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CHAPTER 2.

ALTERNATIVES

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INTRODUCTION

Four alternatives, including the no-action alternative, are analyzed in this environmental assessment / assessment of effect for the South Rim visitor transportation plan. The project alternatives were formulated to meet the project purpose of and need for action as discussed in Chapter 1. The no-action alternative (alternative A), as required under the National Environmental Policy Act, assumes that no substantial physical or operational changes would occur within the project area except for those already underway or planned for the near future; current conditions would continue. The three action alternatives (alternative B, C, and D) present an array of options to achieve the project objectives through combinations of physical improvements and operational strategies. All of the action alternatives would accommodate an increase in visitation consistent with long-term visitation trends through the year 2020, and they would be implemented in phases. (See “Planning Considerations and Assumptions.”)

The alternatives differ primarily in their approach to where development would occur (inside or outside the park) and how visitors would arrive (either by private vehicle or shuttle bus). The action alternatives all provide for an increase in visitor parking to meet projected demand, while maximizing the use of existing parking lots in Grand Canyon Village. New parking, primarily for day visitor use, would be located at Canyon View Information Plaza, which could be supplemented by a new parking area on national forest system land near Tusayan, with shuttle bus service to the park. All of the action alternatives would provide short-term parking at Canyon View Information Plaza, intended to be used while visitors are at the plaza, to ensure that visitors have convenient access to information and visitor services needed to plan an enjoyable visit to the South Rim.

The action alternatives also include coordinated improvements to support multi-modal

travel to and within Grand Canyon Village. All action alternatives would accomplish the following:

- Implement an array of transportation operational strategies to promote alternative travel modes to the park and better integrate connections between parking, shuttle bus, wayfinding, and trip planning.
- Provide expanded tour bus parking, enhanced tour bus loading and unloading areas, and a tour bus management program to increase opportunities for tour bus access.
- Provide greater visitor access and enhanced visitor services at Canyon View Information Plaza, including a theater, food items, and bicycle rentals.
- Implement parking management strategies for new and existing parking lots.
- Enhance the park’s South Rim shuttle bus system with added service to reduce overcrowding and to improve travel time.
- Modify the South Entrance Station to sustain recent improvements in waiting time and congestion.
- Improve loading and unloading of tour buses serving Grand Canyon Railway passengers.
- Limit the costs and impacts of new development by maximizing the utilization and effectiveness of existing facilities and services.
- Implement proposed actions in phases, utilizing an adaptive management approach to monitor the effects of the improvements on transportation conditions and visitor use and to determine the timing and required characteristics of future improvements.

Highlights of the three action alternatives are described below:

- *Alternative B: Preferred Alternative* — The National Park Service would construct new visitor parking at Canyon View Information Plaza and initiate a new shuttle bus route to connect this area with the gateway community of Tusayan. This alternative would emphasize collaboration with the gateway community of Tusayan in meeting visitor transportation needs during the peak season (Memorial Day through Labor Day) by providing a choice of day visitor parking at Canyon View Information Plaza, at currently available parking areas in the community of Tusayan, and to the extent needed over time, at a new parking and shuttle facility on national forest system land north of Tusayan. Frequent shuttle bus service would be provided from Tusayan to Canyon View Information Plaza to meet visitor transportation needs. Parking would accommodate short-term use of the information plaza and Mather Point as well as provide access to shuttle buses to destinations throughout Grand Canyon Village. Visitors could also choose to drive through Grand Canyon Village and park in existing lots at popular visitor destinations.
- *Alternative C: Tusayan Parking Emphasis* — The National Park Service would concentrate most new facilities outside the park, thereby minimizing development within the park. A new large visitor parking area and shuttle bus staging area would be provided on national forest system land just north of Tusayan. Visitors would have the option of riding frequent shuttle bus service from this location to Canyon View Information Plaza or driving into the park. The remote parking and shuttle bus service would operate from March through September. Sufficient parking would be provided near Canyon View Informa-

tion Plaza for short-term use. It is assumed that all long-term parking by day visitors inside the park would occur at existing lots within Grand Canyon Village.

- *Alternative D: Canyon View Information Plaza Parking Emphasis* — The National Park Service would concentrate new transportation facilities within the park at Canyon View Information Plaza, thereby simplifying wayfinding and providing a consistent arrival experience for all day visitors to Grand Canyon Village. This alternative would provide a new large parking area to accommodate short-term use as well as longer term use for visitors wanting to travel by shuttle bus to destinations throughout Grand Canyon Village. This alternative would maximize the use of Canyon View Information Plaza by focusing visitor access at this location.

This chapter describes the alternative development process, the alternatives being considered, the alternatives considered but dismissed from detailed study, the environmentally preferred alternative, and proposed mitigation measures. Summary tables at the end of this chapter compare alternative components, how alternatives meet project objectives, and environmental impacts.

ALTERNATIVES DEVELOPMENT

The alternatives considered in this document are based on preliminary alternatives that were developed after the internal and public scoping process was completed. The preliminary alternatives addressed the project purpose and need for the action and were based on the objectives, planning framework, and input from the scoping effort, as discussed in Chapter 1.

Extensive data on visitor use and transportation conditions were collected in July 2006 and combined with historical data to support refinement of the alternatives. The preliminary alternatives were described for the public

in an August 2006 newsletter, and comments, issues, and concerns were requested from the public. The alternatives were subsequently refined in November 2006 based on the collected data and public comments on the preliminary alternatives. Potential impacts on cultural and natural resources were of paramount importance in this process, and efforts were taken to avoid adverse impacts where possible or to minimize the potential for adverse impacts. The refined alternatives and specific elements, such as parking, shuttle bus, and commercial tour bus improvements, were then reviewed by the interdisciplinary team and evaluated at a Value Analysis / Choosing by Advantages workshop held in late February into early March 2007. This workshop identified the advantages of the refined alternatives and compared costs of each alternative (NPS 2007h). The results of the analysis were used to identify the most advantageous components of the alternatives and to craft the agency preferred alternative, alternative B.

Throughout the alternatives development process, numerous optional plan elements and combinations of elements were studied and subsequently eliminated from further consideration (see the “Alternatives Considered but Dismissed from Detailed Study” section in this chapter for more information).

PLANNING CONSIDERATIONS AND ASSUMPTIONS

The alternatives were defined to meet the objectives of the plan within the “Planning Framework” as described in Chapter 1 (see page 8). The sizes of facilities and the scale of operational strategies in the plan — the requirements — were determined using available data and several assumptions. The primary data and assumptions used in the development of the alternatives include the following:

- Data collection was conducted in July 2006 on the numbers and times of day for South Rim visitor entries, traffic, numbers of vehicles in parking lots,

duration of parking, and shuttle bus system ridership (David Evans and Associates [DEA] 2006). These data were combined with information on vehicle entries by type of user at each entrance station for June, July, and August 2005, and data on the time required to process vehicles at the entrance stations were collected in September 2005 to determine the patterns of visitor arrivals and visitor use in Grand Canyon Village and the required capacity of the South Entrance Station. It is assumed that the current patterns will continue in the future, although the numbers of visitors arriving will increase.

- As stated in the “Planning Framework,” it is assumed that annual visitation will increase 23% over the life of the plan and peak-season visitation is expected to increase 20%. It is assumed that visitation on the design day would increase 20% over the life of the plan.
- Because existing overnight accommodations, including campsites and lodging rooms, are fully occupied during the peak season, all future visitation growth will be accounted for by increases in day visitors. It is assumed that visitors arriving by private vehicle, tour bus, and Grand Canyon Railway would all increase at the same rate over time.
- Available data indicate that visitors who park at or near Mather Point spend about 1 hour in the Mather Point area. The data also indicate that day visitors spend an average of between four and five hours in Grand Canyon Village (including the time spent at Mather Point). It is assumed that visitors would spend similar amounts of time in these areas in the future unless changes occurred in visitor services or the modes of travel used by visitors.

The following sections describe how the requirements were determined for the key components of each alternative.

South Entrance Station

The action alternatives were developed to provide sufficient capacity at the South Entrance Station for private and administrative vehicles, tour buses, and future shuttle buses during peak hours on the design day in 2020. The number of service lanes required under each alternative was determined based on the numbers of day and overnight visitor vehicles, plus other traffic that would pass through the entrance station in a peak 15-minute period. The time required to process each type of vehicle was determined based on data collected in 2005 (Upchurch 2005). Recent improvements to the entrance station added a service lane, bringing the number of lanes to five, and provided a second collection booth in each of two lanes. After observing the operation of the entrance station with these improvements over Memorial Day weekend in 2007 (Upchurch, pers. comm. 2007), the estimated capacity of the station was refined. As described in Chapter 1, the park is preparing to construct up to two additional northbound lanes and a 0.5-mile bypass lane at the south entrance to further alleviate congestion and safety issues during high visitor use periods. This is described in alternative A (the no-action alternative).

Alternative D would require the most capacity at the South Entrance Station because most day visitors to the South Rim would continue to pass through the entrance station, with up to 20% more visitors passing through the station than in 2005. Alternatives B and C, which would provide visitor parking in Tusayan, would reduce the share of visitor vehicles traveling into the park through the South Entrance Station. The required capacity of the station for these alternatives was reduced in proportion to the share of visitor vehicles expected to park in Tusayan.

Day Visitor Parking

The plan alternatives address parking needs for day visitors. It is assumed that overnight visitors would continue to park at their accommodations as well as other locations in

Grand Canyon Village. Visitor parking requirements were estimated using data on the time and numbers of visitor arrivals from the South and East Entrances, and the current occupancy and length of stay in parking lots in Grand Canyon Village. There are currently about 2,040 parking spaces in designated visitor parking areas. Recognizing that some of the spaces are used by overnight visitors and assuming that the overall parking occupancy would be 85% (which allows for efficient turnover of spaces), about 1,190 parking spaces are available for day visitors. About 80 of these parking spaces are in the lot at Mather Point. (There are 111 total spaces at Mather Point. At 85% occupancy there are effectively 94 parking spaces, of which 14 are used by overnight visitors and other drivers). The overall number of available spaces is not adequate to meet existing or future parking demand; therefore, the action alternatives all include new day visitor parking. The shortage of parking at Mather Point compared to other lots is especially critical.

The action alternatives would provide new parking to accommodate visitors to the entire Grand Canyon Village area and to replace any existing visitor parking that would be removed or converted to other uses. The alternatives would meet short-term parking needs at Canyon View Information Plaza for visitors stopping at the Canyon View Visitors Center to plan their visits, to take advantage of the available visitor services, and view the canyon from Mather Point. Parking at this location would also meet the needs of day visitors to Grand Canyon Village, with varying numbers of parking spaces located near Canyon View Information Plaza and outside the park.

The number of parking spaces needed to meet projected day visitor needs depends on the length of time visitors would spend in Grand Canyon Village and the location of proposed parking. New parking facilities away from primary visitor destinations would require visitors to travel by shuttle bus to reach their destinations, thereby extending their stays and increasing the number of required spaces.

