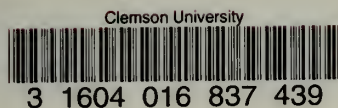


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# road system evaluation environmental assessment

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## BRYCE CANYON

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This road system evaluation has been prepared in response to the Surface Transportation Assistance Act of 1982 (Public Law 97-424), which addresses the nationwide need for rehabilitating and upgrading deteriorating roads in the national park system. The funding authorized by this act has enabled the National Park Service to implement a multiyear program – the Federal Lands Highway Program – for phased improvement of individual park road systems. To fulfill the purpose of the act, the National Park Service is conducting servicewide transportation planning.

# road system evaluation environmental assessment

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draft  
may 1989

**BRYCE CANYON NATIONAL PARK • UTAH**

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UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE



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## **INTRODUCTION**

### **PURPOSE**

This document presents the results of a road system evaluation study for Bryce Canyon National Park, including a proposal for road and parking improvements. An environmental assessment, incorporated into this document, analyzes the impacts of the proposal and three alternatives. The study is comprehensive in that all roads in the park are evaluated; however, the primary emphasis is on the major park road – the entrance/Rainbow Point/rim road (route 10) – and associated parking areas.

Following public and agency review, comments will be considered, it will be decided if an environmental impact statement is needed, and then the study will be finalized.

### **STUDY BACKGROUND**

An "Evaluation of Paved Roads" prepared by the Federal Highway Administration (FHWA, USDOT 1977) concluded that the major roads in the Bryce Canyon needed complete reconstruction. A later study, "Road Inventory and Needs Study" for Bryce Canyon (FHWA 1983), recommended widening the rim road to meet minimum NPS road standards.

A *Transportation/Economic Feasibility Study* (NPS, USDI 1983) prepared by the Denver Service Center evaluated alternatives for the transportation problems at Bryce Canyon. The study concluded that the costs of implementing a full mandatory transit system to serve all park visitors would be prohibitive. At the request of the NPS director, this conclusion is currently being reevaluated.

A *General Management Plan* for Bryce Canyon (NPS 1987a) prepared by the Rocky Mountain Regional Office recommends roadway and parking improvements for the park.

A major road project at Bryce Canyon is currently scheduled for construction beginning in 1992, with construction phased over several years.

### **PROBLEMS AND ISSUES**

The roads at Bryce Canyon were constructed in the 1930s. They are in a deteriorated condition, but it may not be readily apparent in all sections because of recent chipsealing, surface patching, and other maintenance resurfacing projects. The roads have corrugated and undulating sections, unequal widths, extensive cracking, potholes, and severe edge failure. Increased intercity tour bus traffic and winter snowplow activities have aggravated the road deterioration problems.

The Rainbow Point/rim road (15 miles) does not meet minimum standards described in the *Park Road Standards* (NPS 1984) for the volume of traffic it carries. Pavement width varies between 18 and 20 feet, and gravel/dirt shoulders range from 0 to 3+ feet. The roadside has numerous steep cuts and fills that lack vegetation and are unsightly or unstable. In the 1930s the road base was 18 feet wide. Shoulders have been widened by maintenance crews with a variety of materials that generally do not meet structural

standards, and the widening has contributed to slope stabilization problems. Visually contrasting and inharmonious resurfacing and pothole patches detract from road aesthetics. Surface and subsurface drainage as well as structural support beneath the pavement is inadequate in some areas. Sections resurfaced in the summer of 1986 cracked severely by January 1987.

Several overlook parking areas along the Rainbow Point/rim road have perpendicular parking so that motorists are forced to back into traffic lanes when leaving the overlooks. This is especially difficult and dangerous for buses and large recreational vehicles (RVs) that comprise about 20 percent of the traffic at Bryce. Several parking areas become congested during the five-month heavy use season. Some parking areas are extremely close to the rim and overlooks, detracting from the visitor experience. An area of particular concern is the Bryce Point overlook, which becomes crowded daily during the peak summer season. Conflicts between bus and automobile parking occur, and traffic flow becomes badly snarled at times.

The rim road primarily provides access to overlooks along the rim, but it also provides, to some degree, a scenic driving experience. Vegetation blocks the limited views of the landscape in some locations along the road. Three connecting trails lack trailhead parking. There are several small unpaved pullouts along the road in areas that have no overlooks.

Issues addressed in this study include the functional classification and physical standards that will guide road improvement and maintenance. The intended use for each road segment is included along with proposed surface type, road width, shoulder width, design volume, and design speed. The study also includes proposals for road relocations, pullouts and overlooks, critical resource concerns, revegetation needs, erosion problems, and potential vista clearing areas.

## **MANAGEMENT OBJECTIVES**

The following management objectives will guide road improvements and maintenance activities:

- Enhance the experience for visitors traveling on the Bryce Canyon road system.
- Encourage leisurely travel through the park.
- Protect critical natural and cultural resources.
- Reduce maintenance needs.
- Maintain and increase safety.
- Facilitate interpretation of park resources.
- Reduce the impacts of facilities next to the canyon rim.
- Protect visitors from vehicular intrusions, both sights and sounds, as part of their viewing experience.

- Minimize adverse impacts of construction activities.
- Protect endangered and threatened species.
- Reduce existing road scars and improve the aesthetics of the road.
- Consider existing and projected visitor use levels and vehicle types.
- Retain the option of implementing a visitor transportation system in the future.



Pink Cliffs from Rainbow Point



Bryce Point parking area



Bryce Amphitheater from Bryce Point





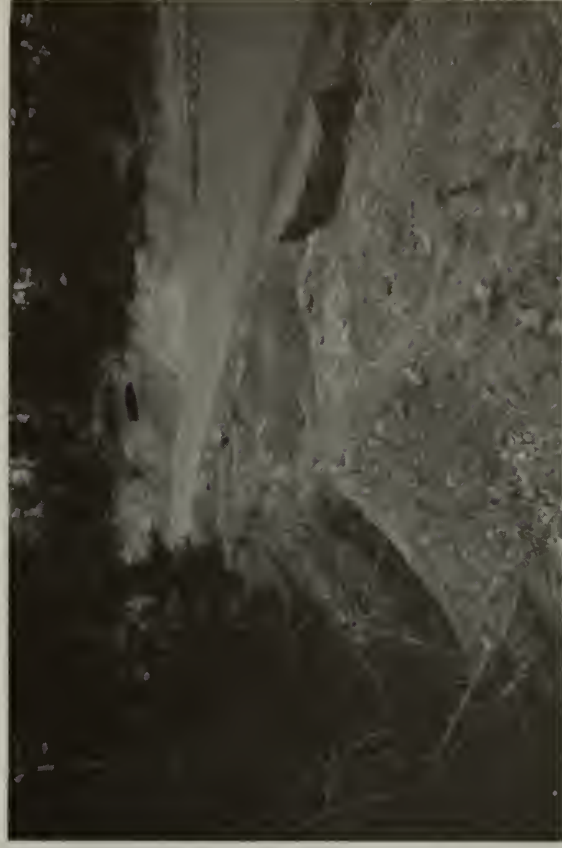
Rim Road in East Creek meadow



Rim Road in Swamp Canyon meadow



Road cut along Rim Road



Shoulder widening on Rim Road



Farview Point overlook



Tour bus on Rim Road



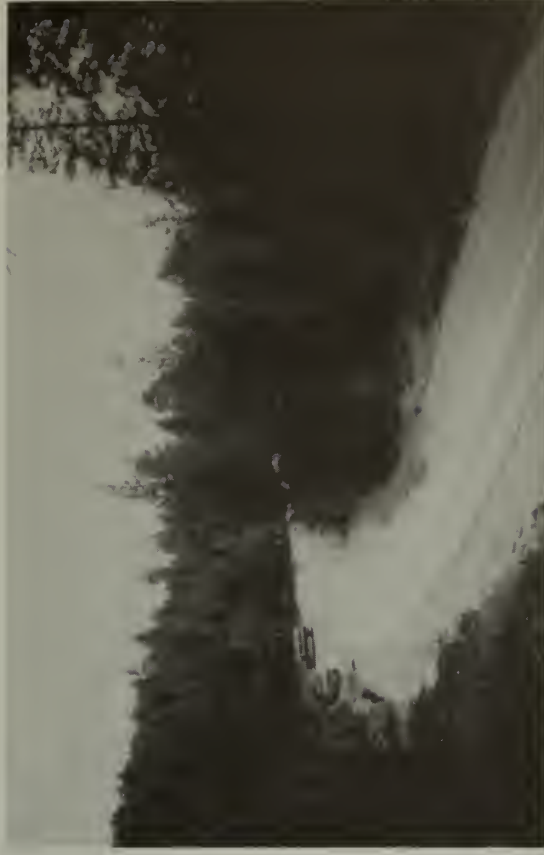
Cracked surface on Rim Road



Informal pullout near Rainbow Point



Natural Bridge



Rim Road at Natural Bridge area

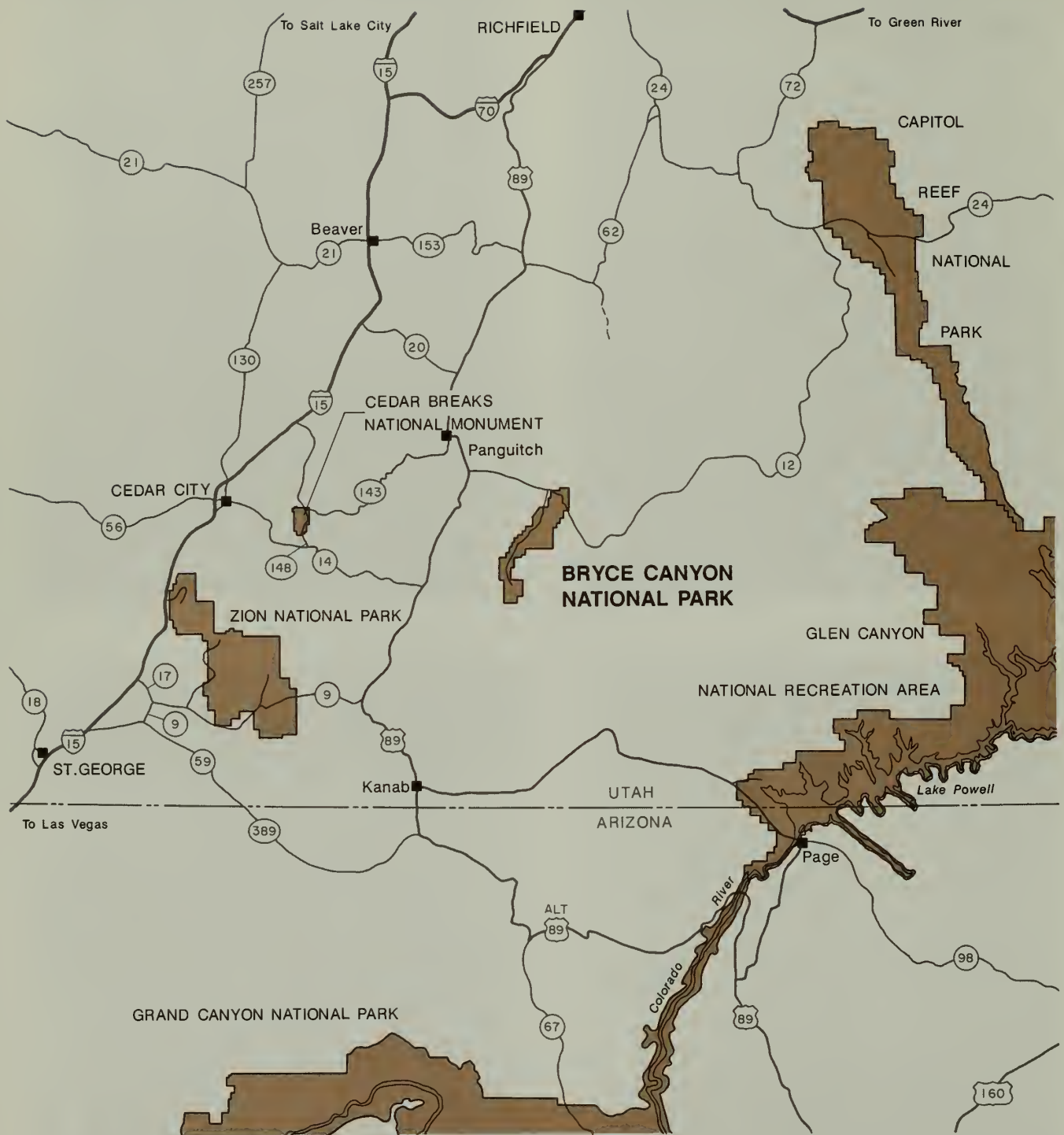


Natural Bridge overlook parking area



Natural Bridge overlook





## REGION BRYCE CANYON NATIONAL PARK

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## **DESCRIPTION OF THE AREA**

### **REGIONAL SETTING**

Bryce Canyon National Park lies in south-central Utah, a region characterized by high plateaus, mesas, mountains, and canyons. Visitors are afforded spectacular views of distant landscapes and nearby colorful rock formations. Naturally sculpted multicolored amphitheaters and rock "hoodoo" formations may be viewed from the plateau rim.

The park encompasses 35,835 acres extending along the southeastern escarpment of the Paunsaugunt Plateau. The elevation at the park entrance is approximately 7,800 feet, and near the southern boundary it is over 9,000 feet. The park is bordered on the west, south, and southeast by the Dixie National Forest, and the north and northeast by state and private land.

Bryce Canyon National Park is approximately 25 miles southeast of Panguitch, Utah. The northern part of the park lies in Garfield County, and the southern part is in Kane County. Access to the park is from Utah 63, a short spur off Utah 12. Route 12 is accessed from US 89 to the west, 1-70 via Utah 24 to the north, and the Burr trail to the east (see Region map).

### **NATURAL RESOURCES**

#### **Geology and Soils**

The predominant rock strata within the park is the colorful Claron formation. This soft calcareous bedrock is composed of clays, silts, and sands cemented by carbonates. These strata contain minerals that provide the rock formation with its various colors of red, pink, yellow, brown, purple, and blue. Many of the soft limey units have been sculpted by wind and water, giving them unusual shapes known as hoodoos. These spires, pinnacles, grottos, arches, and walls have been given such names as the Mormon Temple, Silent City, Hat Shop, and Natural Bridge.

Soils on the plateau surface are generally fine-grained and highly erodible. There is very little topsoil, except in low-lying areas where eroded materials accumulate. The clay/silt soils are poorly drained and tend to hold moisture, generally providing an unstable road foundation. Accumulated moisture causes frost boils and subsequent base and pavement failures. The erosion hazard is high and should be considered in any ground-disturbance activities. The steeper natural slopes and road cuts tend to be unstable, resulting in soil and rock slides.

#### **Vegetation**

Two forest types dominate the top of the Paunsaugunt Plateau. In the northern part of the park, between 7,000 and 8,500 feet in elevation, the plateau supports a ponderosa pine forest community. Here ponderosa pine are interspersed with Rocky Mountain junipers. Limber pine grow on the sunny slopes along the plateau rim. The forest generally has an open canopy that provides adequate sunlight and space to support lower-growing shrubs, grasses, and forbs associated with the ponderosa pine community.

Examples of the dominant shrubs include greenleaf manzanita, antelope bitterbrush, and mountain lilac.

In the lower depressions along the top of the plateau, the ponderosa pine forest opens into sage meadows. These meadows are of various sizes and support a variety of shrubs, grasses, forbs, and sedges. The dominant plant species in these areas are black sagebrush and rabbitbrush. Other species include gray horsebrush, Colorado rubberweed, and matchbrush.

Above 8,500 feet, the plateau supports a spruce-fir forest community. These stands are rather dense and support a variety of conifers interspersed with stands of aspen. The dominant trees are white fir, Douglas-fir, and quaking aspen. Ravines and other moist areas support blue spruce. The dense tree growth above 8,500 feet reduces the potential for understory vegetation. Shade-tolerant shrub species, such as snowberry, creeping barberry, common juniper, wild rose, and mountain lover, do well in these areas. Some grasses, sedges, and forbs also inhabit this area. Common sedges and grasses throughout the plateau include Indian ricegrass, mutton grass, mountain muhly, and Ross sedge.

Bristlecone pine, thought to be the oldest living plant species on earth, are found at various elevations near the plateau rim. They occupy exposed areas with rocky soils.

Nonnative vegetation has invaded disturbed areas along roadways and may be a potential problem following any ground-disturbance activities. These species include Russian thistle, Russian knapweed, crested wheatgrass, pigweed, cheatgrass, shepherd's purse, bull thistle, bindweed, African mustard, horehound, and English plantain.

## **Wildlife**

Mule deer, gray fox, badger, bobcat, squirrels, chipmunks, and small rodents are found in the forest and meadow communities on the plateau. The previously extirpated elk, through a successful reintroduction program outside the park, have extended their range to include areas within the park, and pronghorn are occasionally seen. Black bear and cougar are known to inhabit the area but are seldom seen.

A variety of songbirds inhabit the park, including the Stellar's jay, Clark's nutcracker, pigmy nuthatch, white-breasted nuthatch, mountain chickadee, hairy woodpecker, red crossbill, gray-headed junco, violet-green swallow, and white-throated swift.

Large common avian predators include the red-tailed hawk, great horned owl, goshawk, Cooper's hawk, sharp-shinned hawk, and raven.

## **Endangered and Threatened Species**

Several plant species under review by the U.S. Fish and Wildlife Service for listing as endangered or threatened species that might be in the area, but are not known to inhabit the park, are Autumn buttercup (*Ranunculus acriformis*), Red Canyon catchfly (*Silene Petersonii*), Red Canyon Beardtongue (*Penstemon bracteatus*), Yellow-white catseye (*Cryptantha ochroleuca*), and Stellar's pepper-grass (*Lepidium montanum*). Three species known to inhabit the park are the Reveal Indian paintbrush (*Castilleja reveal*),

Jones Golden aster (*Heterothera jonesii*), and Paria breadroot (*Psoralea pariensis*). These plant species might inhabit areas near sections of the roadway. Potential road realignments, new or expanded parking areas, or other areas to be disturbed will be surveyed before construction activities, and, if possible, impacts will be avoided or minimized.

