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PARKWIDE BICYCLE TRAIL STUDY/TRAFFIC SAFETY STUDY/
ENVIRONMENTAL ASSESSMENT

CAPE COD NATIONAL SEASHORE
Massachusetts

Draft Study
April 1987



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SUMMARY

Cape Cod National Seashore is on the outer portion of the peninsula that juts into the Atlantic Ocean from eastern Massachusetts. The national seashore offers a variety of recreational opportunities and protects over 43,000 acres of ocean frontage, uplands, tidal marshes, bays, and cultural features. Adjacent, similarly composed lands outside the seashore boundary encompass the majority of developed private and commercial activities on the lower cape.

The need for a bicycle trail at Cape Cod National Seashore was identified in the "Master Plan" (NPS 1970) for the seashore. In the 1978 and 1983 outdoor recreation studies, the commonwealth of Massachusetts also targeted the cape as an area that needed bicycle trails for recreation purposes. Significant increases in population and tourism in the last 30 years on the cape have resulted in traffic congestion and bicycle/vehicle conflicts on existing roads, especially on US 6--the only major highway on the lower cape.

This Parkwide Bicycle Trail Study/Traffic Safety Study/ Environmental Assessment has been prepared by the National Park Service to address these needs and conditions and presents a preferred corridor location for a bicycle trail network on the lower cape; it also presents two alternative corridor locations. The generally north-south preferred corridor location provides a destination-oriented transportation route and loop or connector trails for access to town and national seashore areas for more recreation-oriented use.

Each of the three alternative trail corridors has a main stem, which begins at Le Count Hollow Road in Wellfleet (at the terminus of the proposed extension of the Cape Cod Rail Trail) and goes to Provincetown, and loop and/or connector trails. Each alternative also integrates the existing NPS bicycle trails and the existing and proposed Cape Cod Rail Trail system into the proposed trail network.

The preferred bicycle trail corridor location (alternative A) would use the US 6 right-of-way as the main stem of the trail, with the bicycle path separated from the existing roadway. Loop and connector trails would go from the main stem to various locations including town centers, NPS facilities, and other places of interest. Under the preferred alternative A, destination-oriented bicyclists would have a direct route from the Cape Cod Rail Trail terminus to Provincetown and recreation-oriented bicyclists would have a variety of loop and connector trails for access to and through various places of interest.

The main stem in alternative B would be on town-owned and NPS-managed roads and trails and would traverse the lower cape through a more indirect route than in alternative A, going through more natural areas. Alternative B would include loop and connector trails to many locations that are similar to those in alternative A.

The main stem in alternative C would be primarily on NPS-managed roads, trails, and undeveloped lands. Connector trails would go from the main stem, which would be mostly along the ocean side of the seashore, to a few town centers. Connectors to activity areas would be more limited.

Costs for the development of the bicycle trail and connector/loop trails for any of these corridors would be divided among the National Park Service, the commonwealth of Massachusetts, and the towns of Eastham, Wellfleet, Truro, and Provincetown, depending on the specific trail segment locations and ownership.

All three alternatives would promote bicycle use on roadways or paths other than the existing US 6 roadway. This would create a safer transportation system for drivers and bicyclists on the lower cape and would increase recreational opportunities for visitors and residents in the national seashore and surrounding area.

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PURPOSE AND NEED

Tourism, especially in the summer, has become a major economic force on Cape Cod. The number of residents on the cape has also increased at a very high rate over the last three decades. The effect of increases (in population and visitors) on Cape Cod has been increased vehicular and bicycle traffic on the existing road system, increased demand for visitor support facilities, and a need for an alternative safer way of traveling on the cape, especially during the crowded summer season.

The "Statewide Comprehensive Outdoor Recreation Plan" (SCORP) (Commonwealth of Massachusetts 1978) has identified bicycling as one of the three most popular activities. Bicycling and nature walks had the most significant deficit of facilities statewide, and Cape Cod was one of the sections that had the most critical needs. The Outdoor Heritage of Massachusetts (SCORP) (Commonwealth of Massachusetts 1983) reaffirmed the need for bicycle facilities. Trail-oriented activities were explained to be one of the major current and future needs.

Bicyclists use US 6 creating conflicts with vehicles on the sometimes narrow two- and three-lane road. Where shoulders are narrow or nonexistent, bicycles must travel on the vehicular traveling surface. On the four-lane sections in Eastham bicyclists generally use the vehicular traveling surface rather than adjacent sidewalks because driveway access cuts have produced a very uneven traveling surface. With the expanding automobile and bicycle use on Cape Cod, motorists often encounter delays and must move into adjacent lanes to pass bicyclists; some bicycle/automobile accidents occur.

The Boston-Cape Cod Bikeway goes from Boston to Provincetown. As part of this bikeway, the commonwealth of Massachusetts is building the Cape Cod Rail Trail, which will extend from the town of Dennis to Le Count Hollow Road in Wellfleet when completed. A 5-mile portion of the 24.6-mile Rail Trail that is adjacent to and on national seashore land--from just opposite the NPS Salt Pond visitor center in Eastham to Le Count Hollow Road--is not yet constructed. The Rail Trail has led to increased bicycle use on the cape and, when finished, the 5-mile portion will bring riders into the heart of the national seashore. The Rail Trail provides a safe corridor for bicyclists; however, it does not provide safe accesses to many area cultural and scenic resources. The secondary accesses from the Rail Trail are on town roads that have heavy automobile traffic and were not designed for use by bicyclists. The portion of the Boston Cape Cod Bikeway north of the Le Count Hollow Road uses low-volume local roads and two segments of the US 6 corridor, which, as described above, creates traffic congestion and safety problems. No safe bicycle corridor in or adjacent to the seashore exists from the proposed terminus of the Rail Trail to Provincetown, and no safe connector routes are available for accessing cultural or scenic resources.

These considerations, a concern for visitor/resident safety, and the limited number of roads and parking have resulted in the need for a trail system for the lower cape.

The main purpose of this study then is to meet existing and future needs by determining the location of a bicycle corridor that will provide a safe transportation route from Le Count Hollow Road to Provincetown and safe connector routes to various area cultural and scenic resources from Eastham to Provincetown. The route will also serve as an alternate transportation system for permanent and seasonal residents of Cape Cod who are affected by the continuing increase in population and traffic. The study identifies connector routes to NPS facilities, town centers, and other places of interest and provides connections to the Rail Trail and existing NPS bicycle trails at Eastham, Truro, and Provincetown.

Potential points of origin and destination have been identified and analyzed in this study. Origins include town centers, the Rail Trail terminus, bike rental shops, parking lots at visitor areas, and newly created parking lots. Destinations include beaches, natural features, cultural features, scenic vistas, picnic areas, visitor centers, youth hostels, campgrounds, and services in towns.

Trail users have also been identified. Riders differ in their riding ability, stamina, and/or desired length of trip. Some may rent bikes and others may bring their own. Some people may bike the entire trail length, but others may prefer shorter trips. Within the four towns are elementary, middle, and high schools. The proximity of these schools to town and seashore facilities make students another component of the users who must be included in proposed development of bicycle trail corridors. The mixture of different users is important when determining trail origins and destinations.

Unwanted types of use on bicycle trails, such as motorbikes, have also been identified and addressed in this study. Although the trail is intended primarily for bicycles, hiking--particularly near other recreational facilities--is inevitable and was considered.

Trail maintenance and protection from vandalism were considered throughout the study.

ISSUES

One of the most significant issues for this transportation corridor is safety. Currently automobiles and bicycles on the same roadway create traffic congestion and conflicts between bicyclists and drivers. The proposed extension of the Rail Trail into the seashore will intensify these conditions by encouraging more bicyclists. Numerous east-west roads will inevitably bisect any extension of a north-south bicycle trail corridor, and intersections should be treated to maximize safety.



VICINITY

Cape Cod National Seashore
 UNITED STATES DEPARTMENT OF THE INTERIOR/
 NATIONAL PARK SERVICE

DSC/JANUARY 1987/609-40,027A



- Authorized National Seashore Boundary
- * National Seashore Beach
- * Town Beach

Another major issue is the corridor location. Where people want to go must be identified and considered. Will users of the bicycle trail corridor be more interested in reaching specific destinations or will they be more interested in recreational use? Will the corridor be used as a transportation route from residence to work? Will users want direct access from town to town? A questionnaire was distributed to obtain answers to these and other questions (see appendix C for a summary of that information).

One of the most difficult issues is the location of the bicycle trail corridor on nonfederal land. Federal land acquisition is constrained by legislation (refer to "Landownership and Uses" section) and availability of funds. This trail study explores, along with federal acquisition, alternatives for establishing the right-of-way, which may include assistance by the state, local towns, private groups, donations of easements, or a shared trail along existing roads.

Availability of funds for construction of trail segments is another concern because of limited money at all levels. This has been addressed by dividing the total costs by jurisdictions.

Another significant issue is ensuring that the trail does not adversely affect sensitive natural or archeological areas. This is done through corridor location and trail design. Potentially significant archeological areas, especially at Nauset Bay and High Head, require careful evaluation to minimize potential impacts. Sensitive areas must also be protected, and it has been necessary to consider paralleling existing roads, including US 6.

TRAFFIC AND SAFETY ANALYSIS

A major element of this study is the assessment of the safety of the existing trail and roadway systems. Traffic and accident data have been collected and analyzed to evaluate high accident locations on seashore roads and bicycle trails and to identify conflict points. Accident data has been analyzed by location, type, frequency, and time of day, and accident location maps were developed. Traffic and accident data on US 6 was also reviewed. This analysis provided information to help develop safe alternative trail corridor locations (see "Traffic Safety" section).

OVERVIEW FOR THE STUDY

BACKGROUND

Cape Cod peninsula, with several unique landscapes, is a dynamic mix of natural processes and man's activities. The peninsula juts out from the mainland into the Atlantic Ocean and creates Cape Cod Bay. The physical features have influenced man's use of the area. From a sparsely settled, fishing-oriented region, Cape Cod has developed into a heavily used, tourism-oriented area. It is in this complex integration of natural and cultural processes that Cape Cod National Seashore was created.

Legislative History

Cape Cod National Seashore was authorized on August 7, 1961 (PL 87-126) to preserve unique flora and fauna, physiographic conditions, and historic sites and structures for public enjoyment and understanding. Although no development for visitor convenience is to impair these resources, the establishment of trails, observation points, exhibits, and services is specified as important. The 1961 legislation reinforces this balance between preservation and development by further citing the organic act of August 25, 1916, which establishes the National Park Service and mandates conservation of resources for public enjoyment and future generations, and the act of August 8, 1953, which facilitates management of the national park system.

The 1961 legislation, which is specifically for Cape Cod National Seashore, provides authority for acquisition of land and a procedure for zoning to protect land without acquisition. Government condemnation of land is restricted in several ways. Town or commonwealth of Massachusetts property can only be purchased with the consent of the owner. Federal lands can be exchanged. If residential property improved prior to September 1, 1959, is acquired, owners may negotiate to retain use and occupancy for life or 25 years. Improved residential property within seashore boundaries is exempt from condemnation if it conforms with town zoning that meets the standards of the secretary of the interior. The implementation of this legislation has resulted in several blocks of federal land interspersed between town and private property. Locating the bicycle trail corridor among the various landownerships is subject to these restrictions. Another pertinent part of the legislation requires that NPS development will not diminish the value or enjoyment of improved residential property.

Planning History

The approved "Master Plan" (NPS 1970) provides for development of a bicycle and hiking trail for the length of the seashore. It was envisioned to provide internal circulation and access and to expand popular recreational opportunities. The trail was proposed to run from Eastham

GENERAL



Cape Cod Rail Trail, Commonwealth of Massachusetts



Nauset Bicycle Trail, Cape Cod National Seashore



Touring group rest stop, Salt Pond visitor center



At-grade crossing, Nauset Trail and local road

to Provincetown, connecting three existing NPS bike trails (totaling 11 miles) and adjacent towns to beaches. The location of the corridor was only conceptual in the master plan. The need to acquire private land to provide part of this trail was identified in the plan and was listed as one of the top priorities for the future needs of the seashore.

EXISTING CONDITIONS

The future of Cape Cod National Seashore is interwoven with the towns in which it exists. Within the designated seashore boundary nearly 10 percent of the upland area and 25 percent of the tidal lands remain in private, state, town, or other federal ownership. The forces that are affecting the future of entire lower cape therefore affect the national seashore. Any successful bicycle trail plan for the national seashore will depend not only on the commitment and resources of the National Park Service, but also on the commitment and resources of the local towns, the commonwealth, Barnstable County, and local individuals.

Cape Cod serves a local as well as a regional and national audience. Therefore, the proposed bicycle trail needs to provide for recreation, destination, and touring uses, and the proposed trail corridor network should provide access to, through, and beyond the seashore boundary.

Cape Cod has a diversity of landscapes, cultural centers, and historical resources, many of which are beyond the national seashore boundaries. Many of these features provide parts of the story, and they should be available and accessible to help visitors and residents understand the span of nature and culture represented.

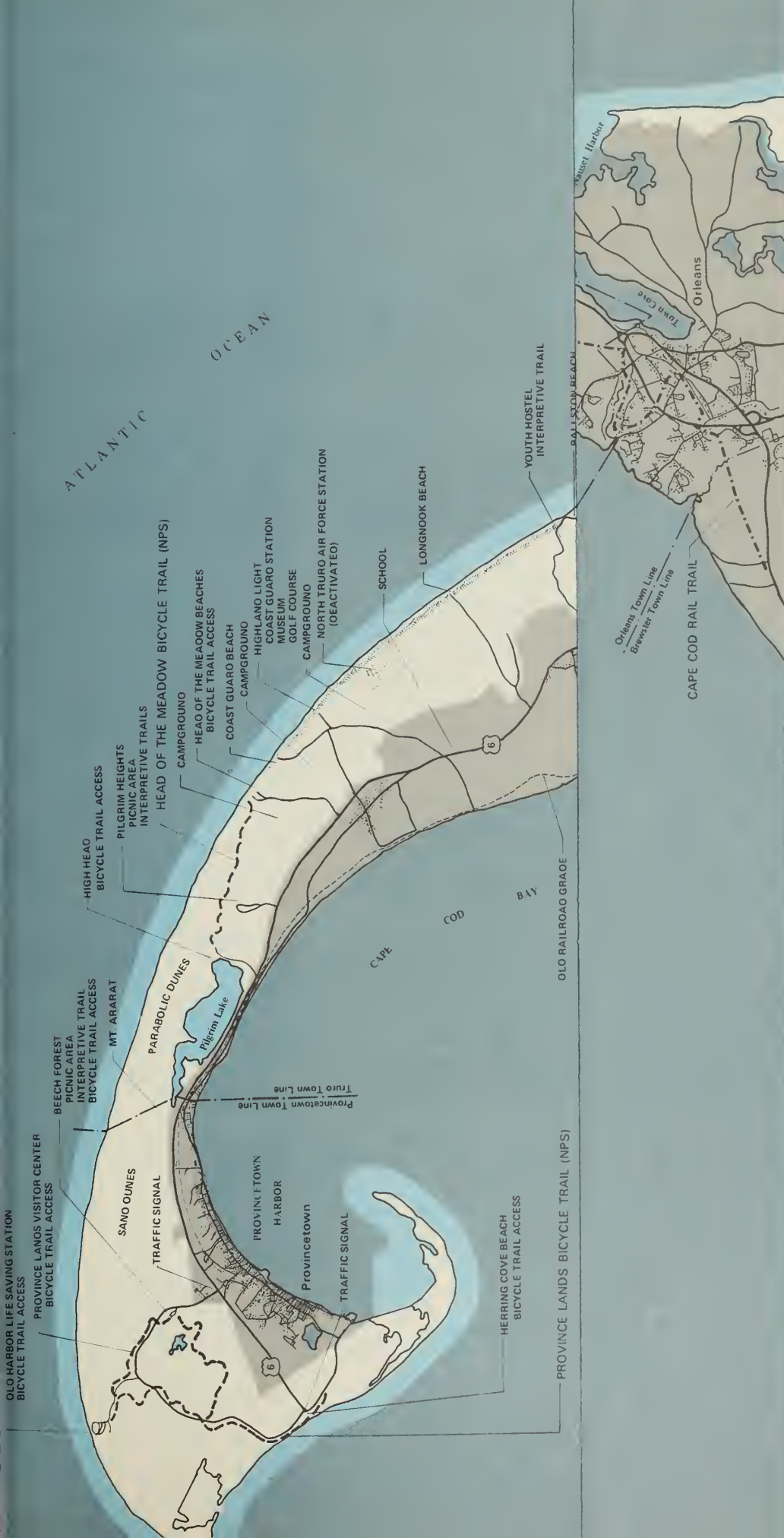
Transportation to Cape Cod National Seashore is by airplane, ferry, automobile, bus, and bicycle. Provincetown and Hyannis airports receive commuter flights. A ferry makes a round-trip once daily from Provincetown to Boston during the summer season. The major transportation vehicle, however, is the private automobile. The narrow, linear layout of the cape has restricted automobile traffic to one highway on the lower cape--US 6--from Orleans to Provincetown. US 6 functions as the main highway, with secondary accesses to the towns, beaches, and other cape resources. During off-season use, US 6 is adequate, but during summer high use days demands often result in sections of US 6 reaching capacity and traffic being slowed well below posted speed limits. The greatest congestion along US 6 on the lower cape during the summer occurs near the Wellfleet and Eastham town centers.

Biking and hiking trails have been developed on the cape, and some also exist within the national seashore. The Rail Trail is on an old railroad grade where the gentle topography affords access to hikers, bicyclists, and horseback riders (motorized vehicles are not allowed on the Rail Trail). Visitors use the Rail Trail to see different areas and reach destinations because it offers a safer alternate route that bypasses many of the heavily congested areas. However, the secondary accesses from the Rail Trail to beaches, accommodations, and cultural and natural

resources are not as safe because they are on town roads that have heavy automobile traffic and are not wide enough for bicyclists because they were not originally designed for that use. Plans are being finalized by the commonwealth to extend the Rail Trail north to Le Count Hollow Road in Wellfleet; beyond that the existing railroad grade is in mixed ownership and there are no plans to extend it beyond Le Count Hollow Road.

Within the national seashore are three bike trails. The Nauset trail (1.6 miles) follows Nauset Bay to Coast Guard Beach from the Salt Pond visitor center and passes close to Doane Rock and its picnic area. A variety of environments can be experienced, including oak-pine forest, the scattered red cedar fields, and Nauset Bay. The Head of the Meadow trail (2 miles) is almost level and was part of the route to Provincetown called the Old Kings Highway; it runs from Head of the Meadow Beach to High Head Road at Pilgrim Lake and passes Pilgrim Spring. The Province Lands trail is a loop trail (5.3 miles) with spurs to Race Point, Herring Cove, and Bennett Pond (2 additional miles). It passes ponds, pine forests, sand dunes, Beech Forest, and the Province Lands visitor center and amphitheater.

Visitor use on Cape Cod varies greatly in type of use and in numbers of users. The natural resources of the cape provide opportunities for hiking, biking, beachcombing, swimming, berry-picking, bird-watching, and hunting. For its relatively small size, the cape has a number of major landscape types--the great beach, the plain, the marshes, and Cape Cod Bay--and within these landscapes are many areas that provide additional diversity and potential for visitor experience and interpretation. (These landscapes are described in more detail in the "Affected Environment" section under natural resources.) A number of historic homes, lighthouses, and wharfs are also available to enjoy. As a result of this rich variety, tourism has become a major economic force on Cape Cod. The popularity of the area, especially for summer vacations, has increased steadily since the 1950s. Peak summer visitation on Cape Cod runs from the end of June through Labor Day. The peak visitor season is also the most crowded period in relation to traffic on all Cape Cod roads. (The "Visitor/Resident Use" section contains more detail on visitation and use.)



Bicycle Trail Corridor EXISTING CONDITIONS

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
OSC/SEPTEMBER 1986/609 40 .066A



ALTERNATIVES

INTRODUCTION

Several objectives were addressed during the development of these alternative bicycle trail corridor locations. An additional transportation method is needed because of high traffic volumes on US 6 during summer months and bicycle/vehicle conflicts and congestion on that road during the same period. The popularity of bicycle use on the cape is increasing. Access to destination points (beaches, town centers, NPS facilities, etc.) is limited to the existing road and trail system. Potential users of a new system include long-distance riders and touring groups as well as recreation-oriented cyclists ranging from experienced riders to those less skilled. The widest possible diversity of access and destination points is important in the bicycle trail system so that the greatest number of people can use the trail.

The many jurisdictions involved on the lower cape were identified and consulted during the development of the alternatives (see appendix B). Successful implementation of the trail system will require coordinated efforts and future agreement by all parties on the final corridor location and the trail segment types.

The construction and maintenance costs of each trail segment will be borne by each respective jurisdiction, and the financial burden will not be on one party. The National Park Service can only construct a bicycle trail on land where it holds some legal ownership (fee title or easement); because of the complex landownership, it is nearly impossible for the National Park Service to construct a trail system that would go to all desired areas. A coordinated effort among jurisdictions is essential to the eventual completion of a bicycle trail system on the lower cape.

The use of transportation and recreation in relation to the type of trail use is discussed in the general descriptions on use and visitor experience in each alternative. In a general sense all trails can be considered recreational in nature because bicycling is considered a recreational activity. However, in some cases where the objective of the cyclists is to get from one point to another as quickly as possible, the use of a bicycle is considered another mode of transportation.

ACTIONS COMMON TO ALL ALTERNATIVES

The three action alternatives (A, B, and C) include common components. The beginning point for the main stem in each alternative is the end of the proposed Rail Trail extension at Le Count Hollow Road. Each alternative is broken into trail segments to adequately describe each trail corridor component. A general description, a map, and a table describing each component part of each alternative is provided.

Because of landownership complexities, each trail segment would be one of three types; this is also shown on the map table for each alternative. The trail types are:

bike path--a bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way

bike lane--a portion of a roadway that has been designated by signing and pavement markings for the preferential or exclusive use of bicyclists

bike route--the designation of an existing roadway for bicycle use with signs and directional markers denoting their use by bicycles in combination with vehicles

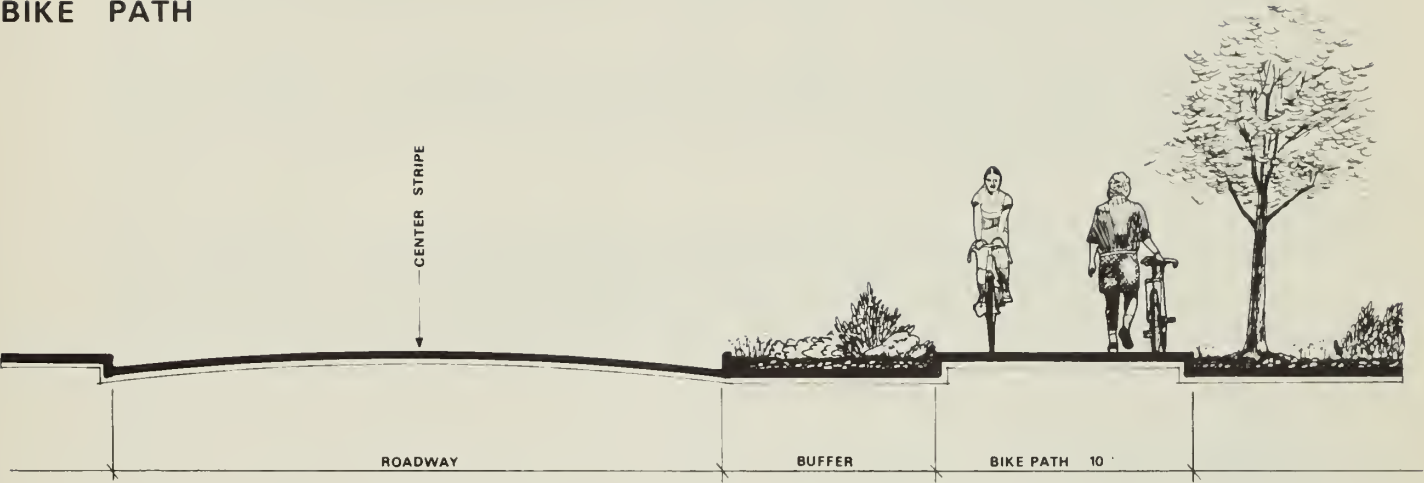
Signs, signals, and markings for the bicycle corridor would conform with required standards and guidelines. A general outline of bikeway design guidelines can be found in appendix E. Bike paths would be 10 feet wide, bike lanes would be 5 feet wide on each side of the vehicular traveling surface, and bike routes would require signs to designate existing roads for bicycle use. All trails would be asphalt on a gravel base unless special structures are required. Bike paths and lanes would be for nonmotorized use only. Bikeway design guidelines call for a 3-foot minimum clearance of vegetation on each side of a bike path. This has been increased from 2 feet to allow for horseback riding on the main stem--a continuation of a use on the Rail Trail. Because of the potential conflicts between bicycles and horses, horse use may be restricted on some parts of the trail. The trail would not be built within 150 feet of the escarpment on the ocean side along the great beach and would avoid going through wetland areas where possible. The standard no-hunting zone of 150 feet on each side of the trail would exist in relation to all trail segments; all hunting regulations would be in effect.

Trail corridors would not impact improved properties, which are defined in Cape Cod National Seashore legislation (see "Background" section and appendix A). Adjustments to avoid private properties might be necessary during the design phase for the trail segment. Easements might be sought for access to federal lands or to enable the National Park Service to construct various trail segments.

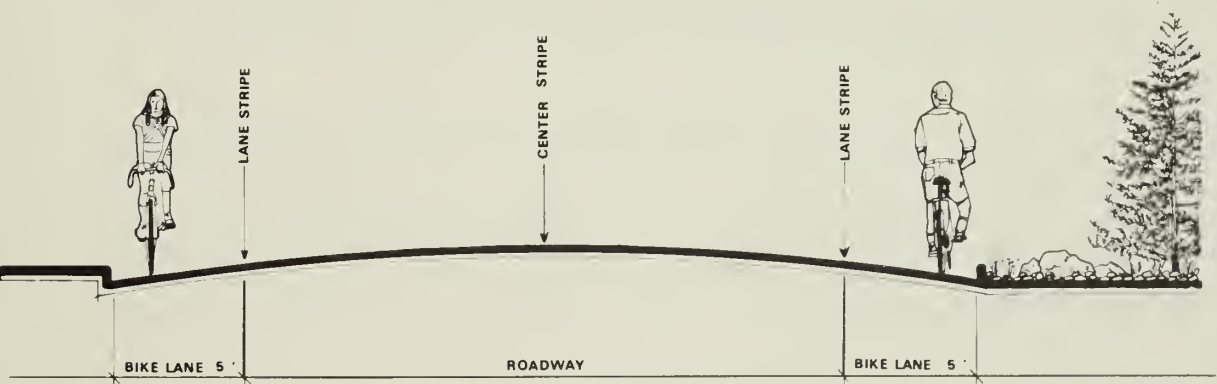
The conversion of some sand roads to bicycle trails may require alternate accesses to private properties or adequate trail construction for simultaneous car and bicycle use. Roads designated as Massachusetts Scenic Roads in Wellfleet (Old Kings Highway, Duck Pond Road, and Black Pond Road) would not be affected by trail construction or tree removal without approval of the town where the road is located.

Specific improvements to existing NPS bike trails (reducing grades and changing curves and alignments) are the same in all alternatives. Changes to each trail follow. Specific trail changes for the Nauset and Province Lands trails can be found in appendix F.

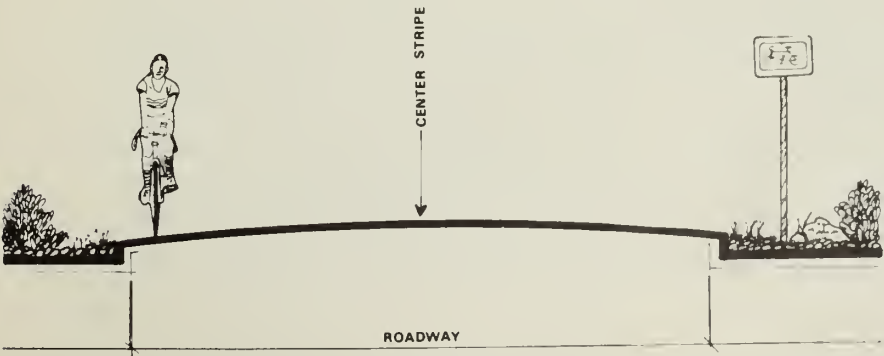
BIKE PATH



BIKE LANE



BIKE ROUTE



Head of the Meadow Trail--Widen entire length to 10-foot-wide paved travel surface, improve sight distance by vegetation removal.

Nauset Trail--Widen entire length to 10-foot-wide paved travel surface, improve sight distance by vegetation removal along curves, and remove several groupings of vegetation for views of Nauset Bay.

Province Lands Trail--Widen trail along Province Lands Road to 10-foot-wide paved travel area, improve surfacing on hills, and improve sight distance by vegetation clearance. Widening of Race Point Road for bike lanes is proposed in all alternatives. After lanes are added, the existing trail that parallels Race Point Road could be removed.

COMPLIANCE

Under all of the alternatives, new construction activities related to the bicycle trail and parking areas would comply with the National Environmental Policy Act. Preparation of the environmental assessment part of this study provides for compliance with many laws and executive orders. Site-specific evaluations would be necessary prior to construction for any trail segments that might affect designated wetlands. Critical natural resource areas have been avoided in the development of alternatives.

Compliance with section 106 of the National Historic Preservation Act, as amended, would be accomplished by the review of this study. No known significant prehistoric or historic sites would be affected by the alternatives. Archeological evaluation of areas disturbed during the construction of new parking areas or bike paths would occur prior to construction. Adjustments of trail locations might be necessary to avoid significant or sensitive sites.

ALTERNATIVE A - US 6, THE PREFERRED

The trail in this alternative would primarily be focused on the placement of the main stem adjacent to but separated from US 6, with secondary loop and connector trails on the east and west sides of the main route. The main stem would be easily accessible from all roads along US 6. By connecting to the northern terminus of the Cape Cod Rail Trail, a direct transportation route from Le Count Hollow Road to Provincetown would be provided. The entire length of the main stem and its secondary components would be 58 miles (see Alternative A map and map table).

The rationale for design and placement of this alternative includes having a trail that functions equally as a transportation system and a recreation system. The main stem, paralleling US 6, would provide a convenient, direct access route. Secondary connectors extending from the main stem

would encourage a slower, more relaxed form of recreational bike riding. Alternative A is the most extensive corridor system in terms of length and number of destinations. Because of its many destinations, this alternative would cross public properties under many different ownerships and therefore would demand close cooperation among local, state, and federal agencies. This alternative emphasizes using existing roads and previously disturbed areas rather than intruding on the remaining natural areas.

The trail user would experience fairly easy grades in most locations, and this alternative would offer trails through all the major landscapes of the cape. The bicycling experience on the main stem would be affected by the flow of traffic on and from US 6. Minimal noise and distractions from passing vehicles would occur; of greater impact would be the continual noise, exhaust vapors, and the presence of vehicles turning into roads, driveways, and parking areas. Safety would be of primary concern because of multiple, at-grade crossings and the close proximity of heavy traffic. Intersections of the trail and roadways that connect with US 6 would need to be carefully designed.

It is anticipated that sight-seeing and pleasure riding would be secondary uses of the main stem in this alternative. The typical user groups for the main stem would be long-distance riders and touring groups. Shorter-distance recreational users would most likely frequent the loops and connectors, but all groups of users could use parts of the main stem to go short, medium, or longer distances on trails or roads to any destination. Views of the ocean and Cape Cod Bay would be from the loop trails on Ocean View Drive and at Marconi Station, Duck Harbor, Highland Light, and Wellfleet, Pamet, and Provincetown harbors.