- For visitors parking on national forest system land north of Tusayan, it was assumed they would park an average of 5.75 hours. They would spend about 1 hour waiting for and riding the shuttle bus to and from Canyon View Information Plaza, where they would spend 1.0 to 1.5 hours, plus 3.0 to 4.0 hours visiting other areas of Grand Canyon Village. Time spent riding shuttle buses is based on the anticipated frequency of shuttle bus service and the assumed operating speeds for the routes. Time spent at Canyon View Information Plaza is based on an existing 60-minute stay plus additional time that would be spent at proposed new facilities.
- For visitors parking at Canyon View Information Plaza and riding shuttle buses through Grand Canyon Village, it was assumed they would park an average of 5.5 hours. They would spend 1.0 to 1.5 hours in the plaza area, plus 4.0 hours elsewhere in the Grand Canyon Village.
- For visitors parking in existing parking lots in Grand Canyon Village, it was assumed they would park an average of 4.0 hours and spend this time in the village area. The overall duration of stays for visitors to Grand Canyon Village is based on data collected in July 2006 (NPS 2007f).

The number of parking spaces needed at Canyon View Information Plaza would be a function of the number of visitor vehicles approaching the plaza, the percentage of the visitors choosing to stop, and the duration of visitor stays. All action alternatives would include the addition of the sale of limited pre-packaged food items, bike rentals, and a theater at Canyon View Information Plaza. These visitor services would increase the share of visitors desiring to stop and the length of time they would stay. It is assumed that 85% of day visitors and 60% of overnight visitors would stop at Canyon View Information Plaza on the way to their final destina-

tions (compared to existing 80% of day visitors and 50% of overnight visitors currently stopping at Mather Point). It is assumed that visitors would spend an average of 1.5 hours at Canyon View Information Plaza and Mather Point (compared to 1.0 hour currently). The extended length of stay is based on the assumption that 50% of visitors to Canyon View Information Plaza would view the program in the theater and that they would spend 45 minutes waiting for and viewing the program. It is assumed that 4% of visitors would rent bikes and spend 2.5 hours riding them. Because of the limited food items that would be offered, it is further assumed that visitor stays would not be lengthened as a result.

Alternatives B and C, which include day visitor parking outside the park, would require fewer parking spaces for short-term use at Canyon View Information Plaza because a portion of the visitors who would otherwise park at Canyon View Information Plaza would be traveling there in shuttle buses from outside the park.

Tour Bus Parking

Commercial tour bus parking requirements were estimated using data on daily tour bus arrivals at the South Rim entrance stations for the 2005 peak season and observations of tour bus parking activity at Canyon View Information Plaza and Bright Angel Lodge in July 2006 (DEA 2006). The observed conditions were expanded to represent design conditions for each alternative for the 2020 planning horizon year. It was assumed that half of the large commercial tour buses that enter Grand Canyon Village on the design day would be parked at any one time.

Shuttle Bus Service

The action alternatives include improvements to the existing South Rim shuttle bus service between Canyon View Information Plaza and Grand Canyon Village and on the Kaibab and Hermits Rest routes. In addition, alternatives B and C include new shuttle bus service be-

tween Tusayan and Canyon View Information Plaza. The numbers of buses required to operate the service and the maximum frequency of service (minimum time between buses on each shuttle route) were based on peak-hour conditions on the design day. Annual operating statistics and costs were estimated recognizing that some shuttle bus routes would not operate and that the number of buses operating on other routes would be reduced during periods of low visitation.

South Rim Shuttle Bus Service

The current South Rim shuttle bus service provides access between Canyon View Information Plaza, visitor parking facilities, and multiple visitor attractions. Current shuttle bus ridership data were collected in July 2006 and used in the definition of shuttle bus elements of the action alternatives. Several options for the South Rim routes were developed for consideration in the Value Analysis workshop held in February 2007. Each of the action alternatives developed for this visitor transportation plan would be expected to cause most day visitors to begin their park visit at Canyon View Information Plaza, resulting in this area becoming a more important visitor entry and orientation point and transportation hub than it is today. Shuttle bus service options were developed to provide adequate capacity to move visitors from Canyon View Information Plaza to other locations in Grand Canyon Village. Shuttle bus options considered would also provide increased capacity recognizing existing and potential future overcrowding on the Village and Hermits Rest routes, and the need for improved access to the South Kaibab trailhead. Shuttle bus options that would reduce indirect travel on the existing shuttle bus system for popular visitor trips were also considered. It was assumed that all South Rim shuttle bus routes would use standard transit buses (40-seat capacity). A preferred option for shuttle bus routes was identified in the Value Analysis workshop and advanced for inclusion with all action alternatives in this document. The selected shuttle bus option is

described under “Elements Common to All Action Alternatives.”

Tusayan to Canyon View Information Plaza

Passenger demand for shuttle bus service between Tusayan and Canyon View Information Plaza for alternatives B and C was computed based on estimated private vehicle arrival and departure rates at the parking areas in Tusayan, including the proposed shuttle transfer facility on national forest system land near Tusayan. Vehicle arrival rates were based on projected design day arrival rates for day visitor vehicles at the South Entrance Station in 2020 and an assumed share of visitors who would choose to park in Tusayan or at the proposed shuttle bus transfer facility on national forest system land near Tusayan. An occupancy factor of 2.9 passengers per vehicle was used to estimate transit passenger demand given the vehicle arrival rate. The required frequency of shuttle bus service and the resulting number of buses were determined assuming both standard transit buses (40-seat capacity) and high-capacity transit buses (64-seat capacity) to demonstrate the tradeoffs associated with different shuttle bus sizes. Fewer buses would be required and less frequent service would be offered with high-capacity buses.

Daily and peak season estimates of operating statistics for the Tusayan shuttle bus service were developed as described for the South Rim shuttle bus service. For the purposes of alternative definition, service levels were assumed to be consistent for each day in each operating season. Actual daily service levels could be modified to increase or decrease as visitation levels dictate over each seasonal period.

Level of Detail and Phased Development

Preliminary facility and equipment costs and ongoing operations and maintenance costs are provided for the full implementation of each alternative. These costs provide an estimate for planning purposes and allow for a compar-

ison of alternatives. The capital cost estimates provided in this document are in 2010 dollars; operating costs are in 2007 dollars and are in addition to current operating costs. Actual costs could be higher or lower and would be refined, along with the design details of the selected alternative, in future stages of project development.

The information presented in the action alternatives is based on conceptual designs and the best available data at the time of analysis. Specific distances, areas, and layouts used to describe the alternatives are estimates that would be refined during design development. If any changes proposed during the design process were inconsistent with the intent and assessed effects of the selected alternative, additional environmental compliance would be conducted as appropriate.

The facilities, services, and related equipment provided under each action alternative were defined to meet visitor transportation needs during typically busy days in the peak season (Memorial Day through Labor Day) in 2020. The improvements included in each alternative would be developed in phases, with the most pressing needs being addressed in the initial development phase. Later phases of development would be designed to meet evolving visitor transportation needs through an adaptive management approach, as discussed later in this chapter. This plan documents the characteristics and impacts of each alternative, assuming full implementation of the alternative and visitation levels projected for 2020.

DESCRIPTION OF ALTERNATIVES

The no-action alternative (alternative A) is described first, followed by a discussion of the elements that would be common to all the action alternatives (B, C, and D), followed by a detailed description for each alternative. For each alternative, an overview of the strategic approach is presented, and the alternative is further defined by a description of proposed actions, organized geographically by locations within the project area. Each alternative also includes a proposed implementation strategy and summary of costs.

ALTERNATIVE A: NO ACTION

Strategic Approach

Alternative A is the no-action alternative, and it assumes that the current mix of transportation modes, or the way that people travel to and around the park, and the way that the park manages visitation and the services it provides for visitors, would continue through 2020. The park's overall transportation system, including park facilities (buildings, roads, trails, parking areas), operations and management strategies, and visitor services, would continue with no substantial improvements or modifications except for those projects for which NEPA compliance has been completed or is underway. These projects represent the current NPS management direction for the park. There would be no new construction triggered by this alternative, beyond what is already scheduled as described under "Park Planning Documents and Other Relevant Projects" (page 13) and in Appendix D. Alternative A provides a baseline for comparing the other alternatives, evaluating the magnitude of proposed changes, and measuring the environmental effects of those changes.

Circulation patterns of visitors within the park varies somewhat by season. The South Entrance Road and Desert View Drive would continue to be open to private vehicles year-

round. Hermit Road would continue to be closed to private vehicles between March 1 and November 30 and to commercial tour buses year-round. The park concessioner would continue to operate bus tours along Hermit Road. Existing trails in the project area would be maintained in their current condition under alternative A, including the Rim Trail and Greenway connectors. No new trail segments would be constructed.

This section further describes the components of alternative A. The key elements of this alternative are summarized in Figure 3.

Transportation System Elements

Canyon View Information Plaza and Mather Point

The Canyon View Visitors Center would continue to be used as a primary information and orientation facility, with ongoing interpretive programs. However, visitor access to the facility would remain limited to tour buses, shuttle buses, bicycles, or pedestrians coming from Mather Point (where there is limited private vehicle parking). The existing 24 commercial tour bus parking spaces would be retained. No new amenities would be provided at Canyon View Information Plaza.

Mather Point would still be accessible by private vehicle, and 111 parking spaces would continue to be provided for private vehicles. Tour buses would be prohibited from the Mather Point lot, and a shuttle bus for visitors with mobility limitations would operate between Canyon View Information Plaza and Mather Point.

Visitors would continue to park along the South Entrance Road near Mather Point when the parking lot was full, and visitors walking between Mather Point and Canyon View Information Plaza would continue to cross the road, which would remain in its current location. Park staff would continue to monitor

and use methods to move traffic and visitors along so as to manage traffic congestion and resource impacts in the area.

Grand Canyon Village Visitor Vehicle Parking

Existing parking for day and overnight visitors would remain at lots A, A Annex, B, C, D, and E; Bright Angel Lodge; Bright Angel trailhead; Yavapai Observation Station; El Tovar / Hopi House; the powerhouse area; and along Village Loop Drive (see Figure 4). No changes would be made to existing parking capacities at these locations.

Large numbers of visitor vehicles would continue to park along the roadside near Mather Point and Yavapai Observation Station. Parking areas at Yavapai Lodge, Maswik Lodge, and Thunderbird and Kachina Lodges would continue to be used mostly by overnight visitors, although day visitors could still park in these areas. A total of about 2,040 visitor parking spaces would continue to be provided, of which approximately 1,190 would be effectively available for use by day visitors. The National Park Service would not implement any parking management strategies under this alternative.

Yaki Point and South Kaibab Trailhead

Access to Yaki Point and the South Kaibab trailhead would continue to be restricted to shuttle buses, park administrative vehicles, and commercial use authorization (CUA) permit holders using the South Kaibab Trail. Concession-operated tour buses would continue to use Yaki Point. Some visitors would continue to park on the Desert View Drive roadside by the picnic area, near the intersection of Desert View Drive and the Yaki Point access road, and walk to Yaki Point or the South Kaibab trailhead, particularly during the peak spring and fall hiking seasons. Other visitors would continue to park elsewhere in Grand Canyon Village and ride shuttle buses to these locations. Many would need to transfer between shuttle bus routes at Canyon View Information Plaza.

