Development Concept Plan, Zions Canyon Headquarters, Zion National Park, Utah

United States Department of the Interior, National Park Service

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Development Concept Plan
April 1994

Zion Canyon Headquarters
Zion National Park, Utah

Recommended: [Signature]
Superintendent
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Regional Director
Rocky Mountain Region

Date 4/1/94
Summary

Zion Canyon Headquarters
Development Concept Plan
Zion National Park

The plan will implement a mandatory shuttle bus system in Zion Canyon during the peak visitor use season. A transit/information center, located in a portion of the Watchman Campground, will function as the shuttle bus staging area. It will include a 575 vehicle parking and bus loading area, information center, visitor comfort facilities, amphitheater, and a picnic area. The Watchman Campground (partially displaced by the shuttle facilities) and South Campground will be rehabilitated to improve circulation and the quality of the campsites. The existing visitor center would be converted to an education center.

Employee housing, and community and day-care facilities will be provided in the housing areas. A resource research camp and plant nursery will be located near the Watchman Campground. An emergency services facility will be built and maintenance facilities will be expanded or added in the existing maintenance area. A maintenance facility for the shuttle system will be outside the park on a portion of BLM land near the town of Springdale.

Implementation of the plan will increase the park staff level by 3 to 5 FTEs. It is estimated that annual operating and maintenance costs will increase by $250,000. The plan is not likely to adversely impact threatened and endangered species, floodplain values, or wetlands. Implementation of the shuttle system will change the way visitors use the park, but the long-term effects of the plan are expected to be positive: a reduction in visitor congestion at visitor-use areas, on roads, and along trails, which, in turn, should contribute to a more fulfilling visitor experience while in the park, protection of intangible resources such as clear night skies, quiet, solitude, and wilderness values.

U.S. Department of the Interior
National Park Service
Rocky Mountain Region
Introduction

Zion National Park is in southern Utah in Washington, Kane, and Iron Counties and in the first Congressional District. The study area is in Washington County, in the natural region of the United States known as the Colorado Plateau, which is characterized by large plateaus bounded by receding escarpments. It is the arid climate, spasmodic rainfall, and the three rivers dissecting the Colorado Plateau - the Colorado, the Escalante, and the San Juan, that have created a landscape of canyons of extraordinary geologic interest and scenic beauty.

The study area, referred to as the headquarters area, incorporates the area from the south entrance station north to the Zion Canyon bridge. This includes the visitor center, the Watchman and South Campgrounds, the amphitheaters, the nature center, the Oak Creek, Watchman, and Pine Creek residential areas, and the Oak Creek maintenance area. The study area encompasses approximately 325 acres. It includes a development zone (107 acres) and a natural zone (218 acres), and is surrounded by a proposed wilderness subzone.

Purpose and Need for the Plan

A Master Plan, which prescribed the management philosophy for the park and how areas would be used was prepared for Zion National Park in 1977. Since that time, visitation has grown dramatically and is impacting resources, facilities, and the visitor experience. Issues specific to the headquarters area, many of which are not covered in 1977 Master Plan, have been identified. Therefore, a new plan for this area is needed.

The purpose of a development concept plan is to address the obstacles preventing park managers from achieving the park’s management objectives and desired future conditions, which are based on the purpose of the park and its significant resources, and to propose management and development concept plans to overcome those obstacles. Four alternative concept plans were developed for the headquarters area by a team consisting of staff from Zion National Park and the Rocky Mountain Regional Office. In October 1993, a Draft Development Concept Plan/Environmental Assessment (DCP/EA) was available for public review and comment for a period of 60 days.

A total of 140 comments were received, on the draft EA, from the public and government organizations during the comment period. All but nine favored the proposed concept of a shuttle bus system in Zion Canyon during the peak visitor use season. There was some general concern about the location of the shuttle parking lot in the park and the secondary one proposed in the town of Springdale. There was also some concern about the reduction in the number of campsites proposed. Comments from three tour bus companies expressed concern about how the plan would not allow tour buses in Zion Canyon during the peak visitor season. Approximately 30 percent of the comments reiterated five points suggested by the National Parks and Conservation Association (require that riding the shuttle be mandatory, cap the size of the shuttle staging parking lot, implement a visitor experience and resource protection program, ban oversize vehicles from the park, and require reservations). Six letters were received from other federal, state, and local governments. Overall, they support the plan. A number of comments, each with an NPS response, have been reproduced in appendix two.

The U.S. Fish and Wildlife Service concurred with the conclusion that the plan would not likely adversely affect threatened and endangered species. In accordance with Section 106 compliance, the State Historic Preservation Office and the Advisory Council on Historic Preservation signed a memorandum of agreement with the National Park Service concerning cultural resources. A statement of findings and a finding of no significant impact are included with the plan.

Upon review and consideration of all the comments by the planning team, the proposed concept was revised and finalized. This document describes the final plan and will be used as the basis for preparing detailed site and building design/construction documents.
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Park Purpose

The erosional features of the area were originally protected by Presidential Proclamation No. 877 on July 31, 1909, when President Taft established Mukuntuweap National Monument. In 1918, the monument was enlarged and the name was changed to Zion National Monument and in 1919, the monument received national park status. Through review of the legislation that established Zion National Park, the National Park Service, and other related legislation, it has been determined that the purpose of the park is to:

- Preserve the dynamic natural processes of canyon formation as an extraordinary example of canyon erosion.
- Preserve and protect the scenic beauty and unique geologic features: the labyrinth of remarkable canyons, volcanic phenomena, fossiliferous deposits, brilliantly colored strata, and rare sedimentation.
- Preserve the archeological features that pertain to the prehistoric races of America and to the ancestral Indian tribes.
- Preserve the entire area intact for the purpose of scientific research.
- Provide a variety of opportunities for visitors to learn about and enjoy the resources without degrading those resources.

The special characteristics that give significance to this area as a national park include the geological formations, the brilliantly colored sandstone cliffs, the free-flowing river system, the diverse topography and elevations, the existence of rare, endangered, and endemic species, remarkable examples of depression-era construction projects, evidence of the interrelationship between the Anasazi and Fremont Intrain cultures, the accessibility of geologic and scenic resources to a wide range of people with differing interests as well as physical abilities, the region’s clean air, the unimpaired views of the scenic resources, the fabulous night skies, and the extremely low levels of background sound.

Park Management Objectives

The park management objectives are statements of the desired future conditions towards which park management is working. These conditions are based on the purpose of the park and its significant characteristics, and describe desired ends rather than specific solutions or means for accomplishing those ends. The following management objectives guided the preparation and analysis of the development plan for the headquarters area.

Resource Management

Management of the park is recognized and valued worldwide and is a model for national and international managers.

Zion’s resources and natural processes are defined, inventoried, and understood by park staff and form the basis for management strategies.

Zion is managed to ensure long-term protection of cultural and natural resources, includes monitoring human use in and around the park.

The public and visitor understand, support, and advocate the mission of Zion National Park, National Park Service in such a way to preserve our nation’s heritage and enhance environmental citizenship.

Zion is managed as a part of its greater regional ecosystem in a manner that recognizes the needs of the park, other land management agencies, and private landowners.

Visitor Services

Visitor facilities and services accommodate and are designed and maintained for sustainability and environmental sensitivity to ensure nondegradation of park resources.

Zion National Park is recognized as a player in determining how regional visitation requirements are met, including cooperation with local, state, federal, and private interests and education of outside interests as to their stake in preserving resources.

Interpretive programs focus on the most essential compelling stories.

Zion National Park provides a spectrum of recreation opportunities and activities compatible with resource protection and visitor experience goals as defined by Zion National Park management, such as: backcountry wilderness, solitude, quiet, sense of scale, night skies, spiritual, canyoneering, nature study, Native American values, and contemplation.

Concession and Zion Natural History Association activities support and enhance the visitor experience.

A crime-free and safe environment exists for all visitors and employees.

Human Resources

Zion employees are a competent, knowledgeable, culturally diverse workforce of adequate size and are appropriately graded and paid.

Employees have adequate support in meeting special needs (elder and child care, health and fitness opportunities, etc.)

Employees have adequate office/work environment and equipment.

An effective environment that recognizes employees contributions toward the goals, purposes, and desired futures of Zion and the National Park Service mission.

Employees have a clear understanding of their role and function through team building or other interactive programs.

Employees are provided opportunities for job enhancement and personal growth.

All channels of communication are open between National Park Service, Zion Natural History Association, the concessioner, and local communities and there is mutual understanding of each others goals and objectives.

An effective environment exists that encourages team work, a sense of family, and esprit de corps between National Park Service divisions, concession staff, and local communities.

Issues

The issue identification process consisted of discussion among park and region staff, and public input through a mail-back brochure. The following issues have been identified as obstacles to successfully achieving and maintaining park management goals and objectives.
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Visitor Use - Park visitor facilities are inadequate to meet visitor needs and numbers. Increasing visitation numbers have resulted in crowded conditions, overuse and degradation of facilities, damage to natural and cultural resources, and to a diminished visitor experience. The visitor center, nature center, campgrounds, park roads, trails, and picnic areas are the facilities of concern. Alternatives for providing facilities that accommodate visitor needs, provide opportunities for a quality recreational experience, and protect the park’s natural and cultural resources need to be addressed.

