caused disturbance (like construction noise), or habitat fragmentation.

Beneficial impacts result in a decrease in take or result in habitat improvement.

Duration

Short- term impacts generally occur within a year or less following implementation.

Long- term impacts result more than a year following implementation.

Alternative A, No Action

Direct/Indirect Impacts The No Action Alternative would maintain the project area in its current state and continue to provide only marginal habitat for wildlife species. Habitat quality in the immediate area would remain relatively low due to the existing level of development and human activity. Without a change in vegetation or human use in the project area, special status populations would generally remain the same. Selection of the No Action Alternative would not affect special status species in the project vicinity, or their habitat, beyond the ongoing impacts of habitat degradation from visitation and human activity that have occurred in the area for many years. Impacts specific to each species appear below.

Mexican Spotted Owl Ongoing activities in the Bright Angel Trailhead Area create daily disturbances during all times of year. Summer is the peak visitor use period and the project area receives the highest levels of human use during this time. This season also corresponds with MSO breeding season. Human disturbance has decreased MSO habitat quality in and around the project area, and this would continue under the No Action Alternative. The existing Bright Angel MSO PAC occupies nesting and roosting habitat nearby below the rim, but is greater than 0.25 miles from the project area (Ward and Dickensen 2006). It is difficult to determine the extent of current traffic or hiker impacts to MSO in this high- use area since information is not available concerning MSO occupation prior to original trail construction or development of this portion of the South Rim. It should be noted, however, that despite its proximity to this high-use rim area and to the Indian Garden developed area along the Bright Angel Trail, the PAC has consistently produced young. In 2007, three young were produced (Ward and Goates 2007).

No vegetation removal would occur under Alternative A, and no new sources of habitat disturbance would be introduced. Surveys of suitable nesting habitat below the canyon rim near the project area have been conducted for several years and no new MSO have been located, other than the confirmed Bright Angel PAC. Therefore, adverse impacts to MSO from Alternative A implementation would be negligible. PAC monitoring would continue through the construction period.

California Condor Existing South Rim developments create year- round human presence in the vicinity. Human presence creates possibilities for condor/human interactions. The project area is consistently used for roosting by condors, and the Kolb Studio area is the location for interpretive programs due to frequency of condor sightings. Condors are monitored daily via radio telemetry. As needed, condors that land in the project area are hazed by permitted park employees to ensure condors do not become habituated to humans. Current park policies and activities would be continued under Alternative A, and adverse impacts to condors would be negligible, long- term, and local. No vegetation manipulation is proposed under Alternative A and there would be no disturbance to any potential condor nesting, roosting, or foraging areas as a result of this alternative. There are no active or previously used condor nests within 0.5 miles of the project area (Ward and Dickenson 2006 and Ward and Goates 2007). Therefore, the No Action Alternative would have no additional effects on California condors.

Deer Goldenbush Deer goldenbush has been observed at several locations along the South Rim but surveys are not complete and how past park activities have impacted populations are not known. It is likely that the construction of overlooks, walkways and visitor facilities (like Kolb Studio and the Bright Angel lodge and cabins) negatively affected the occurrence of this species in the project area, as well as along other areas of the South Rim. It is also likely that previously occupied habitat once existed at other areas with similar limestone substrates. This impact from past activities has been adverse and minor. However, implementing Alternative A would not result in any additional impacts to this species; no habitat disturbance is planned for areas currently occupied within the project area. For these reasons, Alternative A would result in adverse, minor, long- term impacts to deer goldenbush.

Cumulative Impacts Habitat modification has occurred as a result of past activities within Grand Canyon Village and South Rim developed area. While this area at one time may have provided MSO habitat it is unlikely that it would have been used for nesting or roosting due to the lack of mixed conifer forest and the diversity of substrates and microclimates that are present below the canyon rim. Few of the recently implemented or in- progress projects (Appendix E) in the Village Area would result in vegetation disturbance or broad changes in habitat quality. Any disturbance to vegetation and wildlife habitat through planned projects and associated tree removal would occur in the South Rim developed area where development already exists and visitation levels are high during peak visitor season. It is projected, however, that South Rim visitation levels may continue to grow. Human- activity levels in South Rim developed areas have likely caused changes in area use by condors and owls in the past, and it is possible that additional changes could occur in use patterns below the rim as human activities increase. However, human activity would continue to be concentrated in existing developed zones, and future planned projects would continue to consider effects of proposed actions on sensitive species, both directly and indirectly. Now that deer goldenbush has been discovered and named, current and future projects would consider its occurrence within the areas of potential affect and measures would be included in current and future project proposals to minimize the potential for impacts. Therefore, cumulative impacts from Alternative A implementation would result in negligible adverse impacts to MSO and condor and minor adverse impacts to deer goldenbush.

Conclusion Alternative A would result in short- and long- term, negligible, adverse, direct, and indirect impacts to special status species, and negligible adverse cumulative impacts. No impairment of or unacceptable impacts to special status species would result.

Alternative B, Preferred

Direct/Indirect – Phase 1 and Phase 2 Because no suitable MSO nesting, roosting, or foraging habitat exists in the project area, no direct impacts to habitat quality are expected as a result of implementing any project actions for Alternative B. Any potential impacts are limited to noise disturbance of the occupied PAC below the rim. As fully analyzed in the Biological Assessment for this project (NPS 2007, in prep), noise disturbance from construction activities is expected to be minimal since the project area is greater than 0.25 miles from both the confirmed core-area boundary and the known nest and roost sites for this MSO pair. Because the project area is within the “developed urban zone” as defined in the Batch Consultation (NPS 2002a) and the existing ambient noise levels are generally higher here than in other park areas, additional construction noise would not typically be detectable above the existing ambient noise level. If any rock excavation or blasting is deemed necessary for this project, these activities would be restricted to the non- breeding season for MSO (September 1 through February 28), as identified in the mitigation measures section of this document. For these reasons, implementation of Alternative B would result in short- term, negligible to minor direct and indirect, adverse impacts to MSO, minimized through implementation of mitigation measures.

Likewise, suitable condor nesting habitat does not exist in the project area, and roosting and foraging habitat would remain in its current condition with Alternative B implementation. While additional development would occur in the area, it would not affect the frequented condor

roosting areas associated with Kolb Studio or Rim Trail areas. Therefore impacts are associated with short- term disturbance during construction activities. It is possible that, due to frequency of condor use in the project area vicinity, condors may be attracted to the increased human activity during construction. The need for condor hazing may increase during project implementation, as is described in the mitigation measures at the end of Chapter 2. No known or previously- used condor nest sites have been located within one mile of the project area and therefore noise disturbance during the breeding season is limited. However, any new condor location information would need to be verified prior to construction to determine proximity to the project area. For these reasons, Alternative B implementation would result in short- term, negligible to minor direct and indirect, adverse impacts to condors, minimized through implementation of mitigation measures.

Deer goldenbush has been observed within the project area, along the rim edge. A thorough survey of the project area would occur prior to implementation to mark individual plants for avoidance. Due to its preference for limestone outcrops nearest the canyon rim, project actions are not likely to impact plants since most actions are proposed for areas of existing developments and bare ground and one of the objectives of the project is retain as much existing vegetation as is possible. For these reasons, Alternative B implementation would result in short- term, negligible to minor, direct and indirect adverse impacts to deer goldenbush, minimized through implementation of mitigation measures.

Cumulative Impact Because there would be no modification of nesting, roosting, or foraging habitat as a result of this project and deer goldenbush plants would be avoided during construction activities, implementing Alternative B combined with past, present, and reasonably foreseeable future projects, cumulative impacts to MSO, condor and deer goldenbush would be the same as described for Alternative A. Any short- term noise disturbance from this project, combined with others, is minimized by standard mitigation measures for noise disturbance (for example, limiting noise during the breeding season) and sensitive plant avoidance, as carefully evaluated for any project planned currently or in the reasonably foreseeable future.

Conclusion Alternative B would result in short- term, negligible to minor, adverse, direct and indirect impacts to special status species, and negligible adverse cumulative impacts. No impairment of or unacceptable impacts to special status species would result.

Alternative C, Maximized Parking

Direct/Indirect Impacts Alternative C is essentially the same as Alternative B except that the parking area under future phases would be larger resulting in somewhat more construction activity and could result in a longer construction season, slightly increasing the resulting noise level and the area of potential effect. However, the difference between Alternative C and B would be negligible and is not expected to result in any measurable difference to MSO, condor or deer goldenbush other than what has been previously described for Alternative B. Therefore, implementation of Alternative C would result in short- term, negligible to minor, direct and indirect, adverse impacts to MSO, condor and deer goldenbush, minimized through mitigation measures.

Cumulative Impacts Because there would be no modification of habitat as a result of this project, cumulative impacts of implementing Alternative C combined with past, present, and reasonably foreseeable future projects to MSO, condor and deer goldenbush would be the same as those described for Alternative A. Any short- term noise disturbance from this project, combined with others, is minimized by standard mitigation measures for this noise disturbance (for example, limiting noise during the breeding season), as carefully evaluated for any project planned currently or in the reasonably foreseeable future.

Conclusion Alternative C would result in short- term, negligible to minor, adverse, direct and indirect impacts to special status species, and negligible adverse cumulative impacts. No impairment of or unacceptable impacts to special status species would result.

VEGETATION

Affected Environment

The primary biotic community represented in the project area is Great Basin Conifer Woodland which is typically characterized by the unequal dominance of two conifers: juniper (*Juniperus*) and pinyon (*Pinus*). This community is the most common on South Rim, transitioning into areas of ponderosa pine of the Sierran Montane Conifer Forest at higher elevations and into the Great Basin Desert Scrubland at lower elevations below the canyon rim. Great Basin conifer woodland is the most extensive vegetation type in the Southwest. Habitats tend to be rocky, with predominately thin soils (Brown 1994). In the project area, dominant tree species include pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) with a relatively sparse understory of woody shrubs and herbaceous species. Warren et al. (1982) characterized the project area as the Juniper- Big Sagebrush- Pinyon Pine series. This series is found on low to rolling limestone outcrops of all aspects with shallow and rocky soils. It is widespread on South Rim.

Due to the fact that the project area is relatively small and most is developed with buildings, trails, and parking areas, the woodland community within the project area is sparse; clusters of trees occur in specific areas (near the mule corral and on the slope down to Village Loop Drive and scattered around the Bright Angel cabin area). Proposed actions have little potential for spread of exotic species due to implementation of mitigation measures. Other aspects of the biotic community (soil impacts for example) have little potential for impact due to the existing disturbed nature of the area. Special status plants are discussed in the previous section. For these reasons, the vegetation analysis presented here focuses on the potential for impact to the mature pinyon and juniper trees that occur throughout the Bright Angel cabin area from proposed changes to the parking area under the action alternatives.

Based on walk- throughs of the project area by NPS vegetation specialists, there are approximately 50 pinyon and juniper trees within the cabin area that are likely hundreds of years old and have withstood the impacts of the surrounding development for a very long time. These species are intolerant of root covering and root disturbance. Their short stature is an indication of the shallow soil rather than their age (Busco, pers. comm. 2007).

Environmental Consequences

Methodology

Baseline information used to assess impacts to vegetation is described in the methodology section at the beginning of this chapter and includes park staff knowledge of the resources and site; review of existing literature and park studies; information provided by specialists within the National Park Service and other agencies and professional judgment. Detailed information on natural and cultural resources in Grand Canyon National Park summarized in the 1995 GMP and EIS was specifically referenced for information on affected resources in the project area. Additional information sources on vegetation used for this evaluation are as described above in the affected environment section.

Those aspects of the vegetation resource that would be affected by proposed activities include the following:

- ❑ Changes in habitat quality for mature pinyon and juniper trees in the parking area
- ❑ Loss of individual pinyon and juniper trees in the parking area

The thresholds of change for the intensity of an impact on vegetation are defined as follows:

Negligible a change to a biotic community that is not measurable or perceptible.