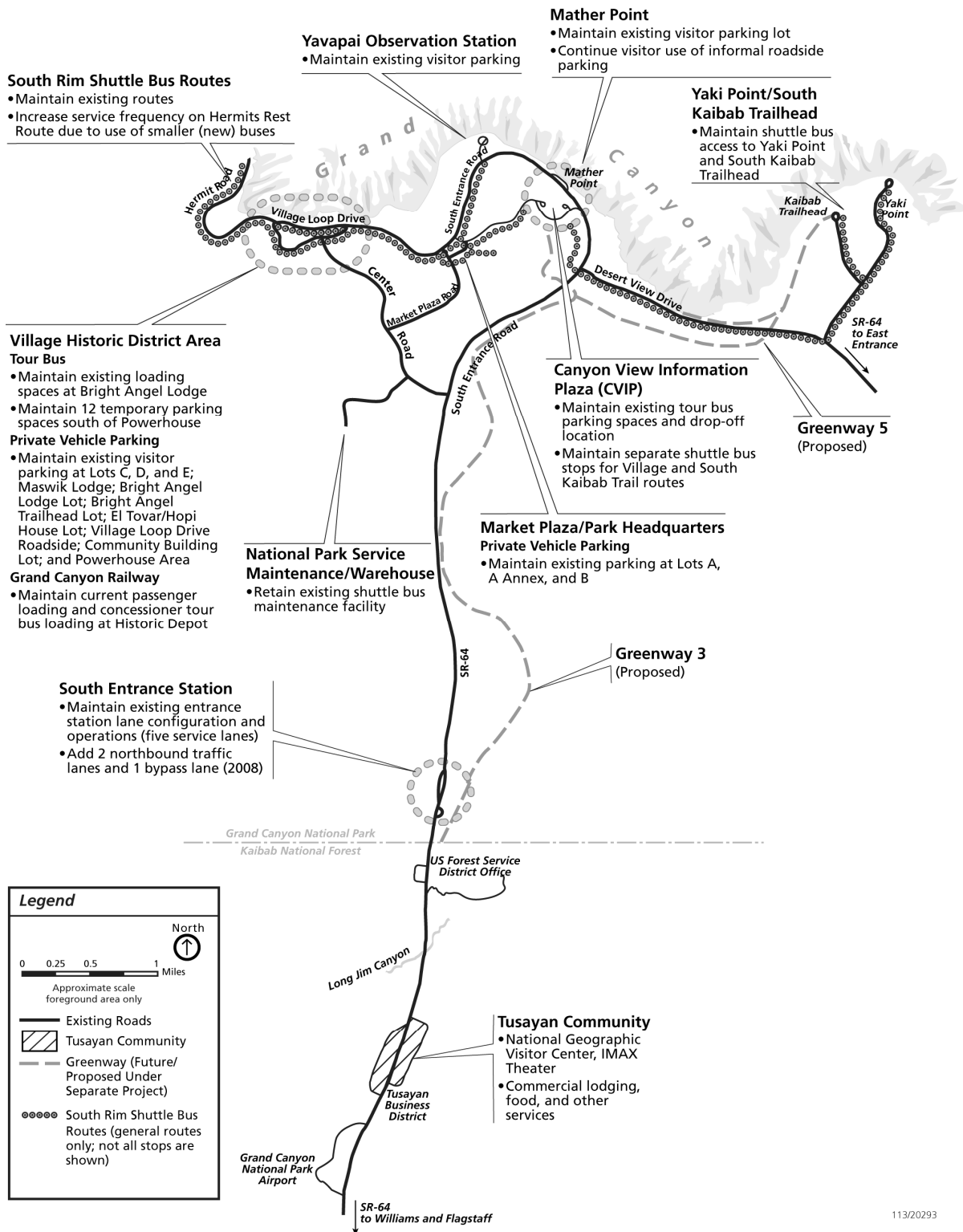
South Entrance Station

The South Entrance Station would continue to operate with five entry lanes and one exit lane west of the entrance lanes. Four entry lanes would continue to be configured for fee collection and one entry lane would continue to be dedicated for use by park employees and residents, visitors, and others holding park passes or receipts. To relieve congestion at the station, the park recently added a fifth lane and added three pre-fabricated kiosks to increase operational capacity. One kiosk was placed at lane 5, and two were placed north of the pre-existing kiosks on lanes 2 and 3, allowing multiple vehicles to be processed at the same time. This configuration would be monitored to assess its operating efficiency. As discussed in the “South entrance Road Improvements” section (page 15), the park would construct up to two additional northbound lanes between the park boundary and the South Entrance Station to alleviate some of the current congestion, and it would construct a 0.5-mile separate inbound bypass lane to the east of the station for shuttle buses and other authorized traffic (see Appendix D). These scheduled improvements would complement recent modifications at the entrance station. Park entrance fee collection administration activities would continue to be located in several places in the administrative area of the park.

Tour Bus Parking and Drop-off

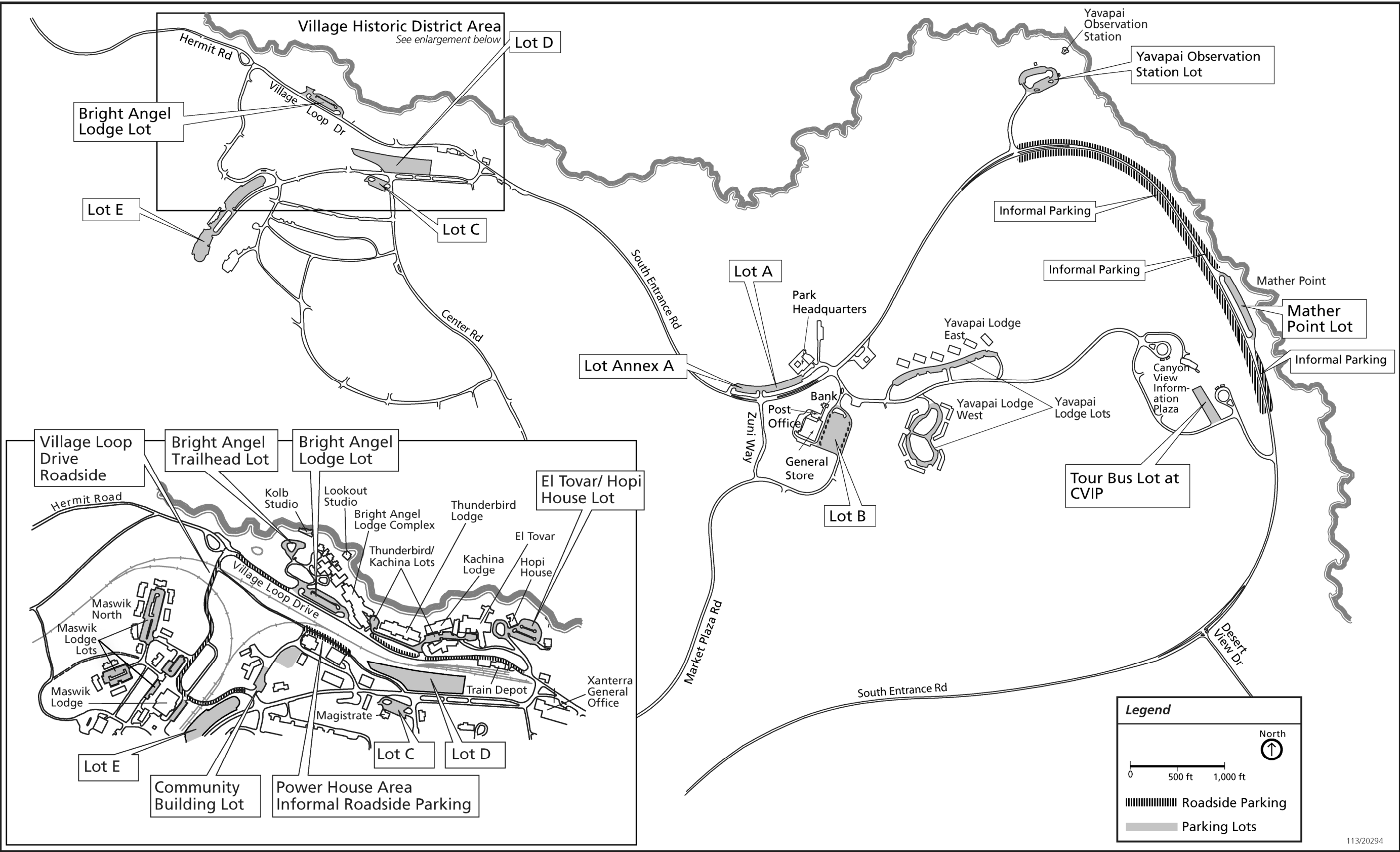
Tour bus access would continue to be provided to the South Rim and would not be expanded. Designated parking would continue to be provided in a paved area in the eastern portion of Canyon View Information Plaza, where 24 buses can be accommodated (see Figure 4). Loading and unloading for up to 6 tour buses would be retained at Bright Angel Lodge. Tour buses also would continue to park in lot B (Market Plaza), lot E (near the Backcountry Office), between the livery stable and powerhouse, which can accommodate up to 12 buses, and in scattered informal locations throughout Grand Canyon Village.

FIGURE 3. ALTERNATIVE A: OVERVIEW



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FIGURE 4. ALTERNATIVE A: SOUTH RIM PARKING LOCATIONS



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There would be no changes to tour bus access, and no additional tour bus parking would be provided. Tour bus drivers would continue to park wherever space was available. The National Park Service would remove parking restrictions for 20- to 21-foot tour buses to enable these vehicles to park in standard vehicle spaces. CUA permit holders would be notified of changes, including new policies, for NPS tour bus management.

Grand Canyon Railway Passenger Loading

The Grand Canyon Railway would continue to operate one to two trains per day from Williams. Passengers would continue to unload at the existing platform near the historic depot and cross Village Loop Drive to reach the rim area. Train passengers would continue to be able to board concessioner-operated tour buses adjacent to the depot. These tour buses would continue to be parked overnight at lots near Maswik Lodge or the former gasoline station site near Yavapai Lodge.

South Rim Shuttle Bus Service

Shuttle bus service would continue to operate on three primary routes in Grand Canyon Village and on Hermit Road.

- The Kaibab Trail route would operate from Canyon View Information Plaza to Yaki Point. It would serve the South Kaibab trailhead and the Pipe Creek Vista overlook on its return route to Canyon View Information Plaza.
- The Village route would operate between Canyon View Information Plaza and the beginning of Hermit Road in the Village Historic District and Maswik Lodge area. It would serve most key visitor destinations in-between.
- The Hermits Rest route would operate from the beginning of Hermit Road in the Village Historic District to Hermits Rest when Hermit Road is closed to private vehicles. The park is purchasing new vehicles for the Hermits Rest route to replace a portion of the aging fleet on

that route. These vehicles will have a lower seating capacity than the current vehicles, requiring service to be operated more frequently to maintain the current passenger capacity. The Hermits Rest route would be operated with three more vehicles, which would reduce the time between buses during the peak-period from approximately 9.4 minutes to 6.8 minutes.