Owing to its spectacular scenic attractions, hiking opportunities, and lodging facilities, the 6.3-mile drive through Zion Canyon has always been the visitor focus of the park. However, many visitors cannot find parking at the trailheads or points of interest because of the sheer number of vehicles. When that happens, visitors either park illegally on the side of the road, impacting the vegetation and creating potential traffic hazards, or leave the canyon without ever experiencing the resources they came to see. This is not the visitor experience or condition park managers want to promote.

The 1977 Zion National Park Master Plan proposed implementation of a shuttle system in Zion Canyon as a solution to the congestion problem. The plan proposed that the shuttle staging area be located within the vicinity of headquarters. Park managers support the idea of alternative means of transportation, but their ability to fully promote or implement it is hindered because no related infrastructure exists. This document will analyze the feasibility, in terms of physical requirements and spatial relationships to other uses, of providing a shuttle system as proposed in the master plan to help reduce congestion in the canyon.

Over the past ten years the park has been experiencing a consistent increase in visitation, which is projected to continue. In 1992, over 2.68 million people visited Zion National Park. Forty percent of them stop at the visitor center during their trip to the park. This has increased demand on that facility, to the point where demand can no longer be accommodated. The visitor center is open every day of the year, and during the peak visitor season it operates from 8 a.m. to 8 p.m. During the peak season, an average of 5,000 visitors use the visitor center every day. With that number of people using the facility, visitors often end up standing two to three deep at the information desk, awaiting orientation and hiking information. Tour buses, which drop off an average of 40 people at the visitor center at one time, also add to the congestion. As visitation has increased over the years, the services offered in the visitor center have also expanded, and the area originally intended to be a lobby has evolved into the Zion National History Association (ZNHA) book sales area, reducing the capacity of the visitor center. Also, the layout of the visitor center space is not conducive to efficiently moving visitors through, which compounds the congestion problem. Because of the space limitations and area layout, the visitor center gets very crowded and visitors leave the facility without receiving the information they desire or without having had the opportunity to fully benefit from the services available to them. In addition, an unknown number of visitors don’t even have the opportunity to get into the visitor center because they are unable to find an available parking space. The number of rest rooms is also inadequate to accommodate the number of visitors, as evidenced by the long lines typically found forming outside.

Another visitor facility, the nature center, is used daily throughout the peak visitor use season, for the Junior Ranger Program. This is an educational program where children spend a day learning about the natural and cultural resources in the park. Picnicking outside of the building by other visitors disturbs participants in this program, reducing its effectiveness. Because there are no designated picnic sites in the study area and the nature center grounds are open and accessible, they are used extensively for picnicking. It is not uncommon to have bus loads of visitors using this area for picnicking at the same time. The heavy use of the grounds by picnickers has negatively impacted natural resources. Alternatives for mitigating these conflicts and impacts to natural resources will be addressed by this plan.

The campgrounds include 381 sites, which are full from April through October. Sites are occupied on a first-come, first-served basis, which results in visitors coming to the park without knowing whether or not they will be able to find a campsite for the night. Because of the first-come, first-served system, there are visitors driving through the
campgrounds at all hours looking for a vacant site. This disturbs the campers who have a site, results in more people in the campground than there is capacity for, and forces some visitors to unexpectedly have to search for overnight lodging. In addition, the intensive use of the campsite and poor layout of roads and sites has resulted in circulation problems and damage to the vegetation. There is little separation of sites or delineation of parking pads. Pull-offs are not designed for larger vehicles, and there are no designated tent pads. This has resulted in uncontrolled vehicular access to most campsites, people driving over vegetation, placing tents and trailers haphazardly throughout the area, and generally degrading the visual quality of the campgrounds.

The practice of visitors pulling off of the road to look at spectacular views has resulted in the informal designation of several pull-offs. Pulling off of the road is easy to do because the main road was designed without curbing, in order to allow rain and snowmelt to flow unrestricted off the road into drainage ditches. The practice has resulted in damage to roadside vegetation, and alternatives for mitigating this damage should be analyzed.

Resource Management - The resource management program and activities are hampered by a lack of proper facilities and work space. Alternatives for providing facilities adequate to carry out the goals of the resource management program need to be addressed.

The park resource management and research division is involved in vegetation research and resegregation of disturbed areas within the park, which requires a supply of native plant material. The park's current plant-rolling facility, a small area within the maintenance yard, does not meet the need because of restricted location and makeshift construction. The resource management workshop is in a small shed in the maintenance yard and is too small to cultivate the quantity of seed stock required for resegregation. A plant drying rack has been set up in a hallway in the administration building because of lack of space. Lack of space and displacement of functions to various locations in the park seriously limits the progress and success of the resource management program.

Allowing scientific research in the park is a park objective, but all work and office space in the administrative building is being used by park staff and there is no housing available to offer visiting researchers.

The visitor center, housing areas, and nature center are irrigated by a pressurized automatic system using potable water, which is an expensive water source and a wasteful method of irrigation. The campgrounds are irrigated by an open ditch system using river water, which is inefficient, outdated, and is not adequately irrigating the vegetation. Compounding the problem is the water intensive use of the areas, which reduces the vegetation's chances of prospering. This combination of conditions has resulted in little regeneration of plant materials. Alternatives for effectively and efficiently maintaining the vegetation in the headquarters area need to be addressed.

Human Resources - Housing, in and outside the park, and recreational and personal amenities available to employees are very limited. This has impacted recruitment efforts, and has resulted in inadequate staffing levels, a high turnover rate, personal hardship, and low employee morale and effectiveness. Alternatives for providing adequate employee facilities and services need to be addressed.

The amount of housing in the headquarters area does not meet the demand by park employees. Compounding the problem is the fact that there is very little housing available outside the park within a reasonable commuting distance. A survey of the housing market from Springdale, Utah, to St. George, Utah, a distance of 40 miles, was conducted by the National Park Service in the fall of 1992. The towns between the park and La Verkin include Virgin, Rockville, and Springdale, all of which have populations below 500. According to that survey, seasonal employees are most affected by the shortage of available rental and short term housing. In addition, the supply of housing for purchase by permanent employees is also limited and beyond affordability for an estimated 98 percent of permanent park employees. The shortage of housing in and outside of the park has impacted park recruitment efforts because people aren't willing to accept a position if housing cannot be secured. This has also resulted in a higher than desired turnover rate of employees and inadequate staffing levels.

Facilities typically found in non-NPS residential communities, such as fitness, and recreation areas and community meeting halls are not available in the park housing areas and are very limited in communities within a reasonable commute. Recreational facilities for park personnel living in the park include one abandoned tennis court pad in the
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Watchman housing area, and a playground each in the Watchman and Oak Creek housing areas. Currently, the nature center and adjacent open area are used for personnel related functions, however, this conflicts and interferes with visitor use. Community facilities are an important element of any residential area, providing valuable social and recreational services to residents. Lack of facilities in or near the park diminishes morale.

Many families working in the park would make use of a day care facility, however, there is no such facility in or near the park. This impacts employees' morale, results in high turnover, and impacts the park's recruiting efforts, making it difficult to attract potential employees who have families and would require such a service.

The design of the existing employee housing units does not provide for adequate storage space. People are therefore forced to throw away, give away, sell, or store their personal items in their yards, or at locations outside the park. The closest public storage area is 25 miles away and vacant space is at a premium.

Park Operations - There are more personnel working in the headquarters building than there is office space available. Facilities for employee training are limited, visitor protection facilities are not available, interpretive storage space is spread throughout the headquarters area, and maintenance functions are being performed in an inefficient manner. These inadequacies result in less efficient operation, loss of materials, and increased costs. Alternatives for providing adequate facilities need to be addressed.

Office space requirements for administrative staff have exceeded available space, causing divisions to be cramped and to compete with each other for space. This has resulted in resource management staff working in a temporary building, more vehicles than there is parking for, and a reduction in the efficiency of park operations.

Training for park personnel is held in the nature center in the off-season, when the Junior Ranger Program is not in session and there are limited alternative spaces for holding training. This restricts opportunities for training at the park when it is most needed - at the beginning of the peak visitor season and throughout the summer. As a result, employees are sent out of the park for training, which has reduced the quality and effectiveness of the training being received, and which is also more costly than in-park training.

Emergency services such as law enforcement, search and rescue, wildland and structural fire protection, resource protection, and animal apprehension are hampered because of nonexistent or outdated facilities. This results in operational inefficiencies and ultimately an increased emergency response time. Personnel, equipment, and facilities are dispersed throughout the headquarters area. Emergency service personnel work from the administration building, however most of the emergency vehicles and equipment are in the maintenance area. The firehouse housing one fire fighter unit and the search and rescue cache are in the maintenance yard. This is no good place to house the 'fire truck.' Flammable are stored in the maintenance yard and the potential exists for fire in this area to block access to the fire fighting equipment. The park is replanning the fire truck with a new one that will be too large for the existing firehouse. Other emergency service vehicles (an ambulance, wildland fire and rescue, vehicles) are parked outside of the administration building, exposed in extremes of weather. The fire cache is a metal shed that is too small for all equipment needs, requiring equipment to be stored in alternate locations. The disposal of equipment and vehicles presents accountability problems because of the number of persons having access to these items. It also creates inventory control problems including over stocking of some items. The emergency services division is also responsible for impounding domestic animals, but there is no place to hold them that does not interfere with other park operations.

