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ALTERNATIVE B: PREFERRED ALTERNATIVE

Strategic Approach

Under alternative B, the preferred alternative, the National Park Service would construct new visitor parking at Canyon View Information Plaza and initiate a new shuttle bus route to the gateway community of Tusayan. This alternative would emphasize collaboration with adjacent communities, businesses, partners, and other agencies to address South Rim visitor transportation needs and would limit new ground disturbance in the park as much as possible. The initial phase of development under this alternative would include the following key elements:

- parking for up to 600 private vehicles at Canyon View Information Plaza (and other physical improvements)
- pilot shuttle bus route between Canyon View Information Plaza and Tusayan
- an adaptive management program to closely monitor and evaluate vehicular traffic, parking use, and shuttle bus ridership to determine the timing and required components of future improvements
- a coordinated program of visitor information and marketing strategies to encourage visitors to travel into and through the park on shuttle buses

Parking at Canyon View Information Plaza would be for visitors making short stops for orientation and canyon viewing then continuing on in their private vehicles, and for a portion of visitors who would leave their cars at the plaza and ride shuttle buses to visit other South Rim destinations during the day. Visitors would continue to have the option of driving through the Grand Canyon Village and parking at an existing parking facility.

It is expected that the new parking at the South Rim would meet parking demand in the off-season (mid-September through the end of March) so that shuttle bus service to

Tusayan would be provided only from April through mid-September and as needed on other busy days. During the peak and shoulder seasons, the park would work with gateway community businesses to encourage visitors already staying in Tusayan to leave their vehicles behind and ride shuttle buses into the park. The park would monitor the use of the pilot shuttle bus route and parking in Tusayan and continue to pursue opportunities for partnering with businesses in Tusayan and other entities to meet the needs for visitor access to the South Rim.

Over time, if careful monitoring and evaluation of this first phase of implementation indicated the need, the National Park Service would construct up to 300 additional parking spaces at Canyon View Information Plaza and/or up to 400 parking spaces with supporting shuttle bus loading and visitor facilities on national forest system land immediately north of Tusayan. Expanded shuttle bus service would connect Tusayan and the potential new parking facility with Canyon View Information Plaza.

Transportation System Elements

The following describes the components of alternative B, and the key elements of this alternative are summarized in Figure 10.

Canyon View Information Plaza / Mather Point

The South Entrance Road would be realigned to loop around Canyon View Information Plaza to the south and west, providing easy access to new parking lots by using a portion of the existing service road. Where feasible, the existing service road would be incorporated into new parking lots or the realignment of the South Entrance Road; otherwise, pavement would be removed and the landscape restored. Realigning the road would allow private vehicle and commercial tour bus parking north of the road, eliminating the need for pedestrians to cross traffic when moving between the parking facilities, Canyon View Information Plaza, and Mather Point.

Changes to the South Rim shuttle bus service, the addition of a new shuttle bus route from Tusayan, and improved shuttle bus passenger loading would also make Canyon View Information Plaza more readily accessible by shuttle bus. Canyon View Information Plaza, which is intended to be the first arrival place for most visitors and where the National Park Service provides general orientation and park information for visitors, would be more readily accessible and inviting with these changes. New amenities such as the theater would enhance this arrival and visitor experience.

At Mather Point the existing South Entrance Road would be removed, along with the congested parking area, and additional pathways would be provided. Visitors would arrive at the overlook area by walking or taking a shuttle bus, rather than in personal vehicles. Tour bus access to the rim and tour bus parking at Canyon View Information Plaza would also be improved. All of these changes would encourage increased use of Canyon View Information Plaza and recognition that it is a key destination point for arriving visitors. The intent of these changes would be to reduce congestion, eliminate overflow parking along roadsides, and reduce resource impacts at Mather Point. The improvements would be designed to make visitor use areas near the canyon rim more calm, contemplative, and pedestrian-oriented. Natural resources would be restored in areas currently impacted by the road and associated roadside parking near Mather Point (see Figure 11).

Visitor Parking. New parking for up to 900 vehicles, including designated parking for persons with disabilities and RVs would be constructed adjacent to Canyon View Information Plaza. Parking for persons with disabilities would be available within 200–400 feet of the rim. The initial phase of development would provide 600 private vehicle spaces at Canyon View Information Plaza, and if needed, up to 300 additional spaces could be added as demand increased (see Figure 11). Access to the parking area for both northbound and southbound travelers would be by

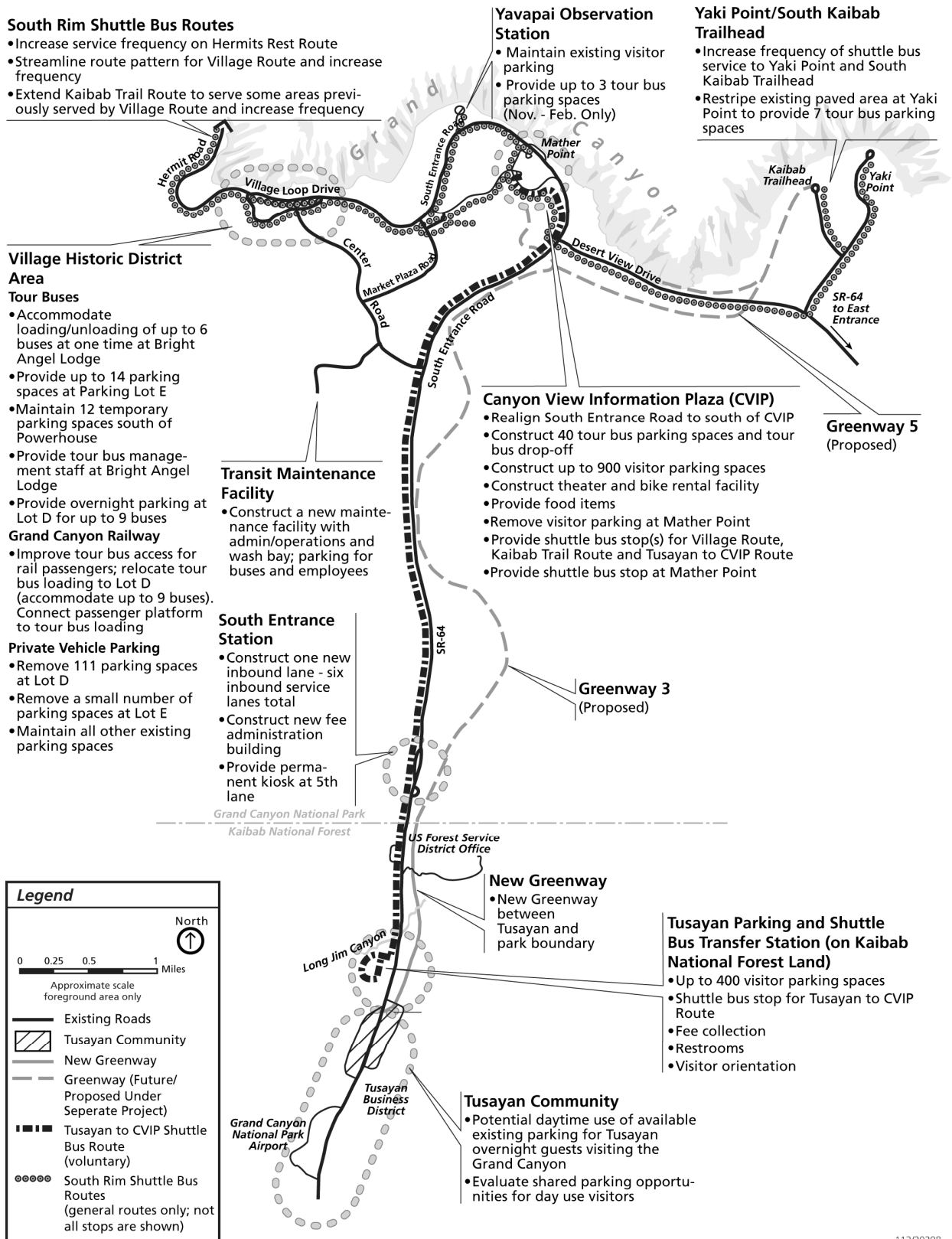
way of the realigned South Entrance Road. To lessen the visual impact of the proposed parking area, parking would be organized into clusters, each accommodating no more than 200 parking spaces and separated by large islands of retained vegetation at least 40–50 feet wide. To the extent possible, the design of parking clusters and roads would incorporate the use of native vegetation to help blend the new development into the existing landscape, and changes to the existing topography would be kept to a minimum. These vegetated islands would also provide a means for managing water drainage by incorporating detention basins or biofilters.