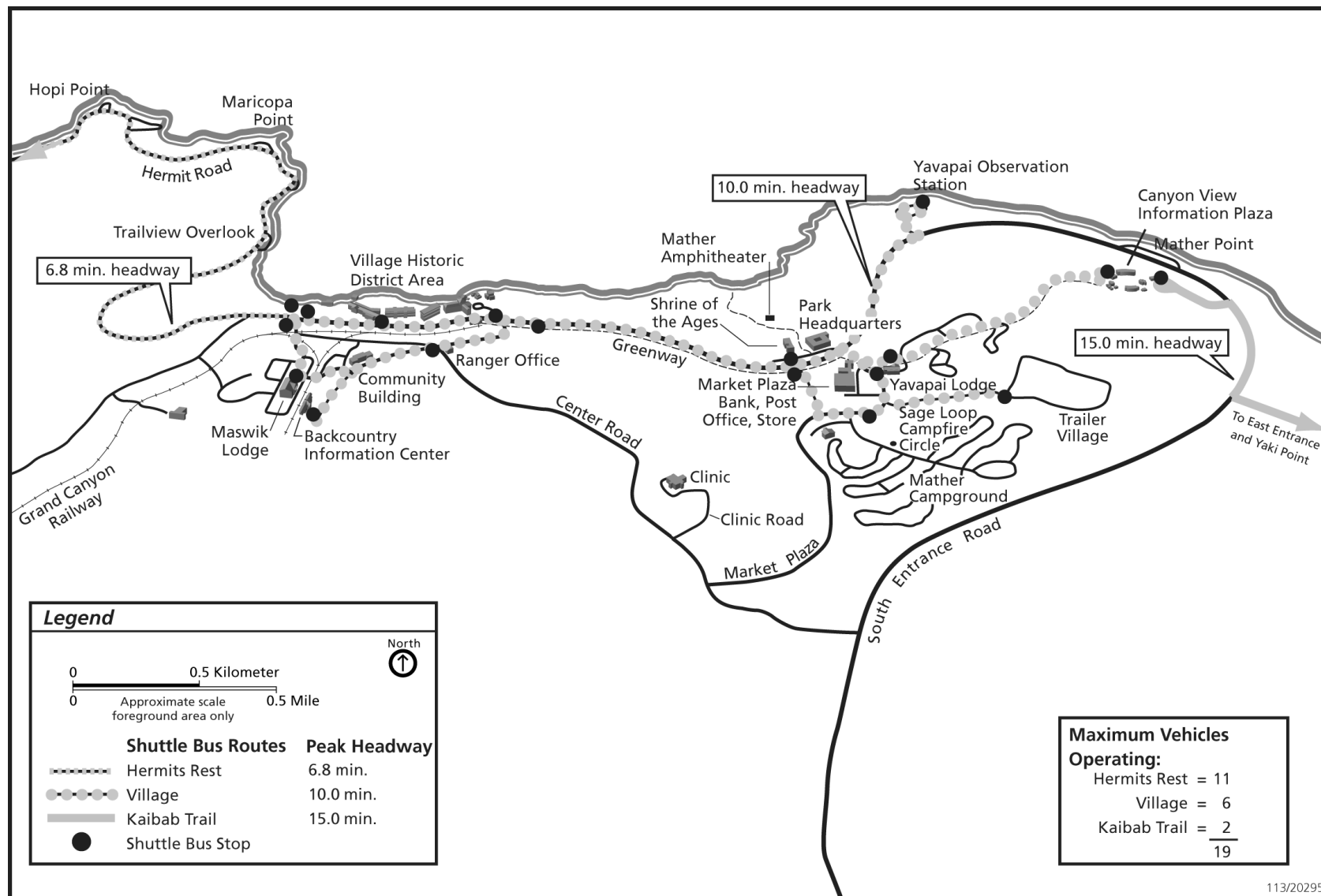
In addition to the primary shuttle routes, the Hiker Express service would continue to connect Bright Angel Lodge and the Backcountry Information Center directly to the South Kaibab trailhead. A shuttle for visitors with mobility limitations also would continue to operate between Canyon View Information Plaza and Mather Point. Route lengths, peak-season headways, and vehicle requirements for each of the South Rim routes in the no-action alternative are illustrated in Figure 5 and listed in Table 1.

TABLE 1. ALTERNATIVE A: PEAK-SEASON CHARACTERISTICS FOR SOUTH RIM SHUTTLE BUS ROUTES

Route	Length (in miles)	Time between Buses (in minutes)	Maximum Vehicles in Operation
Hermits Rest	16.0	6.8	11
Village	8.0	10.0	6
Kaibab Trail	6.0	15.0	2
Hiker Express	12.0	60.0	1
Canyon View Information Plaza/ Mather Point	1.0	15.0	1 (small bus)
Vehicle Subtotal			21
Number of Vehicles Required			
•Floater Vehicles			4
•Spare Vehicles			5
Total Fleet			30

The existing maintenance facility for the contractor-operated South Rim shuttle bus service would continue in use without any modifications under this alternative. It is assumed that the minor increase in fleet vehicles, due to the planned purchase of new vehicles and dedication of more vehicles to the Hermits Rest route, could be accommodated at this facility with a minor loss of efficiency.

FIGURE 5. ALTERNATIVE A: SOUTH RIM SHUTTLE BUS SERVICE



Transportation Operation Strategies

The park currently employs some transportation operation strategies to aid visitors with trip planning and facilitate traffic flow. Under alternative A, the park would continue its current transportation management program which includes providing trip planning information to park visitors through the park website, highway advisory radio, outreach to other information providers, personal contact with visitors at the park entrance stations and contact locations outside the park, printed materials disseminated by entrance station staff, and static informational and directional signage along park roads and trails. Some of the programs the park currently uses are described below.

Traveler Information / Visitor Outreach

The park website, newspapers, and brochures provide helpful tips and information for visitors.

Entrance Fees

Park staff would expand coordination with partners and gateway communities to encourage prepayment of entry fees and to provide visitors with trip planning information before they arrive at the park. The National Park Service collects a \$25 per vehicle entrance fee, which provides access for seven days throughout the park. A \$12 fee applies to bicyclists or those on foot. Other passes available include the America the Beautiful Pass (good at all national park system and many other federal recreation areas), the Senior Pass (lifetime pass for U.S. citizens 62 or older), and the Access Pass (free to citizens with a disability). On the South Rim entrance fees are collected at the South and East entrance stations. Visitors can also purchase the seven-day entry permit at the Williams visitor center, the Valle Travel Stop, the National Geographic Visitor Center in Tusayan, and at lodging facilities in Tusayan. Visitors holding seven-day entry permits can use a prepaid lane at the South Entrance Station.

Intelligent Transportation Systems (ITS)

Intelligent transportation systems include the use of computers, communications, and data gathering technologies to collect, analyze, and share information on current transportation conditions. Under alternative A existing ITS applications include interactive informational kiosks, Internet-based park information and campground reservations, variable message signs displaying park information and owned by the Arizona Department of Transportation, highway advisory radio stations, and automated fee collection. No other ITS applications would occur under the no-action alternative other than upgrades to current systems on a case-by-case basis.

Orientation and Wayfinding

Canyon View Information Plaza is the primary location for in-depth park orientation; however, many visitors do not go to this facility due to its limited access. Some park and orientation information that allows visitors to make informed choices as they arrive is handed out at the entrance stations when they are staffed. Wayfinding is supported through informational and directional signs posted along roadways and pedestrian routes. Park information is also provided at the National Geographic Visitor Center in Tusayan, and at select locations in Flagstaff, Williams, Valle, and on the park's website.

Implementation

As described above, current transportation-related projects that would be implemented in the near term include improvements to the South Entrance Station and SR 64 corridor, as well as Hermit Road and shuttle bus service. No further modifications are proposed under this alternative.

Costs

There would be a slight increase in operations and maintenance costs due to the park's acquisition of new shuttle buses for the Hermits Rest route. These buses would accommodate

fewer passengers than the bus/trailer units they are replacing, and more shuttle buses would need to be operated to maintain the existing capacity. The total increase in annual operating and maintenance costs are estimated to be approximately \$759,000 above current costs. Funding would be allocated through the transportation fee, which comes from fees collected at park entrance stations.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES (ALTERNATIVES B, C, AND D)

Several programmatic elements as well as physical improvements would be implemented as part of any action alternative. Most of these elements are related to operations and complemented by some physical improvements that together would support the park's overall transportation program and visitor experience. These components are described below.

Adaptive Management

All action alternatives would incorporate adaptive management approaches to meet the objectives of the plan. Each alternative would be implemented in phases over time. The park would initially implement those physical improvements (e.g., parking lots) that address the highest need while at the same time investing in operational strategies (such as new directional signs and improved website information). The park would closely monitor the success of these changes before any additional actions were taken. The park would track quantitative information (such as parking occupancy in lots), as well as qualitative information (such as ease of access to key visitor destinations), to evaluate the effectiveness of the first phase of improvements in addressing the park's most pressing transportation needs. Through adaptive management park staff would be able to adjust the timing or intensity of a project as information and feedback were gathered and patterns were tracked. This type of program would also aid the park in making

decisions as to when to undertake projects based on need and funding availability. The principles of adaptive management would be used throughout the life of the plan, so that each successive set of actions would be refined based on lessons learned from earlier phases.

Table 2 describes this adaptive management process and provides specific examples of strategies and potential actions that could be implemented under all of the action alternatives. These examples — for visitor parking, the South Entrance Station, and the South Rim shuttle bus service — would be supplemented and refined upon completion of this plan.