The Utah prairie dog (*Cynomys parvidens*) was reintroduced to the park in 1975. In June 1984, its status was downgraded from endangered to threatened by the U.S. Fish and Wildlife Service. Several prairie dog colonies are just off the roadway, and occasionally the rodents burrow under the road and cause maintenance problems (see Utah Prairie Dog Colonies map). The current population in the park, estimated to be about 500, appears to be stable.

The endangered peregrine falcon (*Falco peregrinus*) inhabits and uses areas within the park boundary. In 1986 there were two active nesting sites in the park – one near the Paria View parking area, and the other near the Rainbow/Yovimpa Point parking area.

The endangered bald eagle (*Haliaeetus leucocephalus*) occasionally visits the park in the winter, but it does not nest in the park.

### **Air Quality**

The park is designated a class I area under the Clean Air Act. The air quality here is among the best in the nation with occasional periods of regional haze, forest fire smoke, or widely dispersed industrial pollution. Traffic using the road undoubtedly produces some air pollutants, although this has not been monitored.

### **Water Quality**

Water quality is considered good. During periods of heavy rainfall or snowmelt, temporary siltation of waterways results from the highly erodible soils. There are no perennial streams on the plateau in the park; however, there are a number of intermittent streams, which generally flow in a westerly direction and drain into the East Fork of the Sevier River. A series of wellheads on the plateau provide groundwater for the park's consumptive uses.

### **Floodplains and Wetlands**

Park roads are exempt from compliance with Executive Order 11988 "Floodplain Management" under NPS procedures for implementation. None of the parking areas addressed in this study are in floodplain areas.

Three palustrine wetlands (wet meadows) occur along the entrance/rim road. One is near the visitor center, and the other two are in the East Creek and Sheep Creek meadow areas. The areas support a variety of grasses and sedges and are generally saturated with water year-round.





# UTAH PRAIRIE DOG COLONIES

## BRYCE CANYON NATIONAL PARK

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## **Visual Quality**

Views from the narrow two-lane roadway change from generally flat terrain in the northern half of the park, to rolling in the mid-section, to mountainous in the southern half. The open canopy forest and sage meadows in the northern part of the park provide excellent sight distance and a feeling of openness. As the traveler enters the more dense spruce-fir forest community in the southern half of the park, this feeling of openness is diminished and sight distance is reduced. At several locations the road comes close to the plateau rim, providing views. These views are obscured by vegetation in some areas. Pullouts are provided at viewpoints; some have been constructed and others have been created by visitors. Road cut scars are common along the mid to southern parts of the park. Some of these road cuts have revegetated since construction of the road in the 1930s, but many of the steeper cuts remain barren, unstable, and a continual maintenance problem.

## **CULTURAL RESOURCES**

According to the park's "Cultural Resources Management Plan" (NPS 1982), the cultural resources of Bryce Canyon are represented in the following themes:

- Prehistoric Man

- Architecture

- Tourism

- Civilian Conservation Corps Activity (New Deal Programs)

## **Archeological Resources**

Bryce Canyon has not been systematically surveyed for archeological resources; however, reconnaissance and preconstruction surveys of most road corridors and developed areas have been conducted. The headquarters area was surveyed in 1974 by the Midwest Archeological Center (MWAC). Two archeological sites were identified, but no significant artifacts were found. A more extensive MWAC survey in 1979 located approximately 10 sites and isolated finds along sections of the roadway and near Fairyland, Bryce/Paria, and Rainbow/Yovimpa Point overlooks. A preliminary analysis of materials indicates that some sites may be significant; however, further evaluation is necessary to determine if these sites are eligible for listing on the National Register of Historic Places. Further evaluation of these sites is necessary before construction.

## **Historic Resources**

Historic resources at Bryce Canyon include districts and structures related to early development of the park. The Bryce Canyon Lodge Historic District is a national historic landmark. The old residential district has been determined eligible for listing on the National Register. Individual structures determined eligible include the old administration building, the Rainbow Point comfort station, and the Rainbow Point overlook. In May 1987 the Bryce Canyon National Park Road System (including the entrance/rim road and



associated overlook spur roads) was determined eligible for the National Register (NPS 1987b). In making the determination, the Keeper of the National Register made the following comments:

The Bryce Canyon National Park Entrance/Rim Road is significant under criterion A for its major role in the development of the park for public recreation and tourism in the period, 1923 to 1935. The road was begun by the Forest Service in 1923 and, from 1930 to 1935, was improved and extended south along the canyon to provide access to scenic vistas and points. It furthermore was influenced by the Utah Parks Company and the Union Pacific Railroad's broader efforts to foster tourism through a tour loop road that was completed in 1930 and connected the national parks and monuments in southwestern Utah and northwestern Arizona.

The placement of the roadway away from the edge of the rim, the design of a main road with spur roads and pullouts to provide access to scenic vistas and points, and the minimal impact that construction had on vegetation and terrain also reflect the distinctive direction and policy of landscape design carried out at Bryce during its early development as a national park. Although sections of the roadway have been widened since the 1930s, the spur road to Sunset Point relocated, and a 1.25 mile segment realigned to bypass the lodge area, the c. 20-mile Entrance/Rim Road overall retains a high degree of historic integrity, particularly of location, setting, design, feeling, and association.

## **VISITOR USE**

The primary visitor experience at Bryce Canyon is viewing the formations from a series of overlooks on the canyon rim. Other visitor activities include photography, hiking, horseback riding, camping, picnicking, and participating in interpretive programs. Bicycling is relatively limited.

Annual park visitation increased slowly between 1972 and 1982 from 338,100 recreational visits to 411,500 recreational visits. As shown below, between 1982 and 1987, recreational visits increased dramatically to 718,300, and in 1988, they rose to 791,300.

---

### **Annual Recreation Visits to Bryce Canyon**

1982	411,500
1983	472,600
1984	495,100
1985	500,800
1986	578,000
1987	718,300
1988	791,300

---

Based on visitation growth for the last 15 years, in the year 2000, visitation is projected to be 995,000, or 1.4 times 1987 visitation, and in 2010, it is projected to be 1,121,000, or 1.6 times the 1987 level. This forecast is based on an optimistic economic outlook.

Bryce Canyon is a seasonal park, although as in all rurally located areas, off-season use has been increasing somewhat. Following is a monthly breakdown for 1988, showing percent of annual visitation.

---

Month	Recreation Visits	Percent
January	4,817	0.6
February	7,277	0.9
March	17,112	2.2
April	42,493	5.5
May	86,275	10.2
June	124,453	15.7
July	160,175	20.3
August	149,395	18.9
September	99,596	12.7
October	73,800	9.4
November	17,300	2.3
December	8,656	1.2

---

Eighty-one percent of the visits occurred from May through September. From 1972 to 1974, about 85 percent of the visits occurred during this same period. In the year 2000, 80 percent of annual visits are expected in these traditional busy months. As indicated in the data above, the peak season occurs between Memorial Day and Labor Day, although the months of May and September are also very active.

Another important visitor use characteristic for road planning is the type of motor vehicle. A significant proportion of the traffic is tour buses, RVs, and automobiles pulling trailers. Based on a 20-day sample during the heavy use season in 1986, the following sizes of vehicles are entering Bryce Canyon:

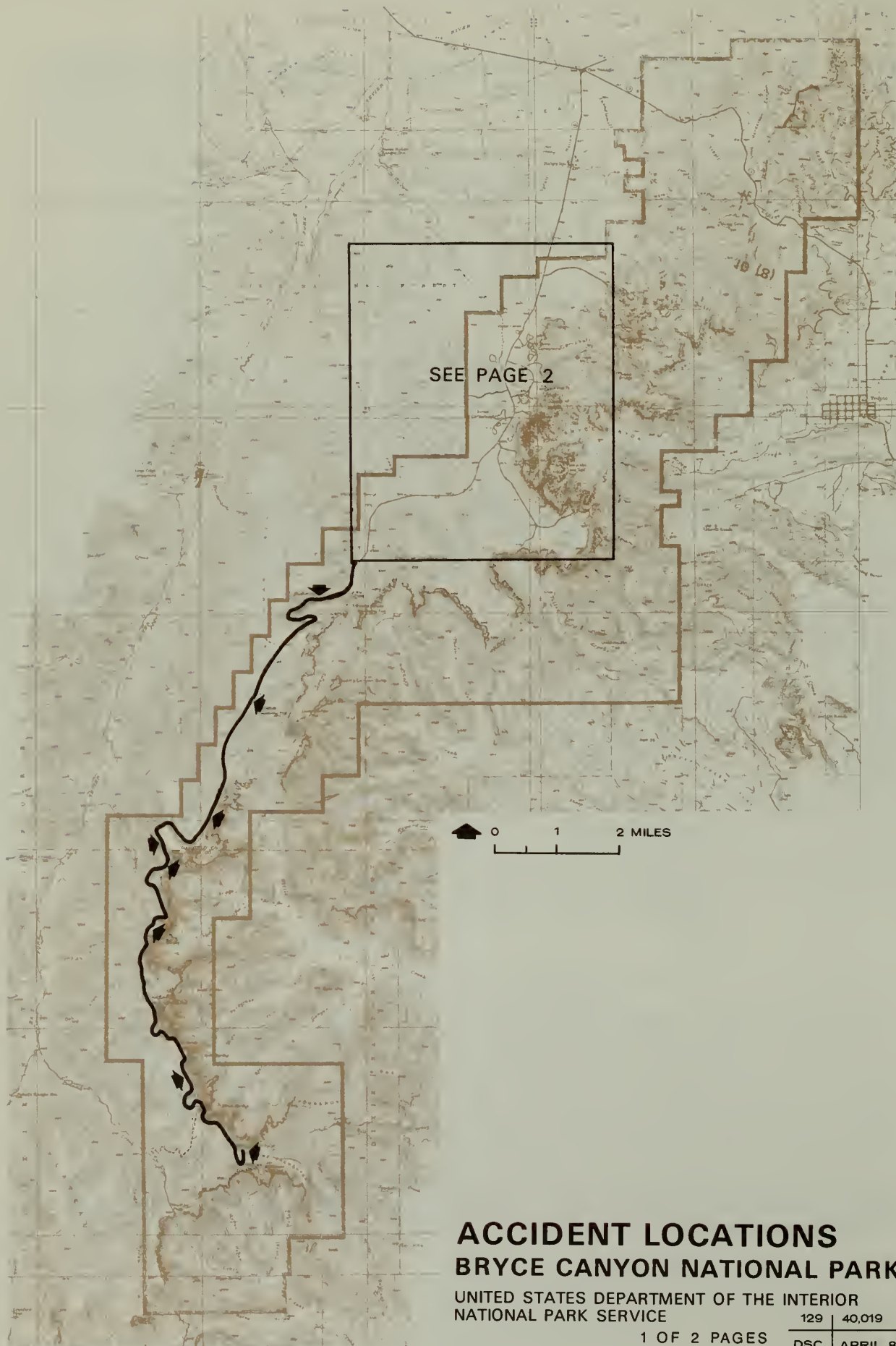
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Length (In feet)	Percent
1-17 feet	30.1
17-25	56.9
25-49	11.2
49+	1.8

---

These figures include vehicles pulling trailers. Most vehicles in the 17- to 25-foot range are less than 20 feet (standard size automobiles). From this data and previous surveys (NPS 1983), it is estimated that about 20 percent of vehicles at Bryce Canyon are oversized (RVs or buses more than 20 feet long). Visitors are required to leave their trailers in the main developed area at the campgrounds or visitor center; however, buses and RVs are permitted on all park roads open to visitor traffic.

Between September 1983 and July 1986, 47 vehicular accidents were reported at Bryce Canyon National Park. Most of these occurred in parking areas and were minor in (see Accident Locations map).



## ACCIDENT LOCATIONS BRYCE CANYON NATIONAL PARK

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## ACCIDENT LOCATIONS DEVELOPED AREA

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## ROAD AND OVERLOOK PARKING INVENTORY

There are 24 roads at Bryce Canyon totaling over 30 miles (see Route Numbers map). The major road, route 10 (18.2 miles), consists of the entrance road (2.8 miles) and the Rainbow Point/rim road (15.4 miles). As shown in table 1, the rim road may be further subdivided into two sections separated at Natural Bridge. Traffic counts show that a significant portion of the visitors do not go all the way to Rainbow Point, and the terrain/road character is substantially different in the two sections. Table 1 summarizes data on length, function, traffic levels, surface type, width, and terrain for each road.

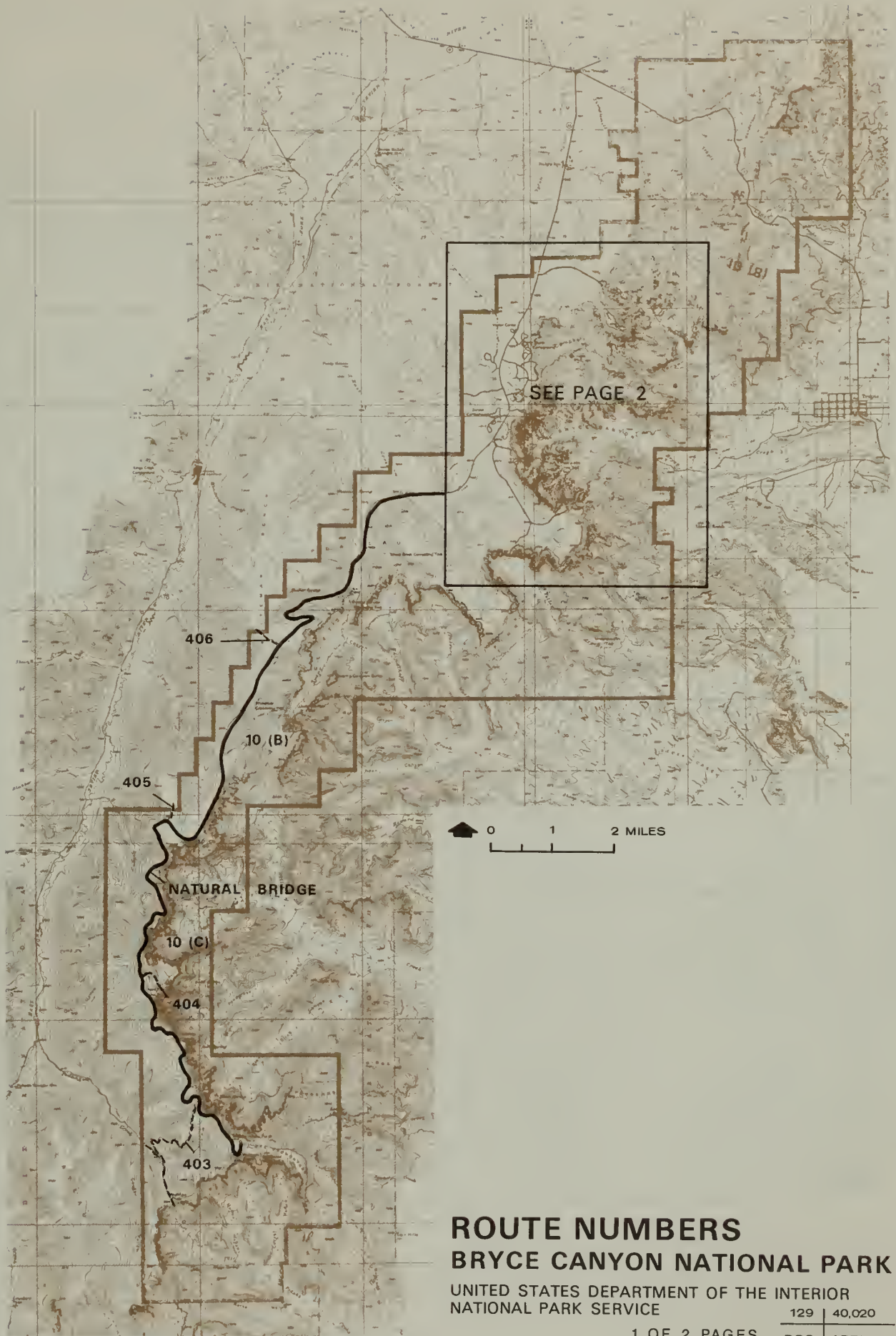
During the summer of 1986, special 48-hour traffic counts were done at 21 selected locations on 11 roads in the park. These data were correlated to the permanent traffic counter at the entrance station to develop seasonal 1988 average daily traffic figures for the major roads (subject to significant visitor use). The results are shown in table 1.

The ADTs are seasonally adjusted, which essentially means they reflect average traffic conditions during the five-month heavy use period. For further information, including annual ADTs, refer to the appendix.

The main visitor center parking area has a capacity of approximately 80 vehicles with little oversize vehicle accommodation. This parking area is heavily used and in recent years has been frequently congested. Most congestion is caused by motorists parking trailers before traveling to Rainbow Point and other overlooks that will not accommodate such vehicles.

As mentioned previously, most of the overlook parking areas are poorly designed and too small to serve visitors during the peak season. Three of the overlook parking areas – Fairyland, Sunset Point, and Rainbow Point – are well designed, with loop configurations. Near the core area of the park, the Sunrise Point, Bryce Point, and Paria View parking areas have capacity problems and design deficiencies that contribute to congestion. Along the rim road, the most critical overlook parking area problem is at Natural Bridge, which is frequently congested during peak hours. Poor roadway geometrics, including poor sight distances on both approaches, contribute to potential safety problems. The overlooks at Farview Point, Agua Canyon, and Ponderosa Canyon meet current parking size needs because the length of stay is shorter, but they require motorists to back into the roadway. Projected needs will surpass the existing capacities, however. The parking area for Yovimpa Point is used by more long-term visitors than the other rim road overlooks, but if that lot becomes full, adequate parking space is usually available at nearby Rainbow Point. However, there is a shortage of oversize space in this area based on the estimated large vehicle ratio in the park. Table 2 summarizes the current parking space at the viewpoints.