The helipad is used by those performing emergency services and wildlife or fire monitoring. It is near the Watchman housing in a fairly flat area, and because of its proximity to the housing area, it does not meet minimum DOI Office of Aircraft Services (OAS) safety standards and alternative locations should be analyzed.

Park rangers are required to participate in a fitness program, but neither the park nor communities within a 50 mile radius of the park have fitness facilities. This makes it difficult for rangers to participate in the fitness program.

Park brochures and newspapers are being stored in three residential garages in the Oak Creek housing area. This use eliminates the occupants' use of the garages for vehicle storage, compounding the personal storage and housing problem. The administration building is full and cannot accommodate storage of this material, and there is no other space available for storage. The need to constantly retrieve material from outlying locations results in less efficient operations for the interpretive division.

Although the maintenance complex includes an auto shop for repairing vehicles and equipment, large vehicles or equipment (dump trucks, and loaders, graders) cannot fit into the shop, and maintenance workers must work on these vehicles outside. Because of the extreme temperatures that occur in this part of the country, and the physically demanding nature of maintenance functions, this is neither a good nor a safe situation.

The maintenance complex also includes a shop, lumber storage shed, warehouse, and a flammable storage shed, all of which are filled to capacity. Employees are computing for work and storage space so they can efficiently and effectively perform their functions. Vehicles and equipment are parked overnight in the yard near the auto shop and warehouse and are often in the way of maintenance operations. Excess park property is stored in a three-sided shed, which is filled to capacity, unsecured, and susceptible to theft. Construction materials, new and used, are stored at the east end of both at the old eastwest treatment plant, and in Sammys Canyon. This is inefficient and inconvenient for maintenance workers. One of the residential garages in the Oak Creek housing area is used for storing old furniture, which precludes use by the residents for parking or storage.

The park is not meeting state or federal EPA standards because of the lack of room for proper storage of fuel and waste oil and disposal of wastewater when vehicles are washed. The park would like to initiate a recycling program, but there is no space to store recyclables until they can be transported outside the park. Explosives are stored in Oak Creek Canyon, outside the maintenance area in buildings that do not meet code. They are difficult to get to in the winter because the road is not maintained.

Employee parking is outside the maintenance complex, but more vehicles are parked there than there are designated parking spaces. This has resulted in damage to the natural resources along the roadway.

The Plan

General Management Theme

The plan is designed to reduce vehicular congestion in Zion Canyon, improve the overall visitor experience, promote protection of the natural and cultural resources, and improve employee effectiveness and morale. This will be accomplished by eliminating vehicles in Zion Canyon and promoting alternative means of transportation during the peak visitor season through the implementation of a shuttle bus system and a bike path, providing facilities for the resource management program, and providing facilities to upgrade employee living conditions.

Visitor Use/Development

To remove the vehicles and congestion along park roads and protect the natural and cultural resources in the park a shuttle bus system based in the park will be implemented during the peak visitor season (March - October). The system will be mandatory for all visitors wishing to go into Zion Canyon during the peak visitor season with the exception of Zion Lodge patrons and others with special permits. The initial phase of operation will run between the transportation center (in the Watchman Campground) and the Temple of Sinawava. In lieu of additional parking in the town of Springdale the system will extend outside the park to include shuttle stops throughout town, transferring visitors at the transit center.

Zion Lodge patrons will be allowed to drive their vehicles to the lodge to check in and drop off luggage; but once there, will be required to ride the shuttle.ски они tear the canyen. Tour bus operators will be required to transfer their customers from the tour bus to the a shuttle bus. Arrangements could be made to accommodate tour bus patrons and the tour operator on one shuttle bus to maintain a cohesive tour group. NPS employees and
concession service vehicles will be allowed to drive the canyon road. The road will continue to be open to through-traffic, connecting State Highway 9, between the south and east entrances of the park.

Upon entering the park, visitors will be directed to the transit/information center. The center will provide visitors with basic orientation, safety, and interpretive information about Zion National Park and the surrounding area at one point. This will facilitate trip planning so visitors can make the best use of their valuable time in the park. The proposed transit center will include an information area, shuttle bus information, backcountry permits, campground information, exhibits, audio visual programs, public announcements, auditorium, Zion Natural History Association sales area, visitor comfort facilities (rest rooms, public telephones, drinking fountain, snack food sales), park office space (interpretation and backcountry personnel), information materials storage (park/ZNHA), and a first aid room.

Outdoor facilities will include parking (575 spaces, including the required percentage designed to meet UFAS/ADA standards for accessible parking), shuttle bus loading/waiting plaza (with shade structure and bicycle racks), amphitheater, picnic area, and a designated pet exercise area. All facilities will be designed to meet UFAS/ADA standards for accessibility.

The existing visitor center will be converted to an education center and a shuttle stop will be at this facility. In contrast to the transit/information center, the education center will focus on providing in-depth information, programs, and materials specific to the resources of Zion National Park. The museum and exhibits will be upgraded, and an interpretive sales area will be in the lobby. Scheduled interpretive talks, videos, and movies will take place on the patio and in the auditorium, and roving interpreters will be available for answering questions and for impromptu interpretive programs. The existing auditorium will also be used as a multi-purpose room for park training and other park functions. Visitor parking will not be allowed here during the peak visitor use season, and visitors will be required to arrive via the shuttle bus. During the winter season when the shuttle system is not operating, the transit/information center will close. The interpretive center will become the main visitor contact center, and visitor parking will be allowed.

The shuttle route within the park is approximately 8 miles one way, from the transit center to the Temple of Sinawava (see Shuttle Stops map · Plan). Intermediate stops include South Campground/Nature Center, the education center, Court of the Patriarchs, Zion Lodge, Grotto picnic area, Weeping Rock, and Big Bend turnout. A 1993 transportation study found that ridership is expected to average 4,300 visitors per day during the summer visitor season (based on 1993 visitation projections). One way travel time from the transit center takes about 44 minutes. The shuttle will operate 14 hours a day (7:00 a.m. to 9:00 p.m.), March through October. Thirteen vehicles (plus two reserve) will be used during the busiest summer season (June through September). The system could run on a limited basis earlier than 7:00 a.m. or later than 9:00 p.m., depending on visitor use demand. Eventually, the east side of the park will be serviced, with a staging area near the east entrance.

Shuttle buses within the park will be open air trams, offering excellent viewing opportunities and ventilation and easy entry and exit. Sixty-passenger trams will be accessible to visitors with disabilities and can be modified to provide storage (for coolers, backpacks, etc.). Trams will use propane, which is preferred over gasoline/diesel, compressed natural gas, or electric power, because of its reduced emissions, lower cost, and as compared to compressed natural gas, more readily available technology. Air-conditioned vans will be operated in town. The shuttle system will be operated by TW Services, Inc., who is currently providing transportation services in the park. An operating fee structure will be developed upon contract negotiations.

An 18,000 square foot shuttle bus storage and maintenance facility will be required for this system and will be built on BLM property west of Springdale that is designated for the town's recreation and public purposes. Springdale has a maintenance facility on this property and has approved construction of a separate maintenance facility on the site for the shuttle system. The facility will include maintenance bays, fueling tanks, a wash facility, and a secured overnight and off season bus storage area. Construction of the shuttle maintenance facility is contingent on completion of surveys of threatened and endangered species, archeological and historic structures, and floodplains.
Shuttle Maintenance Facility/BLM Site
Zion National Park
United States Department of the Interior National Park Service
Shuttle Stops
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and wetlands prior to completion of the comprehensive design drawings. A brief EA addressing such issues will be required prior to any construction activities. If impacts cannot be satisfactorily mitigated, alternative sites for this facility will be assessed.

The Watchman Campground will be partially displaced by the transit center. Some redesign will be necessary throughout the campground to better define and improve access to campsites, and to remove sites from the 100-year floodplain. Areas will be designated for RVs-only and group sites. The RV sites will be close to the transit staging area so visitors could park their RVs in a campsite during the day and walk to the transit center, thereby reducing the amount of space required at the shuttle parking lot. Because an amphitheater will be associated with the transit center, the Watchman amphitheater will be removed.

The South Campground will be designated primarily for tent camping, and redesigned to improve circulation and privacy between sites, reduce the density of campsites, move sites away from the main park road, and reduce impacts on natural resources. Access to the area will be from one entry point near Watchman Campground.

Redesign of the Watchman and South Campgrounds may require relocation of campground registration stations and sanitary dump stations. Redesign of the campgrounds will reduce the total number of sites from 381 to approximately 280. Reservations for a portion of campsites in both campgrounds will be required.

