

# guideline

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## Concession Operations

Park Managers are continually evaluating their operations as the park visitor are his clientele or customer, and services and facilities provided must be acceptable "to the public." The basis for evaluations may or may not be objective and consistent through changes in management over a period of time and the resulting services to the public may vary considerably depending upon individual manager's tastes, personal preferences or desires. Written operation standards are useful if developed to fit the objectives and programs of an individual park department. Standards establish a "yardstick" to better determine the acceptability or non-acceptability of any given operation.

How are standards developed? First, what does the public expect from your concession operations? This is the question that provides the theme for development of each concession operational standard. Standards for each park department must be individually tailored so that the above question is answered and so that your management objectives are built into the standards.

The concession system covers a broad spectrum of various types of services and facilities, from complex marinas to campfire wood vending. The standards presented here define "what the product should be" and the "regulations which provide for safe and healthy activities."

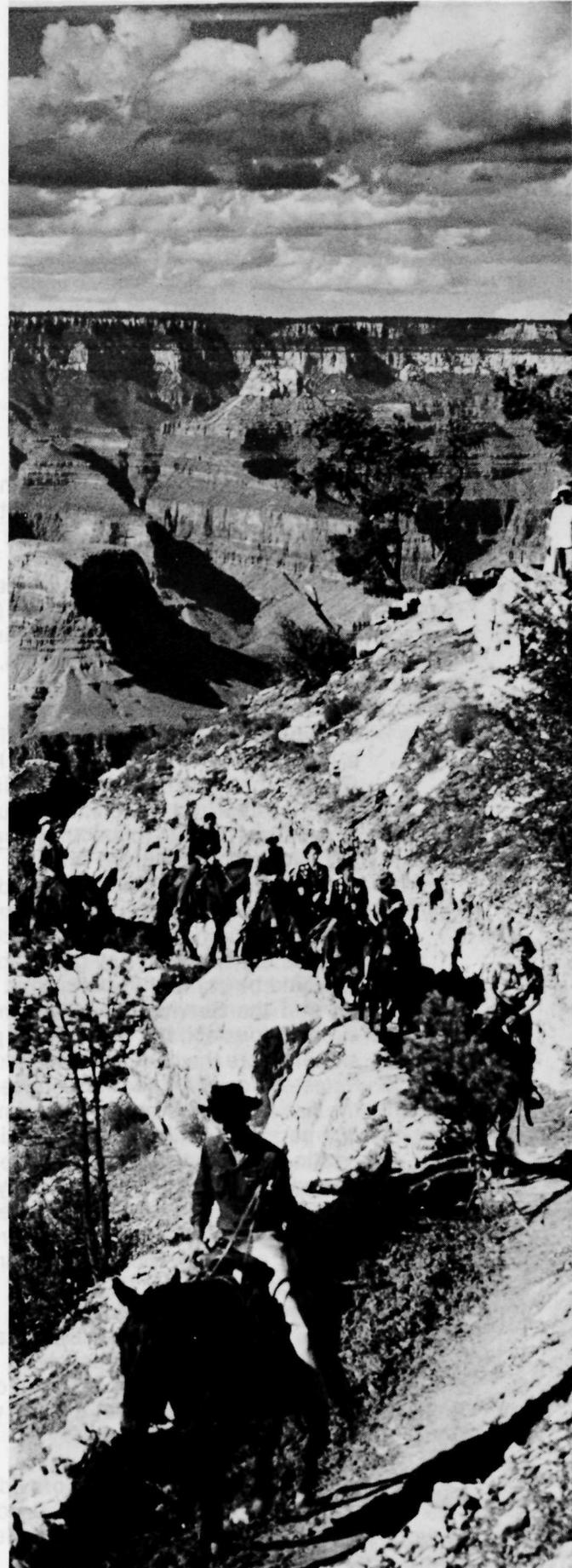
These standards are presented in broad terms and should be adaptable to individual park departments. Each department can build upon, individualize and expand each standard to fit a particular situation. They are an effective management tool if they are individualized to particular situations.

Concession operations will also find standards valuable in assessing their own operations. The following standards have been developed by a National Park Service team for a concessioner system where visitor services are contracted out. They are easily adaptable to a self-operating system as well.

*Andy Wolfe*

*Chief*

*Concessions Management*



# Program Standards

## PART A

A satisfactory concessioner is one who maintains the concession operation in the highest attainable operating condition consistent with that type of operation, and demonstrates a desire to improve facilities and services for the benefit of the public. Factors contributing to this condition are: (1) Quality facilities, (2) quality services, (3) cleanliness, (4) rates charged, (5) maintenance standards, and (6) records, reports and other factors.