Clearly delineated pathways to Canyon View Information Plaza, Mather Point, shuttle bus stops, and the trail system (Greenway Trail and Rim Trail) would be included. Pedestrian crossings of traffic lanes in parking areas would be provided at appropriate locations, and directional signage for pedestrians would be installed. Parking lot and pedestrian path lighting would be provided in accordance with standards to minimize any impacts on the night sky. The parking area would also include one or two conveniently located shuttle bus loading/unloading areas for all shuttle bus routes.

Tour Bus Parking. A new commercial tour bus parking area would be provided at Canyon View Information Plaza, and the number of parking spaces would be expanded from 24 to 40 (see Figure 11). This parking area would be either north or northeast of the existing developed area. Access to the lot for both northbound and southbound buses would be from the realigned South Entrance Road.

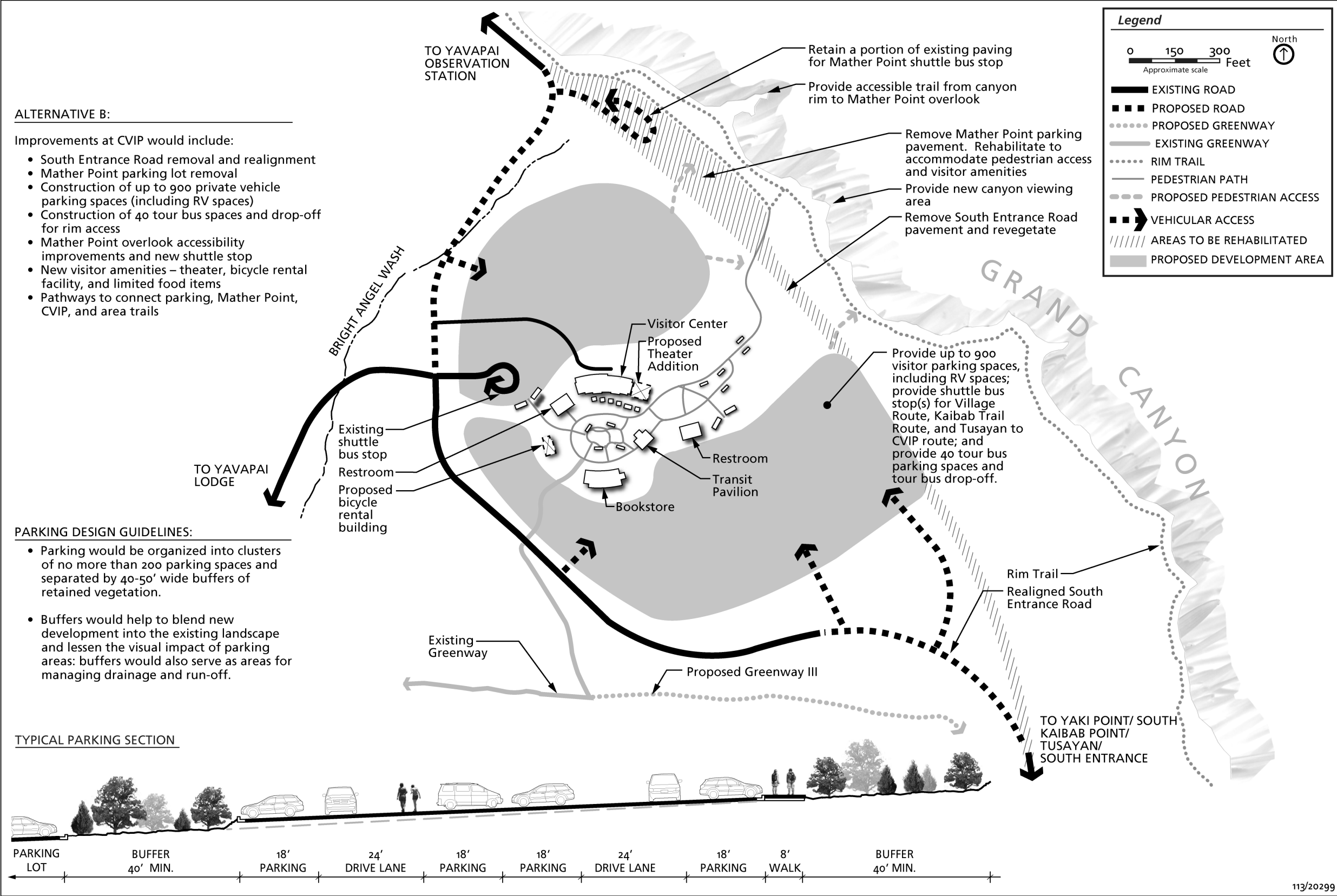
A tour bus passenger drop-off would be constructed within 200–400 feet of the rim for convenient access to rim views at Mather Point. After visiting Mather Point, tour bus passengers could either return directly to their parked bus or walk downhill to visit Canyon View Information Plaza before re-boarding their bus. A new hardened trail would be provided from the new tour bus loading area

FIGURE 10. ALTERNATIVE B: OVERVIEW



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FIGURE 11. ALTERNATIVE B: CANYON VIEW INFORMATION PLAZA / MATHER POINT IMPROVEMENTS



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to the canyon rim, and as needed to Canyon View Information Plaza. A new double vault restroom consistent in design and materials to other restrooms currently being installed at other park overlooks would also be provided near the tour bus drop-off. The initial phase of development would include the tour bus drop-off, tour bus parking, and trail connections.

Mather Point. As described in “Elements Common to All Action Alternatives,” Mather Point would be improved to make it fully accessible to all visitors. Much of the pavement in the parking lot would be removed, but paving on the west end would be retained to accommodate a new shuttle bus stop and turnaround, with a shelter, seating, and signs. Access to Mather Point from Canyon View Information Plaza and the new parking facilities there would be from existing and new pedestrian paths, or by means of the shuttle bus service. As described in “Elements Common to All Action Alternatives,” additional walls and/or guardrails or handrails might be needed along the rim for visitor safety. Areas where the South Entrance Road and parking lot are removed would be revegetated and, as needed, pedestrian paths would be provided to facilitate circulation around the rim overlooks. To the extent possible, small-scale features such as benches and railings would be retained. The changes to the Mather Point area would be implemented in the initial phase of development for alternative B.

South Entrance Station

At the South Entrance Station one additional entrance lane would be constructed, if needed, resulting in a total of six service lanes. The station would then be served by five regular service lanes, a pre-paid lane, and a bypass lane for shuttle buses and other authorized traffic. The existing prefabricated stacked kiosks in lanes 2 and 3 and the existing kiosk in lane 5 would be retained initially. One or more of the lanes could be operated as pre-paid lanes to provide additional service to visitors holding passes, re-entering the park, or purchasing passes before arriving at the

station, similar to the existing operation of the left-most service lane. Through adaptive management, the operation of the entrance station, the types of vehicles using each lane, and the use of the kiosks would be monitored and refined to address changing traffic volumes and types of transactions at the station. If the stacked kiosks continue to provide adequate capacity, they could be replaced with permanent kiosks and, if needed, a sixth service lane could be installed. An exit lane would continue to be located to the west of the entrance lanes. (See Figure 12 for the proposed improvements at this location.) No physical improvements to the South Entrance Station would be included in the initial phase of development for alternative B.

Tusayan

No new facilities would be constructed outside the park during the initial phase of alternative B implementation. A pilot shuttle bus service would be initiated to assist in determining the willingness of visitors to leave their private vehicles outside the park and use shuttle buses to reach Canyon View Information Plaza (see the “Shuttle Bus System” section below.) The pilot shuttle bus route would pick up and drop off passengers along SR 64 on a regular basis at several stops convenient to visitor lodging in Tusayan. Under this pilot program, the park would work closely with businesses to encourage park visitors to take advantage of available parking in Tusayan by riding shuttle buses into the park. Depending on the success of this pilot shuttle bus program, changing visitor access needs over time, and the availability and use of existing parking areas in Tusayan for day visitors, the park might choose to construct a new parking and shuttle bus staging area at the north end of town (as described below and analyzed in this alternative). This would be in support of a permanent shuttle bus service.

The proposed parking and shuttle bus staging improvements near Tusayan would be on national forest system land adjacent to the National Geographic Visitor Center complex on the west side of SR 64. Development would

include a shuttle bus staging and transfer area, related amenities, and new private vehicle parking for up to 400 vehicles, including spaces for persons with disabilities and RVs. The initial phase of parking development on the site would provide 200 parking spaces, with up to 200 more parking spaces added as needed. The new private vehicle parking would accommodate visitors who would choose to park outside the park and ride a shuttle bus to Canyon View Information Plaza to begin their visit to the South Rim. Visitors staying overnight in Tusayan could park at their lodging facilities or at the new facility. Shuttle bus service along SR 64 would stop at the shuttle bus staging area. The park would explore opportunities to share existing parking, and/or to partner with businesses, agencies, and other groups in Tusayan to build or manage these new parking facilities.