Designated trailhead parking for bicyclists would be at seven existing parking areas at Salt Pond visitor center, Little Creek, north of the national seashore headquarters building, Head of the Meadow Beach, Pilgrim Spring, Beech Forest, and Herring Cove. Three new parking areas would be constructed, one at Long Pond Road and the national seashore boundary, one at Pamet Point Road and US 6, and one at North Pamet Road and the national seashore boundary.

Main Stem

The 18.1-mile main stem of the trail would follow US 6 on the east and cross to the south side of the roadway near High Head Road within the existing right-of-way; it would be a separate path at least 15 feet away from the vehicular road surface in most areas. In narrow areas, such as the Main Street intersection in Wellfleet, the trail would be separated from the traveled road surface by barriers. Adequate site distance would be required for crossing intersecting roads. The right-of-way for US 6 is under the jurisdiction of the commonwealth of Massachusetts, including the area from Le Count Hollow Road to the national seashore boundary in Provincetown. The National Park Service would be responsible for the trail along US 6 from the seashore boundary to Herring Cove Beach.

ALTERNATIVE A



US 6 at Main Street, Wellfleet — main stem is on right side



US 6 — main stem of bicycle trail on left side of road



Long Pond Lake — destination point



Ocean View Drive and Coast Guard Beach — loop trail

ALTERNATIVE A MAP TABLE

Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
MAIN STEM									
A1	US 6	End of proposed Rail Trail extension (Le Count Hollow Road) to Herring Cove Beach	State of Massachusetts and NPS	18.1	Varies from two lanes to four with divided highway	80'-300'	In process of being upgraded and widened to four lanes in wellfleet	Bike path ^b	Locate on east side of US 6 to new traffic signal at High Head Road; trail crosses to south side in US 6 right-of-way to end. Many at-grade crossings.
SECONDARY TRAILS									
A2	Governor Prentice Road	Rail Trail to Fort Hill parking lot	Eastham/NPS	1.1	20'	30'	Fair to poor; narrow shoulders	Bike route ^d	Access to Penniman house and interpretive trails; good views. Change flashing signal at US 6 to push-button.
A3	Little Creek	Nauset Trail to Little Creek parking lot	NPS	.2	New	All NPS	New construction	Bike path	Crosswalk at Doane Road. Trailhead parking.
A4	Ocean View Drive	Doane Road to Cable Road	Eastham	1.1	20'	60'	Narrow, shoulders warped and cracked	Bike lane ^c	Ocean views, with beaches at each end. Three Sisters Lighthouses will be placed nearby. Access to Nauset bicycle trail at Coast Guard Beach. Easement needed for road widening.
A5	Cable Road	Ocean View Drive to Nauset Road	NPS	1.0	21'	40'	Good	Bike lane	Several adjacent private properties. Access to Nauset Light Beach.
A6	Nauset/Brackett Roads	Cable Road to Massasoit Road	Eastham	1.4	22'	40'	Good	Bike route	Already posted as bicycle route. Existing signal at Brackett Road for crossing US 6.
A7	Massasoit Road	Brackett Road to Audubon sanctuary entrance on West Road	Eastham/Wellfleet	2.0	18'-20'	40'	Good	Bike route	Residential neighborhood.
A8	Audubon sanctuary entrance road	From sanctuary to Rail Trail	Audubon/Wellfleet	.6	10'/16'	Audubon/25'	Condition of pavement is good but narrow	Bike route	New signal needed on US 6.
A9	Marconi Beach Road	Rail Trail to beach	NPS	1.5	23'	All NPS	Good	Bike lane	Beach access.
A10	Marconi Station Road	Marconi Beach Road to Marconi Station site	NPS	1.0	21'	All NPS	Good	Bike lane	Trailhead parking behind seashore headquarters, interpretive trail access, good views.

a. Additional pavement for bike lanes will be necessary if existing width is less than 25 feet

b. Separate bicycle trail

c. Designated part of roadway used only for bicycles

d. Combined bicycle and vehicle use of roadway

Use This Table With Alternative A Map

Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
A11	Le Count Hollow Road	US 6 to Ocean View Drive	Wellfleet	.75	22'	50'	Good	Bike lane	Terminus of Rail Trail extension. Parking area to be included. Beach access.
A12	Ocean View Drive	Le Count Hollow Road to Newcomb Hollow Beach	wellfleet	3.2	18'-20'	40'-50' (110' some places)	Good condition to Pilgrim Road, then problems with shoulders cracking and warping	Bike lane	Good views. Passes by many private properties and private ways. Access to three town beaches. Easement needed for road widening.
A13	Long Pond Road	Ocean View Drive to Lawrence Road	wellfleet	1.75	20'	40'	Fair to poor, some shoulder cracking and warping; curves	Bike lane	Rolling terrain. Good views of pond. Many private properties. Town beach at pond. Sight distance needs improvement. Easement needed for road widening. Trailhead parking at west end, inside boundary.
A14	Lawrence Road	Long Pond Road to US 6	wellfleet	.2	26'	40'	Good	Bike lane	Access to school and senior center. Use of existing signal to cross US 6.
A15	Mill Hill Road/ Briar Lane	US 6 to Chequessett Neck Road	wellfleet	.8	18'-20'	25'	Good	Bike route	Connects to US 6 at existing signal. Access to town center; residential area, with numerous driveways, and cross-streets. Thickly settled.
A16	Chequessett Neck Road	From Briar Lane to Griffin Island Road	wellfleet	2.3	18'	40' (100' over bridge)	Good	Bike route	Residential and commercial areas. Views of harbor. Access to Great Island trails and picnic area.
A17	Griffin Island Road (departs from road)	From Chequessett Neck Road to Duck Harbor parking lot	NPS	1.5	New	NPS land, 40' right-of-way on planned road	New construction	Bike path	Views of bay. New access off road on previously leveled road. Some private property nearby. Will connect to new Duck Harbor parking lot from high point on bay side of land.
A18	Pamet Point Road	US 6 to Atwood-Higgins complex	wellfleet	1.4	16'-18'	35'-40'	Fair, some cracking and warping on shoulders	Bike route	Private properties north and south of road. Access to Atwood-Higgins historic complex. New traffic signal and trailhead parking at US 6.
A19	Old Kings Highway/ Collins Road	US 6 to South Pamet Road	Truro	2.2	28'	40'	Good, narrow at south end	Bike route	Wide, flat road with easy grades. Narrow at south end.



Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
A20	South Pamet Road	US 6 to Ballston Beach	Truro	1.6	18'-20'	40'	Good, some curves	Bike lane	Access to Ballston Beach. Many adjacent private properties.
A21	Depot Road	US 6 to Pamet Harbor	Truro	1.2	18'	30'	Fair to poor condition, some cracking and warping	Bike route	Views of Pamet Harbor. Many adjacent private properties. Includes part of Old County Road. Access to town center.
A22	North Pamet Road	US 6 to Youth Hostel	Truro	1.5	18'	36'	Cracking, warping on shoulders, gently rolling	Bike route	Access to youth hostel and interpretive trail. Many adjacent private properties. Restrict traffic to local use and bicycles through cooperative agreement with town. Trailhead parking west end.
A23	Smalls Hill	North Pamet Road to Higgins Hollow Road	NPS	1.8	10'-14'	All NPS	Trail and sand road	Bike path	Access to remote area. Good views. Need to avoid one private property.
A24	Higgins Hollow Road	Higgins Hollow sand road to US 6	Truro	.8	20'	30'	Fair	Bike route	Some private properties.
A25	South Highland Road	US 6 to Highland Light Coast Guard Station	Truro	1.5	25'	60'	Good	Bike lane	Wide road; needs only restriping of existing paved surface. Access to lighthouse, museum, campgrounds, golf course, and private properties. Good views.
A26	Coast Guard Road	South Highland Road to Coast Guard Beach	Truro	.8	25'	40'	Good	Bike lane	Wide road, restripe for lanes. Access to town beach.
A27	Old Kings Highway	Coast Guard Road to Head of the Meadow Beach	NPS	.8	10'-12'	All NPS	Sand	Bike path	Crosswalk at Head of the Meadow Road to connect with existing bicycle trail. Access to town and NPS beach. Trailhead parking at NPS beach.
A28	High Head Road	Head of the Meadow Bike Trail to US 6	NPS and Truro	.8	New	All NPS	Poor road--narrow, subject to flooding	Bike path	Requires boardwalk to go through wetland; connects to existing bicycle trail. Access to residential area on adjacent roadway. New signal for main stem crossing of US 6 at west end of segment.



Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
A29	Pilgrim Heights Road	US 6 to picnic area	NPS	.7	20'	All NPS	Good	Bike route	Access to interpretive trails and picnic sites. Views toward Provincetown and bay. Trailhead parking.
A30	Race Point Road	US 6 to Race Point Beach/ US 6 to Provincetown	NPS/ Provincetown	3.0	20'	NPS/40'	Good	Bike lane from US 6 to Race Point Beach; route into town center	Eliminate existing bicycle trail adjacent to Race Point Road once lanes installed. Access to interpretive trails and existing bicycle trail; trailhead parking at Beech Forest. Beach and town center access.
A31	Moors Roads	South Herring Cove parking lot to Provincetown - MA 6A	NPS	1.4	23'	All NPS	New construction	Bike path	Access to beach and existing bicycle trail. Requires cutting through small dunes and use of retaining walls and boardwalk near pond. Trailhead parking at Herring Cove. Town access.





- PROPOSED TRAIL SEGMENT
- A1 SEE MAP TABLE, ABOVE
- DESTINATION POINT
- NEW TRAFFIC SIGNAL
- EXISTING TRAILHEAD PARKING
- NEW TRAILHEAD PARKING
- VIEW
- MARSH

Bicycle Trail Corridor ALTERNATIVE A

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Near High Head Road, the trail would cross to the south side of US 6 at a new traffic signal. New traffic control signals would also be installed at the loop trail crossing for the Audubon sanctuary and at Pamet Point Road. New traffic control signals on US 6 would have to be approved by the commonwealth; the need would be evaluated based upon further traffic analysis.

Secondary Trails

There would be 39.9 miles of loop and connector trails that would connect to the main stem. Approximately 19.25 miles would be NPS trails and 20.65 would be town trails. These trails could be paths, lanes, or routes depending on the specific segment (see Map Table Alternative A).

A connector trail would go from the Rail Trail to Fort Hill, using Governor Prence Road. The flashing signal at US 6 would be changed to a pedestrian activated traffic signal to allow for safe bicycle and pedestrian crossing at this busy location. The designation of this trail would provide additional access into an area with limited parking facilities.

Along with the existing Nauset bicycle trail, Ocean View Drive and Cable Road would be a loop trail from the proposed Rail Trail extension via Nauset and Brackett roads. A spur trail would go from the Nauset trail to the Little Creek staging area. Use of the existing traffic signal at Brackett Road would allow for another loop on the west side of US 6 off the Rail Trail on Massasoit and West roads to the Audubon sanctuary. A new traffic signal at US 6 would be needed to complete the loop on an existing town road and easement back to the Rail Trail.

The bike trail would provide access to both Marconi Beach and Marconi Station by connector trails from the Rail Trail.

Another loop trail would be along Le Count Hollow Road, Ocean View Drive, and Long Pond Road. A trail spur would continue on Ocean View Drive to Newcomb Hollow Beach. The loop trail would turn at Lawrence Road, east of Wellfleet Elementary School, to Gross Hill Road where riders could return to the main stem or cross at the existing traffic signal and go into Wellfleet.

An additional trail connector would go to Wellfleet town center and continue on Chequessett Neck Road to Great Island. From this area a separate trail would head north to Duck Harbor Beach on NPS property west of the existing paved road.

A connector trail would cross US 6 at Pamet Point Road, using the road to Bound Brook Island Road to the historic Atwood-Higgins complex.

Just north of the Wellfleet/Truro town line would be a loop trail on Old Kings Highway and Collins Road to South Pamet Road. The east spur on South Pamet Road would go to Ballston Beach. The west connector would join other trails at the Pamet River near US 6. One trail would be on

Old County and Depot roads ending at Pamet Harbor. The second trail on North Pamet Road would provide access to the youth hostel and the loop trail to Smalls Hill and Higgins Hollow.

Another loop trail would be the next component of this alternative. The trail would leave the main stem at South Highland Road and continue on South Highland Road to Coast Guard Road to its intersection with Old Kings Highway. This part of the Old Kings Highway would be converted to trail use to its intersection with Head of the Meadow Road, which is near the entrance to both Head of the Meadow Beaches parking areas. A marked bicycle crossing point would allow for crossing the road, and the trail would then connect to the existing Head of the Meadow bike trail. A spur trail would connect Coast Guard Beach to the loop trail. A short connecting trail would provide access to Highland Light, Highland Museum, and Highland Golf Course.

Upon reaching the north terminus of the Head of the Meadow trail the bike trail loop would continue through the High Head parking area to its intersection with the existing town road. An elevated boardwalk near the existing road would be constructed to keep the trail above the high water and wetland area of Pilgrim Lake. This boardwalk would continue to the main stem of the bike trail at US 6.

An access trail would be designated on the existing access road into Pilgrim Heights picnic area.

Connector trails would go from the main stem on Race Point Road to the existing Province Lands bike trail and on Conwell Street into Provincetown town center. The last connector in this alternative would go from the south Herring Cove parking area on Moors Road to MA 6A.

ALTERNATIVE B - EXISTING RIGHTS-OF-WAY

This alternative primarily uses existing rights-of-way that are managed by the National Park Service and the towns. The trail would be on existing road shoulders or on sand roads that are currently designated as trails or fire roads. The main stem would have a much more meandering route to reach its terminus in Provincetown than in alternative A. Most bicycle use would not be on US 6 but on the bicycle trail system proposed in this alternative. The total length of this alternative is 49.7 miles, which includes a 19.65-mile main stem (see Alternative B map and map table).

The rationale for design and placement of this alternative includes having a trail that functions more as a recreation system than as a transportation system. The main stem and secondary trails would provide an extensive system to a variety of destinations; however, the less direct main stem would less likely be used as a transportation corridor. Because this alternative would primarily use town roads and NPS rights-of-way, close cooperation between local and federal agencies would be necessary. This alternative emphasizes using existing roads and previously disturbed areas for most trail locations.

Trail users would experience a variety of grades in this scenic and nature-oriented route. Some new trails would go into national seashore conservation areas, thus opening several new areas. The main stem would pass the Wellfleet ponds, neighborhoods, the ocean, remote areas on Old Kings Highway, and return to more densely settled town centers. Views of the ocean and Cape Cod Bay could be seen from Ocean View Drives, Marconi Station, Highland Light, Duck Harbor, and Wellfleet Harbor. Riders would have easy access to major destination areas, such as beaches and town centers. Bicycling would be more leisurely and recreation-oriented, especially on the main stem, than in alternative A. Safety issues would be easier to resolve because at-grade crossings would occur on low-volume town roads and because of the use of road shoulders for trails.

Designated trailhead parking would be at existing parking areas at Salt Pond visitor center, Nauset Regional School (cooperative agreement needed), north of the national seashore headquarters building, Great Island, Head of the Meadow Beach, Beech Forest, and Herring Cove. Two new parking areas would be constructed at Pamet Point Road and Snail Road where they intersect with US 6.

Main Stem

The main stem would start at the Rail Trail on Le Count Hollow Road and go east to Ocean View Drive. It would continue north on Ocean View Drive, past White Crest and Cahoon Hollow beaches, and then turn west along Long Pond Road. At a sand road just outside the NPS boundary the main stem would turn north and follow the sand road to Gross Hill Road. From Gross Hill Road to Gull Pond Road construction on an existing sand road would again be needed. The main stem would then follow the Old Kings Highway sand road into Truro where it would join a paved portion of Old Kings Highway and Collins Road.

The main stem would then turn west, using South Pamet Road to the existing road crossing near US 6 to North Pamet Road; from North Pamet Road it would go north on a sand road that passes west of Smalls Hill to Higgins Hollow Road.

The main stem would continue west on Higgins Hollow Road to its connection with Longnook Road, which it would take east to its connection with another piece of the Old Kings Highway sand road. Continuing north on Old Kings Highway to South Highland Road and north on South Highland Road to the end of the existing Head of the Meadow trail the main stem would be like the loop trail in alternative A.

From the High Head parking area a new trail would be constructed on 3.1 miles of elevated boardwalk in the marsh area on the north side of Pilgrim Lake along the parabolic dunes. This would include staying in the dunes on the north side of Mount Ararat and turning south to meet US 6 across from Snail Road. A new traffic signal would be placed at US 6 and Snail Road, where the trail would cross the highway to get to the abandoned

ALTERNATIVE B



Town Road — main stem on/adjacent to road



Old Kings Highway, sand road; steep grade — location of main stem



Town Road — loop trail on road



Duck Harbor Beach — destination point

ALTERNATIVE B MAP TABLE

Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
MAIN STEM									
B1	Le Count Hollow Road	Rail Trail to Ocean View Drive	Wellfleet	.75	22'	50'	Good	Bike path ^b	Terminus of Rail Trail extension with parking. Beach access. Path would be below road surface without filling some areas.
B2	Ocean View Drive	Le Count Hollow Road to Long Pond Road	Wellfleet	1.75	18'-20'	40'-50' (110 in some areas)	Good to Pilgrim Road, then problems with shoulders cracking and warping	Bike path	Good views. Passes by many private properties. Trail would be lane south of Pilgrim Road. Access to two town beaches.
B3	Long Pond Road	Ocean View Drive to Old Kings Highway	Wellfleet	1.5	20'	40'	Fair to poor, some shoulder cracking and warping	Bike path	Rolling terrain. Good views of pond. Many private properties-four on north side for path to avoid. Town beach at pond.
B4	Old Kings Highway	Long Pond Road to South Pamet Road	NPS/Truro/Wellfleet	3.7	10'/18'-28'	40'	Varies from sand road to wide pavement in good condition	Bike path/bike route on Collins Road	Outside NPS boundary between Long Pond and Gull Pond roads. Portion south of Snow Pond needs paving for trail use. May need to provide vehicle access to private properties.
B5	South Pamet Road	Old Kings Highway to Pamet River bridge	Truro	.75	18'-20'	40'	Good, some curves	Bike path	Many adjacent private properties path would be near road. Wetlands north of road. Access to town center.
B6	North Pamet Road	Pamet River bridge to Old Kings Highway	Truro	1.2	18'	36'	Cracking and warping on shoulders, gently rolling	Bike lane ^c	Youth hostel and interpretive trail nearby. Adjacent private property. Restrict traffic to local use and bicycles through cooperative agreement with town.
B7	Old Kings Highway	North Pamet Road to Higgins Hollow Road	NPS/Truro	1.0	10'-12'	NPS	Sand	Bike path	Steep slope on south end. Access to natural area.
B8	Higgins Hollow/Longnook roads	Old Kings Highway to Old Kings Highway	Truro	.6	16'-18'	30'	Fair to good, cracking near end of pavement	Bike route ^d	Some adjacent private properties
B9	Old Kings Highway	Longnook Road to South Highland Road	NPS	1.75	10'-12'	All NPS	Sand	Bike path	Steep slope on south end. Natural area.
B10	South Highland Road	Old Kings Highway to Highland Light Coast Guard Station	Truro	.75	25'	60'	Good	Bike path	Wide road. Adjacent private properties and campgrounds to avoid. Access to lighthouse, beach, museum, and golf course. Good views.

^a Additional pavement for bike lanes will be necessary if existing width is less than 25 feet

^b Separate bicycle trail

^c Designated part of roadway used only for bicycles

^d Combined bicycle and vehicle use of roadway



Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
B11	Coast Guard Road	South Highland Road to Old Kings Highway	Truro	.6	25'	40'	Good	Bike path	Wide roads. Access to town beach. Some private properties.
B12	Old Kings Highway	Coast Guard Road to Head of the Meadow Beach	NPS	.6	10'-12'	All NPS	Sand	Bike path	Crosswalk at Head of the Meadow Road will connect with existing bicycle trail. Access to town and NPS beach. Trailhead parking at beach.
B13	New trail	Head of the Meadow bike trail north of Pilgrim Lake and Mt. Ararat to US 6 at Snail Road	NPS	3.1	New	All NPS	New construction	Bike path	Boardwalk required to go through wetland and sand dunes. Provides access to new area. Traffic signal needed at US 6. Trailhead parking at Snail Road.
B14	Snail Road	US 6 to railroad grade	Provincetown	.2	18'	25'	Good	Bike route	New access to Provincetown at new traffic signal and crosswalk.
B15	Railroad grade	Snail Road to Commercial Street	Provincetown	1.4	12"	30'	Sand road and paved segments	Bike path and route where paved	Adjacent to residential area. Some at-grade crossings in town.
SECONDARY TRAILS									
B16	Governor Prentice Road	Rail Trail to Fort Hill parking lot	Eastham/NPS	1.1	20'	30'	Fair to poor, narrow shoulders	Bike route	Access to Penniman house and interpretive trails. Good views. Change flashing traffic signal at US 6 to push-button.
B17	Ocean View Drive	Doane Road to Cable Road	Eastham	1.1	20'	60'	Narrow shoulders, warped and cracked	Bike route	Ocean views. Beaches at each end. Three Sisters Lighthouses will be placed nearby. Access to Nauset bicycle trail at Coast Guard Beach. Heavy traffic on roadway.
B18	Cable Road	Ocean View Drive to Nauset Road	NPS	1.0	21'	40'	Good	Bike route	Several adjacent private properties. Heavy traffic on roadway. Access to Nauset Light Beach.
B19	Nauset/Brackett roads	Cable Road to Rail Trail	Eastham	1.0	22"	40'	Good	Bike route	Already posted as bike route. Wide roads with good sight distance.



Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
B20	Wildlife trail	Cable Road to Rail Trail	NPS	1.75	12'	All NPS	New construction and use of existing road bed	Bike path	Goes through wildlife management area; possible conflicts with hunting activities. Will require paving sand road and clearing some vegetation. Trailhead parking at regional high school through cooperative agreement.
B21	Audubon access	Rail Trail to Audubon by way of Village Lane and West Road	Wellfleet	.8	18'-20'	34'-40'	Good	Bike route	Improve connection from existing road in residential area to Rail Trail extension. Traffic signal needed at US 6.
B22	Marconi Beach Road	Rail Trail to beach	NPS	1.5	23'	All NPS	Good	Bike route	Beach access. Two-lane road without shoulders.
B23	New trail	Marconi Beach to Marconi Station	NPS	1.4	New	All NPS	New construction	Bike path	Passes through sand dunes.
B24	Marconi Station Road	Marconi Beach Road to Marconi Station site	NPS	1.0	21'	All NPS	Good	Bike route	Trailhead parking behind sea-shore headquarters. Interpretive trail access.
B25	Long Pond Road	Old Kings Highway to Main Street	Wellfleet	.6	20' (overpass bridge 30')	40'	Fair to poor, some shoulder cracking and warping	Bike route	Narrow road without shoulders. Poor sight distance and curves. Use of road overpass to cross US 6. Rolling terrain. Many private properties.
B26	Main Street/Briar Lane	Long Pond Road to Chequessett Neck Road	Wellfleet	.6	29' including parking lane	30'	Good	Bike route	Connects to US 6 at existing signal. Access to town center. Residential area with numerous driveways and cross streets. Thickly settled.
B27	Commercial Street/ Mayo Beach Road	Main Street to Chequessett Neck Road	Wellfleet	1.5	18'	25'-30'	Good	Bike route	Residential and commercial area. Views of harbor. Access to town center and wharf. Narrow streets and historic village character. Thickly settled
B28	Chequessett Neck Road	Briar Lane to Griffin Island Road	Wellfleet	2.3	18'	40' (100' over bridge)	Good	Bike route	Residential and commercial area. Views of harbor. Access to Great Island trails and picnic area. Trailhead parking at Great Island.



Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
B29	Griffin Island Road	Chequessett Neck Road to Duck Harbor Road	Wellfleet	.75	20'	50'	Paved	Bike route	Private property at intersection. Town beach access.
B30	Duck Harbor Road	Duck Harbor parking lot to High Toss Road	Wellfleet	1.2	Part 18' Part 12'	30'-50'	Narrow, part sand	Bike path	Must use existing sand roadbed; steep slope, and marsh on either side. Boardwalk optional for entire length. Use of roadbed would close area to all other vehicles. Quiet, remote, natural area.
B31	High Toss/Pole Dike roads	Duck Harbor Road to Bound Brook Island Road	Wellfleet	1.0	16'	30'-40'	Sand/dirt	Bike path	Must use existing sand roadbed, marsh and river surround existing raised road in most places. Natural area. Sand excavation and subdivision on east end.
B32	Bound Brook Island Road	Pole Dike Road to Atwood-Higgins complex	Wellfleet	1.0	16'-18'	30'-50' (narrows at intersection with Pamet Point Road)	Fair	Bike route	Access to Atwood-Higgins historic complex. Narrow road surrounded by marsh through natural area. Poor sight distance and some curves.
B33	Pamet Point Road	Bound Brook Island Road to US 6	Wellfleet	1.4	16'-18'	35'-40'	Fair, some cracking and warping on shoulders	Bike route	Private properties north and south of road. Trailhead parking and new traffic signal at US 6.
B34	Black Pond Road	US 6 to Old Kings Highway	NPS	.6	16'	All NPS	Sand/gravel; new construction on old road bed	Bike path	Sand road access to private properties. Would require paving and vehicular access
B35	Old County Road	Pamet Point Road to US 6	Wellfleet/Truro	3.5	18'-23'	60'	Poor (Wellfleet) Fair (Truro)	Bike route	Steep in places, with poor sight distance and curves. Narrow road with many cross streets
B36	Mill Pond Road	Old County Road to Pamet Harbor	Truro	.75	18'	25'	Poor to fair, narrow	Bike route	Access to Pamet Harbor for good view of bay. Thickly settled
B37	Race Point Road	Commercial Street to Race Point Beach	Provincetown/NPS	3.0	20'	NPS/40'	Good	Bike lane	Narrow town roads with heavy traffic eliminate existing bicycle trail adjacent to road to Race Point beach. Parking at Beech Forest. Access to town center, interpretive trails, and beach.
B38	Moors Road	South Herring Cove parking lot to Provincetown-MA 6A	NPS	1.2	23'	All NPS	Good, no shoulders	Bike lane	Narrow road. Access to beach existing bicycle trail, and town center. Trailhead parking at Herring Cove



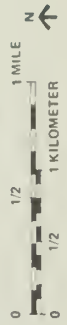


- PROPOSED TRAIL SEGMENT
- ← B1 SEE MAP TABLE, ABOVE
- * DESTINATION POINT
- NEW TRAFFIC SIGNAL
- ←P EXISTING TRAILHEAD PARKING
- P NEW TRAILHEAD PARKING
- - - - - VIEW
- MARSH

Bicycle Trail Corridor ALTERNATIVE B

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- PROPOSED TRAIL SEGMENT
- SEE MAP TABLE, ABOVE
- DESTINATION POINT
- NEW TRAFFIC SIGNAL
- EXISTING TRAILHEAD PARKING
- NEW TRAILHEAD PARKING
- VIEW
- MARSH

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railroad grade. It would proceed as a separate path using the available right-of-way from Snail Road until it reaches Commercial Street in Provincetown town center.

Besides the new traffic signal at Snail Road, additional traffic signals would be needed where the Audubon access trail crosses US 6 and at Pamet Point Road and US 6.

Secondary Trails

Several connecting trails in this alternative are the same as those in alternative A, although the type of trail segment (path, lane, or route) may vary (see map and Map Table Alternative B). Access to Fort Hill would be the same as in alternative A. Use of Ocean View Drive, Cable, Nauset, and Brackett roads is the same except an additional loop using existing sand roads through Marconi wildlife management area would be added. A short connector from the proposed Rail Trail extension would go across US 6 at a newly signalized intersection to the Audubon sanctuary.

At Marconi, separate trails would go to both the beach and station site as in alternative A; however, a 1.4-mile boardwalk between the beach and station site would also be constructed through the existing dune area.

A large loop trail would be designated in Wellfleet and Truro on the bay side of the main stem. On the south end this loop would connect Long Pond Road by way of the existing road overpass of US 6 into Wellfleet town center. The loop trail would then continue to Mayo Beach, Great Island, and Duck Harbor Beach. It would then turn east using existing sand roads along Duck Harbor marsh and the Herring River to Bound Brook Island Road. A connector back to the main stem would be designated on Pamet Point Road from its intersection with Bound Brook Island Road. Use of Old County Road to the Pamet River in Truro completes the loop further north. Access to the Pamet Harbor would be by way of Mill Pond Road from the Old County Road portion of the loop.

The remaining connectors in this alternative would be from the terminus of the main stem in Provincetown town center on Conwell Street and Race Point Road to the Province Lands bike trail and along Moors Road as in alternative A.

ALTERNATIVE C - NPS LANDS

In this alternative the trail system would primarily be on NPS-managed property, although some town and state rights-of-way would also be needed to connect various pieces of federal land. The total length of the trail would be 29.5 miles, which includes 16.1 miles of main stem. In most places it would be a separate bicycle path. Some trail segments, however, would be bicycle lanes or routes (see Alternative C map and map table).

ALTERNATIVE C



Old Kings Highway, sand road —
location of main stem



Town Road — secondary trail



South end of Pilgrim Lake — main stem along High
Head Road



Marconi site — destination point

ALTERNATIVE C MAP TABLE

Seg. No.	Road	From/To	Owner	Length (miles)	Width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
C1	MAIN STEM								
	Le Count Hollow Road	Rail Trail to Ocean View Drive	Wellfleet	.75	18'-20'	50'	Good	Bike lane	Terminus of Rail Trail extension with parking. Road widening would require fill dirt to reach existing roadway level. Beach access.
	Ocean View Drive	Le Count Hollow Road to Newcomb Hollow	Wellfleet	2.9	18'-20'	40-50', 110' in some areas	Good condition to Pilgrim Road, then problems with shoulders cracking and warping	Bike lane ^c	Access to three town beaches. Good views. Flat road. Easement needed for road widening.
C2	New Trail	Newcomb Hollow to Higgins Hollow Road	NPS	4.8	New	All NPS	New construction	Bike path ^b	Use of sand road and trail for entire length. Access to remote natural area. Boardwalk needed at Ballston Beach parking area. Many private properties to avoid, especially at Horseleach Pond and Ballston Beach. Good views of ocean with bay views in some places. Boardwalks and bridges needed in steep and wetland areas. Beach access. Youth hostel nearby. Trailhead parking on east end of North Panet Road.
C3									
C4	Higgins Hollow/Longnook roads	Old Kings Highway to Old Kings Highway	Truro	.8	16'-18'	30'	Fair to good, cracking near the end of pavement	Bike path	Some adjacent private property. New trail needed over Green Hill.
C5	Old Kings Highway	Longnook Road to South Highland Road	NPS	2.0	10'-12'	Most NPS	Sand	Bike path	Steep slope on south end. Natural area.
C6	South Highland Road	Old Kings Highway to Highland Light Coast Guard Station	Truro	.75	25'	60'	Good	Bike path	Several private properties to avoid with new trail. Access to campgrounds, museum, light-house, golfcourse. Good views.
C7	Old Kings Highway	South Highland Road to Head of the Meadow Beach	NPS	1.7	10'-12'	All NPS	Sand	Bike path	Crosswalk at Head of the Meadow Road for access to existing bicycle trail. Town and NPS beach access. Adjacent private properties and campground. Trailhead parking at beach.

- a. Additional pavement for bike lanes will be necessary if existing width is less than 25 feet
- b. Separate bicycle trail
- c. Designated part of roadway used only for bicycles
- d. Combined bicycle and vehicle use of roadway



Use This Table With Alternative C Map

Seg.
No.