Minor a measurable or perceptible, small, localized change to a biotic community. The change is of little consequence.

Moderate a change to a biotic community that is measurable and of consequence but is localized.

Major a measurable change to a biotic community. The change is large and/or widespread and could have permanent consequences for the species or resource.

Nature of the Impact Adverse impacts would result from removal of trees and disturbance of habitat surrounding the trees. Beneficial impacts would result from revegetation of social trailing and denuded areas with native species and protection of existing trees and their root systems from vehicle parking and trampling.

Duration Short- term impacts would occur less than or equal to two- to- three years following implementation. Long- term impacts would typically occur greater than five years following implementation.

Alternative A, No Action

Direct/Indirect Impacts: Under the No- Action Alternative, existing facilities would remain in place, in their current condition. The informal parking area surrounding the cabins would remain and would continue to impact the existing mature trees and their root systems with trampling and vehicle parking. The existing level of social trailing would continue to minimize the potential for new tree growth in the area. Visitors (cabin guests and others) would continue

to be able to utilize the shade provided by many of these trees. Alternative A would result in negligible, long- term adverse impacts to visitor experience in the Bright Angel Trailhead Area.

Cumulative Impacts: Vegetation patterns within the project area have changed little since the early 1900's (Milner and Associates 2005). The approximately 50 mature trees within the cabin area can also be seen on aerial photos of the project area in the late 1970's (Figure 9). While it is likely some trees were removed during the construction of Bright Angel lodge and cabins, little change has occurred since then. Implementation of other planned projects (Appendix E) would not result in changes in this area since none of them occur in the vicinity of the cabins. Therefore, taking no action at this time, combined with past and future actions would not result in measurable changes to the mature trees in the cabin area. It is expected that some individual trees may be lost over time in this area due to other factors (drought, insects, age) and that some trees that are currently experience stress due to vehicle damage, trampling or reduced water infiltration due to soil compaction, may die over time.

Conclusion: Implementation of Alternative A would result in negligible, long- term adverse impacts to mature trees in the Bright Angel Trailhead cabin area. Cumulative impacts would be minor and adverse. No impairment of or unacceptable impacts to vegetation would result.

Alternative B, Preferred

Direct/Indirect Impacts: Phase 1 of the preferred alternative would not result in substantial changes to the existing informal parking area. Some existing trees would benefit from the reduction in the size of the parking area and the delineation of the outer limits; trees outside the limits would be protected from vehicle damage and trampling. Those within the parking area would continue to sustain impacts from these uses as they do currently. If Phase 2 is implemented and the parking area surface is hardened with an all- weather surface, the existing trees would be affected. While some trees would benefit from the islands created around the cabins, several trees (3- 5) may need to be removed to accommodate the new circulation pattern and hardened surface. Those that remain on site within the parking area have the potential to be impacted due to paving. Paving this area would change the environment through decreased water infiltration, increased heat from the new surface, and root disturbance or smothering. Even with protective measures such as creation of adequately- sized non- paved islands within the parking area to protect root systems, it is anticipated that some trees would be indirectly affected over time by these changes in the microclimate and that mortality may occur over the long- term. For these reasons, Alternative B is expected to result in long- term, minor to moderate adverse impacts to the mature trees surrounding the cabins.

Cumulative Impacts: Since past actions since the 1900's have not resulted in noticeable changes to the trees surrounding the cabins and future actions are not proposed for this area, cumulative impacts are not expected. Impacts are limited to direct and indirect impacts as a result of this project, as described above.

Conclusion: Implementation of Alternative B would result in minor to moderate, long- term adverse impacts to mature trees in the Bright Angel Trailhead cabin area. Cumulative impacts would not occur. No impairment of or unacceptable impacts to vegetation would result.

Alternative C, Maximized Parking

Direct/Indirect Impacts: The primary difference between Alternative B and C is in the size and configuration of the parking area under Phase 2. Alternative C would result in a larger parking area with fewer vegetated islands and less open space surrounding the cabins. Direct loss due to tree removal during construction would be greater than that expected under Alternative B. To accommodate the maximum number of parking spaces, more trees (estimated at up to 10 trees) would be removed. The indirect effects from the paving are similar to those described for Alternative B, but may be somewhat more extensive due to the larger surface area paved. For these reasons, Alternative B is expected to result in long- term, moderate adverse impacts to the mature trees surrounding the cabins.

Cumulative Impacts: Since past actions since the 1900's have not resulted in noticeable changes to the trees surrounding the cabins and future actions are not proposed for this area, cumulative impacts are not expected. Impacts are limited to direct and indirect impacts as a result of this project, as described above.

Conclusion: Implementation of Alternative C would result in moderate, long- term adverse impacts to mature trees in the Bright Angel Trailhead cabin area. Cumulative impacts would not occur. No impairment of or unacceptable impacts to vegetation would result.

VISITOR EXPERIENCE

Affected Environment

The Bright Angel Trail is one of the most famous trails in the national park system and a prime destination by many Grand Canyon visitors. It is one of three designated national recreation trails in Grand Canyon National Park and part of the national trails system. Because of the trail's historic importance, a trip down it is the highlight of a Grand Canyon experience for thousands of visitors each year. According to a 2006 visitor study, the Bright Angel Trail, out of all Grand Canyon trails, attracts the most day hikers; the number of hikers per day averages between 464 and 787 from May through October² (Backlund, Stewart, Schwartz, McDonald 2006).

The Bright Angel Trailhead is a transition zone between the more developed frontcountry and more remote backcountry, and between Hermit Road, Bright Angel Lodge Cabins, and the South Rim promenade of shops; the area accommodates a diverse mix of visitors. These include Bright Angel Trail day hikers and backpackers, Rim Trail hikers, mule riders, Bright Angel Lodge guests, rim shoppers, and both Village Loop and Hermit Road shuttle bus riders moving through the area. For backcountry visitors, the Bright Angel Trailhead is more than just a place to start or end hiking activity, it is the area where visitors get oriented and make last minute preparations for their trip. Visitors exiting the trail at the Trailhead use the area to wait for stragglers in their group take off gear and share trip stories (Chang & Stewart 2006).

² Fridays and Saturdays had the highest volume of day hikers on the Bright Angel Trail, while Wednesdays were least busy; a steady flow of visitors hiked uphill across the hours of the day, with daily peaks of uphill hikers between noon and 3:00 p.m.

Visitor access to the Bright Angel Trailhead Area is primarily from the west via the shuttle bus stops (service provided by the park through Paul Revere Transportation via the Village or Hermits Rest Routes); the east via the Rim Trail from Bright Angel Lodge, Kolb Studio, and private vehicle parking; and the north via hikers coming up the Bright Angel Trail.

Shuttle bus ridership for the Village and Hermits Rest Routes has greatly increased since 1974 when Hermit Road shuttles first began. The Hermits Rest shuttle bus stop represents the highest level of passenger activity among all stop locations, with the Village Route/Hermits Rest Transfer exhibiting the next highest level of activity³. Many visitors that disembark at one of these stops go, to the Bright Angel Trailhead area. In visitor studies conducted in July 2006 the highest volume of daily ridership at the Hermits Rest Route was 14,854 boardings, and the highest day for the Village Route was 12,358 boardings. Due to the high ridership volume for the Hermits Rest Route, visitors waiting to board the bus are often left behind, waiting for the next bus; in one count on July 22, 2006, 750 people waited in line to board the Hermits Rest shuttle bus (J. Upchurch, pers. comm., 2006). These data indicate that there is an extremely high volume of visitors frequenting the project area on a typical summer day. To attempt to quantify this and determine how visitors using the shuttle buses and coming from other areas of South Rim use the project area, visitor- use patterns and behavior were elicited in the project area during a study conducted during March 16- 29, 2006 over spring break for universities and public schools, a typically high- use period for South Rim. The objectives of this study were to 1) document visitor movement and travel patterns in the Bright Angel Trailhead Area 2) provide counts of number and type of users of the Bright Angel Trailhead during the sampling period and 3) identify visitor perceptions regarding way- finding⁴ around the Bright Angel Trailhead Area. The study focused on documenting behavior and reporting visitors' reasons for their Trailhead Area travel patterns. Results provide insight into travel patterns and visitor movement around the Bright Angel Trailhead Area during this period, and address issues of visitor behavior and wayfinding perceptions regarding their movement through the environment.

Key findings from this visitor- use study include (Chang & Stewart 2006)

Visitor Counts Of the multiple project- area entry points, the shuttle bus stop location was the one used most by visitors during any given day. Nearly 40% of visitors at any given time block entered from the shuttle bus stop location, and more than 50% of visitors came from this entry point between 5:00 p.m. and 6:00 p.m. on both weekdays and weekends, and from 12:00 p.m. to 1:00 p.m. during weekdays. A significantly higher number of visitors traveled through the project area after noon than before noon with the peak hour of visitors during weekdays between 2:00 p.m. and 3:00 p.m. Weekend use started earlier than weekdays (before noon) with the peak weekend hour being 3:00 p.m. to 4:00 p.m.

Place- Based Mapping Nearly 80% of those walking in the project area were observed on the Rim Trail with the most heavily- traveled location at the north side of the mule corral (between the Trailhead and the information kiosk), due to visitors traveling through from the shuttle bus stops and visitors coming up from the Bright Angel Trail. The north side of the mule corral was also noted as the area with the highest concentration of stopping

³ Since 1998, annual ridership on the Hermits Rest Route has consistently remained above two million (NPS 2005)

⁴ The ability to find one's way to and/or navigate through an environment.

behavior, since visitors read trail information, watch the mules and their riders, check on trail conditions, view the canyon, or wait for group members in this area. This site was also the most popular for picture-taking; second to the trail entrance where visitors could see the trail and the trail sign. Visitors used the few available benches, flat rocks, and logs in the area after their hike to rest and/or wait for stragglers after their hike. More than 80% of all behavior types occurred along the Rim Trail, and 87% of behaviors at the site were walking or stopping.

Person- Based Mapping and Interviews A total of 90 people were observed and 70 of these participated in exit interviews. Of those interviewed, over 70% said their destinations were either the shuttle bus stop or the Bright Angel Lodge. Most interviewees reported that the Rim Trail was their major pathway through the site, on which almost every interviewee walked between the shuttle bus stop entry point and toilets. The primary traffic pattern through the project area was the Rim Trail and a secondary traffic pattern was short-cutting to destinations; visitors using alternative ways to quickly get to their destinations. Rim hikers stopped more frequently than bypass hikers to read information or signs, prepare for their hike or rest afterwards, look at canyon views, watch mules, or wait for group members. Almost half the interviewees reported wayfinding problems (i.e., lack of signs in the area or confusion about location of various destination sites, including the trail entrance near Kolb Studio, and toilets). Some interviewees mentioned the Rim Trail's crowded conditions and narrow width and its effect on their experience; some had negative experiences regarding accessibility; and most indicated the study site should have more directional signs.

When asked if they had any negative experiences while in the project area, interviewees responded with restroom quality, the presence of a parking lot in the area and the lack of signage for it, limited places to sit, and limited historic information about the area.

Environmental Consequences

Methodology

Baseline information used to assess impacts to visitor experience is described in the methodology section at the beginning of this chapter and includes staff knowledge of the resources and site; review of existing literature and park studies; information provided by NPS and other agency specialists, and professional judgment. Detailed information on park natural and cultural resources summarized in the 1995 GMP EIS was specifically referenced for information on project area affected resources. Additional visitor experience information sources used for this evaluation are as described above in the affected environment section.