As described in the “Transportation Operations Strategies” section in “Elements Common to All Action Alternatives” (see page 58), information on the availability of parking in the park, or lack thereof, would be provided to visitors as they approached the parking and shuttle bus staging facility near Tusayan. Visitors would be encouraged to park outside the park and use the shuttle bus service, particularly when parking in the park was full.

Access to the parking area would be provided by way of a proposed roundabout (to be constructed by the Arizona Department of Transportation under separate project) as well as from the National Geographic Visitor Center parking lot. The amount of grading and changes to the existing topography would be minimized to the largest extent possible. Parking areas would be built into the landscape, and vegetation would be retained and supplemented to provide some screening from the highway, although visitors would need to be able to see where to park.

Design treatments similar to those described for parking at Canyon View Information Plaza would be used to minimize the visual impact of parking and to assist in managing water

drainage. The shuttle bus staging area would include a fee collection and visitor information station, a covered shelter for shuttle bus passengers, restrooms, and a wayside exhibit area. New paths would connect the parking areas to the shuttle bus transfer station and to existing pedestrian sidewalks along SR 64 and the proposed extension of the Greenway Trail. In addition, the design plans would incorporate pedestrian crossings of traffic lanes at appropriate locations, directional signs for pedestrians, and sensitively designed lighting for parking and paths.

Shuttle Bus System

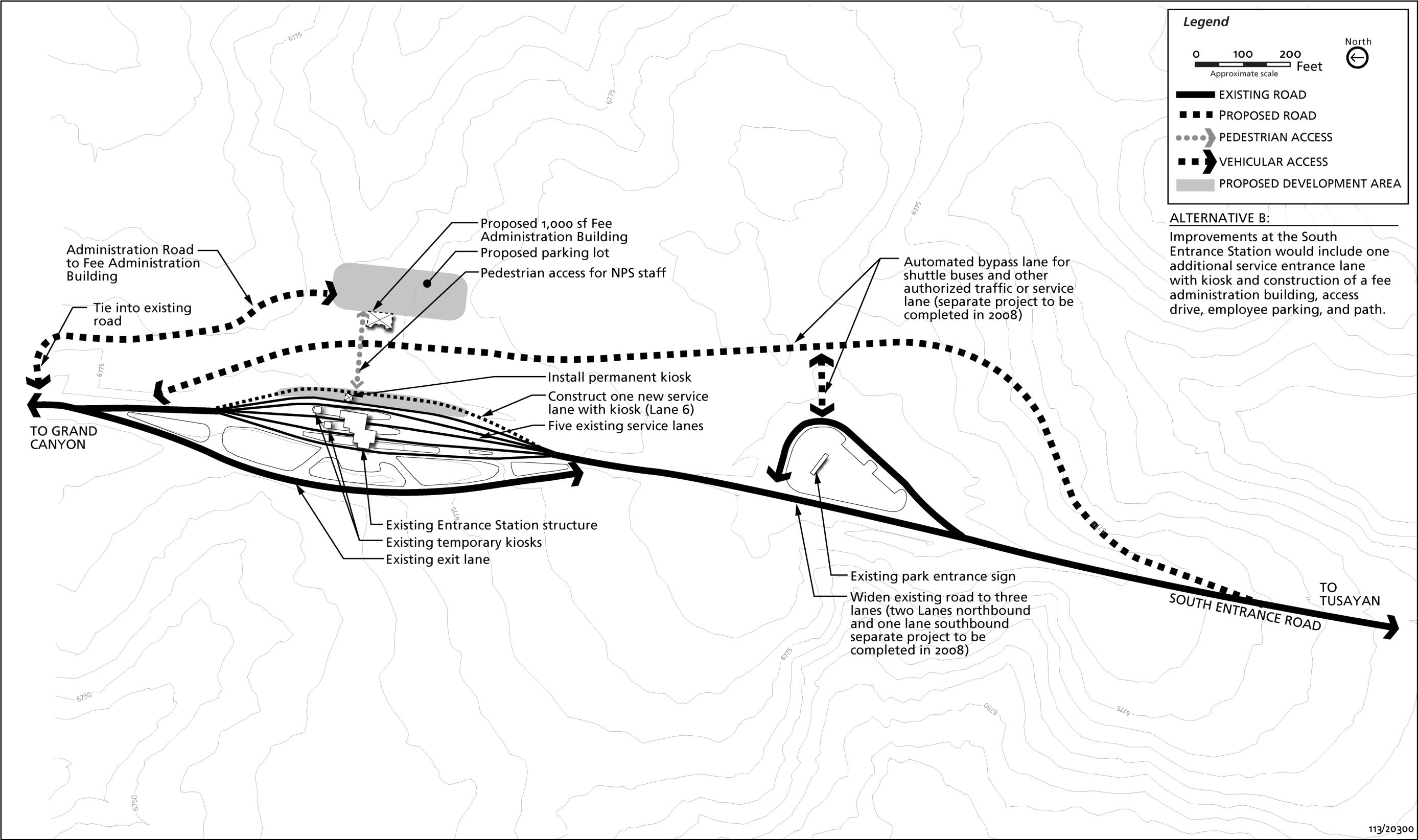
Shuttle bus service improvements under alternative B would include improvements to the South Rim shuttle bus routes (see “Elements Common to All Alternatives,” page 115) and new shuttle bus service from Tusayan to Canyon View Information Plaza. The characteristics of this new shuttle bus route and service are described in Table 3. The route would travel through Tusayan, to the shuttle bus staging area, to Canyon View Information Plaza, and back (see Figure 8).

During the initial development phase, shuttle bus service between Tusayan and Canyon View Information Plaza would be operated as a pilot program. There would be four to six stops in Tusayan that would be convenient to existing lodging facilities, other locations with available parking, and potentially the airport. The service would be operated with two or three buses and would serve stops every 15 to 20 minutes.

TABLE 3. ALTERNATIVE B: SHUTTLE BUS SERVICE, TUSAYAN TO CANYON VIEW INFORMATION PLAZA

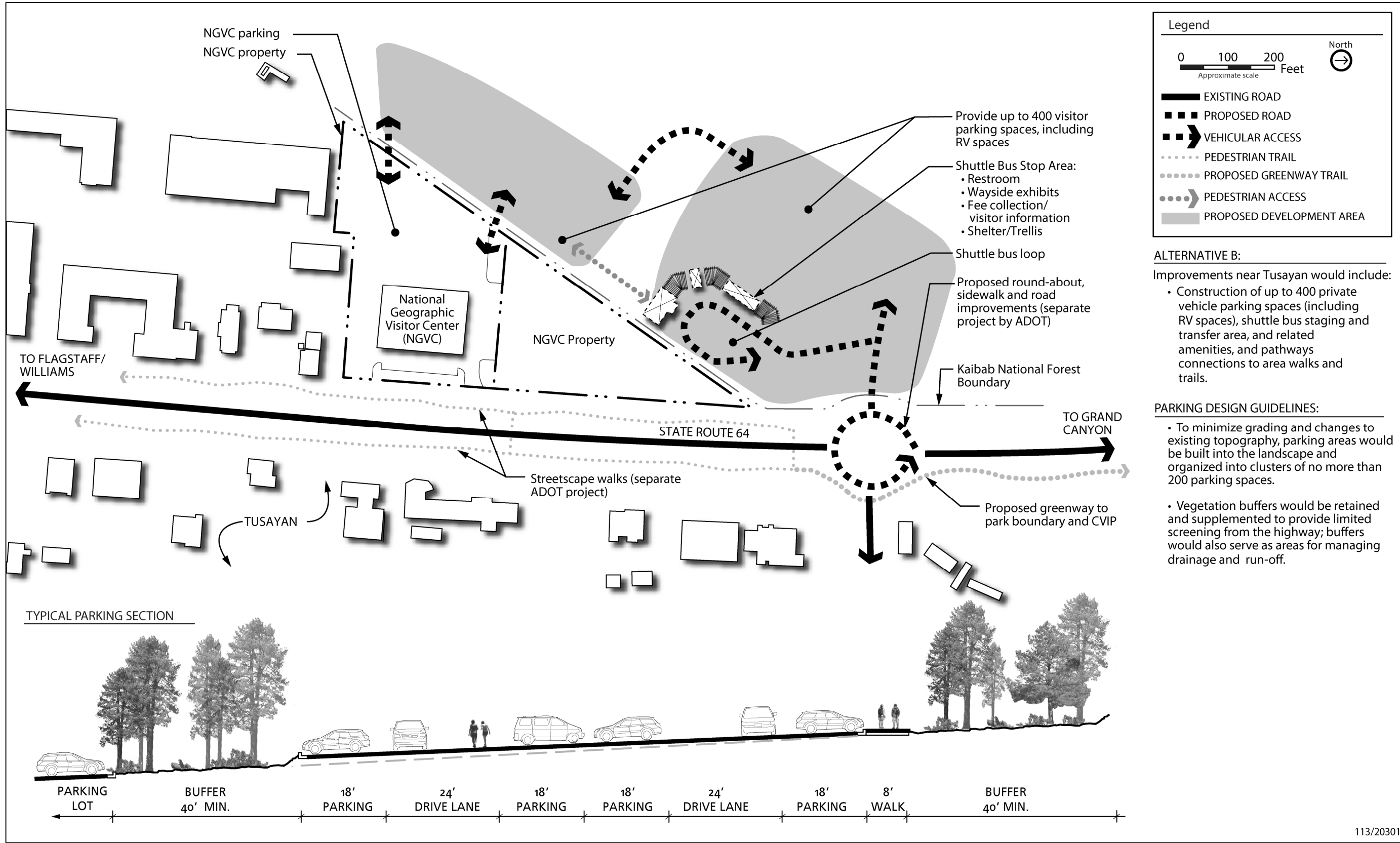
Service Description	Characteristics
Round-trip Length	14.0–16.0 miles
Average Travel Speed	26.7 miles per hour
Dwell/Wait Time at Stops	1–3 minutes per stop
Minimum Round-trip Cycle Time	40.0 minutes
Daily Span of Service	16 hours (12 peak hours, 4 off-peak hours)
Number of Operating Days for Peak-Service Levels	113 (Memorial Day weekend through Labor Day, plus 6 high-demand weekends)