Sec. 1 *Quality Facilities*—Quality generally infers a high standard regardless of what it is. Quality shall mean "the best available for the price charged." Facilities should all be acceptable. That is to say they shall all be good in their own right.

Sec. 2 *Quality Service*—Service provided the park visitor through the concessioner shall be of such quality and in such quantity as is expected for any given operation. It should be compatible with what the visitor and the Service desire and meet the expectations of both. It should be pleasing and promote the image of the park.

Sec. 3 *Rates*—Prices charged for services within the national parks are based primarily on comparability and existing policies shall continue to be used. It should be noted here; however, that comparability should be the dominant factor on determining prices. Rates should reflect a desire to satisfy the needs of various economic and social classes.

(a) A reasonable price so established shall be consistent with accepted costs of a given locale and in a range acceptable by most all income level groups with the emphasis on dollar value.

(b) The price range shall provide for a price at the lower end of the economic scale as may be appropriate for the facility and service provided.

(c) Rate policies for children should be established when desirable.

Sec. 4 *Cleanliness*—All concession operations should maintain a state of cleanliness which is normally expected for that type of operation. It shall not be cluttered, untidy, dirty, or appear to be poorly kept.

Sec. 5 *Maintenance*—To be in good repair the facility shall be in a state of 100 percent readiness at all times except possibly when major repairs are called for, or unforeseen breakdowns occur. As walls crack, paint peels, chairs break and so on, the repairs are made within a reasonable period of time consistent with the time required to do the job.

(a) An adequate maintenance program which is indicative of the size and type of operation will be planned, scheduled and followed by the concessioner and the Service.

(b) The maintenance program includes Government-constructed and concessioner-constructed facilities.

(c) Meet the requirements of the contract.

(d) Scheduled on a regular basis.

(e) Provides for immediate repair consistent with the cost and time required.

(f) Ordinary expenses relating to maintenance shall not be deferred.

## Sec. 6 *Records and Reports*

(a) Employment of generally accepted accounting procedures as adopted by the Service.

(b) Maintain records of employees' payroll and other records with respect to compliance with labor standards and nondiscrimination.

(c) Records shall be sufficient so as to enable the Service to determine that all terms of the contract are being met.

(d) Remain current at all times regarding payment of franchise fees.

(e) Submit required reports on a timely basis as required by the Service.

Sec. 7 *Public Acceptability*—It is intended that concession operations should promote the interests of the Service and visitors. The evaluation process for any conces-

sion should consider visitor complaints. Elements to consider are shown below.

(a) Number of complaints received annually in the past.

(b) Is the current level of visitor complaints acceptable considering the type of complaint in relation to the size of operation and volume of business?

(c) Substantial increase in visitor complaints.

Sec. 8 *Concessioner and Concessioner-Employee Standards*—The concessioner shall promote and protect the interest of its employees. The employees shall be equipped to provide the necessary information and services to the public in a manner which does not create negative reactions.

Sec. 8-A *Concessioner Responsibilities*—It is the responsibility of the concessioner to comply with the labor standards applicable to concession employees as stated in Title 36 "Code of Federal Regulations," Chapter 1, Part 8. It also is the responsibility of the concessioner to comply with the requirements of Executive Order No. 11246 of September 24, 1965, as amended, relating to nondiscrimination in employment.

(a) The inspection and evaluation of employee facilities shall be a part of the inspection which is made of the visitor service facilities. In situations where housing, food and other required facilities are not satisfactory, a report of this condition shall accompany the regular inspection sheet. Employee facilities shall be adequate to meet the conditions of employment.

(b) Food shall be sufficient in quantity, variety and wholesomeness. It shall not be inferior to what should be expected.

(c) Food products and food facilities used by employees shall meet the requirements of the U.S. Public Health Service.

(d) Lodging facilities shall be of such a quality that employees will be provided comfortable quarters which protect them from the elements, provide for leisure activities, and are sufficient to promote a healthy atmosphere.

(e) The facilities shall meet the applicable building codes and health standards to

provide for the individuals' health and safety.

(f) Depending on the number of employees and nature of the operation, the concessioner may be required to provide recreation facilities to maintain the morale and welfare of the employees.

(g) Where recreation facilities are provided by the concessioner, such facilities shall meet the same standards as those offered to the public.

(h) Concessioner must have in effect an affirmative action program which shall be implemented to insure there is no discrimination in any part of any program and that equal employment opportunity is provided.

(i) The concessioner shall designate one employee to serve as resident manager with responsibilities clearly spelled out so as to assist park personnel when the need arises.