Proposed activities have potential to impact visitor experience through

- Visitors' ability to experience the Trailhead Area's resources and its natural and cultural resource settings (vistas, natural sounds and smells, wildlife viewing, photo opportunities, interpretation and historic signing, seating arrangements, and staging areas)
- Access and quality of movement through the project area (wayfinding ability, signing, level of freedom, spontaneity, level of universal access, appropriate width of paths and walkways)

- Access to high quality recreation opportunities (tranquil/contemplative environments, social interactions with family/friends, Rim Trail hiking, photo opportunities, seating arrangements, historic and interpretive information, and staging and orientation areas)
- Potential for vehicle/pedestrian collisions (pedestrian pathway systems, parking area configuration and separation from other areas, wayfinding ability, signing)

Thresholds of change for the intensity of an impact on visitor experience are defined as

Negligible Visitors are likely unaware of any effects associated with alternative implementation.

Minor Change in visitor use and/or experience slight but detectable, affects few visitors, and would not appreciably limit or enhance experiences identified as fundamental to the park's purpose and significance.

Moderate Some characteristics of visitor use and/or experience would change, and many visitors would likely be aware of effects associated with alternative implementation; some changes to experiences identified as fundamental to the park's purpose and significance apparent.

Major Multiple characteristics of visitor experience would change, including experiences identified as fundamental to park purpose or significance; most visitors aware of effects associated with alternative implementation.

Duration

Short-term during construction period

Long-term after construction is complete.

Alternative A, No Action

Direct/Indirect Impacts Under the No- Action Alternative, existing facilities remain in place, in their current condition. No substantial changes occur to the Bright Angel Trailhead Area. No improvements made to wayfinding signage: chemical toilets remain in place, are inaccessible, and do not meet the needs of all visitors; trails need repair, accessible trails are not provided, and confusion continues in the parking area where pedestrian and vehicle use combine. Visitors continue to enjoy panoramic canyon views, but adequate seating, shade, restrooms, and picnicking opportunities not be provided. Visitors have difficulty finding their way through the area due to a lack of signage. Congestion continues to be a problem for multiple users passing through the area on the Rim Trail near the mule corral.

Continuation of existing conditions under Alternative A would not change the long-term ability for visitors to experience the Bright Angel Trailhead Area's resources; would not change visitor access and movement through the area, or access to high-quality recreation opportunities; and would not change the existing potential for vehicle/pedestrian collisions. Alternative A would

result in negligible, long- term adverse impacts to visitor experience in the Bright Angel Trailhead Area.

Cumulative Impacts Many of the recently implemented and in- progress projects (Appendix E) improve visitor experience on South Rim, such as improved restroom facilities at Hermits Rest and Hopi Point, and South Rim viewpoint rehabilitation. The completion of Market Plaza shuttle bus stop, improved visitor facilities along shuttle bus routes and completion of other greenway trail segments (like greenway III) improve experiences park- wide for pedestrians and bicyclists. Future actions such as the South Rim Transportation Plan, Hermit Road Rehabilitation and Greenway V Trail construction would all benefit visitor experience on the South Rim by providing more varied experiences for all user groups (pedestrians, bicyclists, shuttle bus and tour bus riders). Implementation of these planned projects without taking action at this time to improve visitors experience in the Bright Angel Trailhead Area would still result in an overall beneficial impact to visitors on South Rim due to improvements from other past and planned projects, even if no improvements were made in the Bright Angel Trailhead area.

Conclusion Implementation of Alternative A would result in negligible, long- term adverse impacts to visitor experience in the Bright Angel Trailhead Area. Cumulative impacts would be minor and beneficial.

Alternative B, Preferred

Direct/Indirect – Phase I Implementation of Phase I of the preferred alternative would greatly enhance project area visitor facilities and accommodation. Pedestrian circulation would be improved by creation of an accessible path from the shuttle bus stops to the project area, from repairs to the existing rim trail, repair of the Kolb driveway retaining wall and re- opening of this path for use as the Rim Trail connection with the Kolb Studio area, and establishment of obvious secondary trails for circulation between the parking area and plaza, etc. Visitor wayfinding would be improved through enhanced signage throughout the project area. While Phase I only includes minimal signage, even this would be an improvement over the existing condition and would install wayfinding signs in key locations such as at shuttle bus stops, plaza area, and Rim Trail intersections. Enhanced wayfinding would also include differentiating the primary trailhead near the mule corral from the secondary trailhead near Kolb Studio. This would improve visitor’s experience by minimizing confusion.

A sense of place would be established through creation of the Bright Angel Trailhead plaza and its associated shade, restroom, water, and signage (wayfinding, interpretation, preventative search and rescue, etc.). The top of the primary Bright Angel Trailhead would become the primary meeting place for hikers and mule- riders; it would be the place that hikers coming off the trail could wait for others in their hiking party, for hikers going down the trail to prepare for their hike by filling water bottles, checking backpacks, and coordinating with their group; and mule- riders to receive their orientation by mule wranglers before starting their trip. Hikers and other visitors passing through the area could use the area to rest in the shade, fill up water bottles, picnic, and learn about the area.

Separation of the parking area from pedestrian zones through delineation of the parking area's outer boundaries would reduce potential for pedestrian/vehicle collisions and ease visitor movement through the area. Removing vehicle parking from the rim would provide more space for pedestrian circulation, canyon viewing, and seating in this prime location.

Other aspects of Phase 1 such as added revegetation and landscaping, additional seating, burying power lines, and lighting where necessary and appropriate all benefit visitor experience in the area. Therefore, implementation of Alternative B, Phase 1 would substantially improve visitors' long-term ability to experience Bright Angel Trailhead Area resources; would greatly improve visitor access and movement through the area and their access to high-quality recreation opportunities, and would reduce potential for vehicle/pedestrian collisions somewhat.

Direct/Indirect – Phase 2 Implementation of Phase 2 includes additional landscaping and revegetation, additional wayfinding and interpretive signage, as needed, creation of accessible access into Kolb Studio, development of an interpretive node at Kolb Garage and establishment of a 79- stall hardened- surface parking area. All of these actions would continue to benefit visitors using the project area; adding these actions to those from Phase 1 would build upon the improvements achieved in the first phase.

Providing access into Kolb Studio that is free from barriers (stairs) improves the experience for visitors with accessibility needs and goes further than Phase 1 in addressing this need. Creation of an interpretive area using the historic Kolb Garage provides visitors opportunity to learn about the Bright Angel Trailhead Area and its history, depending on interpretive themes chosen in this facility. Use of the building and the gathering area in front of the Garage for interpretive information and talks would take advantage of this prime canyon-viewing location and provide visitors opportunities for continued learning and observation.

Instituting a one-way circulation pattern with designated spaces would ease traffic movement through the area, facilitate visitor's finding a parking space, and provide easy-to-recognize parking zones differentiated from pedestrian zones. A pedestrian path would be created through the center of the cabins so that bypass hikers would have direct access to Bright Angel Lodge from the plaza and could avoid using the Rim Trail, if desired. Hardening the parking-area surface would enhance use during all seasons (less mud during wet periods and easier snow removal in winter.) However, designation of individual parking spaces has potential for indirect negative impacts to visitors wanting to park in this area. The area currently supports an estimated 100- 120 parking spots located randomly and haphazardly in the amorphous dirt lot. Alternative B, Phase 2 would reduce the number of currently available spaces. In addition, with enhanced wayfinding signage it is also possible that more visitors will become aware of this parking area (it currently lacks identification signs or directional signs from Village Loop Drive) so the demand for parking may exceed available spaces. This could have an adverse impact on visitors during peak season. It is also possible that visitors staying in the Bright Angel Cabins or at the Lodge would not be able to find a parking space near their accommodations.

Adverse, minor to moderate impacts to visitors would occur when construction is taking place through the presence of onsite construction equipment, fencing, and other signs of activity and disturbance in the area. These impacts would be short- term, lasting only the duration of construction, but due to the volume of visitors likely affected, would be minor to moderate, minimized through the implementation of mitigation measures (Chapter 2).

Therefore, implementation of Alternative B, Phase 1 and Phase 2 would substantially improve the long- term ability for visitors to experience the Bright Angel Trailhead Area's resources, would greatly improve visitor access and movement through the area and access to high- quality recreation opportunities, and reduce potential for vehicle/pedestrian collisions. Full implementation of all phases of the preferred alternative would result in long- term beneficial impacts to visitor experience. Because the project area is used by so many visitors of all types (lodge guests, shuttle bus riders, overnight and day hikers, Rim Trail users, etc.) beneficial impacts would be moderate, direct and indirect, and both short- and long- term. It is possible that some adverse impacts may result due to the reduction in parking capacity but this impact would be outweighed by other positive improvements for visitors throughout the project area. Short- term impacts during the construction period would be minor to moderate and adverse.

Cumulative Impacts Many of the recently implemented and in- progress projects (Appendix E) improve visitor experience on the South Rim, such as improved restroom facilities at Hermits Rest and Hopi Point, and South Rim viewpoint rehabilitation. Completion of Market Plaza shuttle bus stop, improved visitor facilities along shuttle bus routes, and completion of other greenway trail segments (like greenway III) improve experiences parkwide for pedestrians and bicyclists. Future actions such as the South Rim Transportation Plan, Hermit Road Rehabilitation and Greenway V Trail construction all benefit visitor experience on the South Rim by providing more varied experiences for all user groups (pedestrians, bicyclists, shuttle bus and tour bus riders). Implementation of these planned projects with implementation of the preferred alternative, designed to improve visitor experience in the Bright Angel Trailhead Area would result in long- term cumulative beneficial impacts to visitors that would be moderate and long- term. Many of these past and planned projects have a primary goal of improving visitor experience on South Rim through enhanced trails systems, transportation systems, and visitor facilities.

Conclusion Implementation of Alternative B would result in moderate, long- term beneficial impacts to visitor experience in the Bright Angel Trailhead Area. Cumulative impacts would be moderate and beneficial. Short- term adverse impacts during the construction period would be minor to moderate, minimized through implementation of mitigation measures.

Alternative C, Maximized Parking

Direct/Indirect -Alternative C implementation results in the same visitor benefits described for Alternative B, Phase 1 and most actions identified as part of Alternative B, Phase 2. The only difference is in size and layout of the parking area under a future phase. The 104- stall, hardened- surface parking area included as part of Alternative C, Phase 2 would maximize the number of parking spaces while still reducing outer boundaries, pulling vehicles away from the rim, and creating a pedestrian path/service- vehicle access between cabins. Compared to the

preferred alternative, this parking area more closely resembles the existing lot capacity. For this reason, it is expected to more easily meet parking demand, considering lodge guests, cabin guests, backcountry hikers, day hikers, and other project area users.

Implementation of Alternative C would, like Alternative B, substantially improve the long- term ability for visitors to experience the Bright Angel Trailhead Area's resources, would greatly improve visitor access and movement through the area and access to high quality recreation opportunities, and would reduce potential for vehicle/pedestrian collisions. Picnicking opportunities would be somewhat reduced under Alternative C than Alternative B. However, Alternative C may result in slightly less reduction in potential for pedestrian/vehicle collisions due to the larger and more complex parking configuration. Pedestrians wanting to cross the parking area to get to the pedestrian path between cabins would need to cross three parking bays. Alternative C would also result in short- term adverse impacts to visitors during the construction period that would be minor to moderate.

Full implementation of all phases of Alternative C would result in beneficial impacts to visitor experience. Because the project area is used by so many visitors of all types (lodge guests, shuttle bus riders, overnight and day hikers, Rim Trail users, etc.) beneficial impacts would be, like Alternative B, moderate, direct and indirect, and both short- and long- term. Some adverse impacts may result due to a slight increase in pedestrian/vehicle collisions over Alternative B, and some beneficial impacts may result due to a higher parking capacity. These slight differences between alternatives would not result in a change in beneficial impact intensity.

