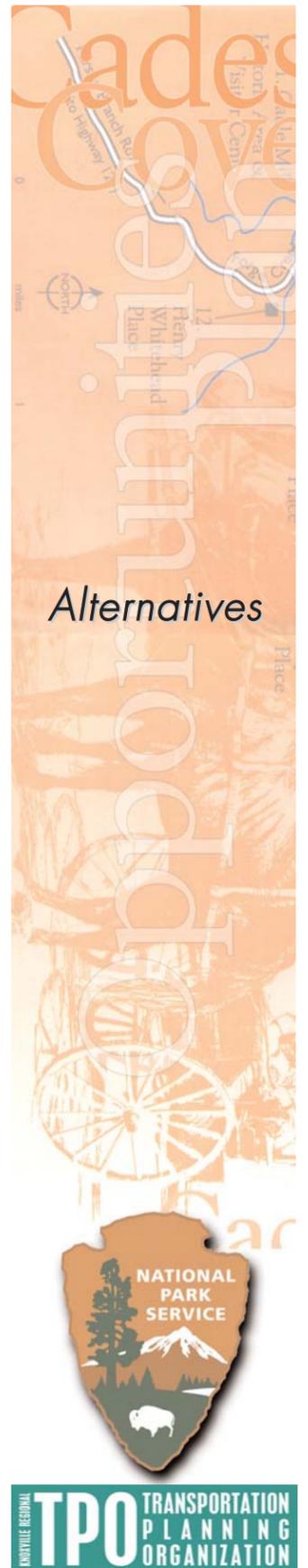


Alternatives

| 5 |

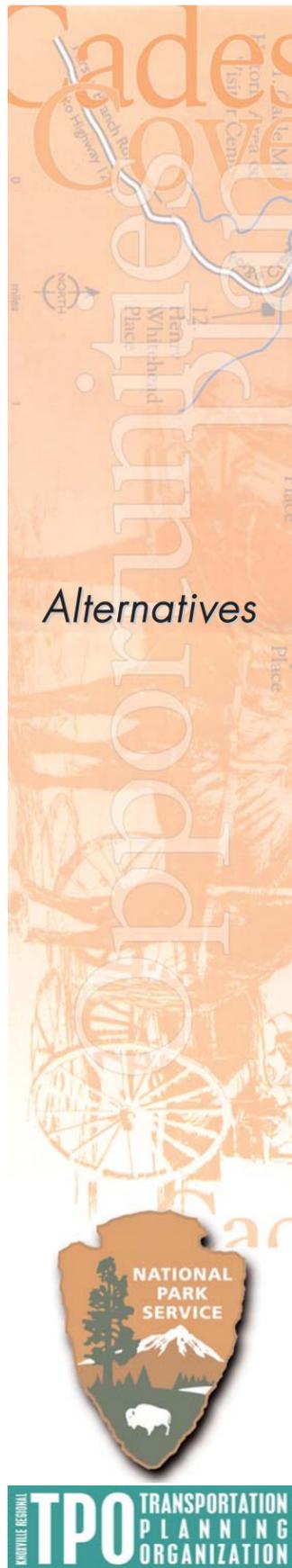
Topics Discussed

- Key Elements of the Alternatives
- Summary of the Alternatives
- Implementation
- Policies, Desired Conditions and Measures
- Alternatives Comparison Matrix
- Analyzing Costs and Benefits
- Choosing by Advantages (CBA)
- Funding Strategies and Pilot Programs
- Frequently Asked Questions



Alternatives





ALTERNATIVES

The project team developed draft alternatives by combining the concepts outlined earlier in this report into five broad packages. This chapter explains the process used to package the concepts, describes some of the key elements of these concepts, outlines the draft alternatives, and discusses how they were refined after NPS and public input was received. The chapter concludes with a discussion of how the alternatives could be implemented.

Key Elements of the Alternatives

This section describes some of the key elements of the alternatives and how they would fulfill project goals and objectives.

Parking and Pull-off Areas

Visitors have established hundreds of informal parking and pull-off areas along the Loop Road. This has occurred because the number of vehicles on the Loop Road (particularly during peak periods) exceeds the small number of formal parking areas and pull-offs that have been developed. Visitors who pull off the road when they see wildlife also have contributed to the creation of these informal parking areas. The prevalence of informal pull-offs has become a major Park management issue. Roadway shoulders have deteriorated and damage to natural resources (through compaction and erosion) has occurred.

To improve the situation, a master plan for these areas is proposed. Such a master plan would examine the benefits and costs related to the consolidation and/or removal of these areas, the establishment of additional pull-offs along the Loop Road, the establishment of small parking areas near scenic vistas, and the protection of areas along the Loop Road from unauthorized parking would meet other plan goals. Figure 12 illustrates the configuration for potential pull-off and minor parking areas. Table 3 shows how proposed changes to parking and pull-off facilities relate to overall goals of the Cades Cove Opportunities Plan.

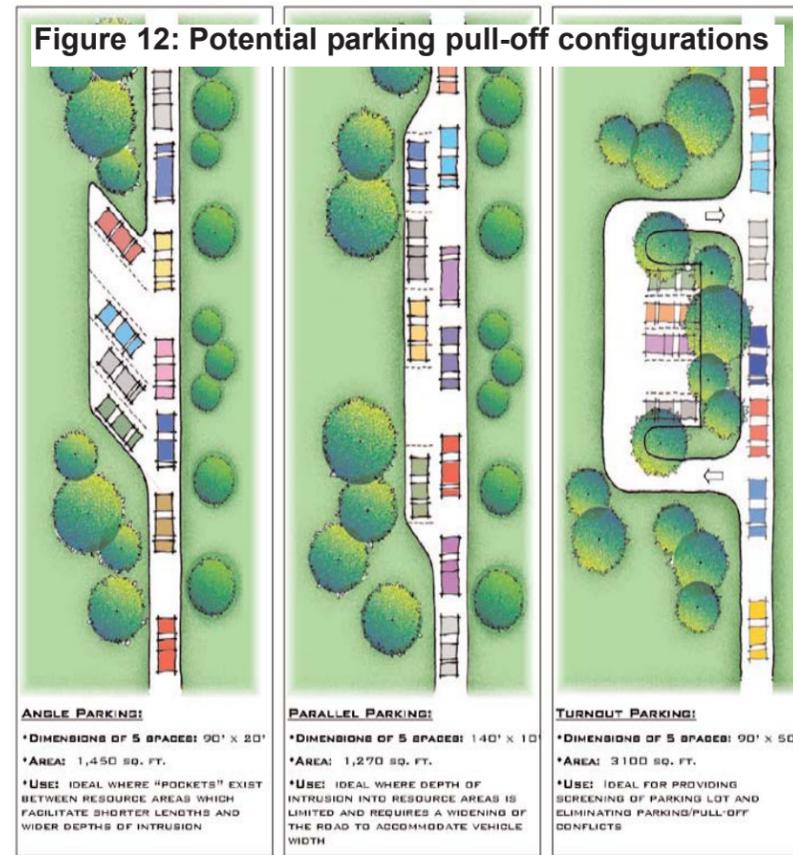


Table 3 Concept: Parking and Pull-Out Areas	
Goal	Objective
Resource	The parking and pull-out master plan would be coordinated with strategies for resource management and support the stewardship of resources. This would reduce vehicle damage to resources along the roadway edge. It would also eliminate large mud puddles and deteriorated roadway shoulders along the Loop Road.
Visitation	Delineating where visitors may and may not pull off the road will improve the visitor experience by providing unobstructed views of the Cove, and by creating a safer location for the placement of interpretive materials.
Resource Education	Parking and pull-out areas would provide locations where ranger programs could be focused.
Facilities and Services	This concept would improve the appearance of the Loop Road and improve the efficiency of roadway maintenance.

Roadway, Parking and Pull-off Improvements

Park roads are generally constructed only where necessary. Roads that cut through parks are often designed for sightseeing and are located on alignments that minimize potential environmental impacts. These

roads tend to be narrow, winding, and hilly and function as scenic drives that attract sightseers.

Although park roads are different from other roads, they still must be designed, constructed, and maintained within the norms and standards for safety and structural sufficiency. Similarly, improvements to the Loop Road should be designed and built in a manner that perpetuates and protects natural and cultural resources as well as the aesthetic values of the area while permitting roadway and roadside maintenance.

Streams, tributaries, and other water features flow under or over the pavement of the Loop Road in approximately 120 locations. In heavy rains, sheets of water can flow rapidly down roadway slopes, eroding the pavement and creating a washboard-like surface. At other times, the culverts beneath the road become clogged or are overwhelmed, and water erodes the shoulders of the roadway.

In many areas, the alignment of the roadway is steep and curved, making it difficult for automobiles and sometimes impossible for large vehicles (e.g., RVs) to navigate the Loop Road. Figure 13 delineates areas along the Loop Road with alignment and drainage problems.

Current data on parking turnover indicate that the number of existing spaces may not be sufficient during peak periods. However, expanding the parking supply could negatively affect the visitor experience and degrade natural and cultural resources.

The situation at John Oliver Cabin is typical. An overflow parking lot has been established a quarter mile from the cabin's primary parking lot. Since the overflow lot opened, visitors have created a number of social paths that interweave their way through the field in front of the cabin. These social trails detract from the cultural landscape, compact soils, affect vegetation and pose tripping hazards.

Visitor Center

The development of visitor orientation facilities in the form of a visitor center – either in the Cove or in the gateway communities – would help to manage visitation by allowing visitors to obtain information

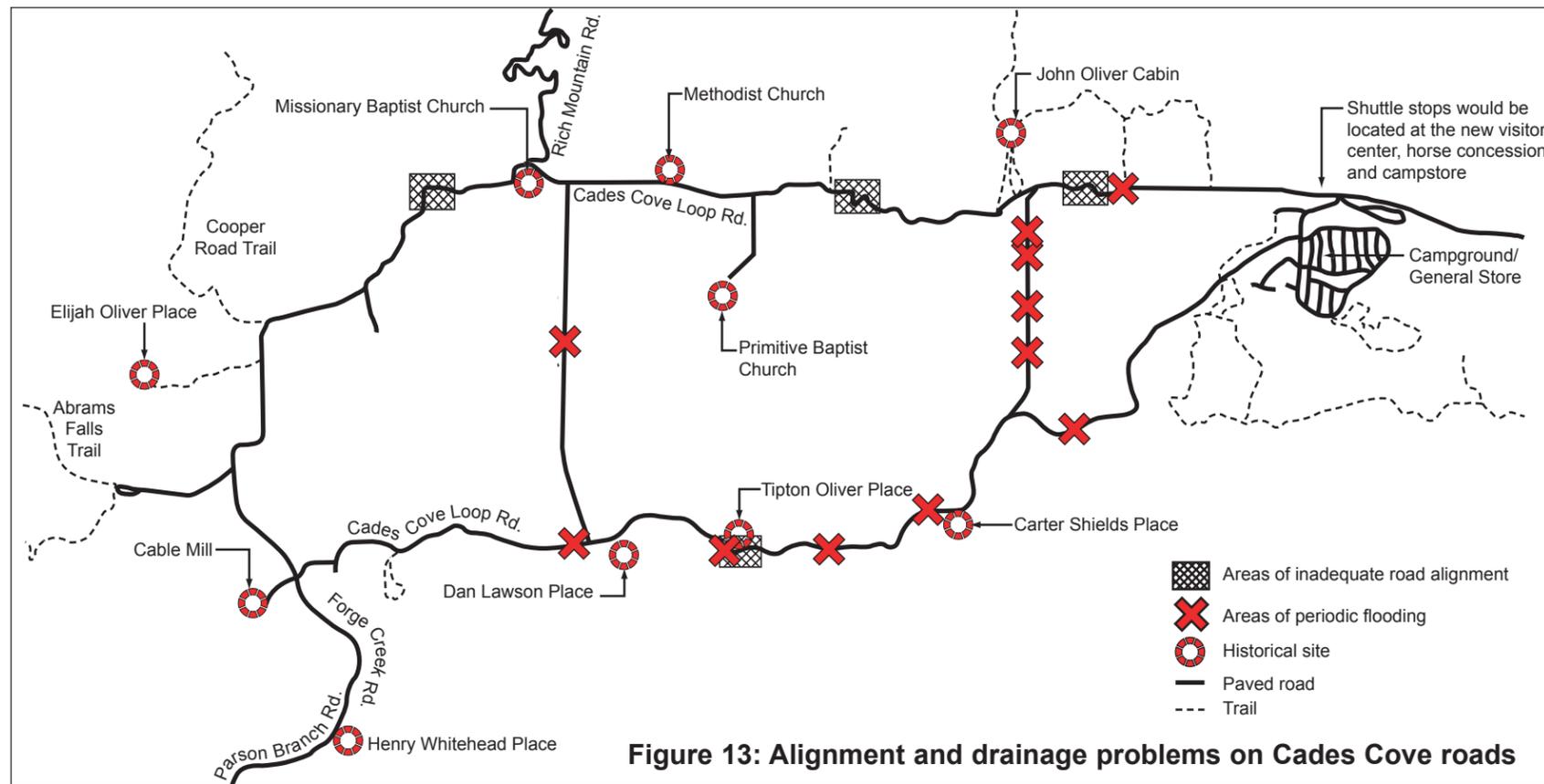


Figure 13: Alignment and drainage problems on Cades Cove roads

about Park rules, the Cove’s natural and cultural resources and other visitor opportunities.

The visitor center could take a number of forms, ranging from a small, simple building at the beginning of the Loop Road to a large center (comparable in size to Sugarlands) that is home to a museum, bookstore, ranger offices and visitor contact center. A visitor center would provide a focal point for visitor services and address several plan goals, as described in Table 4.

Communications Program

Understanding the Cove’s resources and programs is a key part of the visitor experience. Table 5 shows how a communications program could help meet plan goals. Knowing about the activities and attractions available in the Cove can improve the visitor experience for first-time and repeat visitors alike. A communications program also can help address traffic problems; if visitors know the Loop Road is congested before they arrive, they can make alternate plans.

At the conceptual level, a communications program for Cades Cove includes the use of strategically

placed variable message signs, a website, kiosks and signs at visitor centers and a telephone information service. The communication program would incorporate traffic monitoring technology with a combination of tools that would inform visitors of traffic conditions and/or special programs.

While this concept could be incorporated into the action alternatives, it cannot stand alone because it does not address the Park’s operational issues.

Signage and Wayfinding

The need for a signage and wayfinding master plan was identified during the planning process as important to the success of a communications program. As noted in the Facilities Conditions Report, a large number of signs in Cades Cove already inform or direct the visitor in some way. New signs have recently been installed during peak periods. These signs – on the Loop Road approaching Sparks and Hyatt lanes – direct motorists to alternate routes when congestion is heavy. However, the effectiveness of additional signage must be weighed against the impact of additional signage on the visual quality of Cades

Table 4 Concept: Visitor Contact Facilities	
Goal	Objective
Resource and Resource Education	The visitor center would provide a focal point for education programs that foster greater enjoyment, understanding, appreciation, and protection of natural and cultural resources within Cades Cove.
Visitation	The visitor center would be a “quality” facility that would be designed in character with the Cove, and would include visitor amenities (restrooms, etc.). The visitor center would provide space for resource education opportunities, visitor orientation, and education. The visitor center would be the focal point for visitor information and transportation alternatives.
Facilities and Services	The visitor center would be designed to be environmentally sensitive, accessible, and sustainable. The visitor center would be appropriately located to meet visitor needs while respecting natural and cultural resources.

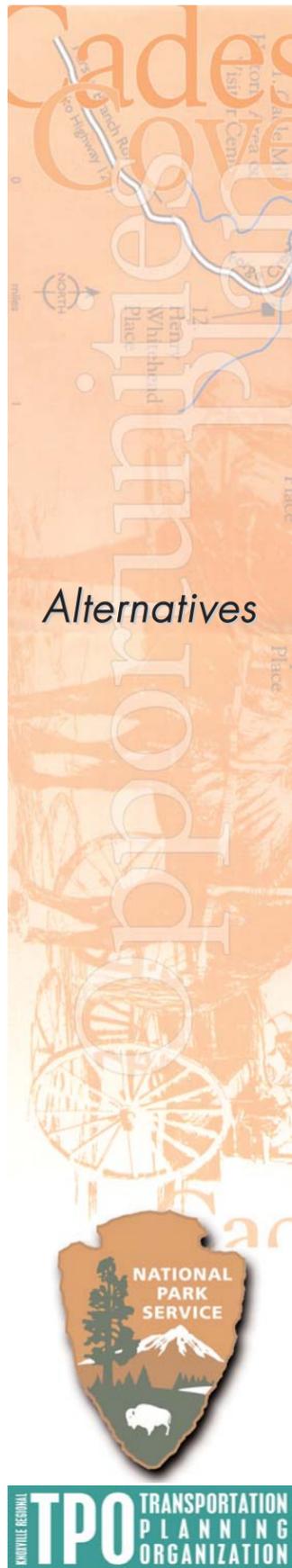
Table 5 Concept: Communications Program	
Goal	Objective
Resource	The communication program can be used to provide information to the public about air quality and other resource issues.
Visitation	Defining appropriate visitor activities is one objective of this goal. The communication program would support this objective by providing a forum for dispensing information.
Resource Education	The communication program can be used to provide information to the public about traffic congestion and facility closures or repairs.
Facilities and Services	The communication program would support efforts to provide visitors with information about traffic congestion as well as information about programs going on in the cove.

Cove. New signage should be coordinated with existing signage to improve wayfinding without detracting from the overall visitor experience.

Transportation and Parking Monitoring System

To create an effective transportation and parking monitoring system, data collection equipment is needed. This could include a series of vehicle “loop detectors”





embedded in the pavement at strategic locations on the Laurel Creek entry road, Loop Road and key parking/pull-off areas (see Figure 14). The loop detectors could be connected by a fiber optic cable to a new traffic operations center in the visitor center at the head of the Loop Road. The transportation operations center could be staffed by at least one full-time NPS employee and at least two part-time employees during peak periods. Data would be collected to calculate:

- Total vehicle counts
- Average hourly entry volumes
- Parking counts and turnover rates
- Estimated travel times for the Loop road
- Specific traffic situations (i.e., wildlife jams)

The proposed monitoring system is an “optimal” system, but does not require full implementation to produce useful information. As the project progresses and additional information becomes available, a less-than-optimal system may be implemented to provide many (but not all) of the full system’s capabilities.

Variable Message Signs

Variable message signs could be of a type and style similar to the sign at the Sugarlands Visitor Center.

The Sugarlands sign has a rustic appearance and features three message lines that provide 14 characters of text per line. Figure 14 illustrates a conceptual plan for potential sign locations under each alternative.

Website

Data collected at the traffic operations center could be uploaded to a page on the NPS’s GRSM website to provide users with traffic conditions and information on activities and rules for driving the Loop Road.

Telephone and Radio Communications

Visitors without internet access could obtain traffic and visitor information by calling a hotline or by tuning to a Highway Advisory Radio (HAR) frequency operated by the NPS.

Management and Law Enforcement

Traffic and visitation data would help the NPS better manage the Cove. This information could be used to develop public information programs, inform the public about road maintenance activities and special

events and help to direct law enforcement resources. By monitoring the time it takes to travel between two loop detectors, the traffic operations center could inform rangers of areas where wildlife jams may be occurring.

Reservation System

A reservation system could be implemented for times when the Loop Road’s capacity is exceeded. Such a system would operate in a manner similar to the existing campsite reservation system. Visitors would make reservations via phone, the internet, at visitor centers or at designated hotels in the gateway communities. A small number of “walk-up” reservations would also be available.

Hourly levels of visitation vary during the day, with higher numbers seen at midday. A reservation system could be structured to give visitors access to the Cove from 10 a.m. to 3 p.m. on weekdays and 10 a.m. to 5 p.m. on weekends. A reservation would include the date of arrival and the period for which the reservation is effective.