FIGURE 12. ALTERNATIVE B: SOUTH ENTRANCE STATION IMPROVEMENTS



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FIGURE 13. ALTERNATIVE B: TUSAYAN PARKING AND SHUTTLE BUS IMPROVEMENTS



- ALTERNATIVE B:**
- Improvements near Tusayan would include:
- Construction of up to 400 private vehicle parking spaces (including RV spaces), shuttle bus staging and transfer area, and related amenities, and pathways connections to area walks and trails.
- PARKING DESIGN GUIDELINES:**
- To minimize grading and changes to existing topography, parking areas would be built into the landscape and organized into clusters of no more than 200 parking spaces.
 - Vegetation buffers would be retained and supplemented to provide limited screening from the highway; buffers would also serve as areas for managing drainage and run-off.

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The passenger and service characteristics in 2020 for the Tusayan to Canyon View Information Plaza shuttle bus route under alternative B would include the following:

- The peak hour for parking arrivals would be from 10:15 to 11:15 a.m.
- An estimated 73 private vehicles would arrive at Tusayan parking areas during the peak hour, resulting in 212 visitors requiring shuttle bus service to Canyon View Information Plaza.
- Four trips per hour using standard shuttle buses (40 passengers) would be required to meet estimated peak visitor demand.
- Three trips per hour using high-capacity shuttle buses (64 passengers) would be required per hour to meet estimated peak visitor demand.

Table 4 summarizes the frequency of service that would be required between Tusayan and Canyon View Information Plaza with full implementation of alternative B. Vehicle requirements for high-capacity buses and standard buses are shown. Fleet requirements are based on the maximum number of vehicles operating during peak service, plus a 20% spare ratio to account for vehicles out of service for routine maintenance or repairs.

Implementation Strategy

Alternative B would be implemented in phases, and the National Park Service would

take an adaptive management approach, as described in “Elements Common to All Action Alternatives,” to determine the timing, scale, and location of improvements. This alternative encompasses a number of projects that would be adjacent to or within the same footprint as existing visitor facilities. Park staff would work closely with the contractor(s) for each major project to plan for the careful sequencing of construction activities to minimize disruption to existing visitor facilities and services.

The initial investment would be made in physical improvements inside the park to meet the most pressing transportation-related needs within available funding, and to initiate the pilot Tusayan shuttle bus service. This would be concurrent with the implementation of operational strategies that would support the plan, in cooperation with the gateway communities (mostly Tusayan).


The first phase of improvements would be closely monitored. The timing of future phases of development would be determined by monitoring various transportation conditions, and through an adaptive management approach, the National Park Service could implement additional phases as necessary. Monitoring and evaluation strategies for the pilot shuttle bus service would include at a minimum visitor use counts, ridership observations, and visitor satisfaction surveys. Shuttle bus service would be adjusted accordingly.

Based on the results of the initial efforts outside the park and changes in visitation and visitor use patterns (induced by the new transportation system and other factors), the park could construct proposed facilities near Tusayan as the next phase of improvements. Depending on the success of the pilot shuttle bus program, the park would work with Tusayan business owners to determine if temporary parking could be used on a more permanent basis for shuttle bus rider parking or if additional parking would be needed. Design of new parking would then be expe-

TABLE 4. ALTERNATIVE B: SHUTTLE BUS REQUIREMENTS, TUSAYAN TO CANYON VIEW INFORMATION PLAZA

	Standard Bus (40 passengers)	High-Capacity Bus (64 passengers)
Frequency of Service		
•Peak Season	10.0 minutes	15.0 minutes
•Shoulder Season	NA	NA
Number of Vehicles Operating during Peak Times	4	3
Total Fleet Size	5	4

TABLE 5. ALTERNATIVE B: IMPLEMENTATION PHASING

Phase I (Target Implementation by 2010)	Monitor and Evaluate	Future Phases (by 2020)
<p>Canyon View Information Plaza / Mather Point</p> <ul style="list-style-type: none"> • Construct 600 visitor parking spaces. • Implement shuttle bus stop improvements. • Construct roadway improvements and pedestrian facilities. • Construct tour bus drop-off area, double-vault toilet, trail connections to canyon rim, and up to 40 tour bus parking spaces. • Construct theater and bike rental facilities; provide limited food items. • Implement accessibility improvements at Mather Point. <p>Village Historic District Area</p> <ul style="list-style-type: none"> • Re-stripe lot E to define 14 tour bus parking spaces and parking for RVs. <p>Shuttle Bus Service</p> <ul style="list-style-type: none"> • Improve South Rim routes (less frequent service on some routes than planned for 2020 conditions). • Provide two new shuttle bus stops near Market Plaza. • Construct new shuttle bus maintenance facility. • Implement pilot shuttle bus service between Tusayan and Canyon View Information Plaza (assume visitors using this pilot service would primarily be overnight guests at Tusayan lodging). <p>Transportation Management</p> <ul style="list-style-type: none"> • Implement strategies such as wayfinding improvements, visitor outreach, enhanced trip information, and expanded offsite entrance permit/pass sales. • Employ methods to manage traffic and parking on days with visitation higher than the design day. 		<p>Canyon View Information Plaza</p> <ul style="list-style-type: none"> • Construct, as needed, up to 300 additional private vehicle parking spaces. • Install other visitor amenities, such as additional wayside exhibits, picnic tables, and seating. <p>Village Historic District Area</p> <ul style="list-style-type: none"> • Implement Grand Canyon Railway improvements: construct new access road and 9 tour bus loading/unloading spaces at lot D. • Remove private vehicle parking spaces in lot D. <p>Tusayan</p> <ul style="list-style-type: none"> • Construct, as needed, an initial 200 visitor parking spaces on national forest system land, including designated RV parking and parking for persons with disabilities. • Construct shuttle bus facilities and visitor amenities, including a shuttle bus loading/ unloading area, shelter, restrooms, fee collection area, information wayside displays, and pedestrian connections. • Initiate regular shuttle bus service from Tusayan to Canyon View Information Plaza; expand South Rim shuttle bus service to meet increased demand. • Based on demand, construct an additional 200 spaces, accompanied by increased shuttle bus service from Tusayan to Canyon View Information Plaza. <p>South Entrance Station</p> <ul style="list-style-type: none"> • Construct, as needed, an additional (sixth) service lane with a kiosk. • Replace existing temporary kiosk(s) with permanent kiosk(s), if needed. • Construct fee administration building. <p>Other Improvements</p> <ul style="list-style-type: none"> • Implement Greenway Trail expansion and enhancements. • Implement additional transportation management strategies.

dited, depending on the demand. The scale and timing of the physical improvements and the accompanying shuttle bus service into the park would be refined based on the lessons learned by monitoring the effects of the initial development phase. As another option, the park could also expand its operational and management strategies, such as providing more shuttle bus service. The National Park Service would actively pursue partnering with businesses, agencies, and other groups to assist in managing and perhaps building transportation components, such as the shuttle bus staging area, outside the park. In general, non-critical visitor services and facilities would be implemented over time as funding became available. See Table 5 for a suggested phasing approach.

Costs

Preliminary facility and equipment costs and ongoing operations and maintenance costs for the full implementation of this alternative are summarized in Table 6. The estimated gross construction costs in 2010 dollars of the transportation elements would be up to \$32,346,000, and total gross construction cost for other site improvements (including the theater and other visitor facilities) would be \$4,093,000, for a total construction cost of \$36,439,000. In addition, there would be up to \$6,160,000 in capital costs for bus purchases. Capital costs would total \$42,599,000. The design of the preferred alternative and the associated costs would be refined in later stages of project development.