A bicycle/pedestrian path provides for alternative transportation through the headquarters area and the canyon. It begins at the south entrance station and generally parallels the river on existing roads or paths, requiring some river crossings. Vehicular traffic volume during peak season will be reduced on the canyon road and bicyclists will share the road with the shuttle buses, lodge patrons, park and concession employees, and service vehicles.

Implementation of a shuttle system will be a major change in the way visitors use the park and will require changes to the park’s interpretive and information programs. An interpretive prospectus will guide these changes. In addition, the park’s information system will be adjusted so potential visitors are informed about the shuttle system and campground requirements before they get to the park. This could be done through the park brochure, signage along State Highway 9, the park’s radio Traveller’s Information System (T.I.S.), at information areas throughout the region, in concessioner’s marketing information, and through local, regional, state, and national travel networks.

The Junior Ranger Program will continue to be held in the nature center. To reduce the disturbances to the Junior Ranger Program, picnicking will not be allowed near the nature center but will be designated near the transit/information center. Access points to the parking lots for the South Campground amphitheater and the nature center will be separated to eliminate conflicting uses.

To reduce the impacts to vegetation along the main road while still allowing visitors to stop and take pictures of the spectacular scenery, pullouts will be designed and designated and non-conforming ones removed.

This development concept plan attempts to balance visitor demand and infrastructure needs with preservation and protection of natural and cultural resources. A visitor experience and resource protection process (VERP) will be implemented to meet this need. A VERP is a management tool similar to the USDA Forest Service’s list of acceptable change (LAC) planning system and the NPCA’s visitor impact management (VIM) process. All of these programs emphasize the conditions desired in an area and require managers to define desired conditions and actions required to achieve and maintain them. Development of the program will include input from local and regional community leaders, other public agencies, and the interested public and will include the following steps.

1 Specification of acceptable and desired resource and social conditions that reflect management objectives and the park purpose, by management zone.
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2. Selection of specific key physical, social, or ecological impact indicators that become baselines for determining whether or not management objectives are being met (following step).

3. Comparison of desired to existing conditions, using the established impact indicators to determine consistency with, or causes of discrepancies from, the desired resource and social conditions.

4. Identification and implementation of management actions necessary to achieve desired conditions.

5. Monitoring and evaluation of management effectiveness to ensure that management objectives continue to be achieved over the long term.

In the headquarters area, the VERP will monitor visitor use of the transit center and shuttle system, campgrounds, trails, the nature center, roads, and administrative and operational facilities.

Resource Management

To promote the park’s revegetation program and to have a stock of native species in the park, there will be a plant nursery and a resource research camp near the campgrounds. The nursery will include shade structures and an irrigation system, and the research camp facility will include 2, 2-bedroom duplexes and an office/work building.

As the campgrounds are redesigned, they will also be revegetated. To reestablish and maintain the vegetation, an irrigation system will be needed. The existing open irrigation ditches will be buried and a pressurized system using river water will be installed throughout the campgrounds. To conserve potable water, the potable water irrigation system around the administration building will be converted to use river water.

Human Resources

Housing for park employees inside the park is allowed when it is determined that necessary service cannot be rendered or property of the United States cannot be adequately protected unless certain employees are required to live in government quarters on site, or an available supply - present and prospective - of governmental and private housing within a reasonable commuting distance will not meet the necessary housing requirements.

Because of the limited amount of available housing in nearby communities, new housing will be built in the Watchman housing area for park employees. There is capacity for 4, 3-bedroom single-family residences, 2, 2-bedroom duplexes, and 3, 4-plex apartments. This will provide housing for park seasonal and permanent employees. Once the Watchman housing area is complete, housing for employees will have to be found outside the headquarters area. Alternatives for providing future employee housing outside the park are being investigated.

Housing for the shuttle operators will be the responsibility of the concessioner.

Because of the limited amount of housing in and outside of the park, the residences in or near the Oak Creek Canyon 100-year floodplain will remain and flood protection will be built.

There will be a community facility in the Watchman housing area to provide employees living in the park with community-oriented and recreational amenities typically found in residential communities. This will be a multi-purpose building to house a meeting room, fitness room, and an outdoor recreation area. A day-care facility will be provided in the Oak Creek housing area. In accordance with the NPS housing initiative, as homes are renovated, storage areas will be incorporated into the design.

Park Operations

With the relocation of the major Zion Natural History Association (ZNHA) sales area to the transit center, the ZNHA warehouse may be relocated out of the park. That space will then be converted to park office space and the temporary resource management building in the administrative parking lot could be removed.

To provide adequate emergency services facilities and to facilitate efficient operations, emergency services vehicles, equipment, and personnel will be consolidated. An emergency services building will be built near the administration building. This facility will include three bays for parking the structural and wildland fire trucks and the ambulance. A fire cache, a visitor first aid room, and a domestic animal impound area. Office space for emergency services personnel will be in the nearby administration building. The fitness room in the community center will be available to support the NPS fitness and wellness program.

To provide necessary and appropriate space to carry out park maintenance functions additional buildings for ship and storage space will be added to the maintenance area. The interpretive printed materials now stored in the residential garages will be stored outside the park. To adhere to EPA regulations, storage facilities for fuel and combustible oil, and proper facilities for the disposal of wastewater when vehicles are washed, will be installed.

Employee parking will be outside the maintenance area, but will be paved and identified, to stop vehicles from impacting the natural resource. Also, a drop-off/storage area for recyclables will be outside the maintenance area.

The helipad will be moved for safety reasons to Coalpits Canyon, south of Rockville and Springdale. Although it is farther away, because of the limited development surrounding the area, Coalpits Canyon is the safest location on park land for helicopter take-offs and landings. Because there will no longer be a helipad in the headquarters area, in extreme emergency situations, helicopters will be allowed to land in open areas of the study area.

Hazard stones have been identified in Oak Creek Canyon, and for safety reasons, will be removed.

Not all existing park and visitor facilities meet accessibility standards of the Rehabilitation Act of 1973. Therefore, each facility in the study area will be evaluated to determine if it meets accessibility standards. Those facilities not meeting the standards will be renovated to meet them.

Future Plans and Studies Needed

Visitor Experience and Resource Protection Program (VERP): Shuttle Operations Plan
Interpretive Prospectus
Cultural Landscape Assessment
Survey and Evaluation of Archeological Sites
Rapid Ethnographic Assessment Procedures
Ethnographic: Overview and Assessment
Campground Revegetation Plan
Engineering Study of Earthen Levee in Watchman Campground

Staffing Requirements

Implementation of the plan is estimated to increase the park staffing level 3 to 5 FTEs, to support the transportation system and campground reservation system. Annual operating and maintenance costs based on implementation of the plan is estimated to increase by $250,000, based on 1992 dollars.

Construction Phasing and Costs

Table 1 is a conceptual phasing program and cost estimate for development of proposed actions. Costs represented are class C estimates based on the NPS estimating guide (April 1991 through October 1994)
Table 1. DEVELOPMENT COST ESTIMATE

<table>
<thead>
<tr>
<th>Action</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHASE I:</strong> TRANSIT SYSTEM (Infrastructure and Maintenance Facility)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit system (Infrastructure &amp; Maintenance Facility)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit system</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PHASE II:</strong> TRANSDISTRIBUTION CENTER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans/distribution center</td>
<td>16,500 sf</td>
<td>4,539,100</td>
</tr>
<tr>
<td>Information center</td>
<td>1,150 sf</td>
<td>736,000</td>
</tr>
<tr>
<td>Shuttle bus loading/parking plaza</td>
<td>2,277 sf</td>
<td>160,000</td>
</tr>
<tr>
<td>Amphitheater</td>
<td>40 seats</td>
<td>62,800</td>
</tr>
<tr>
<td>Information wayfinding</td>
<td>2 ea</td>
<td>24,400</td>
</tr>
<tr>
<td>Bus shelter</td>
<td>2 ea</td>
<td>18,300</td>
</tr>
<tr>
<td>Benches</td>
<td>12 ea</td>
<td>12,200</td>
</tr>
<tr>
<td>Water drinking fountain</td>
<td></td>
<td>7,000</td>
</tr>
<tr>
<td>Picnic tables with ramadas</td>
<td>22 ea</td>
<td>10,500</td>
</tr>
<tr>
<td>Bike racks</td>
<td>5 ea</td>
<td>2,200</td>
</tr>
<tr>
<td>Trash receptacles</td>
<td>3 ea</td>
<td>2,800</td>
</tr>
<tr>
<td>Chlorate grassy area</td>
<td>4,000 sf</td>
<td>41,400</td>
</tr>
<tr>
<td>Landscape</td>
<td>10%</td>
<td>574,000</td>
</tr>
<tr>
<td><strong>PHASE III:</strong> EDUCATION CENTER ADMINISTRATION/Emergency Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education Center/Administration Building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concert view center for interpretive functions/interior area</td>
<td>1,600 sf</td>
<td>628,800</td>
</tr>
<tr>
<td>Construct shuttle stop</td>
<td>4 ea</td>
<td>11,700</td>
</tr>
<tr>
<td>Remove ZNHA warehouse to office</td>
<td>4,000 sf</td>
<td>812,200</td>
</tr>
<tr>
<td>Construct potable irrigation system to inner water</td>
<td>11 sf</td>
<td>108,000</td>
</tr>
<tr>
<td>Remove temporary resource mgmt building</td>
<td>500 sf</td>
<td>1,800</td>
</tr>
<tr>
<td>Emergency Services Facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construct emergency services building</td>
<td>3,600 sf</td>
<td>572,400</td>
</tr>
<tr>
<td>Relocate heliport to Campsite Canyon</td>
<td>1 lump sum</td>
<td>65,500</td>
</tr>
<tr>
<td>Construct flood protection earthen dike</td>
<td>880 yd</td>
<td>18,900</td>
</tr>
</tbody>
</table>