(j) The concessioner shall provide an adequate number of employees which will allow for effective and efficient operations of the concession facility.

Sec. 8-B *Employee Responsibilities*—Regardless of the type of operation we should expect concessioner personnel to understand their role and function accordingly. The employees role basically is as follows:

(a) To meet his responsibilities as an employee and to promote the goals of the Service to provide a meaningful experience for the visitors.

(b) As the overall goal is to assist the visitor, this may be done by projecting a pleasing attitude, maintaining the necessary personal cleanliness standards as are appropriate for the activity, and at the same time meet the required health regulations.

(c) By establishing personnel standards we feel the concessioner and the Service will benefit. It is strongly recommended that this be carried one step further in that employees should be required to attend orientation sessions at the start of their employment.

(d) All employees and applicants for employment are reasonably and accurately informed of the conditions under which

they will work. Such information includes wages, hours of work, availability of housing, cost of housing, meals, etc.

Sec. 9 *Safety*—Safety precautions observed by the concessioner shall include fire and fire control, electrical requirements, structural deficiencies, and all recognizable problem areas which may affect the safety of those persons working in or using the facility and the facilities themselves.

The park safety officer should work directly with the park's concession personnel and the concessioner to implement and expand the goals mentioned above.

Sec. 10 *Contract Compliance*—The concessioner shall adhere to all phases of the contract in meeting its obligations.

The standards shown in this section should be used for all concession operations. At the same time, those standards shown in parts B through F are not limited to their designated function, but should also be applied to others where applicable.

## FOOD SERVICE STANDARDS

### PART B

Food prepared by concessioners shall meet the State, and Federal regulations and be of a type which is expected and accepted by the visitors to park concessions. Consideration shall be given to quality food, quality service, rates and sanitation.

Sec. 1 *Quality Food*—Food shall be prepared in such a way as to be acceptable to the patrons in taste, appearance, portion, size, and doneness.

(a) *Taste*—Food should retain the expected tastefulness, hot food should be hot and cold food should be cold.

(b) *Appearance*—Food should reflect the product from which it is prepared, such as shape or color. (Loss of color may mean loss of quality.)

(c) *Portion size*—Amount of food served shall be sufficient in relation to price and other services offered.

(d) *Doneness*—Food should be cooked to the extent requested and accepted by the patrons.

Sec. 2 *Quality Service*—Service which efficiently takes care of the customer's needs by being prompt, giving attention to patrons

needs and promoting a friendly relationship.

(a) *Type of Food Service*—the food should compliment the facility in which it is used and reflect the eating preference of the patrons.

(b) *Menu*—Any operation offering complete meal service shall offer appropriate entree items with adequate supporting foods to accompany each entree.

(c) *Children*—A separate menu or reduced prices and portions shall be provided for children where complete meal service is offered such as a restaurant or cafeteria and it is deemed to be desirable.

Sec. 3 *Rates*—shall be at a cost commensurate with value received based on existing rate establishment policies shown in Part A, Sec. 3.

(a) *Price Range*—Twenty percent of the entrees presented on the menu should be priced as economy items.

(b) *Rate Criteria*—The establishment of rates is relative to the service offered. As this is affected sometimes by the desired atmosphere, additional services offered, location and other factors, the prices charged shall be established accordingly.

Sec. 4 *Sanitation*—To promote the welfare of the visitor it is imperative that sanitary conditions are met using the following criteria:

(a) *Cleanliness*—That state of being which appears to remain clean and pleasing to the eye. The absence of soil.

(b) *Sanitary*—Those foods, equipment, utensils, etc., which should be sanitary shall be free from harmful bacteria, molds, fungi, or yeast.

(c) *Food service sanitation inspections* shall be conducted using the United States Public Health Service procedures.

(d) *When possible, USPHS personnel* shall be utilized to conduct inspections.

(e) *Inspections* shall be made at least once each year by USPHS and once each month of the operating season by Service personnel.

(f) *Inspection results* shall conform to those standards established by the USPHS.

## LODGING FACILITY STANDARDS

### PART C

All lodging facilities shall meet the expectations of the Service and the public for any given type of facility and provide the public with pleasant and enjoyable accommodations consistent with what is desired.

Sec. 1 *Quality Accommodations*—To establish standards applicable to all types of accommodations one must determine quality and quantity of the services received. "Quality" shall be thought of as "the best available for the money."

(a) *Comfort*—This includes all services normally associated with the style and price charged. The equipment and/or furnishings provided will be of such amount and quality to meet these needs. The amount of space shall be sufficient to allow for normal activities associated with that particular facility.