Canyon View Information Plaza Visitor Amenities

Bicycle Opportunities

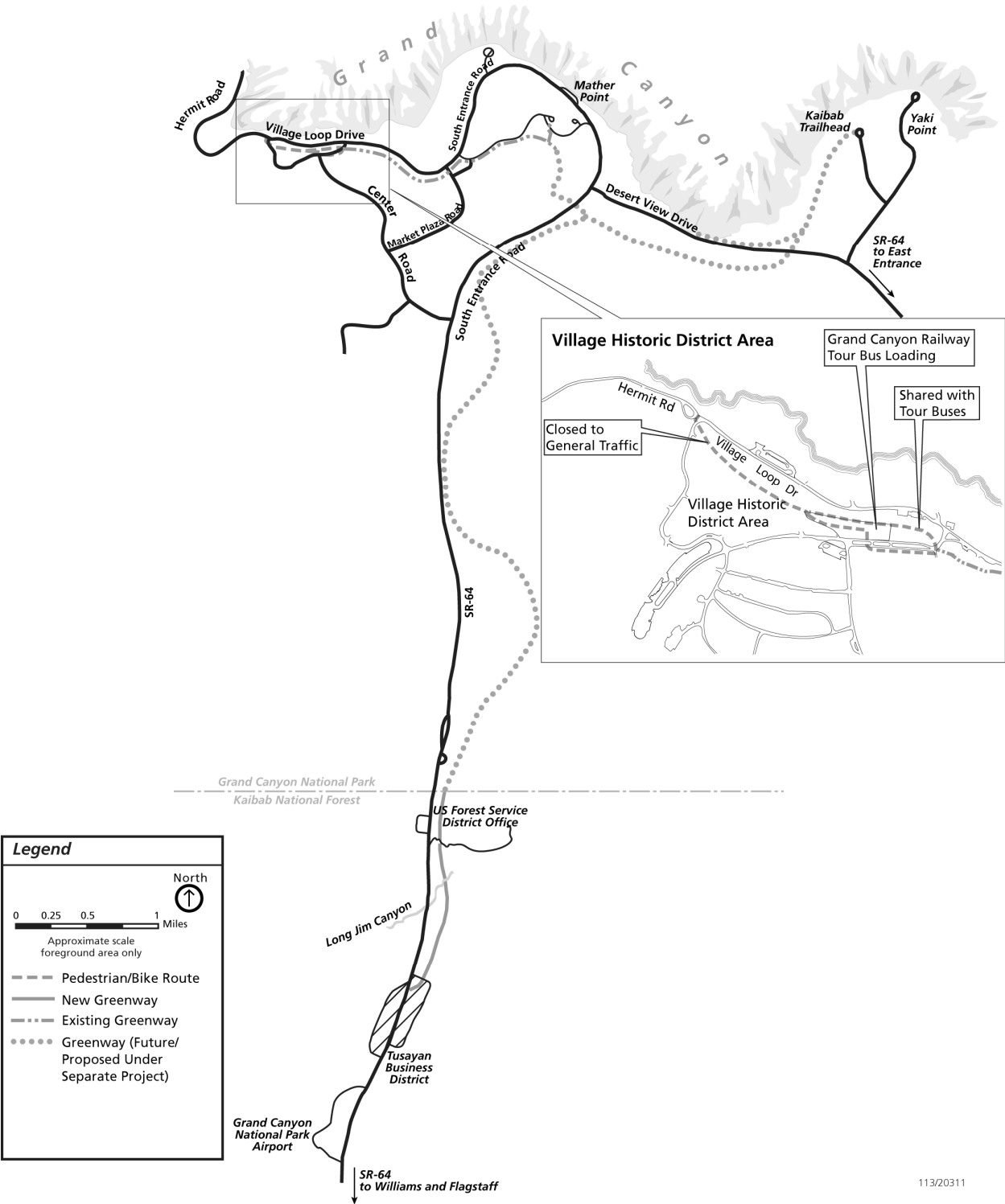
A bicycle rental facility would be constructed at the Canyon View Information Plaza complex. Visitors renting bicycles would have the option of riding on nonrestricted paved roads, on the planned Greenway Trail connecting to Tusayan as well as to the Village Historic District. As part of a current planning effort for the Greenway Trail phase V, the National Park Service is also proposing bicycle and pedestrian trail connections from Canyon View Information Plaza and the Greenway Trail phase III segment to the South Kaibab trailhead (see Figure 6).

The National Park Service also proposes improving bicycle access from the east side to the west side of Village Loop Drive through the railyard in the Village Historic District. This improvement would provide opportunities for continuous off-road bicycling from Canyon View Information Plaza through the Village Historic District to Hermit Road. A more detailed description of the Greenway Trail system on the South Rim and how it relates to this planning effort is included below under "Greenway Trail Expansion."

TABLE 2. ADAPTIVE MANAGEMENT PROCESS FOR THE SOUTH RIM VISITOR TRANSPORTATION PLAN

Actions Implemented	Phase I (by 2010)		Future Phases (by 2020)	
	Monitor	Implement	Monitor	Implement
Phase I improvements implemented.	Monitor and evaluate phase I improvements. Watch for specific indicators to identify any problems. Determine if a problem is short-term, such as temporary spikes in visitation, or a recurring, long-term trend.	Implement short-term operational changes if indicators show a problem is not long-term. Initiate design work for next phase of development.	Monitor and evaluate short-term operational changes. Determine if problem has been resolved or if additional changes are needed. Complete design work for next phase of improvements if problem has not been resolved.	Implement next phase of physical improvements, if needed
Visitor Parking				
Initial phases constructed for visitor parking and associated improvements at Canyon View Information Plaza and/or Tusayan (depending on alternative)	Monitor traffic volumes entering the park and track total accumulation of vehicles: <ul style="list-style-type: none"> • Are vehicles circling parking areas searching for open spaces? • Are visitors parking illegally along roadsides and in nondesignated areas? • Are some parking areas underutilized? 	Take measures to address problems: <ul style="list-style-type: none"> • Actively manage parking to more effectively use underutilized spaces in Grand Canyon Village and Tusayan (depending on alternative) • Provide flaggers and real-time information about available parking. • Encourage overnight visitors to park once and ride the shuttle bus to get around. • Encourage use of the East Entrance Station to relieve pressures in Grand Canyon Village 	Monitor traffic volumes entering the park and track total accumulation of vehicles: <ul style="list-style-type: none"> • Are vehicles circling parking areas searching for open spaces? • Are visitors parking illegally along roadsides and in nondesignated areas? • Are some parking areas underutilized? 	If monitoring indicates an ongoing problem, implement the next phase of physical improvements: <ul style="list-style-type: none"> • Construct additional parking at Canyon view Information Plaza and/or in Tusayan (depending on alternative).
South Entrance Station				
Five service lanes and stacked kiosks are operational; bypass lane constructed; South Entrance Road widened for total of two northbound lanes.	Monitor traffic volumes entering the park and track service and waiting times at the South Entrance Station: <ul style="list-style-type: none"> • Are vehicle waits exceeding 15 minutes? • Are vehicle queues extending south of the park boundary? 	Take measures to address problems: <ul style="list-style-type: none"> • Encourage offsite sales of park entrance passes. • Designate additional service lanes for use by visitors with prepaid entrance passes. • Encourage shuttle bus use to enter park from Tusayan. • Encourage use of the East Entrance Station. 	Monitor traffic volumes entering the park and track service and waiting times at the South Entrance Station: <ul style="list-style-type: none"> • Are vehicle waits exceeding 15 minutes? • Are vehicle queues extending south of the park boundary? 	If monitoring indicates an ongoing problem, implement next phase of physical improvements: <ul style="list-style-type: none"> • Evaluate use of additional stacked kiosks. • Construct an additional service lane (depending on alternative).
Shuttle Bus Service				
South Rim shuttle bus route improved, new shuttle bus stops constructed, and some minor increases in service frequency implemented.	Monitor shuttle bus service in cooperation with service provider: <ul style="list-style-type: none"> • Do large numbers of riders have to stand on shuttle buses? • Are visitors regularly left behind at shuttle bus stops because there is not enough room on buses? • Are any routes underutilized? • Is there a pattern in the time of day or season for spikes in crowding? 	Take measures to address problems: <ul style="list-style-type: none"> • If some routes are underutilized, promote their use by encouraging visitor activities associated with that route (e.g., promoting canyon rim hikes that are served by shuttle buses other than the Hermit Road rim hikes). • Add one shuttle bus during the time of day when visitor use is highest (adjust or decrease service during low use times). 	Monitor shuttle bus service in cooperation with service provider: <ul style="list-style-type: none"> • Do large numbers of riders have to stand on shuttle buses? • Are visitors regularly left behind at shuttle bus stops because there is not enough room on buses? • Are any routes underutilized? • Is there a pattern in the time of day or season for spikes in crowding? 	Implement long-term operational and physical improvements: <ul style="list-style-type: none"> • Add more buses to routes up to anticipated service frequencies.

FIGURE 6. SOUTH RIM PEDESTRIAN / BIKE ROUTES



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Food Items

Limited, prepackaged food items would be provided for sale at Canyon View Information Plaza under the action alternatives. For purposes of this analysis, this service is assumed to be a small-scale operation that would be incorporated with either the bicycle rental or existing bookstore facility.

New Interpretive Services and Visitor Amenities

The existing Canyon View Visitors Center would be expanded to accommodate a theater that would seat up to 250 visitors and would provide two shows per hour of a new film to orient visitors to the park and tell the Grand Canyon story. In addition, enhanced interpretive exhibits would be provided at Canyon View Information Plaza and would include other related exterior visitor amenities as needed, such as seating and shade shelters within the existing plaza area.

Mather Point Improvements

To address the need for enhanced accessibility and safety for visitors at Mather Point, several actions are proposed that would be common to all action alternatives. When the improvements had been completed, the primary Mather Point overlook would be accessible to all visitors, including those with disabilities. An accessible trail, approximately 200 feet long and approximately 6 feet wide, would be constructed from the canyon rim to the primary easternmost overlook and would be compliant with current safety standards and the “Proposed Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas” (Architectural and Transportation Barriers Compliance Board 2007). This would require some rock removal on the point, areas of fill, construction of retaining walls or other structural supports, the addition of walls, guardrails, and/or handrails in some locations, and modifications to the base of the existing stairway. Vegetation would be removed in some locations along the rim edge to accommodate the new trail.

The existing rocky, uneven surface of the point would be made more uniform through rock removal, fill, and/or the addition of concrete or another appropriate material. Existing guardrails and handrails could also be modified as needed. Specific distances, widths, locations, and style of these improvements would be determined during the design phase for the project. The existing stair access would remain or a reconstructed access would replace it so as to provide two access points to the overlook. All of these improvements would be designed to achieve the project objectives while minimizing resource impacts as much as is practicable.

To enhance canyon viewing opportunities for visitors from the existing rim trail, vegetation would be cleared in some areas where trees and shrubs have grown in to block the views since the original construction of the Mather Point facilities in 1953. Vegetation treatments would primarily include the removal of trees and shrubs, as well as the pruning of tree limbs and shrubs. This strategic vista clearing would be carefully evaluated by park resource specialists to select the most appropriate areas to enhance the view while also minimizing impacts to park resources.

A canyon viewing area, approximately 40 feet by 30 feet, would also be created on an existing small, flat rock outcropping to the east of the primary overlook and adjacent to the Rim Trail. The area is already flat and open, so improvements would be minimal and would include hardening the surface and installing walls, guardrails, and other appropriate barriers along the edge.

Where necessary, existing paved surfaces throughout the Mather Point area would also be repaired, widened where appropriate, and resurfaced as needed to eliminate uneven surfaces and provide accessible transitions between existing and new pedestrian pathways. Some existing vegetated islands between the Mather Point parking lot and the canyon rim could be modified or removed to accommodate more pedestrians in conjunction with

parking and access improvements. To the extent possible, small-scale features such as benches and railings would be retained. Also, along the rim additional walls and/or guardrails/handrails might be needed for better visitor safety. Through later design phases, other visitor amenities such as seating, picnic tables, shelters, and trash receptacles would be located in previously disturbed areas. All of these proposed improvements at the Mather Point overlook would be in keeping with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1996b) and would be carefully evaluated by park staff in consultation with the State Historic Preservation Office during the design phase.

Grand Canyon Village

Visitor Parking

Most existing parking lots in Grand Canyon Village would be retained except for changes to accommodate tour buses and the elimination of parking at Mather Point. (Alternative C would retain parking at Mather Point but restrict its use to visitors with mobility permits.) Visitor vehicle parking improvements would include the organization and delineation of parking areas, changes in use for portions of parking facilities, and strategies to reduce/eliminate informal roadside parking.