**Total** | | |

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**PHASE IV:** HOUSING/PARK MAINTENANCE FACILITIES | | |
| Watchman Housing | 4 ea | 960,400 |
| Construct 2: 2-bedroom duplexes | 4 units | 330,100 |
| Construct 3: 4plex apartment buildings | 12 units | 764,100 |
| Off-street parking for apartments | 40 spaces | 80,400 |
| Construct community center | 2,500 sf | 416,800 |
| Construct parking for community center | 30 cars | 150,900 |
| Rehab tennis court | 1 lump sum | 131,000 |
| Landscaping | 10% | 253,200 |
| **Total** | | 2,765,200 |

**Oak Creek Housing** | | |
| Construct flood protection structures around housing | | |
| **Total** | | 65,500 |

**PHASE V:** ROADS/CAMPGROUNDS | | |
| Shuttle Bus Stops (South Campground Nature Center, Court of the Patriarchs, Grosst Park Area, Wearing Rock, Big Bend, Temple of Sneakers) | | |
| Shuttle bus stops | 6 ea | 50,900 |
| Benches | 12 ea | 17,300 |
| Shuttle sign | 6 ea | 3,500 |
| Bus stop signage | 6 ea | 15,500 |
| Information overlay | 6 ea | 15,900 |
| Trash receptacles | 10 ea | 3,700 |
| Subarea at trailhead area | 1 lump sum | 2,090 |
| Loading zone pavement | | 2,660 |
| **Total** | | 22,800 |
| Connect utilities at Lodge & Wearing Rock | | |
| **Total** | | 222,700 |
| Water | 5,000 ft | 262,000 |
| Sewer | 5,000 ft | 117,900 |
| **Total** | | 1,082,600 |

**Watchman Campground** | | |
| Chlorate paint | 13,000 yd | 234,400 |
| Construct campfields | 170 ea | 1,781,600 |
| Construct group campgrounds | 20 ea | 209,600 |
| Add-on rest fields | 170 ea | 133,600 |
| Add-on showers | 170 ea | 6,900 |
| Construct campground vegetation dump stations | 1 ea | 50,900 |
| Construct unfinished | 1,000 sf | 4,900 |
| Install micro-irrigation system | 40 ac | 331,000 |
| **Total** | | 2,614,600 |

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**Subtotal** | 2,614,600 | 2,614,600
South Campground
- Install entrance road to South Campground: 1,400 sf, $451,100
- Install 2-lane bridge: 2,400 sf, $408,700
- Install new roads: 9,000 sq, $4,000,000
- Add picnic tables: 112 ea, $80,900
- Add trash receptacles: 112 ea, $56,600
- Relocate campground registration/bump station: 1 ea, $58,500
- Install pressurized irrigation system: 14 ac, $137,500
- Resurface 5 ac: $13,100
- Convert paved road from Watchman Housing to Watchman Campground to gravel emergency access road: 800 sf, $1,600

- Add additional facilities: $9,900

Total Construction Costs: $25,635,900

### Table 2. Plan Summary

<table>
<thead>
<tr>
<th>Issue</th>
<th>Development Concept Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VISITOR USE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Canyon Congestion</strong></td>
<td>Mandatory shuttle system during peak season. Will run through Springdale and from the Watchman Campground to Temple of Sinawava. Develop and implement visitor experience and resource protection plan.</td>
</tr>
<tr>
<td><strong>Visitor Center</strong></td>
<td>Build visitor information center at transit center. Convert existing visitor center to education center. No visitor vehicular access to education center during peak season.</td>
</tr>
<tr>
<td><strong>Campgrounds</strong></td>
<td>Total number of campsites reduced; campgrounds redesigned/rehabbed. Reservations required for a portion of all campsites.</td>
</tr>
<tr>
<td><strong>Nature Center/Junior Ranger Program</strong></td>
<td>Continue Junior Ranger Program in nature center. Designate parking at transit center.</td>
</tr>
<tr>
<td><strong>Vehicle Pullouts</strong></td>
<td>Existing pullouts formally designated.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>Conduct survey of all facilities and rehab as funds become available.</td>
</tr>
<tr>
<td><strong>RESOURCE MANAGEMENT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Plant Nursery/Research Facility</strong></td>
<td>Construct resource research camp/plant nursery. 2, 2-bedroom duplexes and an office/work building.</td>
</tr>
<tr>
<td><strong>Irrigation</strong></td>
<td>Install pressurized system in campgrounds; convert potable water system to river water.</td>
</tr>
<tr>
<td><strong>HUMAN RESOURCES</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Employee Housing</strong></td>
<td>Construct additional housing units in Watchman housing area. Continue investigating ways to provide additional housing outside the park.</td>
</tr>
<tr>
<td><strong>Community Facilities</strong></td>
<td>Provide community facility to include meeting room, fitness room, outdoor recreation area in Watchman housing area.</td>
</tr>
<tr>
<td><strong>Day Care</strong></td>
<td>Provide day-care facility in Oak Creek housing area.</td>
</tr>
<tr>
<td><strong>Personal Storage</strong></td>
<td>Storage units added to housing units in accordance with NPS housing initiative.</td>
</tr>
<tr>
<td><strong>PARK OPERATIONS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Work and Office Space</strong></td>
<td>Expand administration functions into ZPH4 warehouse space. Relocate warehouse out of the park.</td>
</tr>
<tr>
<td><strong>Employee Training</strong></td>
<td>Training room provided in education center.</td>
</tr>
<tr>
<td><strong>Emergency Services</strong></td>
<td>Construct emergency services building.</td>
</tr>
<tr>
<td><strong>Utility Systems</strong></td>
<td>Bury all utilities.</td>
</tr>
</tbody>
</table>
List of Preparers

Team

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### Appendix One - Building Square Footage Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Center</td>
<td>8,000</td>
</tr>
<tr>
<td>Information area</td>
<td>2,300</td>
</tr>
<tr>
<td>Auditorium</td>
<td>2,400</td>
</tr>
<tr>
<td>Zion Natural History Association sales area</td>
<td>1,600</td>
</tr>
<tr>
<td>Visitor comfort facilities (rest rooms, public telephones, water drinking fountain)</td>
<td>600</td>
</tr>
<tr>
<td>Park office space (4-interpretation and backcountry personnel)</td>
<td>400</td>
</tr>
<tr>
<td>Information and materials storage (park/ZNHA)</td>
<td>100</td>
</tr>
<tr>
<td>First aid room</td>
<td>1,078</td>
</tr>
<tr>
<td>Mechanical (7 percent)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL SQUARE FOOTAGE</strong></td>
<td><strong>16,486</strong></td>
</tr>
<tr>
<td><strong>SAY</strong></td>
<td><strong>16,500</strong></td>
</tr>
</tbody>
</table>
NPS Response: The text referring to populations less than 500 should have read "between the park and La Verkin."

Our analysis of the housing market was done in 1992, at which time, data for St. George and its suburbs of Santa Clara, Washington, and Bloomington reflect single family dwelling income of $115,000-$129,000 for a 2-bedroom unit. This is reflected in a range of $450-$525 per month for a two-bedroom unit and $475-$550 per month for a three-bedroom unit with the tenant normally paying electric costs. Townhomes and single family residences were generally somewhat higher. Mobile homes were in the $350-$450 per month range on a rental basis.

A check into 1993 data, reveals that these figures were substantially higher with the upper range for a representative single family dwelling being $135,000. Although a total of approximately 200 permits for apartments were granted, it has been reported that the vacancy rate is very low. In Hurricane, there are virtually no apartment buildings and although a census survey taken in 1990 indicates that there are a total of 1,325 housing units in Hurricane, of which, 256 are rental units, these are virtually all single family dwellings and are rented on a long-term basis. A 3-bedroom unit, of approximately 1,400 square feet, with a carport, recently rented for $700 per month not including utility costs. A two bedroom, unfurnished, mobile home rented for $350 per month.