Cumulative Impacts Due to similarities between Alternative B and Alternative C and that a somewhat larger parking area in the Bright Angel Trailhead area would not be measurable when combined with other past, present and reasonably foreseeable future actions, cumulative impacts for Alternative C would be the same as Alternative B; beneficial cumulative impacts to visitors would be moderate and long- term.

Conclusion Implementation of Alternative C would result in moderate, long- term beneficial impacts to visitor experience in the Bright Angel Trailhead Area. Cumulative impacts would be moderate and beneficial. Short- term adverse impacts during the construction period would be minor to moderate, minimized through implementation of mitigation measures.

PARK OPERATIONS

Affected Environment

Park operations refer to adequacy of staffing levels and quality and effectiveness of park infrastructure in protecting and preserving vital resources and providing effective visitor experience. Infrastructure includes roads providing access to and in the park (both administrative and visitor use), housing for staff required to work and live in the park, visitor-orientation facilities (visitor centers, developed and interpreted sites and other interpretive features), administrative buildings (staff office and workspace), management- support facilities (garages, shops, storage buildings, and yards used to house and store maintenance equipment, tools, and materials) and utilities such as phones, sewer, water, and electric. For this project,

infrastructure with potential to be affected includes existing roadways between cabins, the parking area surrounding the cabins, existing trails, temporary toilets, trash and recycling bins, benches, existing utility lines and the sewer system, and Kolb Garage. Other project- area structures such as Bright Angel Lodge and Cabins, mule corral, shuttle bus stops, and Kolb Studio would not be altered in any way by this project.

Grand Canyon National Park's Superintendent is ultimately responsible for park operations management. In 2005, the park employed 425 full- time staff (NPS 2006c) to manage operations including visitor services and facilities, resource management and preservation, planning and environmental compliance, emergency medical services, law enforcement, search and rescue operations, fire center operations, air operations, facilities management and maintenance, and administrative duties. Divisions on South Rim with responsibility over the project area and visitor and employee area use are the Facilities Management Division (road, trail, and restroom maintenance), Visitor and Resource Protection (visitor safety), Visitor Education and Interpretation (wayfinding and interpretive programs), Division of Science and Resource Management (resource protection), and Concessions Management (administration of contracts with concessionaires and transportation partners).

Xanterra Parks and Resorts is the current hospitality concessionaire under park contract to operate the Bright Angel Lodge and Cabins as well as Bright Angel Trail mule rides. Most of the project area, from Village Loop Drive to the upper Rim Trail (above Kolb Garage and Kolb Studio) and from the Village Loop Shuttle Bus Stop to the end of the Bright Angel Lodge, is within the land assignment of Xanterra Parks and Resorts. In this area, Xanterra and NPS share maintenance responsibilities. NPS maintains the asphalt Rim Trail (including snow removal), stone walls, chemical toilets, signing, and litter and recycling receptacles. Xanterra maintains flagstone walkways, Bright Angel Lodge, Rim cabins and Bright Angel Cabins and their associated landscaping. Xanterra also maintains the mule corral and mule trail from the mule barn and is responsible for waste removal. The informal cabin parking area and drive lanes are not routinely maintained and snow is typically not removed in this area (Allen, pers. com. 2006).

Xanterra and the NPS share joint responsibility for Bright Angel Trail maintenance. The project area is occasionally used for both Xanterra and NPS trail crew staging of equipment, materials, and supplies for trail work, and to a lesser extent, periodic maintenance of existing area Rim Trails.

Paul Revere Transportation is under park contract to operate the shuttle bus system. Two shuttle bus stops exist in the project area; Village Route Transfer on Village Loop Drive and Hermits Rest Transfer at the intersection of Village Loop Drive and Hermit Road. Buses run daily, approximately every 15- 30 minutes. None of the alternatives propose any changes to shuttle bus stops or shuttle operation.

Grand Canyon Association is a park partner and the current Kolb Studio operator. The Association uses Kolb Garage as storage for Kolb Studio. Association responsibilities include general upkeep and maintenance of Kolb Studio interior while NPS is responsible for exterior

repairs and upkeep including area walkways, walls, and railings. None of the alternatives propose any substantial changes to Kolb Studio that would alter existing maintenance needs.

Environmental Consequences

Methodology

Baseline information used to assess impacts to park operations is described in the methodology section at the chapter beginning and includes park staff knowledge of the resources and site, review of existing literature and park studies, information provided by NPS and other agency specialists, and professional judgment. Detailed information on park resources summarized in the 1995 GMP EIS was specifically referenced for information on affected resources in the project area. Additional park operations information sources used for this evaluation are as described above in the affected environment section.

Proposed activities have potential to impact park operations through

- Long- term maintenance and operational efficiency of any new facilities
- Ability to accommodate potential future changes in parking area if deemed necessary in the future as part of implementation of the 1995 GMP and/or the in-progress South Rim Transportation Plan.

Thresholds of change for the intensity of an impact on park operations are

Negligible Management and operations would not be affected or the effect would not be apparent to park staff or the public.

Minor Adverse: Impacts would be measurable but would not have an appreciable effect on or consequences for park management or operations.

Beneficial: impacts would result in short- term improvements in park management or operations.

Moderate Adverse: Impacts would be readily apparent and would result in a measurable change in park management or operations in a manner noticeable to staff and the public.

Beneficial: Impacts would result in short- to long- term improvement in park management and operations.

Major Adverse: Impacts would be readily apparent and would result in substantial change in park management or operations in a manner noticeable to staff and the public.

Beneficial: Impacts would result in long- term improvement in park management and operations.

Duration

Short- term during construction period

Long- term after construction complete

Alternative A, No Action

Direct/Indirect Impacts

Maintenance needs and operational efficiency Alternative A maintains existing conditions in the project area. Existing chemical toilets would continue to require almost daily emptying and daily maintenance during peak season using a large pumper truck and frequent maintenance during other times of year. Chemical toilets are not designed for long- term use for high numbers of people, as they are being used now, and would require replacement in the next one to two years at a cost of approximately \$5,000 each. These would require replacement again every 10- 15 years. Failing to maintain deteriorated trails, walkways, and stone walls would result in increased long- term maintenance needs over time. Not stabilizing the failed wall above the Bright Angel Trail would result in continued closure to NPS small- vehicle access to Kolb Garage. Failing to restrict parking- area limits from rim edges would result in continued deterioration of some walkways and existing vegetation. Failing to establish landscaped zones free from vehicle parking around Bright Angel Cabins would result in continued deterioration of building exteriors and lack of protection of these historic structures.

The concrete steps into the main level of Kolb Studio would remain and would not be universally accessible. There would be no universally accessible access route from the shuttle bus stops on the project area's west end to the trailhead. The use of Kolb Garage as Studio storage would remain in its current condition.

Flexibility to Accommodate Future Parking Lot Changes Maintaining the parking area's current informal nature, not defining outer boundaries, and not delineating individual spaces would provide flexibility over the long term, if user groups change. As discussed in Chapter 2, the South Rim Transportation Plan is evaluating current and projected parking needs in Grand Canyon Village, and is reviewing GMP EIS recommendations for South Rim parking and transit service. As a result of this effort and projected South Rim visitation levels, some changes in Village parking- area use is possible over the next 5 to 15 years. Not investing money in parking area changes now (Alternative A) would provide the most flexibility in incorporating any changes later. These changes would require funding at that future date.

Alternative A therefore would result in continuation of ongoing, long- term maintenance to existing structures and facilities, resulting in no change in maintenance needs or operational efficiency over the existing condition. Long- term impacts to park operations would be negligible to minor.

Cumulative Impacts Combining implementation of past, present, and reasonably foreseeable future actions with Alternative A implementation would result in beneficial impacts to park operations. Benefits of improved park facilities resulting from past and current actions and those planned would likely outweigh long- term adverse impact of keeping the Bright Angel Trailhead Area in its current condition. While the area would continue to need improvement and repairs, this would be overshadowed by other park areas that have been improved and now require less maintenance. These cumulative impacts to park operations would be minor and beneficial.

Conclusion Alternative A would result in negligible to minor, long- term impacts to park operations and cumulative impacts that would be minor and beneficial over the long- term.

Alternative B, Preferred

Direct/Indirect Impacts- Phase 1

Maintenance needs and operational efficiency Implementation of Phase 1 of Alternative B with improved area trails, landscaping and signage. Creation of a plaza area with restroom, water and shade would require long- term maintenance. However, compared to the existing daily maintenance needs of onsite chemical toilets, long- term maintenance needs for the restroom would be somewhat less than now. While flush restrooms will require daily maintenance during peak season, they are easier and more efficient to clean and do not require a larger pumper truck to do so. Maintenance needs for a restroom with no sinks but with a centralized water station outside the building would require less maintenance than one with sinks inside the building, as initially considered. Increased utilities required for this comfort station (sewer lines and water lines) cumulatively add to the existing infrastructure to maintain over time. Addition of a public restroom would reduce current demand on the Bright Angel Lodge restroom, reducing maintenance and daily upkeep currently required by the park concessioner.

Addition of a plaza area, signs, seating, and secondary trails add to long- term maintenance needs, but this would be minimized through selection of sustainable and environmentally appropriate materials designed to be maintenance- free. Fixing deteriorated trails, walkways, and stone walls would result in decreased long- term maintenance needs. Stabilizing the failed wall above the Bright Angel Trail would result in re- opening this area to NPS small- vehicle access to Kolb Garage.

Delineating parking- area outer boundaries but retaining the dirt surface would reduce the parking area's overall footprint (by approximately 25%); this may have an indirect adverse impact to concessionaire employees who currently park in this area. However, it would provide for more separation of vehicles from pedestrian areas and provide for a slight increase in safety by reducing potential for vehicle/pedestrian conflicts. Dust would still be a problem and would continue to create the need for increased maintenance for Bright Angel Cabins.

Flexibility to Accommodate Future Parking Lot Changes Formalizing the parking area would require expenditure of funds now on construction and maintenance, and would be based on anticipated use levels as described in this project's objectives. As discussed in Chapter 2, the South Rim Transportation Plan is evaluating current and projected parking needs in Grand Canyon Village; current information identifies continued use of the Bright Angel Cabin parking area for cabin guests and day users in the foreseeable future. However, the GMP identifies closure of this parking area to all vehicles when mass transit is in place. It is possible that the need for change in parking- area use could be identified in the next 5 to 15 years, based on South Rim visitation levels and transit systems. It is likely the parking area would continue to be identified for some use (lodge guests only, day users only), in which case expenditure of funds for improvements now would negate funding needs for these improvements later. Parking- area size reduction, under Alternative B, would accommodate either of these user group changes. If

the future recommendation was total closure, current fund expenditures on improvements would be lost over the long term, but would still assist with interim needs.

Alternative B, Phase 1 therefore would result in an overall increase in long- term maintenance needs due to the addition of a restroom and incorporation of new structures and facilities (trails, seating, signing, parking area) in this otherwise essentially undeveloped area.

Direct/Indirect – Phase 2

Maintenance needs and operational efficiency Phase 2 implementation includes additional landscaping, revegetation and site amenities, accessible access to Kolb Studio, creation of an interpretive node at Kolb Garage, and parking- area improvements (designation of approximately 79- stalls with hardened surface). Components with potential for impacts to maintenance and operational efficiency are limited to parking- area changes and the use of Kolb Garage for interpretive functions. Hardening the parking surface would reduce Bright Angel cabin maintenance by reducing dust and creating buffers around individual cabins.

Surface hardening would be an improvement over the existing situation through size reduction in the parking area's overall footprint (lessening impact to nearby trails and walkways from parked vehicles), and would be easier to maintain than the existing mixture of asphalt roads and dirt parking areas. Snow removal would be easier and more efficient on a hardened surface with delineated boundaries than on a dirt or gravel surface. A hardened surface would generally require little annual maintenance, but would likely require replacement every 10- 15 years.