Road	From/To	Owner	Length (miles)	width ^a	Right-of-Way	Condition	Proposed Bikeway Type	Visitor Experiences and Other Considerations
C8	High Head Road	Head of the Meadow bike trail to US 6	NPS/Truro	.8	New	All NPS	Poor road; narrow, subject to flooding	Bike path
C9	US 6	High Head Road to Race Point Road	State	3.3	4 lanes with divided highway	300'	Good	Bike path
SECONDARY TRAILS								
C10	Brckett/Nauset Roads	Rail Trail to Cable Road	Eastham	1.0	22'	40'	Good	Bike route ^d
C11	Cable Road	Nauset Road to Ocean View Drive	NPS	1.0	21'	40'	Good	Bike lane
C12	Audubon sanctuary entrance road	From Rail Trail to sanctuary	Audubon/Wellfleet	.6	10'/16'	Audubon/25'	Condition of pavement is good but very narrow	Bike route
C13	Marconi Beach Road	Rail Trail to beach	NPS	1.5	23'	All NPS	Good	Bike lane
C14	Marconi Station Road	Marconi Beach Road to Marconi Station site	NPS	1.0	21'	All NPS	Good	Bike lane
C15	Long Pond Road	Ocean View Drive to Main Street	Wellfleet	2.0	20' (overpass bridge 30')	40'	Fair to poor; narrow, with shoulder cracking and warping	Bike lane in NPS boundary; route outside
C16	Main Street	Long Pond Road to Wellfleet Harbor	Wellfleet	.4	29' (includes one-lane parking)	30'	Good	Bike route
C17	Race Point Road	US 6 to Race Point Beach/US 6 to Provincetown	Provincetown/NPS	3.0	20'	NPS/40'	Good	Bike lane from US 6 to beach; route from US 6 to town center
C18	Moors Road	South Herring Cove parking lot to Provincetown - MA 6A	NPS	1.2	23'	All NPS	Good, no shoulders	Bike route



Access to beach and existing bicycle trail. Narrow road with high summer traffic volumes. No road shoulder. Town access.

Boardwalk needed from existing trail access to US 6 because of wetlands. Trailhead parking at parking area. Residential traffic on adjacent road.

Cantilevered boardwalk in US 6 right-of-way adjacent to Pilgrims Lake. New signal and trail across US 6 at dune parking area. Continue in US 6 right-of-way to Race Point Road.

Already posted as bicycle route. Wide, flat roads with good sight distance.

Several adjacent private properties. Access to Nauset Light Beach.

New signal needed for crossing US 6. Local road needs paving and connection to Rail Trail.

Beach access.

Trailhead parking behind sea-shore headquarters. Interpretive trail access. Good views.

Rolling terrain. Good views of pond. Use of overpass for town center access. Town beach access at pond. New trailhead parking at west end inside boundary.

Narrow roads, thickly settled. Access to town center. Experience village character.

Eliminate existing bicycle trail adjacent to road. Access to interpretive trails and beach. Trailhead parking at Beech Forest. Town center access.



Bicycle Trail Corridor ALTERNATIVE C

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DSC/JANUARY 1987/609-40,69A



PROPOSED TRAIL SEGMENT



SEE MAP TABLE, ABOVE

DESTINATION POINT

NEW TRAFFIC SIGNAL

EXISTING TRAILHEAD PARKING

NEW TRAILHEAD PARKING

VIEW

MARSH

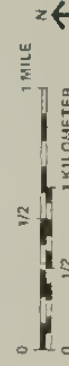




- PROPOSED TRAIL SEGMENT
- ←C1 SEE MAP TABLE, ABOVE
- DESTINATION POINT
- NEW TRAFIC SIGNAL
- EXISTING TRAILHEAD PARKING
- NEW TRAILHEAD PARKING
- VIEW
- MARSH

Bicycle Trail Corridor
ALTERNATIVE C

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
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The rationale for design and placement of this alternative is having a trail that functions as a recreation system. The few secondary trails would connect town centers and a few major features to the main stem. This alternative provides relatively few destinations compared to alternatives A and B. Developed primarily on national seashore land, limited cooperation among local, state, and federal agencies would be necessary. This alternative is mostly on the ocean side of the cape and emphasizes the undeveloped areas and features of the national seashore. The system would use existing roads where possible; however, many of the trail segments would go through undisturbed natural areas. These segments would require sensitive placement along the escarpment and barrier dunes.

Trail users would experience mostly natural settings, with many segments being in remote areas. Some of these remote areas currently have access only by foot. A variety of grades would occur at various areas. Access to town centers would be possible by way of trails and town roads, but would be emphasized less than natural resources. Scenic views and vistas of the ocean would frequently be available. The trail system would go near nine private properties--between Ballston Beach and Horseleach Pond. Safety issues would be reduced because there would be few at-grade crossings and the bike trail would usually be separated from the highway and the roads.

It would be anticipated that sight-seeing and pleasure riding would be the major activities. Views of the ocean and Cape Cod Bay could be from Marconi Station, Ocean View Drive, along the escarpment north of Newcomb Hollow Beach, and from Highland Light.

Designated trailhead parking would be at existing areas at Salt Pond visitor center, north of the national seashore headquarters building, Head of the Meadow Beach, High Head, and Beech Forest. New parking areas would be constructed off Long Pond Road near the national seashore boundary and at the east end of North Pamet Road.

Main Stem

The main stem would begin at the Rail Trail terminus at Le Count Hollow Road, which it would follow to Ocean View Drive. Because of the close proximity of private property owners, Ocean View Drive would need to be used until the main stem reaches Pilgrim Road. At this point the main stem would leave the Ocean View Drive right-of-way and continue on NPS property on the west side of the existing road past White Crest, Cahoon Hollow, and Newcomb Hollow beaches.

The main stem would continue north on existing sand roads and through undeveloped areas, on the east side of Horseleach Pond to Fox Bottom, Brush Valley, and Ballston Beach. It would then continue north on remote trails on the east side of Smalls Hill to Higgins Hollow Road. After a short westerly segment, the main stem would again turn north through undisturbed areas on Green Hill, crossing Longnook Road, then proceeding north again on a sand road east of Old Kings Highway.

Just south of the North Truro Air Force Station the main stem would return to Old Kings Highway and cross South Highland, South Hollow and Highland roads on a sand road west of the existing paved roads. The main stem would continue on Old Kings Highway to Head of the Meadow bike trail as in alternative A.

From the north terminus of the Head of the Meadow bike trail, the new trail would proceed towards US 6 on an elevated boardwalk from the High Head parking area like the one in the alternative A loop trail. Instead of crossing US 6, however, the trail would proceed towards Provincetown on a cantilevered boardwalk adjacent to Pilgrim Lake in the US 6 right-of-way for approximately 1.8 miles to the dune parking area. A new traffic signal at this point would allow the trail to cross the highway where it would parallel US 6 in the highway right-of-way to Race Point Road.

Secondary Trails

This alternative would be limited in the number of connector trails because of the mix of landownership in this corridor location. The existing Nauset bike trail would be retained for access to Coast Guard Beach. A connector trail from the Rail Trail would follow Brackett, Nauset, and Cable roads for access to Nauset Light Beach. A short connector trail would go to the Audubon sanctuary. Marconi Beach and Station site trails would be like those in alternative A.

Long Pond Road from Ocean View Drive would be the only access from the main stem into Wellfleet town center. The connector would use the existing road overpass that crosses US 6 and continues to Mayo Beach using town roads. A short connecting trail would be designated on South Highland Road where it crosses the main stem that goes to Highland Light.

Connector trails, like those in alternatives A and B, would be placed on Race Point Road to the Province Lands trails, on Conwell Street into Provincetown, and on Moors Road.

ALTERNATIVE D - EXISTING CONDITIONS, NO ACTION

The Cape Cod Rail Trail would be extended on the existing railroad bed to Le Count Hollow Road. Unless additional plans or activities were undertaken by the commonwealth of Massachusetts, bicyclists and hikers would have to use the existing road and/or trail systems to reach Provincetown and other locations on the lower cape. This would mean the retention of the existing bicycle/vehicle conflicts and unsafe conditions, especially on US 6.

Bicycle routes are currently designated in pamphlets to instruct bicyclists, especially long-distance riders, on which lesser-used roads on the cape are good for biking. Bicyclists would still be able to use existing roads in their existing conditions under this alternative.

Needed optional transportation access for some crowded/congested NPS facilities would not be provided.

As funding allowed, suggested improvements to existing NPS bike trails would be made.

ALTERNATIVE CONSIDERED BUT REJECTED

During early stages of developing alternatives, one other alternative was discussed. This alternative was to follow the remainder of the railroad grade from Le Count Hollow Road to Provincetown. Its relatively flat grades and access to the bay side of the cape made it appealing as a possible trail corridor. Because the commonwealth of Massachusetts had constructed the Rail Trail on a southern portion of the railroad grade, the Massachusetts Department of Environmental Management was consulted about potentially extending the Rail Trail on the rest of the railroad grade. Discussions and evaluation of existing ownership of the abandoned railroad right-of-way led to the conclusion that using the remainder of the railroad grade was not a feasible alternative.

Of the approximately 16.25 miles of railroad grade from Le Count Hollow Road to its end in Provincetown, 1.4 miles are in NPS ownership, 2.5 miles are owned by the Pennsylvania Central Railroad, and 12.35 miles are in state, town, and private ownership. The 12.35 miles consist of approximately 140 parcels, 20 of which are in state or town ownership. The remaining 120 parcels consist of lands with homes, businesses, driveways, and ancillary structures on them. Most of the state- and town-owned parcels are areas of old bridge crossings at Wellfleet Harbor and Pamet River, rights-of-way for US 6 in Wellfleet and Provincetown, and town streets that were once part of or crossed by the railroad line. The large financial costs involved in acquisition and clearing these parcels make this alternative unrealistic and infeasible. Bridge reconstruction would also be expensive and could affect future improvements of Pamet Harbor.

Portions of the old railroad right-of-way have been sold since 1949, with most of the sales to private owners occurring during the mid 1960s. Portions of the railroad grade have been sold as recently as the early 1980s.

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Cape Cod originated from glacial moraines. It continues to change under the forces of wind, waves, and weather. Beaches, dunes, ponds, plains, and marshes comprise this varied landscape. Some of these natural systems are fragile, particularly the wetlands, dunes, and coastal areas.

Weather

The sea plays a role in all aspects of life on Cape Cod, especially the weather. The cape has a humid maritime climate that is characterized by a moderate annual range of temperatures. Prevailing westerly winds bring continental climate extremes, but the sea tempers the higher summer and lower winter temperatures. Precipitation averages 40 inches per year. Ample groundwater exists because of the humidity and precipitation. In winter, Cape Cod is subject to severe coastal storms that are unique to New England. The "nor'easters" sweep in from the Atlantic Ocean, bringing strong winds, high waves, and heavy rain.

Geology/Topography/Soils

Glacial outwash deposits formed the broad plain that is Cape Cod. The presence of large boulders like Doane Rock is further evidence of the glacial origin of Cape Cod.

Several landscapes occur on Cape Cod:

- the great beach--which extends for 39 miles along the outer side of the cape and includes the dunes in the Province Lands area. North of Highland Light in Truro south to Coast Guard Beach, the great beach narrows below high cliffs. South of Coast Guard Beach it is a barrier beach backed by low dunes and salt marshes.

- the plain--which extends from the edge of the sand cliffs toward Cape Cod Bay. Within this landscape are relatively level areas covered with pines and shrubs. In Wellfleet and further north, this landscape consists of knoblike hills and kettle holes (most of which are freshwater ponds) in a rolling, pine-covered landscape. Where kettle holes have been partially filled with sediments or silt, a bog or marsh has usually developed. Pamet streams begin in valleys behind the great beach and flow west into Cape Cod Bay.

- the marshes--which are in the areas near the bay where there are gently rolling shores. Freshwater marshes develop at the head of pamet streams near dunes on the ocean side of the cape.

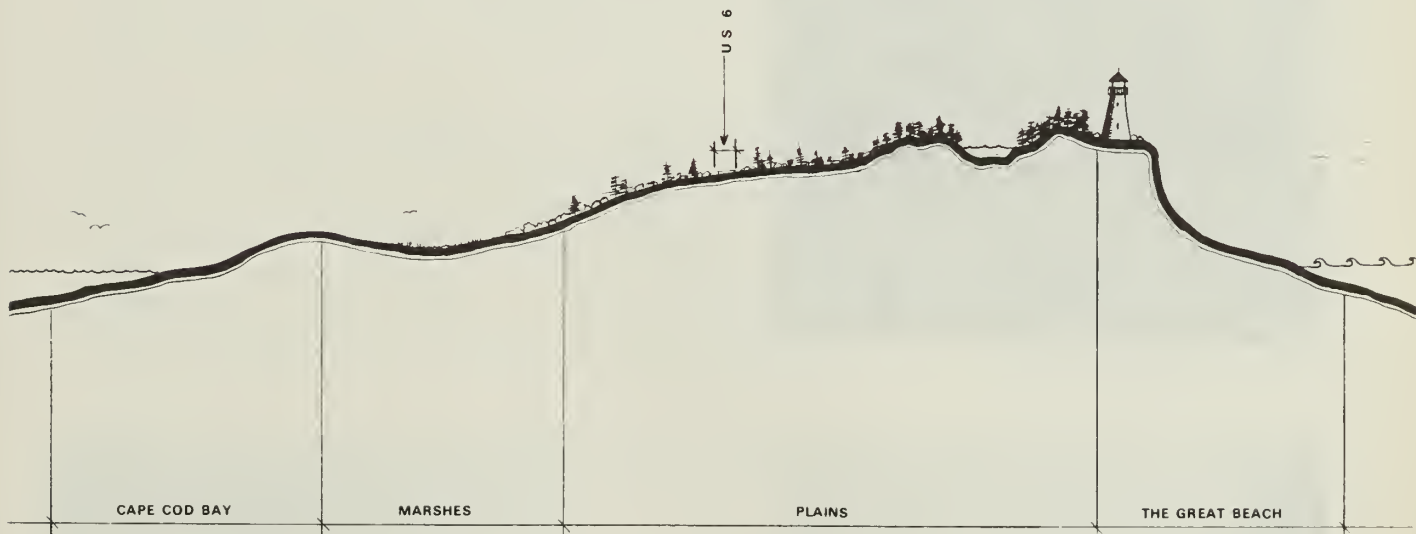
The accretion of sediments has connected what were separate land areas called Great, Griffin, and Bound Brook islands. Extensive marsh areas have developed in these areas and in areas adjoining the Herring River.

Cape Cod Bay--which provides much calmer beaches than those of the great beach. Here, an extremely wide shore gently slopes into the calmer, warmer water of Cape Cod Bay.

The soils of Cape Cod have been classified as excessively drained outwash and are derived from glacial outwashes and moraines. They vary in composition, with glacial till, sand, variable-sized gravels, interspersed layers of clay and silt, and scattered large boulders.

In several areas of the cape, dune deposits overlie the glacial soils. The dunes are formed from beach material that was transported inland by winds. Construction of a bicycle trail on dune areas would require the use of boardwalks and additional maintenance.

MAJOR LANDSCAPE UNITS



NATURAL FEATURES



Flowering shrub



Sand dunes, beach grass, and inlet



Nauset Marsh



Province Lands dunes

Vegetation/Wetlands

The vegetation of lower Cape Cod is predominantly pitch pine and scrub oak, with some small remnants of the once-extensive beech and maple forests. However, remarkable plant diversity still exists. Grasses and herbaceous plants dominate the shore above the high tidemark and on the adjacent ridge of windblown sand. Shrub communities in upland areas include huckleberry, bayberry, bearberry, beach plum, scrub oak, and several rose species. Inland forest areas range in successional stages from early red cedar and locust woodlands through intermediate stands of red cedar, pine, and oak to a near-climax stage of oak with some large pitch pine. Poison ivy is also found in most open areas.

There are several areas of salt marsh on Cape Cod--Hatches Harbor and Wood End in Province Lands, Salt Meadow and Little Pamet River in Truro, Pamet and Herring rivers and the harbor in Wellfleet, and Salt Pond and Nauset Bay in Eastham. These marine wetlands have a distinctive and wide diversity of plants and animals. Numerous rare plants exist where the salt marsh borders on freshwater wetlands. Some nearly impenetrable thickets of swamp azalea, blueberry, red maple, serviceberry, and chokecherry occur around these marsh areas.

Floodplains and wetlands within Cape Cod National Seashore have been determined (500-year floodplain maps are not currently available). Alternatives in this study would not adversely affect water resources, and they would comply with Executive Orders 11988 "Floodplain Management" and 11990 "Wetland Protection." The development of the trail would not involve any drainage, excavation, or dredging of any coastal wetlands. Any structures needed to bridge ecologically significant resource areas would not destroy the character of sensitive areas. Study alternatives are also consistent with the "Massachusetts Coastal Zone Management Plan."

One native plant species, the bushy rockrose (Helianthemum dumosum), has been listed as threatened under the Endangered Species Act of 1973; however, 25 species of plants found within the national seashore are listed as endangered, threatened, or rare by the commonwealth of Massachusetts. Eleven of these species are designated as critical or at a very serious level of concern because of limited sites or numbers remaining in the state. Visitor activities such as pedestrian and off-road vehicle travel and/or recreational use of ponds and rivers may pose serious threats to several plant species.

Cape Cod is a transition area between the Atlantic boreal and the Atlantic temperate regions. This factor, along with the island-like nature of the cape, likely contributes to the occurrence of many uncommon or rare habitats. Atlantic white-cedar swamps are in Wellfleet, Eastham, and in the Province Lands. These are the only examples of this ecosystem in the National Park Service. The white-cedars of the swamp in Wellfleet form a continuous, dense canopy but are interspersed with red maple. The cedars range from 100 to 140 years old. Beech Forest of Province Lands, despite its name, is a stand of mixed hardwood trees. Black oak

dominates the overstory, especially on slopes and along the dune ridge tops. Beech, ranging from 60 to 120 years old, is more common in the hollows. Red maple is the most common tree in the understory and occurs in small clumps on the upper slopes and dune ridges. The largest beech forest is in Provincetown, with smaller stands along the Herring River and near the junction of Snail Road and US 6.

The kettle ponds of Wellfleet and Truro have several plants considered rare by Massachusetts. Bogs have formed in depressions, such as kettle holes or dune blowouts, where groundwater, at least seasonally, intercepts the land surface. Bogs occur east of Round Pond, in the lowlands between Coast Guard Beach and Nauset Light Beach, and in Featherbed Swamp in South Truro.

Coastal heathlands are one of the most distinctive shrub communities of the national seashore and one that is most commonly associated with Cape Cod. They are dominated by bearberry, huckleberry, blueberry, beach heather, and broom crowberry. Heathlands were once much more common on the cape because of land clearing. With the increase in fire suppression and the decline in farming, heathlands are less abundant and are steadily being invaded by larger shrubs, pine, and oak. Many heathlands may eventually be shaded out by the dense canopy of mature forests. Coastal heathlands are along the Atlantic cliffs from Eastham to Truro, in the Pilgrim Spring area, in Newcomb Hollow, in the upland along Cape Cod Bay from Truro to Great Island, and in scattered locations on stable Province Lands dunes.

Wildlife

Cape Cod has several diverse habitats, indicating the possibility of numerous wildlife species; however, investigations and studies have not located any unusual or unexpected species.

The more common mammals, including deer, rabbits, foxes, skunks, raccoon, and several rodent species, occur throughout the forested uplands and heathlands. Deer appear to be in healthy numbers, with no apparent overbrowsing.

Hunting and fishing, including shellfishing, are permitted in the national seashore through a memorandum of understanding with the Massachusetts Division of Fisheries and Game, although the National Park Service has the authority to designate areas where hunting and/or fishing are not allowed. Within the national seashore, regulations have been established for hunting deer, rabbit and hare, raccoon, gray squirrel, opossum, fox, grouse, quail, and pheasant.

Over 300 species of birds--with more or less regular occurrence--have been identified on the cape. Shorebirds, including gulls, herons, sandpipers, and plovers, are abundant. Several tern species are considered uncommon or rare and have been given additional protection. Numerous species of songbirds have been observed. Areas close to the

beach are especially important as feeding sites during migration periods. Cape Cod is along the Atlantic flyway, a major route for migrating birds; therefore, many transient species appear during spring and autumn.

Several species on the federal and state endangered and threatened lists have been observed on the cape. The endangered peregrine falcon (Falco peregrinus) has been seen in pitch pine, open fields, and black locust. Although these are not typical peregrine habitats, they are near the coastal area used by peregrines for feeding and roosting, especially during spring and autumn migrations. The endangered bald eagle (Haliaeetus leucocephalus) has been observed during winter in the vicinity of marsh areas. The spotted salamander (Ambystoma maculatum), listed as a state threatened species, may be in wetland areas. The Eastern box turtle (Terrapene c. carolina) has been found in Nauset Bay and in other wetland areas. The diamondback terrapin (Malaclemys t. terrapin) is a potential nester in several marsh areas. The piping plover (Charadrius melodus) has been listed on the federal list of endangered species and the eastern spadefoot toad (Scaphiopus holbrooki) has been listed by the commonwealth of Massachusetts as threatened.

CULTURAL RESOURCES

The cultural resources in Cape Cod National Seashore and adjacent areas on the lower cape represent a large range of prehistoric and historic activities. The interrelationship of people and their environment is a very prominent theme that is portrayed in archeological sites, houses, cleared fields, harbors, and the road network that exists on the cape.

Archeology

Archeological sites have been discovered on the lower cape that date back 3,000 to 4,000 years. Predominantly Late Archaic sites have been found, which consist of stone tools, pottery, fire hearths, and a burial site. The Nauset Indians inhabited most of Cape Cod at the time of European contact. They were engaged primarily in agricultural practices, in part the production of corn. Many prehistoric sites are known within the seashore boundary. The probability of other sites on the cape is very high in some areas where favorable conditions occurred.

History

Physical evidence of the span of the historic period on the lower cape can be seen in the remaining road system, houses, churches, lighthouses, and Coast Guard structures. Remnants of bridges, piers, wharves, and more recent commercial development such as motels and cottages are also signs of the history of the lower cape.

Exploration of Cape Cod Bay and the later anchoring of the Pilgrims in Provincetown Harbor in 1620 are the earliest records of European contact

CULTURAL FEATURES



Old Harbor Life Saving Station



Highland Light



Coast Guard Station



Wellfleet Town Center

with the cape. Settlement of the towns of Eastham, Wellfleet, Truro, and Provincetown followed. Fishing and whaling industries became important for sustaining the local economies. Because additional transportation costs for raw materials and finished goods increased production costs, industries on the cape could not compete with those closer to rail lines and market places. Even the construction of a railroad from marketing centers in Massachusetts to Provincetown by 1873 did little to improve local industries' chances to compete with inland companies.

Lower Cape Cod became an important communication link between Europe and the major population centers of the northeast. The initial location of the transatlantic cable (1879) and Marconi's wireless radio signal station are within what is now the national seashore.

Highland was the first permanent cape lighthouse location with the first structure constructed in 1797. The present structure was constructed in 1857. In 1808 two lighthouses were constructed at Chatham; they were replaced by new cast-iron lighthouses, one of which was moved to Nauset Light Beach in 1923. This was the third generation of lighthouses at Nauset Light Beach. The 1816 lighthouse at Race Point was replaced by the existing lighthouse in 1876. The 1827 lighthouse on Long Point was replaced by its existing structure in 1875.

The Old Harbor Life Saving Station, recently moved from Chatham to Race Point, is one of the last coastal protection stations on the cape. The currently operating Coast Guard station at Highland and the NPS-owned stations at Race Point and Coast Guard Beach provide evidence of historic activities.

The Cape Cod cottage is the predominate architectural style on the cape. The Atwood-Higgins house and complex (1730-1800) in Wellfleet is a fine example of this style. Many half, three-quarters, and full Cape Cod houses can be seen on the cape (and in New England) today. A later vintage of a more elegant style of home is represented by the Penniman house, with its more elaborate features such as columns, mansard roof, and a cupola. Built for a whaling captain in 1867 on Fort Hill, it is the most ornate house of this type on the lower cape.

By the late 1890s, the effects of earlier tree removal for local construction and fuel were reversed by replanting trees and vegetation in areas that seemed most hospitable for the tourist trade. This reforestation effort was the beginning of the land conservation activities and concerns that continue today. Nickerson State Park in Brewster was established in 1934 for both recreation/tourism and forest conservation.

More leisure time and money throughout the general population and close proximity to the urban centers of the East Coast resulted in a change in cape visitors after World War I--from attracting the wealthy to cultivating the general population's interest in the cape as a vacation site. In the 1920s tourism became Cape Cod's leading industry. Visitors arrived in increasing numbers through the 1930s and 1940s, slowing only slightly during the depression and increasing after World War II. The popularity

of the automobile resulted in the abandonment of rail service to the lower cape in 1965. Road improvements, including construction of the Mid-Cape Highway (US 6) from the Sagamore Bridge to the Orleans rotary, increased accessibility to the lower cape. This was a dramatic improvement from the colonial era's Old Kings Highway. Increases in year-round population and number of tourists continue today.

Several structures and sites located in Cape Cod National Seashore are listed on the National Register of Historic Places:

- Edward Penniman house and barn
- French cable hut
- Marconi wireless station site
- Highland House
- Thomas Atwood house
- Samuel Smith tavern site
- Old Harbor Life Saving Station (USCG station)
- Jedediah Higgins house, Higgins Hollow Road
- Thomas Ahearn house, Pamet Point Road

In addition, several sites in the seashore have been determined eligible for listing on the National Register.

- Samuel Rider house, near Gull Pond Road
- Highland Golf Course
- Archeological site 19BN374

Other National Register properties in Provincetown include the following:

- Center Methodist Church, 356 Commercial Street
- First Universalist Church, 236 Commercial Street
- Hawthorne Class Studio, off Miller Hill Road
- Provincetown Public Library, 330 Commercial Street
- Freeman's Wharf, 125 Commercial Street (eligible)

No known historical or archeological sites would be effected by the actions presented in this study.

LANDOWNERSHIP AND USES

Within the National Seashore

The total area within the designated boundary of the seashore is 43,524 acres, comprising upland and land under water in the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham. As of December 31, 1983, 27,139 acres had been acquired by the National Park Service and approximately 4,455 acres of upland and 11,930 acres of tidal lands remained in private, state, other federal, or town ownership.

Private Property. The private property throughout the seashore includes

undeveloped land--25 parcels, varying in size from 0.10 acre to 30.0 acres.

nonexempt developed land--eight parcels that do not qualify for "improved property" status.

developed property--584 parcels that have "improved property" status. Owners may remain in residence, freely transfer or sell to others, or offer to sell to the United States. These properties are not subject to acquisition by condemnation as long as the towns have zoning bylaws approved by the secretary (PL 87-126, section 4(b)(2)).

commercial property--12 separate parcels with 10 commercial uses that existed prior to the establishment of the seashore. All commercial properties are periodically reviewed for certificate renewal.

Public Land. Public land (other than NPS land) within the seashore is comprised of town and state-owned land and land owned by other federal agencies, including

other federal property--five lighthouses operated by the U.S. Coast Guard and the deactivated U.S. Air Force base being used by the Federal Aviation Administration.

state lands--submerged lands of (1) the great ponds within the towns in the seashore, (2) offshore lands extending one-quarter mile offshore from mean low water of the Atlantic Ocean and Cape Cod Bay, and (3) the right-of-way for US 6 within the seashore boundary.

town lands--approximately 2,612.47 acres of land (including town ways). These parcels vary in size from 0.10 acre to more than 100 acres.

Outside the National Seashore Boundary

Lands outside the seashore boundary are a mix of private and commercial uses that have filled in most developable lands that have not been set aside by towns for public use. Small parks, municipal parking areas, wharves, and harbors are the only open-space areas, along with river estuaries, tidal flats, great ponds, and beaches.

Except for 10 commercial properties inside the boundary, all commercial operations are outside the NPS boundary. The national seashore was established in an area containing long-established communities; however, the final boundary determination left the town centers outside the NPS boundary. Major shopping areas on the lower cape are in the town

centers, and some shopping is also available along US 6. Motels and restaurants are dispersed in all four towns, mostly along US 6, MA 6A, and in or near town centers. Most private property outside town centers is residential, both newer subdivisions and older, single-family homes.

Individual towns manage the beaches on the bay side of the cape as well as taking care of harbors, fishing activities, and shellfishing in tidal areas. Town conservation committees monitor activities on public and private properties that might affect the local environment.

VISITOR/RESIDENT USE

The story of Cape Cod is the story of natural forces and the effect people have had on this landscape. Because of this interrelationship and the small land area, it is difficult to separate the many visitor-related activities into those occurring inside and those occurring outside of the national seashore boundary. People who participate in the activities often travel between the towns and seashore. The limited road system on the lower cape is filled by these people during the peak summer visitor season.

The lower cape area that would be affected by this project consists of four towns on a land area of 44,313 acres (McConnell 1985), approximately 40 miles long and from 1 to 5 miles wide. Overlying a portion of each of these towns is Cape Cod National Seashore, which encompasses about 30,000 land acres. Approximately 27,700 of these upland acres are under NPS ownership.

Access to the national seashore and travel within the boundary is by US 6, state and NPS roads, and many town roads. Most overnight accommodations are outside the seashore boundary, as are most restaurants, stores, and other visitor services. Many beaches, NPS-managed and town-managed, and trails are, however, inside the boundary. The limited land area and mix of facilities and services has resulted in a tremendous mix of activities for visitors and residents. The lower cape was examined, inside and outside of the seashore boundary, in preparing alternative bicycle trail corridors that would encompass visitor and resident needs.

Tourism is a major economic force on Cape Cod. The popularity of the area, especially for summer vacations, has increased steadily since the 1950s. Besides the thousands of people who spend several days or a week at Cape Cod, the Cape Cod Chamber of Commerce estimates that 15,000 people go to the cape each summer day for a one-day outing.



Transported bicycles at trailhead parking



Province Lands Bicycle Trail



Rail Trail tunnel, Nickerson State Park



Bicycling in US 6 traffic lanes

Table 1. Seasonal Population Increases, 1980

Town	Winter Population*	Estimated Summer Population, July	% Seasonal Increase
Eastham	3,472	18,293	444.1
Wellfleet	2,209	14,470	555.0
Truro	1,486	12,892	767.6
Provincetown	3,536	16,138	356.4

*1980 US census

In addition to the number of tourists, year-round residential populations have increased. The population growth for the lower cape has exceeded the average growth rate for Massachusetts over the past three decades. Population density has increased at a rate of nearly 50 percent each decade for the last 30 years.

Table 2. Growth Rates, 1970-1980

Eastham	69.9%
Wellfleet	26.7%
Truro	19.5%
Provincetown	21.5%

The result of these increases have been more people crowded into a small area.

National Seashore Visitor Activities

Cape Cod National Seashore is one of the reasons people travel to Cape Cod. The establishment of the seashore in 1961 protected a large area and made it available to visitors. The national seashore encompasses large areas for hiking, biking, and other recreational activities that are limited elsewhere on the cape and in the region.

The annual visitation of the national seashore in 1985 was just over 4.4 million. The three previous years' figures were 1984 - 4.6, 1983 - 4.6, and 4.0 in 1982. The most popular destination points in the national seashore are the six NPS-managed beaches.

Table 3. Annual Visitation Counts on NPS Beaches

	1982	1983	1984	1985
Herring Cove Beach	581,754	802,843	858,292	838,048
Race Point Beach	516,424	480,367	566,796	637,731
Head of the Meadow Beach	112,169	109,558	142,603	178,848
Marconi Beach	161,148	257,787	232,918	233,961
Nauset Light Beach	519,767	489,687	747,357	647,968
Coast Guard Beach*	239,484	312,517	368,978	99,156

*Counts affected by partial closure of facilities for 1985 construction work. Source: Monthly Public Use Reports 1982-85, National Park Service, Cape Cod National Seashore.