(b) *Atmosphere*—The atmosphere should reflect the image of the facility. It is the "air" of any given place. It is the social influence produced by decoration and design. Each and every facility projects an image and it shall meet the expectations of those using it.

(c) *Support Facilities*—Activities such as exercise facilities, barber shops, bars, pools, sauna baths and other activities associated with lodging facilities shall adhere to local, State, or Federal regulations where applicable.

Sec. 2 *Rates*—Rates shall be established in accordance with existing Service policy.

(a) *Provisions for children*—Rates for children shall be established in those facilities where it is generally expected.

(b) *Off-season Rates*—Where off-season rates are provided by operations outside the park, or the Service deems it necessary, rate schedules shall provide the incentive for increased use of the facility during the off-season.

(c) *Rates for lodging accommodations* shall reflect a desire to accommodate visitors of various economic and social levels with the emphasis on dollar value.

Sec. 3 *Cleanliness and Housekeeping*—An acceptable standard of cleanliness is one which is (1) uncluttered, (2) pleasing to

sight, and (3) appears to have remained well kept at all time, both inside and out.

(a) An uncluttered condition shall be one which does not allow for unnecessary items being left in or around the area being used by the public.

(b) The general appearance should be one that does not appear to be recently cleaned. If it appears as such it suggests that it has been neglected. It should appear as though it does not need cleaning.

(c) A facility may be pleasant to sight if it is attractive, tasteful and not dull, dark, or dirty.

## MERCHANDISING STANDARDS

### PART D

The type and quantity of merchandise sold in any concession shall be at the discretion of the Superintendent who is guided by the policies set forth by the Service.

Sec. 1 *Presentation*

(a) Standards approved by the Director and transmitted to all Field Directors on "Souvenirs and Handicraft" dated November 4, 1970, shall be adhered to.

(b) For regulations governing the sale of all merchandise the Administrative Policies for Natural, Historic, and Recreation Areas set forth the criteria for merchandise relative to the image of the area and shall be followed.

Sec. 2 *Vending Machines*—Vending machine operations and merchandise sold in such machines are subject to the same policies and guidelines as other merchandise sold within the national parks.

(a) The regulations concerning the vending operations may be found in Part 13 of Title 43, "Code of Federal Regulations" which also provides for preferential treatment of blind operators. These regulations shall be the determining factor in providing for this type operation.

(b) The requirements of the United States Public Health Service must be met in vending operations involving consumables.

(c) The National Automatic Merchandising Association has established some very

useful procedures and is a source of information in coping with any problems.

Sec. 3 *Advertising*—Advertising used by the concessioner to promote its interests must conform to the management objectives of the park and have the approval of the Superintendent.

(a) The established policies of the Service regarding what information is required in these publications shall be followed. (Refer CFR 36, Sec. 5.1.)

(b) Highway billboard advertising outside the park involving concessioners shall be discouraged. Any such concessioner advertising which inhibits enjoyment of areas surrounding the parks should not be permitted.

#### LAND AND AIR AND WATER TRANSPORTATION FACILITIES STANDARDS

##### PART E

All transportation vehicles or facilities shall meet the minimum State or Federal regulations where applicable and are subject to evaluation and acceptability standards.

Sec. 1 *Passenger-carrying Vehicles or Facilities*—Passenger-carrying vehicles or facilities are those which provide transportation for persons other than the operator who has legal responsibility for the operation and is paid to operate such a vehicle.

(a) Requirements of the Interstate Commerce Commission are met, if applicable.

(b) Requirements of the Service are met in accordance with Chapter 1, Part 7 of Title 36, "Code of Federal Regulations."

(c) The efficient and safe operation of such vehicles is assured by the concessioner.

(d) The service performed and equipment used are not objectionable to the users of such equipment. The condition of the facility should be in such a state of cleanliness and readiness that it is acceptable for that type of service to most all users.

(e) Operating procedures and equipment are maintained in such a state that insurance costs are not increased due to poor upkeep or maintenance.

(f) Employees should meet the criteria set forth in the section on employee relations.

Sec. 2 *Self-operated Vehicles or Facilities*—In keeping with the definition given for passenger-carrying vehicles or facilities, self-operated vehicles or facilities shall refer to those not under the guidance and supervision of an operator who is hired to control the vehicle.

The criteria used in evaluating passenger-carrying vehicles and facilities shall apply to self-operated vehicles if applicable. In addition the satisfactory concessioner shall:

(a) Provide the proper information necessary for the safe operation of the vehicle.

(b) Emphasize any hazards which may not be apparent and any restrictions as to area or boundaries.