Creation of an interpretive node at Kolb Garage would add a new facility requiring periodic maintenance and upkeep, as well as additional signs, seating, and other site amenities necessary in the gathering area in front of the Garage. While the Garage is an existing in- use park facility (although limited), using it as a public facility would require additional long- term maintenance needs more than currently provided.

Flexibility to Accommodate Future Parking Lot Changes Formalizing the parking area would require expenditure of funds now on construction and maintenance and would be based on anticipated use as described in this project's objectives. If changes are proposed in parking- area use in the future, Alternative B, Phase 2 would provide somewhat less flexibility over Phase 1 since funds would be expended on improvements and on development parking area size.

Short- term adverse, negligible to minor impacts to park operations would occur during construction through presence of onsite construction equipment, fencing, and other area signs of activity and disturbance. This has potential to impact employee access for interpretive programs, PSAR activities, and other administrative use. These short- term impacts during the construction period would be minimized through implementation of mitigation measures (Chapter 2).

Cumulative Impacts Combining implementation of past, present, and reasonably foreseeable future actions with Alternative B implementation would result in beneficial impacts to park operations. Benefits of improved park facilities resulting from past and current actions and

those planned, combined with improvements in the Bright Angel project area would result in long- term beneficial impacts. These cumulative impacts to park operations would be minor and beneficial.

Conclusion Full implementation of all phases of Alternative B would result in an overall minor benefit to park operations through increased operational efficiency. While some maintenance needs would increase, as in the use of Kolb Garage as an interpretive facility, other existing maintenance needs would be reduced through repairs and upkeep of facilities (trail improvements, wall repairs, appropriate surfaces, and removal of chemical toilets). Pavement of the parking area would reduce day to day and annual maintenance needs measurably. Short-term adverse, negligible to minor, impacts to park operations would occur during the construction period.

Alternative C, Maximized Parking

Direct/Indirect Impacts Alternative C, Phase 1 is the same as that described above for Alternative B, Phase 1. Alternative C, Phase 2 includes all the same actions as proposed for Alternative B, Phase 2, except in proposed parking area changes. Alternative C proposes a hardened- surface parking area with approximately 104- parking spaces. The impacts of this on operational efficiency are similar to Alternative B in most aspects except the parking area would be larger, providing approximately 25 more parking spaces. Therefore, impacts to park operations are similar between both alternatives. The surface would be hardened and would therefore require replacement approximately every 10- 15 years as in Alternative B, but the larger area would generally cost more to replace and maintain. Due to the larger square footage and presence of double bay parking areas, snow removal would be necessary on a larger area and would be somewhat more complicated than under Alternative B.

Parking- area capacity in this alternative most closely resembles estimates of existing capacity under the No Action Alternative and is expected to meet parking demand better than Alternative B.

Flexibility to Accommodate Future Parking Lot Changes Formalizing the parking area would require expenditure of funds now on construction and maintenance and be based on anticipated- use levels, as described in this project's objectives. If Alternative C were implemented, the surface hardening and lot capacity increase over Alternative B (with creation of double bays and a more complex configuration), expenditure of funds would be more and provide slightly less future flexibility (when compared to Alternative B) if changes are later proposed in parking- area use.

Alternative C therefore would result in impacts similar to those for Alternative B, except for the parking area's increased size for upkeep and maintenance, and the additional 25 parking spaces, more closely resembling existing parking capacity.

Cumulative Impacts Combining implementation of past, present, and reasonably foreseeable future actions with Alternative C implementation would result in beneficial impacts to park operations, and are the same as Alternative B.

Conclusion Full implementation of all phases of Alternative C would result in an overall minor to moderate benefit to park operations through increased operational efficiency. While some maintenance needs would increase, as in the use of Kolb Garage as an interpretive facility, other existing maintenance needs would be reduced through repairs and upkeep of facilities (trail improvements, wall repairs, appropriate surfaces, and removal of chemical toilets). Paving the parking area would reduce day to day and annual maintenance needs measurably, and providing enough spaces to meet existing demand would likely result in more efficient use of the area over Alternative B. Short- term negligible to minor adverse impacts to park operations would result during construction, minimized through implementation of mitigation measures.

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Chapter 4 – Consultation and Coordination

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Agency Consultation and Public Involvement

NPS began the public scoping process in January 2006 with distribution of a general scoping letter describing the purpose and need for action, proposed objectives, and several preliminary options under consideration for the Bright Angel Trailhead Area. This letter was distributed to the park's approximately 280- person compliance mailing list (which includes state and Federal agencies and Native American tribes), to backcountry hiking groups, in a press release, and was posted on the park's and the NPS Planning, Environment and Public Comment website.

Recipients were asked to respond with issues or concerns to the described options and whether they wished to receive a copy of the EA when distributed for public review. The thirty responses received are briefly described in Chapter 1.

As part of the effort to solicit input, NPS coordinated closely with Xanterra Parks and Resorts, Inc. (concessionaire that operates Bright Angel Lodge), Grand Canyon Association (the operator of Kolb Studio), and Paul Revere Transportation (company under contract to operate the shuttle bus system).

Agencies

At the time of public scoping, NPS also contacted other agencies pertinent to the project including the State Historic Preservation Officer, all affiliated Native American tribes, and the U.S. Fish and Wildlife Service, initiating informal consultation and soliciting issues or concerns.

NPS methods for contacting these groups, and their responses, are detailed in Chapter 1, Appendix B, and are summarized below.

The park contacted the SHPO and invited project discussion and a site visit in December 2005. The park contacted both the SHPO and the Advisory Council on Historic Preservation and requested comments on options under consideration and input on the framework for consultation under Section 106 in January 2006. The SHPO participated in the Value Analysis Workshop held at the park in March 2006. In July and August 2006, the park's Historical Architect consulted with the SHPO on preliminary designs proposed for the restroom building. The project was again discussed with the SHPO during a meeting in the park on July 30, 2007 and the SHPO expressed support for the project and preliminary concept plans for the proposed restrooms. A Memorandum of Agreement is being prepared for this project, separate from this EA, which details the project's expected impacts to cultural resources and methods for continued consultation as the project proceeds into design and implementation. The MOA will be sent to the SHPO, the Advisory Council and any interested American Indian tribes for review and comment.

The park contacted all affiliated Native American tribes and requested comments on preliminary options under consideration in January 2006. No responses were received as a result of this written request. Park representatives met with the Cameron Chapter of the Navajo Nation members in August 2006 to discuss any concerns with this project onsite. Members of the Cameron Chapter requested that the park consider including project- area Navajo history as part of improved interpretive displays. In October 2006, park representatives held three meetings with tribal representatives to discuss this and other projects: a meeting with the Hualapai Historic Preservation Office, the Navajo Historic Preservation Office, and the Hopi Historic Preservation Office. The Navajo representative requested that the NPS consider not paving the parking lot and maintaining the area's rustic character. The Hopi representative requested the NPS consider including prehistoric Hopi use of the Bright Angel Trail and identifying local plants with traditional Hopi names. The park met with representatives from the Hualapai Tribe in March 2007 where they expressed concurrence with project objectives. The park met with representatives of the Havasupai Tribe in April 2007. Tribal representatives expressed concern with new restroom construction in the rim area rather than using existing buildings for this purpose and the potential for impacts to the existing sewer system. The park conducted a Pan- Tribal meeting in July 2007 and discussed this project. The need for lighting at the restroom was mentioned.

The park contacted the USFWS requesting comments on preliminary options in January 2006. NPS met with USFWS in February, April, and July 2006 and in June 2007 to specifically discuss alternatives under consideration, pertinent Federally listed species, and any USFWS issues or concerns. NPS is preparing a Biological Assessment for the project that forms the basis for Section 7 consultation with USFWS under the Endangered Species Act.

EA Review A printed EA will be sent to those who responded during the January 2006 scoping effort or otherwise requested a copy. A printed EA will also be sent to affiliated tribes, Xanterra Parks and Resorts, Paul Revere Transportation, Grand Canyon Association, and USFWS. A

press release will announce EA availability during the public review period, along with a brief project description. The EA will be posted on the Planning Environment and Public Comment (PEPC) website, where the public can comment.

APPENDIX A

Grand Canyon General Management Plan (NPS, 1995b) Excerpts Pertaining to Bright Angel Trailhead Area Design Plan

Applicable GMP Objectives, Facility Design (GMP, page 8)

- Ensure that park developments do not adversely affect park resources and environments, except where absolutely necessary to provide reasonable visitor access and experiences.
- Encourage appropriate use and adaptive reuse of historic structures, while preserving historic integrity.
- Consistent with its purpose, strive to make Grand Canyon National Park a model of excellence in sustainable design and management through such means as energy efficiency, conservation, compatibility with historic setting and architecture, recycling, accessibility, and use of alternative energy sources.

Applicable GMP South Rim Management Objectives (GMP, page 8 and 9)

- Identify and develop an appropriate range of visitor experiences, opportunities, and access that will accommodate a variety of visitor expectations, abilities, and commitment levels.
- Provide canyon viewing opportunities, views and trails access, and interpretation and information, recognizing that these are the most important elements of the South Rim visitor experience.
- Maintain South Rim from Hermits Rest to Desert View as the focus of the majority of visitor use, including major visitor facilities and accommodations.
- Use South Rim's extensive cultural resources as a strong component of the interpretive program, including the interpretation of American Indian cultures.
- Develop and promote use of foot trails, bicycle paths, and public transportation to provide convenient and efficient movement of visitors, employees and residents within Grand Canyon Village, and between major points of interest.

GMP Recommendations specific to the Bright Angel Trailhead Area:

- Kolb Studio will be converted to museum/interpretive/office facility; a restroom will be provided in the Garage (page 30).
- Remove parking areas for Bright Angel when mass transit is implemented (map, page 33).
- Kolb Garage will be used for a restroom for the Trailhead Area (page 34).

APPENDIX B

Public Scoping Summary of Comments Identified within Submissions to April 2006 Bright Angel Trailhead Design Plan Scoping Letter

Concerns/Comments	NPS Response
Kolb Garage	
Use Kolb Garage for visitor contact station/interpretive function; could include Emery Kolb stories as part of interpretive theme.	All action alternatives include use of Kolb Garage for interpretive functions, and telling the Kolb brothers' history will be considered during later design phases.
Shade/seating/site amenities	
Shade is important, including retention of existing vegetation and new planting for this purpose.	Retaining as much existing vegetation during implementation is a primary project objective. New vegetation would also be planted under any action alternative and could double as shade. See Chapter 2 for a discussion of shade options considered.
Add showers to the restroom facility.	Due to the need to keep the restroom facility functional, yet suitable for its setting in the historic district, additional square footage needed for a showering facility would not be feasible. Showers are available at area lodges and the campground, and NPS does not believe the Trailhead Area an appropriate location for a public shower facility.
Add lockers to Kolb Garage or the restroom facility for backpacks.	NPS agrees that a locker facility would provide accommodation to backpackers without private vehicles at the trailhead. However, as in the above comment, accommodating the additional square footage necessary for a locker facility would be problematic, considering the site's limitations. Backpacks can be checked at the Bright Angel Lodge front desk when dining, staying, or shopping in the facility.
Heavily landscape the cabins and separate from pedestrian routes; add seating for cabin users.	Providing landscaped islands around some cabin is proposed, as is additional seating in the project area.
Add stadium seating to provide elevated view.	While additional seating is proposed, stadium seating was deemed not suitable for the area, considering the cultural landscape and adjacent historic structures.
Add display pavilion across road closer to railroad tracks.	Using the utilitarian area across Village Loop Drive and nearest the railroad tracks as an interpretive center for visitors is described in the 1995 GMP (Heritage Education Campus or Village Interpretive Center). This continues to be