The estimated annual operating costs under alternative B (in 2007 dollars) would be \$706,000 for transportation management operations (which includes operational strategies), up to \$2,577,000 for transit operations, and up to \$570,000 for facility maintenance, for a total operating cost of \$3,853,000. Estimated annual operating costs are in addition to the current costs for shuttle bus transit operations, which were \$4,300,000 in 2007.

Capital improvements associated with this alternative would be financed through various sources, largely from the park's recreation fee program. Improvements would be made on priority projects as funding became available. The park would pursue funding opportunities through partnerships, grants, and other opportunities.

TABLE 6. ALTERNATIVE B: ESTIMATED CAPITAL AND OPERATING COSTS

Capital Costs	2010 Dollars
Construction Costs	
•Transportation Elements	\$32,346,000
•Other Site Improvements	\$4,093,000
Construction Cost Subtotal	\$36,439,000
Bus Purchases	\$6,160,000
Capital Cost Total	\$42,599,000
Annual Operating Costs*	2007 Dollars
•Transportation Management	\$706,000
•Shuttle Bus Operations	\$2,577,000
•Facility Maintenance	\$570,000
Annual Operating Cost Total	\$3,853,000

* Estimated annual operating costs are in addition to the current costs for shuttle bus transit operations, which were \$4,300,000 in 2007.

ALTERNATIVE C: TUSAYAN PARKING EMPHASIS

Strategic Approach

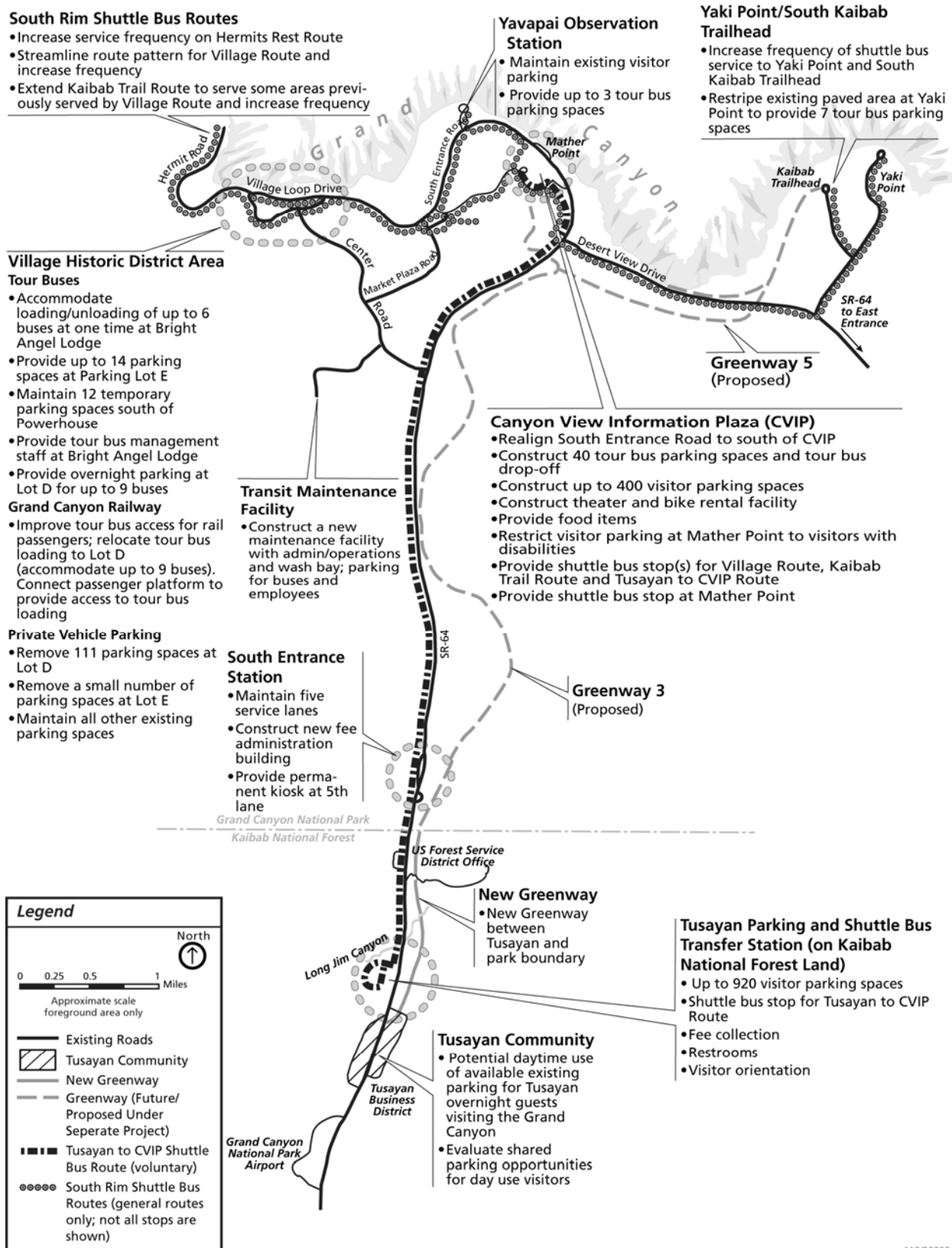
Under alternative C the National Park Service would concentrate most new transportation facilities outside the park, thereby minimizing development within the park and emphasizing shuttle bus access to Grand Canyon Village from Tusayan. A new parking and shuttle bus staging area for use by day visitors would be constructed north of Tusayan. Some parking would be provided near Canyon View Infor-

mation Plaza for short-term visitor use, and the Mather Point parking lot would be retained only for persons with disabilities. Visitors would still have the option of driving into the park; however, the National Park Service would aggressively coordinate visitor information programs and marketing strategies to encourage visitors to park in Tusayan and travel into and through the park on shuttle buses. The National Park Service would also collaborate with the community of Tusayan to develop programs to encourage park visitors to use the park shuttle bus system.

Alternative C would differ from alternative B in that the National Park Service would immediately implement shuttle bus service from Tusayan to Canyon View Information Plaza to make this alternative viable and to achieve project objectives. Initially, 265 parking spaces would be built on national forest system land north of the National Geographic Visitor Center and 400 short-term parking spaces would be constructed at Canyon View Information Plaza. These short-term spaces would be provided for visitors seeking a first view of the canyon at Mather Point and/or learning about the park at the Canyon View Visitors Center and watching the film at the proposed theater. Depending on the results of monitoring and adaptive management, and in response to changing visitor access needs over time, additional parking could be constructed at the Tusayan facility (for a total of up to 920 spaces), and the frequency of shuttle bus service into the park could be increased. No additional parking would be constructed at Canyon View Information Plaza.

It is assumed that visitors who would drive into the park and visit Canyon View Information Plaza would then continue on in their private vehicles to other visitor destinations and parking areas in Grand Canyon Village. As described under "Elements Common to All Action Alternatives," shuttle bus service would provide access to visitor destinations throughout the village. The components of alternative C are further described below, and the key elements are shown in Figure 14.

FIGURE 14. ALTERNATIVE C: OVERVIEW



Transportation System Elements

Canyon View Information Plaza / Mather Point

Similar to alternative B, several modifications would be made at Canyon View Information Plaza and Mather Point to enhance visitor experiences, alleviate current congestion concerns, and improve arrival experiences, particularly for visitors coming by shuttle bus from Tusayan. New parking spaces at Canyon View Information Plaza would be intended for short-term use by visitors driving into the park; long-term parking here would be discouraged, and the National Park Service would implement an active parking management program to ensure that short-term parking would be available. The Mather Point parking area would be retained for parking for persons with disabilities and shuttle bus access.

Portions of the South Entrance Road would be realigned to the south and west of Canyon View Information Plaza. Where feasible, the existing service road would be incorporated into new parking lots or the realigned South Entrance Road (slightly more than under alternative B); otherwise, paved portions would be removed and the landscape restored. The intent of realigning the entrance road would be to allow private vehicle and tour bus parking north of the road, eliminating the need for pedestrians to cross traffic when moving between the parking facilities and Canyon View Information Plaza. Visitors would also be able to walk from the plaza to Mather Point without crossing vehicle traffic. (See Figure 15 for an illustration of the proposed improvements.)

Changes to the South Rim shuttle bus service and the addition of a new shuttle bus route from Tusayan would make Canyon View Information Plaza more readily accessible by shuttle bus, and a new shuttle bus boarding area would be designated. New amenities would be similar to those described under alternative B. As part of the development of new parking, new pedestrian paths, and di-

rectional signs would be provided to connect the parking areas to Canyon View Information Plaza, Mather Point, shuttle bus stops, and the Greenway Trail and Rim Trail.