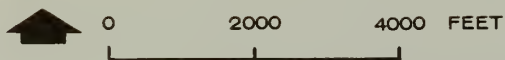
## ROUTE NUMBERS BRYCE CANYON NATIONAL PARK

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**Table 1: Bryce Canyon Road Inventory**

<u>ROUTE NO.</u>	<u>ROUTE NAME</u>	<u>MILES</u>	<u>FUNCTION</u>	<u>1988 SADT</u>	<u>SURFACE TYPE</u>	<u>WIDTH</u>	<u>SHLDR WIDTH</u>	<u>TERRAIN</u>
10(A)	Entrance	2.8	Primary access in park	2890	Paved	23-24'	3'	Flat to Rolling
10(B)	Rainbow Point/Rim (gate to Nat Br)	9.7	Overlook access along rim	1130	Paved	18-20	0-3	Flat to Mountain
10(C)	Rainbow Point/Rim (Nat Br to Point)	5.7	Overlook access along rim	870	Paved	18-20	0-3	Mountain
11	Lodge Loop	1.0	Developed area circulation	820-1570	Paved	22-27	2	Flat
100	Bryce Point	1.9	Overlook access	1300	Paved	22	3	Rolling
200	Fairyland Point	1.1	Overlook access	320	Paved	17-20	1-3	Flat
201	North Campground	1.8	Campground ent. and loops	560	Paved	19 12-20	1-3 0-1	Rolling
202	Sunrise Point Loop	0.5	Developed area circulation	920-1340	Paved	17-23	0-2	Flat
203	Sunset Point	0.2	Overlook access	1560	Paved	21	3	Rolling
204	Inspiration Point	0.2	Overlook access	1010	Paved	21	3	Rolling
205	Paria View	0.4	Overlook access	740	Paved	22	3	Rolling
206	Sunset Campground	1.2	Campground entr and loops	880	Paved	15-18 10	1-2 1	Flat
207	Lodge Parking Loop	0.3	Lodge access and parking	250-2980	Paved	16-26	0-1	Rolling
208	Visitor Center Parking	0.1	Parking	N/A	Paved	N/A	N/A	Flat
400	Concessioner Res Loop	0.4	Housing area	N/A	Paved	16-20	0-2	Flat
401	Utility Area	0.7	NPS and concess utility access	N/A	Paved	21	1	Rolling
402	NPS Residential	0.5	Housing area	N/A	Paved	21-22	0	Rolling
403	Yovimpa Pass	2.8	Patrol and fire management	N/A	Dirt	8	0	Mountain
404	Gravel Pit Spur	0.2	Former gravel pit access	N/A	Gravel	10	0	Mountain
405	Whiteman Cave	0.2	Maint materials storage, patrol	N/A	Gravel	10	0	Flat
406	Whiteman Bench	0.3	Patrol, fire management	N/A	Dirt	8	0	Flat
407	Deep Well	—	Obliterated	—	—	—	—	—
408	Water Tank Spur	0.4	Access to tanks	N/A	Gravel	10	0	Rolling
409	Sewage Pond	0.7	Access to park housing & ponds	N/A	Paved & Gravel	16	2	Flat
410	HQ Administrative Parking	0.1	NPS staff parking	N/A	Paved	21	0-1	Flat
411	Maintenance Area	0.1	Access to NPS maint & housing	N/A	Paved	22-30	1-3	Flat

**Table 2: Overlook Parking Inventory**

<u><b>Viewpoint</b></u>	<u><b>Auto</b></u>	<u><b>Oversize</b></u>
Fairyland	19	3
Sunrise Point	18	0
Sunset Point	95	20
Inspiration Point	30	6
Bryce Point	21	5
Paria View	13	0
Swamp Canyon	4	0
Farview Point	17	0
Natural Bridge	12	0
Agua Canyon	10	0
Ponderosa Canyon	12	0
Rainbow/Yovimpa Points	49	4



## PROPOSAL

This section describes the National Park Service's proposal to solve problems and issues identified in the "Introduction." The road improvements and parking area expansion would fully implement road system concepts identified in the 1987 *General Management Plan* for Bryce Canyon National Park, and no further expansion should occur in the future. If the improved system reaches capacity, the Park Service would implement alternative solutions, such as a visitor transportation system.

### FUNCTIONAL CLASSIFICATION

The assignment of a functional classification to a park road is based on its intended use or function, not traffic volumes or design speed (NPS 1984). For purposes of functional classification, the routes that make up the park road system are grouped, based on use, into two categories: public use park roads and administrative park roads.

#### Public Use Park Roads

This category includes all park roads intended principally for visitor use; i.e., roads that provide access to points of scenic or historic interest, campgrounds, picnic areas, etc. County, state, and U.S. numbered highways maintained by the Park Service are included in this category. Public use park roads are subdivided into the following three classes:

**Class I: Principal Park Road.** Roads that constitute the main access route, circulatory tour, or thoroughfare for park visitors.

**Class II: Connector Park Road.** Roads that provide access within a park to areas of scenic, scientific, recreational, or cultural interest, such as overlooks, campgrounds, etc.

**Class III: Special Purpose Park Road.** Roads that provide circulation within public use areas, such as campgrounds, picnic areas, visitor center complexes, and concessioner facilities. These roads generally serve low-speed traffic and are often designed for one-way circulation.

**Class IV: Primitive Park Road.** Roads that provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. These roads frequently have no minimum design standards, and their use may be limited to specially equipped vehicles. (Note: No roads at Bryce Canyon fit this classification.)

#### Administrative Park Roads

This category consists of all public and nonpublic roads intended principally for administrative purposes. It includes roads servicing employee residential areas, maintenance areas, and other administrative developments, as well as restricted patrol roads, truck trails, and similar service roads. Administrative park roads are subdivided into two classes:

**Class V: Administrative Access Road.** All public roads intended for access to administrative developments or structures such as park offices, employee quarters, or utility areas.

**Class VI: Restricted Road.** All roads normally closed to the public, including service roads and other similar roads.

Figure 1 illustrates the application of these functional classifications to a hypothetical park road system. Table 3 lists the assigned classification for the roads at Bryce Canyon.

## **GENERAL DESIGN STANDARDS**

The following general guidelines should be considered during the design, reconstruction, and maintenance of Bryce Canyon's road system. To ensure an aesthetically pleasing road, it should lie lightly upon the land, using natural support wherever possible. New heavy cuts and fills should be avoided. In an attempt to avoid extensive cuts and fills, grades may be steeper than typically found on developed roads outside the park. Retaining walls should be used to reduce the height and extent of cut-and-fill slopes. Where visible, walls should be constructed using native-type stone or textured concrete to present a natural appearance. Another option to minimize slope impacts is to use a paved curb and gutter at the toe of the slope. Sometimes the alignment may be shifted slightly to reduce impacts. In certain places, hydraulic scaling might work. These and other slope stabilization options will be applied as appropriate for specific site conditions.

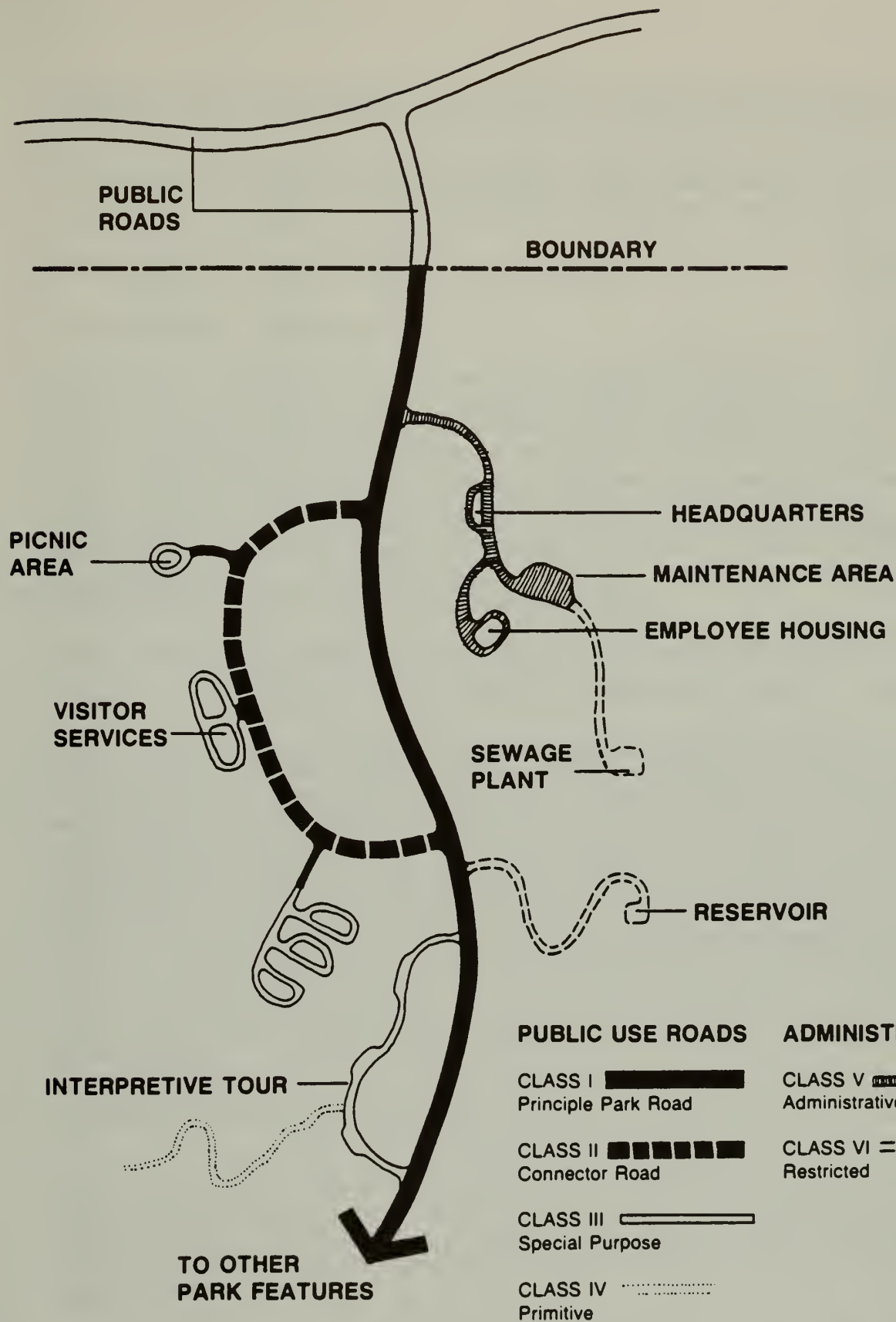
The roadway should be of the highest design quality in terms of blending the traveled surface, shoulders, and ditches into the surrounding environment. Wherever practicable, the color of materials used in road construction should harmonize with the general character of the landscape. Gravel and paving materials used for construction and road repair should blend with the park environment. Therefore, these materials must be reasonably available in the future. Cut-and-fill slopes should be well-rounded and warped at the ends for transition, and properly seeded, fertilized, and mulched for early recovery and to control erosion. Unpaved shoulders on paved roads should be stabilized grass (50 percent aggregate and 50 percent topsoil supporting native grass or other herbaceous plants). Backslopes should be constructed for roads to minimize erosion, slope failure, and ditch blockage, and to maximize revegetation. A maximum maintainable slope in other than bedrock is 2:1 (horizontal to vertical). A 3:1 slope is preferred, where practicable.

Whenever a road is relocated, materials of the old roadbed may be used, providing it is obliterated and revegetated to restore a natural appearance.

To phase out the continuation of backcountry utility line maintenance/access and associated scars, utilities should be buried underground within the road corridors.

Guardrails or guiderails should only be installed at points of unusual danger such as sharp curves or steep embankments. The criteria for installing guardrail on high-speed highways do not apply to the relatively low-speed travel conditions at Bryce Canyon. Guideposts should be used sparingly if at all. Such structures should be constructed with native-type materials and blend with the rustic architectural theme of the park. Structure design and location should recognize snow-removal methods at Bryce Canyon.





**Figure 1**  
**SCHEMATIC SHOWING**  
**FUNCTIONAL**  
**CLASSIFICATION**  
**OF PARK ROADS**  
**NATIONAL PARK SERVICE**

**Table 3: Bryce Canyon Road Classification and Recommended Design Standard**

<u>Route No.</u>	<u>Route Name</u>	<u>Miles</u>	<u>Funct Class</u>	<u>Design Volume</u>	<u>Design Speed</u>	<u>Surface Type</u>	<u>Travel Width</u>	<u>Shoulder Wld/Surf</u>	<u>Comments</u>
10(A)	Entrance (Boundary to gate)	2.8	I	4620	40	Paved	22'	2' Paved & 2' Grass	
10(B)	Rainbow Point/Rim (Gate to Nat Bridge)	9.7	II	1800	35	Paved	22	1 Paved 2 Grass	Portions to be realigned
10(C)	Rainbow Point/Rim (Nat Br to Point)	5.7	II	1390	25	Paved	22	1 Paved 2 Grass	Minor realignment
11	Lodge Loop	1.0	II	1310- 2500	25	Paved	22	1 Paved 2 Grass	
100	Bryce Point	1.9	II	2000	30	Paved	22	1 Paved 2 Grass	
200	Fairyland Point	1.1	II	510	25	Paved	20	2 Paved 1 Grass	
201	North Campground	1.8	III	900	15	Paved	20 12 & 18	3 Grass 0 & 1 Grass	Entrance road 1-way & 2-way loops
202	Sunrise Point Loop	0.5	II	2140	20	Paved	22	3 Grass	Delete sec. between CG and store
203	Sunset Point	0.2	II	2500	25	Paved	22	1 Paved 2 Grass	
204	Inspiration Point	0.2	II	1620	25	Paved	22	1 Paved 2 Grass	
205	Paria View	0.4	II	1180	30	Paved	22	1 Paved 2 Grass	
206	Sunset Campground	1.2	III	1410	15	Paved	20 12 & 18	3 Grass 0 & 1 Gra.	Entrance road 1-way & 2-way loops
207	Lodge Parking Loop	0.3	III	400(W) 4770(E)	15	Paved	20 22	2 Grass 3 Grass	West end of loop East end of loop
208	Visitor Center Parking	0.1	III	N/A	15	Paved	22	1 Grass	To be redesigned
400	Concessioner Res Loop	0.4	V	100	15	Paved	18	1 Grass	
401	Utility Area	0.7	V	100	25	Paved	20	1 Grass	
402	NPS Residential	0.5	V	100	15	Paved	18	1 Grass	
403	Yovimpa Pass	2.8	VI	5	10	Dirt	10	0	Redesign intersection with rim road
404	Gravel Pit Spur	0.2	VI	N/A	-	-	-	-	To be deleted
405	Whiteman Cave	0.2	VI	5	10	Gravel	10	0	
406	Whiteman Bench	0.3	VI	5	10	Dirt	10	0	
407	Deep Well	-	-	-	-	-	-	-	Obliterated
408	Water Tank Spur	0.4	VI	5	10	Gravel	10	0	
409	Sewage Pond	0.7	V VI	25 5	15 10	Paved Gravel	16 10	1 Grass 0	South of res bldg North of res bldg
410	HQ Administrative Parking	0.1	V	N/A	-	-	-	-	To be removed
411	Maintenance Area	0.1	V	100	20	Paved	22	2 Grass	

Roadside signs, whether regulatory, informational, or interpretive, should enhance, rather than detract from, the visitor experience. Information should be clear and unambiguous. Signs should be the minimum necessary and be placed in locations conducive to visitor understanding and decision making. They must conform to the *Manual of Uniform Traffic Control Devices* and the National Park Service *Sign System Specifications*. Graphic symbols should be sized and designed for visual comprehension from moving vehicles but be the minimum size necessary.

## **SPECIFIC DESIGN STANDARDS**

Specific design standards are recommended to provide guidelines for design and maintenance of individual roadways to accommodate the projected level of vehicular traffic but modified by the specific characteristics of the roadway environment. Table 3 lists the recommended design standards for the roads at Bryce. These standards are for typical sections along the road and will vary according to site-specific field conditions identified during design. The width and alignment of much of the park road system would not be changed because the standards are already met. The major exception is the Rainbow Point/Rim road, which would be widened by about 20 percent to meet minimum standards. Most road reconstruction would occur on the existing alignment. Following is more detailed information on the recommended standards.

Design volumes (listed in table 3) were established by increasing the current ADTs (listed in table 1) to reflect the forecasted visitation to the park for the year 2010. (This assumes construction beginning around 1990 and a 20-year design period.)

Design speeds are listed in table 3 to provide a general guideline for setting geometrics during road reconstruction design. The current "design speed" for the entrance road/rim road (route 10) varies between 20 and 50+ mph. The posted speed is 35 mph, with 20 mph warning signs on a few curves. To conform to the existing alignment as much as possible, the proposed design speed would range from 30 to 45 mph for the entrance road (10A) and the rim road to Natural Bridge (10B). The posted speed would continue to be 35 mph. The design and posted speed for the rim road from Natural Bridge to Rainbow Point (10C) would be about 25 mph, with some curves posted at 20 mph to conform to the existing alignment where possible. It would be desirable to achieve a consistent design speed; however, this recommendation does not mean that all curves should be straightened to bring them up to the standard regardless of impact. It also does not imply that excessive adverse curvature should be added to bring the straight sections down to the recommended design speed.

Specific road relocations (as discussed below) are proposed to achieve a variety of purposes, including resource protection, an improved visitor experience, and safety.

Traveled way (traffic lanes) surface materials would remain the same as the existing surface on all roads in the park. Shoulder surface materials on paved roads would be a mixture of aggregate and topsoil supporting native grasses or other herbaceous plants (stabilized grass), or a combination of asphalt and stabilized grass as listed in table 3 and described below. Shoulders on gravel or dirt roads would be the same surface as the traveled way.

Road widths would meet, but not exceed, minimum standards from *Park Road Standards* (NPS 1984). Because of significant RV/bus traffic, a portion of the shoulder would be



paved. The recommended width standards would accommodate a transit system if implemented. The entrance road, route 10A (mile 0 to 2.8), would be reconstructed with 11-foot travel lanes and 4-foot shoulders, (2-foot paved, 2-foot grass). This would create a 30-foot road base and 26-foot paved ribbon, but it would not require significant widening. As mentioned above, the design speed would be 40 to 45 mph with a posted speed of 35 mph. The reconstructed road would generally follow the existing alignment. For a graphic illustration of these width standards, see figure 2.

The rim road to Natural Bridge, route 10B (mile 2.8 to 12.5), would be widened to the minimum width recommended in *Park Road Standards*, i.e., 11-foot travel lanes with 3-foot shoulders. The shoulder would be 1-foot paved and 2-foot grass, which would create a 28-foot road base and a 24-foot total pavement width. The design speed would be 30 to 40 mph with a posted speed of 35.

The rim road from Natural Bridge to Rainbow Point, route 10C (mile 12.5 to 18.2), would also be widened to 11-foot travel lanes and 3-foot shoulders. Again, 1 foot of the shoulder would be paved, and 2 feet would be grass. The design and posted speed would be about 25 mph.