Concerns/Comments	NPS Response
	a long- term NPS goal, but is outside the scope of this project.
Add a Civilian Conservation Corps worker statue to the trailhead.	While a statue would not directly relate to specific project objectives (see Chapter 1) nor is there funding to provide such, the NPS agrees that CCC recognition is worthy of consideration, and forwarded the comment to park management. NPS agrees that telling the CCC story is important, and is sponsoring a 75 th anniversary commemoration from May through October 2008 with a temporary exhibit at Kolb Studio, a one- day speaker forum, and a walking tour of the Village highlighting CCC work. The NPS also agrees that permanent recognition is desirable and is considering inclusion of the CCC story in the Kolb Garage interpretive plan and/or an exhibit in the Bright Angel plaza (see alternative descriptions in Chapter 2).
Improve signage and wayfinding.	Proposed.
Increase information on hiker safety.	Proposed.
Provide year- round drinking water availability.	Proposed.
Increase picnicking opportunities.	Proposed.
Include Navajo history interpretation in any new interpretive displays for the area.	Inclusion of area Native American history will be considered when a detailed interpretive plan is developed during later design phases. This is noted as part of the preferred alternative described in Chapter 2.
Include Hopi tribe history, their prehistoric use of the Bright Angel Trail, and traditional Hopi names on plant-identification signs.	See comment above. While NPS agrees that identification of local plants is a good idea and agrees that inclusion of traditional names has merit, NPS feels that this is outside the scope of this project and is not appropriate for this particular area. However, other areas of the Rim Trail or the West Rim Trail may be a better location for this type of interpretative signing. This suggestion has been forwarded to both Cultural Resources and Interpretation Staff.
Confirm ability of existing sewer system to accommodate new restroom	NPS is confident that the existing sewer system on the South Rim is adequate to accommodate the addition of a new flush restroom facility at the Bright Angel Trailhead.
Trails	
Use the historic trailhead by Kolb Studio as the primary trailhead and/or emphasize this route.	NPS agrees that the original trailhead should be easier for visitors to find, and that it is important to differentiate it from the trailhead by the mule corral. The proposal includes these as objectives.
Make trail accessible down to Hermit transfer bus stop.	Proposed.

Concerns/Comments	NPS Response
Establish main Rim Trail connection.	Proposed.
Mules	
Keep mules.	The proposals do not include any change in the existing mule ride operation; mule use evaluation is outside the scope of this analysis.
Get rid of mules.	The proposals do not include any change in the existing mule ride operation; mule use evaluation is outside the scope of this analysis.
Add enhanced seating/viewing of mules.	Proposed as part of plaza area.
Parking	
If parking area becomes more well- known, will be heavily used.	NPS agrees that if the parking area becomes easier to find for all users, it could become more congested than currently. An evaluation of the No Action Alternative (maintaining the existing situation and Alternative C, a larger capacity lot, provide a detailed analysis of this issue).
Need accessible parking spaces.	Proposed.
Interpretive rangers would like a reserved parking spot or two (carrying props, etc., for talks).	The proposal includes designation of a small number of administrative- use parking spaces that could service interpretive rangers, search and rescue, trail crew, etc.
Consider options other than paving.	Alternative B, Phase 1, evaluates keeping the parking area surface similar to its current dirt surface. Both Alternative B, Phase 2 and Alternative C, Phase 2 propose an all- weather, hardened surface; this does not automatically mean pavement and could include other surface materials with similar durability and maintenance requirements but without the same appearance as pavement.
Encourage hikers to park at the Backcountry Office or other location.	NPS agrees this is a reasonable suggestion and will be evaluating this as part of the ongoing South Rim Transportation planning effort, which will be carefully considering many operational aspects of how visitors move through the Village area.
Reserve trailhead parking spaces for hikers with backcountry permits, lodge guests, and those with accessibility needs.	NPS agrees this is a reasonable suggestion and will be evaluating it as part of the ongoing South Rim Transportation planning effort, which will be carefully considering many operational aspects of how visitors move through the Village area. In addition, the design plan does not preclude designation of parking spaces for specific user groups, such as backcountry hikers, if park management determines this action is needed at some future point.
Reserve parking spaces for lodge guests.	NPS agrees this is a reasonable suggestion and

Concerns/Comments	NPS Response
	will be evaluating it as part of the ongoing South Rim Transportation planning effort, which will be carefully considering many operational aspects of how visitors move through the Village area. In addition, the design plan does not preclude designation of parking spaces for specific user groups, such as lodge guests, if park management determines this action is needed at some future point.
Complete Canyon Visitor Information Plaza (CVIP) and GMP vision: Bright Angel guests would park at CVIP and catch shuttle to lodge. The lot would only be needed for hikers. Don't forget other transportation planning efforts and how they relate to this parking area.	NPS agrees that the planning for the Bright Angel Trailhead Area is linked to the GMP vision and to the South Rim Transportation Planning effort currently underway. The relationship of this plan to these other plans is described in both Chapter 1 and Chapter 2 of this document. In addition, the design plan does not preclude designation of parking spaces for specific user groups, such as backcountry hikers, if park management determines this action is needed.
Area should provide commercial tour- van operator (15 passenger vans or less) parking spaces.	The current proposal includes a zone where passenger vehicles and small vans could drop off and pick up passengers. The proposal does not propose any changes to existing commercial- use authorizations and does not specifically designate any parking spaces for tour- van operators in the Trailhead Area parking lot . However, the design plan does not preclude designation of parking spaces for tour- van operators, or other user groups, if park management determines this action is needed at some future point.
Area needs a loading zone so hikers can unload their gear close to the trailhead (and then park off- site).	Proposed.
Don't improve the parking area.	This suggestion is evaluated as the No Action Alternative and Alternative B, Phase 1.
Bury powerlines.	Proposed.
Project Implementation	
Make sure, if implementation is staggered over time based on available funding, that each step is a success independent of another. Implement strategically.	Proposed.
Base improvements on user data and focus on pedestrian use, protection of resources, and long- term planning for sustainable transportation.	A visitor use study was conducted in the area specifically for this planning effort. NPS agrees that protection of resources and links to the larger transportation planning efforts are key to proposal success. The EA discusses these points.
Area Character	
Maintain the area's rustic/historic character.	NPS agrees that preservation of historic structures and districts and cultural landscapes

Concerns/Comments	NPS Response
	are paramount to this project. Consult Chapter 3 for an evaluation of impacts of each alternative to these resources.
Leave it alone, you can't improve on it.	Evaluated as the No Action Alternative.
Retain all the Bright Angel Cabins.	Proposed.
Make sure improvements conform to the architecture of the district.	NPS agrees that preservation of historic structures and districts and cultural landscapes are paramount to this project; architecture selected for any improvement is compatible with the historic district. Consult Chapter 3 for an evaluation of impacts of each alternative to these resources.
Don't create an accessible entrance to Kolb Studio. Too much impact to historic fabric and too costly.	This is currently proposed as part of Alternative B, Phase 2 and Alternative C, Phase 2. NPS believes a barrier-free entrance into the main level of the studio can be done without substantial impact to historic fabric.
Repair all existing historic retaining walls in project area.	There are insufficient project funds to repair all historic retaining walls although the primary one (above the trail and below the Kolb Garage driveway) is proposed for repair as part of this project.

APPENDIX C

Compliance Summary

The following laws and associated regulations provided direction for project alternatives design, analysis of impacts, and formulation of mitigation/avoidance measures.

National Environmental Policy Act of 1969 (NEPA) (Title 42 U.S. Code Sections 4321 to 4370 [42 USC 4321- 4370]) The purposes of NEPA encourage “harmony between [humans] and their environment and promote efforts which will prevent or eliminate damage to the environment. . .and stimulate the health and welfare of [humanity].” The purposes of NEPA are accomplished by evaluating effects of Federal actions. Results of these evaluations are presented to the public, Federal agencies, and public officials in document format (e.g., Environmental Assessments and Environmental Impact Statements) for consideration prior to taking official action or making official decisions. Implementing regulations for NEPA are contained in Part 1500 to 1515 of Title 40 of the U.S. Code of Federal Regulations (40 CFR 1500- 1515).

Clean Water Act of 1972, as amended (CWA) (33 USC 1251- 1387) The purposes of CWA are to “restore and maintain the chemical, physical, and biological integrity of the Nation's waters.” To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating Federal actions that result in potential degradation of U.S. waters and issuing permits for actions consistent with CWA. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions that affect U.S. waters. Implementing regulations describing the U.S. Army Corps of Engineers CWA program are contained in 33 CFR 320- 330.

Clean Air Act (PL chapter 360, 69 Stat 322, 42 USC 7401 et seq.) The main purpose of this Act is to protect and enhance the nation’s air quality to promote public health and welfare. The Act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. The U.S. Environmental Protection Agency is charged with implementing this Act.

Endangered Species Act of 1973, as amended (ESA) (16 USC 1531- 1544) The purposes of the ESA include providing “a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.” According to the ESA, “all Federal departments and agencies shall seek to conserve endangered species and threatened species,” and “[e]ach Federal agency shall. . .insure that any action authorized, funded, or carried out by such agency. . .is not likely to jeopardize the continued existence of any endangered species or threatened species.” The U.S. Fish and Wildlife Service (non- marine species) and the National Marine Fisheries Service (marine species, including anadromous fish and marine mammals) administer the ESA. The effects of any agency action that may affect endangered, threatened, or proposed species must be evaluated in consultation with either the USFWS or National Marine Fisheries Service, as appropriate. Implementing regulations that describe procedures for interagency cooperation to determine effects of actions on endangered, threatened, or proposed species are contained in 50 CFR 402.

National Historic Preservation Act of 1966, as amended (NHPA) (16 USC 470 *et sequentia*)

Congressional policy set forth in NHPA includes preserving “the historical and cultural foundations of the Nation” and preserving irreplaceable examples important to our national heritage to maintain “cultural, educational, aesthetic, inspirational, economic, and energy benefits.” NHPA also established the National Register of Historic Places composed of “districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture.” NHPA requires that Federal agencies take into account effects of their actions on properties eligible for or included in the National Register of Historic Places and coordinate such actions with State Historic Preservation Offices. NHPA also requires Federal agencies, in consultation with the SHPO, to locate, inventory, and nominate all properties that appear to qualify for the National Register of Historic Places, including National Historic Landmarks. Further, it requires Federal agencies to document those properties in the case of an adverse effect and propose alternatives to those actions, in accordance with NEPA.