Sec. 3 *Livery Service*—Livestock transportation systems shall mean the transporting of persons or goods by means of horseback, mules, or other means, to any location within the park.

(a) Equipment (bridles, saddles, etc.) shall be in sound condition at all times.

(b) Appearance of the facility shall be such that it is acceptable by the users and the Service.

(c) Stables should be provided with an effective drainage system and adequate water for effective cleaning. The stable should be of rodent resistant construction.

(d) Livestock used for this purpose should be tried and tested with a temperament suited for the assigned role.

(e) Animals shall be free from disease which can be transmitted to users.

(f) Provide the proper information or instructions necessary for the safe handling of the animal. Proper guidance given to users and other information stressing "do's" and "don'ts" to insure safe operating practices.

(g) Emphasize hazards which may not be apparent and restrictions as to area or boundaries.

(h) Stables should be kept clean and relatively odor free. Manure should be regularly removed from the stable and stored or disposed of in such a manner to minimize fly breeding.

#### WATER FACILITY STANDARDS

##### PART F

Facilities must be planned so as to be compatible with the natural resources available, the needs of the visitors and the Service, and comply with the regulations governing construction requirements.

Sec. 1 *Wastes*—Prime consideration shall be given to pollution abatement practices whenever the disposal of waste products is a factor in concession operations.

(a) Established regulations regarding waste disposal and collection shall be followed. (Refer to Title 36 CFR Section 3.17.)

(b) Where boats having sewage holding tanks use the facility, sewage pump out stations shall be available.

(c) Reference to those established policies of the Service and standards adopted by the U.S. Coast Guard shall be followed.

(d) Administrative policies established by the Service regarding pollution of the land, air, and water shall be adhered to.

Sec. 2 *Safety*—The recommended standards for safety and public health prescribed by Federal, State, or local authorities having jurisdiction shall be observed.

(a) Navigation aids and equipment shall be planned in collaboration with the U.S. Coast Guard.

(b) Provide for a small boat to be kept in reserve in case of emergencies primarily for safety purposes in and around the immediate area. It should be at 100 percent readiness at all times.

(c) Provide for the proper maintenance and periodic inspections of boats, motors, fuel pumping facilities, and other equipment as is necessary.

(d) Each boat shall be equipped with the necessary equipment.

(e) Have the concession attendant to service all boats at the fuel station. Boat operators shall not be permitted to fill their own boats with fuel. (Explosions may occur through a buildup of static electricity if the gas nozzle is not properly grounded.)

(f) Automatic shutoff on boat gas dispensing nozzles are not permitted.

(g) Have in use an adequate number of life ring stations and ropes or other similar equipment.

(h) Provide adequate operating instructions for ventilating motors and gas storage compartments on inboard-outboards and gas storage compartments in outboard boats. Also instruction information concerning the safe operation of the boat. This should be available in the boat and on the pier or dock area. The concessioner should be reasonably sure that the operator is capable of handling a particular boat and is aware of those areas being used as to any hazards or existing boundaries.

(i) Provide an adequate number of fire extinguishers. Attention should be paid to the type in relation to its intended use. Fuel pump area is important.

(j) Proper storage of life jackets in a dry area, i.e., hung by clothes hanger.

(k) Provide for an adequate number light stanchions on and around the pier, dock, etc.

Sec. 3 *Readiness*—Maintains the operation at an acceptable level or readiness. This includes regularly scheduled maintenance, cleanliness standards acceptable to the public and the Service, and promotes the interest of the users of the facility along with the needs of the Service.



# GUIDELINES FOR BIKEWAYS

In order to establish a common understanding about "Bikeways," these guidelines have been developed by Denver Service Center and are to be used by the National Park Service. It is intended that these guidelines will be revised and/or modified as planning and management of bicycle areas indicates a need to do so.

## Introduction

More and more bicycles are arriving in the parks each year. This is probably due to the fact that the production of bicycles has exceeded that of the automobile and the new rider is an adult. Some parks have started providing for the bicycle. An example would be in Yosemite National Park. Visitors are instructed after parking their cars that they can either "hoof it," ride a bicycle, or take a bus to see the wonders of nature. The roads in Yosemite have been marked with signs, "Bicycles and Cars Have Equal Rights on Roads."

In 1972 Senator Alan Cranston (D-Ga.) introduced a Bicycle bill, S.2440. This bill passed the Senate Public Works Committee, but did not reach the floor of the Senate. Probably within the next year a similar bill will be introduced in both the Senate and House. Passage can be predicted. When a bill of this nature passes it will be the first time the Federal government has invested money for the bicycle as a mode of transportation.