Visitors would be charged a fee for the reservation. The cost would be set at a level that recovered the

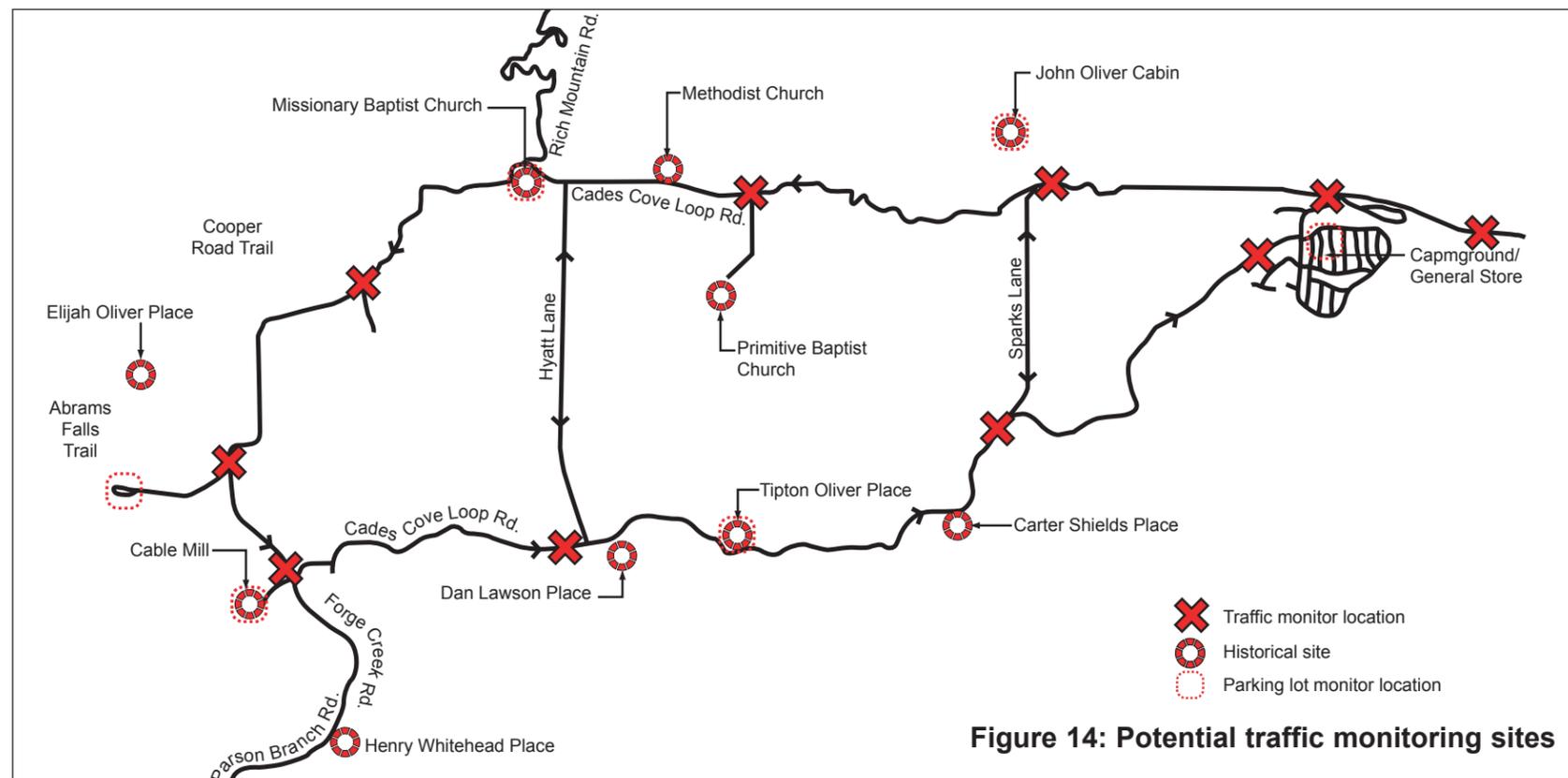
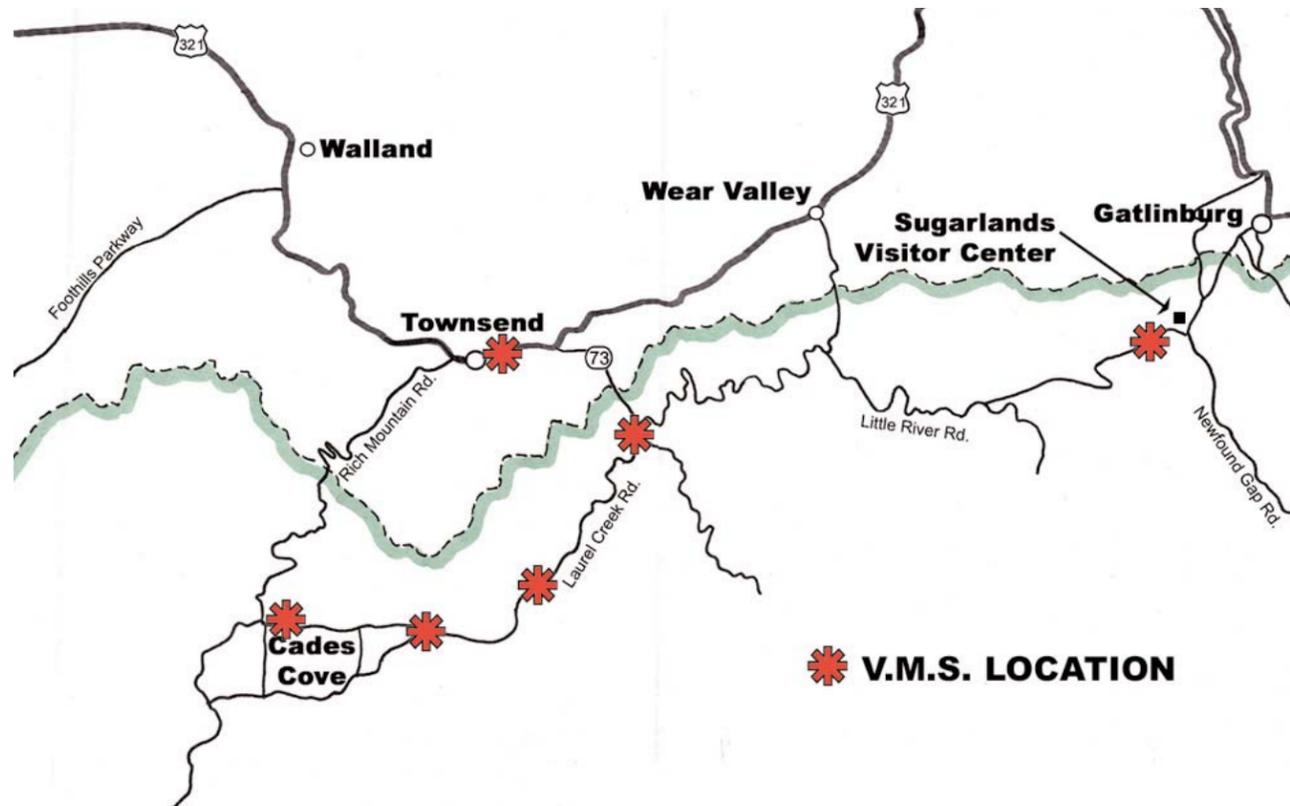


Figure 14: Potential traffic monitoring sites



A variable message sign at the Sugarlands Visitor Center

Figure 15: Proposed VMS locations in the Cades Cove region



	June	July		August		September	October
	Weekends	Weekdays	Weekends	Weekdays	Weekends	Weekends	Weekends
Month and day reservations would be required (based on current peak season, may change based on visitation trends)							
Number of days for reservation operations	8	23	8	23	8	8	8
Estimated number of vehicles per day	3,500	3,150	4,145	2,995	3,940	3,410	4,795
Recommended number of vehicle reservations per day (to maintain road capacity) reserved in advance of travel day	2,760	2,440	2,880	2,400	2,850	2,650	3,025
Recommended number of vehicle reservations held for same-day access - purchased at visitor center ("walk-ups")	500	500	500	500	500	500	500
Total number of vehicle reservations issued per day (advance order + same day purchase)	3,260	2,940	3,380	2,900	3,350	3,150	3,525
Parking spaces at new Cove visitor center	290						
Time reservation operations would begin	10 a.m.						
Time reservation options would end	3 p.m. weekdays and 5 p.m. weekends						

Note: These numbers are preliminary and could change as additional capacity studies and impact analyses take place.

cost of operating the system, but not more. It is estimated that a reservation would be between two and eight dollars per vehicle. According to the road capacity analysis, the number of vehicle reservations would range between 2,400 and 3,500 vehicles per day (see Table 6).

Two potential reservation system operating models were identified. The first was a separate system that would be developed and operated by the NPS. The second would add the visitor reservation system to the NPS's campground reservation system, which is operated by a private vendor.

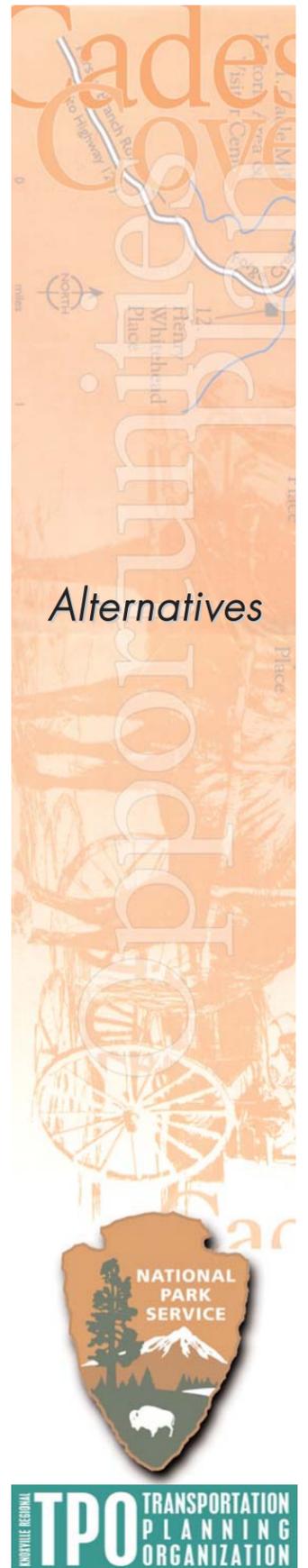
Under the second alternative, the Park would not have to budget for equipment and personnel and cost recovery would be related to operation costs (the recovery of personnel and overhead expenses). Table 7 explains how this concept would meet plan goals.

Goal	Objective
Resource	The reservation system would provide stewardship of resources by matching the number of visitors to the capacity of the resources. This also promotes sustainability.
Visitation	By managing the number of visitors, the reservation system would help ensure the high quality of visitor facilities and services.
Resource Education	The reservation system would provide a point of contact for distributing information about Cades Cove to visitors. This could include rules, safety, and program information.
Facilities and Service	The system would enable adequate sizing of facilities and personnel to accommodate visitors to Cades Cove.

Alternative Transportation System (ATS)

An alternative transportation system (ATS) in the form of motorized shuttles could operate during peak periods to reduce the number of vehicles in the Park on the Cove's roads. Such a shuttle system would be designed to be efficient, friendly and easy for visitors to use.

Three service operations have been proposed. These include two general purpose gateway shuttle services operating from Townsend and Gatlinburg



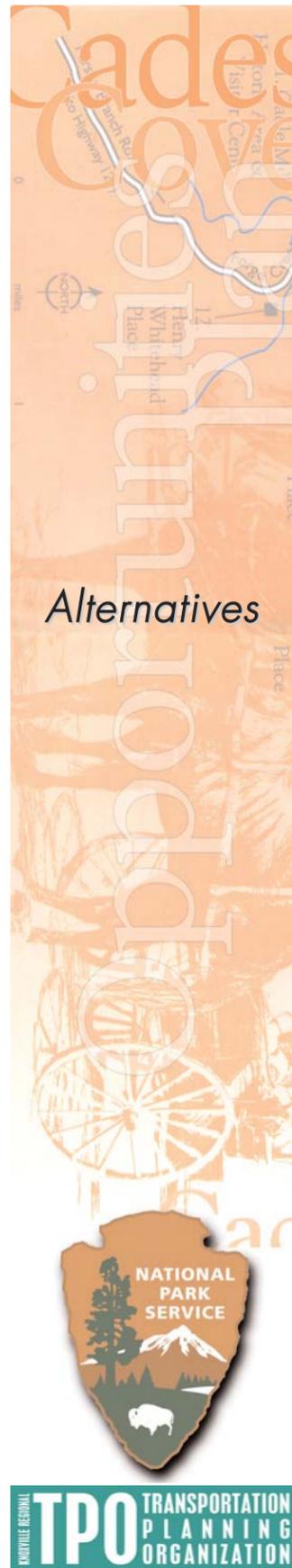


Table 8: Alternative Transportation System Characteristics

Gatlinburg Gateway Shuttle	Alternative 4	Alternative 5
Service		
Bus Trips Per Hour - Weekdays (July)	NA	3
Bus Trips Per Hour- Weekends (Oct)	NA	5
Operating Hours - Summer	NA	8 am - 9 pm
Operating Hours - Fall	NA	8 am - 8 pm
Vehicles		
Required Number of Vehicles	NA	17
Vehicle Type	NA	Standard 40 ft. Bus
Parking For Users		
Existing Spaces	NA	300
New Spaces	NA	0
Cades Cove Loop Service		
Service		
Bus Trips Per Hour - Weekdays (July)	5	15
Bus Trips Per Hour- Weekends (Oct)	9	22
Operating Hours - Summer	10 am - 7 pm	10 am - 7 pm
Operating Hours - Fall	10 am - 6 pm	10 am - 6 pm
Vehicles		
Required Number of Vehicles	17	41
Vehicle Type	Bus/Trailer - 70 pass.	Bus/Trailer - 70 pass.
Parking For Users		
Existing Spaces	None	None
New Spaces	None	None
Support Facilities		
Bus Parking Spaces	32	90
Maintenance Building (sq. ft.)	10,200	21,700
Townsend Gateway Shuttle		
Service		
Bus Trips Per Hour- Weekdays (July)	5	12
Bus Trips Per Hour- Weekends (Oct)	9	19
Operating Hours - Summer	9 am - 8 pm	9 am - 8 pm
Operating Hours - Fall	9 am - 7 pm	9 am - 7 pm
Vehicles		
Required Number of Vehicles	15	32
Vehicle Type	Bus/Trailer - 70 pass.	Bus/Trailer - 70 pass.
Parking For Users		
Existing Spaces	520	800
New Spaces	250	700

and a shuttle service operating around the Loop Road. Each of these services is described below.

General Purpose Gateway Shuttle

A general purpose shuttle could operate from a gateway community - either from Townsend or Gatlinburg - and travel to the head of the Cove

A Townsend shuttle would travel approximately 22 miles on a round trip that would take about 90 minutes and stop 14 times. The shuttle would stop at hotels and motels and serve the Townsend visitor center, which would also have some parking spaces reserved for shuttle users.

Some shuttle users could park in existing lots and facilities in Townsend. Others could park at new parking lots developed in conjunction with shuttle stops. The intent of this plan is to keep these parking facilities no larger than 75 to 80 spaces in size and to co-locate parking whenever possible.

The number of parking spaces needed would vary by alternative. A summary of shuttle characteristics by alternative appears in Table 8.

A Gatlinburg shuttle would travel approximately 30 to 32 miles one way on a route between Gatlinburg and Cades Cove. This trip would take approximately 90 minutes, depending on the number of stops. The shuttle could stop at several locations in Gatlinburg and also could stop at Elkmont. Parking for the Gatlinburg service could be provided at the existing transit center, as well as at lodging facilities in the community.

Service levels would be tailored to the demand by season, day of week, and time of day. Service levels also would vary by alternative. Based on current visitor patterns, these shuttles would operate only during the peak season.

Vehicles would be selected to serve route needs. The Townsend shuttle likely would require high capacity vehicles, such as articulated buses or combination trolley/trailer vehicles. This shuttle route is short, so it may be acceptable for some passengers to stand for a portion of the trip. The operating plan for the Townsend shuttle assumes that vehicles with a

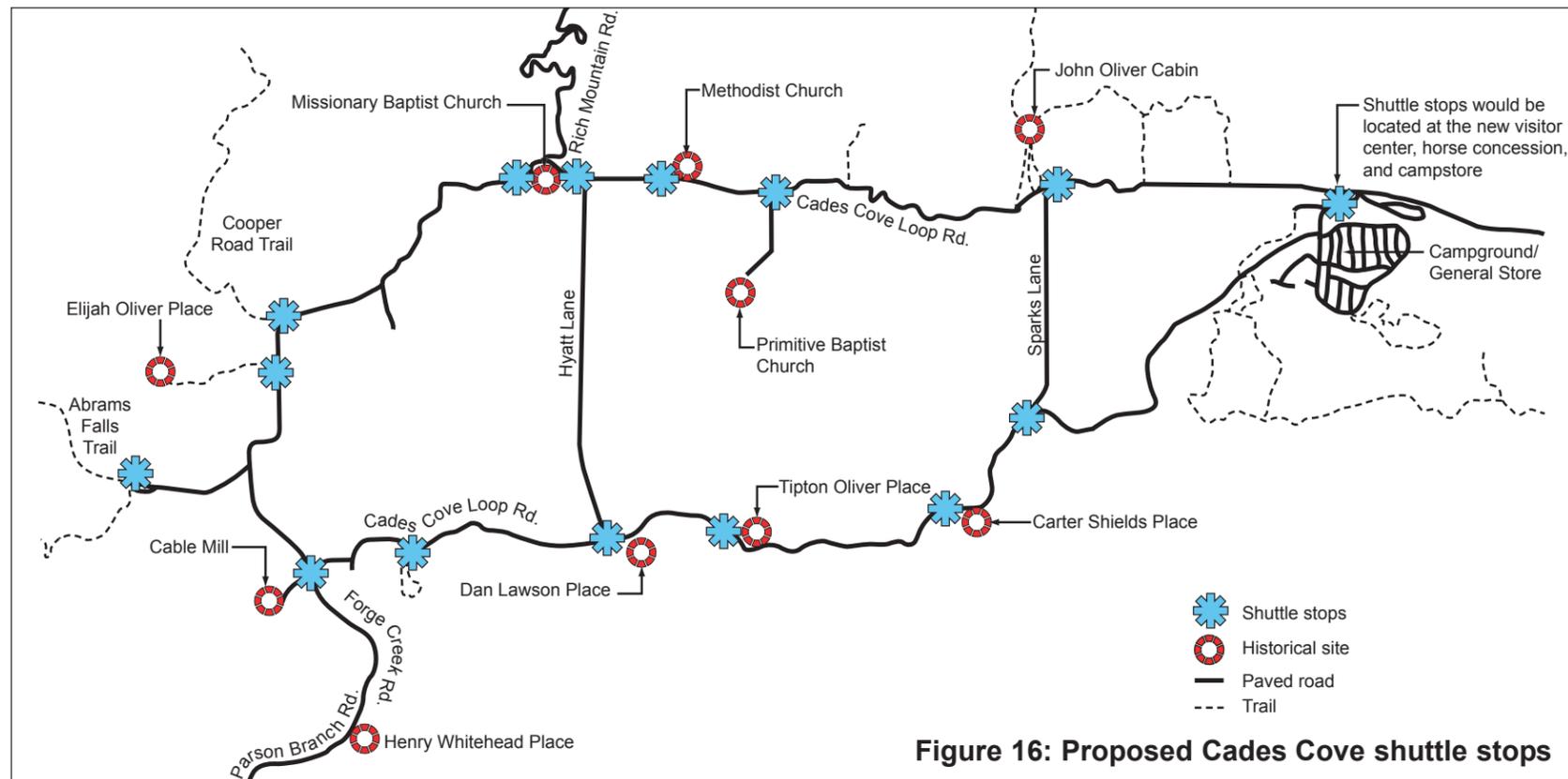


Figure 16: Proposed Cades Cove shuttle stops

capacity of 70 would be used on the route. Because demand would vary by day and by season, a bus/trailer combination vehicle would be a good choice. This vehicle type offers flexibility to match capacity to demand.

The route for the Gatlinburg shuttle is much longer than the Townsend route. Consequently, a different type of vehicle would be required. A conventional transit bus or coach is recommended for this service. These buses have a capacity of approximately 50 passengers. Each type of vehicle would have an expected service life of 12 to 16 years.

Loop Road Service

Shuttle service also could be provided from the proposed visitor center at the head of the Cove and travel along the Loop Road. Interpretive and orientation materials, perhaps including a recorded interpretive program, could be made available to shuttle riders. This service would serve pedestrians/hikers who want to travel within the Cove and visitors who want to stop at historic and other sites in the Cove.

Approximately 17-18 stops would be made at key sites, trailheads, and scenic vistas along the Loop Road, as shown in Figure 16. The entire trip is expected to take about 1 hour and 40 minutes. During peak visitation periods, shuttles would arrive once every three to four minutes (in Alternative 5). This would enable visitors to spend as much or as little time as they like at any one location. When ready to move on, those visitors could board the next shuttle and continue to their next destination.

Shuttle vehicles within the park would need to be “high capacity,” such as combination trolley/trailers. These larger vehicles would accommodate the high volume of visitors anticipated in the Cove (a capacity of 70 passengers was assumed for this service).

These vehicles would have an expected service life of 12 to 16 years. It is possible that the vehicles operated on the Loop Road could be modified to provide an open-air “feel,” as several members of the public suggested, or provide another type of unique experience, depending on availability and cost of the option.