The peak summer visitation season on Cape Cod runs from the end of June through Labor Day. July and August are the busiest months at all NPS facilities. In 1985 Nauset Light Beach received over 213,000 visits in July and over 178,000 in August. Herring Cove Beach recorded over 165,000 and 164,000 for the same periods. The other NPS beaches also have a major increase in these months. Visits to these areas occur all year, with 11,382 and 14,578 recorded in January 1985 at Nauset and Herring Cove, respectively.

Some town-managed beaches are within the national seashore boundary: nine are on the ocean side, one is on Cape Cod Bay, and three are at freshwater ponds in Wellfleet. Year-round or summer residents can obtain permits that allow use of limited parking facilities at town beaches. Only White Crest, Cahoon Hollow, Head of the Meadow (town), and Nauset (Orleans) beaches allow general public use of town parking lots, for a fee. Pedestrian and bicycle access to town facilities is not restricted.

Besides beaches, the seashore has other facilities that can be visited and used year-round. These facilities also receive peak visitation during the busy summer season. Visitor centers at Salt Pond and Province Lands (closed during winter months) received 873,647 visits in 1985 for purposes of information, programs, and natural and cultural resource interpretation. The 10 interpretive trails throughout the seashore attract the casual visitor as do the conducted ranger walks during the summer season. Evening programs at the visitor centers' amphitheaters attracted an average of over 100 visitors a night during the summer season. Picnic areas are also available year-round for all visitors at Doane Rock, Pilgrim Heights, Great Island, and Beech Forest.

Three privately operated campgrounds are in the town of Truro within the seashore boundary. In 1985, 223,245 people used these facilities. Again, July and August were the most heavily used periods. One of these facilities, North Truro Camping Area, remains open on a year-round

basis. American Youth Hostel, Inc., operates a NPS-owned facility near Ballston Beach on North Pamet Road during the summer. During the spring and fall, the youth hostel and the old Coast Guard station at Coast Guard Beach are used as environmental education centers. In 1985, 12,638 visits were recorded at these facilities.

Visits to historic homes, lighthouses, and other NPS facilities occur throughout the year. It is difficult to estimate visitor use for casual walks, hiking, photography, or beachcombing; however, it is presumed that some of these activities occur on a year-round basis, with increases during favorable weather.

The more relaxed pace of the seashore during the off-season allows for an increased proportion of resident use of seashore lands and facilities. The waters of the Atlantic Ocean may be too cold for swimming, but year-round use of beaches occurs. Hiking, berry-picking, and bird-watching occur when appropriate conditions exist. The feeling of remoteness in some parts of the seashore is another facet of the area's qualities.

Hunting in Cape Cod National Seashore is controlled by Massachusetts fish and wildlife laws. It is allowed during specified seasons for deer, upland game, and migratory waterfowl. No open season exists on nongame species. The Marconi Beach wildlife management area is one of the largest areas (1,200 acres) in the seashore that is open to hunting. Visitor use areas and thickly settled sections are safety zones where hunting is not allowed. Hunting is restricted 150 feet on either side of existing bicycle trails. Fishing occurs at some ponds and in the open waters of the ocean and Cape Cod Bay.

Visitor Activities Outside the National Seashore

Several hundred motels and cottages, restaurants, campgrounds, and other commercial operations existed in the four towns according to the Cape Cod Chamber of Commerce. Providing accommodations and other provisions to the many visitors each summer has become a major role of these towns. Many of these businesses are only open on a seasonal basis, often operating from early April through October.

The concentration of commercial operations in some areas results in the concentration of people and traffic in the same areas. The town centers of Wellfleet and Provincetown become congested with people and cars during July and August--to the point that sometimes traffic is stop-and-go and sidewalks overflow with people. Commercial Street in Provincetown is often closed to motorized traffic in the summer. Traffic congestion exists on several stretches of US 6 from the Orleans rotary north, resulting in travel times extending two or three times their normal duration.

The Massachusetts Audubon Society operates a wildlife sanctuary in Wellfleet. Adjacent to US 6, the sanctuary is easily accessible and used

by residents and summer visitors for hiking, bird-watching, and other forms of nature study.

Estimated annual use of the Rail Trail was placed at 133,000, based upon periodic observations and an estimate of 40,000 use counts in August 1985 at Nickerson State Park. Besides bicycling, hiking and horseback riding are permitted uses in the Rail Trail corridor. (As previously explained the Rail Trail will be extended to areas in and adjacent to the national seashore.)

GENERAL DEVELOPMENT

National Seashore Facilities

The national seashore provides a number of facilities intended to support recreation and interpretation. Along with their other purposes, the Salt Pond and Province Lands visitor centers serve as centers for hiking and biking trails. The national seashore headquarters is in the Marconi area. Maintenance areas are adjacent to headquarters and near Beech Forest. Staff quarters are scattered throughout the national seashore.

All six NPS-managed beaches have parking and three (Marconi, Herring Cove, and Race Point) have bathhouse facilities. Bathhouses at Coast Guard and Nauset Light beaches are under construction. Beaches have large parking areas, ranging from 157 to 528 cars and averaging over 300 cars. Most of the parking lots are filled to capacity during the peak summer months. Shuttle buses operate from the lots at the Salt Pond visitor center and Nauset Regional High School to Coast Guard and Nauset beaches, respectively. When these parking lots are full, there is no alternate method of transportation to these beaches.

Eleven miles of hiking trails, primarily for interpretive walks, have been developed at Fort Hill, Red Maple Swamp, Nauset Marsh, Great Island, Pamet Cranberry Bog, Atlantic White Cedar Swamp, Small Swamp, Pilgrim Spring, and Beech Forest. The Buttonbush Trail at the Salt Pond visitor center provides interpretation for the blind. In addition, there are limitless possibilities for informal hikes. There are 40 miles of beach as well as abandoned roads and unpublicized trails. Existing bike trails are far less numerous within the seashore. Bicycling is primarily an informal activity on town roads, except for use of NPS and state trails.

Horse trails, which pass through a variety of ecosystems including dunes, marshes, beaches, pitch pine and black oak forests, freshwater ponds, and wild cranberry bogs, are within the Province Lands area of the park. Horseback riding is restricted to designated trails only.

Facilities Outside the National Seashore

Whereas many of the experiences with Cape Cod National Seashore focus on the natural processes and resources, the area beyond the boundary is

rich with village centers, main streets, and cultural landscapes. Orleans, Eastham, Wellfleet, Truro, and Provincetown provide many tourist facilities in addition to the quaint, historical setting in which they developed. Scenic views of Wellfleet, Pamet, and Provincetown harbors and their locations adjacent to the town centers reinforce the relationship of man and sea.

Within the town of Brewster is Nickerson State Park, with many hiking, biking, and camping activities. The Cape Cod Rail Trail passes through the park and is part of a network of bicycle paths and routes that stretch from Boston to Eastham. Beyond the end of the Rail Trail, the cyclist must choose how to continue to Provincetown. US 6, the main access for the lower cape, varies in width and has heavy traffic. Particularly during the summer, side roads are narrow, less heavily traveled than US 6, but often provide a very indirect route.

ACCESS AND ROADS ON THE LOWER CAPE

Access to Lower Cape Cod

Lower Cape Cod is accessible by way of state, federal, and town roads. US 6 serves the total length of the cape from the Cape Cod Canal to the national seashore boundary north of Provincetown. State routes 6A and 28 parallel US 6 in the upper cape area and join US 6 in Orleans. US 6 is the main transportation artery for the lower cape for 26.9 miles from the Orleans rotary to Herring Cove in Provincetown. MA 6A is separate from US 6 in part of Truro and in Provincetown; it provides a parallel route to US 6 from North Truro into Provincetown town center.

Access to the national seashore from US 6 and MA 6A and 28 is by town and NPS roads. In a number of instances seashore roads and facilities are only accessible by the use of town roads.

The Cape Cod Rail Trail for bicyclists provides access from Dennis through Nickerson State Park to Locust Road in Eastham, which is near the national seashore's Salt Pond visitor center.

US 6 and MA 6A

US 6 is the only continuous vehicular route from the upper to the lower end of the cape. Through the lower cape, it varies from a two-lane uncontrolled access highway to a four-lane, divided, controlled-access highway.

Table 4. US 6 Physical Characteristics

<u>Location</u>	<u>Number of Lanes</u>	<u>Access Control</u>	<u>Traffic Signal</u>
Eastham - through town	4	no	Governor Prentice Road* Samoset Road* Nauset/Doane Road Brackett Road Aspinet/Nauset Road
Eastham - town line to West Road	2	no	
Wellfleet - West Road to Pleasant Point Road	3	no	Marconi Beach Road
Wellfleet - Pleasant Point Road to Gull Pond Road	2	no	Main Street Gross Hill Road
Wellfleet - Gull Pond Road to Truro town line	3	no	
Truro - town line to 6A junction	2	no	
Truro/Provincetown - 6A junction to Herring Cove	4	yes	Race Point Road Province Lands Road

*Yellow flashing caution signal

In Eastham, US 6 has four travel lanes with curb and gutter. Through Wellfleet, the roadway width is quite constant but lane designation varies between two and three lanes. In the two-lane sections, there are 8-foot shoulders or breakdown lanes, and in the three-lane sections, the middle lane is for passing. The shoulder width is 2 feet in these three-lane sections.

The US 6 right-of-way through Wellfleet, Truro, and Provincetown was examined to determine if a parallel bicycle trail could be constructed apart from the US 6 roadway. Potential widening of US 6 to four lanes in some areas was also considered in this evaluation. The narrowest right-of-way section in the three towns is in Wellfleet--from immediately south of Cahoon Hollow Road to immediately north of Main Street--amounting to 80 feet in width; this 80-foot right-of-way section is approximately one-fourth mile in length. The Duck Creek Cemetery abuts the right-of-way on the east. This section of roadway may be the most constrained area on US 6 for placement of a bicycle trail. South of Cahoon Hollow Road, the right-of-way varies between 90 feet and 160

feet. At Le Count Hollow Road, the US 6 right-of-way amounts to 160 feet. North of Main Street in Wellfleet, the right-of-way widens up to 200 feet in some locations prior to the US 6 and MA 6A junction. US 6 right-of-way north of this junction widens to 300 feet at some locations to its terminus at Herring Cove.

The Massachusetts Department of Public Works has tentative plans for widening US 6 to four lanes through Wellfleet and eventually constructing a four-lane section in Truro. Widening the roadway to four lanes and/or restriping and adjusting the existing road surface will, in most places, leave enough room within the right-of-way for a 15-foot bicycle trail corridor. In narrow areas, adequate space exists for a trail that may be close to the roadway but still feasible if barriers are used to separate the trail from the road.

MA 6A has numerous driveway access cuts, no access control, and the traveling surface is two lanes with no shoulders. The traveling surface is also uneven along portions of the route.

Town Roads

Town roads provide access to national seashore areas and town beaches and are connectors to seashore roads. The major town roads serving the national seashore in most instances contain two lanes with traveling surfaces ranging from 18 to 25 feet in width. In general, shoulders, if they exist, are usually unpaved. Rights-of-way range from 25 to 60 feet. Many of the rights-of-way are 40 feet in width. Changes in road grades and curvature are prevalent in Wellfleet and Truro because of variation in topography. Additional information on town roads that provide access to national seashore facilities is in appendix H.

General National Seashore Roadway Conditions

The major roads in the national seashore include Doane, Cable, Marconi Beach, Marconi Station, Race Point, Province Lands, and Moors roads. These roads comprise 11.2 of the 19 miles of roads under national seashore jurisdiction. The classification and physical characteristics of each seashore road can be found in appendix D.

Of the 19 miles of seashore roads, 3/4 mile is unpaved--Head of the Meadow residence road and High Head and Atwood-Higgins roads, part of Pumphouse Road, and a park residence road. Only High Head and Atwood-Higgins roads serve visitor use functions; both have low traffic volumes. High Head Road is in poor condition, with poor drainage features and a rough traveling surface.

Based on a road inventory and needs study prepared by the Federal Highway Administration (FHWA) in 1976 and updated in 1980, the condition of the traveling surface of most of the paved roads in the national seashore was good. Seashore road shoulders are not stabilized

and are sometimes rutted below the traveling surface or mounded above the roadway from blowing sand/materials. The FHWA study indicated that new construction of High Head Road and the west-end section of Pump House Road is needed to correct safety deficiencies. When considering roadway segment needs, particularly those roads for general public access, High Head Road improvements were ranked as the highest priority in the FHWA study.

TRAFFIC SAFETY

TRAFFIC VOLUMES ON US 6, MA 6A, AND SELECTED TOWN ROADS

Traffic volumes have increased historically on US 6 in the towns in and near the national seashore. Table 5 shows 1985 average daily traffic (ADT) in Eastham, Wellfleet, Truro, and Provincetown. These volumes are adjusted to reflect ADT on an annual basis. The actual volumes are 35 to 40 percent higher during August. The high volumes, particularly during summer weekend days and holidays, cause considerable congestion on US 6. The high volume in Wellfleet south of Long Pond Road is probably because of traffic circulating in the Wellfleet area and in the pond area east of Wellfleet town center.

Table 5. Traffic Volumes - US 6

<u>Location</u>	<u>1985 ADT</u>
Eastham	
North of Orleans rotary	15,889*
Orleans/Eastham town line	12,875
Wellfleet town line	9,991*
Between Kings Berry and Old Orchard roads	10,300
Wellfleet	
North of Le Count Hollow Road	4,392
South of Long Pond Road	13,854
Wellfleet/Truro town line	5,698
Truro	
Truro/Provincetown town line	12,243
Provincetown	
West of Conwell Street	11,009

Source: Massachusetts Department of Public Works

*1984 data

Traffic volumes and congestion levels are high on MA 6A in Provincetown, particularly considering the characteristics of the roadway (see table 6).

Table 6. Traffic Volumes - MA 6A and Selected Town Roads

<u>Location</u>	<u>1985 ADT</u>
Wellfleet	
Cahoon Hollow Road - east of US 6	1,670
Ocean View Drive - south of Long Pond Road	377
Truro	
6A - Provincetown town line	4,343
6A - south of Pond Street	2,941*
Provincetown	
6A - north of Bradford Street	3,755*
Howland Road - south of US 6	349
Conwell Street - south of US 6	5,231

Source: Massachusetts Department of Public Works

*1984 ADT

Vehicular Accident Characteristics - US 6 and MA 6A

The Cape Cod Planning and Economic Development Commission developed a summary of accident information for US 6 on Cape Cod based on data from the Massachusetts Department of Public Works for 1975 through 1980 and 1983 (see tables 7 and 8).

The seven-year US 6 data trend indicates that Eastham recorded the highest number of accidents by all types and the highest accident rate of the four towns. Also, Eastham recorded the highest number of accidents and highest rates for all of the Cape Cod towns (not all towns are shown in the table); however, the accidents occurred prior to the widening and improvement of US 6 in Eastham. The four lower cape towns mentioned above recorded higher accident rates than the other cape towns. For the seven-year period, of the four lower cape towns, US 6 through Truro had the lowest accident rate and the second lowest number of accidents. US 6 through Provincetown recorded the lowest number of accidents. The accident rate for 1983 was lower for all four towns when compared with the seven-year totals. Roadway and safety improvements have been made on some sections of US 6 since 1975.

From accident information received from the town of Eastham, 107 of the 179 town accidents occurred on US 6 in 1985. Using the 1985 ADT of 12,875, the accident rate for US 6 through Eastham amounted to 3.73 or slightly higher than 3.66 in 1983.

The average accident rate for Massachusetts primary, undivided, multilane rural highways is 2.59, which is lower than for the town of Eastham. The accident rate for urban highways of this type is 3.86. US 6 through the four lower cape towns more closely resembles a rural than urban

Table 7. Vehicular Accident Characteristics - US 6

Town	PDO**		Number of Accidents by Type		Accident Rate*		Accidents per Mile		
	1975-80/83	1983	Injury	Fatal	1975-80/83	1983	Road Miles	1975-80/83	1983
Eastham	474	59	260	7	4.25	3.66	6.1	17.4	15.9
Wellfleet	258	25	140	10	2.60	1.39	7.3	7.9	4.8
Truro	174	13	93	4	1.27	.69	9.9	3.9	2.4
Provincetown	54	6	26	1	2.36	1.31	3.6	3.2	2.0

Source: 1975-80/83 data from Cape Cod Planning and Economic Development Commission
1983 - computer printouts from the Massachusetts Department of Public Works

*Number of accidents/million vehicle miles traveled

****property damage only**

Table 8. Vehicular Accident Characteristics - MA 6A

Town	Number of Accidents by Type				Accident Rate*		Accidents per Mile						
	PDO**		Injury		Fatal		Total						
	1975-80/83	1983	1975-80/83	1983	1975-80/83	1983	1975-80/83	1983					
Truro	45	11	21	4	1	0	67	15	1.83	2.89	4.6	2.0	3.3
Provincetown	10	1	6	0	0	0	16	1	1.75	.62	1.4	1.6	.7

Source: Computer printouts from the Massachusetts Department of Public Works

*Number of accidents/million vehicles miles traveled

****Property damage only**

roadway section. A review of these rates provides a means of comparing the relative safety of different locations and road networks.

The Massachusetts Department of Public Works compiled accident data for MA 6A for 1975 through 1980 and 1983 (see table 8). A total of 67 accidents occurred in Truro as compared to 16 in Provincetown over this time frame. Consultation with the law enforcement personnel in the four towns indicated that the highest number of vehicular accidents in Eastham, Wellfleet, and Truro occurred on US 6 or at intersections of roadways with this route. In Provincetown, the highest frequency of accidents occurred from vehicles maneuvering and backing in the developed area of the town.

Vehicular Accident Characteristics - National Seashore Roads

Accident History. To identify important characteristics of traffic accidents in the seashore and define high accident locations, a computer file was developed. Copies of accident reports for each traffic accident that occurred from 1982 through 1985 were obtained and nine items from each report were coded for entry in the file (see appendix G).

Based upon a detailed examination of seashore traffic accident records, 140 motor vehicle accidents occurred on seashore roads during the four-year period from 1982 through 1985.

Table 9. Vehicular Accident Characteristics - National Seashore Roads

<u>Year</u>	<u>PDO</u>	<u>Injury</u>	<u>Fatality</u>	<u>Total</u>
1982	25	2	-	27
1983	36	5	-	41
1984	37	5	1	43
1985	<u>24</u>	<u>5</u>	<u>-</u>	<u>29</u>
	122	17	1	140

Source: NPS data

The only fatality in these four years occurred near Herring Cove rotary westbound on US 6. The driver was killed while driving under the influence of alcohol and at an excessive speed; a passenger was injured.

Seventeen injury accidents (12.1 percent of the total accidents) occurred over this four-year period. Six of these injury accidents occurred at the Herring Cove north parking lot. Two each occurred on Moors Road between Provincetown and the old rotary and on Race Point Road between

the seashore boundary near US 6 and the picnic area at the Beech Forest access road. The remaining seven injury accidents were on various other portions of the road system or beach. Two of the injury accidents were off-road motorcycle and all-terrain vehicle accidents: one was a motorcycle rider falling off the vehicle while learning to operate it in a parking lot and another injury resulted from a person falling or jumping off of a moving pickup truck on Moors Road. The ratio of injury accidents to the total is quite low, probably because of the overall low operating speeds on seashore roads.

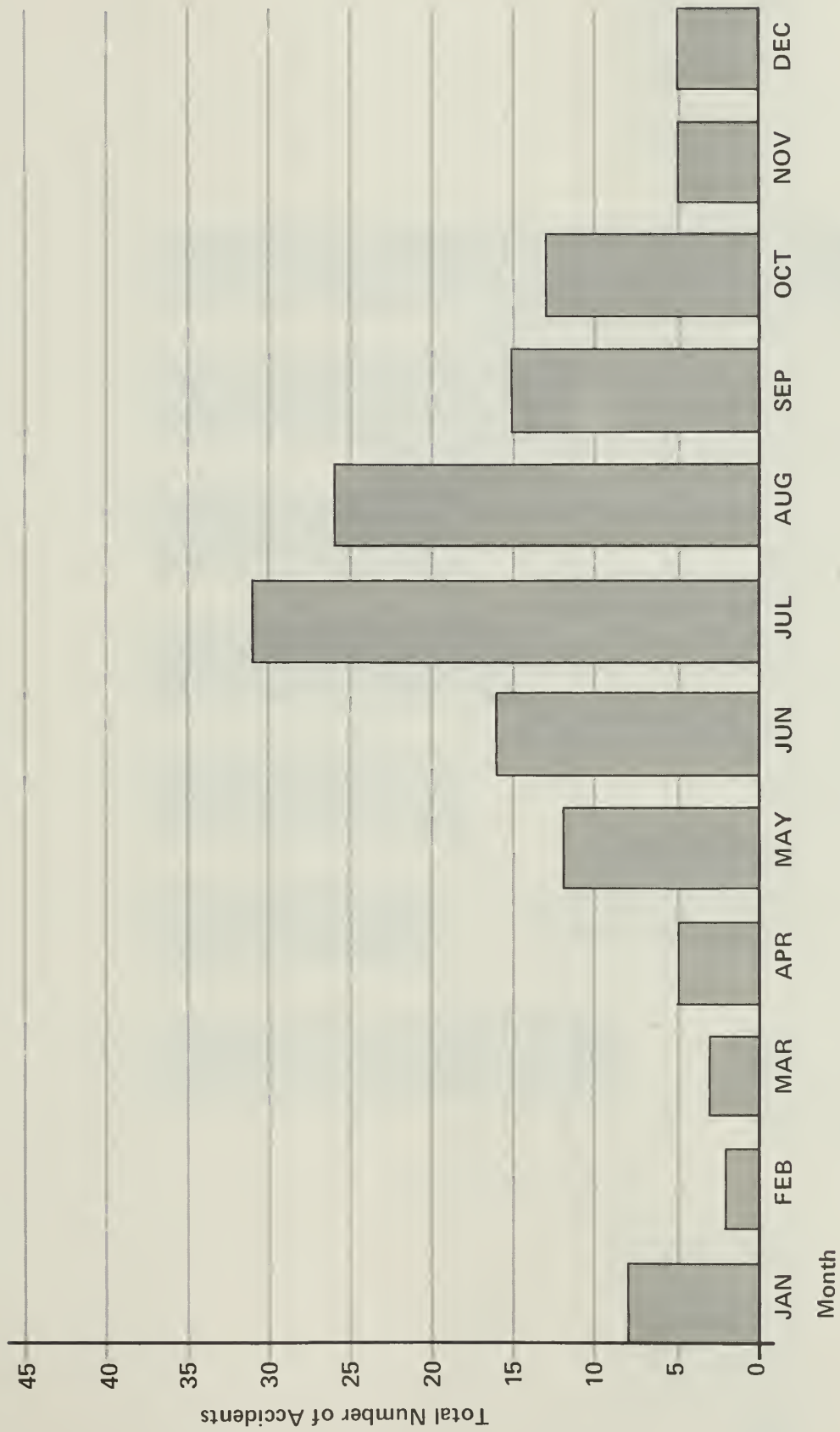
A total of 28.6 percent of the accidents were attributed to improper backing and parking, 14.3 percent to inattention, 10.0 percent to other, 9.3 percent to emergency control measures, 7.1 percent to reckless driving, and 31.7 percent to the remaining causes, as shown in table 10. Approximately 75 percent of the 40 accidents attributed to improper backing and parking occurred at the Herring Cove and Race Point Beach parking lots.

Table 10. Causes of Accidents, 1982-1985

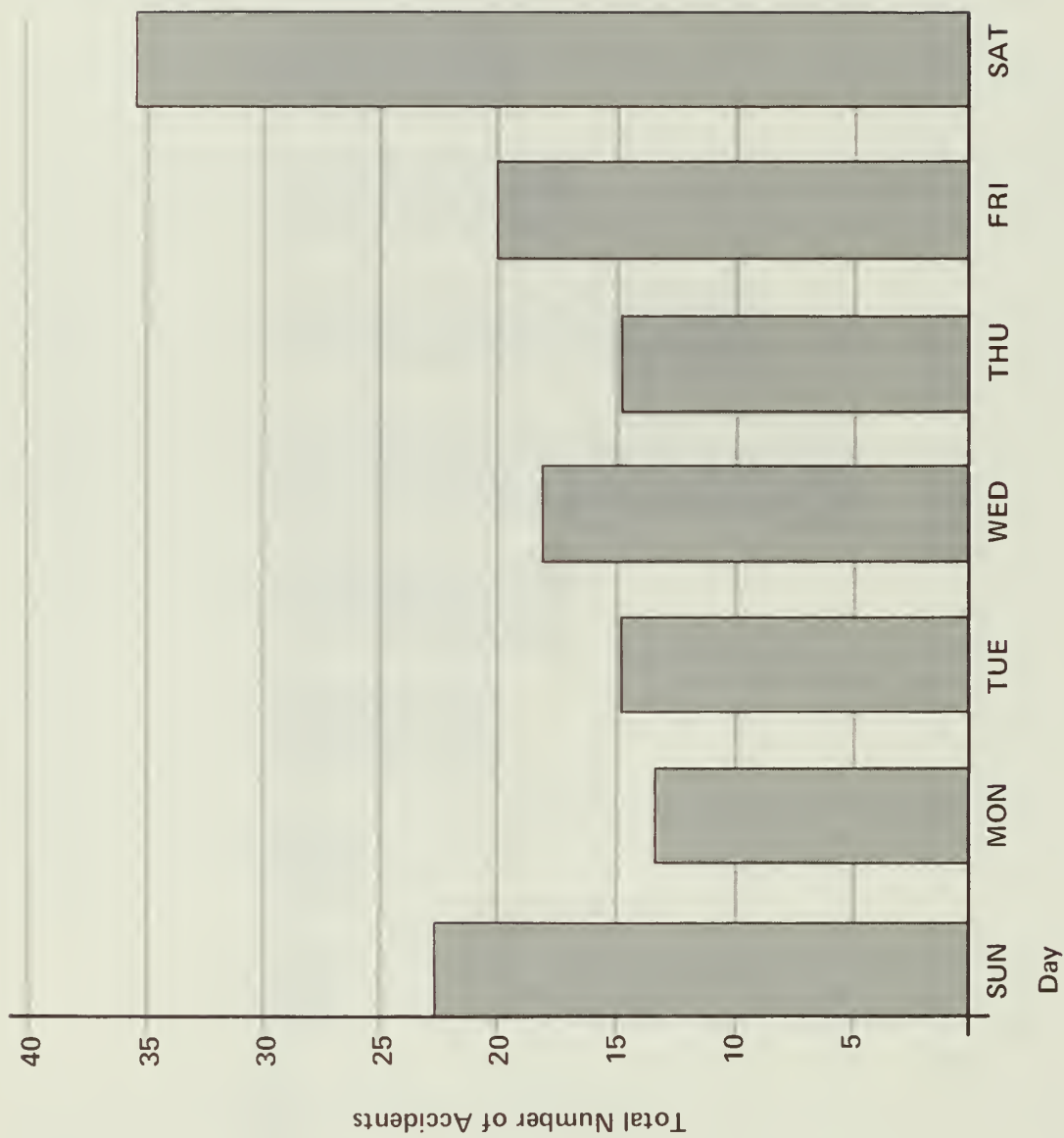
<u>Causes</u>	<u>Number</u>
Improper backing and parking	40
Inattention	20
Other	14
Emergency control	13
Reckless driving	10
Excessive speed	9
Weather	8
Unknown	5
Improper turn	4
Right-of-way violation	4
Driving under influence	4
Mechanical failure	2
Road defect	2
Improper lane change	2
Following too closely	1
Physical failure	1
Overtaking - wrong side	<u>1</u>
	140

Source: NPS data

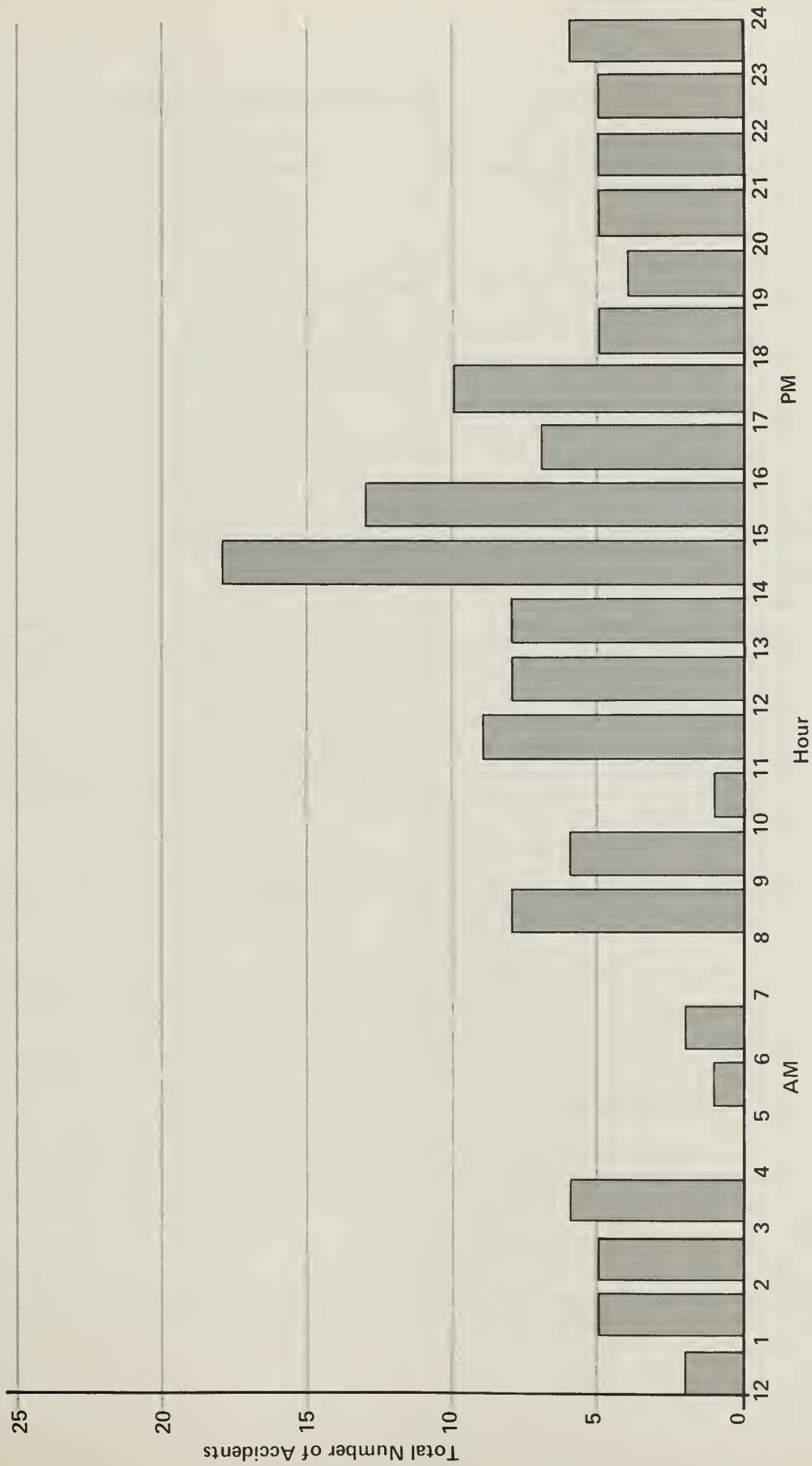
The following charts illustrate the frequency of accidents by month, day of week, and hour of day for the same four-year period. The highest frequency month was July, with 31 of the total 140 accidents. The greatest number of accidents occurred on Saturdays and from 2 to 3 p.m.