Most all parks have a need to create an efficient means for movement of people. There is a need to

eliminate, as much as possible, traffic congestion, air and noise pollution.

In the bicycle trail guide of Cape Cod National Seashore, the first statement is, "Bicycling is a healthful and fun way to view the magnificent scenery of the Cape Cod National Seashore." The viewing from a bicycle is a healthy way to see and enjoy the entire National Park System. In the past years many roads and highways have been built in national parks to accommodate the automobile. The future should see more accommodations for bicycles. This involves more planning in many parks in order to make bikeways an integral part of the transportation and pedestrian system of that park.

In 1885, the British Rover "safety bicycle" was introduced and by 1893, the addition of pneumatic tires, roller chain drive, and "diamond" frame evolved the Rover into a form essentially similar to the bicycles of today. Additional sophistications introduced before the turn of the century included the suspension wheel, ballbearings for crank and hubs, weldless steel tubing for the frame, and coaster brakes.

It was around this period of time that the bicycle boom began. In 1900 the bicycle had been reduced in price and could be purchased for less than \$20.00. Due to mass production the annual sales in America were around two million. The safety bike enjoyed the privilege of being the fastest thing on the road. Bicycles were made that could change gears. All the experimentation with bicycles helped the idea of the automobile to grow. The bicycle gave the automobile everything that was needed except the engine. It was in a bicycle repair shop that the first American car was made. The Wright Brothers and Henry Ford were some of the more famous bicycle repair men. The owners of these two bike shops had a great deal of influence upon the future history of the world. Mass production is usually associated with Henry Ford, and the Wright Brothers are given credit for the birth of aviation.

After an elapse of half a century the bicycle boom is on once again. Sales in 1972 will exceed the 10 million mark. The future prediction by the Bicycle Institute of America is that there will continue to be an increase for a period of time. Some of the major airlines are beginning to advertise "fly with your bicycle." Many national parks are designed ideally for the bicycle.

## The Planning Process

The master plan is designed as an orderly process for development. Any additional development initiated by the park should be in compliance with the master plan or revision should be made to update the existing master plan. The addition of a bikeway in a park requires a certain amount of planning. The planning process is similar whether it is planning a bikeway for a city or for a national park.

The following planning process is by Vincent R. Desimone, a transportation planning engineer, Automobile Club of Southern California.

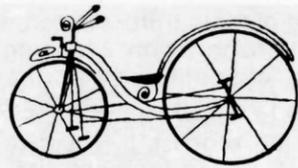
It is necessary to follow all the steps in the transportation planning process in order to determine the proper scale of development and investment for bicycle facilities. Without adequate planning, actions taken to provide facilities for bicycles are more likely to be failures. It is likely that there will be poorly coordinated facilities that do not give the public an adequate return on investment. Plans should be chosen through an examination of alternative strategy.

Any planning which concludes with recommendations of expenditure of public funds must be based upon supportable facts. The first step in the planning process should be to inventory existing bicycle facilities and their use. These inventories should cover travel characteristics, characteristics of the user, land use and the physical facilities available. Forecasts of travel and demand should be made. Once forecasts of use and demand are made, goals can be formulated stating objectives or criterias against which all later proposals can be measured. Some objectives are quantifiable, others are subjective. Whatever course of action is selected, it must be supportive of these objectives.

The next step is to develop proposals for facilities. Having developed the proposals, an evaluation should be made as to the impact that these proposals will have on the goals. Working within the professional and political process, the decisions can be made as to whether a facility should be built and where.

Goals and objectives that should be kept in mind in planning are identified as safety, mobility, efficiency and pleasure. Safety must be provided for the cyclist as well as for the pedestrian and the motorist. Mobility for the cyclist, as well as mobility of the overall transportation system, must be kept in mind since the cyclist and motorist often will hinder each other. Increased efficiency will result in the best use of facilities for the cyclist as well as the motor vehicle. Pleasure should be maximized for the cyclist as well as for the others he interacts with in the operation of his bicycle.

The application of the technical planning process is new to bicycle facility planning. It should be kept in mind that the planning process is iterative requiring trial of various alternatives, followed by improvements incorporated in succeeding trials. To bring the planning process full circle, it is necessary to undertake a continuing evaluation of bicycle facilities as they are put into operation. The wave of interest in bicycles is a new experience for most communities in the United States; and it will require a period of trial and error to determine which facilities are feasible, which are safe, and how much public money can be allocated for their implementation."