Characteristics of ATS

ATS have been successfully implemented at Yosemite, Zion, Acadia, Grand Canyon, and other national parks. Most of these existing systems are free to users, but the costs of those systems may be partially recouped through other fees, such as Park entrance fees. The ridership on these systems is influenced by several factors, including:

- Locations served
- Convenience of the service (wait time, travel time)
- Amount paid by riders
- Comfort of the vehicles
- Traffic and/or parking management measures that limit access by private vehicles

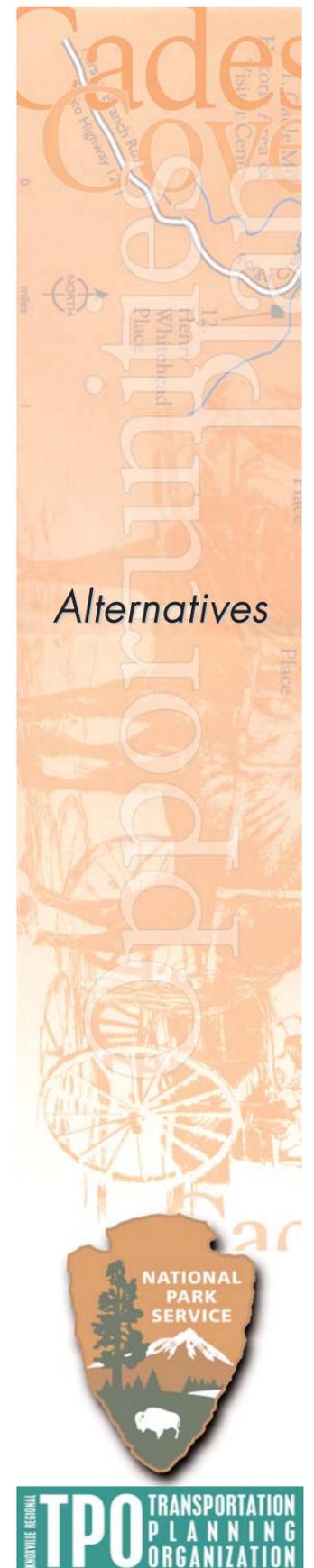
Transit systems that serve areas that cannot otherwise be reached by private vehicles have the greatest likelihood of success in recreational settings such as Cades Cove. The transit systems at Yosemite, Grand Canyon and Zion all provide service to areas where private vehicles are prohibited for at least a portion of the year. The following sections describe the major ATS elements proposed in this plan:

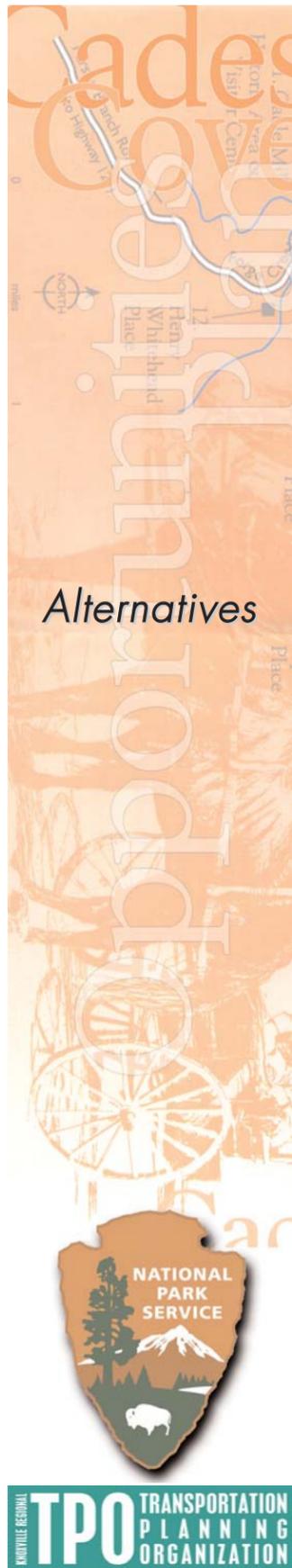
Support Facilities and Related Improvements

An ATS requires support facilities, including vehicle storage facilities and a maintenance shop, as well as facilities to meet passenger needs. Passenger shelters and other amenities may be included at stops along each of the routes. These facilities should be designed in a manner that reinforces a positive image for the service and includes information on schedules and routes. In this plan, the scale of the facilities needed varies by alternative.

Service Delivery Options

Several service options are possible under this plan. These options include variations on ownership and maintenance of the vehicles, ownership and operation of support facilities and the means of providing the staffing required to operate the service.





Vehicle Ownership and Maintenance

Transit vehicles can be procured and owned by the government or be owned or leased by a contractor. The systems at Zion and Grand Canyon feature government-owned vehicles. Parks employing privately owned or leased vehicles include Yosemite, Rocky Mountain National Park and Point Reyes National Seashore.

One advantage of government ownership is the ability to specify and acquire vehicles tailored to the park’s unique needs. Contractor-provided vehicles often are less expensive “off-the-shelf” models that may not have all of the features a park may desire.

Provisions for maintenance of the vehicle fleet depend on the location of the park. Parks that are close to major metropolitan areas often contract all or part of maintenance services with a vendor. In parks with large, specialized fleets or those located in remote areas, it is usually desirable to provide on-site maintenance facilities. These facilities can be located in or near the park. Maintenance can be provided by park employees, although contractors commonly do such work.

Ownership and Operation of Support Facilities

Most park systems deliver transit service via a contractor. This is because operating a transit system requires specialized management capabilities that are usually not available on park staffs. If a contract is used to deliver the service, the Park would need to assign resources to oversee the contractor to confirm that the contract provisions are being followed and that the contractor is providing a high quality of service.

The most common forms of contracts are concession contracts and service contracts. The biggest distinction between these contracts is how the contractor receives payment.

In a concession contract, the contractor collects direct or indirect charges from users. At Yosemite, Yosemite Concession Services (YCS) funds the operation of shuttle services through add-ons to the room charges, meals and retail purchases. Users do not pay a fare or user fees. YCS also provides



Examples of different ATS applications in Zion National Park

premium transportation services for which it charges users directly.

Concession operators at other parks charge visitors a direct fee (like a fare) for the use of transportation services. By contrast, service contracts involve payment by the government to a contractor to provide service. This type of contract is used at the Grand Canyon and Zion National Park, among others.

Contract rates can be negotiated and are influenced by a number of factors. One important consideration is the ownership of the vehicles and facilities. When

Table 9 Concept: Alternative Transportation System (ATS)	
Goal	Objective
Resource	The development and implementation of an ATS would be coordinated with resource management plans and programs. ATS supports the stewardship objective by providing opportunities for educating visitors. An ATS is an access strategy that is sustainable and long term. ATS could take advantage of alternative fuels and noise suppression designs.
Visitation	Facilities related to alternative transportation would provide visitor comfort and education/interpretation opportunities. Resource education programs would be made available on the ATS and in the visitor center. The ATS provides transportation choices that accommodate appropriate visitor activities while protecting resources.
Resource Education	Coordination of the gateway and Cades Cove service would require relationships with civic and community groups that can be fostered for resource education opportunities.
Facilities and Services	The ATS would include staff and visitor facilities to improve efficiency and meet operational needs. The ATS would stress the development of public-private partnerships for implementation.

the vehicles and facilities are owned by the government, the contractor is responsible only for the provision of the labor and materials needed to deliver the service. Contract rates in this case will be less than when the contractor must provide vehicles and facilities. If the facilities and vehicles are the responsibility of the contractor, the contract rates must be increased to cover this capital investment.

One of the challenges in Cades Cove is to define a revenue source that can cover the operating, maintenance and replacement costs associated with the service. Since the Park is precluded from collecting entrance fees, one of the more common sources of funding used by other parks is not available. Table 9 explains how the concept of an alternative transportation system would meet project goals.

Bicycle/Pedestrian Elements

Bicycle and pedestrian strategies focus on access, the bicycle/pedestrian-only time periods on the Loop

Road, and the development of a new bicycle/pedestrian pathway that would be separate from the Loop Road.

The addition of a separate bicycle/pedestrian pathway would provide cyclists and walkers with access to the Cove while greatly reducing concerns about conflicts with motorized vehicles on the Loop Road. This pathway could follow some of the historic traces and farm roads within the valley floor of the Cove. Providing an alternative visitor experience of this nature could entice more visitors to the Cove without necessarily increasing automobile traffic on Cades Cove roads. However, if the paths prove to be popular, they may generate demand for additional parking spaces dedicated to bicycle/pedestrian visitors.

In addition, a bicycle/pedestrian path system could serve as an access and circulation system for law enforcement and emergency vehicles. This path is an optional element that could be added to any alternative.

A shuttle service for bicyclists, walkers and hikers is another element of the bicycle and pedestrian access strategies. This would be a specialized service catering to the needs of hikers and bicyclists. Shuttle riders would park in the gateway communities and take the shuttle to the beginning of the Loop Road. This shuttle service is an optional element that could be added to any alternative (for other options, see p. 49).

Summary of Alternatives

The development of alternatives represents the culmination of extensive public input into the problems and potential solutions for Cades Cove. The alternatives were developed in a manner that recognized the wide range of comments received. The project team developed the alternatives in a hierarchical fashion, starting with the “no action” alternative and progressing to an alternative that would prohibit private motorized vehicles from entering the Loop Road during peak periods. Each of the five alternatives includes management action elements related to the four management themes of the Opportunities Plan.

After reviewing comments from the internal and public scoping sessions, the project team refined the alternatives. This involved identifying the elements that were common to all of the alternatives and optional elements and making revisions based on public input. The following text describes the alternatives as presented at the internal and public scoping sessions.

Alternative 1: No Action

Alternative 1 would continue existing National Park Service management policies and actions in Cades Cove. Private vehicle and bicycle/pedestrian access to the Loop Road would not be changed. Existing visitor orientation facilities (including the open air shelter at the start of the Loop Road and at Cable Mill) would remain unchanged. Existing field management procedures, maintenance and resource education operations, and ranger activities would remain at current levels.

Alternative 2: Roadway Improvements

Alternative 2 involves a series of minor improvements to the Loop Road, Sparks Lane and Hyatt Lane, and calls for the development of a “Master Circulation Plan” for the Cove. This plan would identify appropriate locations for formal visitor pull-offs, roadside parking for scenic vistas and parking needs at cultural attractions. The plan would also coordinate the location and design of directional and informational signing.

Private vehicle access would continue as it is today. Alternative 2 would institute a communications program to include variable message signs, a telephone information service and a website. Through these services, visitors would be able to receive information about current traffic conditions and other information about Cades Cove. This alternative would result in a low-level increase in the operations staff (rangers, etc.) for managing visitors and maintaining the Cove. In addition, a minor visitor center would be developed at the entrance to the Cove to serve as a primary visitor contact point.

All other existing contact points would continue as they are today.

Alternative 3: Managing Demand through Peak Visitation Reservations

Alternative 3 would institute a reservation program for private vehicle access to the Loop Road during peak visitation periods. Access to the campground, picnic, and horse concession areas would continue as today. Provision for special events such as Old Timers Day and for cemetery maintenance workdays by Park partners would be provided.

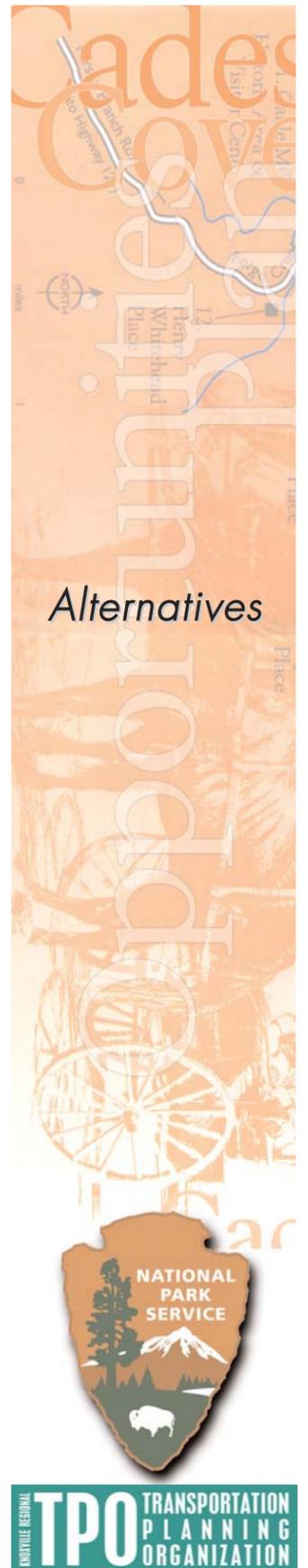
During off-peak periods, visitors would continue to have unrestricted private vehicle access to the Cove. This alternative would include the communications program described in Alternative 2 and would result in a low to moderate increase in the operations staff.

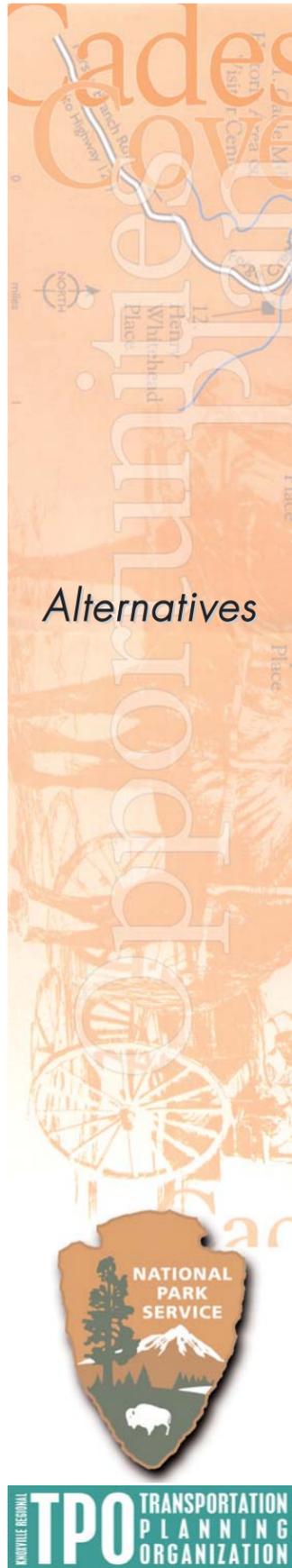
Alternative 3 includes a moderately-sized visitor facility in the Park, providing educational and interpretative resources. A small visitor contact facility outside the Park would provide visitors with an opportunity to make reservations and collect basic information about the Cove.

Alternative 4: Managing Demand through Peak Visitation Reservation and Voluntary Transit

Alternative 4 would add the reservation system described in Alternative 3 and combine it with a voluntary transit system during peak periods. Access to the picnic, campground and horse concession areas would not be restricted. Special events and cemetery maintenance would be handled in a manner similar to Alternative 3. The voluntary transit system would be based outside the Park. Visitors would ride transit vehicles into the Cove and arrive at a visitor center located at the beginning of the Loop Road.

Once inside the park, visitors would board tramstyle transit vehicles that travel the Loop Road. Different options for these vehicles include trolleys featuring interpretive programs and vehicles that simply





provide Loop Road transportation or access to trailheads. This system would enable visitors to enjoy the Cove at their own pace.

Alternative 4 includes the communications program described in Alternative 2. This alternative would require a moderate to high increase in the level of the operations staff. Visitor orientation would be provided at a moderately-sized Visitor Center at the entry to Cades Cove. The visitor center would be the point where visitors would transfer between the gateway shuttle (or private vehicle) and the Loop Road shuttle.

The visitor center would include interpretation space, bookstore, restrooms and staff workspace. A moderate visitor facility would be located outside the Park. This facility would function as the primary access point for the voluntary transit system. It would also provide reservation and other information about Cades Cove.

Alternative 5: Visitor Management through Peak Visitation Transit Access

Alternative 5 reflects the greatest change in visitation. Under this alternative, access to the Cove would be limited to transit vehicles during peak periods. During off-peak periods, unrestricted private vehicle access would continue. There is an option to continue the transit service as voluntary during the non-peak periods.

The transit system would operate in the same manner as in Alternative 4. This alternative also includes the communications program described in Alternative 2 and would require a moderate to high increase in the level of operations staff.

Two visitor orientation facilities would be developed. The first would be at the entrance to the Loop Road and would serve as the transfer center for the transit system. It would also be home to visitor orientation kiosks, a museum, restrooms, and the relocated amphitheater, bike concession area, snack shop and bookstore.

The second visitor facility would be a moderately-sized visitor center outside the Park. This facility would serve as the main transit operation point to access the Cove, and would provide orientation material and visitor information.

Elements Common to All Action Alternatives

Visitation:

- Enhance visitor contact by providing Visitor Center at entrance to Cades Cove.
- Allow unrestricted private vehicle access to Loop Road during non-peak visitation periods.
- Allow unrestricted access to Picnic Area, Campground, and Horse Concessions.
- Provide for descendant access to family cemeteries located within the Cove.
- Provide for special activity days or events such as Decoration Day and Old Timers Day.
- Improve roadway circulation features (pull-offs/parking areas) around Loop Road.
- Implement a communications network (e.g., Variable Message Signs, FM radio, phone-in service and web connections) to provide real time information on Cove conditions (e.g., congestion level, driving time, camping/picnic availability, parking, weather conditions, road closures, etc.).

Resources:

- Maintain National Register historic structures and other historic features based upon the Secretary of the Interior Standards for Rehabilitation and the Secretary of the Interior Standards and Guidelines for Archeology and Historic Preservation in Cades Cove including churches, cemeteries, home sites, Cable Mill, and the Cades Cove valley floor.
- Develop and implement a long-range field management plan to guide yearly maintenance and manage valley floor in a manner consistent with the 1800-1920 National Register nomination of Cades Cove.
- Maintain the valley floor as open grasslands with small woodlots and fencerows allowing for wildlife viewing and preserving the scenic vistas.

Resource Education:

- Provide a Visitor Center at entrance to Loop Road for interpretive and educational opportunities.
- Provide educational opportunities and materials regarding safety, protection of the Cove's natural and cultural resources, wildlife, visitor activities (ranger-led activities, special events, and park programs).
- Provide interpretive signage that will convey important park values and provide an interpretive context to view Cades Cove resources.

Facilities and Services:

- Extend underground electric and telephone services to proposed Visitor Center.
- Expand/extend underground water and sewer services to the proposed Visitor Center.
- Provide an appropriate level of Park staff to support the alternative (law enforcement, interpretive, maintenance, and administrative).
- Ensure that the existing electrical and telecommunications lines along Park roads are capable of handling the proposed communications program.
- Telecommunications from Townsend and Sugarlands to handle variable message sign needs.

Optional Elements

Several optional elements were developed for potential inclusion in any of the alternatives. They are described below.

Campstore Options

- Campstore continues as existing (1,000 square feet, including vending area and restrooms).
- Small expansion of the campstore for storage and customer flow.
- Bike shop rehabilitation, including covered bike storage.
- Increase parking for campstore and bike shop.
- Rehab and expand restrooms.
- Relocate snack bar portion of campstore to new visitor center.
- Relocate campstore and bike shop to new visitor center.

Campground Options

- Campground continues as existing (four group camping stations, 163 campsites, six comfort stations without hot water or showers).
- Campground rehab to comply with ADA standards.
- Increase parking for campground guests.
- Concession-operated shower facilities.
- Electric hookup at campsites.

Horse Operations Options

Horse Concession

- Horse concession facilities continue as existing (at Loop Road entrance).
- Make horse concession trails separate from day-use trails.
- Relocate horse concession within developed area of the Cove.

Horse Camp

- Horse camp operations continue as existing.
- Rehab horse camp at existing location (including potable water and improved toilets).
- Co-locate horse camp and day-use horse operations at Turkeypen Gap with improved facilities.

Day-Use

- Day-use horse operations continue as existing.
- Provide delineated signed parking for trailers in developed area.
- Modify trailer access.
- Co-locate horse camp and day-use horse operations at Turkeypen gap with improved facilities.

Picnic Area Options

- Picnic facilities continue as existing (60 picnic sites and three comfort stations).
- Add group picnic facility (can occur only with relocation of amphitheater to new visitor center).

Utility Improvements

Developed Area

- Developed area utilities continue as existing.
- Expand electric services to campsites (underground).
- Improve water and sewer service to accommodate utility changes (at the Visitor Center, campground showers, etc.).

Cable Mill Area

- Cable Mill utilities continue as existing.
- Rehab and expand restrooms.
- Improve water and sewer service to accommodate restroom changes.
- Extend electric services (underground).
- Extend telephone service (underground).
- Add call boxes.
- Add beverage vending machines.

Additional Optional Elements

Alter Bicycle and Pedestrian Hours

- Continue bicycle and pedestrian hours as existing.
- Extend season for bike/ped closures.
- Add evening closure for bike/ped.
- Eliminate Saturday morning bike/ped closure.

Bike/Ped Shuttle

- Add concession-oriented shuttle from Gateway community to visitor center for bicyclists and hikers.
- Add primitive restrooms at up to four locations along the Loop Road.

Separate Bike/Ped Path Inside the Cove Using Trace Farm Roads

- Short loop connecting to at least one historic structure.
- Medium loop connecting to multiple attractions.
- Long loop connecting to Cable Mill and attractions along route (could be combined with a shorter loop).

Cable Mill Area

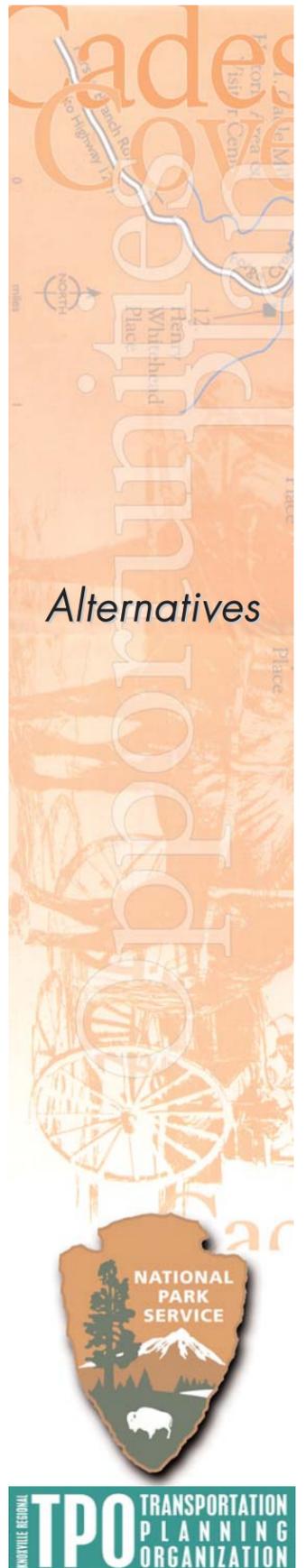
- Remove non-historic cabin (only with relocation of bookstore).
- Rehab of non-historic cabin for different NPS use (only with relocation of bookstore).