VEHICULAR ACCIDENTS BY MONTH - 1982-85



VEHICULAR ACCIDENTS BY DAY OF WEEK - 1982-85



VEHICULAR ACCIDENTS BY HOUR OF THE DAY -- 1982-85

Bicycle Accident Characteristics - US 6, MA 6A, and Town Roads

Seven-year bicycle accident data (for 1975-80 and 1983) compiled from computer printouts from the Massachusetts Department of Public Works indicate that 30 bicycle accidents occurred on US 6 in Eastham, Wellfleet, Truro, and Provincetown. A total of 21 occurred in Eastham, five in Wellfleet, three in Truro, and one in Provincetown; there were no fatalities, one property-damage-only accident, and 29 injury accidents. These data reflect similar trends to vehicular accidents, with Eastham recording the highest number and Provincetown the least. The seven-year data for MA 6A reported by the Massachusetts Department of Public Works indicates that there were two injury accidents in Truro and none in Provincetown. Law enforcement personnel in the four towns indicated that there is a very low incidence of bicycle accidents on town roads away from the US 6 corridor.

The results of these data indicate that bicycle trail crossings of US 6 in Eastham can potentially be the most hazardous of all US 6 crossings in the lower cape. These crossings will require signalization. At-grade bicycle trail crossings of US 6 in other lower cape towns should also be signalized.

Accident Locations. Each traffic accident that occurred during the four-year period was on the national seashore road network and identified by NPS case number to easily reference individual accident reports for future study. A four-year composite map was prepared to indicate fatality, injury, and property damage accidents on the seashore road system. The Accident Location map illustrates the location and severity of the traffic accidents. This composite accident map provides the basis for the identification of high accident locations in the national seashore.

High accident locations include

- the Herring Cove rotary/intersection (reconstructed in 1985 with the elimination of the traffic rotary)

- Moors Road (has been improved)

- Race Point Road from the seashore boundary to the Beech Forest area entrance

- Province Lands Road, from the intersection of Race Point Road west for approximately .5 mile

- Cable Road and Ocean View Drive intersection (intersection and parking lot entrance to Nauset Light Beach have been reconstructed)

- access to the Marconi Beach parking area

- the Race Point Beach and North Herring Cove parking areas

Because improvements have been made to the Herring Cove area and the Cable Road/Ocean View Drive intersection, accident histories should improve in these areas. Although improvements have been made to Moors Road, accident data should be closely monitored for trends and causes. Geometric improvements may be needed to enhance roadway safety.

Accident data should be carefully reviewed prior to scheduling improvements for Race Point Road and the east section of Province Lands Road to identify design features that would enhance safety.

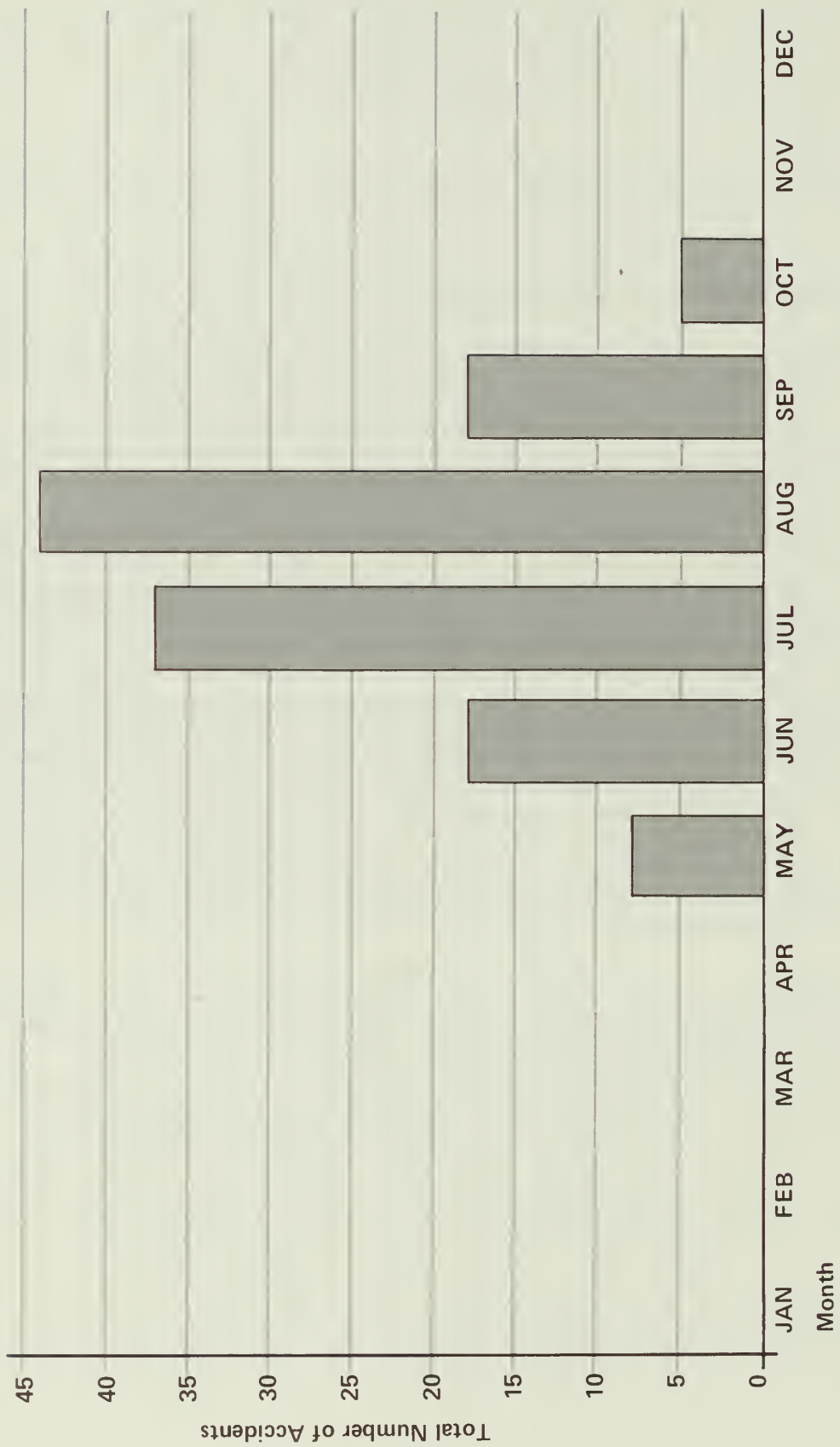
Bicycle Accidents, National Seashore Bicycle Trails

Accident History. Copies of accident reports for each bicycle accident from 1982 through 1985 also were coded for entry into a computer file. Five items were coded for each accident and are shown in appendix G. A total of 129 accidents were reported over the four-year period. Twelve of the accidents occurred on roads, 11 of the accidents occurred in parking lots, and the remaining 106 accidents were on bicycle trails.

Bicycle accidents on vehicular roadway segments were a low percentage (9.3) of total bicycle accidents. This is probably because of much greater use of seashore bicycle trails than seashore-managed roads for bicycling. Accidents also may have occurred because of the existence of tighter geometrics and less sight distance on the bicycle trails.

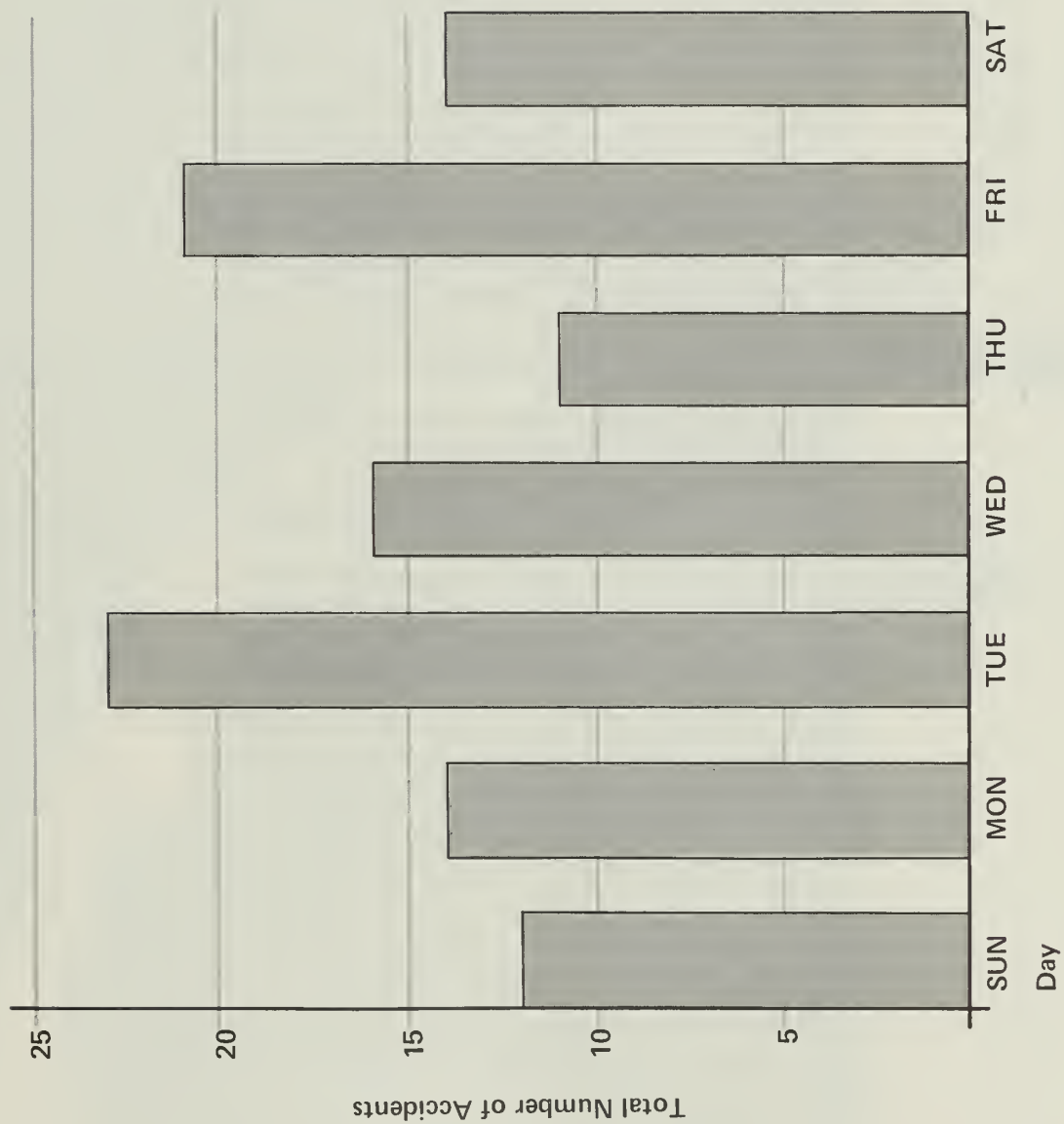
The following charts show the frequency of accidents by month, day of week, and hour of day for the four-year period. The highest frequency month was August, with 44 of the 129 accidents. July was the second highest month, with 37. The greatest number of bicycle accidents occurred on Tuesdays, followed closely by Fridays, and from 2 pm to 3 pm. It is interesting to note that Saturdays and Sundays accounted for the highest number of vehicular accidents. Perhaps this can be explained by high weekend vehicular use from nearby urban areas and weekday recreational bicycle tourists.

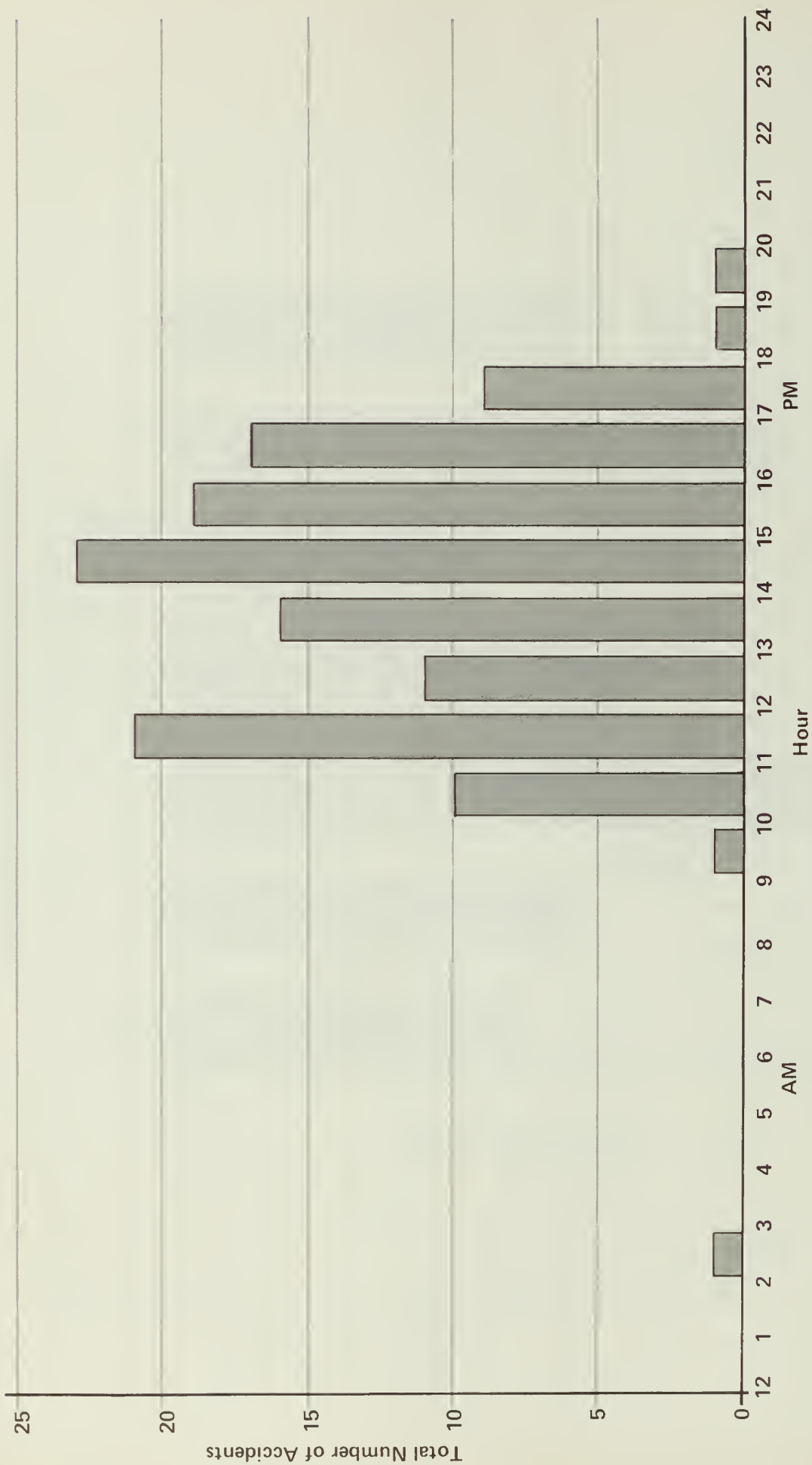
Accident Locations. 1985 bicycle accident locations on the national seashore bicycle trails are shown on the Accident Locations map. Bicycle accident data recorded for previous years did not describe exact locations of accidents; consequently, only 1985 locations were mapped. The seashore maintains three bicycle trails--the Nauset Trail, the Head of the Meadow Trail, and the Province Lands Trail. Of the 29 bicycle accidents reported in 1985, 16 occurred on the Province Lands Trail or nearby, 13 occurred on or near the Nauset Trail, and none were reported on the Head of the Meadow Trail. None were reported on seashore roads during 1985. Eight of the 16 accidents reported on the Province Lands Trail occurred near the Province Lands visitor center. Eight of the 13 accidents on the Nauset Trail were reported between the Doane Rock picnic area road and the bicycle trail bridge near Coast Guard Beach. According to seashore staff documentation, 10 of the 29 accidents were caused by riders losing balance or control, four by speeding, three by bicycle collisions, three by unknown reasons, and the remaining classified



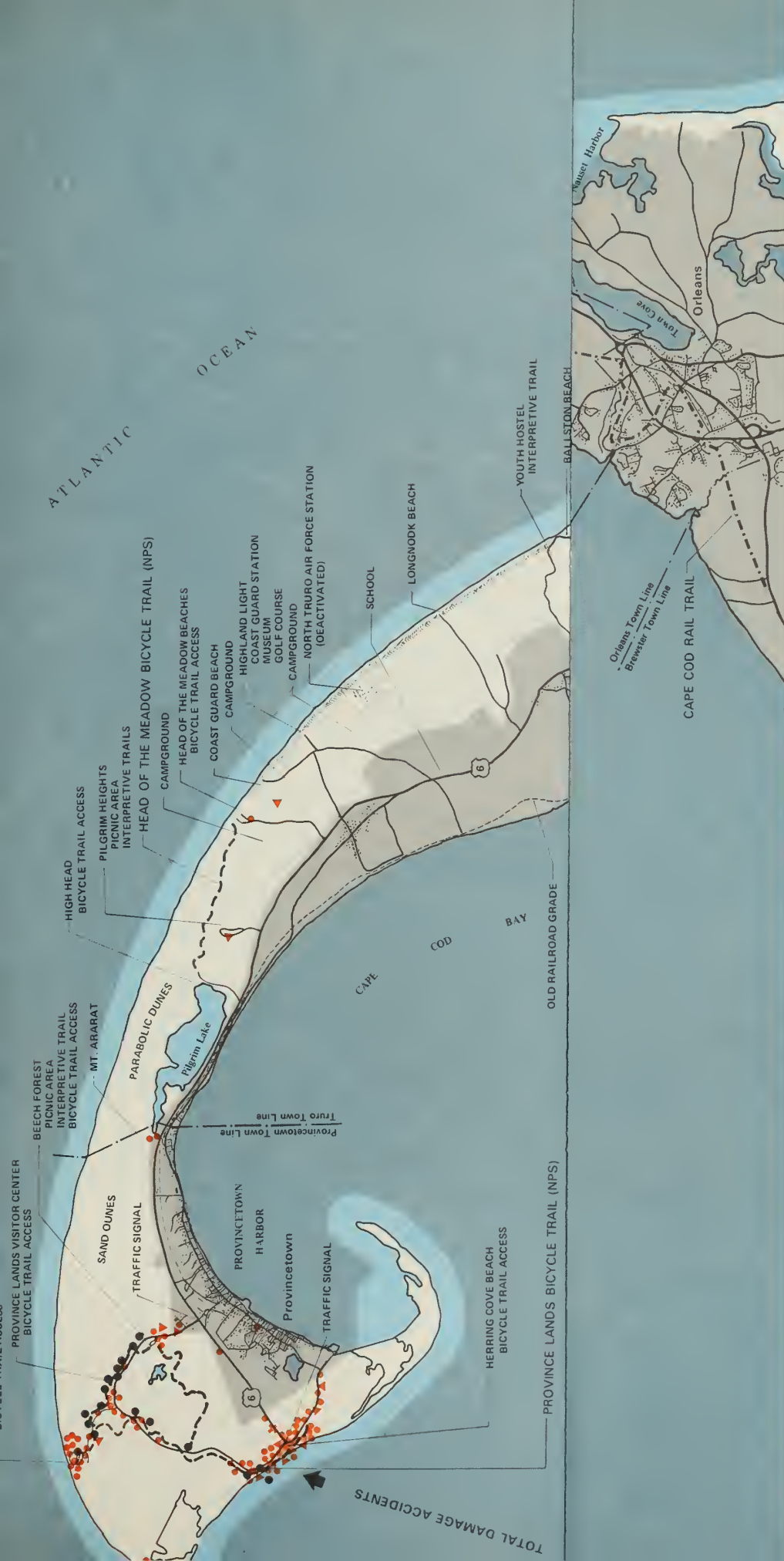
BICYCLE ACCIDENTS BY MONTH - 1982-85

BICYCLE ACCIDENTS BY DAY OF WEEK – 1982-85





BICYCLE ACCIDENTS BY HOUR OF THE DAY - 1982-85



Bicycle Trail Corridor ACCIDENT LOCATIONS

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DSC/JANUARY 1987/609-40,070A



Bicycle Trail Corridor ACCIDENT LOCATIONS

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

05C/JANUARY 1987/609-40,070A



VEHICLE ACCIDENT LOCATIONS (1982-1985)

- + FATALITY
 - ▲ INJURY
 - PROPERTY DAMAGE
- BICYCLE ACCIDENTS (1985)
- ACCIDENT LOCATION

as other causes. Curves, grades, sight distance, materials on trails, bicycle rider inexperience, speeding, and unfamiliar rental equipment are contributing factors to the incidence of accidents on these trails.

CONCLUSIONS

Based upon the analysis of previously discussed information about vehicle and bicycle use on the lower cape, the following conclusions can be reached.

High traffic volumes exist on US 6 in Eastham and Wellfleet during the summer, especially on weekends. Vehicle conflicts on the highway exist in these towns because of the many secondary roads that intersect US 6. Also, variations in the number of lanes and shoulder widths on US 6 in Wellfleet and Truro can result in safety problems because the conditions change unexpectedly.

Most public roads in the national seashore are in good condition and have a low accident history. The ratio of vehicular injury accidents to property damage accidents is low on national seashore roads. Nearly 30 percent of the accidents have occurred because of improper backing and parking maneuvers. Anticipated improvements in areas where accidents have occurred will require the consideration of existing road features and adjusting conditions towards improving safety.

Bicyclists use the vehicle traveling surface on US 6 for several reasons. In Eastham bicyclists often use the roadway because adjacent sidewalks contain obstacles and driveway access cuts resulting in an uneven surface. The absence of road shoulders at some places in Wellfleet and Truro forces bicycles into the traveling lanes. When bicycles travel in vehicle lanes, the faster-moving cars and trucks must either slow down or change lanes, resulting in delays of traffic and potential vehicle conflicts.

The number of bicycle accidents on US 6 has been low except in Eastham, probably because of the higher traffic volumes in Eastham than in the other towns. Bicycle crossings of US 6 and side road intersections with the highway have also been conflict areas. Of the 129 bicycle accidents reported in the national seashore from 1982 to 1985, 82.2 percent occurred on designated bicycle trails, 9.3 percent on roads, and 8.5 percent in parking lots. Modifications to the Province Lands and Nauset bicycle trails to improve sight distance and reduce curves will be necessary to reduce accidents (see appendix F).

ENVIRONMENTAL CONSEQUENCES

The consequences of each of the bicycle trail corridor alternatives are presented in the following table. Impacts on natural resources, cultural resources, landownership, visitor and resident use, general development, NPS operations, and traffic safety are discussed.

Table 11. Environmental Consequences

	Natural Resources	Cultural Resources	Landownership	Visitor and Resident Use/General Development	NPS Operations	Traffic and Safety
Alternative A (US 6 and loop trails)	<p>Construction in wetlands along High Head Road mitigated by use of elevated boardwalk (less than 1 mile).</p> <p>Vegetation removal minimal for widening existing corridor and sight-distance clearance.</p>	<p>No known significant sites affected.</p> <p>Archeological evaluation needed for new construction, with possible trail adjustments to avoid newly discovered sites.</p>	<p>NPS receipt of easements from towns to build bike lanes. Land acquisition needed for one parking area.</p>	<p>Provides optional transportation method to reach destination areas. Provides additional recreation opportunities for experiencing sea-shore environment.</p> <p>Twenty-eight destination points identified; three new, small, trailhead parking areas to be constructed. Most direct north/south route for bicycles on lower cape.</p>	<p>Additional maintenance needed for new paths: state to take care of main stem (18.1 miles); NPS paths (6.5 miles), lanes, and routes to be maintained by party responsible for roadway segment. Minor increase of NPS patrols to more remote path areas.</p>	<p>Reduced bicycle/vehicle conflicts on US 6 and other high traffic volume roads by removing bicycles from these roads and designating specific routes and lanes for bicycle use. Low traffic volume roads designated as bicycle routes may have moderate increase in bicycle traffic. Many at-grade crossings of paths and secondary roads along US 6 would exist.</p>
Alternative B (existing rights-of-way)	<p>Construction in wetlands along Pilgrim Lake mitigated by use of elevated boardwalk (2.6 miles). Construction of boardwalk across 1.9 miles of dunes at Marconi and north of Mount Ararat.</p> <p>Vegetation removal moderate for widening existing corridor and sight-distance clearance.</p>	<p>Same as A</p>	<p>Land acquisition needed for one parking area. Access to private properties near Old Kings Highway (Wellfleet) may need to be provided on bicycle path.</p>	<p>Provides access to greatest land area on lower cape. Greatest variety in recreation use of trail for access to seashore and town destination points--24 identified. Two new trailhead parking areas to be constructed.</p> <p>Greatest access to natural areas. Possible conflicts between cyclists and hunters on Marconi wildlife segment.</p>	<p>Additional maintenance needed for new paths. NPS paths (11.2 miles), lanes, and routes to be maintained by party responsible for roadway segment. Moderate increase of NPS patrols to remote areas--Pilgrim Lake area. Cooperative agreement for use of Nauset Regional High School parking lot needed.</p>	<p>Reduced bicycle/vehicle conflicts on US 6 and other high traffic volume roads by removing bicycles from these roads and designating specific routes and lanes for bicycle use. Low traffic volume roads designated as bike routes may have moderate increase in bicycle traffic. Use of existing rights-of-way may create some bicycle/vehicle conflicts.</p>
Alternative C (NPS land)	<p>Construction in wetlands along High Head Road and Pilgrim Lake (2.6 miles) mitigated by use of elevated boardwalk.</p> <p>Vegetation removal moderate for widening existing corridor and sight-distance clearance.</p>	<p>Same as A</p>	<p>Easements for trail continuity through ponds area may be needed.</p>	<p>Provides additional recreational access to seashore areas, especially remote areas. Possible conflicts between private landowners and visitors in thickly settled areas. Remoteness of trail in some areas may result in transportation-oriented cyclists continuing to use US 6 and other roads rather than using new trail. Destination points identified--19; new parking areas--2.</p>	<p>Additional maintenance needed for new paths. NPS paths (9.3 miles), lanes, and routes to be maintained by party responsible for roadway segment. Remote areas near ponds will require transportation of staff and equipment long distances. High increase in NPS staff and patrols to some remote areas.</p>	<p>Use of low-volume roads and separate trails would reduce bicycle/vehicle conflicts. A small number of at-grade crossings would exist.</p>
Alternative D (No Action)	<p>None</p>	<p>None</p>	<p>None</p>	<p>Existing bicycle/vehicle conflicts will continue on US 6 and other roads.</p>	<p>None</p>	<p>Bicycles would continue to use US 6 for north/south route on lower cape, disrupting traffic flow during high-volume periods.</p>

COST ESTIMATES

The following cost estimates are for the entire length of each alternative bicycle corridor as explained in the "Alternatives" section of this study. The mileage given for each of the trail segments does not take into account possible switchbacks or trail meandering that might be necessary to achieve maximum allowable trail grades or to avoid natural features or archeological sites.

All costs are estimated based upon NPS standards, and they include trail segments, signs, and traffic signals that would be installed, designed, or constructed by jurisdictions other than the National Park Service. A breakdown of costs by bikeway type and costs, and by jurisdiction and bikeway type follows each alternative's total cost figure. All new parking areas would be constructed by the National Park Service. All new traffic signals in the US 6 right-of-way would be acquired and installed by the commonwealth.

Table 12. Alternative A Total Costs

Trail Segments	Type of Trail and Ownership	Cost
A1 - 18.1 miles	path - state	\$2,389,000
A2 - 1.1 miles	route - .8 Eastham/.3 NPS	400
A3 - .2 mile	path - NPS	26,000
A4 - 1.1 miles	lane (easement) - Eastham	75,000
A5 - 1.0 mile	lane - NPS	68,000
A6 - 1.4 miles	route - Eastham	600
A7 - 2.0 miles	route - 1.6 Eastham/.4 Wellfleet	800
A8 - .6 mile	route - Eastham	400
A9 - 1.5 miles	lane - NPS	102,000
A10 - 1.0 mile	lane - NPS	68,000
A11 - .75 mile	lane - Wellfleet	51,000
A12 - 3.2 miles	lane (easement) - Wellfleet	218,000
A13 - 1.75 miles	lane (easement) - Wellfleet	119,000
A14 - .2 mile	lane - Wellfleet	14,000
A15 - .8 mile	route - Wellfleet	400
A16 - 2.3 miles	route - Wellfleet	1,000
A17 - 1.5 miles	path - NPS	198,000
A18 - 1.4 miles	route - Wellfleet	500
A19 - 2.2 miles	route - Truro	800
A20 - 1.6 miles	lane - Truro	109,000
A21 - 1.2 miles	route - Truro	500
A22 - 1.5 miles	route - Truro	600
A23 - 1.8 miles	path - NPS	238,000
A24 - .8 mile	route - Truro	300
A25 - 1.5 miles	lane (stripling) - Truro	6,000
A26 - .8 mile	lane (stripling) - Truro	4,000
A27 - .8 mile	path - NPS	106,000
A28 - .8 mile	path (boardwalk) - NPS	1,270,000
A29 - .7 mile	route - NPS	400
A30 - 3.0 miles	lane - 2.2 NPS	150,000
	route - .8 Provincetown	300
A31 - 1.4 miles	path - NPS	185,000
Total 58.00 miles	Subtotal	\$5,403,000
<u>New Parking Areas</u>		
Pamet Point Road - 15 cars		\$ 24,000
Long Pond Road - 7 cars		12,000
North Pamet Road - 5 cars		8,000
<u>New Traffic Signals</u>		
Audubon access trail at US 6		\$ 50,000
Pamet Point Road at US 6		50,000
High Head Road at US 6		50,000
Replace with pedestrian-activated signal at Gov. Prentice Road		50,000
Trail removal adjacent to Race Point Road - 2 miles		64,000
Miscellaneous signs, directional markers, and mileposts (average 3 per mile)		24,000
	Subtotal	\$5,735,000
Archeological surveys (bike paths and parking areas only)		58,000
Indirect costs for surveys, design, contract documents, contract award, and administration		2,638,000
	Grand Total	<u>\$8,431,000</u>
 Annual maintenance costs - labor and materials		
(NPS trail only)		\$ 61,000
Annual cost for increase in patrols - 1/8 person-year (NPS trail only)		\$ 4,800

Table 13. Alternative B Total Costs

Trail Segment	Type of Trail and Ownership	Cost
B1 - .75 mile	path - Wellfleet	\$ 99,000
B2 - 1.75 mile	path - Wellfleet	231,000
B3 - 1.5 mile	path - Wellfleet	198,000
B4 - 3.7 mile	path - 1.4 - NPS	185,000
	route - 1.8 - Truro	
	route - .5 - Wellfleet	1,000
B5 - .75 mile	path - Truro	99,000
B6 - 1.2 miles	lane - Truro	82,000
B7 - 1.0 mile	path - .6 - NPS/.4 - Truro	132,000
B8 - .6 mile	route - Truro	500
B9 - 1.75 miles	path - NPS	231,000
B10 - .75 mile	path - Truro	99,000
B11 - .6 mile	path - Truro	80,000
B12 - .6 mile	path - NPS	80,000
B13 - 3.1 miles	path (boardwalk) - NPS	4,914,000
B14 - .2 mile	route - Provincetown	400
B15 - 1.4 miles	path - .7 - Provincetown	93,000
	route - .7 - Provincetown	400
B16 - 1.1 miles	route - .8 Eastham/.3 NPS	400
B17 - 1.1 miles	route - Eastham	400
B18 - 1.0 mile	route - NPS	400
B19 - 1.0 mile	route - Eastham	500
B20 - 1.75 miles	path - NPS	231,000
B21 - .8 mile	route - Wellfleet	400
B22 - 1.5 miles	route - NPS	600
B23 - 1.4 miles	path (boardwalk) - NPS	2,219,000
B24 - 1.0 mile	route - NPS	400
B25 - .6 mile	route - Wellfleet	600
B26 - .6 mile	route - Wellfleet	600
B27 - 1.5 miles	route - Wellfleet	800
B28 - 2.3 miles	route - Wellfleet	1,000
B29 - .75 mile	route - Wellfleet	400
B30 - 1.2 miles	path - Wellfleet	159,000
B31 - 1.0 mile	path - Wellfleet	132,000
B32 - 1.0 mile	route - Wellfleet	400
B33 - 1.4 miles	route - Wellfleet	600
B34 - .6 mile	path - NPS	80,000
B35 - 3.5 miles	route - .3 Wellfleet/3.2 Truro	1,400
B36 - .75 mile	route - Truro	500
B37 - 3.0 miles	lane - 2.2 NPS	150,000
	route - .8 Provincetown	300
B38 - 1.2 miles	lane - NPS	82,000
Total 49.7 miles	Subtotal	<u>\$9,588,000</u>
<u>New Parking Areas</u>		
Pamet Point Road at US 6 - 15 cars		\$ 24,000
Snail Road at US 6 - 25 cars		40,000
<u>New Traffic Signals</u>		
Audubon access trail at US 6		\$ 50,000
Pamet Point Road at US 6		50,000
Snail Road at US 6		50,000
Replace with pedestrian-activated signal at Gov. Prence Road		50,000
Trail removal adjacent to Race Point Road - 2 miles		64,000
Miscellaneous signs, directional markers, and mileposts (average 3 per mile)		<u>19,000</u>
	Subtotal	<u>\$9,935,000</u>
Archeological surveys (bike paths and parking areas only)		53,000
Indirect costs for surveys, design, contract documents, contract awards, and administration		<u>4,570,000</u>
	Grand Total	<u>\$14,558,000</u>
Annual maintenance costs - labor and materials		
(NPS trail only)		\$ 73,000
Annual cost for increase in patrols - 1/7 person-year (NPS trail only)		\$ 5,100