Proposed modifications to all other roads are outlined in table 3. In a few cases, widening these other roads may be necessary, but most road top widths are adequate. Some of the existing road pavement and shoulder sections are too wide and would be reduced according to the design guidelines when they are repaved or reconstructed.

## ROAD RELOCATIONS

Relocations are recommended for five sections near overlooks and at the switchbacks on the rim road. (See Proposed Road Relocation and Parking Concepts map.) A road relocation is defined in this document to be any lateral shift in the centerline of more than 15 feet. Anything less than 15 feet is considered a minor realignment. The following proposed road relocations would affect only about 3 percent of the road system and not change the basic layout, access to overlooks, and quality of the driving experience significantly. All abandoned road sections would be obliterated and the sites restored.

At the Whiteman Bench switchbacks the road would be relocated to make the design speed more compatible with the rest of the road in this segment and improve roadway safety for park visitors. At Farview the road would be relocated up to 300 feet west to enhance the visitor experience at the overlook and to improve the parking area's entrance/exit safety.

To reduce impacts on the rim, improve the visitor experience, and enhance safety, the road at Natural Bridge would be shifted about 50 to 150 feet to the northwest. A bridge or substantial fill would be required in this area. During preliminary design the curve one-half mile north of Natural Bridge would also be evaluated for a possible road relocation to eliminate the broken-back curve.

At the Agua and Ponderosa Canyon overlooks, the road is contiguous with the parking areas atop a narrow ridge. The steep topography precludes a substantial separation between the road and the overlooks; however, the road would be shifted about 20 to 40 feet away from the rim to separate it from the parking areas and to improve safety. Some fill would be required because of steep slope conditions, and a retaining structure

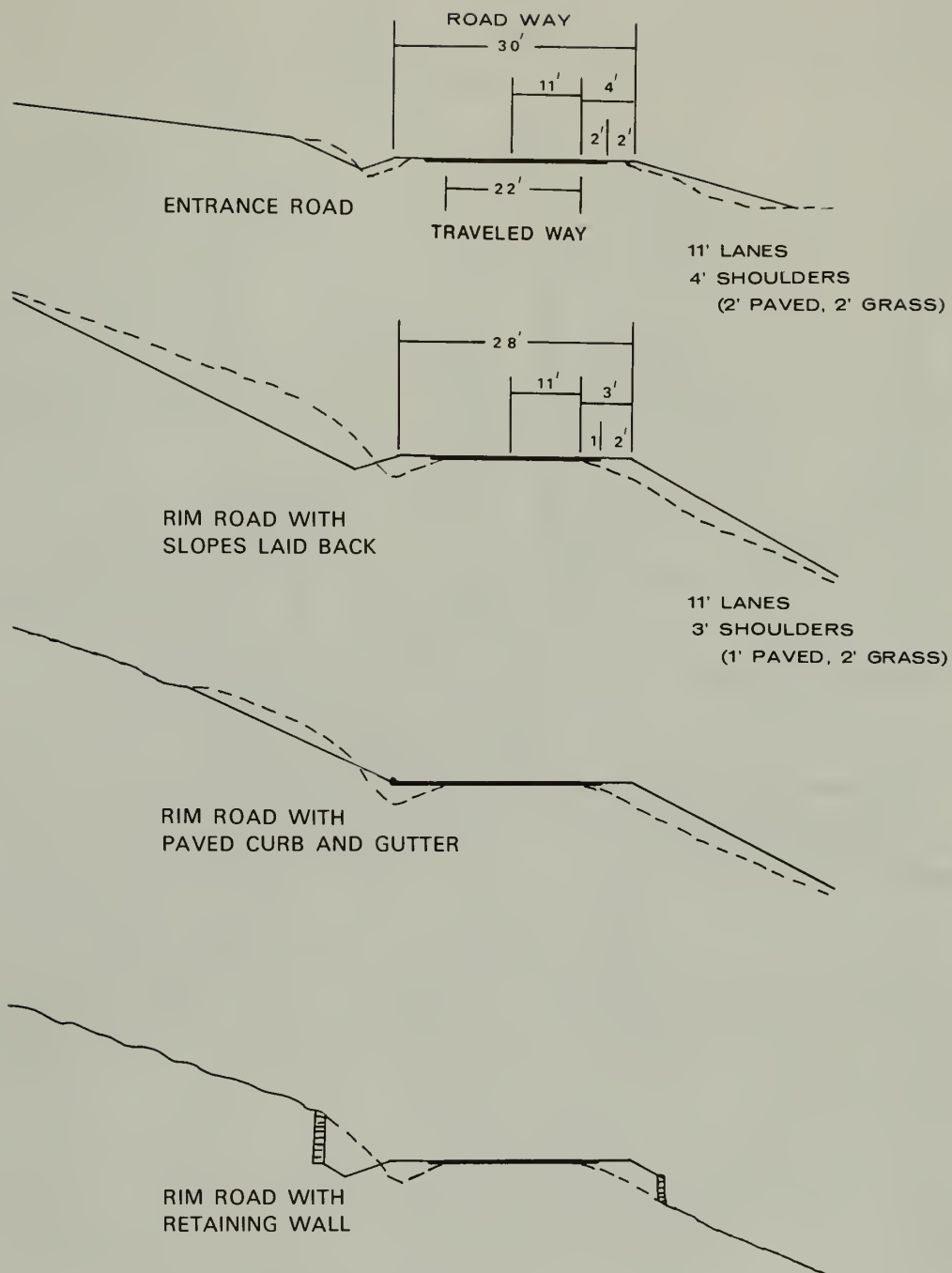
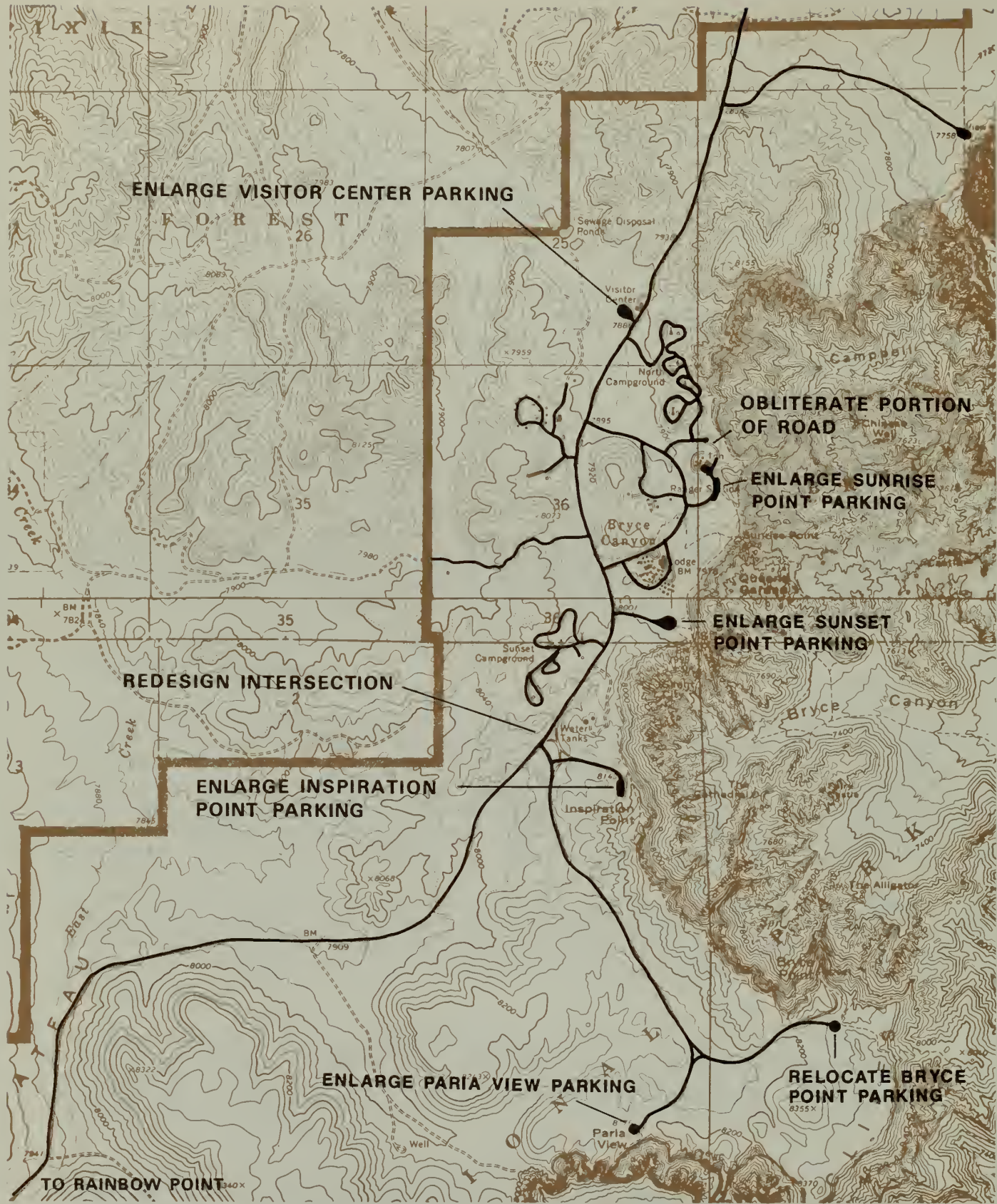


FIGURE 2  
**PROPOSED ROAD CROSS-SECTIONS**  
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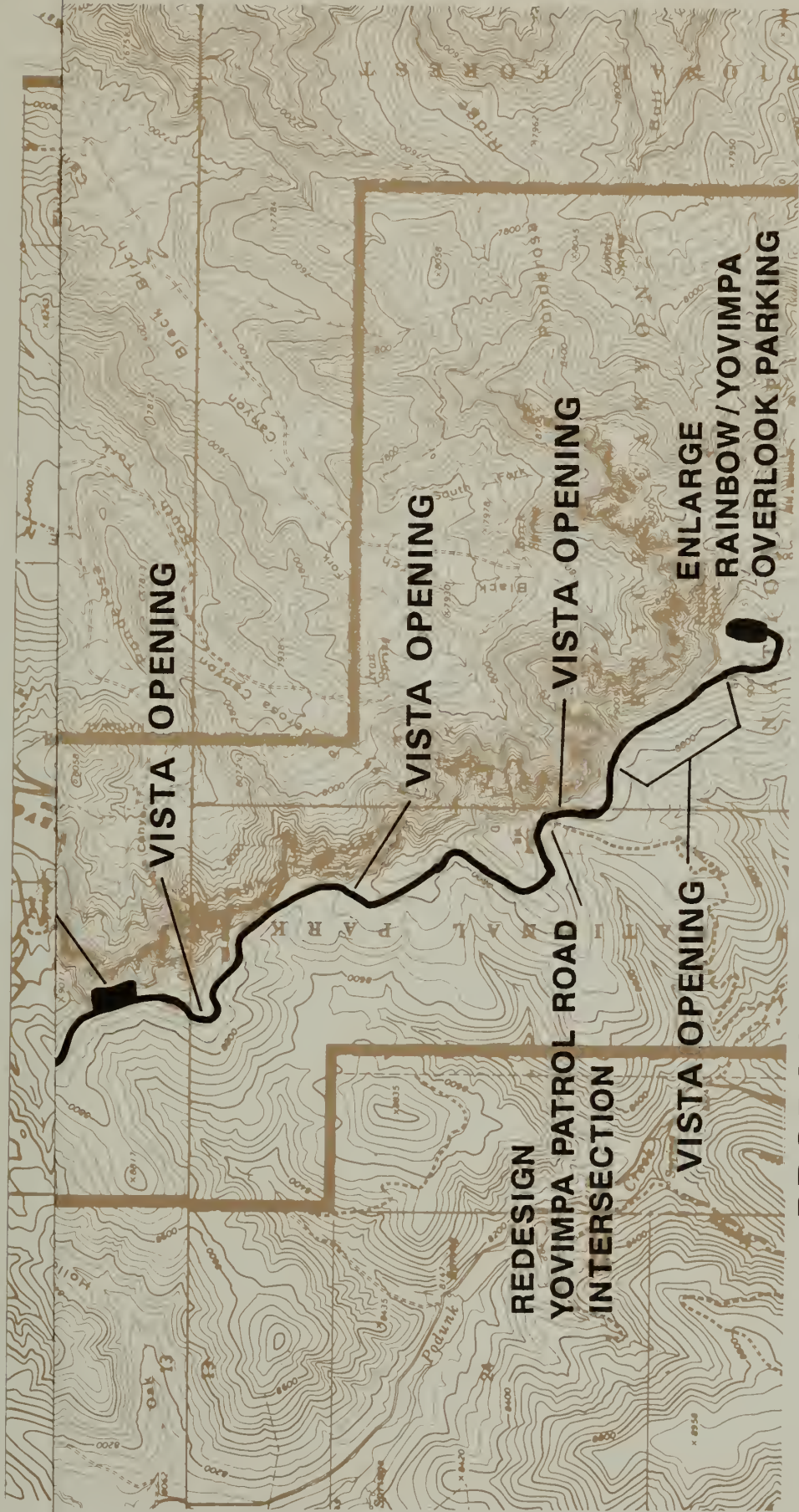
## PROPOSED ROAD RELOCATION AND PARKING CONCEPTS

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# **PROPOSED ROAD RELOCATION AND PARKING CONCEPTS**

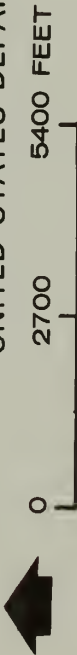
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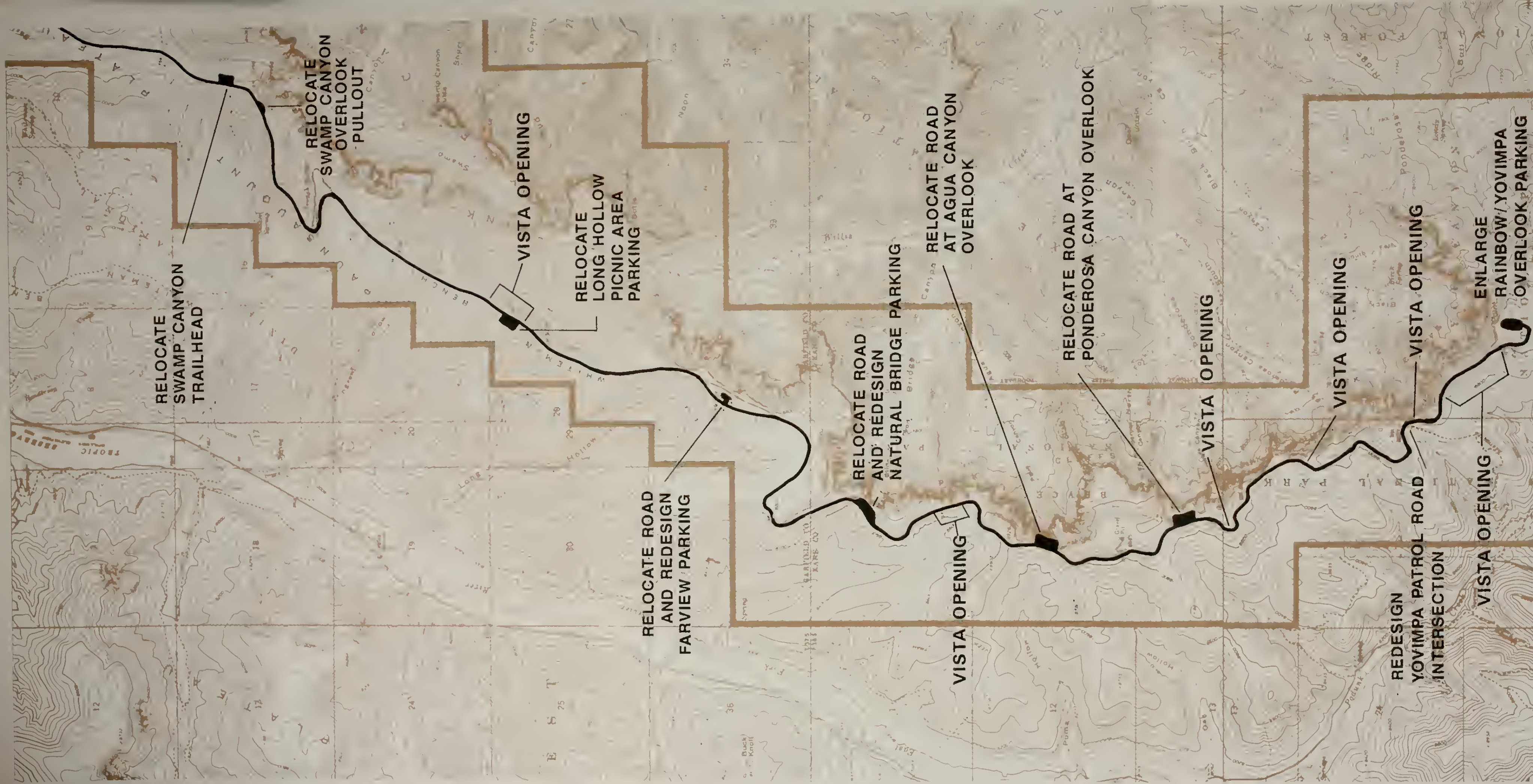
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## PROPOSED ROAD RELOCATION AND PARKING CONCEPTS

BRYCE CANYON NATIONAL PARK

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(up to 500 feet long) might be needed at each location. To reduce the fill, lowering the road and parking area below the grade of the overlook would also be considered during design. Road curvature in the vicinity of the overlooks would also be taken into account.

## **INTERSECTION REDESIGN**

The Bryce Point/rim road intersection is confusing and a potential safety hazard. It is currently a double Y. The intersection would be redesigned, retaining the rim road as the through-road. Two separate T intersections would provide access to Inspiration Point and Bryce Point/Paria View (see Proposed Road Relocation and Parking Concepts map).

The existing Bryce Point/Paria View road intersection is a single Y and less confusing than the double Y. Therefore, it would be retained to reflect the original character of the road system.

The intersection of the rim road with the Yovimpa patrol road (route 403) near milepost 17 would be redesigned/relocated. The existing intersection is on a blind curve with a steep uphill grade, making it extremely dangerous. The intersection would be redesigned with improved access and sight distance. Abandoned intersection alignments would be obliterated, recontoured, and revegetated.