Laws, Regulations and Policies Consulted

Relevant Laws, Policies, and Regulations		
Law, Policy, or Regulation (by date)	Acronym	Record
Yosemite Act of 1864		13 Stat. 325
General Grant National Park and a portion of Sequoia National Park Act of 1890		26 Stat. 650
Yosemite Act of 1906		34 Stat. 831
Clean Water Act of 1948	CWA	33 U.S.C. 1251 et seq.
Clean Air Act of 1955 as amended 1963	CAA	42 U.S.C. 7401 et seq.
The Wilderness Act of 1964	WA	Public Law 88- 577
National Historic Preservation Act of 1966 and regulations implementing NHPA	NHPA	16 U.S.C. 470 et seq. 36 CFR Part 800 as amended
National Environmental Policy Act of 1969	NEPA	42 U.S.C. 4321 et seq.
Endangered Species Act of 1973	ESA	16 U.S.C. 1531 et seq.
CEQ General Regulations Implementing National Environmental Policy Act of 1978		40 CFR Parts 1500–1508
Archaeological Resources Protection Act of 1979	ARPA	18 U.S.C. 1312
Farmland Protection Policy Act of 1981	FPPA	Public Law 97- 98
Aircraft Overflights in National Parks Act of 1987		Public Law 100- 91
Native American Graves Protection and Repatriation Act of 1990	NAGPRA	25 U.S.C. 3001
Americans with Disabilities Act of 1990	ADA	Public Law 101- 336
Migratory Bird Treaty Act of 2001 (Migratory Bird Guidance)		16 U.S.C. 703- 711
Executive Orders		
Floodplain Management Act of 1977		Executive Order 11988

Protection of Wetlands Act of 1977		Executive Order 11990
Environmental Justice Act of 1994		Executive Order 12898
Indian Sacred Sites Act of 1996		Executive Order 13007
Invasive Species Act of 1999		Executive Order 13112
Consultation and Coordination with Indian Tribal Governments Act of 2000		Executive Order 13175
Migratory Birds		Executive Order 13186
Director's Orders (National Park Service)		
Park Planning	DO- 2	Director's Order #2
Conservation Planning, Environmental Impact Analysis and Decision Making	DO- 12	Director's Order #12
Environmental Management Systems	DO- 13	Director's Order #13
Cultural Resources Management	DO- 28	Director's Order #28
Wilderness Preservation and Management	DO- 41	Director's Order #41
Implementation of the NPS Organic Act	DO- 55	Director's Order #55
Explosives Use and Blasting Safety	DO- 65	Director's Order #65
Natural Resources Protection	DO- 77	Director's Order #77
Wetland Protection	DO- 77- 1	Director's Order #77- 1
Other		
2006 National Park Service Management Policies 2006		
1988 Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. Office of Water, EPA 832- R 92- 005. Washington, DC.		
1995 Programmatic Agreement among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Draft General Management Plan/Environmental Impact Statement, Grand Canyon National Park, Arizona.		
1996 Endangered and Threatened Wildlife and Plants: Establishment of a Nonessential, experimental population of California condors in Northern Arizona. Federal Register, October 16, 1996. Volume 61, Number 201, pages 54043-54060.		
2000 Endangered and Threatened Wildlife and Plants: Proposed Designation of Critical Habitat for the Mexican Spotted owl: Federal Register, July 21, 2000. Volume 65, number 141, pages 45336- 45353.		

APPENDIX D

Species of Special Concern Species Descriptions

Mexican Spotted Owl – Threatened - The Mexican spotted owl (MSO; *Strix occidentalis lucida*) was listed as a threatened species in March 1993, and a recovery plan was issued in 1995. MSO typically breed and roost in deep canyon or diverse forested habitats. They are associated with late seral forests and are generally found in habitat that includes mixed- conifer and pine-oak forests, riparian madrean woodland, and sandstone canyonlands (USFWS 1995). However, MSO have been found in relatively open shrub and woodland vegetation communities in arid canyonland habitat (Willey 1995). Nesting habitat is typically in areas with complex forest structure or rocky canyons containing mature or old growth stands that are uneven- aged and multi- storied with high canopy closure. MSO usually nest in abandoned stick nests or cliff or tree cavities. Tree nests can be on platforms such as old raptor nests or witches' brooms formed by dwarf mistletoe (*Arceuthobium* sp.) or in cavities formed by broken branches or tree tops. Nests in rock canyon areas are usually in rock cavities or caves (Ganey and Dick 1995).

MSO diet varies depending on location and habitat. Generally it consists of small and medium-sized mammals such as peromyscid mice, voles (*Microtus* spp.), pocket gophers (*Thomomys* spp.), ground squirrels (*Spermophilus* spp.), and woodrats (*Neotoma* spp.). Woodrats are the most common and important prey item range- wide, as measured in frequency in the owls' diet and in biomass consumed (Ward and Block 1995). Other animals that may occasionally be consumed include small birds (usually Passeriformes), lizards (*Sceloporus* spp.), bats (Chiroptera), beetles (Coleoptera), and rabbits (*Sylvilagus* spp.). MSO use a wider variety of forest conditions when foraging than when nesting or roosting, and a diverse prey base is dependant on the availability and quality of diverse habitats. Spotted owls typically forage at night, although diurnal foraging has also been observed.

Data Sources MSO within Grand Canyon National Park were confirmed in 1992 through field surveys of approximately 2,430 ha (6,000 acres) of suitable habitat on North and South Rims. Additional MSO surveys occurred in 1994 and 1995 along South Rim, and in 1998 and 1999 along North Rim. These surveys did not detect any spotted owls. In 1999, additional surveys were conducted in side- canyon habitat along the Colorado River corridor and responses were received at six locations. Surveys continued along the river corridor in 2001, with new owls located. An extensive owl survey was initiated in 2001 in the inner canyon and river corridor, owl habitat below North and South Rims, and portions of North and South Rim plateaus. Surveys have continued regularly in many park areas, including canyon habitat below South and North Rims through 2007.

Critical MSO habitat was designated in 2001 and includes most of the park except South Rim. Owl habitat in Grand Canyon National Park is cool canyon habitat defined as areas with low thermal intensity, short thermal duration, and steep slopes (Spotskey and Willey 2000). Predicted habitat has been spatially defined through a geographic information system

(GIS) model and may or may not include forested habitat; i.e., the coolness and short thermal duration may be a result of vertical rock faces, cliff walls, and aspect and not necessarily because an area has dense vegetative canopy cover.

The size and extent of the MSO population at Grand Canyon is currently unknown. MSO have been confirmed using rugged canyonland terrain within Grand Canyon, including use of small Douglas fir stringers below the rim. No MSO are known from the park's plateau areas. The park falls within the Colorado Plateau Recovery Unit. The Mexican Spotted Owl Recovery Plan (USFWS 1995) provides three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. As of 2006, 41 MSO Protected Activity Centers have been designated for known MSO park locations. Protected habitat in the Colorado Plateau Recovery Unit includes any PACs, designated wilderness areas, and any mixed- conifer forests on slopes over 40%. Restricted habitat in the Colorado Plateau Recovery Unit includes mixed- conifer forests or riparian habitats that have primary constituent elements, which, in these habitat types include high basal area of trees, uneven-aged structure, and high snag basal area. Primary constituent elements in canyon habitat include cooler and more humid conditions than the surrounding area; tree clumps or stringers; canyon walls with crevices, ledges, or caves; high percent cover of ground litter or woody debris; and riparian or woody vegetation.

One MSO Protected Activity Center Core Area occurs within the vicinity of the Bright Angel Trailhead, below the rim, associated with Garden Creek. Core- area boundaries are below the canyon rim and do not overlap the project area. All portions of the project area are greater than 0.25 miles from the core- area boundary (Ward and Dickenson 2006, Ward and Goates 2007).

Threats Primary threats cited for the owl in most Recovery Units include large- scale catastrophic wildfire and timber harvest. Potential threats cited specifically for the Colorado Plateau Recovery Unit focus more on recreational impacts, road building, and overgrazing.

California Condor – Threatened – California condors (*Gymnogyps californianus*) are large birds that reach sexual maturity at five to six years of age. They are strict scavengers and find food visually, often by investigating the activity of ravens, coyotes, eagles, and other scavengers. Without parental guidance young inexperienced juveniles may also investigate human activity. As young condors learn and mature, this human- directed curiosity diminishes.

The California condor was listed as an endangered species in March 1967. In 1996, the USFWS established a nonessential, experimental population of California condors in northern Arizona. In December 1996 the first condors were released in the Vermillion Cliffs area of Coconino County, Arizona, approximately 48 km (30 miles) north of Grand Canyon National Park. Subsequent releases occurred in May 1997, November 1997, November 1998, December 1999, February 2002, and December 2002 in the same vicinity and in the Hurricane Cliff area, which is 96 km (60 miles) west of Vermillion Cliffs. By declaring the population nonessential, experimental, the USFWS can treat this population as threatened and develop management regulations less restrictive than mandatory prohibitions covering endangered species. This

facilitates efforts to return the condor to the wild by providing increased opportunities to minimize conflict between condor management and other activities. Within Grand Canyon National Park, the condor has the full protection of a threatened species.

Nesting habitat for California condors includes various types of rock formations such as crevices, overhung ledges, and potholes. Most California condor foraging occurs in open meadows and throughout rim forested areas. Typical foraging behavior includes long- distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass. Roost sites include cliffs and tall trees, including snags.

Data Sources As of April 2006, the population of free- flying condors in Arizona totaled 58. All California condors in northern Arizona are fitted with radio transmitters that allow field biologists to monitor movements. These condors have been observed as far west as the Virgin Mountains near Mesquite, Nevada; south to the San Francisco Peaks outside Flagstaff, Arizona; north to Zion and Bryce Canyon National Parks and beyond to Minersville, Utah; and east to Mesa Verde, Colorado and the Four Corners region (Peregrine Fund 2000). Monitoring data indicate condors are using habitat throughout Grand Canyon National Park, with concentrations in Marble Canyon, Desert View to the Village on South Rim, and the Village to Hermits Rest. The North Kaibab National Forest is also used frequently for perching, roosting, and foraging. Potential nesting habitat exists throughout the park. One nesting attempt was documented in the Marble Canyon area in 2001. Two nest sites on the South Rim, one on The Battleship and one on Dana Butte, were initiated in 2002. Both nest sites failed. In 2003, a condor chick hatched in the Salt Creek drainage area, the first condor born in the wild since reintroduction efforts began. In 2005, the Salt Creek nest was active again as was the Vermillion Cliffs nest. A new nest in the King's Canyon area of the Kaibab National Forest failed. In 2006, all three nest attempts in northern Arizona failed. In 2007, condors nested on sites near the South Rim and the North Rim and at Vermillion Cliffs north of the park boundary. No previously occupied or active nests occur within 0.5 miles of the project area (Ward and Goates 2007).

Threats The main reason for condor decline was an unsustainable mortality rate of free-flying birds combined with a naturally low reproductive rate. Most deaths in recent years have been related to human activity. Shootings, poisonings, lead poisoning, and power- line collisions are considered the condor's major threats.

Deer goldenbush – Species of Special Concern - Deer goldenbush (*Ericameria arizonica*) is a recently- named endemic shrub previously included within the taxon *Haplopappus cervinus*. It bears yellow flowers from September – October and occurs on limestone substrates, often near the canyon rim. Recent surveys in the park have located individuals along the South Rim near Mather Point, Maricopa Point, Pipe Creek Vista and South Kaibab Trailhead. This species has not been surveyed for thoroughly (Roberts et al. 2005) and its rarity is unknown.

APPENDIX E

Recently Completed, In- Progress, and Foreseeable Future Actions Bright Angel Trailhead Area Design Plan

PROJECTS WITHIN THE GRAND CANYON VILLAGE NHL DISTRICT

Recently Completed or In- Progress Projects

El Tovar Rehabilitation (Complete) – An interior and exterior renovation was recently completed on El Tovar hotel including re- roofing and interior upgrades to the lobby, restaurant, and rooms. El Tovar is approximately 0.5 miles from the project area along the Rim Trail and is within the Grand Canyon Village NHL district.

Parkwide Walkways (Complete) – An effort to upgrade walkways in visitor use areas was completed recently and included walkways at the Shrine of the Ages, areas on North Rim, and on the Rim Trail promenade between El Tovar and Bright Angel Lodge, in close proximity to the project area and within the Grand Canyon Village NHL district.

Foreseeable Future Actions

South Rim Transportation Plan - The purpose of the South Rim Visitor Transportation Plan is to provide a transportation system that addresses the park's most pressing transportation issues through the year 2020. The plan would accommodate current and anticipated South Rim visitation levels, facilitate enhanced visitor experiences, and protect park resources. Alternatives under consideration may include new parking areas near Canyon View Information Plaza or outside the park north of Tusayan; expanded shuttle bus transit from Tusayan to CVIP; expanded shuttle bus transit within the Village and to Hermits Rest; improvements at South Entrance Station to reduce wait times, such as additional vehicle lanes and tour bus parking/management. The EA is expected to be completed by winter 2007/2008, and, if approved, implementation would occur from 2008 to 2012. Aspects of the plan relevant to the Bright Angel Trailhead area include shuttle bus operations at the Hermits Rest and Village Route transfers and parking in Grand Canyon Village. Some aspects of the project are located within the Grand Canyon Village NHL district.