Visitor Parking. The new 400-vehicle parking area at Canyon View Information Plaza would be south of the existing facilities (see Figure 15). Since this area would be limited to short-term vehicle parking, hikers going to the South Kaibab trailhead and other visitors needing long-term parking would be encouraged to park at Tusayan or in other lots in Grand Canyon Village and ride a shuttle bus to their destination.

Similar to alternative B, the new parking area would be easy to find and sensitively designed to fit into the landscape. Parking would be broken into clusters, separated by large islands of retained vegetation, and the National Park Service would restrict grading as much as possible to minimize changes to the topography. Parking lot and pedestrian path lighting would be provided consistent with guidelines to preserve the night sky. It is anticipated that all of the proposed parking at Canyon View Information Plaza would be constructed in the first phase of development.

Tour Bus Parking. Under alternative C the existing tour bus parking lot would be expanded to accommodate 40 tour buses (see Figure 15). Access to the lot would be by way of the realigned South Entrance Road for both northbound and southbound buses. A drop-off facility would be provided at the west end of the tour bus parking area for convenient pedestrian access to Canyon View Information Plaza. Pedestrian access to Mather Point would be by way of the existing path between the plaza and Mather Point. The expanded tour bus parking area would be included in the first development phase of alternative C.

Mather Point. The Mather Point parking area, vegetated island, curbing, and other small-scale features would be retained, but the lot would be converted for parking use only by persons with disabilities. The lot would also be used by South Rim shuttles buses as a

turnaround and drop-off / pick-up location. A new shuttle bus shelter, seating, and signs would be provided at the west end of the lot.

For the segment of the South Entrance Road removed east of Mather Point parking, the profile and alignment of the former roadbed would be retained. The details of the road removal and new path construction would be determined at a future design stage.

As described in the “Elements Common to All Action Alternatives,” the primary Mather Point overlook would be improved to make it accessible to all visitors, including those with disabilities. Access to Mather Point from Canyon View Information Plaza and the new parking areas would be along existing and new pedestrian pathways or by shuttle bus to the new shuttle bus stop. Measures would be taken to reduce or eliminate informal roadside parking alongside the existing road, thus allowing natural resources to be restored (see Figure 15).

South Entrance Station

Alternative C would have the lowest private vehicle traffic volume at the South Entrance Station of any alternative because of more visitors choosing to park in and near Tusayan and take shuttle buses into the park rather than drive. Improvements at the South Entrance Station under alternative C would be similar to those under alternative A. The five existing service lanes would be retained. The new bypass lane (being developed as part of a separate project) would be used by the shuttle buses traveling from Tusayan, providing a faster trip with minimal delays. A permanent kiosk could replace the prefabricated kiosk in lane 5. If the stacked kiosks provided adequate capacity, they could be replaced with permanent kiosks or removed at the discretion of park management. One or more of the lanes could be operated as pre-paid lanes to provide additional service to visitors holding passes, re-entering the park, or purchasing passes before arriving at the station, similar to the existing operation of the left-most service lane. The exit lane would continue to be on

the west side of the entrance lanes. The South Entrance Station would not be upgraded in the initial development phase of alternative C (see Figure 16).

Tusayan

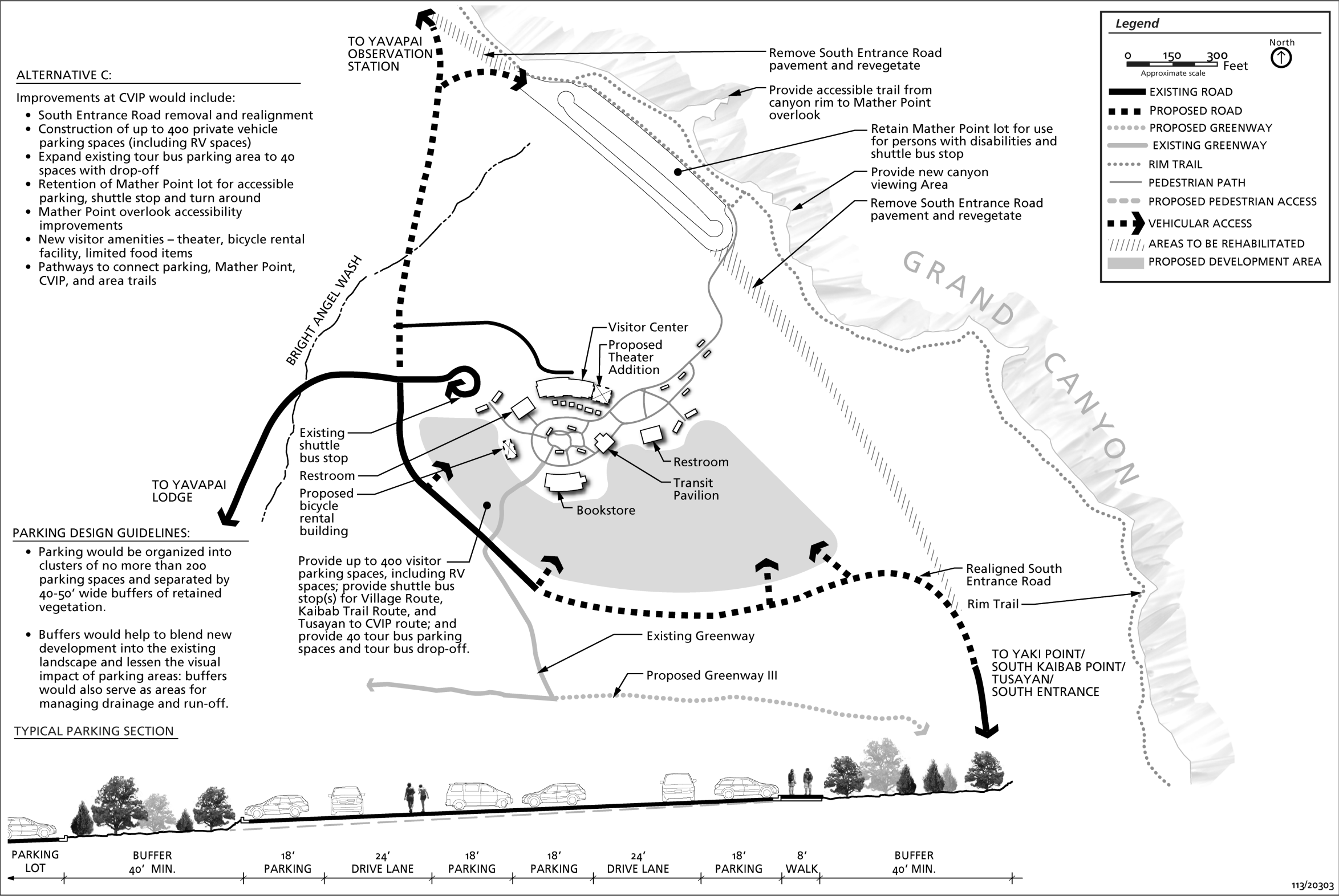
Similar to alternative B, a new private vehicle parking and shuttle bus staging area would be provided on national forest system land north of Tusayan to accommodate day visitors choosing to ride the shuttle bus system into the park. However, to minimize the need for new facilities in the park under alternative C, more visitor day parking would be provided near Tusayan as compared to alternative B, resulting in a larger development footprint. In the first development phase up to 265 parking spaces would be constructed north of Tusayan, in conjunction with the construction of up to 400 parking spaces at Canyon View Information Plaza. This early development would support the immediate initiation of shuttle bus service between Tusayan and the park.

By 2020 up to 655 additional parking spaces could be constructed near Tusayan, for a total of 920 spaces, including parking for RVs and persons with disabilities. The Tusayan parking and shuttle bus service would operate during the peak season, as well as the shoulder seasons (March through October).

Similar to alternative B, the new parking area and shuttle bus staging area would be constructed entirely on national forest system land at the north end of Tusayan on the west side of SR 64 and adjacent to the National Geographic Visitor Center. Access to the parking area would be by way of a proposed roundabout (constructed as a separate project by the Arizona Department of Transportation) as well as from the existing National Geographic Visitor Center parking lot. Two new parking areas would be provided: one on the north side of the site and one on the south (see Figure 17).