## **PULLOUTS AND PARKING AREAS**

Several pullouts and parking areas discussed below would be redesigned to enhance the visitor experience, eliminate safety problems, increase parking capacity, and reduce congestion. These parking areas would accommodate a transit system if one is implemented. Existing small and informal pullouts along the rim road, which have been created by motorists, would be paved if there is adequate site distance to provide safe vehicular use. Three informal trailhead parking areas would be combined with overlook parking areas or eliminated (see Parking Area and Vista Opening Sites map). The discussion below describes more specific recommendations, starting from the park entrance and moving south to Rainbow Point (see figure 3). The graphic illustrations are preliminary concepts only and will be subject to further analysis and refinement during the detailed design phase. Proposed parking capacities were established in the 1987 GMP for the park.

To provide adequate parking for trailers that are not permitted outside the main developed area, the visitor center parking area would be redesigned and expanded as proposed in the GMP to add spaces that would accommodate about 90 additional cars and 40 more oversized vehicles. The employee parking area access (route 410) would be eliminated and combined with the visitor center parking access (route 208). The entrance road would be realigned near the fee collection kiosks to improve the approach alignment. A more functional and visually appropriate entrance station should be considered to replace the kiosks. The headquarters building facade should also be rehabilitated to more clearly identify the visitor center and improve the building aesthetics. It is possible that a new entrance station and visitor center facade improvements could be done with one architectural treatment. These architectural issues would be addressed in a detailed design study and funded separately from the road project, although implementation should be coordinated with road improvements, if possible.

The Sunrise Point parking area would be enlarged to provide space for about 16 additional cars and six oversized vehicles. The general store and laundry parking area would be redesigned to more clearly identify parking spaces and reduce circulation problems in the area. The direct connection to the campground would be eliminated. The Sunset Point parking area would be expanded to accommodate about 20 additional cars. Once improvements are made at Sunrise Point, it would be resigned to direct traffic to that overlook rather than Sunset Point parking as at present.

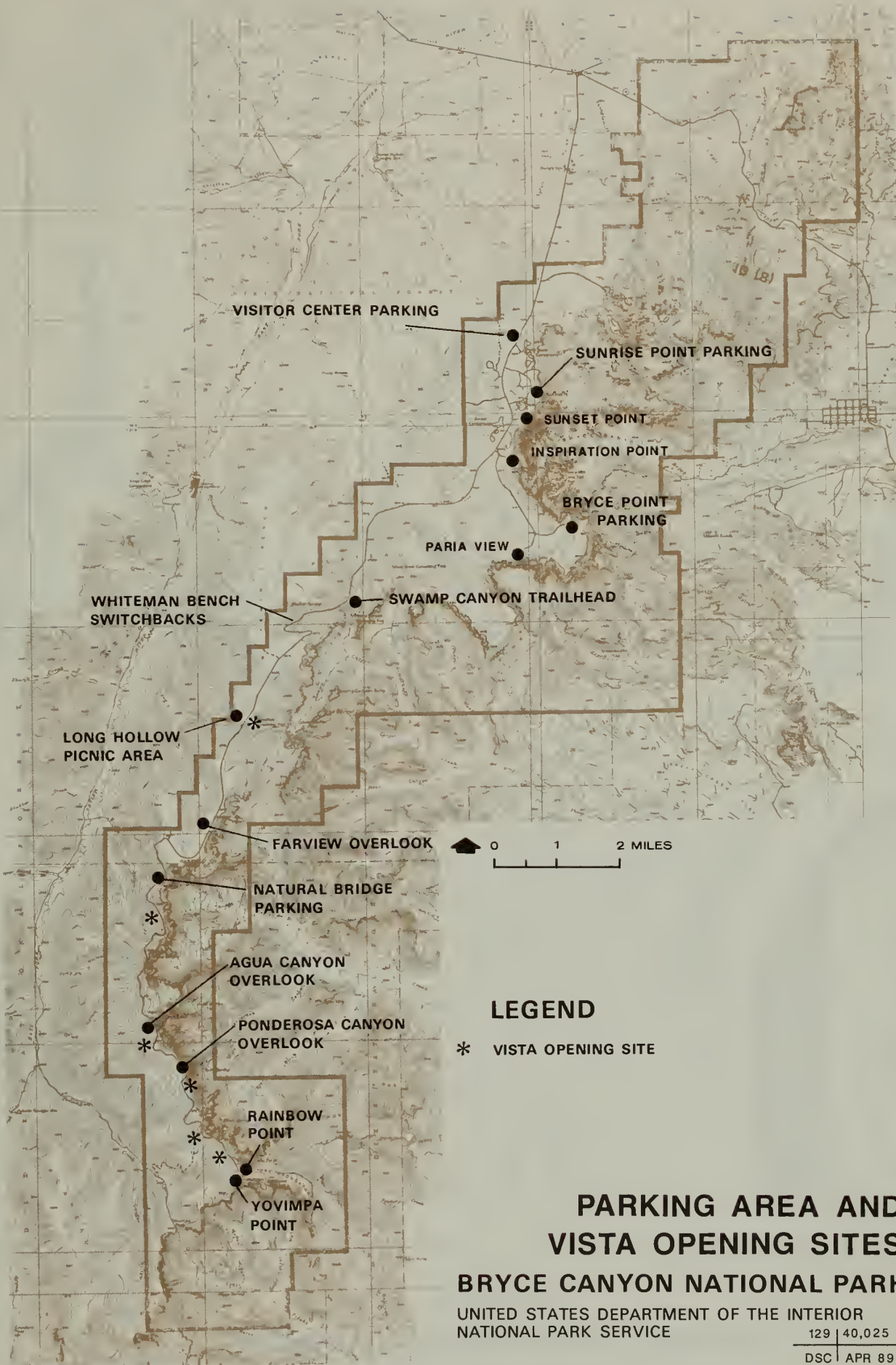
The Inspiration Point parking area would be enlarged and redesigned to provide space for 15 additional cars and two more oversized vehicles.

As discussed above, the Bryce Point parking area becomes extremely congested during the five-month heavy use season, and severe site constraints preclude expansion in its current location on the rim. To address these problems and to offer an improved visitor experience for those willing to take the time to walk, a location change is proposed in this area. The existing Bryce Point parking area and approach road would be abandoned, obliterated, recontoured, and revegetated. A new parking area would be constructed about 500 feet south of the current Bryce Point parking area at a site set back from the canyon rim. Parking would be provided for about 66 cars and 14 oversized vehicles. The GMP did not set a proposed capacity for Bryce Point parking area. The current proposal is based on the need to resolve existing parking demands taking into account the greater setback from the overlook. Access to the overlook would be on an extended connecting trail, increasing the trail distance from about 500 feet to about 1,000 feet long. Steep grades on the existing trail prevent this overlook from being handicap accessible.

The Sheep Creek and Swamp Canyon trailhead parking areas would be removed and a new parking area constructed to accommodate both trailheads. Both trails would need to be extended to join the new parking area. The lot would be constructed for about 10 cars and two oversized vehicles. The existing parking areas (actually pullouts) are poorly located and are close enough to be combined into one facility. The Swamp Canyon overlook pullout would be relocated about 500 feet south to improve the site distance and remove an existing sliver cut. The existing Sheep Creek trailhead parking would be obliterated. The Long Hollow picnic area would be relocated about one-half mile north and combined with the Whiteman trailhead. Parking would be provided for about 10 cars and two oversized vehicles. This facility would also serve a proposed west side overlook. The Farview Point parking area would be moved back from the overlook and be designed for about 34 cars and six oversized vehicles. As discussed above, the road would be relocated to separate it from the parking area and to move it back from the rim.

To separate development from a primary resource, improve the visitor experience at the overlook, reduce congestion in the parking area, and increase safety for pedestrians and motorists, the Natural Bridge parking area would be redesigned to remove parking from the area immediately adjacent to the overlook. Space would be provided for up to 42 cars and 8 oversized vehicles. This would more than double the existing parking space, but it is necessary to alleviate existing capacity problems and to accommodate increased visitation. As discussed above, the road would also be shifted away from the Natural Bridge overlook and separated from the parking area. Maximum use would be made of the old roadbed for the proposed parking area.





## LEGEND

\* VISTA OPENING SITE

## PARKING AREA AND VISTA OPENING SITES

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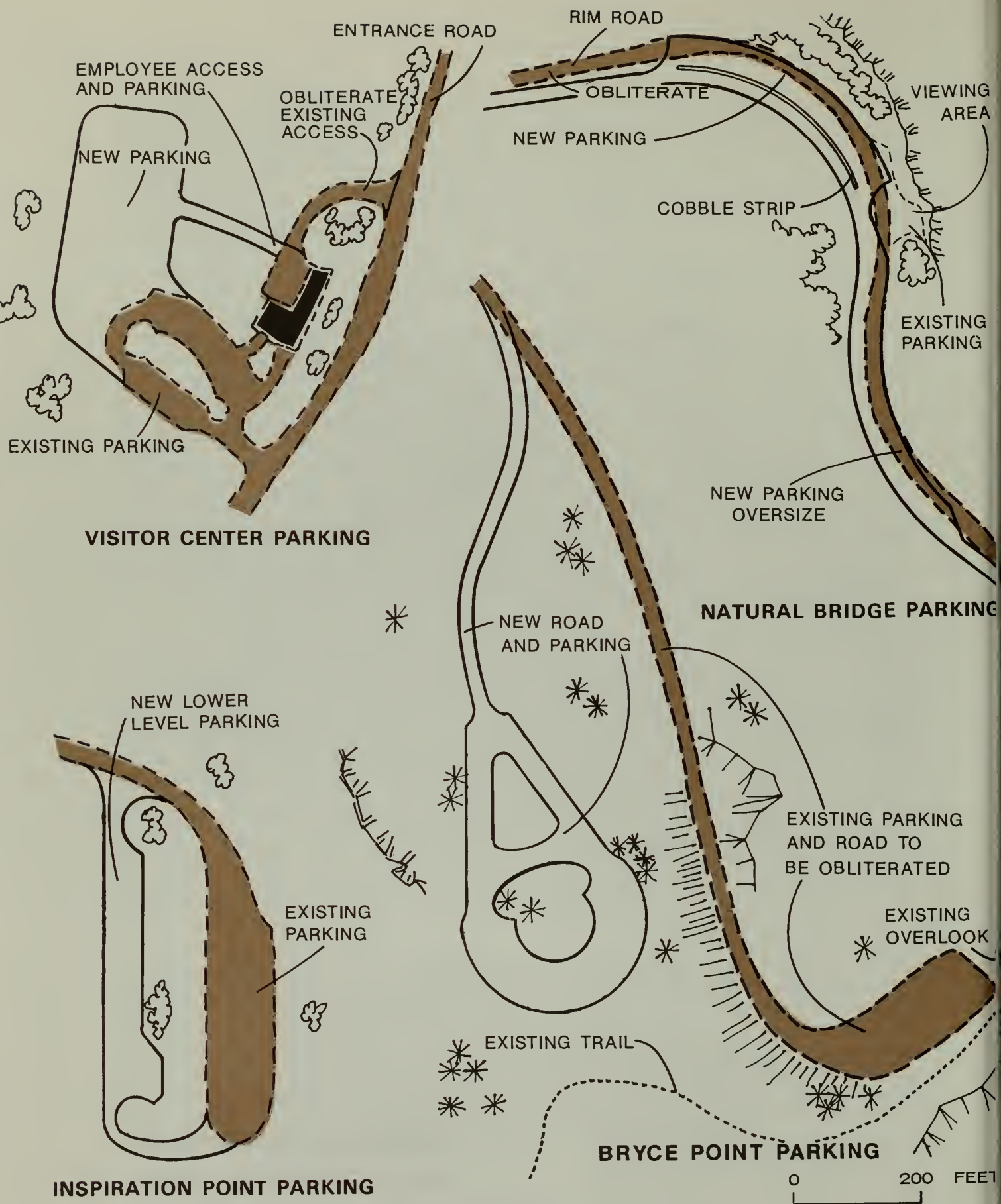


FIGURE 3

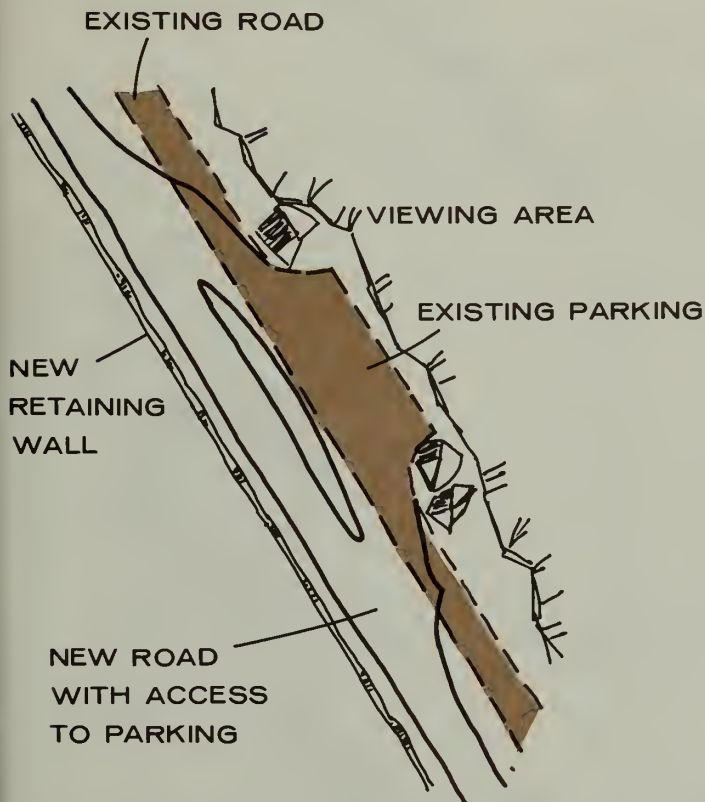
**PROPOSED PARKING DESIGN CONCEPTS**  
**BRYCE CANYON NATIONAL PARK**



**SWAMP CANYON TRAILHEAD PARKING**

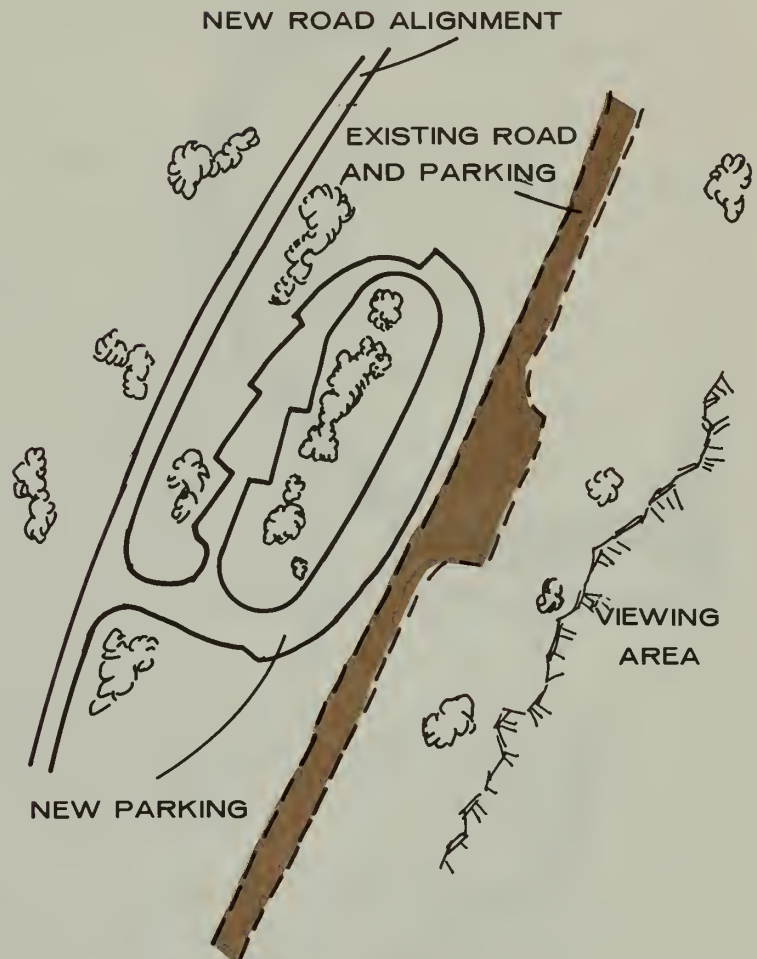


**LONG HOLLOW PICNIC AREA PARKING**



**ROAD REALIGNMENT AT AGUA CANYON AND PONDEROSA CANYON OVERLOOKS**

100'