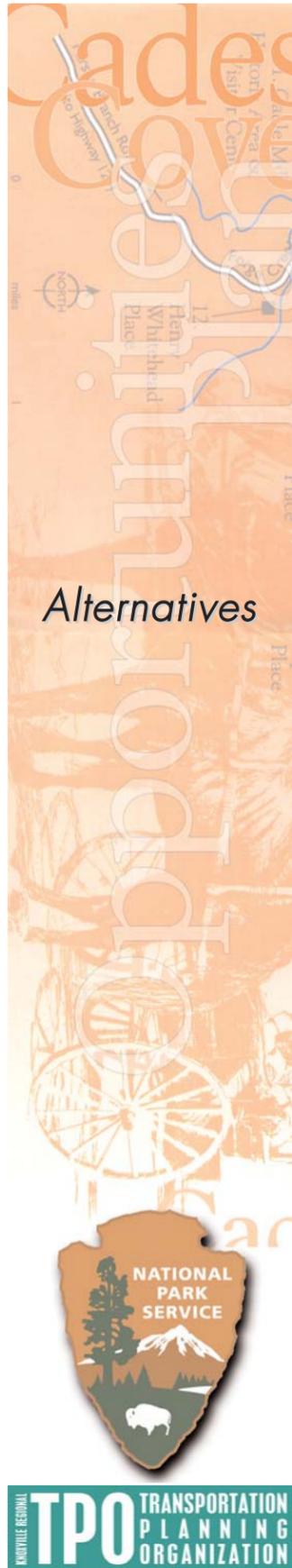
Implementation

An effective plan requires effective implementation strategies. Although this process has not identified a preferred alternative, it has generated a “first cut” of potential implementation strategies for the major concepts identified here. As the planning process moves forward and the alternatives become more detailed, these implementation strategies will need to be updated and expanded as well.

The first round of implementation strategies include:

- Relevant NPS policies that will shape the implementation of this plan
- Statements of desired future conditions
- Measures for the achievement of project goals and objectives
- A comparative review of the alternatives
- Preliminary cost estimates
- An overview of the Choosing by Advantages process, which, when complete, will help to identify the project’s preferred alternative
- Potential funding ideas and strategies
- A description of several pilot projects





**Table 10
NPS Policies Table - Cades Cove Opportunities Plan**

“The National Park Service preserves, unimpaired the natural and cultural resources and values of the national parks system for the enjoyment, education and inspiration of this and future generations.”		
Natural Resource Management	Management Policy 4.0 deals with natural resource management. It calls for the NPS to strive to understand, maintain, restore and protect the inherent integrity of the natural resources, processes, systems and values of the parks. Section 4.1.5 calls for the re-establishment of natural functions and processes including the removal of exotic species. Two examples provided where exotic species may be maintained deal with cultural resources - “needed to meet the desired condition of a historic resource but only where it is prevented from being invasive...” and “an agricultural crop used to maintain the character of a cultural landscape.” This section also calls for the Service to phase out the commercial grazing of livestock whenever possible. Recreational and administrative use of livestock will be managed to prevent unacceptable impacts on park resources.	
Cultural Resource Management	Management Policy 5.0 deals with cultural resource management and is derived from a suite of historic preservation, environmental and other laws, Executive orders, etc. Cades Cove is listed on the National Register of Historic Places and is managed as a historic district (1982 GMP). Of specific interest in Policy 5.0 is Section 5.3.1.6 dealing with carrying capacity. The NPS is to set, enforce and monitor carrying capacities to limit public visitation or use of cultural resources that would be subject to adverse effects from unrestricted levels of visitation or use. Section 5.3.2 deals with accessibility and historic properties. It is the highest feasible level of physical access that is reasonable and consistent with the preservation of significant historic features. Section 5.3.5.2.5 deals with Biotic Cultural Resources and calls for the development of a plan (both the natural and cultural resource components) for the treatment and management of biotic cultural resources.	See also Director’s Order 28 - Cultural Resource Management
	Section 5.3.5.3 deals with Ethnographic Resources. This policy recognizes these as the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. The NPS must be respectful of these resources and carefully consider the effects that actions may have on them. Section 5.3.5.3.1 calls for the NPS to strive for continued access and use of these ethnographic features but notes that this access may not be allowed if it violates criteria listed in Section 8.2 dealing with use of the parks.	
Use of Parks	Management Policy 8.0 deals with use of parks and the parameters within which use must occur. Section 8.2.1 - Visitor carrying capacity is the type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in the park. By identifying and staying within carrying capacities, park uses that may unacceptably impact park resources may be prevented. Section 8.2.4 deals with accessibility for persons with disabilities. The Service is committed to designing, constructing and operating all buildings and facilities so that they are accessible to and usable by persons with disabilities to the greatest extent reasonable. Section 8.2.6.2 - the NPS is directed to operate a national reservation service of its own or participate in an inter-agency system. Superintendents are encouraged to have their parks participate in the Service-wide reservation system and must determine that the Service-wide system already in operation does not accommodate the park’s reservation needs before participating in some other type of reservation system.	Note that GRSM currently participates in the Service-wide reservation system by using it for campground reservations.
	Section 8.6.8 deals with domestic and feral livestock. Four criteria are given under which livestock is permitted - authorized in enabling legislation, required as a reserved right of use, to maintain a historic scene, or as an integral part of a recreation activity. However, no matter how authorized unacceptable impacts to park resources, values or purposes are not allowed. Section 8.6.10 deals with cemeteries and burials. This policy allows for continued access to family cemeteries for upkeep and commemoration provided that safety is not jeopardized and resources are protected.	
Park Facilities	Management Policy 9.0 deals with park facilities. Through these policies the NPS strives to provide visitor and administrative facilities that are necessary, appropriate and consistent with the conservation of park resources and values. Section 9.1.2 provides direction regarding transportation systems calling for a sufficient percentage of fully accessible vehicles to provide effective service to persons with disabilities. Section 9.2.1 deals with road systems and calls for the NPS to consider the use of alternative transportation systems or limitations of use when park roads are chronically at or near capacity. It also notes that some park roads are important cultural resources whose values must be preserved. Through Section 9.2.2 the Service is directed to work cooperatively with other federal agencies; tribal, state and local governments; regional planning bodies and others to design and promote alternative transportation systems for park access and circulation. Linkages to public transportation systems should be promoted when feasible. While all alternative systems may be considered conceptually, a compelling advantage would need to be shown before a mode other than rubber-tired vehicles operating on existing roads would be authorized by the Director.	See also Director's Order 87A Park Roads and Parkways. Other sources of information relative to Alternative Transportation Systems include Director's Order 87B . Director's Order 42 , deals with Accessibility for Visitors with Disabilities in National Park Service Programs and Services and Director's Order 16A focuses on employees.
	Section 9.2.3 deals with trails and walks directing that they be planned as an integral part of the parks transportation system and that they incorporate principles of universal design. Section 9.2.3.4 deals specifically with bicycle trails. Bicycle trails may be integrated with park roads when considered to be safe and feasible. The designation of bicycle routes other than on park roads and in parking areas requires a written determination that this use is consistent with the protection of a park’s natural and cultural, scenic, and esthetic values, safety considerations and management objectives, and will not disturb wildlife or other park resources. Section 9.3 deals with visitor facilities with 9.3.1.3 providing direction relative to visitor centers. It notes that when an in-park location would create unacceptable environmental impacts, authorization should be obtained to place a visitor center outside the park. Section 9.3.3 provides direction relative to comfort stations requiring that they meet Public Health Service Standards and noting that level of use determines the size and nature of utility system provided.	Universal Design is the design of products and environments to be usable by all people, to the greatest extent possible, with out the need for adaption or specialized design. Director's Order 42 , dealing with Accessibility for Visitors with Disabilities in National Park Service Programs and Services directs that it is "good sense to employ the principles of universal design in providing facilities for everyone, rather than for only a portion of the population. Applicable guidelines include the accessibility guidelines for outdoor developed areas that have been developed by the Architectural and Transportation Barriers Compliance Board and the <i>Guide for the Development of Bicycle Facilities</i> from the American Association of State Highway and Transportation Officials.
Concessions and Commercial Service	Management Policy 10 deals extensively with concessions and commercial visitor services. Section 10.2.2 calls for concession management plans or commercial services plans that support a park’s purpose and significance, exceptional resource values and visitor experience objectives and are consistent with enabling legislation.	

Policies, Desired Conditions and Measures

Policies

The management of the National Park system is directed by laws, policies and plans in that order. Law and policy deal with musts – things that must happen in the Park because they have been mandated by Congress or the NPS leadership. Plans deal with wants – the things that different people want to happen in a park – and must be accomplished within the sideboards of law and policy. Planning provides the process for choosing among the wants.

The National Historic Preservation Act, Wilderness Act, National Environmental Policy Act, Endangered Species Act, American Indian Religious Freedom Act and numerous other laws and policies are sideboards within which planning is accomplished. These laws and policies guide everything from concession operations to labor laws to the protection of cultural and natural resources. The Opportunities Plan must be developed in light of the sideboards provided by applicable law and policy, some of which are specific to Great Smoky Mountains National Park while others have affect servicewide.

The GMP for the Park provides an extensive listing of legislation, agreements, and provisions affecting the management and use of Great Smoky Mountains National Park. Of these, deed restrictions place by the State of Tennessee upon land conveyed to the United States Government is of specific consequence to the Opportunities Plan planning process. These deeds placed restrictions upon the imposition of fees by the federal government upon the public use of State Highways 71 and 73. Congress also dealt specifically with fee systems in Great Smoky Mountains National Park in 16 USC §4601-6a(a)(3) which states in pertinent part:

“In the Smoky Mountains National Park, unless fees are charged for entrance into said park on main highways and thoroughfares, fees shall not be charged for entrance on other routes into said park or any park thereof.”

Other sections of US Code Title 16, Chapter 1, Subchapter LXIX, Part B of consequence to access issues and this planning process include and state pertinent part:

4601-6a(a)(12)(f) “The head of any Federal agency, under such terms and conditions as he deems appropriate, may contract with any public or private entity to provide visitor reservation services. Any such contract may provide that the contractor shall be permitted to deduct a commission to be fixed by the agency head from the amount charged the public for providing such services and remit the net proceeds therefrom to the contracting agency.”

4601-6a(a)(12)(l) “Where the National Park Service provides transportation to view any or a portion of the National Park System, the Director may impose a charge for such service in lieu of an admission fee under this section. The charge imposed under this paragraph shall not exceed the maximum admission fee under subsection (a) of this section.”

4601-6a(a)(12)(d) “All fees established pursuant to this section shall be fair and equitable, taking into consideration the direct and indirect cost to the Government, the benefits to the recipient, the public policy or interest served, the comparable recreation fees charged by non-Federal public agencies, the economic and administrative feasibility of fee collection and other pertinent factors.”

4601-6a(a)(3) “Nor shall any fee be charged for travel by private, non-commercial vehicle over any road or highway to any land in which such person has any property right if such land is within any such designated area.”

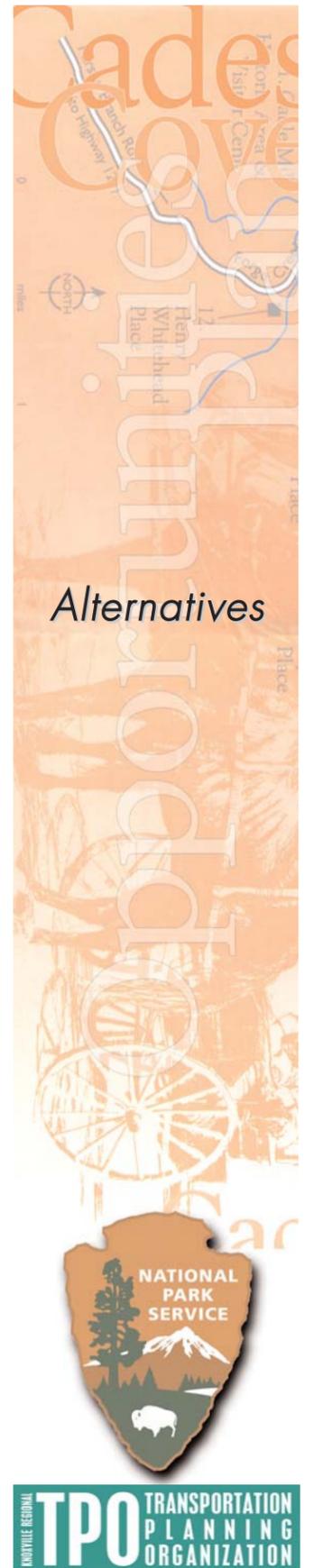
Based on these provisions in US Code Title 16, Great Smoky Mountains National Park is severely limited in its ability to implement any admission or user fee scenarios. However, if the purpose is appropriate control of a Park subunit then proper measures such as reservation systems or transit are available to pursue. Further legal review may be required to ascertain the feasibility of reservation or transit fees as alternatives are further developed.

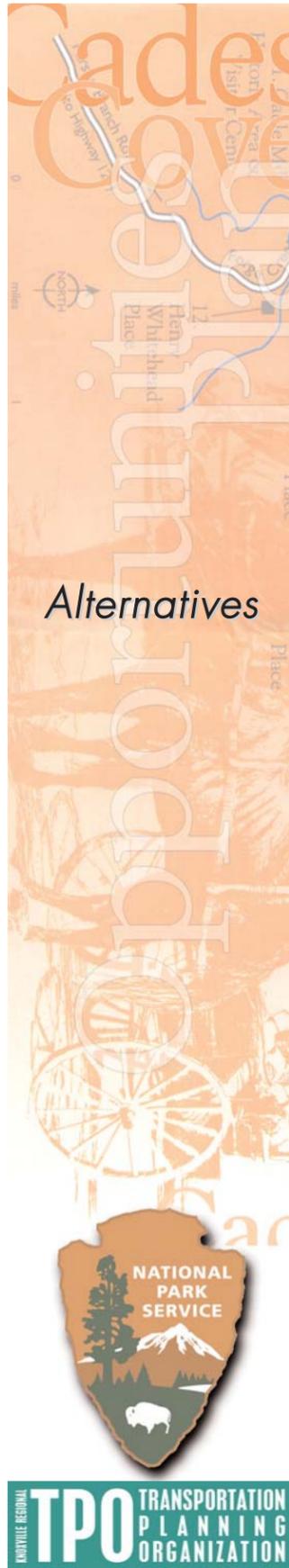
Other provisions in Title 16 of specific consequence to this planning process include:

Chapter 43, Section 2301 in which Congress finds that “circumstances which necessarily require people desiring to visit units of the National Park System to rely on personal vehicles may diminish the natural and recreational value of such units by causing traffic congestion and environmental damage, and by requiring the provision of roads, parking and other facilities in ever-increasing numbers and density.” Congress through this chapter desired to “make the National Park System more accessible in a manner consistent with the preservation of parks and the conservation of energy by encouraging the use of transportation modes other than personal motor vehicles for access to and within units of the National Park System with minimum disruption to nearby communities.”

Chapter 79, Sections 5961 and 5981 provides special rules for transportation contracting services in NPS units. Section 5961 limits the term of service contracts for the provision of solely transportation services to “no more than 10 years in length, including a base period of five years and annual extensions for an additional four-year period.” Section 5981 allows the imposition of a reasonable and appropriate charge to the public for the use of transportation services and allows these transportation fees to be retained by the NPS unit collecting the transportation fee. Section 5981 directs that any fees retained by expended only for the cost associated with the transportation system. The Secretary is also permitted to enter into an agreement with qualified entities to collect the transportation fee.

The National Park Service has established policies that set the framework and provides direction for all management decisions. These management policies are consistent with the higher authorities of public law, executive orders, regulations and directives of the Secretary of the Interior and the Assistant Secretary for Fish and Wildlife and Parks. NPS Management Policies is the highest of three levels of guidance documents in the NPS Directives System. Interim updates or amendments are accomplished through Director’s Orders with handbooks or reference manuals to provide comprehensive guidance. Table 10 provides a summary of NPS policy of specific consequence to this planning process. Full text is available in Management Policies 2001. Other





applicable reference material such as Director’s Orders may be noted in the table.

Desired Future Conditions

Articulating desired future conditions is an important element of implementing a plan. By stating where we want to be, we can identify the management steps needed to get there and maintain the desired conditions. In this light, the following statements provide a vision for Cades Cove management and are organized by the major themes of the Opportunities Plan (resources, visitation, resource education and facilities/services). These statements are built upon the Park’s purpose, significance, and applicable legislation as well as public comment, and principles of sustainable resource and visitor management.

Cades Cove represents opportunities for visitors that are different from those available in other areas of the Park. Historic cabins nestled on the edge of the broad open valley floor and surrounded by the forested mountains of the Southern Appalachians provide the Cove’s aesthetic, inspirational and emotional appeal. Wildlife abounds, attracting many of the Park visitors. A successful management vision for Cades Cove will need to reflect the importance of these attributes.

Resources

Cades Cove should be a model of a coordinated and collaborative effort between the divisions of the Park to manage (both long-term and day-to-day) the Cove as a cultural district. The irreplaceable cultural resources of Cades Cove that contribute so much to the special quality of the Cove should be appropriately used and their integrity maintained.

Management actions should lead to improved overall resource quality and provide the best balance between cultural resources and natural resources. Air quality is of critical concern to the Park and management actions should contribute to improved air quality. Efforts to enhance resource conditions should extend beyond Park boundaries in the form of partnerships and cooperative efforts to enhance

resources such as air quality, water quality and night sky conditions.

Visitation

As a unique and special place in Great Smoky Mountains National Park, Cades Cove should continue to accommodate large numbers of visitors, but related conflicts and resource impacts should be minimized. Diverse opportunities to experience the Cove should be available to the visitor from solitude to social exchange in developed areas. The visitor should be able to experience the Cove at her own pace, allowing for a comfortable, un-rushed experience. Alternate means of accessing the Cove such as walking and bicycling should be encouraged. Many visitors have a special connection to the Cove, one of family and tradition that should be respected and sustained.

Resource Education

Visitors should have the opportunity to interact with resource education staff and volunteers who are knowledgeable both about the Cove and Park. Visitors should be stewards of the resource – the result of a better appreciation of the diversity and abundance of resources found in Cades Cove, the continuum of human history demonstrated by resources in the Cove and of Cades Cove as a refuge of scenic beauty.

To support these educational efforts, resource education staff and volunteers should have access to both traditional and new, innovative tools. A strong relationship between the Park and civic and community groups in the surrounding region should be nurtured to support and enhance educational and volunteer programs.

Facilities and Services

Cades Cove should be a model of environmentally sensitive and sustainable practices. Visitor facilities and amenities should enhance the visitor experience of the Cove. Support facilities and services should enhance the NPS’s ability to preserve and protect Park resources while allowing for public enjoyment of these resources. All new facilities should be cost effective, energy efficient, fit into the natural and

cultural surroundings and complement the history and natural beauty of their surroundings.

The Park should work cooperatively with gateway communities and other affected entities to encourage compatible, aesthetic and well-planned development and recreational opportunities. Facilities and services should be developed and operated in a cooperative spirit utilizing public/private partnerships for construction and operations.

Measures

Measures are quantifiable attributes related to the desired future conditions for the Cove and the service-wide policies that guide decisions within the Cove. Measures will be incorporated into the Choosing by Advantages process described later in this chapter. Table 11 lists the measures that have been identified. At this point in the planning process, these measures cannot be quantified. The process of selecting and quantifying measures will be finalized during the EIS phase of the project. These recommended measures provide a basis for further discussion and consensus toward a final set of measures.

Factor	Measures	Method
Visitation	Visitor Satisfaction Resource Condition	<ul style="list-style-type: none"> • Visitor Comments • Visitor Surveys • Resource Education Program Statistics • Resource Monitoring • Resource & Visitor Protection Statistics
Resources	Resource Condition	<ul style="list-style-type: none"> • Resource Monitoring • Resource & Visitor Protection Statistics
Resource Education	Visitor Satisfaction	<ul style="list-style-type: none"> • Visitor Comments • Visitor Surveys • Resource Education Program Statistics
Facility and Services	Visitor Satisfaction Visitor & Staff Safety Resource Condition	<ul style="list-style-type: none"> • Visitor Comments • Visitor Surveys • Resource Monitoring • Resource & Visitor Protection Statistics

Alternatives Comparison Matrix

A matrix was developed to facilitate the comparison of the no-action and the four action alternatives. The matrix (published on the following pages) is divided into four categories. Each category describes an element that would be included in an alternative.

Category 1: Roadway, pull-off and parking improvements

Category 2: Communications

Category 3: Reservation System

Category 4: Alternative Transportation

The table is organized with each of the alternatives across the top row and each of the categories listed in the first column. Within each category, sub elements are listed. Sub-elements are further divided to identify minor and moderate improvements. A description of each element is also provided.

Analyzing Costs and Benefits

Three types of costs have been quantified for the Opportunities Plan. The first are “Class C” estimates of the elements of the alternatives; the second are the operating costs related to the elements; and the third are the life-cycle costs. The following discussion defines these cost parameters, identifies the estimates and lists the assumptions made in developing them.

Class C Estimates

Class C costs are rough estimates developed based on the average cost of similar facilities. Actual costs may be higher or lower depending on the final design, site conditions, and the contracting agency. These estimates are preliminary and are intended to help the comparison of the relative cost of alternatives. These cost estimates do not include all items that will be listed in the more inclusive Class C cost estimates to be developed in subsequent planning efforts. For example, the more inclusive Class C cost estimates for the visitor center would include exhibits, furnishings and landscaping. The results of the analysis along with notes on the assumptions are shown in Tables 12-15.

Operating Costs

Operating cost estimates were developed for the anticipated Park staffing levels required to administer resource, visitor and management activities for each of the alternatives. Table 16 provides a comparison of operating costs for the alternatives and notes on the assumptions made in this analysis. **Table 16 represents only the first step in estimating operational costs related to staffing. More detailed discussions with Park Division Chiefs is needed for a full understanding of operational impacts and staffing needs under the alternatives. Also, Table 16 does not reflect staffing needs of a Park-operated transit or reservation alternative.**

Life Cycle Costs

Life cycle cost estimates consider the long term costs related to operating and maintaining facilities. These preliminary estimates were made by utilizing a range of costs related to recurring maintenance and energy needs for buildings and facilities. Tables 18-21 describe these costs. These preliminary life cycle costs will be updated in subsequent planning efforts.