Narrowband/Digital Radio Conversion – The park is proposing to convert all radio communications to this new technology, to create more available radio spectrum that will meet the most current privacy and security requirements. Measurable conversion results would improve communications for public safety, meet Federal standards, provide better services to park visitors, and improve interoperability with other agencies. Additional radio towers would be necessary throughout the park. One is near Hermit Road, at the Hopi Point Fire Tower. The proposal includes cleaning up this site, consolidating all users' antennas onto one tower, replacing the existing shelter with a new weather- proof building, and installing a new 60- foot free- standing tower with multiple antennae attached at different locations. The site may be fenced for public safety. Another tower is located at the Emergency Services Building, within

the Grand Canyon Village NHL district. This project is expected to be implemented in the next one to two years.

Reclaimed Water Line – This project would replace the 9,000 linear foot existing reclaimed water line that runs from the waste water treatment plant to the Grand Canyon School. The existing line was installed in 1926 and has exceeded its useful service life. Loss of the line would prevent use of reclaimed water by most of South Rim’s major visitor and administrative use areas. This project is expected to be implemented in the next two years.

Powerhouse Stabilization – To stabilize this National Historic Landmark Building, being vacated by the park’s hospitality concessionaire, and prepare it for future use, this project would rehabilitate the building to include seismic and structural upgrades, reproofing, repair of drainage issues, demolition of interior non- historic materials, exterior repairs, and hazardous material abatement. The Powerhouse is located south of the Bright Angel Trailhead Area on the other side of Village Loop Drive and the railroad tracks. It is located within the Grand Canyon Village National Historic Landmark District. This project is expected to be implemented in the next one to three years.

Bright Angel Lodge and Cabins Rehabilitation – The Lodge and associated cabins rehabilitation would be extensive. Proposed actions include renovation of the restroom located within Bright Angel Lodge; upgrades to the kitchen, dining room, bar, and retail operation; and rehabilitation of the lobby, Arizona Room restaurant, soda fountain, and history room. Exterior upgrades such as re- roofing, painting, sidewalk, and railings repair are also proposed. Actions are anticipated in 2008, and the Lodge will most likely be closed during renovation. The Bright Angel Cabins are located within the project area and the Lodge is in close proximity; both are located within the Grand Canyon Village NHL boundary.

PROJECTS OUTSIDE THE GRAND CANYON VILLAGE NHL DISTRICT

Recently Completed or In- Progress Projects

Hopi Point Vault Toilet Installation (Complete) - Hopi Point is a primary stop along Hermit Road for both tour buses and shuttle buses; many visitors come to this point to watch sunset. There are currently two portable toilets that must be pumped frequently and do not meet the need for this heavily used site. This project proposes installation of a double vault prefabricated concrete building, an accessible concrete walk, and a pathway through the island to the existing trail east of Hopi Point. Construction is complete. Hopi Point is approximately 2.5 miles along the Rim Trail from the Bright Angel Trailhead Area and approximately 0.5 miles along Hermit Road via shuttle bus.

Yavapai Observation Station Restroom Rehabilitation (Complete) - Rehabilitation and expansion of the Yavapai Observation Station comfort station was completed to upgrade and expand the 1960s- era restroom to meet current demands. While this project is approximately

two miles along the Rim Trail from the Bright Angel Trailhead, it addresses restroom needs on the South Rim.

Desert View Drive Restrooms (Complete) – Construction of new vault toilets at Yaki Point, Yaki Picnic Area, and Shoshone Point are complete. These prefabricated vault toilets were installed in these visitor use areas to replace existing temporary chemical toilets. While Desert View Drive is over three miles from the project area, the restrooms along the road address restroom needs on the South Rim.

Parkwide Walkways (Complete) – An effort to upgrade walkways in visitor use areas was completed recently and included walkways at the Shrine of the Ages, areas on North Rim, and on the Rim Trail promenade between El Tovar and Bright Angel Lodge, in close proximity to the project area and within the Grand Canyon Village NHL district.

Hermits Rest Restroom Replacement (Complete) – The existing Hermits Rest restroom consists of a 1960s- era block building with non- accessible chemical flush toilets. The chemical waste system is no longer effective, resulting in strong offensive odors and constant maintenance. All toilets are mounted on a platform with steps, making them inaccessible to many visitors. This project includes demolition of the existing restroom building and associated waste tanks. Improvements include site grading, installation of four double- vault prefabricated concrete buildings, construction of accessible pathways from the shuttle bus stop and Hermits Rest, replacement of the existing roadway adjacent to the new restrooms, and replacement of electrical service to the four existing structures at Hermits Rest. Construction began in March 2006 and should be complete by winter 2006/2007. This restroom is over seven miles from the project area, but addresses restroom needs on the South Rim.

South Rim Viewpoint Rehabilitation (In Progress) – This project would address need for maintenance and rehabilitation of approximately 14 viewpoints along Hermit Road and five viewpoints along Desert View Drive. Lack of consistent maintenance combined with heavy visitor use has resulted in deterioration of masonry structures, surface tread, and fencing at these viewpoints. This project would repair and repoint historic walls; reset loose railing stanchions and footings; tighten or replace screws and brackets on railing stanchions; repair, replace or remove chain- link fencing; stabilize historic and modern rock retaining walls and trail liners; remove vegetation affecting historic features and visitor safety; repair asphalt; rehabilitate and alter walkway at Maricopa Point, and remove graffiti. Implementation has begun and is expected to occur through 2008. No new ground disturbance would result. All overlooks are outside the project area and outside the Grand Canyon Village NHL district. They do, however, address accessibility and safety needs for visitors at popular destinations along South Rim.

Greenway Trail – Phase III (In Progress) - This approximately seven- mile Greenway Trail segment would provide a pedestrian/bicycle/equestrian trail from Tusayan, Arizona (located outside the park's southern boundary) to Canyon View Information Plaza within Grand Canyon National Park. This trail would provide an off- road means for nonmotorized park access. It

would also provide a separated experience from the existing road and vehicles entering the park. The trail would be ten- feet wide with a hardened surface and a stabilized shoulder made from a mix of aggregate and topsoil. An area 12- to 14- feet wide would be temporarily disturbed during construction. Design and construction would promote sustainability where possible and would strive to minimize impacts on the land. The trail would provide an extension of the Arizona Trail into the park for hikers, cyclists, and equestrians. The trail would become part of the park's overall trail system and would be included in routine park ranger patrols. Construction on trail portions has begun. New ground disturbance is estimated at approximately four acres. While this trail is outside of the Grand Canyon Village NHL district and over two miles from the project area it is relevant in that it completes pedestrian trail connections in South Rim, including improving access to other greenway trail and Rim Trail segments on South Rim.

Foreseeable Future Actions

Three- Mile Composting Toilet Installation – Three- Mile Resthouse along Bright Angel Trail provides shade and water but no restroom. A composting toilet occurs at 1.5 Mile Resthouse (1.5 miles from Bright Angel Trailhead) and at Indian Gardens, but not at Three Mile. Due to the area's high use, NPS proposes to construct a new composting toilet, similar in size and design to that at 1.5 Mile, near the Three Mile Resthouse. This project is expected to be implemented in spring – summer 2007.

Pipe Creek Composting Toilet Installation – Pipe Creek Resthouse along the Bright Angel Trail provides shade but does not provide drinking water or a restroom. In combination with construction of a composting toilet at Three Mile, one at Pipe Creek would complete restroom installation in these popular rest stops for hikers on Bright Angel Trail, minimizing litter and waste cleanup needs in the surrounding areas and providing an enhanced visitor experience. The project would likely be implemented within the next two to five years.

Desert View Drive Vault Toilet Installation and Existing Restroom Rehabilitation – To complete rehabilitation and replacement of restrooms parkwide, an effort initiated in 2001, vault toilets would be constructed at Grandview Trailhead, Buggeln Hill Picnic Area, Tusayan Museum, and Desert View Campground. In combination with the completion of new toilets on Hermit Road, North Rim, and at Yavapai Observation Station, this project would comprehensively address the need for visitor facilities in these popular areas. This project is expected to be complete in 2008. These restrooms are over five miles from the project area but are relevant in that they address overall restroom needs on the South Rim.

South Rim Transportation Plan - The purpose of the South Rim Visitor Transportation Plan is to provide a transportation system that addresses the park's most pressing transportation issues through the year 2020. The plan would accommodate current and anticipated South Rim visitation levels, facilitate enhanced visitor experiences, and protect park resources. Alternatives under consideration may include new parking areas near Canyon View Information Plaza or outside the park north of Tusayan; expanded shuttle bus transit from Tusayan to CVIP;

expanded shuttle bus transit within the Village and to Hermits Rest; improvements at South Entrance Station to reduce wait times, such as additional vehicle lanes and tour bus parking/management. The EA is expected to be completed by winter 2007/2008, and, if approved, implementation would occur from 2008 to 2012. Aspects of the plan relevant to the Bright Angel Trailhead area include shuttle bus operations at the Hermits Rest and Village Route transfers and parking in Grand Canyon Village. Some aspects of the project are located within the Grand Canyon Village NHL district.

Greenway V – This project would construct a one- mile paved pedestrian path from Pipe Creek Vista to the South Kaibab Trailhead. This trail segment would connect with an already completed Rim Trail section that extends from Mather Point to Pipe Creek Vista, a shuttle bus stop. This project is expected to be implemented in 2007/2008. The project area is outside of Grand Canyon Village and approximately three miles from the project area but it forms the eastern extent of the Rim Trail, whose western extent is within the Bright Angel Trailhead project area.

Narrowband/Digital Radio Conversion – The park is proposing to convert all radio communications to this new technology, to create more available radio spectrum that will meet the most current privacy and security requirements. Measurable conversion results would improve communications for public safety, meet Federal standards, provide better services to park visitors, and improve interoperability with other agencies. Additional radio towers would be necessary throughout the park. One is near Hermit Road, at the Hopi Point Fire Tower. The proposal includes cleaning up this site, consolidating all users' antennas onto one tower, replacing the existing shelter with a new weather- proof building, and installing a new 60- foot free- standing tower with multiple antennae attached at different locations. The site may be fenced for public safety. Another tower is located at the Emergency Services Building, within the Grand Canyon Village NHL district. This project is expected to be implemented in the next one to two years.

Hermit Road Rehabilitation – This seven- mile- long, narrow, historic roadway connecting Grand Canyon Village to Hermits Rest would be widened and rehabilitated to accommodate current levels of shuttle bus and tour bus traffic. The road begins at the Hermits Rest Shuttle Bus Transfer Stop, just outside the Bright Angel Trailhead project area. This project also includes repair and upgrades to multiple overlook parking areas and construction of an approximately three- mile- long Greenway Trail between the Abyss (a popular overlook) and Hermits Rest. This project is expected to be implemented in 2008. The beginning of Hermit Road is located at the Hermits Rest shuttle bus stop, within the project area. The shuttle bus stop and roadway are located just outside the Grand Canyon Village NHL boundary.

List of Abbreviations and Acronyms

ACHP	Arizona Council on Historic Preservation
AEF	Assessment of Effect Form
AGFD	Arizona Game and Fish Department
BA	Biological Assessment
CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLR	Cultural Landscape Report
CVIP	Canyon View Information Plaza
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highways Administration
GIS	Geographic Information System
GMP	General Management Plan
IDT	Interdisciplinary Team
MOA	Memorandum of Agreement
MSO	Mexican Spotted Owl
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
PAC	Protected Activity Centers
PEPC	Planning, Environmental and Public Comment (NPS website)
PIDT	Parkwide Interdisciplinary Team
PSAR	Preventative Search and Rescue
SHPO	State Historic Preservation Officer
USFWS	U.S. Fish and Wildlife Service