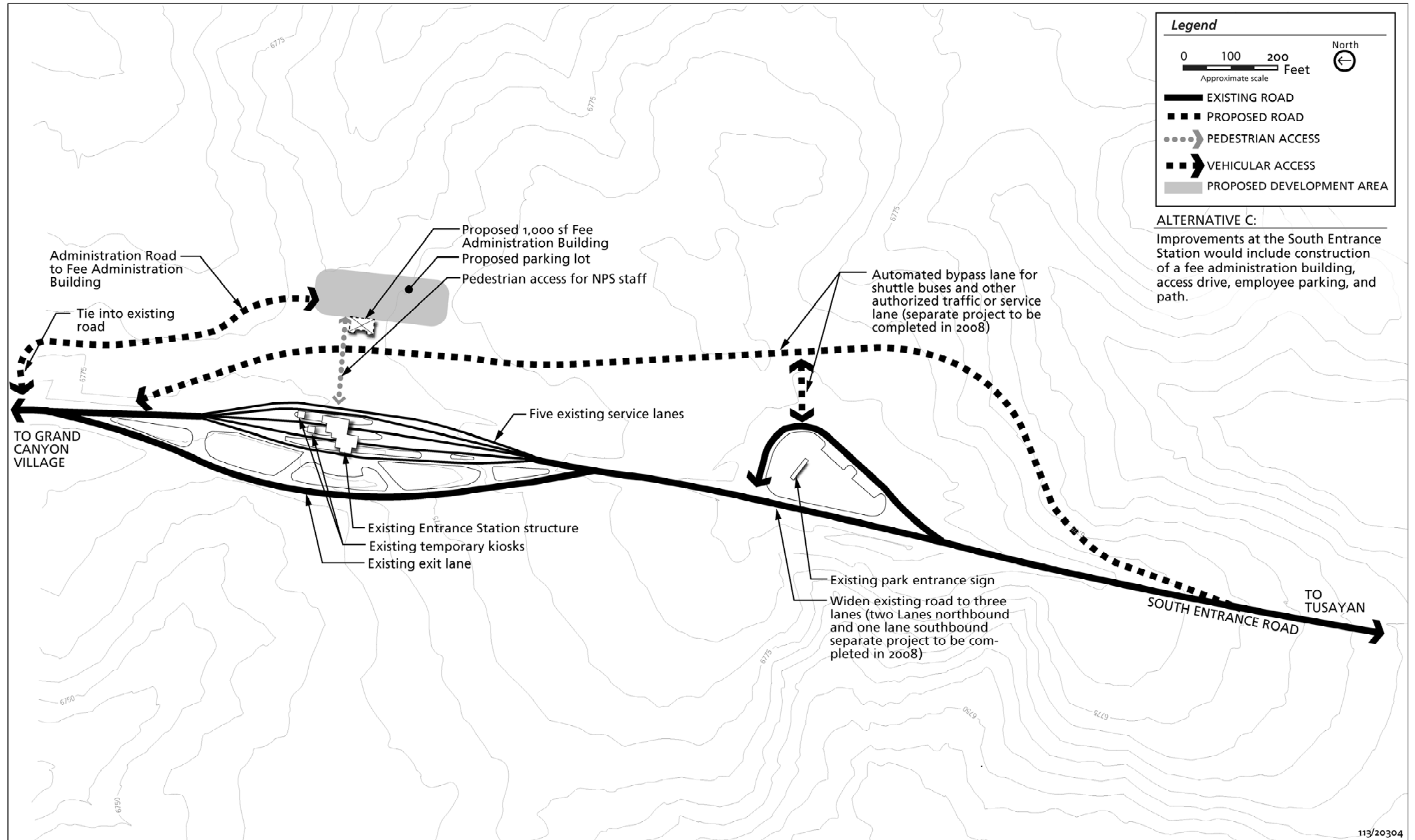
Similar to alternative B, the new parking areas would be built into the landscape, and as

FIGURE15. ALTERNATIVE C: CANYON VIEW INFORMATION PLAZA / MATHER POINT IMPROVEMENTS



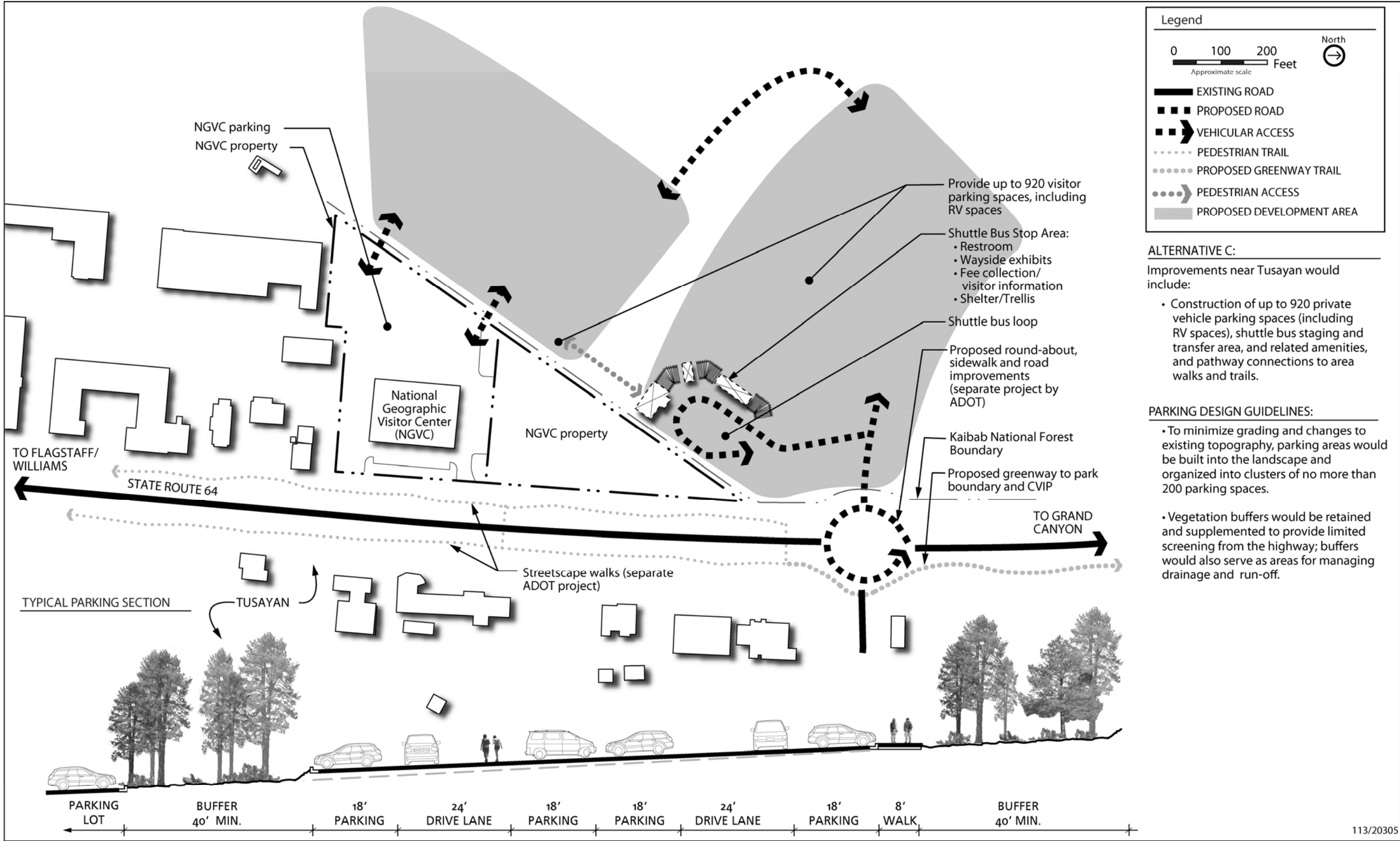
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FIGURE 16. ALTERNATIVE C: SOUTH ENTRANCE STATION IMPROVEMENTS



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FIGURE 17. ALTERNATIVE C: TUSAYAN PARKING AND SHUTTLE BUS IMPROVEMENTS



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much vegetation as possible would be retained, supplemented with additional plantings to provide some screening of the development from the highway view corridor. Grading and topographic alterations would be minimized, and best management practices would be used in managing water drainage. Amenities at the site would include a shuttle bus loading/unloading area, shelter, rest-rooms, fee collection area, and information wayside displays. New pedestrian and bicycle paths would be provided to connect parking areas to the shuttle bus transfer station and to existing paths and sidewalks, including the start of the Greenway Trail along SR 64. Similar to alternative B, pedestrian crossings, directional signs, and sensitively designed lighting consistent with guidelines to preserve the night sky would be incorporated into the landscape design.

Shuttle Bus System

Regular shuttle bus service would be implemented between Tusayan and Canyon View Information Plaza from March through October. Similar to alternative B, the shuttle bus service would make pick-ups/drop-offs at the new parking and shuttle bus staging facility and approximately four to six stops in Tusayan that would be convenient to existing lodging facilities, other locations with available parking, and potentially at the airport. The convenience of stops in Tusayan might further encourage overnight lodging guests to use the shuttle rather than driving. It is assumed that visitors using the shuttle bus service would include both overnight guests at lodging facilities in Tusayan, as well as visitors parking at the new parking area north of Tusayan. Shuttle bus assumptions and characteristics for alternative C are described in Table 7.

The passenger and service characteristics for the Tusayan to Canyon View Information Plan shuttle bus route under alternative C would include the following:

- The peak hour for parking arrivals would occur from 10:15 to 11:15 a.m.