Choosing by Advantages (CBA)

The Choosing by Advantages (CBA) decision-making system, used extensively by the NPS, helps to sort the advantages, disadvantages and costs of alternatives and the potential of alternatives to meet project goals and objectives. The key to the CBA process is identifying the advantages that one alternative may have over another. CBA helps analysts accomplish this by highlighting the differences between alternatives. The first step in the CBA process is to define factors, attributes and advantages. Then the attributes of each alternative are summarized, the advantages of each alternative are identified, and the importance of each advantage is determined. The costs of each alternative also are identified and weighed against the importance of the advantages for each alternative in an iterative process.

The Opportunities Plan is not at the point where the CBA process can be implemented. Additional analysis is required to refine the alternatives further and to quantify measures. A CBA process is to be included in the next phase of the project.

Funding Strategies and Pilot Programs

Funding for implementation is always a challenge. This section identifies recommended pilot programs (or demonstration projects) and outlines potential funding strategies. Although a preferred alternative has not been identified, this information can be used to guide future discussion of the alternatives.

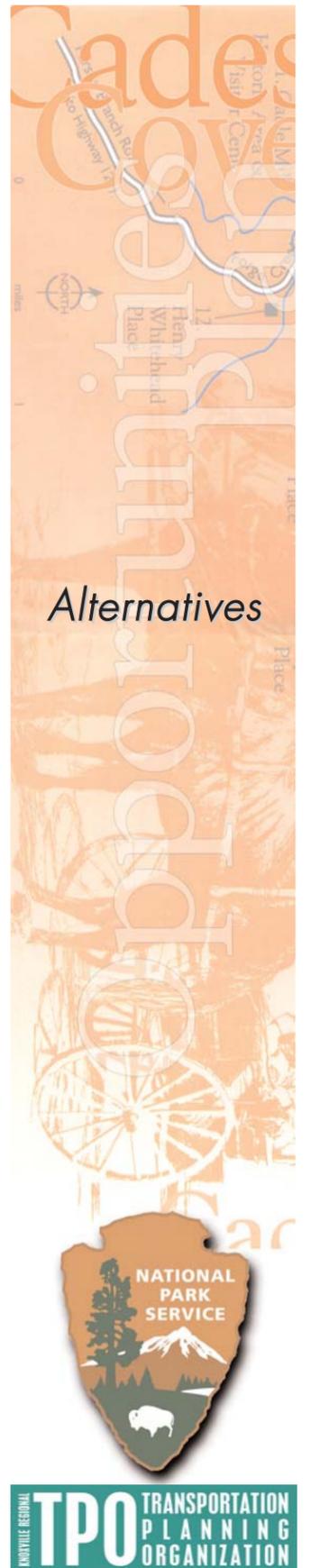
Funding Resources

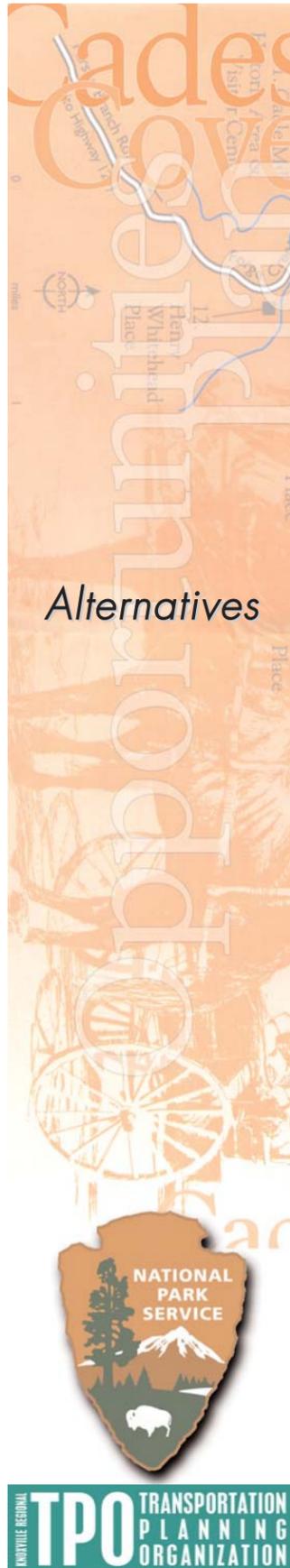
Federal funding is the primary implementation resource for improvements in Cades Cove. Funding obtained through appropriations or spending bills is the typical source for improvements in national parks.

A memorandum of understanding between the National Park Service and the Federal Highway Administration also exists related to planning and the development of alternative transportation systems in national parks. Such an arrangement makes it possible for project funding to be provided by the Federal Highway Administration, State Department of Transportation and the National Park Service. Other sources for funding park improvements include grants, donations, organizations such as Friends of Great Smoky Mountains National Park, cooperating organizations such as Great Smoky Mountains Association, local communities and partnerships with business and other agencies.

The implementation of the Opportunities Plan will likely require innovative funding approaches and funds from many, if not all, of these sources. As a first step in identifying funding strategies, major project elements, phasing suggestions and proposed funding mechanisms are outlined in Table 22.

(Continued on page 66)





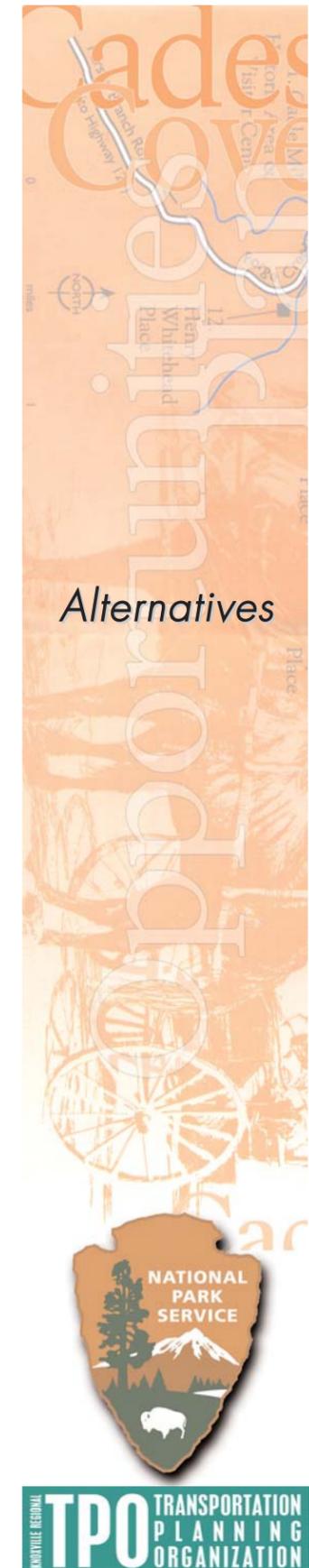
Roadway, Pull-off and Parking Improvements

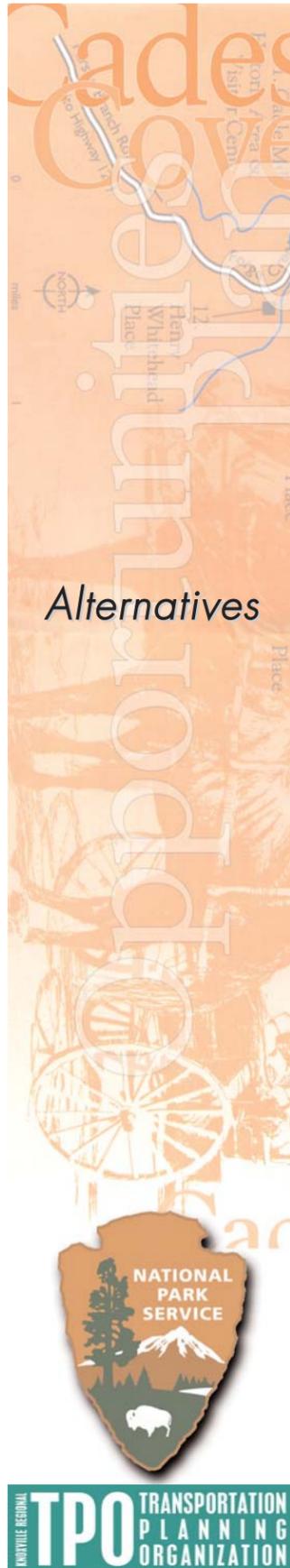
ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Pavement Improvements	Minor Roadway Improvements	What will the improvements include? A detailed assessment of the roadway condition to identify priority improvement areas where the pavement would be replaced, drainage issues resolved and shoulders improved.	X	X		
		How many miles of Loop Road and Cades Cove roads would be improved? Minor improvement would constitute improving three miles of the Loop Road.	X	X		
		Phasing - How long will it take to make the improvements? Five years (from design to construction)	X	X		
	Moderate Roadway Improvements	What will the improvements include? Design and construction plans for reconstructing the Loop Road. Plans would take into account the size and frequency of alternative transportation service utilizing the Loop Road.			X	X
		How many miles of Loop Road would be improved? Moderate improvement would constitute re-paving and making minor alignment changes to the entire Loop Road as well as other Cades Cove roads, depending on final design.			X	X
		Phasing - How long will it take to make the improvements? 10 years (from design to construction)			X	X
Pull-off and Parking Improvements	Develop and implement a master plan for Loop Road pull-offs. This will include Hyatt and Sparks Lane as well. Also develop a parking improvement master plan.	What will the service look like? A master plan for Loop Road pull-offs would be developed and implemented. This will include Hyatt and Sparks Lane.	X	X	X	X
		What will the improvements include? A detailed assessment of the existing formal and informal pull-off areas would be undertaken. This study would determine the optimal number of pull-offs and undertake a design process for constructing new pull-off areas as well as removing and protecting informal pull-off areas that are no longer desirable. Based on visitation reports and parking demand estimates, a plan for expanding existing or adding new parking lots would be undertaken. This plan would include the development of design and landscaping plans for parking areas.	X	X	X	X
		Phasing - How long will it take to make the improvements? Five years (occurs in coordination with roadway improvement design process).	X	X	X	X

* Note: All service times and details are subject to change as further studies are completed, or as visitation patterns change. These tables do not include Alternative 1, which would maintain current operations.

Communication System

ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Collect and disseminate transportation information	Design, locate and construct variable message signs.	What will the service look like? Vehicle detection units would be placed in the pavement to track entering traffic from the Townsend "Wye," traffic entering the Loop Road, traffic using the picnic ground, visitor center, and other parking lots, traffic on Sparks and Hyatt Lane, traffic at Cable Mill and traffic in other major visitation areas of the Cove.	X	X	X	X
		How would the visitor access the service? Variable message signs would be located at six locations including Little River Road (Sugarlands area), Townsend "Wye," gateway community, Laurel Creek Road, at the beginning of the Loop Road and at Sparks Lane. Data collected on traffic conditions in the Cove would be displayed on these signs. Messages include travel time for the Loop Road, alternative activities in the area, or parking availability in Cades Cove. This information would allow the visitor to make an informed decision about visiting Cades Cove.	X	X	X	X
		Phasing - How long will it take to develop? Three years	X	X	X	X
	Design, develop, and launch web-based communications program.	What will the service look like? The web based communications program would utilize traffic data and provide visitors with this information over the internet. Access to this information would be available from homes, libraries, local hotels (that have internet service) and gateway/NPS visitor centers.	X	X	X	X
		How would the visitor access the service? Through their personal computer at home or through computers located at hotels and other attractions in the gateway communities.	X	X	X	X
		Phasing - How long will it take to develop? One year (occurs after data collection step).	X	X	X	X
	Design, and implement a phone-in information service.	What will the service look like? An "800" number would be set up with a recorded message. The message would provide information on traffic and visitation conditions in Cades Cove. This system would be based on data collected from the detector network. It would be recommended that the phone service be updated at least every three hours during peak visitation periods.	X	X	X	X
		How would the visitor access the service? Via personal telephone, cellular phone, or gateway hotel/attraction phone line.	X	X	X	X
		Phasing - How long will it take to develop? One year (occurs after data collection step).	X	X	X	X



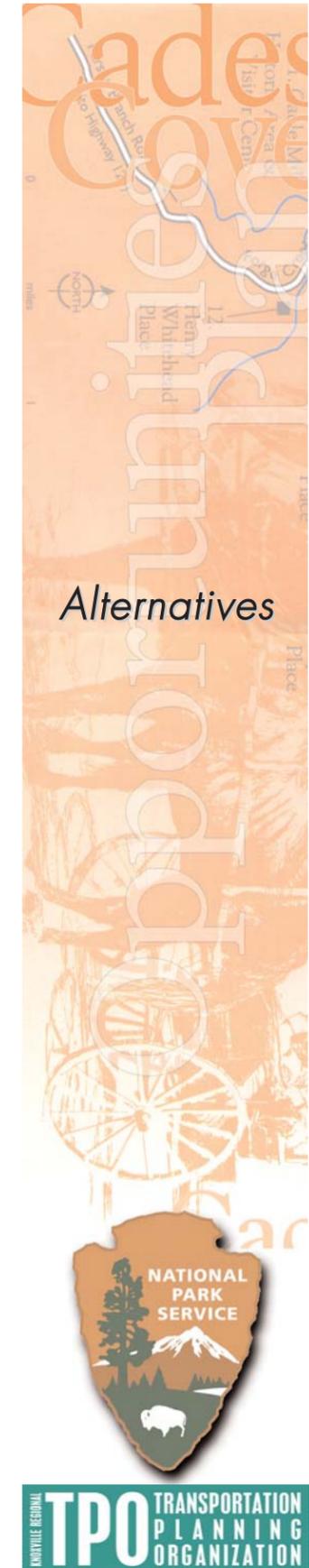


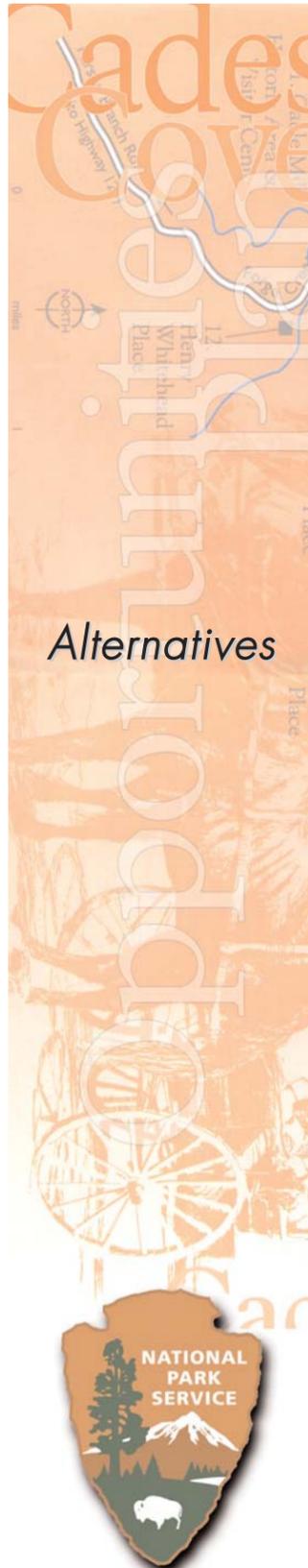
Reservation System

ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Peak period visitation	Peak Season Reservation System	How will visitors access Cades Cove? In order to tour the Loop Road in private vehicles visitors will need to have a "reservation" prior to arriving at the Cades Cove visitors center. Access to trail heads for hikers would be through the reservation system or prior to 10:00 a.m. Reservations are included for visitors staying at the Cades Cove campground. Visitors riding bicycles or walking the Loop Road will have unrestricted access throughout the year (no reservation required) Special provisions will be made for access to family cemeteries, and during special events such as Old Timers Day and Decoration Day.		X	X	
		How will the reservation system operate? During peak visitation periods, visitors would call or visit the NPS website and reserve a date and time for their tour of the Loop Road. The system would operate in a similar fashion to the campground reservation system.		X	X	
		What will be the fee for making a reservation? Fees for reservation are estimated to range between \$2 and \$8 per vehicle. This fee would be set to cover the cost of operating the system only.		X	X	
		When will reservations be required? Weekends June through October (from 10 a.m. to 5 p.m.) and weekdays during the months of July and August from 10 a.m. through 3 p.m.		X	X	
		How many reservations will be available? Current analysis indicates that there would be 2,900 to 3,500 reservations available during the peak visitation periods. This would include approximately 500 "walk-up" reservations each day.		X	X	
		How long will it take to implement a reservation system? The time frame for implementing a reservation system is estimated at 3 years (from design to construction). There would need to be studies undertaken related to the carrying capacity of Cades Cove (roadway, resource, staffing, and visitor experience).		X	X	
		Non-Peak Visitation	Non-peak Period	How do I access the Loop Road during non peak visitation? Access would be unrestricted - no reservations would be required.	X	X
When is NON-PEAK visitation? Under current visitation conditions NON-PEAK visitation occurs from November through May (every day), weekdays in June, September and October.	X			X	X	X

Alternative Transportation System

ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Voluntary shuttle service	Access to the Loop Road	How will I access Cades Cove? During peak visitation periods, a voluntary shuttle system will operate from the gateway community (Townsend) to the new visitor center at the beginning of the Loop Road. There will also be a shuttle service along the Loop Road. People who were not able to obtain reservations for private vehicle access and those who want an alternative experience would have access to a voluntary shuttle.			X	
		Visitors staying in the gateway community would be able to leave their car at the hotel (or other site). Or visitors arriving for a trip to the Cove (without a reservation) could park in a designated parking area within the gateway community. A shuttle service would stop at the gateway visitor center and several other stops in the gateway community prior to making the trip to the Cades Cove visitor center inside the Park.			X	
		Access by private vehicle to the Cades Cove picnic area, campground, horse concession and visitor center would not be restricted.	X	X	X	X
		Access to trailheads would be through reservations, voluntary shuttle service or before 10:00 a.m. during peak visitation periods.	X	X	X	
		Visitors riding bicycles or walking the Loop Road will not be restricted from access.	X	X	X	
		Special provisions will be made for access to family cemeteries, and during special events such as Old Timers Day and Decoration Day.		X	X	X
		There would be no restrictions on private vehicle access during "NON-PEAK" visitation periods.	X	X	X	X
	Gateway community service	Which gateway communities would be served? There would be one gateway shuttle service provided in Townsend.			X	
		There would be several stops in Townsend including the visitor center, major hotels, and visitor parking lots.			X	
		How would the Townsend service operate? On weekends from June through October, shuttles would make between 6 and 9 trips per hour between Townsend and the new visitor center in Cades Cove. On weekdays in July and August, shuttles would make between 3 and 5 trips per hour.			X	
		Shuttles would hold 35 passengers. On weekends, trailers would be attached to the shuttle, allowing 70 passengers to be accommodated.			X	

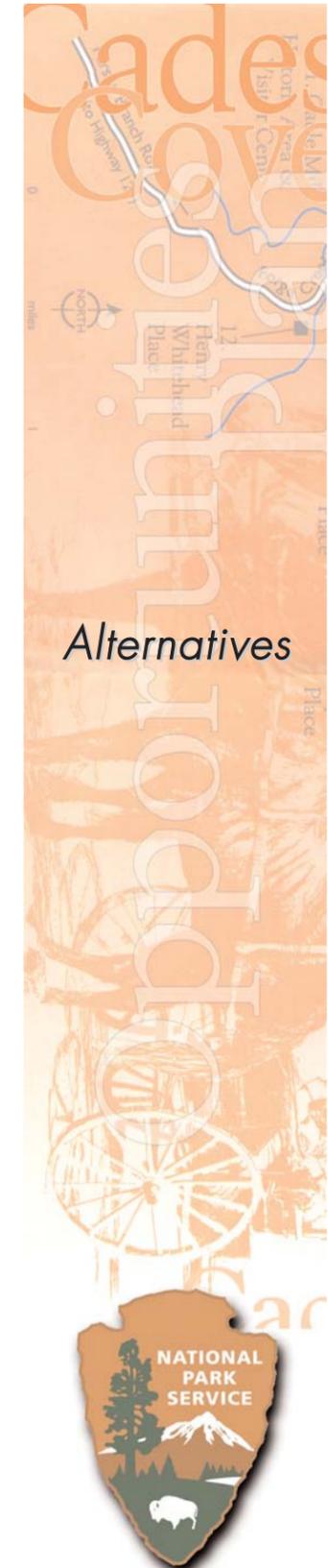


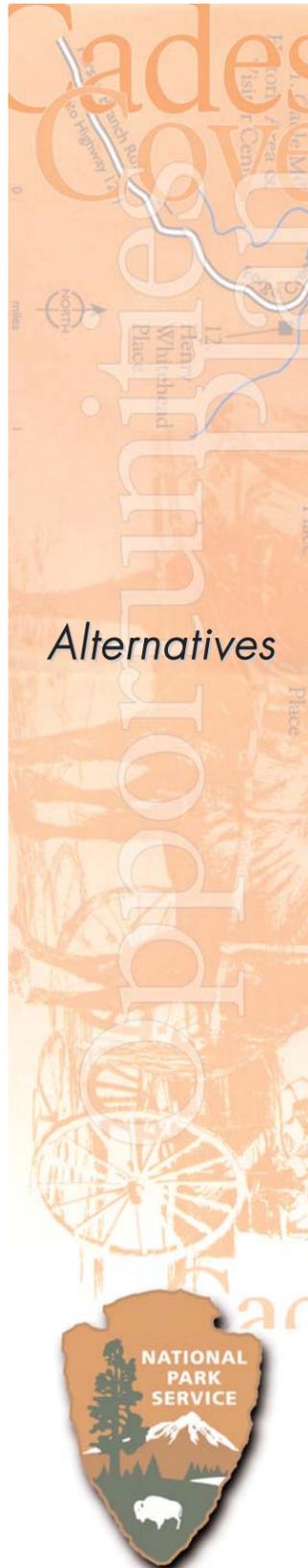


Alternative Transportation System						
ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Voluntary shuttle service	Loop Road service	How will I travel the Loop Road? If a visitor was unable to get a reservation to travel by private vehicle, or desires a different experience, the voluntary shuttle service for the Loop road would begin at the Cades Cove visitor center. Shuttles would operate around the Loop Road from 10 a.m. until 7 p.m. during the summer, and 10 a.m. until 6 p.m. in October.			X	
		Which sites along the Loop Road would be served? The shuttles will stop at 16 major Loop Road sites including cabins, churches, cemeteries, trailheads, scenic views and Cable Mill.			X	
		How will the Loop Road service operate? On weekends from June through October, shuttles would make between 6 and 9 trips per hour along the Loop Road. On weekdays in July and August, shuttles would make between 3 and 5 trips per hour.			X	
		Shuttles would hold 35 passengers. On weekends, trailers would be attached to the shuttle, allowing 70 passengers to be accommodated. Shuttle vehicles would be selected to reflect the character of the Cove.			X	
		Will visitors be able to get on and off easily? Visitors would be able to get off the shuttle at any of the stops they choose, spend as much time at a site as they want, and provide the visitor with the ability to catch the next shuttle when they are ready to continue their visit.			X	
	Parking	Will there be parking in the gateway community? There would be 770 parking spaces within the gateway community. The majority of these, 520, are existing spaces at hotels, the gateway visitor center, and other tourism sites. The 250 new parking spaces would be developed in conjunction with shuttle stop locations, with each lot containing 50 to 80 spaces. Parking developed in the gateway community would include landscaping and screening in order to mitigate negative impacts, including water quality and aesthetic concerns.			X	
		Will there be parking in Cades Cove? The new visitor center in Cades Cove would have 290 spaces..			X	
	Phasing	How long will it take to make the improvements? New-start alternative transportation systems require five to ten years of planning, design and development to implement.			X	