All of the regular private vehicle parking spaces at lot D would be converted to tour bus loading operations or would be displaced by the restoration of the underlying railroad tracks (see Figure 8). Tour bus parking would be better defined in lot E and tour bus operators would be directed to use the spaces in lot E. Overall, the number of parking spaces available for day visitors in existing Grand Canyon Village lots would decline from about 1,190 to about 1,040. The displaced day visitor parking would be accommodated at proposed new parking facilities described under each action alternative, primarily at Canyon View Information Plaza. Overnight parking now occurring in lot D would be accommodated in lots C and E. Visitors using these more remote locations for overnight parking could use the

shuttle bus system to reach destinations on the canyon rim.

Physical barriers such as curbing, boulders, or other deterrents to prevent roadside parking would be installed along the roadside between Mather Point and the Yavapai Observation Station access drive, and along Desert View Drive near the Yaki Point picnic area.

Tour Bus Parking and Drop-Off

Opportunities for commercial tour bus access would be expanded at Canyon View Information Plaza and selected overlooks in Grand Canyon Village. Improvements would include expanding tour bus parking capacity at the plaza to 40 spaces and striping the Yaki Point parking area to accommodate seven tour buses on a first-come, first-served basis.

A December 2005 *Environmental Assessment* and “Finding of No Significant Impact” for the rehabilitation of Yavapai Observation Station recommended work to restore the original open-air terrace (NPS 2005). For this work to occur, visitation to this facility would need to be limited to approximately 2,500 people daily. To ensure that those numbers were achieved, the “Finding of No Significant Impact” recommended that tour buses no longer have direct access to this facility. This plan recommends that limited tour bus access to Yavapai Observation Station be allowed from November through February only, with the parking area accommodating up to three tour buses at one time. This tour bus access would be provided on a trial basis and monitored to ensure that it did not overwhelm the recently renovated facility. If the facility became overwhelmed, tour bus access would be discontinued.

Loading and unloading for up to six tour buses would be retained at Bright Angel Lodge. After unloading here, the tour buses would be directed to park at lot E, which could accommodate up to 14 buses, or between the livery stable and powerhouse, which could accommodate up to 12 buses. (See Figure 4 for these locations). Either the

National Park Service or its service providers would use roving parking/tour bus management staff to enforce tour bus loading and unloading and parking policies. Overnight parking for up to 9 buses would be allowed in the loading and unloading spaces for Grand Canyon Railway bus tours described below.

Grand Canyon Railway Staging

There are seven railroad tracks within the railyard adjacent to the Grand Canyon Depot. Grand Canyon Railway currently uses four of the tracks to provide passenger service from Williams to the Grand Canyon. Tracks 5–7 are south of tracks 1–4, and a portion of tracks 5–7 are buried beneath lot D. If needed, the park could allow additional tracks (likely 5 and 6) to be opened in the future to accommodate additional trains, and additional environmental analysis could be required to assess the effects of additional train service and more passengers. Opening these tracks would displace a portion of the parking spaces in parking lot D. It is assumed that track 7 would not be needed by 2020.

To improve railway passenger tour bus loading operations, a one-way westbound access road and nine passenger loading and unloading spaces would be provided on the south side of the railyard and within the eastern portion of parking lot D for Grand Canyon Railway bus tours. The access road and tour bus loading/unloading spaces would be constructed on the south side of track 6 and over a portion of track 7, north of the Bright Angel Wash. As needed, a new passenger loading/unloading platform between the tracks as well as between the bus loading area and the tracks would be provided. A portion of the stone masonry wall on the east side of the railyard would need to be removed to build the access road. The access road would be approximately 14–16 feet wide and paved. Vehicular parking would be eliminated from lot D except for nine spaces that would be available for overnight parking for commercial tour buses. The park concessioner, in cooperation with the National Park Service,

would actively manage tour bus and train loading/unloading operations. (See Figure 7 for proposed improvements at lot D.)

All visitor vehicular traffic on Village Loop Drive would be required to circulate past the Maswik Lodge; the Old Village Bypass Road (a narrow one-way road that extends from the west side to the south side of Village Loop Drive) would be closed to all but administrative use. This closure and change in traffic routing would need to be adaptively managed to ensure that it did not result in traffic congestion near Maswik Lodge.

From east to west, pedestrians and bicyclists could share the new access road for tour buses serving Grand Canyon Railway and could continue to Hermit Road by way of the Old Village Bypass Road. Existing paths along the south side of Village Loop Drive could also be used to connect to the Old Village Bypass Road and access Hermit Road. (See Figure 6 for proposed Greenway Trail improvements and bicycle/pedestrian connectors.)

South Rim Shuttle Bus Service

The South Rim shuttle bus service for all action alternatives would include the following:

- increased frequency of service to address current demand that exceeds capacity, as well as increases in future ridership due to projected visitation growth
- changes to the Village route to eliminate indirect movements that increase travel time for visitors
- access improvements to Yaki Point and the South Kaibab trailhead
- better operating efficiency

The shuttle bus routes included in all action alternatives are illustrated in Figure 8 and described below:

- *Hermits Rest Route* — The frequency of service on the Hermits Rest route would be increased to provide a minimum time between bus arrivals at each stop (also referred to as headway) of 6

minutes. The frequency of service on the Hermits Rest route would be limited to retain the desired visitor experience along Hermit Road. Adaptive management strategies would be applied to establish a balance between ridership demand and shuttle bus service on this route while protecting resources and the desired visitor experience. These strategies could include adding a bus to the route during especially busy periods or active visitor management measures that would encourage visitors to go to other areas in Grand Canyon Village during times that the Hermits Rest route is overcrowded.

- *Village Route* — The Village route would be simplified so that a common path would be followed in both directions for most of its length. The route would operate on the roadways closest to the canyon rim. The Village route would provide access to Mather Point from Canyon View Information Plaza by way of a portion of the proposed realigned South Entrance Road, and it would extend to Yavapai Observation Station along the present South Entrance Road. Yavapai Observation Station would be served in both directions, rather than only in the westbound direction from Canyon View Information Plaza. Two new stops (one in each direction) would be required near the park headquarters to serve Market Plaza. The stops would be located along the South Entrance Road near the pedestrian trail that connects the Mather Amphitheater / Park Headquarters on the north side of the road to the Market Plaza area on the south side. The existing shuttle bus stops at the nearby Shrine of the Ages would be removed. The portion of the Village route that serves the Mather Campground, Trailer Village, and Market Plaza would be eliminated and served by an extension of the Kaibab Trail route. The frequency of service on the refined Village route would be in-

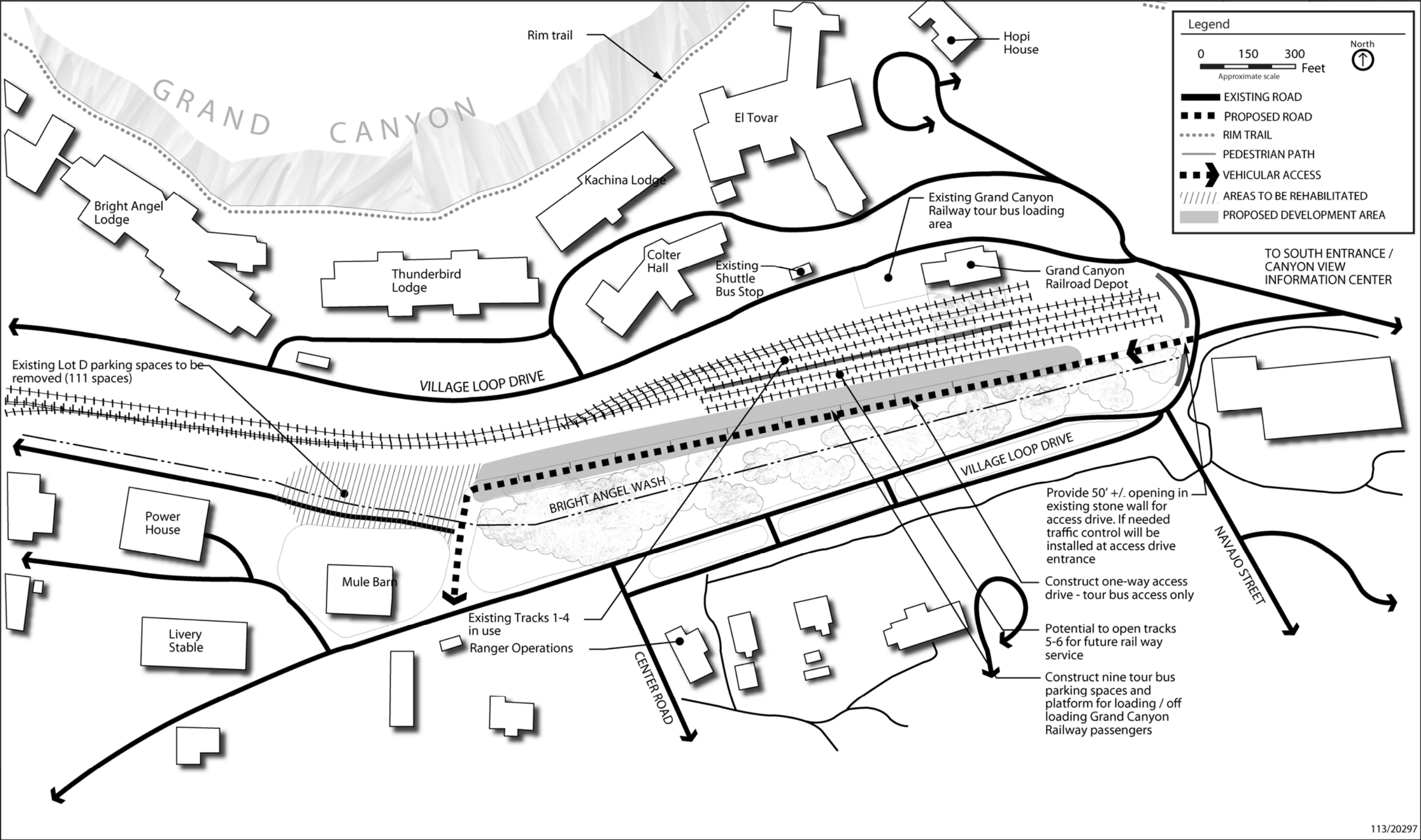
creased to 7.5 minutes between buses, as opposed to the existing 10 minutes.

- *Kaibab Trail Route* — The Kaibab Trail route would continue to serve areas east of Canyon View Information Plaza. The route would be extended to serve the eliminated portions of the Village route from Market Plaza to Mather Campground. The service frequency would be slightly improved from 15 minutes between buses to 12.5 minutes to accommodate demand along the portion of the route serving Market Plaza. The route extension and improved frequency would increase the opportunity for visitors to use the shuttle bus system to access Yaki Point, the South Kaibab trailhead, and future extensions of the Greenway Trail system east of Canyon View Information Plaza.
- *Other Routes* — The Hiker Express route would be retained, but the Canyon View Information Plaza / Mather Point route for mobility limited visitors would be eliminated since the Village route would provide this service.

The proposed South Rim shuttle bus system would provide three primary transfer points between routes — at Canyon View Information Plaza, Park Headquarters, and the Hermits Rest / Village transfer location at the west end of the village. Ongoing adaptive management would be applied to adjust service frequencies to accommodate future changes in passenger demand, travel patterns, and desired visitor experiences. Visitor use and shuttle bus travel patterns would be monitored to assess the impacts of the proposed new visitor facilities at Canyon View Information Plaza (such as the theater and bike rental) on visitor behavior and travel desires.