### Definitions

There are many terms describing right-of-ways for the bicycle. The term "Bikeway" will be used to cover all definitions. A bikeway provides for bicycle travel.

Bicycle paths and bicycle trails will have a completely separate right-of-way designated exclusively for the use of bicycles. Motorized cycles will not be allowed on these bikeways. Pedestrians may be allowed.

Bicycle Lane, Bicycle Track, Bicycle Route, and Sidewalk—Bikeway, refer to the mixing of bicycles, motorized cycles and pedestrians. This is considered as on the road bikeway. The right-of-way is visually designated by signing. The right-of-way may be restricted or shared.

### Design Speed

The narrow-tread, lightweight bicycle has a capability of traveling at high speeds, especially going downhill. Most bicyclists travel at a speed between 5 and 25 miles per hour. A design speed of 15 miles per hour is desirable. Bicycle paths and trails are designed for two purposes—recreation, and transportation from one point to another. In both cases standards must be maintained for the purpose of safety.

### Capacity

The estimated capacity for a two-way bikeway is very high. Two-way bikeways containing one lane in each direction would have a carrying capacity of over 1,000 bicycles per hour. The type of bikeway, whether used for recreation or for transportation from one point to another, would have some effect on the carrying capacity. It is doubtful that even a recreational bikeway would reach a maximum carrying capacity within the near future.

### Grade

If the average grade over a long section is over 10 percent, do not plan a bikeway. The overall grade of an entire bikeway should not exceed 2 percent. Short grades of less than 1 mile at a 10 percent grade are allowable. At the top of any grade that requires a lot of energy for an average cyclist to cycle, a 3- or 4-foot wide pulloff should be constructed.

The radius of curvature should also be considered during the design process. The size of the radius will increase with speed. The formula used for determining the proper radius of curvature—

$$R = 1.25V + 1.4$$

R = The radius of curvature (ft.)

V = The velocity in m.p.h.

If a bicycle was going 10 m. p. h. the desirable radius of curvature should exceed 13.9 feet.

### Facilities

When a bikeway is established, parking facilities should be provided. Adequate bicycle parking facilities will reduce the possibility of thefts. In many cities theft of bicycles has become a major activity. In the city of Denver during 1971 there were over 5,000 bicycles stolen. The yearly average recovery rate was around 50 percent.

Parking facilities should be at appropriate locations with locking devices to discourage both the prankster and professional theft.

The space requirement for parking facilities will depend upon the number of bicycles a park desires at one location. Twelve bicycles equals the same parking space requirements as one average sized automobile. There are many designs of bicycle racks. The most successful design of a bicycle rack would allow both wheels and frame of a bicycle to be locked securely with a heavy chain. The chain should be rubber-coated. The Denver Bikeway Plan gives the following information on bike racks:

A high security bike rack has the following characteristics: (1) a chain or cable is permanently welded to the rack; (2) construction is of a heavy gauge material; (3) both wheels and the frame are securely locked to the rack; and (4) the rack is located in low activity areas (low pedestrian traffic around rack all day). A low security bike rack has the following characteristics: (1) no chain or cable is permanently attached to the rack (the bicyclist carries his own chain or cable and padlock); (2) the rack is placed in high activity areas (high pedestrian traffic around rack all day); and (3) only the front wheel and the frame can be locked to the rack. Some of the types of racks are V-Bar, Radial, Standard and Tree Guard.

### Signing

Bicycle signs that are used on the highway shall be standard in compliance with the Manual on Uniform Traffic Control Devices by the U. S. Department of Transportation, 1971 edition. The two types of bicycle signs used are:

### Bicycle Route Sign

A guide for marking an officially designated bicycle trail shall be a 24 inch by 18 inch sign with a white legend consisting of a bicycle symbol, the word BIKE ROUTE, and a border in white on a green background. This sign is intended to guide cyclists on a predetermined bicycle route that may be a trail, secondary road, or a combination of safe and suitable surfaces.



When needed, a supplementary sign with a directional arrow may be placed below the BIKE ROUTE sign. The supplementary plate shall be 24 inches by 6 inches with a white arrow and border on a green background.

### Bicycle Crossing Sign

The Bicycle Crossing sign is intended for use in advance of a point where an officially designated bicycle trail crosses a roadway.

The signs to be used on a bicycle trail or path may be based on an individual situation. If a park wishes to use the same type of Bike Route sign as used on the highway this is permissible. A bicycle path or trail may be interpretive; therefore, any appropriate signing method may be used.

If a bicycle path or trail is not to be interpreted it is recommended that the signing system comply with the National Park Service sign system specifications. When desirable to use a legend to guide visitors while on the bike trail, the oversized symbol sign plant is excellent.