Alternative Transportation System

ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Mandatory shuttle service	Access to the Loop Road	How will I access Cades Cove? During peak visitation periods, a shuttle system would operate from the gateway community (Townsend) to the new visitor center at the beginning of the Loop Road. Once visitors arrive at the Cades Cove visitor center, they could board a shuttle that would travel the Loop Road.				X
		Visitors staying in the gateway community would be able to leave their car at the hotel (or other site). Visitors arriving for a trip to the Cove would park in a designated parking area within the gateway community. A shuttle service would stop at the gateway visitor center and several other stops in the Townsend area prior to making the trip to the Cades Cove visitor center inside the Park.				X
		Access by private vehicle to the Cades Cove picnic area, campground and visitor center would not be restricted.	X	X	X	X
		Access to trailheads would be through shuttle service or before 10 a.m. during peak visitation periods.	X	X	X	X
		Visitors riding bicycles or walking the Loop Road will not be restricted from access.	X	X	X	
		Special provisions will be made for access to family cemeteries, and during special events such as Old Timers Day and Decoration Day.		X	X	X
		There would be no restrictions on private vehicle access during "NON-PEAK" visitation periods.	X	X	X	X
	Gateway community service	Which gateway communities would be served? There would be one gateway shuttle service provided in Townsend and a potential private service from Gatlinburg.				X
		There would be several stops in Townsend, including the visitor center, major hotels and visitor parking lots.				X
		How would the Townsend service operate? On weekends from June through October, shuttles would make between 16 and 19 trips per hour between Townsend and the new visitor center in Cades Cove. On weekdays in July and August, shuttles would make 12 trips per hour.				X
		Shuttles would have attached trailers, allowing 70 passengers to be accommodated (35 in each cabin).				X
		How would the Gatlinburg service operate? If this service is provided by a private operator, the recommended service would be 5 trips per hour on peak weekends and 3 trips per hour on peak weekdays, with service from 8 a.m. to 9 p.m. Due to length of the trip, a standard 40-foot tour bus would be recommended for visitor comfort.				X





Alternative Transportation System						
ALTERNATIVE MATRIX		DESCRIPTION*	ALTERNATIVE			
			2	3	4	5
Mandatory shuttle service	Loop Road service	How will I travel the Loop Road? Once visitors arrive at the Cades Cove visitor center, they could board a shuttle that travels the Loop Road. Shuttles would operate around the Loop Road from 10 a.m. until 7 p.m. during the summer, and 10 a.m. until 6 p.m. in October.				X
		Which sites along the Loop Road would be served? The shuttles would stop at 16 major Loop Road sites including cabins, churches, cemeteries, trailheads, scenic views and Cable Mill.				X
		How will the Loop Road service operate? On weekends from June through October, shuttles would make between 19 and 22 trips per hour along the Loop Road. On weekdays in July and August, shuttles would make between 14 and 15 trips per hour.				X
		Shuttles would have attached trailers, allowing 70 passengers to be accommodated (35 in each cabin). Shuttle vehicles would be selected to reflect the character of the Cove.				X
		Will visitors be able to get on and off easily? Visitors would be able to get off the shuttle at any of the stops they choose, spend as much time at a site as they want, and provide the visitor with the ability to catch the next shuttle when they are ready to continue their visit.				X
	Parking	Will there be parking in the gateway community? There would be 1,500 parking spaces within the gateway community. The majority of these, 800, are existing spaces at hotels, the gateway visitor center, and other tourism sites. The 700 new parking spaces would be developed in conjunction with shuttle stop locations, with each lot containing 50 to 80 spaces. Parking developed in the gateway community would include landscaping and screening in order to mitigate negative impacts, including water quality and aesthetic concerns.				X
		Will there be parking in Cades Cove? The new visitor center in Cades Cove would have 350 spaces.				X
Phasing	How long will it take to make the improvements? New-start alternative transportation systems require five to ten years of planning, design and development to implement.				X	

Table 12: Class C Estimate for Alternative 2

Alternative 2		
	Range	
	Low	High
Variable Message Signs		
6 locations 3 miles of electric line for Hyatt Lane VMS Traffic Operations Center (TOC) related to the VMS signs*** ***T.O.C. cost is for technology support only, bldg costs are incorporated in new visitor center	\$2,450,000	\$2,850,000
Roadway improvements (12' wide avg.)		
Resurfacing of roadway - 11 miles Site prep, tack coat, 2-inch mat, seal and chip	\$2,300,000	\$2,700,000
Formalize pull-offs (25 locations, 6 spaces each)		
3,833 sq. yd. of pull-off surface 6" base course 4" Asphalt concrete surface	\$110,000	\$140,000
Additional turnarounds at various VMS locations		
3 turnarounds, 1,500 sq. ft. 6" base course 4" asphalt concrete surface	\$5,000	\$6,000
Bike racks		
15 locations	\$28,000	\$32,000
Field Management		
Use annual allowance for implementation practices		annual cost
Cades Cove Visitor Center		
Minor visitor center (3,000 sq. ft.) Parking area (290 spaces)	\$700,000 \$450,000	\$900,000 \$500,000
Utilities: 1000' electric line (underground in PVC conduit) 1000' water line (underground 4" PVC) 1000' sewer line (underground 6" PVC)	\$100,000	\$120,000
Park Operations		
Facilities within Developed area of the Cove - low level expansion: Expand existing ranger station (additional 200 s.f.) Expand existing resource education facilities (additional 300 s.f.) Expand existing maintenance facilities (additional 600 s.f.)	\$130,000	\$160,000
	Low	High
Subtotal	\$6,300,000	\$7,400,000
2 year inflation (8%)	\$504,000	\$592,000
10% contingency	\$630,000	\$740,000
	Low	High
Total	\$7,434,000	\$8,732,000
18% design/admin fee	\$1,338,120	\$1,571,760
	Low	High
Total estimate	\$8,772,120	\$10,303,760
	Low	High
Range of Capital Costs	\$8,800,000	\$10,300,000

Table 13: Class C Estimate for Alternative 3

Alternative 3		
	Range	
	Low	High
Variable Message Signs		
6 locations 3 miles of electric line for Hyatt Lane VMS Traffic Operations Center (TOC) related to the VMS signs*** ***T.O.C. cost is for technology support only, bldg costs are incorporated in new visitor center	\$2,450,000	\$2,850,000
Roadway improvements (12' wide avg.)		
Resurfacing of roadway - 11 miles Site prep, tack coat, 2-inch mat, seal and chip	\$2,300,000	\$2,700,000
Formalize pull-offs (25 locations, 6 spaces each)		
3,833 sq. yd. of pull-off surface 6" base course 4" Asphalt concrete surface	\$110,000	\$140,000
Additional turnarounds at various VMS locations		
3 turnarounds, 1,500 sq. ft. 6" base course 4" asphalt concrete surface	\$5,000	\$6,000
Bike racks		
15 locations	\$28,000	\$32,000
Field Management		
Use annual allowance for implementation practices		annual cost
Cades Cove Visitor Center		
Moderate visitor center (5,000 sq. ft.) Parking area (290 spaces)	\$1,200,000 \$450,000	\$1,500,000 \$500,000
Utilities: 1000' electric line (underground in PVC conduit) 1000' water line (underground 4" PVC) 1000' sewer line (underground 6" PVC)	\$100,000	\$120,000
Visitor center (outside the park)		
Moderate visitor center (5,000 sq. ft.) Parking area (175 spaces)	\$1,200,000 \$250,000	\$1,500,000 \$300,000
Park Operations		
Facilities within Developed area of the Cove - low level expansion: Expand existing ranger station (additional 200 s.f.) Expand existing resource education facilities (additional 300 s.f.)	\$22,000 \$33,000	\$25,000 \$37,000
New maintenance facility (outside the park): Equipment storage shelter (5000 sf) Storage building for vehicles, equip., tools, materials (8000 sf) Parking and maintenance yard pavement (9000 sf) Security fencing (1,700 lf) Expand/improve utilities (1) vehicle wash station (1) fueling station (1) enclosed storage building	\$200,000 \$1,000,000 \$700,000 \$66,000 \$82,000 \$28,000 \$155,000 \$600,000	\$250,000 \$1,400,000 \$800,000 \$74,000 \$88,000 \$32,000 \$165,000 \$700,000
	Low	High
Subtotal	\$11,000,000	\$13,200,000
2 year inflation (8%)	\$880,000	\$1,056,000
10% contingency	\$1,100,000	\$1,320,000
	Low	High
Total	\$12,980,000	\$15,576,000
18% design/admin fee	\$2,336,400	\$2,803,680
	Low	High
Total estimate	\$15,316,400	\$18,379,680
	Low	High
Range of Capital Costs	\$15,300,000	\$18,400,000

Note: The information provided in these tables is preliminary and will change as more in depth planning and design is completed.

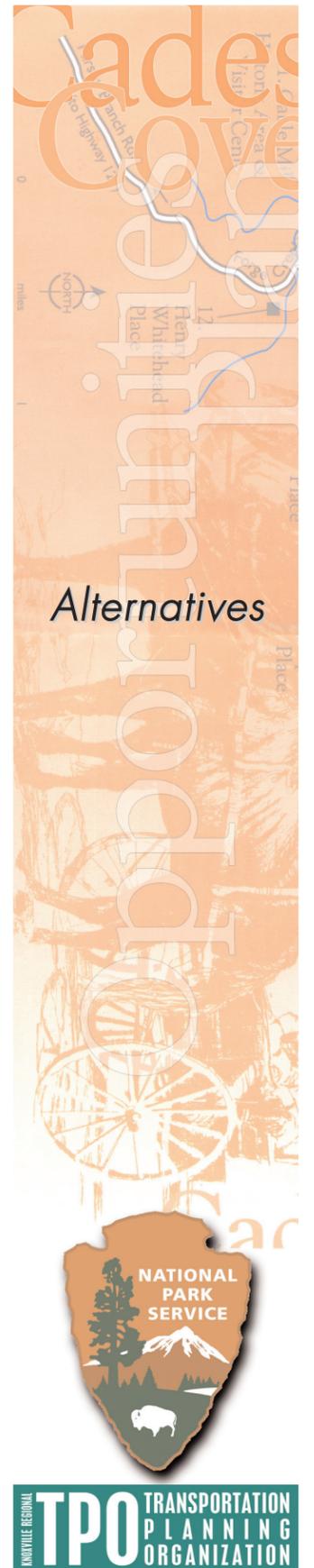


Table 14: Class C Estimate for Alternative 4

Alternative 4		
	Low	High
Variable Message Signs		
Main Facility:		
Bus bays (5 @ 1,500 s.f.)	\$1,400,000	\$1,700,000
Mechanic/maintenance shops (1,376 s.f.)	\$270,000	\$310,000
Office (1,331 s.f.)	\$260,000	\$300,000
Bus parking (32 spaces)	\$265,000	\$305,000
Fleet:		
Bus/trailers (32)	\$11,350,000	\$12,250,000
Shelters:		
16 @ 200 s.f./each	\$325,000	\$365,000
Variable Message Signs		
6 locations		
3 miles of electric line for Hyatt Lane VMS		
Traffic Operations Center (TOC) related to the VMS signs***		
***T.O.C. cost is for technology support only, bldg costs are incorporated in new visitor center	\$2,450,000	\$2,850,000
Roadway improvements (12' wide avg.)		
Complete reconstruction of roadway - 11 miles		
Demo existing roadway		
Site preparation - minor grading		
6" base course		
4" asphalt concrete surface	\$3,700,000	\$3,900,000
Formalize pull-offs (25 locations, 6 spaces each)		
3,833 sq. yd. of pull-off surface		
6" base course		
4" Asphalt concrete surface	\$110,000	\$140,000
Additional turnarounds at various VMS locations		
3 turnarounds, 1,500 sq. ft.		
6" base course		
4" asphalt concrete surface	\$5,000	\$6,000
Bike racks		
15 locations	\$28,000	\$32,000
Field Management		
Use annual allowance for implementation practices		annual cost
Cades Cove Visitor Center		
Moderate visitor center (5,000 sq. ft.)	\$1,300,000	\$1,400,000
Parking area (290 spaces)	\$450,000	\$500,000
Utilities:		
1000' electric line (underground in PVC conduit)		
1000' water line (underground 4" PVC)		
1000' sewer line (underground 6" PVC)	\$100,000	\$120,000
Visitor center (outside the park)		
Moderate visitor center (5,000 sq. ft.)	\$1,200,000	\$1,500,000
Parking area (250 spaces)	\$385,000	\$425,000
Park Operations		
Facilities within Developed area of the Cove - low level expansion:		
Expand existing ranger station (additional 200 s.f.)	\$22,000	\$25,000
Expand existing resource education facilities (additional 300 s.f.)	\$33,000	\$37,000
New maintenance facility (outside the park):		
Equipment storage shelter (5000 sf)	\$200,000	\$250,000
Storage building for vehicles, equip., tools, materials (8000 sf)	\$1,000,000	\$1,400,000
Parking and maintenance yard pavement (9000 sf)	\$700,000	\$800,000
Security fencing (1,700 lf)	\$66,000	\$74,000
Expand/improve utilities	\$82,000	\$88,000
(1) vehicle wash station	\$28,000	\$32,000
(1) fueling station	\$155,000	\$165,000
(1) enclosed storage building	\$600,000	\$700,000
	Low	High
Subtotal	\$23,800,000	\$26,900,000
2 year inflation (8%)	\$1,904,000	\$2,152,000
10% contingency	\$2,380,000	\$2,690,000
	Low	High
Total	\$28,084,000	\$31,742,000
18% design/admin fee	\$5,055,120	\$5,713,560
	Low	High
Total estimate	\$33,139,120	\$37,455,560
	Low	High
Range of Capital Costs	\$33,100,000	\$37,500,000

Table 15: Class C Estimate for Alternative 5

Alternative 5		
	Low	High
Variable Message Signs		
Main Facility:		
Bus bays (10 @ 1,500 s.f.)	\$3,000,000	\$3,300,000
Mechanic/maintenance shops (3,870 s.f.)	\$800,000	\$830,000
Office (2,831 s.f.)	\$575,000	\$615,000
Bus parking (90 spaces)	\$780,000	\$820,000
Fleet:		
Bus/trailers (73)	\$25,000,000	\$29,000,000
45' Bus (17)	\$5,400,000	\$5,800,000
Shelters:		
16 @ 200 s.f./each	\$325,000	\$365,000
Variable Message Signs		
6 locations		
3 miles of electric line for Hyatt Lane VMS		
Traffic Operations Center (TOC) related to the VMS signs***		
***T.O.C. cost is for technology support only, bldg costs are incorporated in new visitor center	\$2,450,000	\$2,850,000
Roadway improvements (12' wide avg.)		
Complete reconstruction of roadway - 11 miles		
Demo existing roadway		
Site preparation - minor grading		
6" base course		
4" asphalt concrete surface	\$3,700,000	\$3,900,000
Formalize pull-offs (25 locations, 6 spaces each)		
3,833 sq. yd. of pull-off surface		
6" base course		
4" Asphalt concrete surface	\$110,000	\$140,000
Additional turnarounds at various VMS locations		
3 turnarounds, 1,500 sq. ft.		
6" base course		
4" asphalt concrete surface	\$5,000	\$6,000
Bike racks		
15 locations	\$28,000	\$32,000
Field Management		
Use annual allowance for implementation practices		annual cost
Cades Cove Visitor Center		
Major visitor center (10,000 sq. ft.)	\$2,500,000	\$2,900,000
Parking area (330 spaces)	\$515,000	\$545,000
Utilities:		
1000' electric line (underground in PVC conduit)		
1000' water line (underground 4" PVC)		
1000' sewer line (underground 6" PVC)	\$100,000	\$120,000
Visitor center (outside the park)		
Moderate visitor center (5,000 sq. ft.)	\$1,200,000	\$1,500,000
Parking area (700 spaces)	\$1,080,000	\$1,180,000
Park Operations		
Facilities within Developed area of the Cove - low level expansion:		
Expand existing ranger station (additional 200 s.f.)		
Expand existing resource education facilities (additional 300 s.f.)		
New maintenance facility (outside the park):		
Equipment storage shelter (5000 sf)	\$200,000	\$250,000
Storage building for vehicles, equip., tools, materials (8000 sf)	\$1,000,000	\$1,400,000
Parking and maintenance yard pavement (9000 sf)	\$700,000	\$800,000
Security fencing (1,700 lf)	\$66,000	\$74,000
Expand/improve utilities	\$82,000	\$88,000
(1) vehicle wash station	\$28,000	\$32,000
(1) fueling station	\$155,000	\$165,000
(1) enclosed storage building	\$600,000	\$700,000
	Low	High
Subtotal	\$50,400,000	\$57,400,000
2 year inflation (8%)	\$4,032,000	\$4,592,000
10% contingency	\$5,040,000	\$5,740,000
	Low	High
Total	\$59,472,000	\$67,732,000
18% design/admin fee	\$10,704,960	\$12,191,760
	Low	High
Total estimate	\$70,176,960	\$79,923,760
	Low	High
Range of Capital Costs	\$70,200,000	\$79,900,000

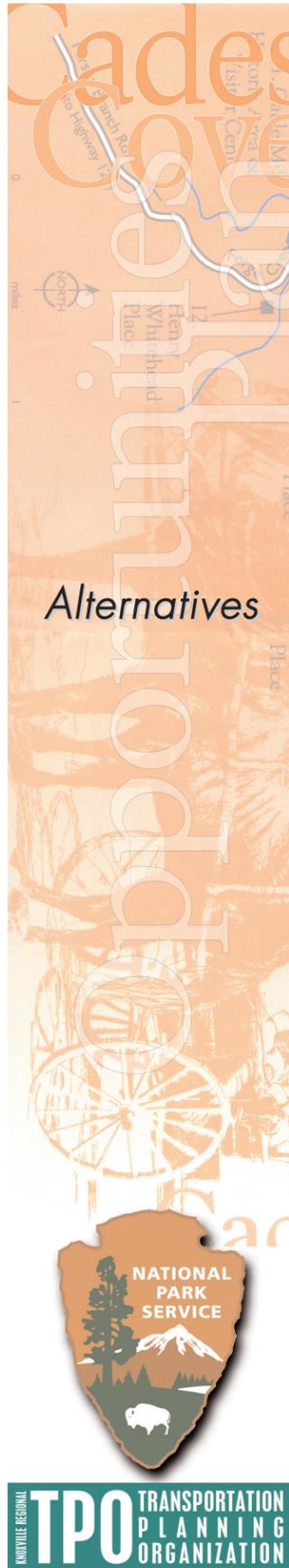


Table 16:

COST ESTIMATES RELATED TO OPERATIONAL STAFF FOR CADES COVE ALTERNATIVES
SUMMARY TABLE

Staffing Category	Alternative One		Alternative Two			Alternative Three		
	Staffing Requirement	Cost Estimate	Staffing Requirement	Cost Estimate	Percent Change	Staffing Requirement	Cost Estimate	Percent Change
1 Cades Cove Administrative Staff	5	\$238,338	5	\$238,338	0.00	7	\$333,673	0.29
2 Park Ranger (enforcement) Staff	7	\$333,673	16	\$762,682	0.69	16	\$762,682	0.00
3 Resource Education Staff	3	\$143,003	6	\$286,006	0.17	7	\$333,673	0.29
4 Maintenance Road Crew Staff	10	\$475,114	12	\$570,136	0.58	12	\$570,136	0.58
5 General Maintenance Staff	16	\$760,182	20	\$950,227	0.75	20	\$950,227	0.75
	41	\$1,950,309	59	\$2,807,389	2.19	62	\$2,950,392	1.90

Staffing requirement of Alternative One is the same as existing operations staff for Cades Cove.

These cost estimates only cover the direct salaries related to Cades Cove District operations. This does not cover general administration, science, special programs and other staff that are employed by the park and undertake projects within the Cades Cove District.