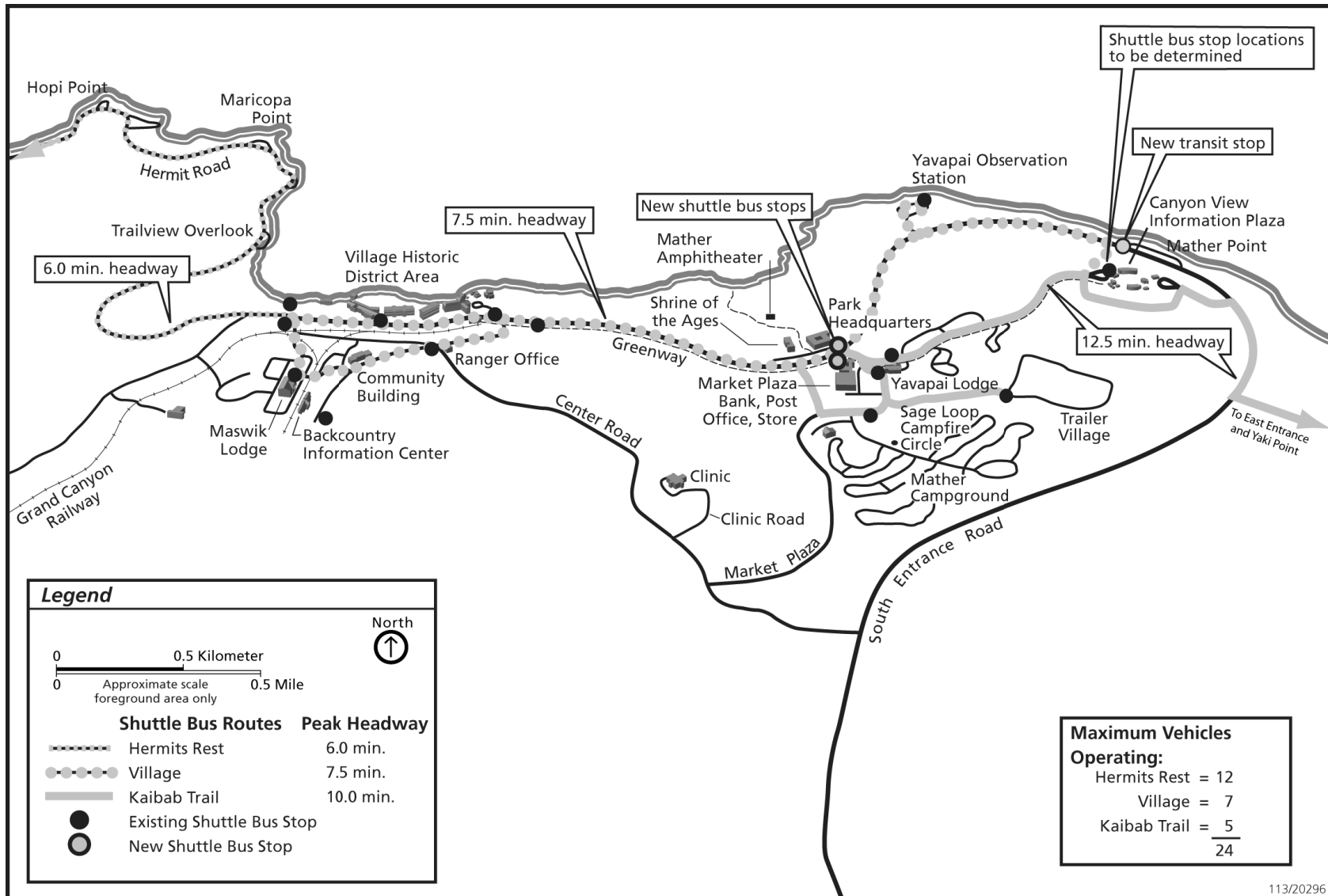
The shuttle bus service provider might need to use additional shuttle buses and drivers and/or use buses normally reserved as spares to meet demand on peak days. Through adaptive management it would be determined if a higher than normal percentage of reserve

FIGURE 7. COMMON TO ALL ACTION ALTERNATIVES: GRAND CANYON RAILROAD YARD IMPROVEMENTS



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FIGURE 8. COMMON TO ALL ACTION ALTERNATIVES: SOUTH RIM SHUTTLE BUS SERVICE



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buses (e.g., 20%–30%) should be used for flexible demand responses on high use days based on cost-effectiveness.

As part of the new shuttle bus services, the National Park Service or its service providers would station greeters at key stops to assist with orientation during implementation of the new services. As part of the adaptive management process, park staff would review the results of this program on a regular basis to determine if the use of greeters should be extended beyond the initial implementation period (e.g., beyond the second year of operation of the new shuttle bus services).

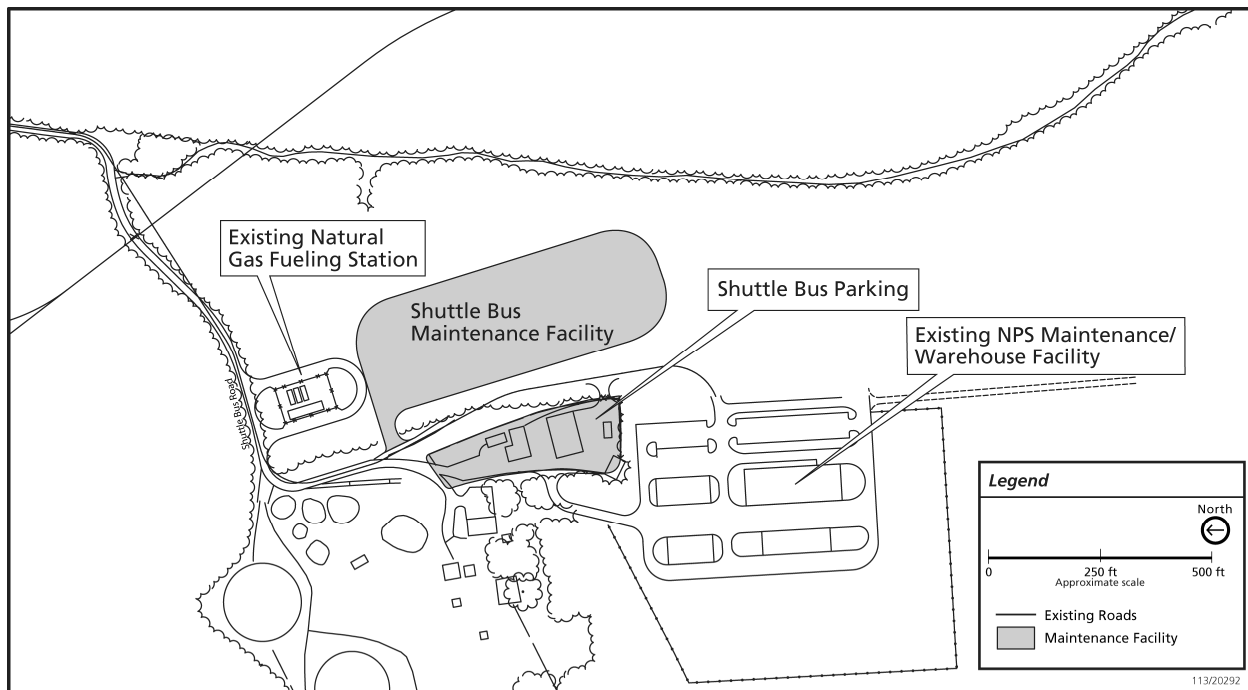
As part of the proposed shuttle bus service improvements under the action alternatives, park interpretation and orientation could be provided by the driver or audio/electronic systems. These systems could use pre-recorded announcements on the vehicles' public address systems, personal headsets, or

electronic screens, depending on cost and available technology.

Shuttle Bus Maintenance and Storage Facility

The 1999 *Environmental Assessment for the South Rim Maintenance, Warehouse, and Transportation Facilities* (NPS 1999b) found that the current maintenance facility used for the South Rim shuttle bus service is inadequate for an expanded visitor transportation system. The 1999 *Environmental Assessment* identified a 45.5-acre site to accommodate shuttle bus and light rail transit vehicle maintenance facilities (see Figure 9). Subsequently, a general program was developed to determine design parameters, site requirements, and cost estimates for a maintenance facility to serve the buses that would be required to support the action alternatives considered in this document. The required facility could be developed well within the

FIGURE 9. COMMON TO ALL ACTION ALTERNATIVES: PROPOSED SHUTTLE BUS MAINTENANCE AND STORAGE FACILITY



areas of disturbance defined in the 1999 *Environmental Assessment*. The key assumptions used to define the characteristics of the shuttle bus maintenance facility included:

- capacity for a vehicle fleet of up to 53 standard shuttle buses, or 48 vehicles with a mix of 38 standard buses and 10 high-capacity/articulated buses and the ability to accommodate a 10% increase in the fleet
- outdoor bus parking
- work sites for up to 120 employees
- operation of the system by a private contractor, overseen by the National Park Service
- the outsourcing of major vehicle repairs (engines, transmission, air conditioning system, tires and body/paint), but onsite brake work and tire replacement
- an overall site of 6.4 acres, with a 64,000-square-foot building, a portion of which would be on the site of the existing bus maintenance facility

For alternatives with a smaller bus fleet, it was assumed that the facility requirements and associated costs would be reduced in proportion to the size of the bus fleet.

Construction Staging and Temporary Facilities

Each action alternative would be implemented in phases. A variety of construction projects would occur at different times and at different sites within the project area. A material and equipment staging area for construction would be designated for each project, either in a previously disturbed area near the project site or in other disturbed areas that would best meet the project needs and minimize new disturbance. As part of the construction staging, an asphalt batch plant would be set up at the park's dump site (previously used for this purpose); it is located approximately 0.25 mile west of the South Entrance Road and east of Center Road, near Grand Canyon Village. This approximate 5- to 8-acre site was

previously disturbed and could potentially be used for construction staging and an asphalt batch plant as part of the Hermit Road project (see Appendix D).

In preparation for anticipated work at Canyon View Information Plaza, a temporary 150-space gravel parking lot would be constructed adjacent to the west shuttle bus stop at the plaza. This lot could be used by visitors to the South Kaibab trailhead until the new parking areas were completed and open for use. As part of final construction, the gravel lot would be incorporated into the proposed Canyon View Information Plaza development.

South Rim Trails and Greenway Trail Expansion

Existing trails in the South Rim area would be retained under all action alternatives. Use of the Rim Trail, in combination with shuttle and parking area improvements, would provide expanded hiking opportunities. Visitors would also be able to park once, hike out, and take a shuttle back to parking areas.

Consistent with previous park planning, an extension of the Greenway Trail system (phase III) would be completed between Canyon View Information Plaza and Tusayan (NPS 2002b). While the portion of the proposed extension from the information plaza to the park boundary near the South Entrance Station has been approved, only a very small section has been constructed. Under the action alternatives considered in this document, the remaining 1.2 miles of the trail from the park boundary to the north end of Tusayan would be constructed, but along a different alignment than that studied in 2002 (see Figure 6). The new alignment would be on the east side of SR 64 on national forest system land, and the southern terminus would connect to the proposed roundabout on SR 64 to be constructed by the Arizona Department of Transportation just north of milepost 236. Visitors could then access the park by trail from Tusayan, and once in the park, they could connect to the existing South Rim and

Greenway trail systems. The entire proposed trail extension from Canyon View Information Plaza to Tusayan would most likely be constructed at one time and coordinated with the U.S. Forest Service.