**FARVIEW PARKING**

0 200 FEET

EXCEPT AS NOTED

**FIGURE 3**

**PROPOSED PARKING DESIGN CONCEPTS**

**BRYCE CANYON NATIONAL PARK**

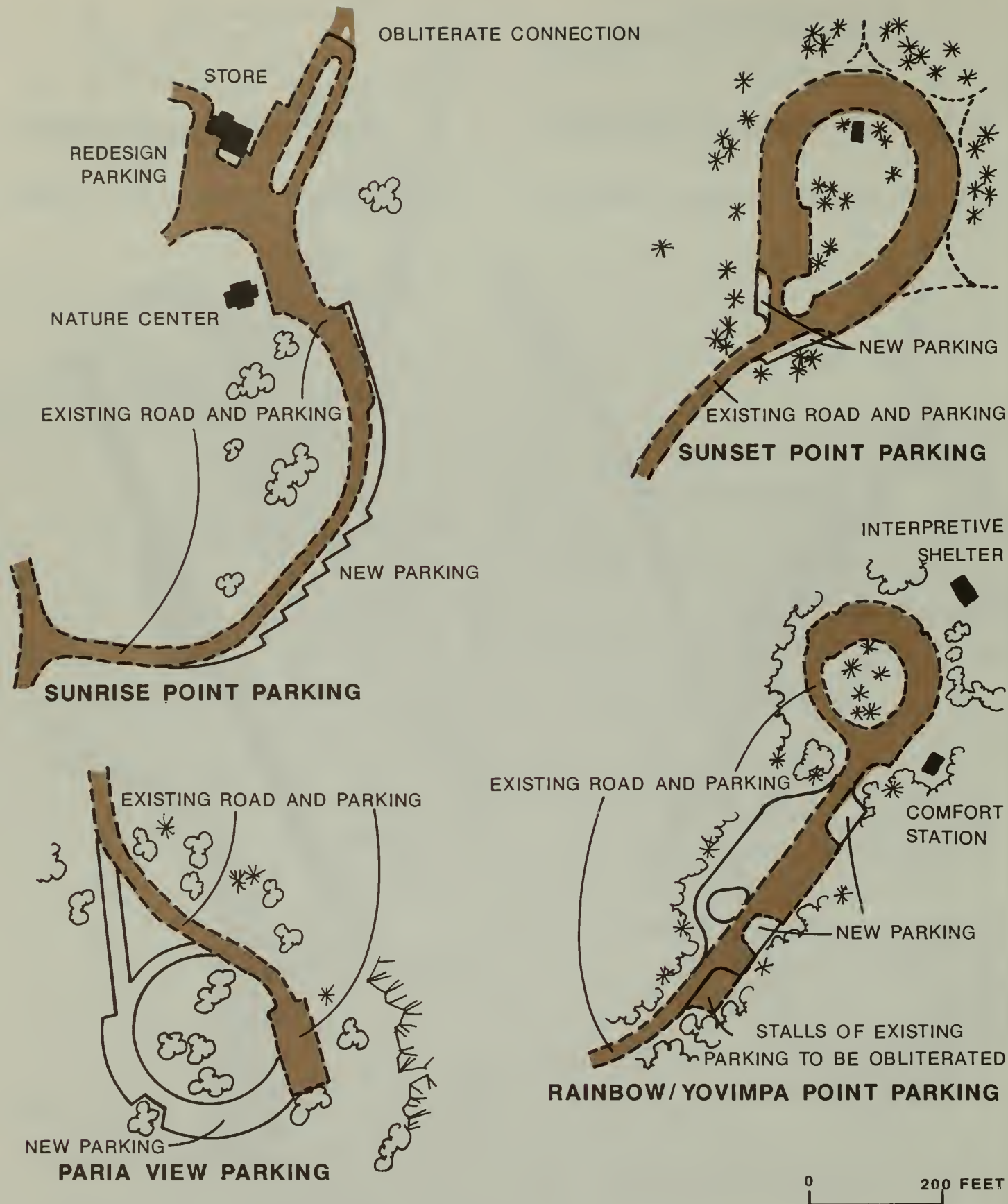


FIGURE 3

## PROPOSED PARKING DESIGN CONCEPTS

### BRYCE CANYON NATIONAL PARK



Because of severe site constraints and anticipated use levels, the Agua and Ponderosa Canyon parking areas would be reconstructed in their current locations to provide parking for up to their present capacity (10 cars at Agua and 12 cars at Ponderosa). The road would be moved away from the rim about 20 to 40 feet to separate it from the parking areas, increase safety, and improve the visitor experience. Site constraints, safety concerns, costs, and resource factors may necessitate a reduction in parking capacity during detailed design.

At Rainbow/Yovimpa Point, the parking would be enlarged to add 11 cars and 6 oversize vehicles. A few spaces near Yovimpa Point would be relocated to increase safety near the curve approaching the area. This would not affect the historic overlook or comfort station.

**Table 4: Summary of Parking Area Capacities**

<u>Location</u>	<u>Existing Parking</u>		<u>Proposed Parking</u>		
	<u>Auto</u>	<u>Oversize</u>	<u>Auto</u>	<u>Oversize</u>	
Fairyland	19	3	19	3	
Visitor Center	77	3	170	40	
Sunrise Point	18	0	34	6	
Sunset Point	95	20	113	20	
Inspiration Point	30	6	45	8	
Bryce Point	21	5	66	14	Relocated
Paria View	13	0	30	6	
Swamp Canyon Trailhead	4	0	10	2	Relocated
Long Hollow Picnic Area	4	0	10	2	Relocated
Farview Point	17	0	34	6	
Natural Bridge	12	0	42	8	
Agua Canyon	10	0	10	0	
Ponderosa Canyon	12	0	12	0	
Rainbow/Yovimpa Point	49	4	60	10	

## REVEGETATION

Much of the rim road is in rolling to mountainous terrain, with about 5 miles of cut-and-fill slopes, some of which are very steep. A few of these slopes have stabilized and revegetated but most have not. Widening the road would require regrading many of the disturbed slopes and some previously undisturbed areas. Selected steep slopes would be excavated and laid back (slope angle reduced to 2:1). These slopes would also be rounded to create a more natural appearance. Excess materials would be used for fill along the reconstructed roadway.

Upon completion of parkwide road and parking area reconstruction, up to 97 acres of surface disturbance would be left to reclaim. This reclamation would include abandoned road alignments and parking/pullout areas, disturbed cut-and-fill slopes, staging areas, and general construction disturbance along the roadway and near parking areas. Use of walks, paved curb and gutter, and other slope stabilization techniques would reduce this area to the degree they are applied. Detailed revegetation plans would be completed prior to construction. These plans would specify revegetation requirements to be

accomplished with construction each project, such as plant species types, topsoil requirements, exotic species control, revegetation timing, and erosion control techniques to be used during construction.

Native plant species would be used for revegetation areas. Pursuant to NPS management policy, they should be from populations as closely related genetically and ecologically as possible to the park populations. The park staff is currently working with the USDA, Intermountain Forest and Range Experiment Station to establish a native seed/plant source, using gene pools from the southern Utah region. Substantial quantities of seeds or plants may be available from this source in the future.

## VISTA OPENINGS

As mentioned in the "Introduction," some views along the rim road are currently blocked or partially screened by vegetation. Selected areas are recommended for vista opening to enhance views from the road and to improve the scenic driving experience. Potential sites and areas are shown on the Proposed Road Relocation and Parking Concepts maps. This would not entail extensive vegetation removal, but rather, selective cutting of individual trees leaving a natural looking appearance. Specific trees would be identified during design in consultation with park staff. The size of vista openings would take into account the 35 mph speed limit.

## PRIORITIES AND COST ESTIMATES

Table 5 lists the priorities and estimated costs for road reconstruction projects at Bryce Canyon. Actual phasing may differ somewhat due to funding constraints, design needs, construction scheduling considerations, or other factors.

**Table 5: Preliminary Road Construction Priorities and Costs**

<u>Priority</u>	<u>Route Name</u>	<u>Number</u>	<u>Miles</u>	<u>Gross Cost</u>
1	Rainbow Point/Rim	10C	5.7	\$4,816,000
2	Bryce Point	100	1.9	741,000
3	Rainbow Point/Rim	10B	9.7	5,336,000
4	Paria View	205	0.4	156,000
5	Inspiration Point	204	0.2	78,000
6	Entrance	10A	2.8	1,092,000
7	Fairyland Point	200	1.1	429,000
8	Sunrise Point	202	0.5	195,000
9	Lodge Parking	207	0.3	78,000
10	Lodge Loop	11	1.0	351,000
11	North Campground	201	1.8	468,000
12	Sunset Campground	206	1.2	312,000
13	Sunset Point	203	0.2	78,000
<b>Total</b>				<b>\$14,130,000</b>

Estimated costs include contracted construction, project development, construction engineering, and contingencies (FHWA). These figures are rough preliminary estimates based on average costs for similar work (class C). Better estimates would be developed during project design based on site-specific details, obliteration needs, and revegetation plans.

In addition to road reconstruction costs, there would be parking area redesign and expansion costs. Table 6 indicates preliminary cost estimates for this work, listed in approximate priority order (consistent with road priorities).

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**Table 6: Parking Area Construction Priorities and Costs**

<u>Priority</u>	<u>Parking Area</u>	<u>Spaces</u>	<u>Cost</u>
1	Natural Bridge	42 car/8 oversize	\$ 139,000
2	Agua Canyon	10 car	24,000
3	Ponderosa Canyon	12 car	29,000
4	Rainbow/Yovimpa Point (add.)	11 car/6 oversize	55,000
5	Bryce Point	66 car/14 oversize	226,000
6	Farview Point	34 car/6 oversize	110,000
7	Long Hollow Picnic Area	10 car/2 oversize	34,000
8	Swamp Canyon Trailhead	10 car/2 oversize	34,000
9	Paria View	30 car/6 oversize	101,000
10	Inspiration Point (addition)	15 car/2 oversize	46,000
11	Visitor Center (addition)	93 car/37 oversize	401,000
12	Sunrise Point (addition)	16 car/6 oversize	67,000
13	Sunset Point (addition)	18 car	43,000
<b>Total</b>			<b>\$1,309,000</b>

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These costs would be reduced somewhat if a transit system is proposed because smaller parking areas would be required. However, a large staging area (500-700 cars) would be required for the system. Better cost estimates would be developed during project design based on site-specific details, obliteration needs, and revegetation plans.



## **ALTERNATIVES**

This section describes alternatives to the proposal. Many options to resolve issues are possible; however, the three contained here are feasible concepts that would create significantly different impacts or might cause potential controversy.

### **ALTERNATIVE A – NO ACTION**

Implementation of this alternative involves the continuation of existing conditions. Existing roads and parking areas would be retained at current widths, on existing alignments, with current capacities at existing locations. Resurfacing would occur as a cyclic maintenance activity. (Refer to the "Road Inventory" section for additional details.)

### **ALTERNATIVE B – MINIMUM ROAD CONSTRUCTION**

Under this alternative park roads would be rehabilitated at existing widths, some of which are below minimum NPS standards. The entrance road would have 22 feet of pavement plus 3-foot gravel shoulders. The rim road would have 20 feet of pavement with 3-foot gravel shoulders. Parking areas would be rehabilitated with minimal redesign at current locations and capacities.

A new, high-use season parking area would be developed near the Bryce Point/Paria View intersection. During the busy season the road would be closed and visitors would be asked to hike or bicycle to Bryce Point and Paria View. Other parking areas would be rehabilitated at existing capacities.

Priorities would be similar to the proposal; however, costs would be less for the minimum road reconstruction (about \$5 million) and more modest parking area rehabilitation (about \$200,000).

### **ALTERNATIVE C – MAJOR ROAD RECONSTRUCTION**

Under this alternative the entrance road, rim road, Bryce Point road, Paria View spur, and Inspiration Point road would all be widened to 32 feet and paved (12-foot travel lanes and 4-foot paved shoulders; see figure 5). The design speed would be a more consistent 45 mph, with some exceptions on the rim road.

The rim road through the East Creek meadow area bisects the threatened Utah prairie dog colonies. It runs directly through a wetland (wet meadow), and blowing/drifted snow creates problems. The road includes long, straight sections, and subsurface water is causing severe structural problems. Under this alternative the road would be relocated to the eastern and southern edge of the meadow where it would be drier, skirt along the edge of the prairie dog colony, and be better protected from blowing/drifted snow. The new, curvilinear alignment would provide a more leisurely driving experience (see Alternative C - Road Relocation and Parking Concepts map).

The existing alignment through the Sheep Creek meadow is also in a wetland. The road is severely deteriorating because of its low grade and excessive subsurface water. It

would be shifted to the west to a drier, more suitable location, and the alignment would be more curvilinear than the present road.

The Fairyland Point road would also be redesigned to make a smoother curvilinear alignment.

Parking areas would be developed as recommended in the "Transportation/Economic Feasibility Study" (NPS 1983a), and incorporated in the 1987 GMP, except at Bryce Point, which is explained below (see figure 4). Informal or unpaved pullouts along the road would be obliterated during reconstruction activities.

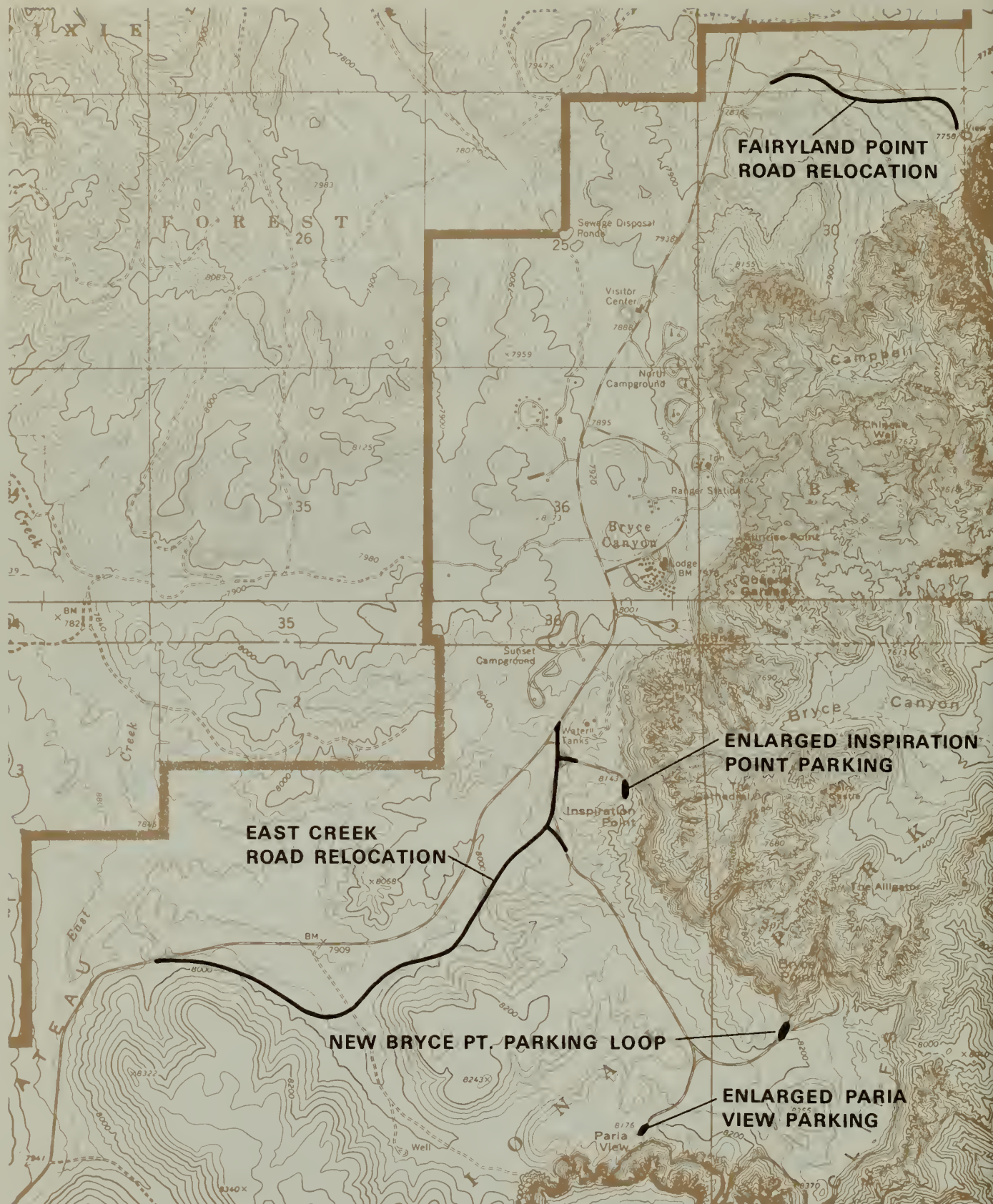
The Bryce Point parking area would be relocated to a new site about 500 feet west of the existing parking area, which would be obliterated. The new parking area capacity would be similar to the proposal.

A new parking area would serve a potential overlook site just south of the Whiteman Bench switchbacks near milepost 8. The capacity of the parking area would be about 20 cars and four oversized vehicles. The new Pink Cliffs overlook would provide a viewing opportunity that is not currently offered along this section of the rim road.

The costs would be somewhat higher for road reconstruction under this alternative because of the added width and greater road relocation, requiring more new construction, obliteration, and site restoration work. This would increase the cost by about \$2.5 million for the road system.

Parking area improvement costs would also be somewhat higher than the proposal (about \$116,000 more) for the new Pink Cliffs overlook.