Table 14. Alternative C Total Costs

Trail Segment	Type of Trail and Ownership	Cost
C1 - .75 mile	lane - Wellfleet	\$ 51,000
C2 - 2.9 miles	lane - Wellfleet	197,000
C3 - 4.8 miles	path - NPS	634,000
C4 - .8 mile	path - Truro	106,000
C5 - 2.0 miles	path - NPS	264,000
C6 - .75 mile	path - Truro	99,000
C7 - 1.7 miles	path - NPS	225,000
C8 - .8 mile	path (boardwalk) - NPS	1,270,000
C9 - 3.3 miles	path (1.8 is cantilevered boardwalk) - state	3,051,000
C10 - 1.0 mile	route - Eastham	500
C11 - 1.0 mile	lane - NPS	68,000
C12 - .6 mile	route - Wellfleet	400
C13 - 1.5 miles	lane - NPS	102,000
C14 - 1.0 mile	lane - NPS	68,000
C15 - 2.0 miles	lane - 1.6 Wellfleet	109,000
	route - .4 Wellfleet	500
C16 - .4 mile	route - Wellfleet	800
C17 - 3.0 miles	route - .8 Provincetown	300
	lane - 2.2 NPS	150,000
C18 - <u>1.2 miles</u>	route - NPS	<u>500</u>
Total 29.5 miles		<u>\$6,397,000</u>
<u>New Parking Areas</u>		
Long Pond Road at NPS boundary - 5 cars		\$ 8,000
North Pamet Road near youth hostel - 10 cars		16,000
<u>New Traffic Signals</u>		
Audubon access trail at US 6		\$ 50,000
Dune parking area at US 6		50,000
Replace with pedestrian-activated signal at Gov. Prence Road		50,000
Trail removal adjacent to Race Point Road - 2 miles		64,000
Miscellaneous signs, directional markers, and mileposts (average 3 per mile)		<u>11,000</u>
Subtotal		\$6,646,000
Archeological surveys (bike path and parking areas only)		34,000
Indirect cost for surveys, design, contract documents, contract awards, and administration		<u>3,057,000</u>
Grand Total		<u><u>\$9,737,000</u></u>
Annual maintenance costs - labor and materials (NPS trail only)		\$ 75,000
Annual cost for increase in patrols - 1/7 person-year (NPS trail only)		\$ 5,900

Table 15. Trail Costs by Bikeway Type (Net)

	Alternative A			Alternative B			Alternative C		
Bike Path	24.6	mi.	\$4,412,000	20.6	mi.	\$9,262,000	14.15	mi.	\$5,649,000
Bike Lane	16.6	mi.	984,000	5.4	mi.	314,000	10.95	mi.	745,000
Bike Route	16.8	mi.	7,000	23.7	mi.	12,000	4.4	mi.	3,000
	58.0	mi.	\$5,403,000	49.7	mi.	\$9,588,000	29.5	mi.	\$6,397,000

Table 16. Trail Costs by Jurisdiction (Net)

	Alternative A			Alternative B			Alternative C		
NPS									
Bike Path	6.5	mi.	\$2,023,000	11.2	mi.	\$8,020,000	9.3	mi.	\$2,393,000
Bike Lane	5.7	mi.	388,000	3.2	mi.	232,000	5.7	mi.	388,000
Bike Route	1.0	mi.	500	3.8	mi.	1,500	1.2	mi.	500
*Eastham	1.1	mi.	75,000						
*Wellfleet	4.9	mi.	337,000						
	19.25	mi.	\$2,823,500	18.4	mi.	\$8,253,500	16.2	mi.	\$2,781,500
Common. of Mass.									
Bike Path	18.1	mi.	\$2,389,000	-		0	3.3	mi.	\$3,051,000
Eastham									
Bike Lane	1.1	mi.**	0	-		0	-		0
Bike Route	4.4	mi.	\$ 1,900	2.9	mi.	\$ 1,200	1.0	mi.	\$ 500
Wellfleet									
Bike Path	-		0	6.2	mi.	\$ 819,000	-		0
Bike Lane	.95	mi.	\$ 65,000	-		0	5.25	mi.	\$ 357,000
	4.95	mi.**	0	-		0	-		0
Bike Route	4.9	mi.	\$ 2,100	9.75	mi.	\$ 5,300	1.4	mi.	\$ 1,700
Truro									
Bike Path	-		0	2.5	mi.	\$ 330,000	1.55	mi.	\$ 205,000
Bike Lane	3.9	mi.	\$ 119,000	1.2	mi.	\$ 82,000	-		0
Bike Route	5.7	mi.	\$ 2,200	6.35	mi.	\$ 2,900	-		0
Provincetown									
Bike Path	-		0	.7	mi.	\$ 93,000	-		0
Bike Route	.8	mi.	\$ 300	1.7	mi.	\$ 1,000	.8	mi.	\$ 300
TOTALS	58.0	mi.	\$5,403,000	49.7	mi.	\$9,588,000	29.5	mi.	\$6,397,000

*Lane acquired through easement.

**by National Park Service

IMPLEMENTATION SCHEDULE

The following schedule for the phased development of each alternative delineates the order in which all components of each alternative would ideally be put in place. It does not restrict the construction of later phases before earlier ones, but suggests that earlier phases should have priority. Although this schedule includes all aspects of each alternative regardless of jurisdiction, it is only suggesting to all non-NPS agencies the order in which their parts of the trail network could be constructed.

As an interim action, specific trail segments that are part of the final alternative may be designated as a bicycle trail by signing.

Phased Development - Alternative A

	<u>Costs</u>
Phase 1 - A1 and traffic signal at High Head Road,* A2, A30, A31	\$2,774,700
Phase 2 - A3, A4, A5, A6, A7, A15, A16, A25, A26, A27, A28	\$1,554,200
Phase 3 - A8 and traffic signal, A11, A12, A13 and parking area, A14, A17, A22 and parking, A23, A24	\$ 726,900
Phase 4 - A9, A10, A17, A18 and traffic signal and parking area, A19, A20, A21, A29	\$ 541,200

Phased Development - Alternative B

	<u>Costs</u>
Phase 1 - B1, B2, B3, B16, B17, B18, B20, B25, B37, B38	\$ 810,900
Phase 2 - B4, B5, B6, B7, B8, B9, B10, B11, B12, B19	\$ 990,000
Phase 3 - B13, B14 and traffic signal and parking area, B15	\$5,097,800
Phase 4 - B21 and traffic signal, B26, B27, B28, B29, B30, B31, B32, B33 and traffic signal and parking area, B34, B35, B36	\$ 562,100
Phase 5 - B22, B23, B24	\$2,220,000

*Parts of A1 could be constructed in later phases. Loop trails from A1 should not be built until it is in place.

Phased Development - Alternative C

	Costs
Phase 1 - C1, C2, C15 and parking area, C16, C17, C18	\$ 517,100
Phase 2 - C3 and parking area, C4, C5, C6, C7	\$1,344,000
Phase 3 - C8, C9 and traffic signal	\$3,698,000
Phase 4 - C10, C11, C12 and traffic signal, C13, C14, C15	\$ 398,400

APPENDIXES

XIII. LEGISLATION RELATING TO NATIONAL SEASHORES

1. Cape Cod National Seashore

Establishment authorized-----Act of August 7, 1961

An Act To provide for the establishment of Cape Cod National Seashore, approved August 7, 1961 (75 Stat. 284)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) the area comprising that portion of the land and waters located in the towns of Provincetown, Truro, Wellfleet, Eastham, Orleans, and Chatham in the Commonwealth of Massachusetts, and described in subsection (b), is designated for establishment as Cape Cod National Seashore (hereinafter referred to as "the seashore").

(b) The area referred to in subsection (a) is described as follows:

Beginning at a point in the Atlantic Ocean one-quarter of a mile due west of the mean low-water line of the Atlantic Ocean on Cape Cod at the westernmost extremity of Race Point, Provincetown, Massachusetts;

thence from the point of beginning along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean, Cape Cod Bay, and Provincetown Harbor in generally southerly, easterly, and northerly directions rounding Long Point and then southwesterly to a point a quarter of a mile offshore of the mean low-water line on the harbor side of the dike depicted on the United States Geological Survey Provincetown quadrangle sheet (1949) crossing an arm of the Provincetown Harbor;

thence northerly, along a line a quarter of a mile offshore of and parallel to the low-water line at the dike to a point easterly of the point of intersection of the said dike with the boundary of the Province Lands Reservation as depicted on the said Provincetown quadrangle sheet;

thence westerly to the said point of intersection of the dike and the Province Lands Reservation boundary;

thence along the boundaries of the Province Lands Reservation northwesterly, northeasterly, northerly, and easterly to the easternmost corner of the reservation being near United States Route 6;

thence leaving the said easternmost corner along an extension of the southerly reservation boundary line easterly to the northerly right-of-way line of United States Route 6;

thence along the northerly right-of-way line of United States Route 6 in a general easterly direction crossing the Truro-Provincetown line and continuing in the town of Truro in a generally southeasterly direction to a point four-tenths of a mile south-easterly of the southerly right-of-way line of Highland Road;

thence easterly five-tenths of a mile to a point;

thence turning and running in a southeasterly direction paralleling the general alignment of United States Route 6 and generally distant therefrom five-tenths of a mile to a point approximately 700 feet northwesterly of Long Nook Road;

thence southwesterly along a ridge generally paralleling the alignment of Long Nook Road and distant approximately 700 feet therefrom to a point two-tenths of a mile northeasterly of the northerly right-of-way line of United States Route 6;

thence southeasterly paralleling the general alignment of United States Route 6 and generally distant two-tenths of a mile northeasterly thereof to a point 300 feet south of the southerly right-of-way line of Higgins Hollow Road;

thence in a general easterly direction paralleling the southerly alignment of Higgins Hollow Road and 300 feet distant southerly therefrom to a point five-tenths of a mile east of the easterly right-of-way line of said Route 6;

thence turning and running in a southeasterly and southerly direction paralleling the general alignment of United States Route 6 and distant five-tenths of a mile easterly therefrom to a point 300 feet north of the northerly right-of-way line of North Pamet Road;

thence in a generally southwesterly direction paralleling the general alignment of North Pamet Road and generally distant 300 feet northerly therefrom to a point approximately two-tenths of a mile east of the easterly right-of-way line of United States Route 6;

thence in a southerly direction paralleling the alignment of United States Route 6 and generally distant two-tenths of a mile easterly therefrom to a point three-tenths of a mile south of South Pamet Road;

thence west to the intersection of Old County Road and Mill Pond Road;

thence following the easterly right-of-way line of Old County Road southward to a point opposite the southerly right-of-way line of Ryder Beach Road at its intersection with Old County Road;

thence eastward to a point 300 feet east of the easterly right-of-way line of said Old County Road;

thence in a southerly direction paralleling Old County Road at a distance of 300 feet to the east of the easterly right-of-way line of said road to a point 600 feet south of the southerly right-of-way line of Prince Valley Road;

thence in a generally westerly direction, crossing Old County Road and the New York, New Haven, and Hartford Railroad right-of-way to the southern extremity of the town landing and beach in the Ryder Beach area, and continuing to a point in Cape Cod Bay a quarter of a mile offshore from the mean low-water line of Cape Cod Bay;

thence turning and running along a line a quarter of a mile offshore of and parallel to the mean low-water line of Cape Cod Bay in a general southerly and easterly direction rounding Jeremy Point and thence in a general northerly direction along a line a quarter of a mile offshore of and parallel to the mean low-water line on the westerly side of Wellfleet Harbor, to a point one quarter of a mile due north of the mean low-water line at the eastern tip of Great Island as depicted on the United States Geological Survey Wellfleet quadrangle sheet (1958);

thence north to the mean high-water line on the north shore of the Herring River estuary in the vicinity of its confluence with Wellfleet Harbor;

thence following the mean high-water line southwesterly, northwesterly, and northeasterly to the easterly right-of-way line of Chequesset Neck Road at its crossing of Herring River;

thence following the course of Herring River along the 20-foot contour line of the southeasterly shore thereof to a point near Mill Creek;

thence crossing Mill Creek in a northeasterly direction to the 20-foot contour level near to and northeast of the confluence of Mill Creek and Herring River;

Cape Cod
National Sea-
shore, Mass.
Establishment.

thence following generally northerly and easterly along the easterly edge of the Herring River marshes on the 20-foot contour to a point north of which the easterly right-of-way line of a medium duty road, as depicted on said Wellfleet quadrangle sheet, crosses northward across a marshy stream near the juncture of said medium duty road with Bomb Brook Island Road;

thence crossing said marshy stream along said easterly right-of-way line of said medium duty road, and continuing in a northerly direction to the 20-foot contour level on the north side of said marshy stream;

thence following the 20-foot contour line westward approximately 1,000 feet to its intersection with an unimproved dirt road, as depicted on said Wellfleet quadrangle sheet, leading from a point near the juncture of Bomb Brook Island Road and the said medium-duty road;

thence following said unimproved dirt road northwesterly for approximately 1,600 feet to the 20-foot contour line bordering the southerly edge of the Herring River marshes;

thence following said 20-foot contour line in an easterly direction to Route 6;

thence crossing Route 6 and continuing to a point on the easterly right-of-way line of a power transmission line as depicted on said Wellfleet quadrangle sheet;

thence in a general southerly direction along the said easterly right-of-way line of a power transmission line to the Eastham-Wellfleet town line;

thence southeasterly for a distance of approximately 5,200 feet to a point due north of the intersection of the easterly right-of-way line of Nauset Road with the northerly right-of-way line of Cable Road;

thence due south to the intersection of the said easterly right-of-way line of Nauset Road and the said northerly right-of-way line of Cable Road;

thence in a general southerly direction crossing Cable Road and along said easterly right-of-way line of Nauset Road to a point 500 feet north of the northerly right-of-way line of Doane Road and its intersection with Nauset Road;

thence west to a point 500 feet west of the westerly right-of-way line of Nauset Road;

thence southerly and westerly 500 feet from and parallel to the said right-of-way line of Nauset Road to the easterly right-of-way line of Salt Pond Road;

thence southerly along the easterly right-of-way line of said Salt Pond Road to its intersection with the southerly right-of-way line of Nauset Road;

thence westerly along the southerly right-of-way line of Nauset Road to its intersection with the easterly right-of-way line of United States Route 6;

thence southerly along the easterly right-of-way line of said Route 6 a distance of about four-tenths of a mile to the northerly boundary of the Eastham town hall property;

thence easterly to a point one-tenth of a mile from United States Route 6;

thence turning and running in a generally southerly direction paralleling the general alignment of United States Route 6 and generally distant therefrom one-tenth of a mile to a small stream approximately one-tenth of a mile beyond Governor Prence Road extended;

thence southeasterly along the said stream to the Orleans-Eastham town line;

thence along the Orleans-Eastham town line to the southerly tip of Stony Island;

thence generally southeasterly in the town of Orleans by Nauset Harbor Channel to a point due north of the northerly tip of Nauset Heights as depicted on United States Geological Survey Orleans quadrangle sheet (1946);

thence due south to the 20-foot contour line in Nauset Heights as delineated on the said Orleans quadrangle sheet;

thence generally southerly along the said 20-foot contour to a point about one-tenth of a mile northerly of Beach Road;

thence southwesterly along a line intersecting Beach Road at a point two-tenths of a mile easterly of the so-called Nauset Road leading northerly to Nauset Heights;

thence southerly to a head of a tributary to Little Pleasant Bay at the northerly tip of Pochet Neck as depicted on the said Orleans quadrangle sheet;

thence generally southerly along the thread of channel of the said tributary passing westerly and southwesterly around Pochet Island and thence southwesterly into Little Pleasant Bay passing to westerly of the northerly tip of Sampson Island, the westerly tip of Money Head, and the southwest-erly tip of Hog Island following in general the centerline of Little Pleasant Bay to Pleasant Bay;

thence generally southeasterly in Pleasant Bay along a line passing midway between Sipson Island and Nauset Beach to a point on the Chatham-Orleans town line one-quarter of a mile westerly of the mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach;

thence generally southerly in Pleasant Bay in the town of Chatham along a line a quarter of a mile offshore of and parallel to the said mean low-water line of Pleasant Bay on the westerly shore of Nauset Beach to a point a quarter of a mile south of the mean low-water line of the southern tip of Nauset Beach;

thence easterly rounding the southern tip of Nauset Beach along a line a quarter of a mile offshore of and parallel thereto;

thence generally northerly and northwesterly, and westerly along a line a quarter of a mile offshore of and parallel to the mean low-water line of the Atlantic Ocean on the easterly shore of Nauset Beach and on to the outer cape to the point of beginning. (16 U.S.C. § 459b.)

SEC. 2(a) The Secretary of the Interior (hereinafter referred to as "Secretary") is authorized to acquire by purchase, gift, condemnation, transfer from any Federal agency, exchange, or otherwise, the land, waters, and other property, and improvements thereon and any interest therein, within the area which is described in section 1 of this Act or which lies within the boundaries of the seashore as described pursuant to section 3 of this Act (both together hereinafter in this Act referred to as "such area"). Any property, or interest therein, owned by the Commonwealth of Massachusetts, by any of the towns referred to in section 1 of this Act, or by any other political subdivision of said Commonwealth may be acquired only with the concurrence of such owner. Notwithstanding any other provision of law, any Federal property located within such area may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use by him in carrying out the provisions of this Act.

(b) The Secretary is authorized (1) to use donated and appropriated funds in making acquisitions under this Act, and (2) to pay therefor not more than the fair market value of any acquisitions which he makes by purchase under this Act.

(c) In exercising his authority to acquire property by exchange, the Secretary may accept title to any non-Federal property located within such area and convey to the grantor of such property any federally owned property under the jurisdiction of the Secretary within such area. The properties so exchanged shall be approximately equal in fair market value: *Provided*, That the Secretary may accept cash from or pay cash to the grantor in such an exchange in order to equalize the values of the properties exchanged.

The Secretary shall report to the Congress on every exchange carried out under authority of this Act within thirty days from its consummation, and each such report shall include a statement of the fair market values of the properties involved and of any cash equalization payment made or received.

Acquisition of
land, etc.
Authority.

Funds.

Report to
Congress.

"Fair market value."

(d) As used in this Act the term "fair market value" shall mean the fair market value as determined by the Secretary, who may in his discretion base his determination on an independent appraisal obtained by him. (16 U.S.C. § 459b-1.)

Notice
Publication
in F.R.

SEC. 3. (a) As soon as practicable after the date of enactment of this Act and following the acquisition by the Secretary of an acreage in the area described in section 1 of this Act that is in the opinion of the Secretary efficiently administrable to carry out the purposes of this Act, the Secretary shall establish Cape Cod National Seashore by the publication of notice thereof in the Federal Register.

(b) Such notice referred to in subsection (a) of this section shall contain a detailed description of the boundaries of the seashore which shall encompass an area as nearly as practicable identical to the area described in section 1 of this Act. The Secretary shall forthwith after the date of publication of such notice in the Federal Register (1) send a copy of such notice, together with a map showing such boundaries, by registered or certified mail to the Governor of the Commonwealth of Massachusetts and to the board of selectmen of each of the towns referred to in section 1 of this Act; (2) cause a copy of such notice and map to be published in one or more newspapers which circulate in each of such towns; and (3) cause a certified copy of such notice, a copy of such map, and a copy of this Act to be recorded at the registry of deeds for Barnstable County, Massachusetts. (16 U.S.C. § 459b-2.)

Acquisition by
condemnation.
Provisions.

SEC. 4. (a) (1) The beneficial owner or owners, not being a corporation, of a freehold interest in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term of twenty-five years, or for such lesser time as the said owner or owners may elect at the time of such acquisition.

(2) The beneficial owner or owners, not being a corporation, of a freehold estate in improved property which property the Secretary acquires by condemnation, who held, on September 1, 1959, with respect to such property, an estate of the same nature and quality, may elect, as an alternative and not in addition to whatever right of election he or they might have under paragraph (1) of this subsection to retain the right of use and occupancy of the said property for noncommercial residential purposes (i) for a term limited by the nature and quality of his or their said estate, if his or their said estate is a life estate or an estate *pur autre vie*, or (ii) for a term ending at the death of such owner or owners, or at the death of the survivor of them, if his or their said estate is an estate of fee simple.

(3) Where such property is held by a natural person or persons for his or their own life or lives or for the life or lives of another or others (such person or persons being hereinafter called "the life tenant"), with remainder in another or others, any right of election provided for in paragraph (2) of this subsection shall be exercised by the life tenant, and any right of election provided for in paragraph (1) of this subsection shall be exercised by the concurrence of the life tenant and the remainderman or remaindermen.

"The life
tenant"

(4) The beneficial owner or owners of a term of years in improved property which the Secretary acquires by condemnation may elect, as a condition to such acquisition, to retain the right of use and occupancy of the said property for noncommercial residential purposes for a term not to exceed the remainder of his or their said term of years, or a term of twenty-five years, whichever shall be the lesser. The owner or owners of the freehold estate or estates in such property may, subject to the right provided for in the preceding sentence, exercise such right or rights of election as remain to them under paragraphs (1) and (2) of this subsection.

Violation of
regulations

Suspension of
authority

"Improved
property."

(5) No right of election accorded by paragraphs (1), (2), or (4) of this subsection shall be exercised to impair substantially the interests of holders of encumbrances, liens, assessments, or other charges upon or against the property.

(6) Any right or rights of use and occupancy retained pursuant to paragraphs (1), (2), and (4) of this subsection shall be held to run with the land, and may be freely transferred and assigned.

(7) In any case where a right of use and occupancy for life or for a fixed term of years is retained as provided in paragraph (1), (2), or (4) of this subsection, the compensation paid by the Secretary for the property shall not exceed the fair market value of the property on the date of its acquisition by the Secretary, less the fair market value on such date of the said right retained.

(8) The Secretary shall have authority to terminate any right of use and occupancy of property, retained as provided in paragraph (1), (2), or (4) of this subsection, at any time after the date when any use occurs with respect to such property which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in regulations issued pursuant to section 5 of this Act and in effect on said date: *Provided*, That no use which is in conformity with the provisions of a zoning bylaw approved in accordance with said section 5 which is in force and applicable to such property shall be held to fail to conform or be opposed to or inconsistent with any such standard. In the event that the Secretary exercises the authority conferred by this paragraph, he shall pay to the owner of the right so terminated an amount equal to the fair market value of the portion of said right which remained on the date of termination.

(b)(1) The Secretary's authority to acquire property by condemnation shall be suspended with respect to all improved property located within such area in all of the towns referred to in section 1 of this Act for one year following the date of its enactment.

(2) Thereafter such authority shall be suspended with respect to all improved property located within such area in any one of such towns during all times when such town shall have in force and applicable to such property a duly adopted, valid zoning bylaw approved by the Secretary in accordance with the provisions of section 5 of this Act.

(c) The Secretary's authority to acquire property by condemnation shall be suspended with respect to any particular property which is used for commercial or industrial purposes during any periods when such use is permitted by the Secretary and during the pendency of the first application for such permission made to the Secretary after the date of enactment of this Act provided such application is made not later than the date of establishment of the seashore.

(d) The term "improved property," wherever used in this Act, shall mean a detached, one-family dwelling the construction of which was begun before September 1, 1959 (hereinafter referred to as "dwelling"), together with so much of the land on which the dwelling is situated, the said land being in the same ownership as the dwelling, as the Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the land so designated. The amount of the land so designated shall in every case be at least three acres in area, or all of such lesser amount as may be held in the same ownership as the dwelling, and in making such designation the Secretary shall take into account the manner of noncommercial residential use in which the dwelling and land have customarily been enjoyed: *Provided, however*, That the Secretary may exclude from the land so designated any beach or waters, together with so much of the land adjoining such beach or waters as the Secretary may deem necessary for public access thereto.

(e) Nothing in this section or elsewhere in this Act shall be construed to prohibit the use of condemnation as a means of acquiring a clear and marketable title, free of any and all encumbrances. (16 U.S.C. § 459b-3.)

Issuance of regulations.

SEC. 5. (a) As soon after the enactment of this Act as may be practicable, the Secretary shall issue regulations specifying standards for approval by him of zoning bylaws for purposes of section 4 of this Act. The Secretary may issue amended regulations specifying standards for approval by him of zoning bylaws whenever he shall consider such amended regulations to be desirable due to changed or unforeseen conditions.

Submission to Congress.

All regulations and amended regulations proposed to be issued under authority of the two preceding sentences of this subsection shall be submitted to the Congress and to the towns named in section 1 of this Act at least ninety calendar days (which ninety days, however, shall not include days on which either the House of Representatives or the Senate is not in session because of an adjournment of more than three calendar days to a day certain) before they become effective and the Secretary shall, before promulgating any such proposed regulations or amended regulations in final form, take due account of any suggestions for their modification which he may receive during said ninety-day period. All such regulations and amended regulations shall, both in their proposed form and in their final form, be published in the Federal Register.

The Secretary shall approve any zoning bylaw and any amendment to any approved zoning bylaws submitted to him which conforms to the standards contained in the regulations in effect at the time of the adoption by the town of such bylaws or such amendment unless before the time of adoption he has submitted to the Congress and the towns and published in the Federal Register as aforesaid proposed amended regulations with which the bylaw or amendment would not be in conformity, in which case he may withhold his approval pending completion of the review and final publication provided for in this subsection and shall thereafter approve the bylaw or amendment only if it is in conformity with the amended regulations in their final form. Such approval shall not be withdrawn or revoked, nor shall its effect be altered for purposes of section 4 of this Act by issuance of any such amended regulations after the date of such approval, so long as such bylaw or such amendment remains in effect as approved.

(b) The standards specified in such regulations and amended regulations for approval of any zoning bylaw or zoning bylaw amendment shall contribute to the effect of (1) prohibiting the commercial and industrial use, other than any commercial or industrial use which is permitted by the Secretary, of all property within the boundaries of the seashore which is situated within the town adopting such bylaw; and (2) promoting the preservation and development, in accordance with the purposes of this Act, of the area comprising the seashore, by means of acreage, frontage, and setback requirements and other provisions which may be required by such regulations to be included in a zoning bylaw consistent with the laws of Massachusetts.

(c) No zoning bylaw or amendment of a zoning bylaw shall be approved by the Secretary which (1) contains any provision which he may consider adverse to the preservation and development, in accordance with the purposes of this Act, of the area comprising the seashore, or (2) fails to have the effect of providing that the Secretary shall receive notice of any variance granted under and any exception made to the application of such bylaw or amendment.

(d) If any improved property with respect to which the Secretary's authority to acquire by condemnation has been suspended by reason of the adoption and approval, in accordance with the foregoing provisions of this section, of a zoning bylaw applicable to such property (hereinafter referred to as "such bylaw")—

(1) is made the subject of a variance under or an exception to such bylaw, which variance or exception fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in the regulations issued pursuant to this section and in effect at the time of the passage of such bylaw, or

(2) is property upon or with respect to which there occurs any use, commencing after the date of the publication by the Secretary of such regulations, which fails to conform or is in any manner opposed to or inconsistent with any applicable standard contained in such regulations (but no use which is in conformity with the provisions of such bylaw shall be held to fail to conform or be opposed to or inconsistent with any such standard),

the Secretary may, at any time and in his discretion, terminate the suspension of his authority to acquire such improved property by condemnation: *Provided, however*, That the Secretary may agree with the owner or owners of such property to refrain from the exercise of the said authority during such time and upon such terms and conditions as the Secretary may deem to be in the best interests of the development and preservation of the seashore. (16 U.S.C. § 459b-4.)

SEC. 6. The Secretary shall furnish to any party in interest requesting the same, a certificate indicating, with respect to any property located within the seashore as to which the Secretary's authority to acquire such property by condemnation has been suspended in accordance with the provisions of this Act, that such authority has been so suspended and the reasons therefor. (16 U.S.C. § 459b-5.)

SEC. 7. (a) Except as otherwise provided in this Act, the property acquired by the Secretary under this Act shall be administered by the Secretary subject to the provisions of the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat. 535), as amended and supplemented, and in accordance with laws of general application relating to the national park system as defined by the Act of August 8, 1953 (67 Stat. 496): except that authority otherwise available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this Act.

(b)(1) In order that the seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate: *Provided*, That the Secretary may provide for the public enjoyment and understanding of the unique natural, historic, and scientific features of Cape Cod within the seashore by establishing such trails, observation points, and exhibits and providing such services as he may deem desirable for such public enjoyment and understanding: *Provided further*, That the Secretary may develop for appropriate public uses such portions of the seashore as he deems especially adaptable for camping, swimming, boating, sailing, hunting, fishing, the appreciation of historic sites and structures and natural features of Cape Cod, and other activities of similar nature.

(2) In developing the seashore the Secretary shall provide public use areas in such places and manner as he determines will not diminish for its owners or occupants the value or enjoyment of any improved property located within the seashore.

Certificate.

Administration.

16 U.S.C. § 4

16 U.S.C. § 1b-1d

Protection and development.

Publication in F.R.

Zoning bylaws. Approval.

Special provisions.

Hunting and
fishing.
Regulations.

(c) The Secretary may permit hunting and fishing, including shellfishing, on lands and waters under his jurisdiction within the seashore in such areas and under such regulations as he may prescribe during open seasons prescribed by applicable local, State and Federal law. The Secretary shall consult with officials of the Commonwealth of Massachusetts and any political subdivision thereof who have jurisdiction of hunting and fishing, including shellfishing, prior to the issuance of any such regulations, and the Secretary is authorized to enter into cooperative arrangements with such officials regarding such hunting and fishing, including shellfishing, as he may deem desirable, except that the Secretary shall leave all aspects of the propagation and taking of shellfish to the towns referred to in section 1 of this Act.

Navigation.

The Secretary shall not interfere with navigation of waters within the boundaries of the Cape Cod National Seashore by such means and in such areas as is now customary. (16 U.S.C. § 459b-6.)

Cape Cod
National Sea-
shore Advisory
Commission.

SEC. 8. (a) There is hereby established a Cape Cod National Seashore Advisory Commission (hereinafter referred to as the "Commission"). Said Commission shall terminate ten years after the date the seashore is established under section 3 of this Act.

Membership.

(b) The Commission shall be composed of ten members each appointed for a term of two years by the Secretary as follows:

(1) Six members to be appointed from recommendations made by each of the boards of selectmen of the towns referred to in the first section of this Act, one member from the recommendations made by each such board;

(2) One member to be appointed from recommendations of the county commissioners of Barnstable County, Commonwealth of Massachusetts;

(3) Two members to be appointed from recommendations of the Governor of the Commonwealth of Massachusetts; and

(4) One member to be designated by the Secretary.