There are presently 62 permanent park employees. Only 12-15 percent of the permanent staff have an income of $30,000 or more. The others range down to a GS-3 at $15,000-20,000 per year. The rule of thumb according to the mortgage underwriting standards is that a family could afford to pay a mortgage of approximately $45,000-90,000. As the family's per month income, there are very few that would be in this price range. Because of the uncertainty of extended employment for seasonals, renting is their preference. With their low salaries, seasonals could at best, afford to pay in the range of $375-425 per month, including utilities. Based on this data, the NPS still believes the purchase of a single family dwelling or the rental of a 2 or 3 bedroom apartment between Springdale and St. George is not affordable for most park personnel.

The National Park Service realizes that space and resources are limited within the park and would appreciate an opportunity to find adequate housing outside. Currently, it would take congressional authorization for the National Park Service to provide housing outside the park. However, we are continuing to investigate ways to do that.

Although St. George may be considered within a reasonable commuting distance for housing, the NPS does not feel it is reasonable to expect someone living in the park to commute 40 miles one-way, on a frequent basis, for access to community facilities such as a meeting room, fitness room, or recreational facilities.

The acquisition of the large fire truck was in response to emergency service needs. It is unfortunate that the existing garage cannot accommodate the truck. But is not the justification for the emergency service building. A facility is needed for any emergency services to protect them from adverse climatic conditions so they are in prime running condition when needed. Also, emergency service equipment and employees are in various places in the headquarters area. To improve efficiency and response time, it is preferable to locate them all in one area.

Comment: The relocation of the helipad to Coolspits Canyon seems reasonable. But lacks an analysis of impacts to nearby properties. Is the park ensuring quiet and solitude in the headquarters area at the expense of Springdale and Rockville residents and landowners? The analysis does not answer this question adequately.

NPS Response: The helipad is being relocated in response to safety and noise concerns. Placement at Coolspits reduces noise impacts within the canyon and in Springdale and Rockville due to fewer flights over those areas.

Comment: The facility is designed to accommodate a hazardous waste storage facility. The planning process was not supportive of the building's potential use, and development of the building is not proceeding.

NPS Response: A geotechnical engineer performed an on-site analysis of the study area prior to alternative development. The area was evaluated for the presence or absence of destructive land forms and associated drainage problems.
Zion Canyon Headquarters Development Concept Plan

Comment: The Socioeconomic Resources section includes manufacturing as a "dominant" industry. In reality, the June 1993 non-agricultural employment numbers for Washington County were: trade 5,740; services 4,933; government 3,157; construction 1,733; and manufacturing 1,644. With the dramatic difference in numbers, it seems that construction and manufacturing should not be included as "dominant" industries.

NPS Response: We stand corrected. The figures used in the draft were from 1990 data.

Comment: About 1,700 campsites are identified in the "region." The region needs to be defined.

NPS Response: The 1,700 campsites were identified in St. George, Washington, La Verkin, Leeds, Veyo, Hurricane, Springdale, Orderville, Mt. Carmel Junction, Snow Canyon State Park, and Red Cliff. These areas were considered because they are within or near the corridor most visitor to Zion National Park travel in: State Highway 9 from St. George through the east park entrance. Since our survey we have learned that the Zion development at the east entrance to the park is building 100 campsites that will be completed for occupancy in the spring of 1994.

Comment: It is stated that "The proposal is not likely to adversely impact wildlife, floodplain values, or wetlands." Perhaps it will not SIGNIFICANTLY impact these resources, but it will certainly adversely impact them.

NPS Response: We believe our statement "not likely to adversely affect" is correct for T & E species, wetlands, and floodplain values, but we should have stated for wildlife, that the plan will not significantly impact wildlife.

Comment: The pressurized irrigation system called for in the proposal will affect the quantities of water being used for such purposes. It appears that the Utah Water Engineer should be consulted regarding charge of diversions impact to water rights, and the impact to Springdale town's rights.

The installation of pressurized irrigation should be accomplished, but the alternative uses of the culinary water freed up by the system should be identified.

NPS Response: In 1997 water rights claims were filed on behalf of the United States of America for Zion National Park. These claims are being considered along with other claims in the Virgin River basin as part of the adjudication process coordinated by the State Engineer. The actions described in this plan will have no effect on the water rights for the town of Springdale.

The culinary system is nearing capacity and any additional water conserved will be held to meet future increasing visitor needs.

Comment: The segment of the Virgin River passing through the area has been determined to meet the recreational classification under the Wild and Scenic Rivers Act. How will this designation affect downstream users? Will the Springdale water diversion be affected? These questions should be answered in the final DCP.

NPS Response: Designation will have no effect on downstream users. The Springdale diversion will not be affected.

Page 62 [of the draft plan] notes that the Desert tortoise has been "seen in the study area, but is not thought to be a permanent resident." All of the evidence gathered on the tortoise indicates a very limited range for individual or "nest.” If tortoises have been seen they most assuredly are resident. After all that Washington County officials have been through regarding this issue, it seems that one sentence in the EA is inadequate to cover the tortoise issue. There were tortoises seen? When were they seen? How many were seen? Were dens identified? What was the age of the tortoises seen? How will the park assure a "no take” of the population? All of these questions should be answered in the final DCP.

NPS Response: A more detailed tortoise survey will be conducted in the park prior to completion of comprehensive final design drawings for the area and construction. A preliminary survey for tortoes on the BLM property proposed for use for the shuttle bus maintenance facility, was recently conducted by a BLM biologist. Evidence of desert tortoises was found south and west of the area proposed for the maintenance facility. No evidence of desert tortoises was found on the actual proposed site. A comprehensive survey is scheduled prior to completion of the comprehensive final design for the shuttle maintenance facility. In addition, a biologist will be on site during construction to assist with relocation should that be necessary. Placement of permanent protective fencing around the site to prevent tortoises from entering the site will be considered during the design phase.

Comment: The statement that "canyone mountain lion and bobcat mostly just pass through the area" seems to be very user friendly. Does this mean that den sites are out of the headquarters area, and if these species use the area for hunting.

NPS Response: Canyone and bobcat are relatively rare in attendance and distribution throughout the park based on wildlife observation records maintained since the park was established. Mountain lions, on the other hand, are found throughout the park and are abundant. Due to the heavy visitation in the study area, lions occasionally transit the area but do not have den sites in the area, or use it for hunting.

Comment: What will the effects be on real companies?

NPS Response: This plan will not change current park policy regarding outside developments, including real companies.

Comment: Mitigation impacts to other parts of the park by the 20 percent of park visitors not riding the shuttle should be given further consideration.

NPS Response: As mentioned in the draft EA implementation of a mandatory shuttle system during the peak season is expected to deter some visitors from riding the shuttle. This will displace visitors to other areas of the park increasing use on existing trails and perhaps creating new social trails. In the short term, the NPS will attempt to mitigate impacts through range patrols, distribution of information, and use of backcountry permits. Development of the visitor experience and recreation protection program (ERPP) will also help identify, where impacts are occurring so park managers can take corrective action. For the long term, within the next few years, the park will be developing a general management plan to guide the management of the park for the next twenty years. That plan will identify any needs for improving the trail system, expanding the shuttle system, limiting visitation, or other methods to preserve the natural resources of Zion National Park.

Comment: Although the document states that increases in emissions "would not be high enough to negatively impact air quality" (page 90), it does not refer to any supporting analysis. If they have not already been done, tableable or modeling should be run to address potential Class 8 NAAQS and Class 1 impacts on the park. The Class 1 analysis, applicable to the park itself, should indicate whether or not the minor source baseline data for PM 10 and NOx has been triggered in the vicinity of the project. If this is the case, a PSD increment analysis should be conducted to evaluate the effect of this project and other changes in emissions that have occurred since the baseline data was triggered. In addition, any air quality modeling analysis should be conducted to determine if visibility impairment is expected within the Class 1 area.

NPS Response: Air quality analyses that analyzed the amount of air pollution emissions was performed to calculate the total change in air pollution emissions resulting from the project. This analysis was performed with the EPA MOBILE source model that includes the maps of nitrogen oxides (NOx), carbon monoxide (CO), and hydrocarbons (HC). NOx source emissions for each vehicle in the state are then used to model how the emissions would be affected by the ECT. This analysis for the proposal indicates that these would be overall small relative to NOx CO and HC emissions, thereby leading to a net improvement in air quality and its effects on the National Ambient Air Quality Standards, and the Prevention of Significant Deterioration (PSD) NOx incursion.
The MOBILE5a analysis calculated the emissions reductions due to the propane-powered bus fleet eliminating the need for 1,543 daily vehicle trips for the year 1997. These trips would be eliminated from the park entrance to the end of the canyon for a round-trip of 16 miles. The vehicles of those persons using the bus system will be parked in a 575-vehicle parking lot. The lot is expected to provide for a daily total of 1,543 vehicles. The lot is 1.5 miles from the park entrance. The MOBILE5a analysis calculated emissions for the trip to the parking lot and emissions from an assumed 1.5-mile drive around the parking lot as "new" emissions. Also modeled as a "new" emission, was the exit from the parking lot and Zion NP using the "cold start" option in MOBILE5a. The fourteen propane-powered buses sharing a total of 266 16-mile round trips were also modeled as "new" emission increases. The emission rates for the propane-powered buses were obtained from actual tests performed by the Colorado Department of Health. By adding "new" emissions from the vehicles using the parking lot to the emissions from the bus fleet, and subtracting the emissions eliminated from vehicles whose owners are now using the bus system, there is a net reduction of CO, NOₓ, and HC. The reduction in emissions will result in lower concentrations in and outside of the park. The results of the analysis are found in table 1, and are expressed in terms of pounds per 14-hour day (lb/day) of the maximum use scenario.