The trail concept identified in the 2002 *Greenway Trail Environmental Assessment* analyzed a trail that would be 10 feet wide with a hardened surface and a stabilized shoulder made from a mix of aggregate and topsoil. The current planning effort proposes a change to the trail surface for the entire phase III alignment to better facilitate use by bicyclists and equestrians. This change would include a 7- to 8-foot-wide asphalt paved area for bicyclists and pedestrians, with an adjacent 2- to 3-foot-wide gravel path for equestrians, for a total width of 10–11 feet. A stabilized shoulder, as described above, would be included. An area 12 to 14 feet wide would be temporarily disturbed during construction. Areas along the trail that might experience heavy runoff could be paved for the entire width to prevent erosion. The trail would be constructed in accordance with the “Proposed Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas” (36 CFR Part 1195) for recreational trails.

The Greenway Trail would extend the Arizona Trail into the park for hikers, cyclists, and equestrian users. Motorized vehicles would not be allowed except for maintenance activities or emergency access. Areas along the trail with dense vegetation might be cleared below shoulder height for safer maneuverability. The trail would become part of the park’s overall trail system and would be included in routine patrols by park rangers. Safety and traffic control signs would be located along the trail as needed.

An additional route for bicyclists and pedestrians through the Village Historic District would provide a convenient connection from the terminus of the Greenway Trail at the east end of the Village Loop Drive to Hermit Road, (discussed in more detail under “Grand Canyon Railway Staging”).

South Entrance Station Fee Administration Facility

As part of the proposed improvements to the South Entrance Station, a new approximately 1,000-square-foot fee administration building would be constructed east of the entrance station (see **Error! Reference source not found.**, **Error! Reference source not found.**, and **Error! Reference source not found.** later in this document). Currently, fee administration activities occur at several locations in the park; these dispersed functions would be consolidated at the new facility to improve operational efficiency. Once the building was constructed, the existing fee collection administration space would be made available for other park uses. Improvements would also include construction of an access drive, employee parking, and a pedestrian path between the new facility and the entrance station. The new access road to the fee administration building would intersect the South Entrance Road approximately 750 feet north of the entrance station.

Transportation Operation Strategies

Under all action alternatives the National Park Service would implement a broad range of management strategies to improve the effectiveness of transportation-related facilities and services already in place, thus reducing, postponing, or eliminating the need for substantial investment in facilities or other capital improvements while also improving the visitor experience. These strategies are intended to:

- positively influence visitation patterns, such as encouraging off-peak visitation
- encourage visitors to use other approaches or methods to enter the park (for example, using the East Entrance) to alleviate overcrowding at the South Entrance
- provide higher capacity and more efficiency within existing facilities, such as modifying fee collection procedures at the South Entrance Station and directing visitors to available parking spaces

- improve the integration of transportation systems, such as providing for better connections between parking and transit, and wayfinding (signs and other information used to guide visitors to their desired destinations)

The following transportation operation strategies would function together as a set of inter-related tools. They would be closely monitored by park staff to determine their effectiveness, both individually as well as collectively, and adjustments would be made to improve them accordingly.

Parking Management

A coordinated visitor information and marketing program, including real-time information on parking availability in the park, would be developed to encourage visitors to use the parking as described in each alternative.

The National Park Service would actively manage parking for maximum utilization of parking areas. Appropriate parking management solutions (ITS, parking management staff with radios, etc.) would be determined for each activity area, including Canyon View Information Plaza, Market Plaza, and Grand Canyon Village, because each has unique needs and configurations. Active parking management would require park staff to determine a sequence to appropriately fill parking areas as visitors arrived and would provide real time parking availability information so visitors could decide where to go.

Parking management efforts would focus on lots A through E (see Figure 4) and would involve delineating all parking spaces in Grand Canyon Village and examining the potential to maximize the number of cars that could be parked. The use of designated parking spaces would allow parking to be allocated by vehicle type (e.g., automobiles, RVs, and tour buses), as well as by function (e.g., overnight lodging versus short-term day parking). The National Park Service would encourage and strongly promote a “park once” approach for overnight visitors near their accommodations,

recommending that visitors leave their vehicles parked and use the shuttle bus service. The National Park Service would also provide real-time parking availability by using low technology systems (i.e., simple, manually changed signs — one before arriving in Tusayan and two at Canyon View Information Plaza). For alternatives B and C, which include parking near Tusayan, the National Park Service would also apply these parking management strategies to those new lots.

On days when visitation was higher than the design day (primarily the Memorial Day, July 4th, and Labor Day weekends), the National Park Service would intensively manage parking. On these occasions the shuttle bus service provider might use spare buses to meet demand (see “South Rim Shuttle Bus Service”). The transit service provider could be contracted to manage this effort.

Traveler Information System / Visitor Outreach

Under all action alternatives traveler information systems and visitor outreach programs would be implemented for visitors in private vehicles and commercial tour buses, as well as for pedestrians and bicyclists, to improve their visitor experiences and to efficiently distribute visitors on the South Rim. Improvements could include new information sources and enhanced orientation and planning information to promote efficient trip planning by visitors. Park staff could use this information to manage visitor trips, thereby relieving congested areas and promoting the use of less frequented areas.

The National Park Service would provide in-park and regional trip planning tips that would reflect a welcoming and informative “know before you go” approach. For example, other park and regional attractions could be promoted, such as the Grand Circle and mini-Grand Circle with Wupatki National Monument, Sunset Crater Volcano National Monument, for visitors to consider in their trip planning.

The National Park Service would create an enhanced website to make travel information and solutions to traffic congestion at the South Rim readily available and easy to find and understand. Links for other transportation providers, such as Grand Canyon Railway, could also be available on the park's website, as well as video podcasts on pertinent information for visitors. In addition, the National Park Service would prepare a standard visitor outreach media "kit," which would be updated annually; provide regular updates to the 511 traveler information system and highway advisory radio; and enhance printed media, such as brochures and the Grand Canyon's visitor's guide, in a manner similar to the website. The National Park Service would also coordinate with businesses and partners outside the park to pursue incentives to encourage off-peak or car-free travel.

By using all of these media sources, the National Park Service would seek to reinforce the following key messages to visitors:

- when to generally expect parking and congestion problems and visitor travel-oriented tips (including identifying less congested times of day, how to get to the East Entrance Station, etc.)
- suggestions to arrive at off-peak times or seasons to reduce demand in peak periods — As an incentive for visitors to alter travel behavior and travel off-peak, the park would promote the potential for visitors to save travel time, improve the range of visitor experiences, and the probability of available parking.
- suggestions to use environmentally friendly transportation alternatives for coming to the park (such as leaving one's car outside the park and using Grand Canyon Railway or other tour options to visit)
- the availability and travel benefits of using the shuttle bus service
- the option of obtaining entrance passes at offsite outlets, how to purchase them,

and how to use the pre-paid lanes at the South Entrance Station

- promotion of the East Entrance Station as an alternative to the South Entrance Station to enter the park and access the South Rim
- the availability of NPS-scripted, in-park, self-guided tours that would offer a range of experiences for differing lengths of stay and activity interests

In addition, the National Park Service would continue to refine fee collection processes to reduce transaction times at the South Entrance Station. The use of static and electronic signage and highway advisory radio would be improved to easily inform visitors of which lane to use as they approached the entrance station. These improvements would reduce overall wait times for entering the park.

Offsite Pass Sales

The National Park Service would actively strive to increase offsite sales of park entrance passes by means of kiosks, web sales, and outreach to businesses in gateway communities. All offsite pass transactions would provide opportunities for the purchaser to acquire information regarding shuttle bus services and routes, websites, entrance station operations, and parking. In addition, the park would work with business communities in Tusayan, Williams, Cameron, and Flagstaff to potentially increase park pass sales through methods such as kiosks, lodging and retail sale sites, and marketing materials.

Intelligent Transportation Systems

The National Park Service would implement the ITS measures as described under alternative A, plus under all action alternatives additional dynamic visitor information would be offered about congestion and transit choices en route to the park. Grand Canyon National Park ITS information would also be provided at Canyon View Information Plaza, lots A-E in the Village, and within the Tusayan area. Improvements to regional ITS information for

visitors who are en route to the park would be provided through an agreement with the Arizona Department of Transportation to use the state's changeable message signs.

Transportation Operations Coordination and Monitoring

The National Park Service would set up an annual coordination and monitoring program for transportation operations and related visitor outreach. This monitoring program would be an integral component of the adaptive management approach for transportation-related programs and facilities. A designated staff person would be assigned to coordinate these efforts. Specific monitoring activities would assist the park with determining if objectives were being met and in making adjustments and management recommendations (i.e., increased or decreased parking management, changes in information outreach techniques or messages). As an example, based on the results of project monitoring, park staff might decide to pursue short-term pilot programs to test new methods and management techniques.

The National Park Service would also undertake data collection to gain an understanding of visitor satisfaction and suggestions for improvements. Other operational efforts could include coordinating with shuttle bus staff to identify potential changes to the shuttle bus service; applying for transportation grants to fund future improvements to transportation operations in the park; and exploring opportunities for partnering with regional partners.

Orientation and Wayfinding

Under all action alternatives the “Draft Sign Plan for the South Rim” (NPS 2004b) would be updated, and park orientation and wayfinding would be improved by using consistent graphics for parking areas and shuttle stops and by improving vehicular circulation. An easily recognized sign system for shuttle bus users would be established and would use common, graphically unified themes, designs

for visitor information materials, and vehicle paint schemes that would match graphics on websites and park maps. This would help guide visitors to key activity areas, parking, and shuttle stops. Signs, icons or graphic systems would help visitors make routing decisions to parking areas, shuttle bus stops, and other points of interest or attractions.

The National Park Service would implement improvements to wayfinding through a combination of static and dynamic signs to facilitate better in-park vehicular circulation and simplified routing to parking lots. An example would be the installation of a sign that calls out “Visitor Center x miles ahead” immediately after the South Entrance Station, followed by the use of periodic signs along the way indicating that the visitor is on the correct route to their destination (a method known as trailblazing). This could be combined with dynamic electronic signs that indicate parking availability (e.g., “Parking Available at Canyon View Information Plaza in Lot x”).

In coordination with the sign plan update, wayfinding programs for pedestrians and bicyclists would be implemented under all action alternatives. These messaging programs could include maps, signs, brochures, kiosks, and expanded Internet information.

Universal Design

The National Park Service would incorporate universal design concepts to maximize accessibility for all visitors, including those with disabilities, in all facility designs to the greatest extent possible. New pedestrian facilities would meet outdoor accessibility guidelines as outlined in the *Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas: Final Report* (United States Access Board 1999). All new or reconstructed access routes to public accommodations and commercial facilities for individuals with disabilities would meet the “Proposed Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas” (36 CFR Part 1195).