(c) The Secretary shall designate one member to be Chairman. Any vacancy in the Commission shall be filled in the same manner in which the original appointment was made.

Compensation.

(d) A member of the Commission shall serve without compensation as such. The Secretary is authorized to pay the expenses reasonably incurred by the Commission in carrying out its responsibilities under this Act upon vouchers signed by the Chairman.

Duties.

(e) The Commission established by this section shall act and advise by affirmative vote of a majority of the members thereof.

(f) The Secretary or his designee shall, from time to time, consult with the members of the Commission with respect to matters relating to the development of Cape Cod National Seashore and shall consult with the members with respect to carrying out the provisions of sections 4 and 5 of this Act.

(g) No permit for the commercial or industrial use of property located within the seashore shall be issued by the Secretary, nor shall any public use area for recreational activity be established by the Secretary within the seashore, without the advice of the Commission, if such advice is submitted within a reasonable time after it is sought.

Exemptions.

(h) (1) Any member of the Advisory Commission appointed under this Act shall be exempted, with respect to such appointment, from the operation of sections 281, 283, 284, and 1914 of title 18 of the United States Code and section 190 of the Revised Statutes (5 U.S.C. 99) except as otherwise specified in subsection (2) of this section.

62 Stat. 697,
793.

(2) The exemption granted by subsection (1) of this section shall not extend—

(i) to the receipt or payment of salary in connection with the appointee's Government service from any source other than the private employer of the appointee at the time of his appointment; or

(ii) during the period of such appointment, and the further period of two years after the termination thereof, to the prosecution or participation in the prosecution, by any person so appointed, of any claim against the Government involving any matter concerning which the appointee had any responsibility arising out of his appointment during the period of such appointment. (16 U.S.C. § 459b-7.)

Appropriation.

SEC. 9. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act; except that no more than \$16,000,000 shall be appropriated for the acquisition of land and waters and improvements thereon, and interests therein, and incidental costs relating thereto, in accordance with the provisions of this Act. (16 U.S.C. § 459b-8.)

Separability.

SEC. 10. If any provision of this Act or the application of such provision to any person or circumstance is held invalid, the remainder of this Act or the application of such provision to persons or circumstances other than those to which it is held invalid shall not be affected thereby. (16 U.S.C. § 459b note.)

APPENDIX B: CONSULTATION AND COORDINATION

Because of the complexities of landownership and use within the national seashore boundary and adjacent areas, it was an important aspect of this study that concerned public and private interests were consulted during the development of the bicycle trail corridor alternatives. It was also critical that the many jurisdictions, agencies, and others provide information that could be used in this study. Meetings were held at the national seashore headquarters in March and May 1986 to discuss possible trail corridor locations, destination areas, anticipated trail experiences, issues, and concerns. Input and discussions occurred in these meetings, as well as through individual telephone and personal contacts to agencies listed below. Because of the information received, appropriate adjustments were made in the alternatives in this study.

Bicycle Committee	
Board of Selectmen/Town Manager	
Conservation Commission	
Police Departments	
Clerks and Assessors Offices	

} [for the towns of Eastham,
Wellfleet, Truro, Provincetown]

Cape Cod Planning and Economic Development Commission
Cape Cod Chamber of Commerce
Coastal Zone Management Commission
Massachusetts Audubon Society
Massachusetts Historical Commission
Massachusetts Department of Environmental Management
Massachusetts Department of Public Works
 District Office, Taunton
 Central Office, Boston
Massachusetts Department of Environmental Quality Engineering
Massachusetts Department of Fisheries, Wildlife, and Recreational
 Vehicles
Massachusetts Department of Commerce and Development
U.S. Federal Highway Administration
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Coast Guard
National Marine Fisheries Service
U.S. Soil Conservation Service

APPENDIX C: NEWSLETTER QUESTIONNAIRE SURVEY RESULTS

In the fall of 1985 the National Park Service distributed a newsletter and questionnaire that was designed to inform the public about the study as well as identify potential users of and destinations for the proposed trail. Approximately 950 questionnaires were distributed to local, state, and federal agencies, individuals and groups on the national seashore mailing list, and others on request; 140 respondents (15 percent) answered the questionnaire. This information has aided the study team in developing locations for the bicycle trail corridor alternatives. The following is a synthesis of the information received from the returned questionnaire.

Origin and Destination. The town centers chosen for the new bike trail to connect were, in order of preference, Wellfleet, Truro, Provincetown, Eastham, and Orleans. Regarding town facilities, 43 percent of the respondents favored connecting the beaches, 42 percent wanted to connect natural and cultural features, and 28 percent wanted connections to bike rental/repair shops. Regarding NPS facilities, 54 percent of the respondents favored connecting the beaches, followed by 40 percent wanting to connect to picnic areas or trails, and 27 percent wanting to connect to visitor centers.

Use. The vast majority of the respondents (83 percent) said they wanted to use the trail for sight-seeing/pleasure riding. The next more favored uses were for going to the beach (62 percent), going to other recreation sites (49 percent), for hiking (32 percent), and for going shopping (32 percent). The preference for use of this trail, based on this survey, is for recreation, with less potential use by commuters to or from work or children going to school.

Frequency of Use. When asked how frequently they would use a bike trail, over 51 percent of respondents said they would use it several times a week. Another 24 percent said they would use a trail at least once a month. Sixty-one percent of respondents said they would choose the bike over the car occasionally or weekly. Although 15 percent of the respondents said they would choose the bike over the car for transportation on a daily basis, 18 percent said they never would.

Ability. Most respondents (66 percent) ranked themselves as having fair to good bicycle riding ability. Nineteen percent ranked themselves as very good or expert, whereas 20 percent indicated that they did not usually ride a bike or that they usually walked.

Preference. Most respondents (89, or 65 percent) preferred a bike trail that would be separate from the road as opposed to having a bike path along the road shoulder or a combination of both. The majority also preferred that the trail be a combined biking/hiking trail.

It can be said that the majority of respondents want a trail that serves Wellfleet, Truro, and Provincetown and that serves recreation destinations and purposes (sight-seeing/pleasure riding, beaches, and other natural and cultural features and recreational facilities). The majority of users will have fair to good riding ability and will use the trail several times each week.

The majority of responses were received from individuals from the northeast United States. One-third of those who included their names and addresses were residents of the lower cape, one-third were from the upper cape and southeast Massachusetts, and about one-fourth lived within a two-hour automobile drive of the cape.

During the summer of 1986 a second distribution of the newsletter, which included several questions related to bicycle touring, was distributed to members of touring groups and was made available at national seashore visitor centers. Sixty-five responses were received. Of the 52 responses returned with names and addresses, over one one-third were from the upper cape and southeast Massachusetts, one-fourth were from within a two-hour automobile drive of the cape, and one-third were from a longer distance away in the eastern United States. Responses from touring group members numbered 41.

Information received from the additional responses was similar to the initial responses. Origin and destination preferences were the same priorities for town centers, town facilities, NPS facilities and trail use. Traveling by bicycles to the youth hostel and campgrounds in Truro ranked higher in this second group of responses (66 percent of responses ranked these after other recreation sites in priority). A greater use of existing and future trails for touring and transportation was indicated by these respondents.

Because the majority of respondents in this group live off the cape, their reference to frequency of use related to limited periods of vacationing/touring on the cape. Approximately 40 percent said they would bicycle several times a week while they are on the cape, and just under one-third said they would bicycle daily. Almost 50 percent stated they would use a bicycle instead of a car occasionally or weekly.

The ability ratings were much higher, with 64 percent ranking themselves as expert or very good. Thirty-three percent ranked themselves as good or fair. Most respondents (70 percent) again preferred a separated bicycle trail as well as a combined bicycle/hiking trail.

New information received from the second set of responses revealed that bicycle touring is a popular activity on the lower cape. Sixty-four percent of the responses were from people participating with a touring group. The objective of touring groups ranked about evenly between viewing scenic and natural areas and getting to destination points. Touring groups ranged mostly from 10 to 25 members, with about half that number of groups having one to 10 members. Only two groups were larger than 25 members. The primary destinations of tour group members were the youth hostel and campgrounds.

A wide range of daily and trip mileages was revealed by touring group members who bicycle the cape. Daily mileage ranged from 10 to 100 miles, with most responses stating about 40 miles per day. Trips ranged from 50 to 1,000 miles, with the majority in the 300- to 400-mile range.

The majority of touring members use the Cape Cod Rail Trail (49 percent), but they also use designated bicycle routes, MA 6A, and other roads equally. The preference for a bicycle route from the Orleans rotary north to Provincetown was the Rail Trail and designated bicycle routes (65 percent). Less than 25 percent of the responses preferred US 6 or other roads to get to Provincetown.

Less than 10 percent of the respondents preferred bicycle lanes along the side of US 6 if bicycles were restricted from using automobile traffic lanes. Over 35 percent preferred a path near but separated from the highway, and 45 percent preferred a trail away from US 6.

Conclusions reached from the second group of responses are similar to those for the first set. Keying in on a special group brought forth information about their preferences and identified new destinations that they wanted to add. This set of responses also widened the range of users to include expert bicyclists and reinforced the need for long- and short-range trails for transportation and recreation.

APPENDIX D: NATIONAL SEASHORE ROAD CLASSIFICATION

Classification of National Seashore Roads

The classification of the roads in the seashore is based on the functional classification system described in the 1984 NPS "Park Road Standards." Each seashore road segment has been classified, according to its intended use or function, as a public use road or an administrative road.

Public Use Roads. All roads that are intended principally for the use of visitors for access into and within the seashore are classified as public use roads. These roads are defined in the NPS standards and subdivided into the following four classes:

Class I: Principal Road/Rural Parkway--This road class includes main access routes, circulatory tour routes, or thoroughfares for visitors.

Class II: Connector Road--Connector roads provide access to areas of scenic, scientific, recreational, or cultural interest, such as beaches and picnic areas.

Class III: Special Purpose Road--Special-purpose roads provide circulation within public use areas, such as campgrounds, picnic areas, and visitor center complexes. They generally serve low-speed traffic and are often designed for one-way circulation.

Class IV: Primitive Road--Primitive roads provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. They frequently have no minimum design standards, and their use may be limited to specially equipped vehicles.

Administrative Roads. The administrative road category consists of all public and nonpublic roads intended principally for administrative uses. Administrative roads are subdivided into two classes:

Class V: Administrative Access Road--This class includes all public roads intended for access to administrative developments or structures, such as offices, employee quarters, or utility areas.

Class VI: Restricted Road--Restricted roads are normally closed to the public. They include patrol roads, fire roads, truck trails, and other similar roads.

Race Point, Province Lands, and Moors roads and US 6, all within national seashore boundary, are considered class I roads. These serve as the major access or circulatory roads in the seashore. Cable, Doane, and Marconi Station and Marconi Beach roads are classified as class II roads and rank immediately below those class I roads identified above but

do not serve as many uses and use areas. The Road Classification table shows each road's functional classification and other pertinent information, which is divided into the south and north management districts of the seashore. The Road Classification map shows road locations.

ROAD CLASSIFICATION TABLE

Route No.	Road Segment From/To	Length (miles)	Functional Classification - Purpose	Average Daily Traffic	Surface Type	Width (feet)	No. of Lanes	Terrain
<u>South District</u>								
10	Doane Road - US 6 to Ocean View Drive	1.96	II - access to Coast Guard Beach	2,630	paved	19	2	level
11	Cable Road - Nauset Road to Ocean View Drive	1.06	II - access to Nauset Light Beach	2,630	paved	21	2	level
12	Marconi Beach Road - US 6 to Marconi Beach parking lot	1.95	II - access to Marconi Beach	690	paved	23	2	level to rolling
13	Marconi Station Road - Marconi Beach Road to Marconi station site and parking lot loop	1.09	II - access to Marconi station site	210	paved	21	2	level
200	Fort Hill Road - Penniman house parking lot to Ft. Hill parking lot	.31	II - access to Fort Hill trail	530	paved	20	2	rolling
201	Doane Rock picnic area - Doane Road to parking lot	.20	II - access to Doane Rock Picnic Area	100	paved	19	2	level
202	Tomahawk Trail - Doane Road to residence	.62	V - access to residences	40	paved	21	2	level to rolling
203	Salt Pond visitor center road - Doane Road to visitor center parking lot and parking lot	.27	III - access to Salt Pond visitor center	1,110	paved	21	2	level
204	Nauset Regional School Road - Marconi Station Road to school	.23	V - access to school site	100	paved	24	2	level
214	Great Island picnic area - Chequesset Road to picnic area	.13	II - access to picnic area	10	paved	19	2	level
215	Atwood-Higgins Road - Bound Brook Road to fence	.10	III - access to residences	10	dirt	9	1	level
216	Nauset Light Beach access road - Ocean View Drive to parking lot and parking lot	.04	II - access to parking lot		paved	22	2	level to rolling



Use This Table With Road Classification Map

Route No.	Road Segment From/To	Length (miles)	Functional Classification - Purpose	Average Daily Traffic	Surface Type	Width (feet)	No. of Lanes	Terrain
217	Realignment of Ocean View Drive - Ocean View Drive to Nauset Beach Light Road	.10	V - access to residences		paved	22	2	level to rolling
218	Coast Guard Beach access road - Doane Rock Road to beach parking lot	.21	II - access to parking lot		paved	22	2	level to rolling
219	Cable Road - Nauset Light Beach access road to private residence	.08	VI - access to private residence	10	paved	12 and 22	1 to 2	rolling
220	Entrance road to Coast Guard Beach parking lot Doane Road to parking lot and parking lot	.19	II - access to parking lot		paved	24	2	level
221	Bus access road to Coast Guard Beach parking lot - Doane Road to bus turnaround	.25	II - access to bus turnaround		paved	12	1	level
400	Park residence road - Doane Road to residence	.09	II - access to residence	10	sand	11	1	level
401	Pump house road - Marconi Station Road to pump house	.24	VI - access to pump house	10	paved	16	1	level
401	Pump house road - Marconi Station Road to pump house	.09	VI - access to pump house	10	sand	11	1	level
402	Marconi residence road - Nauset Regional School road to residences	.16	V - access to park residences	30	paved	21	2	level
403	Marconi maintenance area road - residence road to maintenance area	.19	V - access to maintenance area	50	paved	20	2	level
409	Doane memorial road - Doane Rock picnic area to memorial		III - access to memorial		sand	10	1	level



Route No.	Road Segment From/To	Length (miles)	Functional Classification-Purpose	Average Daily Traffic	Surface Type	Width (feet)	No. of Lanes	Terrain
<u>North District</u>								
14	Race Point Road - park boundary to Race Point Beach parking lot and parking lot	1.98	I - access to beach parking lot and Province Lands Road	6,450	paved	20	2	rolling
15	Province Lands Road - Race Point Road to US 6	2.17	I - connects Herring Cove/US 6 and Race Point Road	720	paved	20/23	2	rolling
17	Moors Road - US 6 to park boundary	1.01	I - access to Herring Cove	1,610	paved	23	2	level to rolling
18	US 6 - Moors Road to US 6 to park boundary	.38	I - access to Herring Cove	400	paved	45	4	level
205	Head of the Meadow Beach Road - Head of the Meadow town road to beach parking lot and parking lot	.18	II - access to beach parking lot	225	paved	25	2	level
206	Pilgrim Heights picnic area road - US 6 to parking lot and parking lot	.91	II - access to picnic area	280	paved	13/20	1 to 2	level
207	High Head Road - town road to end of parking lot and parking lot	.43	II - access to parking area	20	gravel	15	1 to 2	level
208 *	Dunes Road - US 6 to end of parking lot and parking lot	.17	VI - access to parking lot	360	paved	19	1	level
209	Coast Guard Station Road - Race Point Road to Coast Guard Station	.16	II - access to Coast Guard Station	80	paved	20	2	level
210	Race Point Beach parking lot loop and parking lot	.34	III - access/parking for Race Point Beach	1,105	paved	20	1	rolling
211	Province Lands visitor center road - Race Point Road to visitor center parking lot and parking lot	.42	III - access to visitor center	470	paved	23	1	rolling

*Closed to public



Route No.	Road Segment From/To	Length (miles)	Functional Classification-Purpose	Average Daily Traffic	Surface Type	Width (feet)	No. of Lanes	Terrain
212	Beech Forest Road - Race Point Road to end of loop and parking lot	.21	III - access to picnic area	190	paved	24	2	level
213	Herring Cove Beach parking lot road - Province Lands Road to north and south parking lots and parking lots	.58	III - access to north and south lots	620	paved	24	2	level
404	Head of the Meadow residence loop to and from Head of the Meadow Road	.13	V - access to residence	10	sand	21	1 to 2	level
405	Province Lands maintenance area road - Province Lands residence road to maintenance area	.14	V - access to maintenance area	30	paved	21	2	level
407	Province Lands residence road - Race Point Road to residence	.15	V - access to residence	10	paved	20	2	level
408	MacPhearson Road - Nauset Road to residence		V - access to residence	20	paved	22	2	level to rolling





Bicycle Trail Corridor ROAD CLASSIFICATION

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DSC/JANUARY 1987/609-40.071A



ROAD

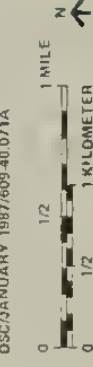
← ROUTE NUMBER SEE MAP TABLE, ABOVE



Bicycle Trail Corridor ROAD CLASSIFICATION

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

05CJANUARY 1987/609.40.071A



ROAD
← ROUTE NUMBER SEE MAP TABLE. ABOVE

APPENDIX E: BIKEWAY DESIGN GUIDELINES

<u>Trail Width</u>	<u>Preferred</u>	<u>Minimum</u>
bike path	10 feet	8 feet
bike lane	5 feet (each side of roadway)	4 feet

Horizontal clearance (either side of trail thread): 3 feet main stem, 2 feet elsewhere. This can be decreased in areas, if necessary, such as between US 6 and Main Street on Wellfleet. Three feet is designated as minimum clearance on the main stem because the Rail Trail (to which the main stem extends) is a mixed-use trail (bikers, hikers, and horseback riders).

Vertical clearance: 10 feet minimum

Design speed: 20 mph
30 mph on grades exceeding 5%

Gradient: less than 5% - preferred
10% - for short distances grades over 5% require increasing design speed to 30 mph and additional widening of path on curves.

Stopping sight distance: 50 feet minimum
100 feet preferred (See AASHTO standards.)

Lateral clearances on horizontal curves: 10 feet minimum
20 feet preferred

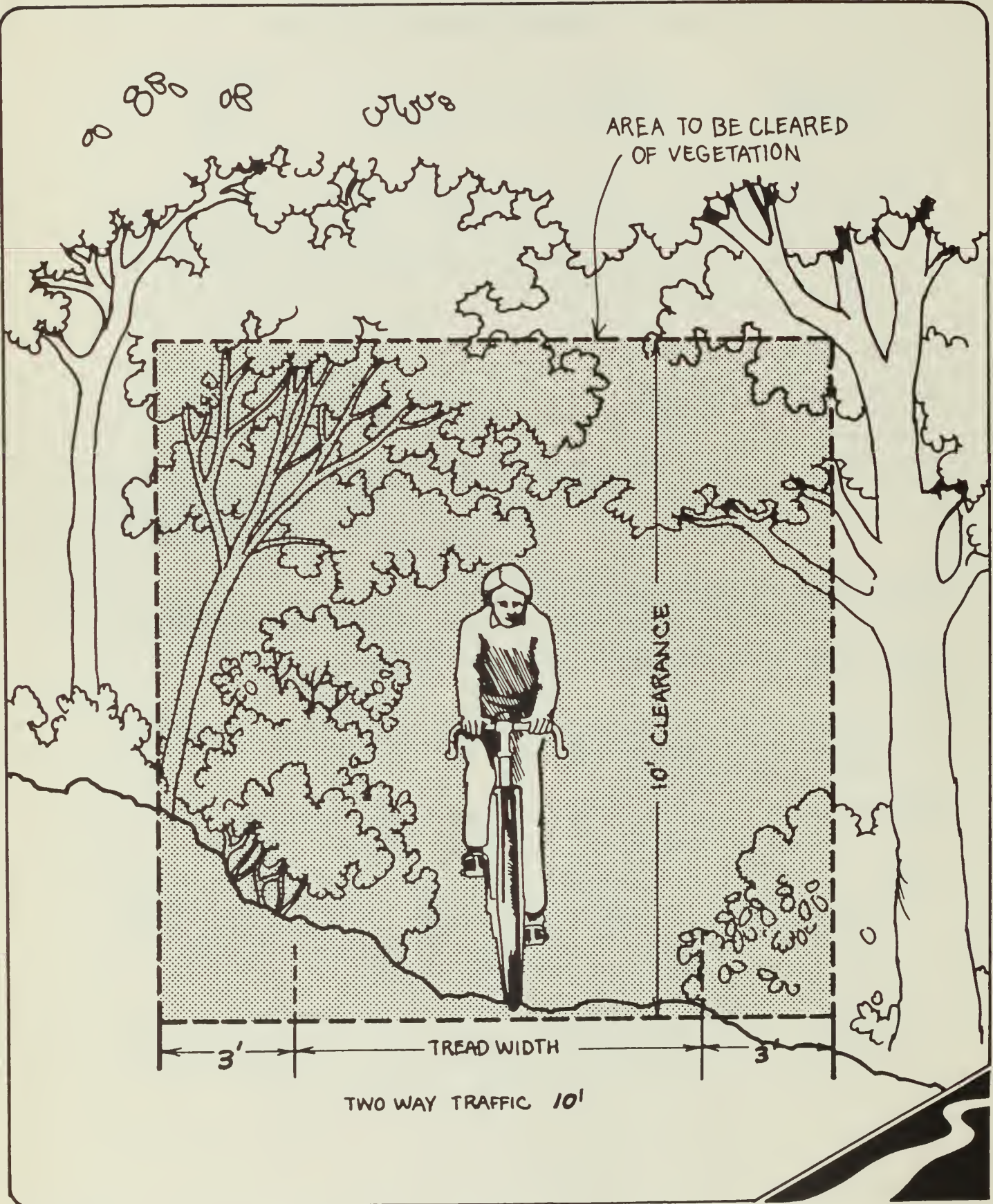
Shrubs over 2 feet high should be cleared. Trees can remain if trunks are of size and density not to block line of sight. (See AASHTO standards.)

Bridges: smooth planking, straight approaches, should accommodate maintenance equipment - minimum 10 feet inside clearance.

Signing: In addition to the general application of traffic control devices as described in the Manual on Uniform Traffic Control Devices mileposts should be at mile intervals along the trail. Because of the length of bike trails to be developed, pinpointing locations of accidents and required maintenance is necessary.

Intersections: Signing has not been effective on the cape to slow bicyclists at road crossings. Rumble strips are recommended to warn bicyclists of approaching road crossings and possible hazards.

BICYCLE TRAIL



APPENDIX F: DESIGN CHANGES TO EXISTING BICYCLE TRAILS

PROVINCE LANDS BIKE TRAIL

The following recommendations have been established from review of the accident reports occurring on the Province Lands Bike Trail during the years 1982-85. Where possible the accidents were mapped and their causes reviewed to determine (1) high accident locations, (2) cause, and (3) possible improvement of those locations by physical design.

Most of the bike accidents occurring at Province Lands were the result of inexperienced riders or unfamiliar equipment (rented bikes). Many of these accident situations were aggravated by steep grades that were followed by sharp curves. (Limited sight distance was only a minor problem on this trail.) The steep grades and sharp turns combined with the native sand that blows onto the trail make certain areas of the bike trail particularly hazardous. The number and severity of accidents could, however, be greatly reduced by reductions in speed. The following recommendations for decreasing bike speed are listed in priority order to minimize unnecessary costs and environmental impact. (They are recommended for the areas indicated on the following map.)

1. Increase Surface Friction -- Increasing surface friction increases perceived speed; therefore, riders have a tendency to slow down. This could be implemented by either resurfacing or possibly scoring the existing surface at regular intervals. If this proves successful, it should also be used at hazardous intersections.
2. Increase Frequency of Maintenance -- Increasing the frequency of sweeping and maintenance would help the situation but has long-term costs and could have very sporadic results because of wind and storms.
3. Redesign -- Redesign the trail in the areas indicated on the following map to add more, gentler curves and length to encourage speed reduction. This would be costly and have environmental impacts.

In addition to these general recommendations, the pavement through the tunnel from the visitor center toward Herring Cove needs to be removed and replaced. This will allow sufficient clearance in the tunnel (which was lost because of pavement buildup).

NAUSET BIKE TRAIL

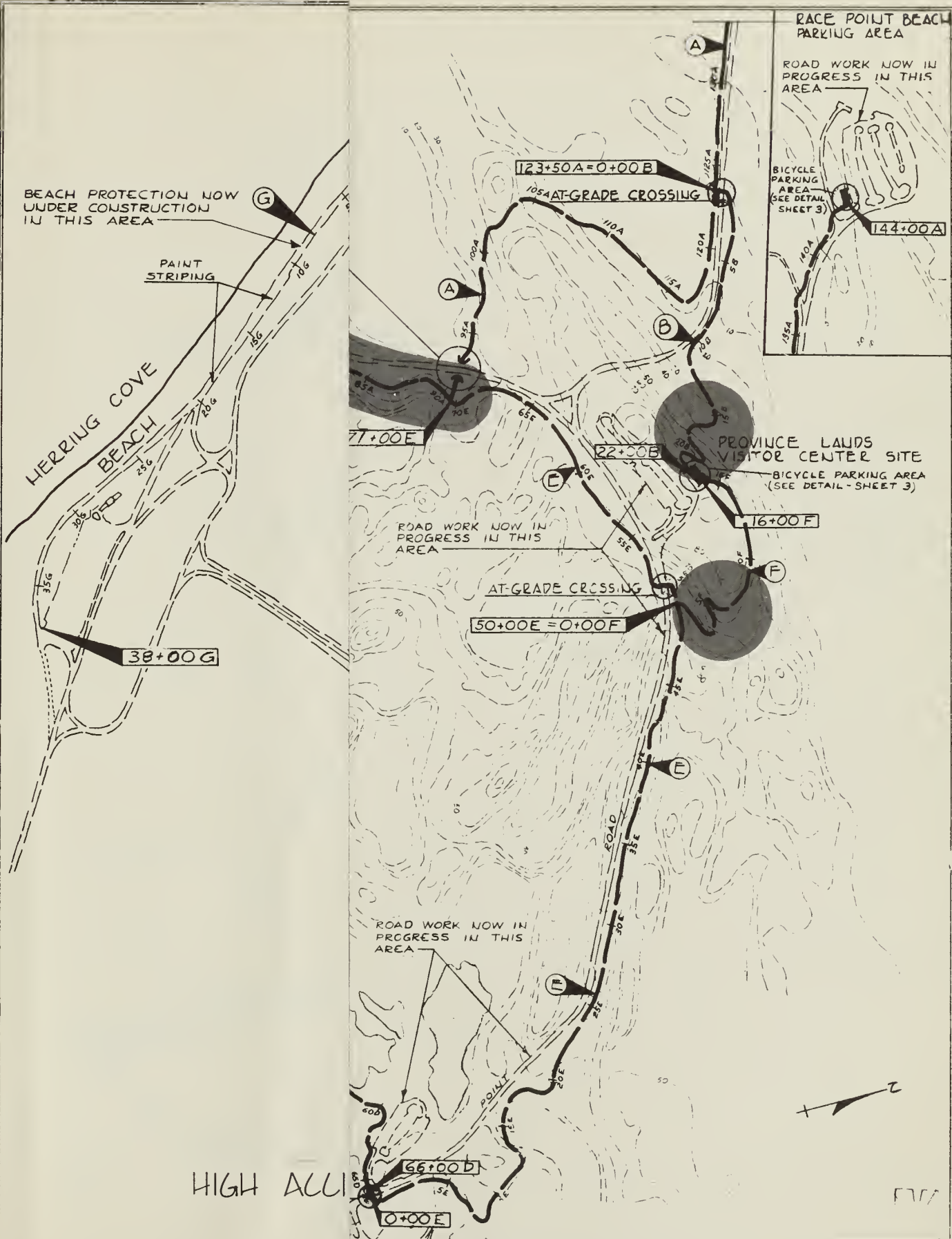
As with the Province Lands trail, these recommendations have been established from review and evaluation of the Nauset Bike Trail accident reports. The majority of the accidents occurring on the Nauset Bike Trail were again the result of inexperienced riders and unfamiliar

equipment. Grades and curves are an additional problem (less, however, than on the Province Lands trail), but are greatly aggravated by limited sight distances. This is further aggravated by sand on the trail.

The number and severity of these accidents could be greatly reduced by increasing visibility and reducing speed. Recommendations are listed below. The areas to apply these recommendations are indicated on the following map.

1. Increase Sight Distances -- All curves should have a minimum sight distance of 20 feet from the pavement on the inside edge of the curve. Low shrubs may stay, along with deciduous trees that are pruned to prevent visual interference. Tall shrubs and evergreens should be removed.
2. Increase Surface Friction -- Roughen or score the surface in locations where steep grades occur in conjunction with curves.

In addition to these general recommendations, the intersection of the bike trail with the parking lot at the Salt Pond visitor center needs to be converted to mountable curbing.