TABLE 7. ALTERNATIVE C: SHUTTLE BUS SERVICE, TUSAYAN TO CANYON VIEW INFORMATION PLAZA

Service Description	Characteristics
Round-trip Route Length	14.0–16.0 miles
Average Travel Speed	26.7 miles per hour
Dwell/Wait Time at Stop Locations	1 - 3 minutes per stop
Minimum Round-trip Cycle Time	40.0 minutes
Daily Span of Service	16 hours (12 peak and 4 off-peak)
Number of Operating Days for Peak-Service Levels	113 (Memorial Day weekend through Labor Day plus 6 high-demand weekends)
Number of Operating Days for Shoulder-Season Service Levels	56 days (April and May without high-demand weekends)

- An estimated 167 private vehicles would arrive at parking areas in Tusayan during the peak hour in 2020, resulting in 484 visitors requiring shuttle bus service to Grand Canyon National Park.
- A total of 13 trips per hour using standard shuttle buses (40 passengers) would be required to serve the estimated peak visitor demand.
- A total of eight trips per hour using high-capacity shuttle buses (64 passengers) would be required to serve the estimated peak visitor demand.

Table 8 summarizes the frequency of shuttle bus service that would be required between Tusayan and Canyon View Information Plaza under alternative C. Vehicle requirements for two types of buses are presented to show the tradeoffs (e.g., using high-capacity buses would require fewer vehicles and less frequent

TABLE 8. ALTERNATIVE C: SHUTTLE BUS REQUIREMENTS, TUSAYAN TO CANYON VIEW INFORMATION PLAZA

	Standard Bus (40 passengers)	High-Capacity Buses (64 passengers)
Frequency of Service		
•Peak Service	4.6 minutes	7.5 minutes
•Shoulder Season Service	15.0–20.0 minutes	15.0–20.0 minutes
Maximum Number of Vehicles Operating during Peak	10	6
Fleet Vehicles Size	12	8

service). Vehicle requirements for high-capacity buses and standard buses are shown. Fleet vehicle requirements are based on the maximum vehicles operating during peak service, plus a 20% spare ratio to account for vehicles undergoing routine maintenance or repairs.

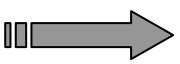
Implementation Strategy

Alternative C would be implemented in phases, similar to alternative B. The initial improvements would be prioritized to address the most pressing existing visitor transportation needs within available funding. Since alternative C would encompass several projects that would be adjacent to or within the same footprint as existing visitor facilities and ser-

vices, park staff would work closely with the contractor(s) to carefully sequence construction activities to minimize disruption to existing visitor facilities and services. Table 9 presents a possible phasing approach.

The first phase of improvements would be evaluated and monitored, and through adaptive management, as described in “Elements Common to All Action Alternatives,” additional phases of transportation improvements would be implemented if needed. The park would actively pursue partnering to assist in the management and perhaps building of transportation components outside the park.

TABLE 9. ALTERNATIVE C: IMPLEMENTATION PHASING

Phase I (Target Implementation by 2010)	Monitor and Evaluate	Future Phases (by 2020)
<p>Canyon View Information Plaza / Mather Point</p> <ul style="list-style-type: none"> • Construct 400 new visitor parking spaces. • Implement shuttle bus stop improvements. • Construct roadway improvements and pedestrian facilities. • Construct new tour bus drop-off and up to 40 new tour bus parking spaces. • Construct theater and bike rental facilities; provide limited food items. • Implement accessibility improvements at Mather Point. <p>Village Historic District/Maswik Lodge Area</p> <ul style="list-style-type: none"> • Re-stripe lot E to define parking for 14 tour buses and parking for RVs. <p>South Entrance Station</p> <ul style="list-style-type: none"> • Implement minor improvements, as needed. <p>Tusayan</p> <ul style="list-style-type: none"> • Construct an initial 265 visitor parking spaces on national forest system land, including designated parking for RVs and persons with disabilities. • Construct shuttle bus facilities and visitor amenities, including a shuttle bus loading / unloading area, shelter, restrooms, fee collection area, information wayside displays, and pedestrian connections. <p>Shuttle Bus Service</p> <ul style="list-style-type: none"> • Implement South Rim shuttle bus route improvements (with less frequent service on some routes than planned for 2020 conditions). • Provide two shuttle bus stops near Market Plaza. • Initiate regular shuttle bus service from Tusayan to Canyon View Information Plaza. • Construct new shuttle bus maintenance facility. <p>Transportation Management</p> <ul style="list-style-type: none"> • Implement strategies such as wayfinding improvements, visitor outreach, enhanced trip information, and expanded off-site entrance permit/pass sales. • Employ methods to manage traffic and parking on days with visitation higher than the design day. • Employ parking management strategy for short-term parking at Canyon View Information Plaza. 		<p>Canyon View Information Plaza</p> <ul style="list-style-type: none"> • Install other visitor amenities such as additional wayside exhibits, picnic tables, and seating. <p>Village Historic District</p> <ul style="list-style-type: none"> • Implement Grand Canyon Railway improvements: construct new access road and nine tour bus loading/unloading spaces. • Remove private vehicle parking spaces at lot D. <p>South Entrance Station</p> <ul style="list-style-type: none"> • Replace existing temporary pre-fabricated kiosks with permanent kiosks, if needed. • Construct fee administration building. <p>Tusayan</p> <ul style="list-style-type: none"> • Construct, based on demand, up to 655 additional parking spaces in phases. <p>Shuttle Bus Service</p> <ul style="list-style-type: none"> • Expand South Rim shuttle bus routes to meet increased demand. • Increase shuttle bus service from Tusayan to Canyon View Information Plaza to meet demand. <p>Other Improvements</p> <ul style="list-style-type: none"> • Implement Greenway Trail expansion and enhancements. • Implement additional transportation management strategies.

The first phase of transportation improvements would be in operation for the 2010 peak visitation season. As part of the initial phase of work, the National Park Service would invest in physical improvements both within the park and near Tusayan to meet visitor transportation needs while limiting development within the park. All proposed parking at Canyon View Information Plaza, as well as shuttle loading and unloading, roadway, and tour bus parking improvements would be constructed. Approximately 265 visitor parking spaces, shuttle bus facilities, and visitor amenities would be developed near Tusayan. To supplement the physical changes, the park would also invest in operational strategies to support the plan in close cooperation with the gateway communities.

In general, future phases would be constructed as needed and funding was available. The timing of future phases would be determined by monitoring various transportation conditions. As an example, under alternative C, the park would rely on visitors voluntarily shifting from private vehicles to shuttle buses to enter the park. However, if enough visitors did not voluntarily choose to ride the shuttle bus and park their cars outside the park, then other measures would have to be implemented such as employing other means to encourage visitors to ride the shuttle bus to achieve the stated objective. As part of future phases of work under alternative C, it is assumed that up to 655 additional visitor parking spaces would be constructed at the Tusayan site, shuttle bus service would be increased from Tusayan to Canyon View Information Plaza, and the South Rim shuttle bus service would be expanded to meet increased demand. Other visitor services and facilities would be developed over time as funding was available.

Costs

Alternative C would result in substantial capital improvements to the park's transportation infrastructure, as well as a new staging area on national forest system land north of Tusayan. Similar to alternative B, capital improvements associated with shuttle bus services would be financed through various sources, largely from the park's recreation fee program. Capital costs in 2010 dollars for alternative C are summarized in Table 10. The total gross construction costs for transportation improvements would be up to \$28,493,000, and total gross construction cost for other site improvements (including the theater and other visitor amenities) would be \$4,093,000. The total construction cost would be \$32,586,000. In addition, there would be up to \$8,800,000 in capital costs for bus purchases. Capital costs would total \$41,386,000.

Estimated annual operating costs (in 2007 dollars) would be \$746,000 for transportation management operations (including operational strategies), up to \$3,491,000 for shuttle bus operations, and \$504,000 for facility maintenance. Total annual operating costs would be \$4,741,000. Estimated annual operating costs are in addition to current shuttle bus operational costs which were \$4,300,000 in 2007.

TABLE 10. ALTERNATIVE C: ESTIMATED CAPITAL AND OPERATING COSTS

Capital Costs	2010 Dollars
Construction Costs	
•Transportation Elements	\$28,493,000
•Other Site Improvements	\$4,093,000
Construction Cost Subtotal	\$32,586,000
Bus Purchases	\$8,800,000
Capital Cost Total	\$41,386,000
Annual Operating Costs*	2007 Dollars
•Transportation Management	\$746,000
•Shuttle Bus Operations	\$3,491,000
•Facility Maintenance	\$504,000
Annual Operating Cost Total	\$4,741,000

* Estimated annual operating costs are in addition to the current costs for shuttle bus transit operations, which were \$4,300,000 in 2007.