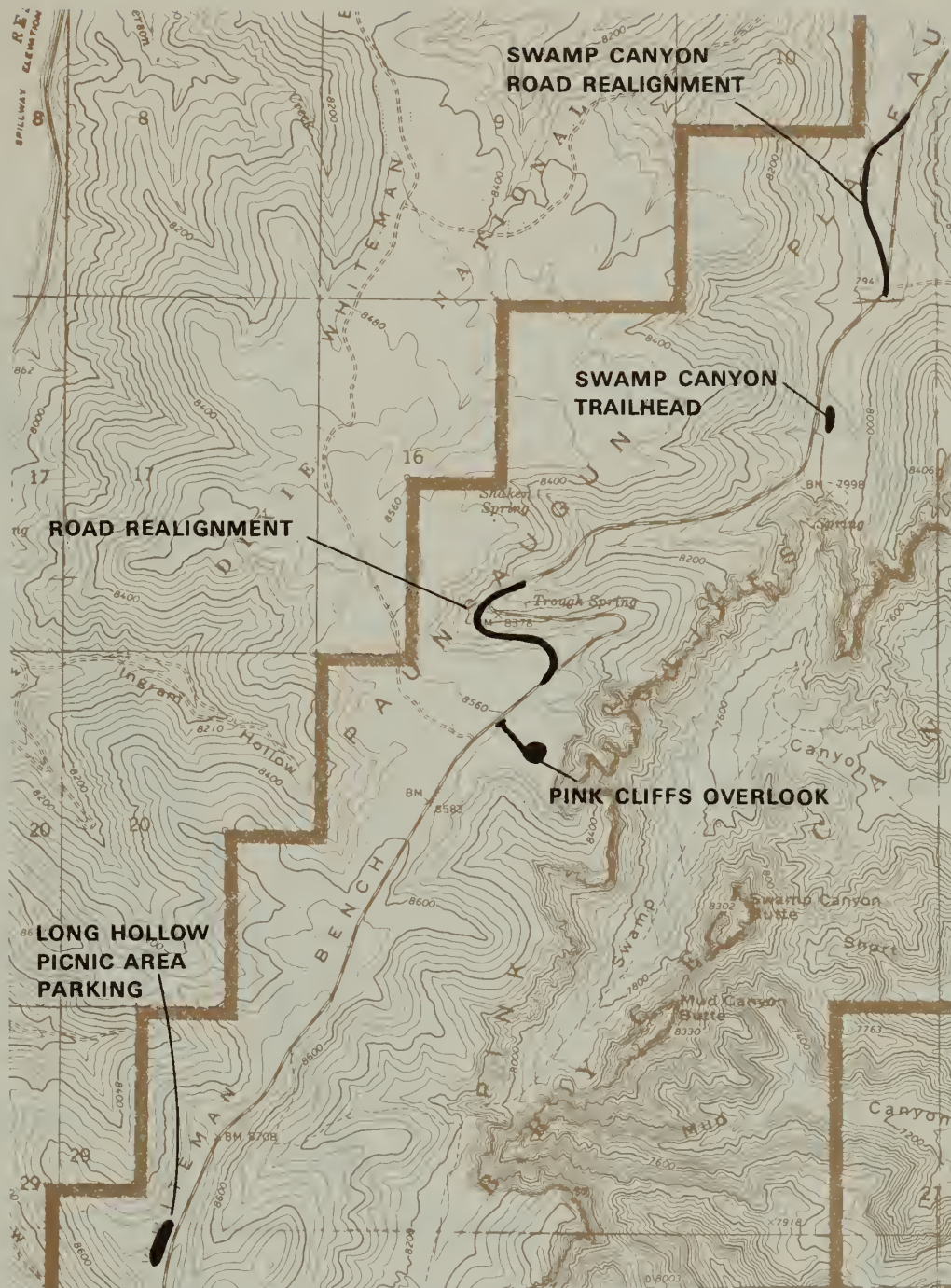
## ALTERNATIVE C ROAD RELOCATION AND PARKING CONCEPTS

**BRYCE CANYON NATIONAL PARK**

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

129 | 40,022A

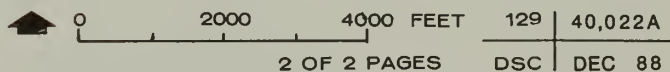


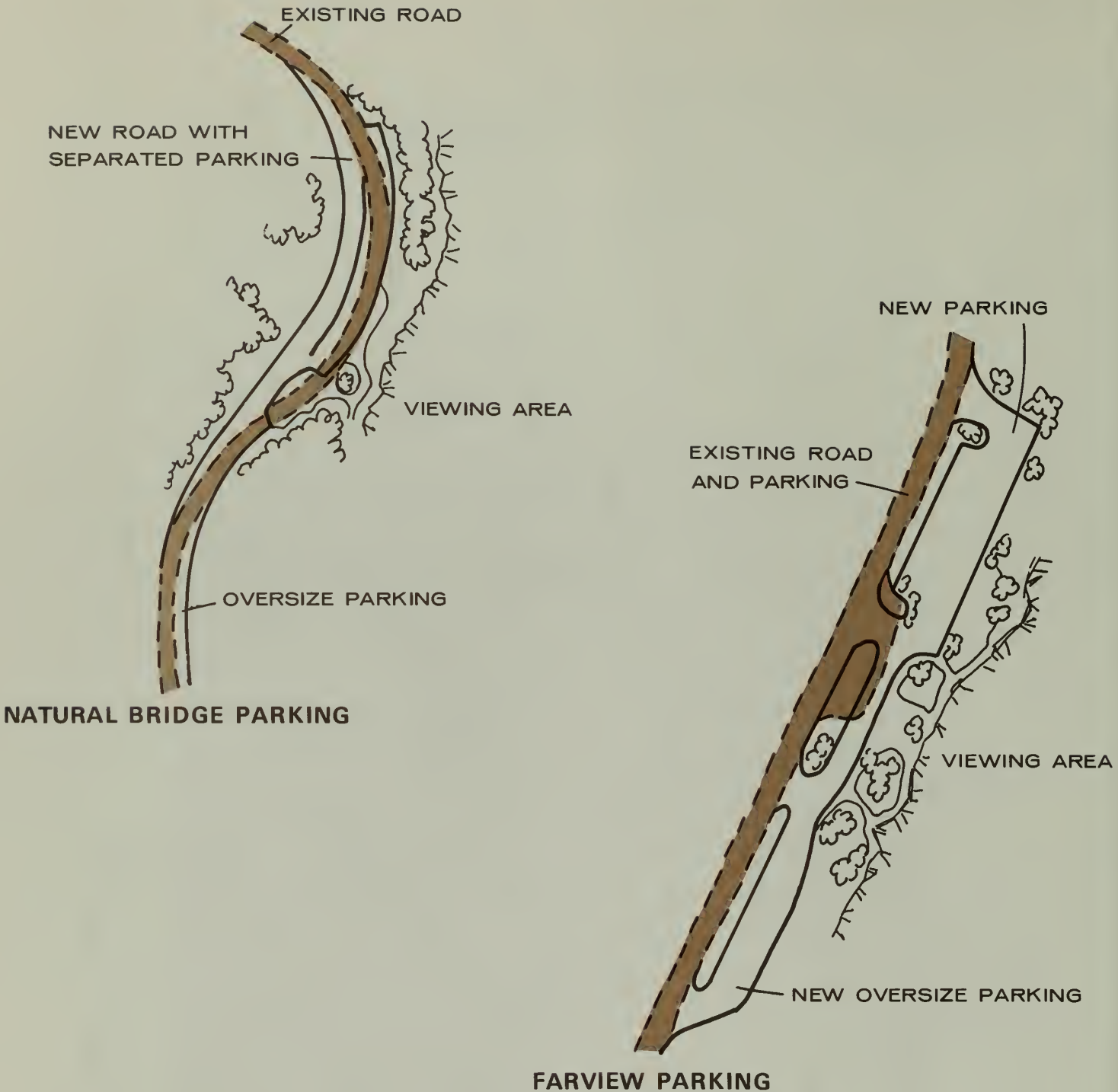


## ALTERNATIVE C ROAD RELOCATION AND PARKING CONCEPTS

**BRYCE CANYON NATIONAL PARK**

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE





0 2000 FEET

FIGURE 4  
ALTERNATIVE C  
PARKING CONCEPTS FROM THE 1983 TRANSPORTATION STUDY  
BRYCE CANYON NATIONAL PARK

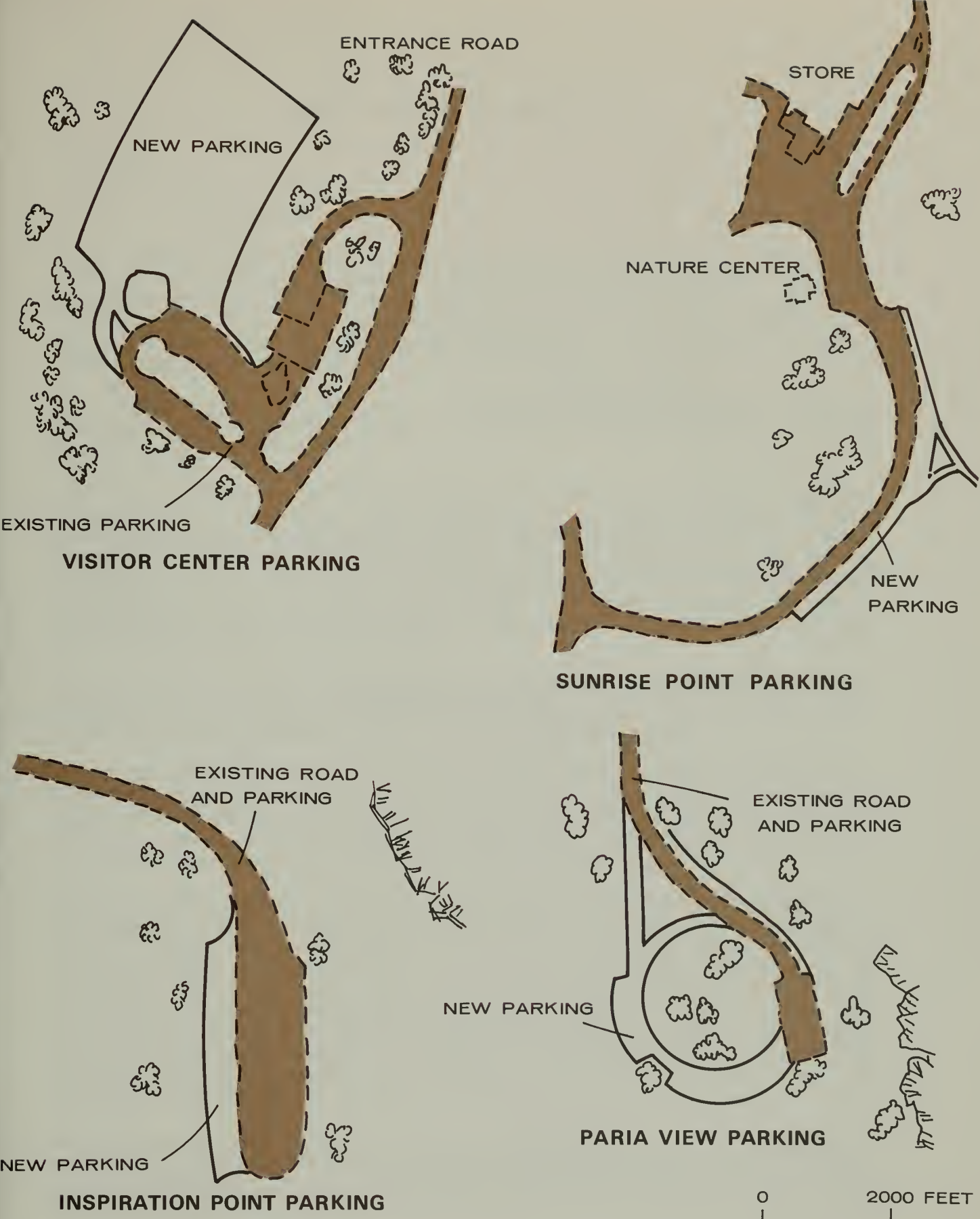


FIGURE 4  
ALTERNATIVE C  
PARKING CONCEPTS FROM THE 1983 TRANSPORTATION STUDY  
BRYCE CANYON NATIONAL PARK



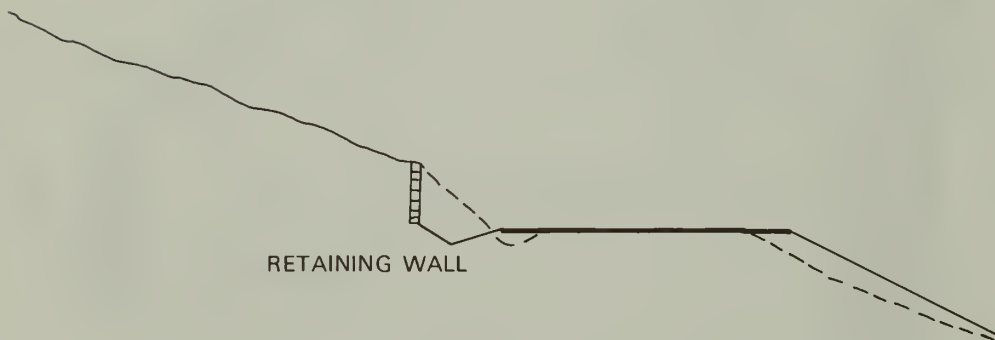
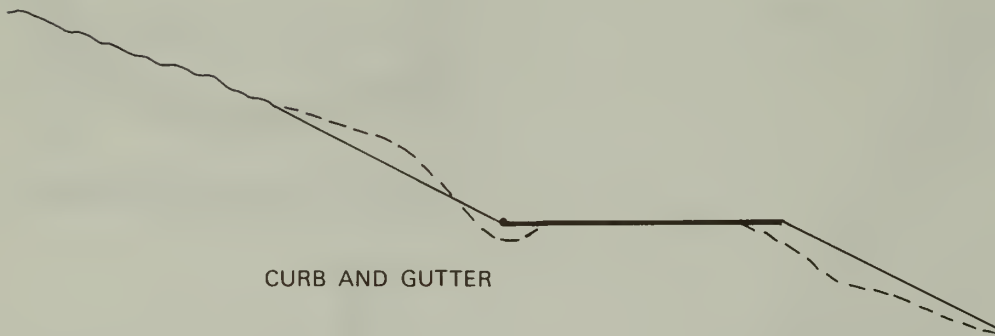
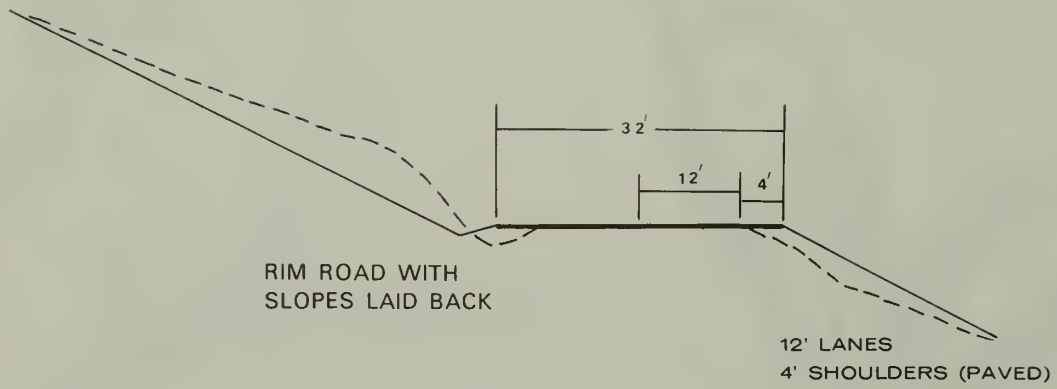


FIGURE 5  
**ALTERNATIVE C**  
**ROAD CROSS-SECTIONS**  
 BRYCE CANYON NATIONAL PARK

## **ENVIRONMENTAL CONSEQUENCES**

### **PROPOSAL**

#### **Impacts on Natural Resources**

A total of approximately 155 acres would be affected by proposed road and parking area reconstruction – 115 acres of previously disturbed areas (i.e., existing road prism and parking areas) and 40 previously undisturbed acres. The majority of the disturbed areas, about 97 acres, would be reclaimed/revegetated following reconstruction activities. The total paved area would be about 58 acres. The previously undisturbed areas (40 acres) would comprise about one-tenth of one percent of the park.

The impacts would primarily occur in ponderosa pine and spruce-fir vegetative communities. Rare or unique plant communities or critical wildlife habitat would not be affected.

Previously undisturbed areas would be cleared of vegetation, soils would be redistributed and recontoured, and in some places, bedrock would be ripped or blasted. Increased pavement from road widening and new parking areas would cover about 17 acres. Areas adjacent to the roadside and parking facilities, particularly sloped areas along the rim road, would be the most heavily affected. An indeterminate amount of bedrock would be irretrievably lost from excavation, slope flattening, and grading. Selective blasting or ripping would be used to loosen bedrock as necessary. Flattening/grading would also result in soil compaction and displacement.

Topsoil would be removed and stockpiled for reuse during revegetation efforts. Where practicable, retaining walls, paved curbs, and other slope stabilization techniques would be used to reduce the extent of slope cuts, thus lessening impacts.

The erosion of disturbed soils, particularly on sloped areas, would be a problem until vegetation was adequately reestablished. Generally, the more the slope is laid back or flattened the broader the surface disturbance, but slope flattening also helps reduce soil erosion and tends to assist revegetation efforts. Other erosion control methods and devices to be used would include contour ditches and matting.

There would be a short-term loss of up to 23 additional acres of vegetation disturbed by construction that would be replanted, and a long-term loss of up to 17 additional acres for road widening and new parking spaces. Vista openings would affect only a small number of mature trees outside the road construction zone. Disturbed areas to be revegetated would be replanted with native plant species associated with adjacent forest and meadow communities. Recovery time for grasses, sedges, and forbs would be two to three years. Shrubs and trees might take 20 to 30 years to recover. Exotic plant species might become a problem if revegetation efforts were not fully successful. The combination of disturbed soils and the distribution of water for compaction and dust abatement would enhance the opportunity for exotic plant species proliferation.

Some bristlecone pines might be damaged or destroyed by construction/reconstruction activities. Two sites of particular concern would be the Paria View parking area and the proposed new location of the Bryce Point parking area. Trees near these or other

locations would be identified and marked by park staff to help reduce the possibility of negative impacts during construction or reclamation.

Construction activities, particularly vegetation clearing and soil/rock displacement, would result in the short-term disturbance or possible death of wildlife, particularly those species that inhabit areas near the road and parking facilities. To reduce impacts on nesting birds, vegetation clearing, particularly tree removal, should be done before or after the spring nesting period. If erosion control methods were not successful, increased siltation might affect water quality and fish populations in the East Fork of the Sevier River and Tropic Reservoir. There would be a long-term loss of up to 15 additional acres of wildlife habitat. Improvements in sight distance might reduce vehicle-wildlife accidents.

Areas that would be affected by road/parking reconstruction would be surveyed for potential endangered or threatened plants prior to completion of preliminary design work. If any of these plant species were found in or adjacent to proposed construction areas, mitigating measures such as realignment, retaining walls, or special restrictions on construction activities would be used to minimize negative impacts.

The threatened Utah prairie dog would continue to be adversely affected by the existing road alignment through the East Creek Meadow. The colony in this meadow is currently bisected by the roadway, and prairie dogs crossing the road are sometimes killed. A fence that is set up each winter along the road to prevent drifting/blowing snow also causes negative impacts. Snow accumulates along the fence and does not melt until late in the spring. When it does melt, the additional water causes surface flooding of feeding grounds and subsurface flooding of burrows.

The endangered peregrine falcons are sensitive to construction activities, particularly during their critical nesting period from mid-April through mid-June. More information on nesting locations would be required to effectively prevent or reduce potential impacts on this species. No construction would be permitted within 1 mile of known eyries during the nesting period. Nesting activities would have to be closely monitored by the park during the construction period, requiring additional park staff resources for the fieldwork. If this essential data were not collected and the location of nesting sites remained uncertain, there would be increased potential for negative impacts, including nest abandonment or death.

Because endangered bald eagles visit Bryce Canyon during the winter months, construction activities would cause only minor negative impacts, such as additional stress. Eagle deaths would not be expected. Bald eagle roost trees would be identified by park staff, and their removal would be avoided.

Small intermittent streams near the roadway and parking areas would be temporarily affected by increased siltation from disturbed and eroded soils. Erosion control devices and techniques such as matting and contour ditches would be used to minimize the problem. An adequate supply of groundwater from park wells would be available for compaction and dust abatement. Water trucks would be filled in the maintenance yard or at hydrants in the developed area. Groundwater supplies would not be seriously affected.