### TABLE 1

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Present Emissions (lb/day)</th>
<th>New Emissions From Buses and Parking Lot (lb/day)</th>
<th>Net Reduction (lb/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>916</td>
<td>487</td>
<td>-428.6</td>
</tr>
<tr>
<td>NOₓ</td>
<td>108</td>
<td>41</td>
<td>-67.0</td>
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**FINDING OF NO SIGNIFICANT IMPACT**

**IMPLEMENT THE HEADQUARTERS DEVELOPMENT CONCEPT PLAN**

**ZION NATIONAL PARK**

A draft development concept plan/environmental assessment (DCP/EA) that addressed issues concerning inadequate park visitor and employee work facilities, a lack of employee housing amenities, and office space, and outdated maintenance facilities was prepared in August 1993. The environmental assessment analyzed four alternatives including: no-action alternative one. alternative two, and the proposal. The proposal was revised to incorporate public comments and is now considered the plan.

**THE PLAN**

The plan will implement a mandatory shuttle bus system based in the Watchman Campground with a 575 vehicle parking lot. A new transit/information center will be located at the shuttle staging area to provide visitors with information and interpretation at the beginning of their trip. Employee housing and community and day-care facilities will be provided in the housing areas. An emergency services facility will be built near the administrative area, and maintenance facilities will be expanded or added in the existing maintenance area. A storage and maintenance facility for the shuttle system will be located outside the park on BLM land. The shuttle system will also expand to operate through the town of Springdale.

**ALTERNATIVES CONSIDERED**

The no-action alternative would continue existing management activities. Visitor facilities would be maintained to support current activities and programs. Day and overnight visitor use and administrative and employee functions would continue in this area. Routine maintenance would continue. Continuation of operations under the no-action alternative would result in continued impacts to natural and cultural resources and the visitor experience. Alternative one addressed actions park managers would need to take to stay within current funding and staffing levels while attempting to resolve issues and address visitor demands. These actions include: reducing the hours the visitor center is open, restricting tour buses from stopping at the visitor center during peak hours, implementing a reservation system for the campgrounds and eliminating commercial camping, restricting the number of vehicles allowed in Zion Canyon during peak hours, and expanding the concessionnaire's shuttle system to operate in the campgrounds. Alternative two would remove development from the headquarters area and implement a shuttle system. The campgrounds would be completely removed and revegetated. A mandatory shuttle bus system would be implemented through the headquarters area and Zion Canyon, but would be based outside the park on a parcel of BLM land on the edge of the town of Springdale. Some administrative space would be relocated outside the headquarters area, and the visitor center would expand into that space. An emergency services building would be built near the existing administration building.
PUBLIC INVOLVEMENT

The draft development concept plan/environmental assessment was made available for public review and comment during a 60-day period from October 24, 1993, to December 24, 1993. Public workshops were held on November 29, December 6, 15, and 16, 1993, to give the public an opportunity to comment on the plan. A total of 140 comments were received from the public and government organizations during the comment period. All but nine favored the proposed concept of a shuttle bus system in Zion Canyon during the peak visitor use season. There was some general concern about the location of the shuttle parking lot in the park and the secondary one proposed in the town of Springdale. There was also some concern about the reduction in the number of campsites proposed. Comments from three tour bus companies expressed concern about how the plan would not allow tour buses in Zion Canyon during the peak visitor season. Approximately 30 percent of the comments reiterated five points suggested by the National Parks and Conservation Association: require that riding the shuttle be mandatory, cap the size of the shuttle staging parking lot, implement a visitor experience and resource protection program, ban oversized vehicles from the park, and require reservations. Six letters were received from other federal, state, and local governments. Overall, they support the plan. The U.S. Fish and Wildlife Service concurred with the conclusion that the plan would not likely adversely affect threatened and endangered species.

In accordance with $106 of the National Historic Preservation Act, the State Historic Preservation Office and the Advisory Council on Historic Preservation signed a memorandum of agreement with the National Park Service concerning cultural resources.

In response to the change in the final plan from the draft DCP/EA, which will continue visitor use near one of two known archeological sites in the Watchman Campground, this archeological site will be evaluated for listing on the National Register of Historic Places. After further investigation, a portion of the archeological site could be excavated and used for visitor interpretation. The comprehensive design drawings of the proposed development will respect the existence of this site and will be prepared in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. A data recovery plan will be prepared, for any construction activities that impact an archeological site, prior to collection of artifacts and will be approved by the Utah State Historic Preservation Officer and the Advisory Council on Historic Preservation.

For construction activities exceeding 5 acres, a general construction storm water permit will be required by the state of Utah, Department of Environmental Quality.

Because some facilities will be within the probable maximum flood area, a statement of findings on floodplains was prepared.

Implementation of the shuttle maintenance facility is contingent on completion of surveys of threatened and endangered species, archeology and historic structures, and floodplains and wetlands prior to completion of the comprehensive design drawings for this facility. A brief EA addressing such issues would be required prior to any construction activities. If impacts cannot be satisfactorily mitigated, alternative sites for this facility will be assessed.

CONCLUSION

The plan does not constitute an action that normally requires preparation of an environmental impact statement (EIS). The plan will not have a significant effect on the human environment. Negative environmental impacts that could occur are minor and temporary in effect. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local law. Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Approved: ____________________________
Regional Director, Rocky Mountain Region Date / /
Statement of Findings

Introduction

Description of the Site

The Zion Canyon Headquarters Environmental Assessment, Development Concept Plan (EA) for Zion National Park described and analyzed four alternatives—no-action, alternative one, alternative two, and the proposal. Among other things, the effects of flooding on existing and proposed facilities within the headquarters area and to the natural and beneficial floodplain values were detailed in the EA. This Statement Of Findings applies to the proposal.

The Headquarters study area encompasses lands from the south entrance station to the Virgin River bridge, approximately 325 acres. It includes the South and Watchman Campgrounds, the Oak Creek Historic District (housing and maintenance areas), the Watchman and Pine Creek housing areas, the Visitor Center/Administration building, and the Nature Center.

Description of the Proposed Action

The proposal will implement a mandatory shuttle bus system, which will be staged in the existing Watchman Campground. The existing campground will be displaced and reduced in size to accommodate the staging area. The transit center (staging area) will include a parking area for up to 575 cars, a bus loading and waiting area, and a visitor/information center (relocated from its current location). A bike trail will be constructed through the study area. Employee housing and a community building will be added in the Watchman housing area, and a day-care facility will be located in the Oak Creek housing area. An emergency services facility will be built near the existing visitor center (which will be converted to an education center) and maintenance facilities will be expanded or new ones added within the existing maintenance area. The maintenance and storage facilities for the shuttle system will be outside the park. The shuttle system will also expand to operate through the town of Springdale.

Flooding Characteristics in the Area

Two and one-half miles upstream from the park, the Kolob Reservoir releases into Kolob Creek, which runs southeast into the North Fork of the Virgin River. The North Fork of the Virgin River is the main drainage through Zion Canyon and the study area. The river experiences wide fluctuations in flow with a seasonal snowmelt peak in the spring, followed by generally low summer and fall flows. Occasional heavy storms, which can occur at any time of the year but are most common in summer and early fall, produce the largest flows in the Virgin River system. These runoff events are usually of short duration and can occur suddenly.

Through much of the headquarters area, the 100- and 500-year floodplains closely follow the banks of the river. The probable maximum flood area flows out into open areas, the housing areas, campgrounds, and much of the study area. There is one residence within the Oak Creek 100-year floodplain. Two homes along Oak Creek are in the 500-year floodplain.

There is an earthen levee along the riverbank at the Watchman Campground that altered the historic floodplains in this area, and which now contains the 100- and 500-year floods. Removal or failure of this levee would result in flood waters encroaching into the campground. Eight to ten campsites in the Watchman Campground are in the 100-year floodplain of the Virgin River.

There is an emergency action plan for response to possible failure of the Kolob Reservoir that details procedures for notification and evacuation. The flash flood warning and evacuation plan in place at the park consists of daily contact with the National Weather Service by the park during the summer to receive the storm potential and for observation of drainage conditions by park rangers. In the event an evacuation of the campgrounds or other areas were necessary, park rangers would be sent out to notify and remove people.

There are no state or local floodplain standards applicable to the proposal. The EA also indicates that there will be no adverse impacts to wetlands.

Justification for Use of the Floodplain

Why the Proposal Would Build in the Floodplain

Because of the physiographic characteristics of the headquarters area—a narrow valley confined by high canyon walls with a river running the length of it and two creeks flowing into the river—much of the existing development, especially the campgrounds and the Oak Creek housing area, is within the probable maximum flood area. There are few flat, open areas outside the probable maximum flood area on which to develop or relocate facilities. There are no critical actions proposed in the 500-year floodplain.