This is a starting point for analyzing the operating costs related to the CCOPP plan. Additional detail will be added as the project progresses.

Staffing Category	Alternative Four			Alternative Five		
	Staffing Requirement	Cost Estimate	Percent Change	Staffing Requirement	Cost Estimate	Percent Change
1 Cades Cove Administrative Staff	7	\$333,673	0.29	7	\$333,673	0.29
2 Park Ranger (enforcement) Staff	11	\$524,344	0.55	12	\$572,011	0.58
3 Resource Education Staff	7	\$333,673	0.29	7	\$274,585	0.13
4 Maintenance Road Crew Staff	13	\$617,648	0.61	13	\$617,648	0.61
5 General Maintenance Staff	24	\$1,140,273	0.79	24	\$1,140,273	0.79
	62	\$2,949,610	2.52	63	\$2,938,189	2.41

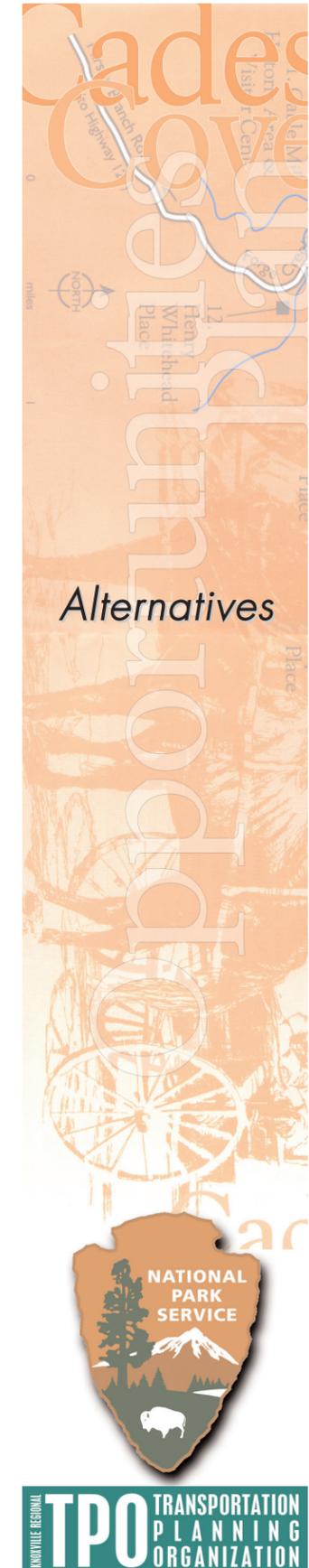
Assumptions related to estimating operational cost ranges for the Cades Cove study area.

- 1 Management/administrative staff levels would not increase from action alternative to action alternatives
- 2 Park Rangers assigned to enforcement would increase more in Alternatives 2 and 3 than in Alternatives 4 and 5.
- 3 Resource education staff would be greater in Alternatives 4 and 5 than in Alternatives 2 and 3.
- 4 Road maintenance crew would increase proportionate to the intensity of the alternative.
- 5 General maintenance crew relates to trails, facilities, mowing, litter pick-up, etc.
- 6 The general maintenance crew would increase proportionate to the intensity of the alternative.
- 7 Source for salary information is through the General Services Salary Tables 2003 - ATL
- 8 Includes staff at the visitor center(s), Cable Mill area, and other sites within the Cove. Includes gatekeeper staff for reservation system, and staff for interpretive programs on transit vehicles.
- 9 Field mowing is contracted out today.
- 10 Field management plan may include the equipment to do the management work.
- 11 This would be a seasonal person.
- 12 There are eight full time and four seasonal road crew staff for the Cades Cove District for estimating purposes. This was rounded to ten full time equivalent employees.
- 13 There are ten full time (three subject to furlough) and 12 seasonal, and four to eight volunteers that are involved in general maintenance for the purpose of this analysis this was rounded to sixteen staff for general maintenance within the Cades Cove district.
- 14 Five administrative people are not assigned solely to Cades Cove and are not located in Cades Cove.

Table 17:

Life Cycle Cost Analysis of Asphalt vs. Concrete Pavement					
Material	Approx. # of years until first overlay	Cost per square yard of overlay*	Overlay cost for one mile of 12' wide road	Approx. number of overlays in 50 years	Approx. cost of overlays over 50 years**
Asphalt	12	\$44	\$306,000	4	\$1,224,000
Concrete	25	\$108	\$760,000	2	\$1,520,000

*Costs based on NPS Class 'C' Cost Estimation Guide
**Further detail of life cycle costs would require a geotechnical survey



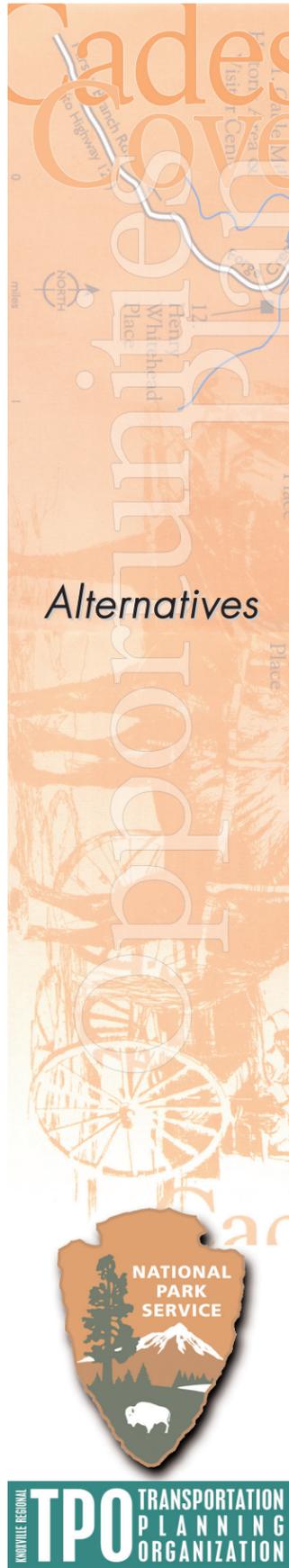


Table 18:

LIFE CYCLE COST ANALYSIS (LCCA)

Project/Location: Cade's Cove, Smoky Mountains National Park
 Item: Alternative 2

VE No.

Description:				Original Design		Proposed Design	
Project Life Cycle = 30 Years							
Discount Rate = 4.00%							
Present Time = Date of Occupancy							
INITIAL COSTS	Quantity	UM	Unit Price	Est.	PW	Est.	PW
A. Visitor Center	3000	sf	\$270	810,000	810,000		0
B.					0		0
C.					0		0
D.					0		0
E.					0		0
F.					0		0
G.					0		0
H.					0		0
I.					0		0
J.					0		0
Total Initial Cost					810,000		0
Initial Cost PW Savings (Compared to Original Design)							0
REPLACEMENT COST/ SALVAGE VALUE							
Description	Year	PW Factor					
A. Replace roofing	20	0.4564		10,725	4,894		0
B. Stain exterior wood	8	0.7307		3,300	2,411		0
C. Stain exterior wood	16	0.5339		3,300	1,761		0
D. Stain exterior wood	24	0.3901		3,300	1,287		0
E. Paint/stain interior	5	0.8219		2,700	2,219		0
F. Paint/stain interior	10	0.6756		2,700	1,824		0
G. Paint/stain interior	15	0.5553		2,700	1,499		0
H. Paint/stain interior	20	0.4564		2,700	1,232		0
I. Paint/stain interior	25	0.3751		2,700	1,012		0
J. Replace flooring	15	0.5553		0	0		0
K. Replace HVAC equipment	15	0.5553		19,800	10,994		0
L. Replace plumbing equipment	15	0.5553		2,000	1,110		0
M.					0		0
N.					0		0
O.					0		0
P. Salvage Value					0		0
Total Replacement/Salvage Costs					30,243		0
ANNUAL COSTS							
Description	Escl. %	PWA					
A. Custodial	0.0%	17.292		60,000	1,037,522		0
B. Repair and maintenance	0.0%	17.292		6,000	103,752		0
C. Energy	0.0%	17.292		9,000	155,628		0
D.	0.0%	17.292			0		0
E.	0.0%	17.292			0		0
F.	0.0%	17.292			0		0
Total Annual Costs (Present Worth)					1,296,902		0
Total Life Cycle Costs (Present Worth)					2,137,145		
Life Cycle Savings (Compared to Original Design)							
Total Life Cycle Costs (Annualized)							
				PP Factor			
				0.0578	123,591 Per Year		Per Year

PW: Present Worth
 PWA: Present Worth of Annuity
 PP: Periodic Payment

Table 19:

LIFE CYCLE COST ANALYSIS (LCCA)

Project/Location: Cade's Cove, Smoky Mountains National Park
 Item: Alternative 3

VE No.

Description:				Original Design		Proposed Design	
Project Life Cycle = 30 Years							
Discount Rate = 4.00%							
Present Time = Date of Occupancy							
INITIAL COSTS	Quantity	UM	Unit Price	Est.	PW	Est.	PW
A. Visitor Center	5000	sf	\$270	1,350,000	1,350,000		0
B.					0		0
C.					0		0
D.					0		0
E.					0		0
F.					0		0
G.					0		0
H.					0		0
I.					0		0
J.					0		0
Total Initial Cost					1,350,000		0
Initial Cost PW Savings (Compared to Original Design)							0
REPLACEMENT COST/ SALVAGE VALUE							
Description	Year	PW Factor					
A. Replace roofing	20	0.4564		17,875	8,157		0
B. Stain exterior wood	8	0.7307		4,500	3,288		0
C. Stain exterior wood	16	0.5339		4,500	2,402		0
D. Stain exterior wood	24	0.3901		4,500	1,755		0
E. Paint/stain interior	5	0.8219		4,500	3,698		0
F. Paint/stain interior	10	0.6756		4,500	3,040		0
G. Paint/stain interior	15	0.5553		4,500	2,498		0
H. Paint/stain interior	20	0.4564		4,500	2,053		0
I. Paint/stain interior	25	0.3751		4,500	1,688		0
J. Replace flooring	15	0.5553		6,600	3,664		0
K. Replace HVAC equipment	15	0.5553		33,000	18,323		0
L. Replace plumbing equipment	15	0.5553		2,000	1,110		0
M.					0		0
N.					0		0
O.					0		0
P. Salvage Value					0		0
Total Replacement/Salvage Costs					51,676		0
ANNUAL COSTS							
Description	Escl. %	PWA					
A. Custodial	0.0%	17.292		75,000	1,296,902		0
B. Repair and maintenance	0.0%	17.292		10,000	172,920		0
C. Energy	0.0%	17.292		15,000	259,380		0
D.	0.0%	17.292			0		0
E.	0.0%	17.292			0		0
F.	0.0%	17.292			0		0
Total Annual Costs (Present Worth)					1,729,203		0
Total Life Cycle Costs (Present Worth)					3,130,879		
Life Cycle Savings (Compared to Original Design)							
Total Life Cycle Costs (Annualized)							
				PP Factor			
				0.0578	181,059 Per Year		Per Year

PW: Present Worth
 PWA: Present Worth of Annuity
 PP: Periodic Payment

Table 20:

LIFE CYCLE COST ANALYSIS (LCCA)

Project/Location: Cade's Cove, Smoky Mountains National Park

VE No.

Item: Alternative 4

Description:				Original Design		Proposed Design	
Project Life Cycle = 30 Years							
Discount Rate = 4.00%							
Present Time = Date of Occupancy							
INITIAL COSTS	Quantity	UM	Unit Price	Est.	PW	Est.	PW
A. Visitor Center	3000	sf	\$270	810,000	810,000		0
B. Visitor Center	5000	sf	\$270	1,350,000	1,350,000		0
C.					0		0
D.					0		0
E.					0		0
F.					0		0
G.					0		0
H.					0		0
I.					0		0
J.					0		0
Total Initial Cost				2,160,000		0	
Initial Cost PW Savings (Compared to Original Design)						0	
REPLACEMENT COST/ SALVAGE VALUE							
Description	Year	PW Factor					
A. Replace roofing	20	0.4564		28,600	13,052		0
B. Stain exterior wood	8	0.7307		7,800	5,699		0
C. Stain exterior wood	16	0.5339		7,800	4,164		0
D. Stain exterior wood	24	0.3901		7,800	3,042		0
E. Paint/stain interior	5	0.8219		7,200	5,917		0
F. Paint/stain interior	10	0.6756		7,200	4,864		0
G. Paint/stain interior	15	0.5553		7,200	3,997		0
H. Paint/stain interior	20	0.4564		7,200	3,285		0
I. Paint/stain interior	25	0.3751		7,200	2,700		0
J. Replace flooring	15	0.5553		6,600	3,664		0
K. Replace HVAC equipment	15	0.5553		52,800	29,317		0
L. Replace plumbing equipment	15	0.5553		4,000	2,221		0
M.					0		0
N.					0		0
O.					0		0
P. Salvage Value					0		0
Total Replacement/Salvage Costs				81,922		0	
ANNUAL COSTS							
Description	Escl. %	PWA					
A. Custodial	0.0%	17.292		135,000	2,334,424		0
B. Repair and maintenance	0.0%	17.292		16,000	276,673		0
C. Energy	0.0%	17.292		24,000	415,009		0
D.	0.0%	17.292			0		0
E.	0.0%	17.292			0		0
F.	0.0%	17.292			0		0
Total Annual Costs (Present Worth)				3,026,106		0	
Total Life Cycle Costs (Present Worth)				5,268,028			
Life Cycle Savings (Compared to Original Design)							
Total Life Cycle Costs (Annualized)				304,651 Per Year		Per Year	

PW: Present Worth
PWA: Present Worth of Annuity
PP: Periodic Payment

Table 21:

LIFE CYCLE COST ANALYSIS (LCCA)

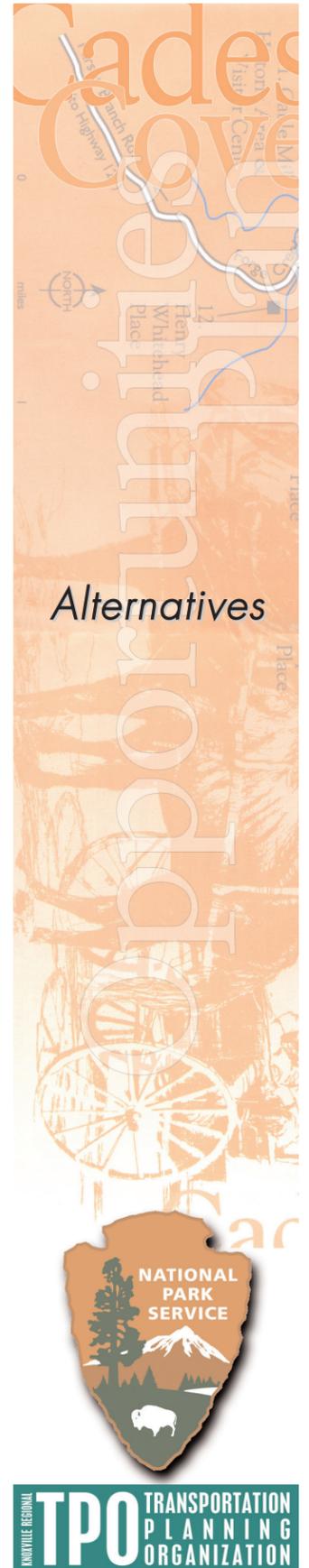
Project/Location: Cade's Cove, Smoky Mountains National Park

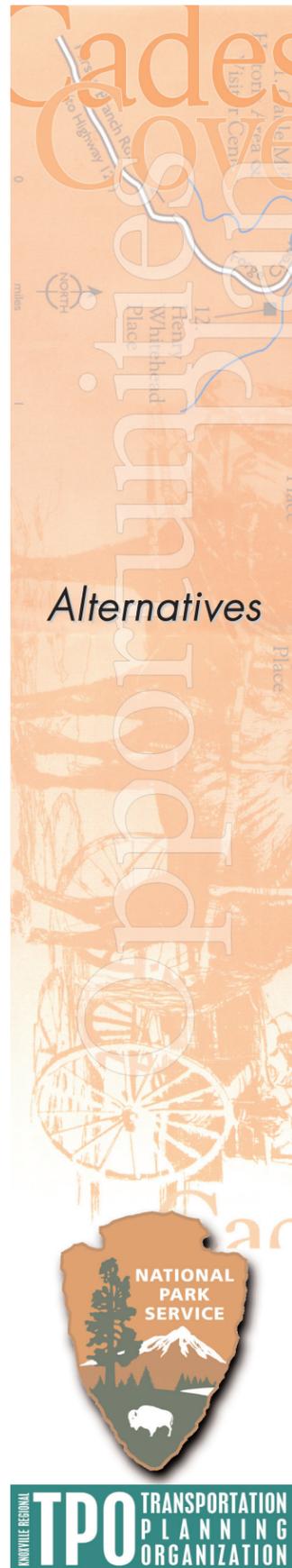
VE No.

Item: Alternative 5

Description:				Original Design		Proposed Design	
Project Life Cycle = 30 Years							
Discount Rate = 4.00%							
Present Time = Date of Occupancy							
INITIAL COSTS	Quantity	UM	Unit Price	Est.	PW	Est.	PW
A. Visitor Center	5000	sf	\$270	1,350,000	1,350,000		0
B. Visitor Center	10000	sf	\$270	2,700,000	2,700,000		0
C.					0		0
D.					0		0
E.					0		0
F.					0		0
G.					0		0
H.					0		0
I.					0		0
J.					0		0
Total Initial Cost				4,050,000		0	
Initial Cost PW Savings (Compared to Original Design)						0	
REPLACEMENT COST/ SALVAGE VALUE							
Description	Year	PW Factor					
A. Replace roofing	20	0.4564		53,625	24,473		0
B. Stain exterior wood	8	0.7307		12,000	8,768		0
C. Stain exterior wood	16	0.5339		12,000	6,406		0
D. Stain exterior wood	24	0.3901		12,000	4,681		0
E. Paint/stain interior	5	0.8219		13,500	11,096		0
F. Paint/stain interior	10	0.6756		13,500	9,120		0
G. Paint/stain interior	15	0.5553		13,500	7,496		0
H. Paint/stain interior	20	0.4564		13,500	6,161		0
I. Paint/stain interior	25	0.3751		13,500	5,064		0
J. Replace flooring	15	0.5553		13,200	7,329		0
K. Replace HVAC equipment	15	0.5553		99,000	54,971		0
L. Replace plumbing equipment	15	0.5553		4,000	2,221		0
M.					0		0
N.					0		0
O.					0		0
P. Salvage Value					0		0
Total Replacement/Salvage Costs				147,786		0	
ANNUAL COSTS							
Description	Escl. %	PWA					
A. Custodial	0.0%	17.292		195,000	3,371,946		0
B. Repair and maintenance	0.0%	17.292		30,000	518,761		0
C. Energy	0.0%	17.292		45,000	778,141		0
D.	0.0%	17.292			0		0
E.	0.0%	17.292			0		0
F.	0.0%	17.292			0		0
Total Annual Costs (Present Worth)				4,668,849		0	
Total Life Cycle Costs (Present Worth)				8,866,635			
Life Cycle Savings (Compared to Original Design)							
Total Life Cycle Costs (Annualized)				512,758 Per Year		Per Year	

PW: Present Worth
PWA: Present Worth of Annuity
PP: Periodic Payment





While implementation strategies for each of the three major elements are presented here as independent of each other, it is important to understand the strong interdependence of plan elements. For example, a communication strategy should not be fully developed until strategies for other elements of the plan are understood at a similar level to ensure that the communication strategy supports the needs of other elements. Similarly, implementation of one plan element should not exceed the capacity of supporting elements. At times, funding is available for initial implementation or construction, but not for ongoing operating or staffing costs. All appropriate funding should be secured before implementation. Pilot or demonstration projects are offered here as a means of testing strategies and finding strengths and weaknesses.

An implementation strategy has been developed for each of the three major elements of the Opportunities Plan. This section describes each element, outlines a potential scope of implementation, identifies potential project partners and identifies implementation strategies to guide future phases of the project.

Communications System

A communications system project would provide visitors with information about traffic conditions, travel time for the Loop Road and other information about safety or Park programs. This system would inform visitors about potential travel times, maintenance activities, weather or accident related road closures or other important information. The system also could provide information on:

- Special events
- Ranger/VIP led programs
- Weather alerts
- Safety tips
- Rules for traveling the Loop Road

Scope

Implementing a communications system would involve:

- Identifying what information is needed to communicate Cove conditions to the public, as well

as identifying the hardware, software and facilities needed to collect and disseminate this information.

- Defining the implementation area.
- Refining the program based on the available data (such as traffic counts, visitor use statistics, etc.)
- Developing schematic design plans for the installation of information collection equipment such as vehicle detection units (VDUs) and communications hardware at locations throughout the implementation area. Several VDUs would be needed to collect meaningful data.
- Developing schematic design plans for the installation of variable message signs (VMSs) and or other communication hardware at key locations. In the case of VMS, signs may be required at several locations to reach visitors effectively. Potential locations include Little River Road near the Sugarlands Visitor Center, Townsend “Wye,” within the gateway communities, and within the Cove itself.
- Developing schematic design plans for a GRSM Traffic Operations Center (TOC).ⁱ These plans should include space for an administrative office, work area and a traffic operations console.

Potential Pilot or Demonstration Projects

As a first step toward implementing a communications program, the Park has installed static signs during peak visitation periods. These signs direct motorists to use Sparks or Hyatt lanes as “short cuts” through the Cove. As a further step, these signs could be used year-round or installed at other locations to provide further travel information to motorists.