A temporary reduction in ambient air quality would occur from dust and fumes from construction activities. Burning would not be permitted. Tree trunks, stumps, and slash would be removed from the park and disposed of in an approved manner. Some of the materials might be retained for land rehabilitation or other uses. A temporary storage site



would be identified by the park. All construction-related garbage, crankcase oil, and other refuse would be removed from the park by the contractor.

A short-term increase in noise would also occur from construction activities resulting in temporary disturbances to nearby wildlife. Trucks hauling construction materials would be a source of air pollution and noise. Batch plants and crusher operations would occur outside the park.

### **Impacts on Cultural Resources**

The majority of proposed road and parking area reconstruction would be within the existing road corridor that has been previously disturbed by construction and maintenance activities. Ten archeological sites or isolated finds lie adjacent to or under the existing roadway. Additional surveys would be done in unsurveyed areas, and identified archeological sites would be evaluated for significance and mitigation requirements. There is a high probability of finding additional archeological resources in those unsurveyed areas proposed for reconstruction. Some archeological materials might be disturbed or destroyed during road reconstruction. Additional preconstruction survey work would be required to reduce this potential. For affected sites, archeological data recovery would occur on the basis of recovery plans prepared by the National Park Service in consultation with the Utah State Historic Preservation Officer. The construction contract would require work stoppage to allow evaluation/mitigation if materials were found.

This *Road System Evaluation* does not recommend any changes to the road alignments or parking areas in or near the Bryce Canyon Lodge Historic District or the old residential district. When these roads require resurfacing or reconstruction, the widths would be made more consistent, which would require only minor increases or decreases in pavement. The proposed road reconstruction and parking redesign near Rainbow Point would not affect the historic overlook or comfort station.

The Bryce Canyon road system was determined eligible for the National Register of Historic Places in 1987. Under the proposal, reconstruction of the roadway and parking areas would result in alterations to some design features, such as road width and alignment and parking area capacity. The original road corridor has been modified several times over the life of the park, but these changes have not degraded the historical integrity of the road. The modifications proposed in this document would also change some characteristics of the original design, but would not substantially degrade the historical qualities of the roadway or detract from its National Register status. The original road concept, general layout, access to historic viewpoints, and overall historical purpose and integrity would be maintained.

### **Impacts on Socioeconomic Environment/Visitor Use**

In the short term, visitors would be inconvenienced by road reconstruction, with disruptions in normal traffic patterns and delays/detours common during the construction period. These delays would range from 2 to 20 minutes. Slow-moving trucks hauling construction materials and equipment would be an additional source of delay inside and outside the park. Reconstruction of parking areas would require temporary closures that

might result in increased congestion at other parking areas. Construction scars would be common along the project route.

The relocation of the Bryce Point parking area would have an impact on visitor use in the area. Some people might be discouraged from visiting this popular overlook because they prefer not to, or cannot, walk twice the distance (about 1,000 feet in the proposal) to the overlook; however, there are many other overlooks with drive-up parking. Pulling the parking areas away from the canyon rim would improve the aesthetics of the overlooks and increase alternatives for ways of experiencing the park.

Over the long term, it is anticipated that the road would provide a safer, more enjoyable park experience. The overall visual effect would be a smoother road with a more consistent design speed, somewhat wider paved top, consistent shoulder width, lower-angled side slopes, and improved sight distance. Road maintenance work would be substantially reduced. The newly redesigned/constructed parking areas would be less congested, less confusing, and, where possible, screened from the roadway. It is anticipated that these changes would encourage visitors to stay longer and to enjoy a more aesthetic park experience.

## **ALTERNATIVE A – NO ACTION**

### **Impacts on Natural Resources**

Current management and existing uses of the roadway and parking areas would continue. No new significant impacts on bedrock, soils, vegetation, wildlife, endangered and threatened species, floodplains and wetlands, water quality, or air quality would be expected. Only minor impacts on natural resources would occur from normal, ongoing maintenance activities, including the occasional disturbance of roadside soils and vegetation. Existing unstable cut slopes would not be able to revegetate, and erosion would continue to be a problem.

### **Impacts on Cultural Resources**

Under this alternative, there would be no new impacts on cultural resources. No known archeological resources would be disturbed. The historical integrity of the road system and parking areas would not be further affected.

### **Impacts on Socioeconomic Environment/Visitor Use**

The roadway would continue to deteriorate because of a substandard road base causing increased maintenance practices and related costs. Traffic would be forced to move slower because of rough pavement, and damage to motor vehicles would increase. If current trends continued, the pavement surface would deteriorate to a point where traffic restrictions or road closures would be required because of unsafe conditions.

Existing unstable cut slopes would remain unable to revegetate and would continue to be a maintenance problem and a visual intrusion.

Congested parking areas and confusing intersections would continue to be a source of aggravation for visitors. The continued congestion and poorly maintained roadway would detract from the quality experience most visitors have come to expect in an NPS area.

Business at concessions and local communities would not be affected in the short term, but if road deterioration continued, visitation could decline and adversely affect profits.

## **ALTERNATIVE B – MINIMUM ROAD CONSTRUCTION**

### **Impacts on Natural Resources**

Road rehabilitation under this alternative would have minimal impact on the natural environment. Impacts on bedrock, soils, vegetation, and wildlife would be similar to those for the no-action alternative, except that some minor disturbance would occur along the road edge within the existing disturbed corridor. Because there would be no changes in the existing alignment, scarring and subsequent erosion and revegetation problems would be negligible.

Existing unstable cut slopes would remain unvegetated and the problem of erosion would continue.

Construction of the new parking area at the Bryce Point/Paria View road intersection would disturb 2 acres of land at the edge of a sage meadow/ponderosa pine plant community. Proposed construction in this area could adversely affect some bristlecone pine trees. The trees in this area would be identified and marked by the park staff to reduce their potential for damage or destruction.

A survey for potentially endangered and threatened plant species and measures to protect the bristlecone pines would still be necessary for proposed parking area actions as described in the proposal.

Under this alternative there would be no improvement in existing prairie dog habitat in the East Creek Meadow area. Use of the snow fence would continue to cause negative impacts as described under the proposal.

Peregrine falcons might still be adversely affected, but because of the smaller scale of construction, the potential would be much less.

Sections of the road would continue to be in wetland/wet meadow areas.

### **Impacts on Cultural Resources**

Proposed areas of new disturbance would require an archeological survey. The potential exists for disturbance of archeological sites as discussed under the proposal; however, because of the minimal level of construction proposed under this alternative, the potential would be much less.

Generally, road and parking area reconstruction called for under this alternative would have minimal effect on the historic resources. However, construction of the new Bryce



Point/Paria View parking area would alter the historical integrity of the roadway in that area.

### **Impacts on Socioeconomic Environment/Visitor Use**

Short-term impacts would be similar to those discussed under the proposal.

Construction of the new parking area at the Bryce Point/Paria View road intersection and closure of the Bryce Point and Paria View roads and parking areas would result in major changes in visitor use patterns. The distance to the overlooks would be about 2 miles round-trip, which would undoubtedly discourage many people from using these viewpoints. Beneficial impacts of this new parking area would be similar to those discussed in the proposal.

The long-term effects from this road construction alternative would be a smoother and somewhat safer road, but many of the negative characteristics of the existing road, such as inconsistent design speed and narrow width, would remain.

## **ALTERNATIVE C – MAJOR ROAD RECONSTRUCTION**

### **Impacts on Natural Resources**

Substantial changes to the existing roads would cause major impacts along the road corridor, particularly in the southern half of the park where the prism is restricted because of steep and narrow terrain. Approximately 190 acres would be disturbed, of which about 75 acres would be in previously undisturbed areas. Impacts on bedrock, soils, vegetation, wildlife, endangered and threatened species, and air and water quality would be similar to the proposal but on a substantially larger scale. Because of necessary flattening, some slopes would be severely affected, resulting in major cuts requiring more extensive revegetation.

An endangered and threatened plant species survey and measures to protect the bristlecone pines would be required as discussed under the proposal.

Realignment of the road to the eastern edge of the East Creek Meadow area would improve and increase habitat for the threatened Utah prairie dog. Short-term disturbances, including the death of some prairie dogs, might occur during construction of the new road and obliteration of the old road alignment.

The wetlands that border the roadway at East Creek and Sheep Creek meadows would be temporarily affected during realignments. Roadside vegetation would be destroyed and soils compacted. Most disturbances would be from reclamation efforts. The road in both areas would be rerouted/realigned away from the wet meadow bottoms where possible, allowing for revegetation/restoration of these areas.

Relocation of the Bryce Point parking area would result in less impact on area resources because most of the parking area would be constructed on the existing roadbed. The existing parking area would be reclaimed.

Construction of the new Pink Cliffs parking area and access road near Whiteman Bench would cause adverse impacts in a previously undisturbed area, including the long-term loss of approximately 1.5 acres of vegetation and wildlife habitat.

Impacts at the Sunrise Point parking area would be similar to the proposal but would affect a larger area.

### **Impacts on Cultural Resources**

The additional road width and realignments would greatly increase the potential for impacts on archeological resources in the park, including the disturbance or destruction of materials or sites. As in the proposal, surveys would precede construction.

This alternative would have the greatest impact on the historical integrity of the roadway. The proposed changes and modifications would substantially alter the original layout, character, and design quality of the roadway.

### **Impacts on Socioeconomic Environment/Visitor Use**

The socioeconomic impacts of this alternative would be similar to those addressed in the proposal.

The potential Pink Cliffs overlook would provide an additional viewing opportunity for visitors.

The long-term impacts would also be similar to the proposal, but the scale of reconstruction would require much more terrain alteration and subsequent reclamation, temporarily reducing the visual quality along the roadway. The design speed of the road would be consistent all the way to Rainbow Point, which would enhance the driving experience.

## **CONSULTATION AND COORDINATION**

The National Park Service is consulting with the Federal Highway Administration in preparation of this study.

Because Bryce Canyon National Park contains resources listed in or eligible for listing on the National Register of Historic Places, the Park Service is consulting with the Advisory Council on Historic Preservation and the state historic preservation officer. The Park Service is also informally consulting with the U.S. Fish and Wildlife Service regarding potential impacts on listed endangered species.

Copies of this document will be sent to selected state, federal, and local agencies, interested organizations, and individuals for review and comment.



# APPENDIX: BRYCE CANYON SPECIAL COUNTS

CONTROL STATION 1101  
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MONTH NUMBER	NORTH BOUND			SOUTH BOUND			BOTH DIR.			COUNT ARRAY			MONTH			SEASONAL AWD FCTR			ANNUAL AWD FCTR		
	ADM	AWD	ADM	ADM	AWD	ADM	ADM	AWD	ADM	ADM	CUM	ADM	ADM	AWD	FCTR	ADM	AWD	FCTR	ADM	AWD	FCTR
1	913	923	901	908	1814	1831	927	950	174	160	174	174	174	174	174	174	174	174	174	174	174
2	470	480	457	470	927	950	927	950	174	160	174	174	174	174	174	174	174	174	174	174	174
3	129	133	128	132	257	265	257	265	174	160	174	174	174	174	174	174	174	174	174	174	174
4	80	87	80	87	160	174	160	174	174	160	174	174	174	174	174	174	174	174	174	174	174
5	83	87	82	87	165	174	165	174	174	165	174	174	174	174	174	174	174	174	174	174	174
6	85	94	85	93	170	187	170	187	174	160	174	174	174	174	174	174	174	174	174	174	174
7	226	246	226	246	452	493	452	493	174	160	174	174	174	174	174	174	174	174	174	174	174
8	394	399	393	394	787	793	787	793	174	160	174	174	174	174	174	174	174	174	174	174	174
9	883	926	870	894	1753	1820	1753	1820	174	160	174	174	174	174	174	174	174	174	174	174	174
10	1133	1137	1106	1108	2239	2245	2239	2245	174	160	174	174	174	174	174	174	174	174	174	174	174
11	1321	1346	1280	1300	2601	2646	2601	2646	174	160	174	174	174	174	174	174	174	174	174	174	174
12	1329	1345	1288	1302	2617	2646	2617	2646	174	160	174	174	174	174	174	174	174	174	174	174	174
TOTALS	7046	7203	6896	7022	13942	14225	13942	14225	174	160	174	174	174	174	174	174	174	174	174	174	174
AVERAGE	587	600	575	585	1162	1185	1162	1185	174	160	174	174	174	174	174	174	174	174	174	174	174
80%																					

BLANKET STATIONS - 1986  
\*\*\*\*\*

STATION NUMBER	STATION LOCATION		ROUTE NUMBER		DATE TAKEN	48 HOUR VOLUME		24 HOUR VOLUME		SEASONAL FACTOR		ANNUAL FACTOR		SEASONAL ADT		ANNUAL ADT	
	FWHA	PARK	FWHA	PARK		FWHA	PARK	FWHA	PARK	FWHA	PARK	FWHA	PARK	FWHA	PARK	FWHA	PARK
1101	10	1	10	1	ALL YEAR	--	--	--	--	--	--	--	--	--	--	2238	1185
1103	10	1	10	1	JUL 14-16	6090	6090	3045	0.86	0.86	0.86	0.46	0.46	2619	1401	2619	1401
1104	200	3	200	3	JUL 14-16	605	605	303	0.86	0.86	0.86	0.46	0.46	260	139	260	139
1105	201	5	201	5	JUL 15-17	1060	1060	530	0.86	0.86	0.86	0.46	0.46	456	244	456	244
1106	201	5	201	5	JUL 16-18	835	835	418	0.86	0.86	0.86	0.46	0.46	359	192	359	192
1107	11	4	11	4	JUL 16-18	1553	1553	777	0.86	0.86	0.86	0.46	0.46	668	357	668	357
1108	11	4	11	4	JUL 20-22	2955	2955	1478	0.86	0.86	0.86	0.46	0.46	1271	680	1271	680
1109	202	4	202	4	JUL 20-22	1732	1732	866	0.86	0.86	0.86	0.46	0.46	745	398	745	398
1110	202	4	202	4	AUG 03-05	2525	2525	1263	0.86	0.86	0.86	0.46	0.46	1086	568	1086	568
1111	207	4	207	4	JUL 20-22	5623	5623	2812	0.86	0.86	0.86	0.46	0.46	2418	1293	2418	1293
1112	207	4	207	4	JUL 22-24	473	473	237	0.86	0.86	0.86	0.46	0.46	203	109	203	109
1113	203	6	203	6	JUL 22-24	2943	2943	1472	0.86	0.86	0.86	0.46	0.46	1265	677	1265	677
1114	206	7	206	7	JUL 22-24	1668	1668	834	0.86	0.86	0.86	0.46	0.46	717	384	717	384
1115	10	1	10	1	JUL 27-29	3658	3658	1829	0.86	0.86	0.86	0.46	0.46	1573	841	1573	841
1116	204	2A	204	2A	JUL 27-29	1896	1896	948	0.86	0.86	0.86	0.46	0.46	815	436	815	436
1117	100	2	100	2	JUL 27-29	2447	2447	1224	0.86	0.86	0.86	0.46	0.46	1052	563	1052	563
1118	100	2	100	2	JUL 29-31	2138	2138	1069	0.86	0.86	0.86	0.46	0.46	919	492	919	492
1119	205	2B	205	2B	JUL 29-31	1395	1395	698	0.86	0.86	0.86	0.46	0.46	600	321	600	321
1120	10	1	10	1	JUL 30-31	2138	2138	1069	0.86	0.86	0.86	0.46	0.46	919	492	919	492
1121	10	1	10	1	AUG 03-05	2126	2126	1063	0.86	0.86	0.86	0.46	0.46	914	478	914	478
1122	10	1	10	1	AUG 03-05	1634	1634	817	0.86	0.86	0.86	0.46	0.46	703	368	703	368

BRYCE CANYON SPECIAL COUNTS

CONTROL STATION 1101

MONTH NUMBER	NORTH ROUND			SOUTH ROUND			BOTH DIR.			COUNT			ARRAY			SEASONAL			ANNUAL		
	MONTH	AWD	ADM	AWD	ADM	ADM	AWD	ADM	ADM	MONTH	ADM	CUM	ADM	%	MONTH	AWD	FCIR	AWD	FCIR	AWD	FCIR
1	DEC 87	119	114	116	111	235	178	225	225	JUL 88	3323	3323	3323	17	DEC 87	12.28	12.28	6.80	6.80	*****	*****
2	JAN 88	90	90	88	89	179	179	179	179	AUG 88	3156	6479	6479	34	JAN 88	16.21	16.21	8.93	8.93	*****	*****
3	FEB 88	124	139	123	137	247	276	276	276	JUN 88	2845	9324	9324	49	FEB 88	6.47	11.68	6.47	6.47	*****	*****
4	MAR 88	280	285	277	284	557	570	570	570	SEP 88	2898	12132	12132	64	MAR 88	5.18	5.18	2.87	2.87	*****	*****
5	APR 88	563	571	560	571	1123	1142	1142	1142	MAY 88	2296	14428	14428	76	APR 88	2.57	2.57	1.42	1.42	*****	*****
6	MAY 88	1118	1150	1115	1146	2231	2296	2296	2296	OCT 88	1762	16190	16190	85	MAY 88	1.29	1.29	0.72	0.72	*****	*****
7	JUN 88	1425	1441	1385	1404	2808	2845	2845	2845	APR 88	1142	17332	17332	91	JUN 88	1.03	1.03	0.57	0.57	*****	*****
8	JUL 88	1663	1692	1599	1631	3262	3323	3323	3323	MAR 88	570	17902	17902	94	JUL 88	0.88	0.88	0.49	0.49	*****	*****
9	AUG 88	1587	1608	1523	1548	3110	3156	3156	3156	NOV 88	513	18415	18415	96	AUG 88	0.93	0.93	0.51	0.51	*****	*****
10	SEP 88	1375	1433	1317	1375	2692	2808	2808	2808	FEB 88	276	18691	18691	98	SEP 88	1.07	1.07	0.59	0.59	*****	*****
11	OCT 88	887	887	871	875	1758	1762	1762	1762	DEC 87	225	18916	18916	99	OCT 88	1.64	1.64	0.91	0.91	*****	*****
12	NOV 88	261	258	258	255	519	513	513	513	JAN 88	179	19095	19095	100	NOV 88	5.55	5.55	3.08	3.08	*****	*****

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As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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