The proposed shuttle system will reduce vehicle congestion in Zion Canyon and promote long-term protection of park resources, which is in turn expected to improve the visitors' experience. Because of the number of visitors the system will be required to accommodate, a fairly large parcel of land will be needed to stage vehicles. Within the study area, a portion of the Watchman Campground was found most suitable for this purpose because of the flat topography and compatibility with surrounding land uses. Locating the shuttle staging area in the Watchman Campground requires redesign of the campground, which will remove existing campsites from the 100-year floodplain.

Because of the shortage of available, affordable housing outside the park, the proposal will add employee housing to the Watchman Housing area, some of which will be in the probable maximum flood area. A day-care building is proposed in the Oak Creek housing area, and employee parking and additional buildings are proposed in the maintenance area, all of which will also be within the probable maximum flood area. The proposed recyclable storage area (for paper, glass, and aluminum cans) is within the 500-year floodplain and the probable maximum flood area.
Zion Canyon Headquarters Development Concept Plan

Alternatives Considered in the Environmental Assessment/Development Concept Plan

No Action. The no-action alternative would continue existing management activities. Existing visitor facilities would be maintained to support current activities and programs. The area would continue to be managed as a multi-use development zone. Day and overnight visitor use, administrative, and employee functions would continue in this area. Required improvements to safety, sanitation, and access for persons with disabilities would continue to be accomplished as funding permits. Road repairs and other routine maintenance would continue.

Alternative One. Alternative one would address those actions park managers would need to take within the headquarters area to stay within current funding and staffing levels while attempting to resolve issues and address visitor demands. These actions include: reducing the hours the visitor center is open, restricting tour buses from stopping at the visitor center during peak hours, implementing a reservation system for the campgrounds and eliminating commercial camping, restricting the number of vehicles allowed in Zion Canyon during peak hours, and expanding the concessioner's shuttle system to operate in the campgrounds.

Alternative Two. Alternative two would remove development from the headquarters area and implement a shuttle system. The campgrounds would be completely removed and revegetated. A mandatory shuttle bus system would be implemented through the headquarters area and Zion Canyon, but would be based outside the park on a parcel of BLM land on the edge of the town of Springdale. Some administrative space would be relocated outside the headquarters area, and the visitor center would expand into the existing space. An emergency services building would be built near the existing administration building.

Description of Site-specific Flood Risk and Actions to Minimize Harm to Floodplain Values and to Minimize Risk to Life or Property

The proposed transit/visitor center and parking area in the existing Watchman Campground will be within the probable maximum flood area and protected from the 100- and 500-year floods by the existing earthen levee. An engineering study will be conducted to determine the structural integrity of the existing earthen levee in this area and the levee will be periodically monitored to ensure its continued effectiveness.

The potential for damage by flooding to the residences existing in or near the 100-year floodplain in Oak Creek Canyon will be reduced by building dikes or other protective structures around them. Mound-type diking near the proposed emergency services building will protect it from potential flooding. These protective measures are not likely to adversely impact the natural or beneficial floodplain values. If channelization of runoff is needed to protect the proposed access road to the South Campground, the channel could be designed such that runoff is directed to go under the road and continue to flow naturally, which is not expected to impact floodplain values.

The proposed actions are estimated to increase the number of people at one time in the probable maximum flood area. It is estimated that approximately 800 people could be in the probable maximum flood area at one time. However, the number of people in the 100-year floodplain will drop to 2, because camping will be removed from the 100-year floodplain, leaving only one residence in the floodplain.

The flash flood warning and evacuation plan will be enhanced to gauge the flood discharge in The Narrows (upstream from the Temple of Sinawava) in order to provide a thirty-minute or greater lead time in warning and evacuating persons in the probable maximum flood area of the headquarters area. This enhanced flood plan will mitigate potential loss of life situations.

Natural and beneficial floodplain values include water resource values (natural moderation of floods, water quality maintenance, and groundwater recharge), living resource values (fish, wildlife, and plant resources), and cultural resource values (natural beauty, scientific study, outdoor education, and recreation). Construction of the transit/information center, parking area and bus loading/waiting area in the park will cover a total of 4.8 acres and could affect groundwater recharge. Paved surfaces prevent water absorption and increase runoff. However, the overall impact of this is expected to be minimal and mitigation could include using permeable building materials or retaining the water until it could be absorbed or discharged at a reasonable rate. No other impacts are anticipated to the natural or beneficial floodplain values.

There are no anticipated secondary effects to floodplains and there is no anticipated increase in flood loss potential to existing developments from the proposal.

Summary

Based on the proposed actions and mitigating measures described above and in more detail in the draft EA, the National Park Service has determined that the preferred plan is the most practicable compared to the other alternatives considered. This decision was based on the need to provide adequate visitor and administrative facilities, to improve visitors' experiences and safety, and for long-term resource protection. The risk to human safety will be minimized by the flood warning systems, instructing visitors on actions to take during emergency flooding situations, and by flood-proofing facilities when necessary.
WHEREAS, the National Park Service (NPS) has determined that the implementation of the Development Concept Plan (DCP), Zion Canyon Headquarters, Zion National Park (ZION), may have effects on properties that are eligible for inclusion in the National Register of Historic Places, and has consulted with the Utah State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. Section 470 (the Act), and its implementing regulations (36 CFR Part 800); and

WHEREAS, the SHPO and the Council have participated in the consultation, and have been invited to concur in this Memorandum of Agreement (MDA); and

NOW, therefore, the NPS, the SHPO, and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the implementation of the DCP, Zion Canyon Headquarters, ZION, Utah, on historic properties.

STIPULATIONS

The NPS will ensure that the following stipulations are implemented:

1. ZION will ensure that the design of the project is compatible with the historic and architectural qualities of the historic properties identified in the DCP, Zion Canyon Headquarters, and is consistent with the recommended approaches to rehabilitation set forth in the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings and that the design and specifications for the project are developed in consultation with the SHPO.

2. ZION will ensure that the project design for new construction is compatible with the historic and architectural qualities of the historic properties identified in the DCP, Zion Canyon Headquarters, in terms of scale, massing, color and materials, and is responsive to the recommended approaches to new construction set forth in the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, and that the design and specifications for the project are developed in consultation with the SHPO.

3. Prior to the relocation, removal or demolition of any historic property identified in the DCP, Zion Canyon Headquarters, ZION will contact the Rocky Mountain Regional Office (RMRO), NPS, to determine what level and kind of recordation is required for this property. ZION shall ensure that all documentation is completed and accepted by the Historic American Building Survey/Historic American Engineering Record (HABS/HAER) prior to the relocation, removal, or demolition, and that copies of the documentation are made available to the SHPO and appropriate local archives designated by the SHPO.

4. (A) ZION shall ensure that an archeological survey of any area identified in the DCP, ZION, is conducted in a manner consistent with the Secretary of the Interior’s Standards and Guidelines for Identification (48 FR 44720-23) and taking into account NPS publication, The Archeological Survey, Methods and Uses (1974; GPO Stock #249-016-00091) and NPS-28 Cultural Resources Management Guidelines. The survey shall be conducted in consultation with the SHPO, the Division of Cultural Resources, RMRO, NPS, and a report of the survey, meeting the standards of the SHPO, shall be submitted to the SHPO for review and approval.

(B) ZION shall evaluate properties identified through the survey in accordance with 36 CFR Part 800.4(c). If the survey results in the identification of properties that are eligible for the National Register, ZION shall comply with 36 CFR Part 800.3 and 800.4.

5. (A) ZION shall ensure consultation with Native American groups and tribes in accordance with the Council’s Guidelines for Public Participation in Section 106 Review and any policy issued by the Regional Director, RMRO, NPS.

(B) ZION shall ensure that traditional cultural properties will be identified in a manner consistent with National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties.

(C) If the survey results in the identification of properties that are eligible for the National Register, ZION shall comply with 36 CFR Part 800.3 and 800.4.

6. ZION shall ensure that all materials and records resulting from surveys conducted at areas identified in the DCP, Zion Canyon Headquarters, are curated in accordance with 36 CFR Part 79.

7. ZION shall ensure that suitable arrangements for archeological monitoring will be made in consultation with the Division of Cultural Resources, RMRO, NPS and the SHPO prior to construction in any area identified in the DCP, Zion Canyon Headquarters. If historic properties are identified, ZION shall comply with 36 CFR Part 800.11.
Execution of this Memorandum of Agreement and implementation of its terms are evidence that NPS has afforded the Council an opportunity to comment on the implementation of the DCP. Zion Canyon Headquarters and its effects on historic properties, and that NPS has taken into account the effects of the undertaking on historic properties.

ZION NATIONAL PARK

BY: [Signature] DATE: 1/24/92

NATIONAL PARK SERVICE

BY: [Signature] DATE: 12-24-93

UTAH STATE HISTORIC PRESERVATION OFFICER

BY: [Signature] DATE: 1-11-93

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: [Signature] DATE: 3-5-94