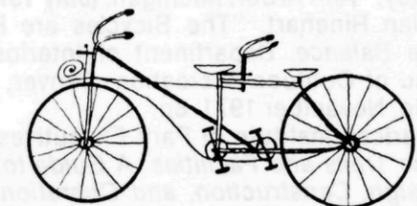
The legend may carry a direction arrow in eight positions, feet or mileage distance, abbreviations, e. g., 3 mi., indication of the beginning or end of a trail, e. g., start, head, end, or be numbered in sequence to indicate progression on a trail, or (a number or name of a trail bearing that number or name) to indicate the trail being followed. Oversize symbol plates in the 18" or 12" category may use the 8" or 6" symbols respectively in place of text.

### Safety

All uniformed personnel should be schooled in bicycle safety. There are numerous bicycle accidents each year that should be prevented. The number of bicycle accidents in the United States last year that required emergency room treatment was over one million. The estimated number of people killed while riding a bicycle was around 850.

Many states have inadequate rules and regulations concerning the bicycle. Some states have left the traffic laws regulating the operation of bicycles up to the towns, cities and local municipalities. The laws pertaining to the bicycle in some states were passed years ago when the bicycle was considered a toy and an automobile doing 25 miles an hour was going like a "bat out of hell." The bicycle is a vehicle. Bike drivers should be subject to the same traffic laws as automobile drivers. In national parks there will be no distinction between automobiles and bicycle violators.

Safety rules tell bicycle riders what they should do. Traffic laws tell them what they must do.



### General

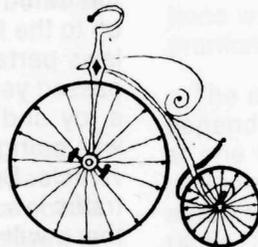
- A bicycle is clean, efficient and economical and would be excellent to use between facilities that are more than 5 miles apart.
- All bikeways should be a minimum of three-fourths of a mile and the maximum length as long as feasible.
- Bicycle licensing will not be required on paths or trails. If a state, county or city has jurisdiction over a highway through the park, licensing will be the responsibility of that authority.
- Motorcycles will not be allowed on bicycle paths or trails. The motor creates a noise disturbance and unsafe conditions would prevail.

## AVERAGE CONSTRUCTION COSTS

5,280 ft. long x 10 ft. wide

52,800 S. F. = 5,900 S. Y.

a. Clear and Grub - 2 acres	\$4,000
b. Excavation (6" average) - 1,000 C. Y.	2,000
c. Grading - 5,900 S. Y.	6,000
d. Aggregate Base (4") - 5,000 S. Y.	9,000
e. Asphalt Surface (2") - 5,900 S. Y.	15,000
f. Drain Pipe (12") - 300 L. F.	4,000
g. Drainage Ditch - 1,400 L. F. (not paved)	4,000
h. Topsoil and Seed - 1,800 S. Y.	3,000
i. Signs	<u>500</u>
	<b>\$47,500</b>



## REFERENCES

1. Haldon L. Smith. "Ann Arbor Bicycle Path Study," Ann Arbor, Michigan, (July 1972)
2. Julian Rinehart. "The Bicycles are Hers." *The Balance*, Department of Interior, Bureau of Outdoor Recreation, Denver, Colorado, November 1971. 8p.
3. American Institute of Park Executives, Inc., *Bike Trails and Facilities: A Guide to Their Design, Construction, and Operation*, Walter L. Cook. Published by The Bicycle Institute of America. (no date) 52p.
4. Bicycle Institute of America, *Boom in Bike-ways*, New York, New York, Vol. 6 #2, 1971.
5. Bicycle Institute of America, *Boom in Bike-ways*, New York, New York, Vol. 7 #3, 1972. 9p.
6. Bicycle Institute of America, *Boom in Bike-ways*, New York, New York, Vol. 7 #4. 8p.
7. State of California Department of Public Works, Division of Highways, *Bikeway Planning Criteria and Guidelines*. April 1972. 175p.
8. Oregon State Highway Division, *Footpaths and Bike Route Standards and Guidelines*, January 1972. 35p.
9. Illinois Secretary of State, *Illinois Bicycle Rules of the Road*. (No date) 80p.
10. Bicycle Institute of America, *Pedal Primer*, New York, New York.
11. City and County of Denver, *The Bikeway Plan*. October 1972. 66p.
12. Vincent R. Desimone, *Planning Criteria for Bikeways*, presented at the Metropolitan Association of Urban Designers and Environmental Planners, San Francisco, California, December 13-15, 1972.