In addition, a website could be developed to provide travel and visitor information. Such a website could be developed in partnership with the local visitors and convention bureau.

i. The Great Smoky Mountains National Park has installed variable message signs at the Sugarlands Visitor Center on Newfound Gap Road. These signs are a first phase of an Intelligent Transportation Program designed to provide visitors with information on road conditions. If a traffic operations center (TOC) is developed in the Park, it would likely serve more than just Cades Cove. Future traffic operations at Cades Cove should be coordinated with other ITS programs within the Park.

Partnerships could also be developed with local businesses that serve visitors, such as hotels and motels, to disseminate visitor information. Finally, a telephone line could be established to provide prerecorded visitor information, a service that could be updated frequently at low cost.

Partners

It will be important to identify a project champion to work closely with the NPS to implement the communications program. Potential partners include the Tennessee Department of Transportation and the Knoxville Area Transportation Planning Organization (TPO). As described here, a communication system is likely to require skills that NPS staff currently does not have. However, the data collected and disseminated through the communications program could benefit businesses and transportation planning entities. Therefore, a champion could emerge from one of these organizations.

Implementation Steps

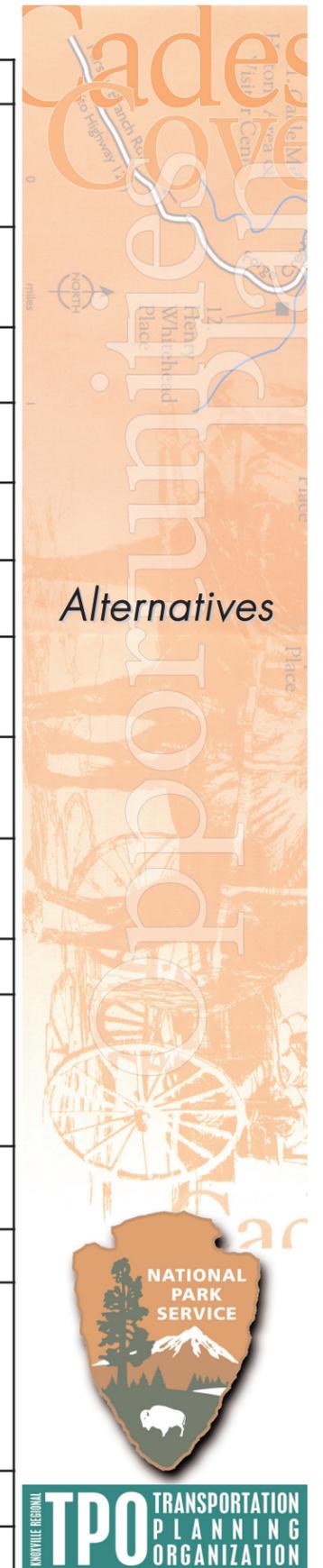
Two avenues should be pursued with respect to project implementation. The first is to establish relationships with the Tennessee DOT and the local MPO to identify potential funding sources for facilities and equipment.

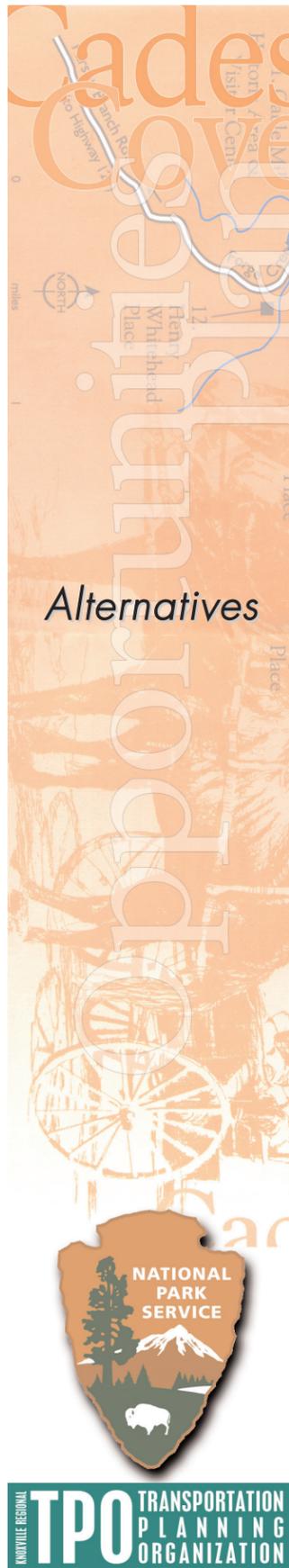
Public support would be critical to the program. Therefore, it is also recommended that symposium style meetings be held in local communities to discuss the project. These meetings could help to build a base of support and collect ideas from the public that could strengthen the project.

Three or four public meetings could be held at key points during project development. State and federal officials should be invited to these meetings to keep them apprised of the project. Meetings also should be held with state legislators. These meetings could be led by the non-NPS project champion and include key local partners and the Park superintendent. A similar meeting could be scheduled with the governors of Tennessee and North Carolina.

Table 22: Funding Strategies

Element Description	Activity	Phasing	Funding Mechanism	Partners
Roadway Improvement - Undertake a detailed assessment of the roadway condition to identify priority improvement areas where the pavement would be replaced, drainage issues resolved and shoulders improved. Develop and implement a master plan for Loop Road pull-offs. This will include Hyatt and Sparks Lane. The master plan would consider attraction sites and view shed areas.	Planning	First Phase	Federal, State, NPS, Tea-21 - Park Roads and Parkways Program, priority projects program, FHWA Public Lands Highway Discretionary (PLHD)	National Park Service, Federal Highway Administration, State of Tennessee and Knoxville TPO
Roadway Improvement - Design and construction plans for reconstructing 3-miles of the Loop Road. OR Design and construction plans for reconstructing all of the Loop Road. In either case plans would include pull-off and parking improvements per the Master Plan.	Design/Construction	First Phase	Same as above	Same as above
Communications Program - Develop a communications implementation plan (ITS Early Deployment Plan)	Planning	First Phase	Same as above	Same as above
Communications Program - Construction and implementation of communication facilities and signs and other programs as defined in the plan.	Design/Construction	First Phase	Same as above	Same as above
Development of detailed planning and implementation program for a visitor reservation system.	Planning	Second Phase	Same as above	NPS, TN Department of Tourism, local visitor and convention bureaus and other businesses.
Construction of communications system and programs related to implementing a visitor reservation system	Design/Construction	Second Phase	Same as above	Knoxville TPO, Friends of the Smokies, visitors and convention bureaus
Schematic design, Design development, and construction documents for a visitors center located in the gateway community. This may be either a minor or moderate center dependent on the alternative.	Design/Construction	Phase 3	Tea-21, Congressional, Grants, Tennessee Dept. of Tourism, local chamber/visitor bureau, NPCA/Friends	Tennessee Dept. of Tourism, local chamber/visitor bureau, NPCA/Friends, local business, universities etc...
Schematic design, Design development and construction documents for a visitors center at the beginning of the Loop Road. This may be a minor, moderate, or major center depending on the alternative.	Design/Construction	Phase 3	Same as above	Same as above
Detailed program and operations planning for the development of an alternative transportation system for the gateway community and Loop Road	Planning/Design	Phase 4	Tea-21 ATS program	National Park Service, State of Tennessee, Knoxville TPO, existing transit system operators, convention and visitors bureaus
Construction of ATS facilities and acquisition of shuttle vehicles.	Construction	Phase 4	Tea-21 ATS program	Same as above
Projects to preserve/protect cultural and natural resources		On-going	PL 93-291, Cades Cove Preservation Society, Grants, NPCA/Friends	Cades Cove Preservation Society, Townsend convention & visitors bureaus, Tennessee State Historic Preservation Office, University of Tennessee and other universities, NPCA/Friends organizations
Develop plans for a separate bicycle/walking pathway	Planning	Phase 3/4	Tea-21, Enhancement Grant, State of Tennessee	Local cycling/hiking organizations, Friends/NPCA, Tourism organizations.
Design and Construct a separate bicycle/walking pathway in Cades Cove	Design/Construction	Phase 3/4		
Utilities improvements and/or extensions	Planning	Coordinated with development of construction plans and documents for the Loop Road visitor center.	Funding should be incorporated with the design phase of the visitor center.	See visitor center section.
Design and construct utility improvements and/or extensions	Design/Construction	Same as above		
Staffing and volunteers		Activities to increase staff and volunteer workforce members in Cades Cove should begin as a First Phase activity.	Congress, NPCA/Friends, Grants, Visitor and Convention Bureaus	Universities (students), city/county partnerships, Convention and Visitors Bureau, local businesses.





Visitor Reservation System

The following factors should be considered when implementing a visitor reservation system.

Scope

Implementing a visitor reservation system would involve:

- Undertaking detailed visitor use surveys, traffic counts and origin/destination studies to quantify visitation patterns within the Cove.
- Developing the contractual parameters of the reservation system program with the NPS Reservation Service or other concession operation arrangement.
- Developing a marketing plan and program to inform visitors and the general public about the reservation system.
- Undertaking pilot reservation system testing.
- Implementing the reservation system.

Partners

The development of a reservation system is a transportation demand management technique. Coordinating and cooperating partners may also include:

- Local hotels and major tourist attractions
- Chamber of Commerce/Visitors Bureaus
- Local elected officials (city, town, county)

Ongoing coalition building should be undertaken at the local, state and federal levels to maintain interest and support for the overall project.

Alternative Transportation System

Table 8 on page 44 lists the operating characteristics of an ATS in Cades Cove, as part of Alternatives 4 and 5. In addition, a number of factors should be considered when implementing an alternative transportation system.

Scope

Implementing such a system could involve the following steps:

- Utilizing updated data on visitor use and activities to refine existing transit operations forecasts.
- Identifying the capacity and frequency of operation from the gateway community.
- Identifying the capacity and frequency of operation around the Loop Road.
- Determining vehicle propulsion and fuel usage.
- Identifying design fueling facilities.
- Identifying design operations and maintenance facilities.
- Determining the style and appearance of shuttle vehicles.
- Determining a user fee structure if applicable.
- Coordinating with regional transit service if applicable.
- Identifying operating entity (NPS, concessionaire, other).

Potential Pilot or Demonstration Projects

Several pilot or demonstration projects could be undertaken to launch an alternative transportation system. These include a campground shuttle service, perhaps funded in part by a partner organization, or a demonstration of alternative fuel vehicles, which could be done in concert with an industry such as TVA or a transit vehicle manufacturer.

The demonstration program should focus on providing visitors with access to the Cove as an alternative to private vehicles. This could include incentives to tour the Cove via foot or bicycle or activities that highlight the trails in the Cove. Such demonstration programs could operate during bicycle/pedestrian only times and provide visitors with educational/interpretive information.

Partners

These types of demonstration projects are likely to require a project champion. Often a local business or civic leader with a strong political, professional and personal network can serve as a champion, as has happened on a similar project undertaken in Acadia National Park.

The relationship between the project champion and the NPS/TPO must be strong. Open and frequent communications are important to the relationship. Therefore, it is recommended that a full time alternative transportation professional be designated to work as the Park's representative to the project champion. In Acadia, the Deputy Superintendent acted as the full time ATS leader for the park.

Funding is another important element. To help build financial support for the program, relationships can be developed with:

- Local businesses
- Chamber of Commerce/Visitors and Convention Bureaus
- Local elected officials (city, town, county)
- State elected officials (from the district(s) encompassed by the project)
- Regional agency leaders

Partners for operating and maintaining the project could include:

- Concession operations
- Existing transit operating entity
- The National Park Service
- Visitors and Convention Bureau

Implementing an alternative transportation system will require significant efforts to build partnerships at many different levels.ⁱⁱ

One example is the NPS's Alternative Transportation Program (ATP), which was developed to promote the introduction of transportation services that reduce the effects of vehicle traffic on park resources and the visitor experience through the use of partnerships with local governments and community groups.

Few national parks have the resources to conceive, plan, implement and operate an alternative transportation system on their own. In this way, partnerships can save both time and resources. Bringing a diverse array of stakeholders into the planning process can help generate transportation solutions

ii. Partnering for Success. USDOT Volpe National Transportation Systems Center 2003

that meet both park and stakeholder needs. In addition, organizations or coalitions that support a project can influence local and state transportation and land use decision-making and funding.

As noted above, Acadia National Park provides one example of where an effective project champion led to the implementation of an alternative transportation system.ⁱⁱⁱ

Acadia hosts 2.5 million visitors per year, with 90 percent visiting during the summer months. Much like Cades Cove, traffic congestion and air pollution from vehicles traveling on the Acadia Loop Road have been a major issue related to resource protection and visitor experience.

To undertake an ATS project, Acadia developed partnerships with multiple stakeholders including NPS, USDOT, Maine DOT, several town governments and the Friends of Acadia, as well as several other public and private organizations.

An alternative transportation system could be operated through a concession agreement. The National Park Service Concessions Management Act of 1998 was enacted to provide public accommodations, facilities and services as needed within the park within a set of carefully controlled safeguards. The act seeks to insure that visitation does not impair park resources at the same time that visitors are provided with accommodations that are consistent with the mission of the park.

Concession contracts are competitively selected through a solicitation process and all prospective concessionaires must meet the minimum requirements of the contract. The legislation contains a “special” rule related to contracting transportation services (Section 412). This provision allows the park to contract solely for transportation services through a concession agreement of up to 10 years (a five-year period with one-year options for as many as five additional years). The transportation service contract extensions are based on satisfactory performance of the contract.

iii. Partnering for Transportation Success at Acadia National Park Prepared by the US Department of Transportation John A. Volpe National Transportation Systems Center, 2003.

Lessons for Developing Partnerships

A review of partnership efforts undertaken at other parks has yielded a number of “lessons learned.” These ideas, provided as part of the implementation program for the Opportunities Plan, are listed below.

- Ensure that local interests, including town leaders, business and other organizations, play a prominent role in the planning process.
- Design ATS operations in a way that responds to the needs of gateway communities and others that may be directly affected by the system.
- Work closely with the state DOT or other relevant transportation planning organizations from concept through deployment and beyond.
- Plan for one full-time position to be devoted to ATS planning and deployment.
- Take advantage of opportunities provided by the MOU between the USDOJ and the USDOT.
- Take a conservative approach to system concept and deployment.
- Examine closely the provision of fare-free service.
- Identify mechanisms for working with potential corporate sponsors.
- Have transit/transportation concept ready to go.

Implementation Strategies

The implementation strategy would follow the same pattern as described in the communications section. This would include establishing a project champion as the catalyst for bringing in other partners. Symposium-style meetings also could be held to build public support.

Frequently Asked Questions

Why is this project being undertaken?

It has become increasingly difficult for the National Park Service to maintain a pastoral setting in Cades Cove given the large number of visitors each year. While some of these visitors have learned to accept and expect long travel times and traffic congestion, for others, these conditions result in a quality of experience that does not meet their expectations. The purpose of this study is to identify long range management alternatives that ensure the Cove can

continue to be enjoyed by everyone without infringing upon the visitor experience or the Cove’s cultural and natural resources.

What are the peak visitation periods of Cades Cove?

Visitation currently peaks during July and August and on weekends in June, September and October. Because visitation patterns and rates do change, however, peak periods in the future may be different.

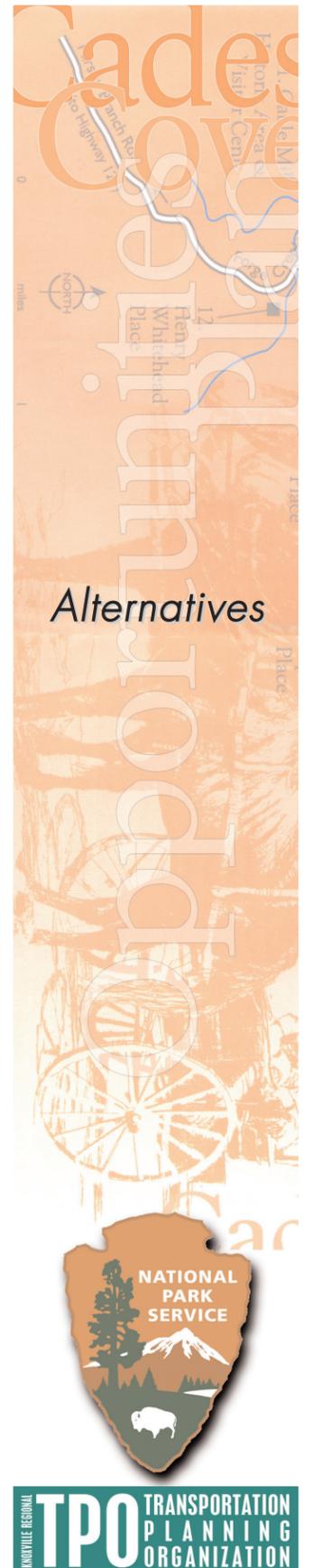
Over a 10-year period between 1990 and 2000, visitation grew significantly during the off-peak months of November through March. In 1990, for instance, approximately 1.51 million visitors came to the Park during these months. By 2000, this number had grown to more than 2.36 million. This trend is likely to continue as more visitors come to the Park during less busy periods or are attracted to events in the gateway communities designed to attract visitors to the area.

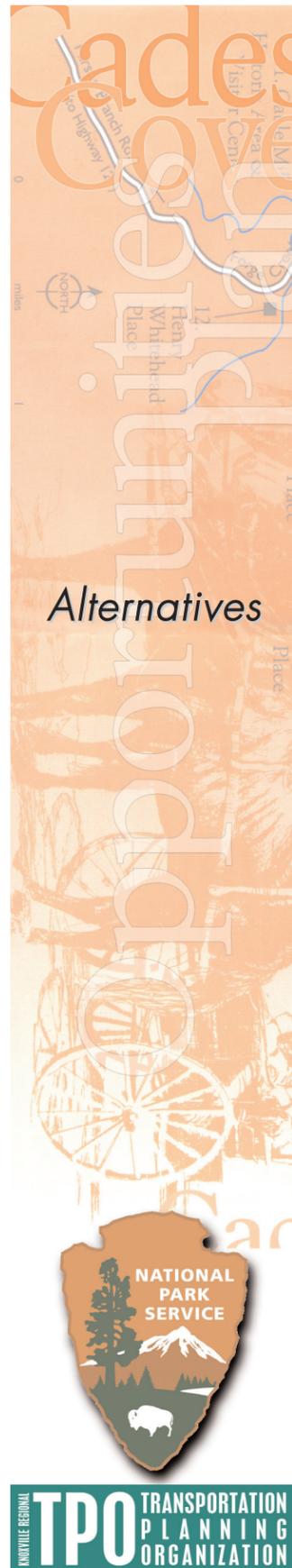
Will descendants be allowed to continue visiting family grave plots in the Cove?

Each of the alternatives includes provisions to allow descendants to access family cemeteries in the Cove. Special activity days or events such as Decoration Day and Old Timers Day also are provided for in each alternative.

Will cars no longer be allowed into the Cove?

The objective of this project has been to identify a range of long-term management alternatives that will preserve the Cove’s natural and cultural resources and provide a quality visitor experience. Each alternative allows private vehicle to access the Cove during off-peak periods (currently defined as November through May). During peak periods, private vehicles would be allowed to access the Loop Road in all alternatives except Alternative 5. Alternatives 3 and 4 would require that vehicles have a reservation to drive the Loop Road, but private vehicles would not be prohibited.





How will I get to trailheads?

During off-peak periods, there would be no change in trailhead access. In the peak periods under Alternatives 3, 4 and 5, visitors would be required to obtain a reservation (to enter the Cove with a vehicle) or ride transit. It is possible, however, that reservations and/or transit may not be required during early morning hours. In this case, hikers who started out early in the morning could drive to a trailhead before reservations or transit was required. Under the transit alternatives, the feasibility of a special shuttle or van from the Cable Mill area to the Gregory Bald trailhead will be considered.

How will I be able to bring in my picnic lunch, lawn chairs and other items into the Cove if I ride a shuttle?

Picnicking is an important activity that is accommodated in each alternative. The transit vehicles are likely to include space to accommodate picnic baskets, lawn chairs, strollers, etc.

Will visitors still be able to picnic at the picnic grounds?

Yes. None of the alternatives restrict access to the Cades Cove picnic area.

Why does the plan not recommend returning the Loop Road to a two-way (or 2-lane) road as it was many years ago?

Historically, the Loop Road was a single lane used by residents in both directions. With the opening of Laurel Creek Road in 1950, access to the Cove was improved and one-way traffic was initiated to accommodate the increased traffic. The Loop Road continues to follow this historic alignment, with curves and a narrow roadway being integral parts of the visitor experience. The Loop Road cannot be widened to accommodate two lanes of traffic without changing how the visitor experiences and understands the history of the Cove. The two-lane option was considered but rejected because this option would compromise the historic integrity of the roadway and roadside resources.

Why is the Park planting wildflowers and native grasses? The height of these plants restricts the view of wildlife.

Most of the Cove is covered with non-native fescue and lespedeza. These grasses were established in the 1950's and do not reflect the Cove's historic condition. Fescue offers little nutritional value or cover for wildlife and can be infected with toxic fungi that harms mammals. NPS policies provide the basis for the removal of exotic species and the restoration of native plant species.

All of the existing managed native grass fields are interior to the Cove and are not located along the Loop Road. Thus, the tall grasses the visitor sees are mostly non-native fescue.

Why have the cattle been removed?

The removal of cattle has significantly improved the water quality of Abrams Creek and its tributaries. Large-scale cattle operations dominated the Cove's landscape in the 1950's but did not accurately portray life in the Cove as it was prior to establishment of the Park. These cattle operations generated high silt and nutrient loads in the tributaries of Abrams Creek. Now that cattle operations have ended, populations of darters, a rare and endangered native species of fish, and other fish species are flourishing.