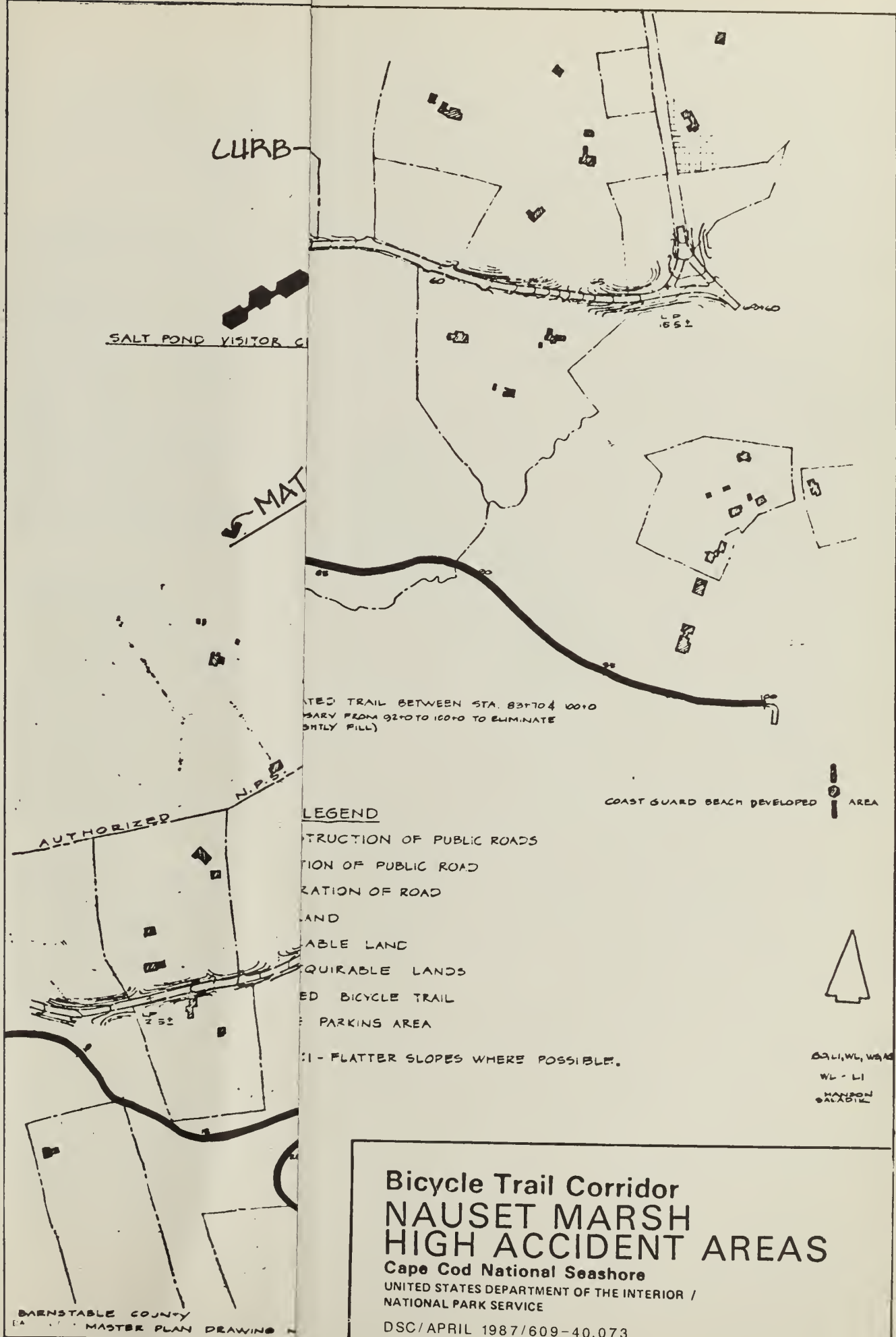


HIGH ACCIDENT

Bicycle Trail Corridor PROVINCELANDS HIGH ACCIDENT AREAS

Cape Cod National Seashore

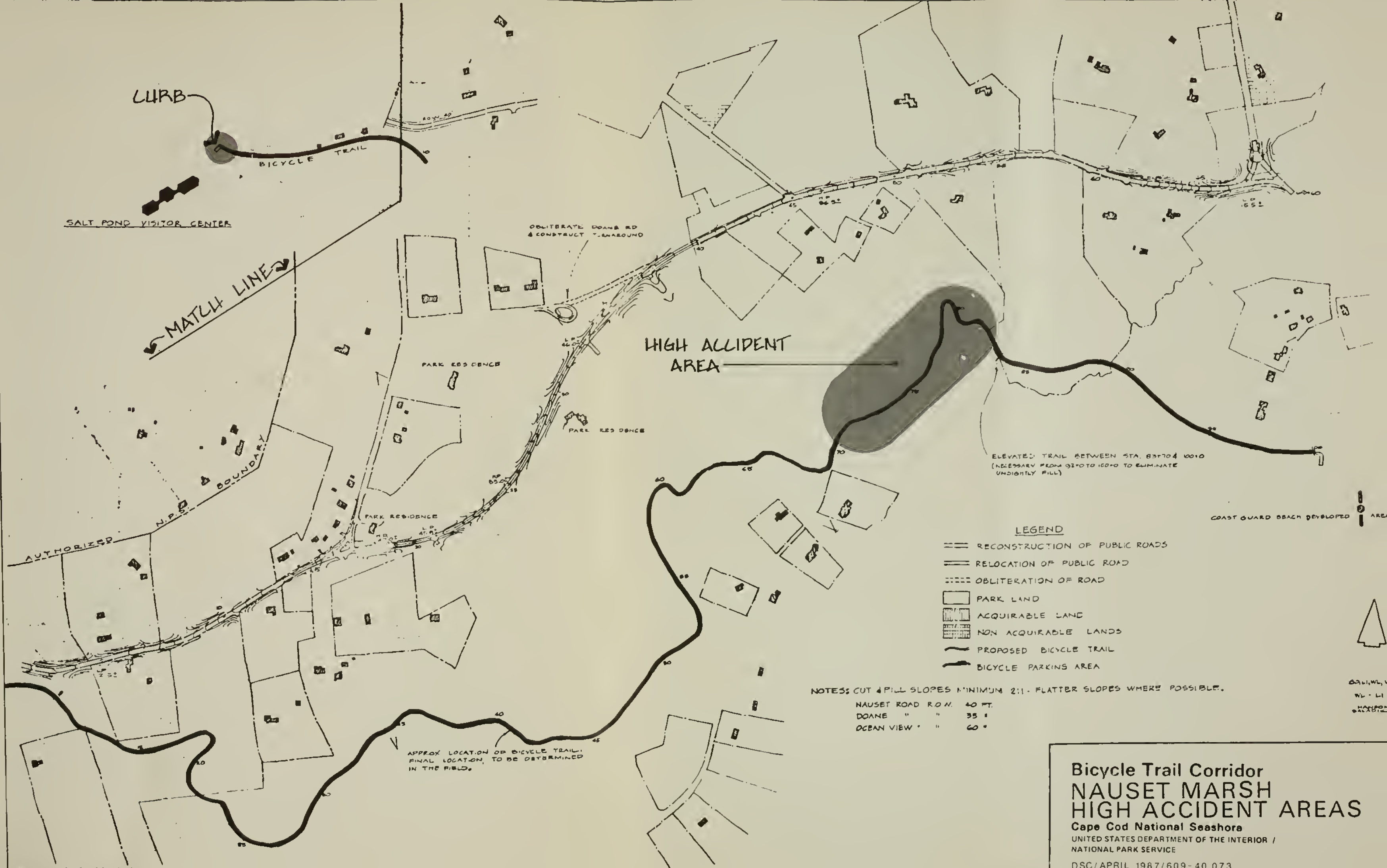
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NATIONAL PARK SERVICE



Bicycle Trail Corridor NAUSET MARSH HIGH ACCIDENT AREAS

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR /
NATIONAL PARK SERVICE

DSC/APRIL 1987/609-40,073



LURB

BICYCLE TRAIL

SALT POND VISITOR CENTER

MATCH LINE

OBLITERATE DOANE RD
& CONSTRUCT T-SHAROUND

HIGH ACCIDENT
AREA

PARK RES DENCE

PARK RES DENCE

PARK RESIDENCE

ELEVATED TRAIL BETWEEN STA. 837704 10010
(NECESSARY FROM 9170 TO 10010 TO ELIMINATE
UNDIGNITY HILL)

COAST GUARD BEACH DEVELOPED AREA

LEGEND

- RECONSTRUCTION OF PUBLIC ROADS
- RELOCATION OF PUBLIC ROAD
- OBLITERATION OF ROAD
- PARK LAND
- ACQUIRABLE LAND
- NON ACQUIRABLE LANDS
- PROPOSED BICYCLE TRAIL
- BICYCLE PARKING AREA

NOTES: CUT & FILL SLOPES MINIMUM 2:1. FLATTER SLOPES WHERE POSSIBLE.

NAUSET ROAD R.O.W.	40 FT.
DOANE " "	35 "
OCEAN VIEW " "	60 "

APPROX. LOCATION OF BICYCLE TRAIL.
FINAL LOCATION, TO BE DETERMINED
IN THE FIELD.

Bicycle Trail Corridor
NAUSET MARSH
HIGH ACCIDENT AREAS

Cape Cod National Seashore
UNITED STATES DEPARTMENT OF THE INTERIOR /
NATIONAL PARK SERVICE

DSC/APRIL 1987/609-40,073

APPENDIX G: BICYCLE AND VEHICLE ACCIDENT INFORMATION

Table G1. Bicycle Accidents - 1982-1985

Location	Near	Date	Hour	Day of Week
<u>Roads</u>				
Doane Rd	Eastham MTCE area	06-29-82	1400	3
Oceanview Dr	W of CG Bch triangle	07-02-82	1300	6
Doane Rd	Coast Guard triangle	07-10-82	1400	7
Coast Guard triangle	CG Bch/Doane Rd	08-20-82	1610	6
Cable Rd	1/2-way down	08-23-82	1030	2
Ocean View Dr	speed bump	09-03-82	1145	6
Doane Rd	CG triangle	09-19-82	1000	
Province Lands Rd		06-29-83	1500	4
Ocean View Dr		07-25-83	1330	2
Race Point Rd		06-23-84	1148	7
Herring Cove Rotary		07-11-84	0255	4
Race Point Rd	VC	08-22-84	1745	4
<u>Parking Lots</u>				
Race Point lot		07-13-82	1200	3
Marconi Beach lot		08-17-82	1115	
Salt Pond VC lot		08-20-82	1015	6
Herring Cove - N lot		05-20-84	1415	1
Herring Cove	south dunes	06-03-84	1145	1
Salt Pond VC lot		07-30-84	1150	2
Salt Pond VC		07-03-85	1730	4
Herring Cove		07-29-85	1430	2
Race Point Bch		08-01-85	1518	5
Salt Pond VC lot		08-18-85	1730	1
Race Point lot		10-12-85	1400	7
<u>Trails</u>				
Provincelands Trl	2nd Tnl/Herring Cove	05-25-82	1445	
Herring Cove Trl	Province Lands Rd	06-01-82	1010	3
Province Lands Trl		06-22-82	1645	3
Province Lands Trl	tunnel	06-26-82	1520	7
Nauset Trl		07-11-82	1515	1
Nauset Trl		07-22-82	1010	5
Trail	N lot/Herring Cove	07-23-82	1115	
Nauset Trl	1/2-way between Salt Pond	07-23-82	1545	6
	VC/CG Bch			
Trail	pasture pond	08-04-82	1245	4
Province Lands Trl	Beech Forest	08-06-82	1100	5
Trail		08-09-82	1830	2
Eastham Trl	Tomahawk Trl	08-10-82	1350	3
Province Lands Trl	1st tunnel	08-10-82	1735	3
Trail	tunnel	08-10-82	1740	
Province Lands Trl	amphitheatre	08-11-82	1100	4

Location	Near	Date	Hour	Day of Week
S District Trail	Doane Rd	08-13-82	1045	6
Trail	CG Beach	08-13-82	1120	6
Province Lands Trl	2 mi from Beech Forest	08-14-82	1655	7
Trail	cranberry lot	08-16-82	1715	2
Province Lands Trl	amphitheatre	08-20-82	1230	6
Salt Pond Trail	Shaw Rd/trail	08-24-82	1230	3
Province Lands Trl	near VC	08-28-82	1410	7
Race Point Trl	tunnel at Province Lands Rd	08-29-82	1150	
Province Lands Trl	tunnel	09-01-82	1515	
		09-12-82	0930	
Province Lands Trl	Herring Cove	10-10-82	1415	
Province Lands Trl	north tunnel	06-10-83	1200	
Province Lands Trl		06-12-83	1300	
Trail	Herring Cove	06-21-83	1655	3
Trail	Doane Rock area	06-27-83	1620	2
Province Lands Trl	tunnel at VC	06-29-83	1330	4
Province Lands Trl		06-29-83	1520	
Province Lands Trl	Race Point Rd/airport	06-30-83	1700	5
Trail	Salt Pond/CG Bch	07-10-83	1315	1
Pilgrim Spring Trl	1/2 mi. from Head of Meadow	07-17-83	1220	1
Trail		07-18-83	1000	3
Trail	Province Lands VC/Beech Forest	07-19-83	1400	
Trail	Coast Guard Station	07-21-83	1330	5
Province Lands Trl	1/4 mi from Roco Point	07-26-83	1125	3
Trail	Head of Meadow	07-27-83	1710	4
Province Lands Trl	1/2 mi S of Herring Cove	07-28-83	1430	5
Trail		07-28-83	1515	5
Province Lands Trl		07-29-83	1430	6
Trail	Salt Pond VC	07-30-83	1415	7
Trail	Doane Rd	08-05-83	1350	6
Trail	1/2 mi E of Race Point	08-09-83	1500	3
Trail	1 mi from Salt Pond	08-14-83	1155	6
Trail		08-16-83	1145	3
Trail	3/4 mi from Province Lands Rd	08-16-83	1930	3
Trail	1/4 mi into trail	08-17-83	1140	4
CG Trail		08-26-83	1230	6
Trail		08-30-83	1450	3
Trail	VC tunnel	08-30-83	1600	3
Trail	Coast Guard Beach	09-05-83	1615	2
Race Point Rd Trl		09-07-83	1130	4
Province Lands Trl	Beech Forest/VC	09-09-83	1709	6
Race Point Rd Trl	airport	09-11-83	1340	1
Trail	Race Point lot	09-12-83	1130	2
Trail	CG end	09-12-83	1210	2
Nauset Trail	Salt Pond VC	09-18-83	1400	1

Location	Near	Date	Hour	Day of Week
Trail	Doane Rk/CG Bch	09-19-83	1130	2
Province Lands Trl	Herring Cove lot	05-14-84	1400	
		05-19-84	1330	
Province Lands Trl	2nd tunnel	05-22-84	1510	3
Province Lands Trl	Herring Cove N. lot	06-03-84	1200	1
Province Lands Trl	1/4 mi from Herring Cove lot	06-05-84	1400	3
Province Lands Trl	Race Point	07-02-84	1330	3
Trail	rear of Salt Pond VC	07-02-84	1500	2
		07-06-84	1415	6
Trail	Salt Pond VC	07-10-84	1630	3
Trail	W of Salt Marsh	07-10-84	1650	3
Province Lands Trl	Herring Cove	07-11-84	1400	4
Race Point Trail	Race Point crossing	07-29-84	1530	1
Province Lands Trl	Dike Rd	08-03-84	1400	6
Province Lands Trl	Bennett Pond spur	08-15-84	1650	4
Province Lands Trl	Beech Frst/Herring Cove	08-27-84	1605	2
Trail	VC/Race Point	08-29-84	1140	4
Province Lands Trl	tunnel (Province Lands Rd)	09-01-84	1510	7
Province Lands Trl	first tunnel	09-02-84	1430	7
Race Point Trl	Race Point lot	09-10-84	1515	2
Nauset Trl		09-26-84	1025	4
Province Lands Trl		05-24-85	1330	6
Province Lands Trl		05-24-85	1430	6
Trail		05-25-85	1310	7
Province Lands Trl	amphitheatre	05-29-85	1110	4
Province Lands Trl		06-22-85	1015	7
Province Lands Trl		06-25-85	1530	3
Province Lands Trl		07-04-85	1120	5
Province Lands Trl		07-05-85	1630	6
Province Lands Trl		07-07-85	1115	1
Province Lands Trl		07-19-85	1215	6
Trail	Salt Pond	07-23-85	1510	3
Province Lands Trl		07-25-85	1450	5
Trail	Salt Pond VC/Eastham	07-30-85	1610	3
Province Lands Trl		08-02-85	1530	6
Rail Trail	Eastham	08-02-85	1645	6
Rail Trail	Eastham	08-03-85	1500	7
Province Lands Trl		08-04-85	1040	1
Trail	CG wood bridge	08-14-85	1356	
Trail	Doane Rk	08-14-85	1530	
Salt Pond/CG Trl		08-18-85	1410	
Trail		08-21-85	1600	
Trail	CG Station	08-28-85	1645	4
Herring Cove/N dune path		09-05-85	1255	5
Province Lands Trl	Beech Forest/VC	09-05-85	1630	5
Province Lands Trl	Province Lands VC	10-12-85	1415	7
Nauset Trl	Doane Rk/bridge	10-26-85	1330	7

Source: Park Data

Table G2. Vehicle Accidents - 1982

Date	Hour	Day of Week	Light Condition	Weather Condition	Accident Type*	Accident Degree**	Cause	Number of Vehicles
01-31-82	2030	1	night	rain	2	3	weather	1
02-09-82	1600	3	dusk	snow	2	3	emergency control	1
05-03-82	2100	2	night	clear/cloudy	2	3	emergency control	1
05-11-82	1730	3	day	clear/cloudy	4	3	emergency control	1
05-12-82	0230	3	night	clear/cloudy	2	3	reckless driving	1
05-15-82	1900	7	day	clear/cloudy	1	3	improper backing and parking	2
05-29-82	2400	7	night	rain	1	3	improper backing and parking	2
06-06-82	1845	1	dusk	rain	4	3	emergency control	1
06-09-82	1430	6	day	rain	2	3	inattention	1
07-08-82	0943	5	day	clear/cloudy	2	3	improper backing and parking	1
07-16-82	0206	6	night	clear/cloudy	4	2	other	1
07-17-82	0930	7	day	clear/cloudy	1	3	improper backing and parking	2
07-19-82	1400	2	day	clear/cloudy	1	3	emergency control	2
08-04-82	1115	4	day	clear/cloudy	1	3	improper backing and parking	2
08-08-82	1800	1	day	clear/cloudy	1	3	improper backing and parking	2
08-28-82	1600	7	day	clear/cloudy	1	2	other	2
09-04-82	1715	7	day	clear/cloudy	1	3	overtaking - wrong side	2
09-05-82	1700	1	day	clear/cloudy	1	3	improper backing and parking	2
09-11-82	1820	7	day	clear/cloudy	1	3	improper backing and parking	2
09-21-82	1530	3	day	clear/cloudy	1	3	reckless driving	2
09-25-82		7	day	clear/cloudy	2	3	excessive speed	1
10-05-82	0855	3	day	clear/cloudy	1	3	improper backing and parking	2
10-10-82	1530	1	day	clear/cloudy	1	3	inattention	2
10-12-82	1630	3	day	clear/cloudy	4	3	emergency control	1
11-15-82	0830	2	day	rain	2	3	weather	1
11-19-82	2235	6	night	clear/cloudy	4	3	mechanical failure	1
12-25-82	2230	7	night	rain	4	3	reckless driving	1

*1 - collision with other vehicle, 2 - collision with fixed object, 3 - collision with pedestrian,
4 - noncollision, 5 - other

**1 - fatal, 2 - injury, 3 - property damage only

Table G3. Vehicle Accidents - 1983

Date	Hour	Day of Week	Light Condition	Weather Condition	Accident Type*	Accident Degree**	Cause	Number of Vehicles
03-16-83	0300	4	night	clear/cloudy	2	3	emergency control	1
04-03-83	2230	1	night	rain	2	3	mechanical failure	1
04-23-83	0600	7	dawn	clear/cloudy	2	2	inattention	1
05-11-83	1830	4	dusk	rain	2	3	emergency control	1
05-25-83	1715	4	day	clear/cloudy	2	3	improper backing and parking	1
05-27-83	0855	6	day	clear/cloudy	1	3	improper backing and parking	2
05-28-83	1200	7	day	clear/cloudy	1	3	improper backing and parking	2
06-05-83	0200	1	night	fog	2	3	weather	1
06-11-83	1715	7	day	clear/cloudy	1	3	other	2
06-12-83	0300	1	night	clear/cloudy	2	3	other	1
06-16-83	0200	5	night	clear/cloudy	2	3		1
06-27-83	0328	2	night	rain	5	3	other	1
06-27-83	1030	2	day	clear/cloudy	2	3	improper backing and parking	1
06-28-83	2130	3	night	clear/cloudy	5	3	other	1
07-01-83	1300	6	day	clear/cloudy	1	3	improper backing and parking	2
07-06-83	1125	4	day	clear/cloudy	2	3	inattention	1
07-09-83	1245	7	day	clear/cloudy	2	3	inattention	1
07-09-83	1430	7	day	clear/cloudy	2	3	improper turn	1
07-13-83	1600	4	day	clear/cloudy	1	3	improper backing and parking	2
07-14-83	1530	5	day	clear/cloudy	1	3	improper backing and parking	2
07-15-83	1945	6	dusk	clear/cloudy				2
07-20-83	2000	4	day	clear/cloudy		2		2
07-22-83	2140	6	night	clear/cloudy	2	3	road defect	1
07-23-83	1110	7	day	clear/cloudy	1	3	right-of-way violation	2
07-27-83	1145	4	day	clear/cloudy	1	2	inattention	2
07-31-83	1430	1	day	clear/cloudy	1	3	improper backing and parking	2
08-03-83	1405	4	day	clear/cloudy	1	3	improper turn	2
08-05-83	0045	6	night	clear/cloudy	2	3	weather	1
08-08-83	1130	2	day	clear/cloudy	1	3	improper turn	2
08-17-83	1450	4	day	clear/cloudy	1	3	right-of-way violation	2
08-17-83	1530	4	night	clear/cloudy	1	3	improper backing and parking	2
08-30-83	0545	3	dawn	fog	4	3	other	1
09-01-83	1445	5	day	clear/cloudy	1	3	improper backing and parking	2
09-03-83	1625	7	day	clear/cloudy	1	3	improper turn	2
09-03-83	2310	7	night	clear/cloudy	1	2	excessive speed	1
09-04-83	1255	1	day	clear/cloudy	3	2	inattention	1
10-09-83	0330	1	night	clear/cloudy	2	3	inattention	1
10-14-83	1410	6	day	clear/cloudy	1	3	inattention	2
10-29-83	2300	7	night	clear/cloudy	2	3	inattention	1
12-28-83	0200	3	night	clear/cloudy	2	3	emergency control	1
12-28-83	0300	4	night	clear/cloudy	4	3	inattention	1

*1 - collision with other vehicle, 2 - collision with fixed object, 3 - collision with pedestrian, 4 - noncollision, 5 - other

**1 - fatal, 2 - Injury, 3 - property damage only

Table G4. Vehicle Accidents - 1984

Date	Hour	Day of Week	Light Condition	Weather Condition	Accident Type*	Accident Degree**	Cause	Number of Vehicles
01-02-84	1240	2	day	snow	2	3	weather	1
01-02-84	1420	2	day	clear/cloudy	1	3	weather	1
01-12-84	0848	5	day	snow	1	3	weather	2
01-21-84	1126	7	day	clear/cloudy	1	2	emergency control	2
01-22-84	1500	1	day	clear/cloudy	4	3	emergency control	1
06-13-84	1320	4	day	clear/cloudy	1	3	improper backing and parking	2
06-23-84	2215	7	night	clear/cloudy	2	1	driving under influence	1
06-24-84	1200	1	day	clear/cloudy	1	3	improper backing and parking	2
06-29-84	1315	6	day	clear/cloudy	2	3	other	1
07-02-84	0000	2			2	3		
07-05-84	0945	5	day	clear/cloudy	1	3	improper backing and parking	2
07-06-84	1230	6	day	clear/cloudy	1	3	improper backing and parking	2
07-07-84	1220	7	day	clear/cloudy	5	3	weather	2
07-13-84	1550	6	day	clear/cloudy	1	3	inattention	2
07-19-84	1430	5	day	clear/cloudy	4	2	inattention	1
07-21-84	2045	7	night	rain	1	3	reckless driving	2
07-25-84	1700	4	day	clear/cloudy	1	3	improper backing and parking	2
08-04-84	1315	7	day	clear/cloudy				2
08-04-84	1845	7	day	clear/cloudy	1	3	inattention	2
08-07-84	0130	3	night	clear/cloudy	2	3	emergency control	2
08-11-84	1700	7	dusk	clear/cloudy	1	3	improper backing and parking	2
08-14-84	0930	3	day	clear/cloudy	1	3	reckless driving	2
08-17-84	1445	6	day	clear/cloudy	1	3	improper backing and parking	2
08-18-84	1445	7	day	clear/cloudy	1	3	improper backing and parking	2
08-18-84	1930	7	dusk	clear/cloudy	2	3	improper backing and parking	1
08-23-84	1400	5	day	clear/cloudy	1	3	improper backing and parking	2
08-25-84	0600	7	dawn	clear/cloudy	2	3	reckless driving	1
08-26-84	1530	1	day	clear/cloudy	4	2	road defect	1
08-27-84	1530	2	day	clear/cloudy	1	3	improper backing and parking	2
08-29-84	1135	4	day	clear/cloudy	1	3	improper backing and parking	2
09-02-84	1900	1	dusk	clear/cloudy	1	3	improper lane changes	2
09-08-84	0100	7	night	clear/cloudy	2	2	driving under influence	1
09-15-84	1450	7	day	rain	1	2	inattention	2
09-21-84	0840	6	day	clear/cloudy	1	3	improper lane changes	2
09-28-84	1415	6	day	clear/cloudy	1	3	right-of-way violation	2
10-11-84	1730	5	day	clear/cloudy	1	3	right-of-way violation	2
10-13-84	0800	5	day	clear/cloudy	4	3	other	1
10-26-84	2305	6	night	rain	2	3	excessive speed	1
10-28-84	0100	1	night	clear/cloudy	2	3	reckless driving	1
11-09-84	1130	6	night	clear/cloudy	2	3	excessive speed	1
11-27-84	0930	3	day	clear/cloudy	2	3	improper backing and parking	1
11-27-84	1500	3	day	clear/cloudy	2	3	improper backing and parking	1
12-19-84	1118	4	day	clear/cloudy	2	3	improper backing and parking	1

*1 - collision with other vehicle, 2 - collision with fixed object, 3 - collision with pedestrian, 4 - noncollision, 5 - other

**1 - fatal, 2 - injury, 3 - property damage only

Table G5. Vehicle Accidents - 1985

Date	Hour	Day of Week	Light Condition	Weather Condition	Accident Type*	Accident Degree**	Cause	Number of Vehicles
01-13-85	1603	1	day	clear/cloudy	4	3	excessive speed	1
01-19-85	1337	7	day	snow	2	3	excessive speed	1
02-26-85	1230	3	day	clear/cloudy	1	3	other	2
03-09-85	1310	7	day	clear/cloudy	1	3	improper backing and parking	2
04-16-85	1645	3	day	clear/cloudy	5	3	other	1
04-25-85	2100	5	night	clear/cloudy	4	3	reckless driving	1
04-26-85	2230	6	night	clear/cloudy	3	2	driving under influence	1
05-05-85	2300	1	night	rain	1	2	inattention	2
05-25-85	0020	7	night	clear/cloudy	4	3	emergency control	1
05-25-85	1600	7	day	clear/cloudy	2	3	inattention	1
06-22-85	0835	7	day	clear/cloudy	3	2	reckless driving	1
06-24-85	2040	2	dusk	clear/cloudy	1	3	improper backing and parking	2
06-25-85	1700	2	day	clear/cloudy	1	3	inattention	2
07-04-85	0940	5	day	clear/cloudy	1	3	improper backing and parking	2
07-07-85	1325	1	day	clear/cloudy	1	3	following too closely	2
07-07-85	2330	1	night	clear/cloudy	1	3	other	2
07-09-85	1530	3	day	clear/cloudy	1	3	driving under influence	2
07-10-85	0330	4	night	fog	2	3	inattention	1
07-20-85	1735	7	day	clear/cloudy	2	3	excessive speed	1
07-28-85	0830	1	day	clear/cloudy	2	3	inattention	1
08-01-85	1505	5	day	clear/cloudy	1	3	improper backing and parking	2
08-05-85	1430	2	day	clear/cloudy	2	3	improper backing and parking	1
08-11-85	1440	1	day	clear/cloudy	1	3	improper backing and parking	2
08-22-85	2130	5	night	clear/cloudy	1	2	reckless driving	2
09-01-85	0150	1	night	clear/cloudy	2	3	excessive speed	1
10-17-85	1530	5	day	clear/cloudy	5	3	other	1
10-18-85	1330	6	day	clear/cloudy	1	3	physical failure	2
10-30-85	1400	4	day	clear/cloudy	2	2	excessive speed	1
12-13-85	2000	6	night	rain	4	3	other	1

*1 - collision with other vehicle, 2 - collision with fixed object, 3 - collision with pedestrian, 4 - noncollision, 5 - other

**1 - fatal, 2 - injury, 3 - property damage only

APPENDIX H: TOWN ROADS

Table H1. Major Town Roads That Provide Access
to National Seashore Activities

<u>Road Ownership</u>	<u>Road Name</u>	<u>Seashore Areas Served</u>	<u>Length/Miles</u> ¹
Orleans	Beach Road	Orleans (Nauset) town beach	2.7
Eastham	Governor Prentice Road	Fort Hill Road to Fort Hill	.1
Eastham	Nauset Road ²	Cable Road to Nauset Light Beach	.2
Eastham	Ocean View Drive	Connector between Nauset Light and Coast Guard beaches	.9
Eastham	Brackett Road	Nauset Road to Cable and Doane roads to beaches	.9
Wellfleet	Le Count Hollow Road	Ocean View Drive and town beaches	.9
Wellfleet	Ocean View Drive	Le Count Hollow (Maguire Landing), White Crest, Cahoon Hollow, and Newcomb Hollow town beaches	3.0
Wellfleet	Cahoon Hollow Road	Great Pond, Ocean View Drive, and Cahoon Hollow Beach	3.0
Wellfleet	Long Pond Road	Long Pond and Ocean View Drive	2.7
Wellfleet	Chequessett Neck Road	Great Island Trail and Duck Harbor Beach	4.2
Wellfleet	Gross Hill Road	Gull Pond and Ocean View Drive	2.9
Wellfleet	Gull Pond Road	Gull Pond and Gross Hill Road	1.4
Wellfleet and Truro	Old County Road	Bound Brook Island Road and Atwood-Higgins complex	6.1
Wellfleet	Pamet Point Road	Old County Road	1.6
Truro	Collins Road	US 6 to South Pamet Road to Ballston town beach	2.1
Truro	South Pamet Road	Ballston town beach	1.7
Truro	North Pamet Road	Pamet Cranberry Bog Trail and Youth Hostel (environmental education center)	1.7
Truro	Longnook Road	Longnook town beach	1.6
Truro	South Highland Road	US Coast Guard Station, Highland Light	1.6
Truro	Highland Road	Coast Guard town beach	.8
Truro	Coast Guard Road	Coast Guard town beach	.7
Truro	Head of the Meadow Road	Head of the Meadow Beaches (NPS and town)	.9
Provincetown	Race Point Road	Seashore boundary, Province Lands Road, Provincetown, and Race Point Beach	.3

¹ Rounded to nearest tenth mile--includes segment under town jurisdiction from US 6, NPS roads, or other crossroads.

² From Brackett Road to Cable Road.

BIBLIOGRAPHY

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

- 1981 "Guide for Development of New Bicycle Facilities, 1981," Washington, D.C.

CAPE COD PLANNING AND ECONOMIC DEVELOPMENT COMMISSION

- 1982 Population Estimates and Projections for Barnstable County 1980-2000. Barnstable County.

1986 Correspondence about traffic and accident data.

COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

- 1978 "Statewide Comprehensive Outdoor Recreation Plan" (SCORP) 1977-1982.

1983 The Outdoor Heritage of Massachusetts (SCORP) 1983-1988. Publication Number 13, 650-118-2000-6-84 C.R.

COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS, TRAFFIC ENGINEERING SECTION

- 1985 Report No. 4 Highway Analysis (computer printout of traffic and accident data).

DE LEUW, CATHER, AND COMPANY

- 1974 "Bikeways, State of the Art, 1974," prepared for Federal Highway Administration, National Technical Information Service, and U.S. Department of Commerce.

FEDERAL HIGHWAY ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION

- 1980 "Road Inventory and Needs Study for Cape Cod National Seashore."

FORESTER, JOHN

- 1977 "Cycling Transportation Engineering," Custom Cycle Fitments, Palo Alto, California.

FOSTER, CHARLES H.W.

- 1985 "The Cape Cod National Seashore, A Landmark Alliance." University Press of New England, Hanover, NH 03755.

GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR

- 1976 "Geologic History of Cape Cod, Massachusetts." Washington, D.C.: Government Printing Office.

HUDSON, MIKE

- 1978 The Bicycle Planning Book, Friends of the Earth, London.

INSTITUTE OF TRANSPORTATION AND TRAFFIC ENGINEERING

1973 "Proceedings of the Pedestrian/Bicycle Planning and Design Seminar." University of California, Berkeley, California.

JARRELL, TEMPLE R.

1974 Bikeways, Design-Construction-Programs, National Recreation and Park Association.

JILLA, ROBERT J.

1974 "Effects of Bicycle Lanes on Traffic Flow," Joint Highway Research Project between Indiana State Highway Commission and Purdue University, West Lafayette, Indiana.

McCONNELL, WILLIAM

1985 "Land Use Update for Cape Cod 1980 and 1984," prepared for Barnstable County Planning and Economic Development Commission.

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

1982 "Trails Manual: Development and Maintenance."

NATIONAL PARK SERVICE, U.S. DEPARTMENT OF THE INTERIOR

1970 "Highland Light Development Concept Plan," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1970 "Master Plan," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1974 "Development Concept Plan, Atwood-Higgins Complex," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1978 "Eastham Area, Development Concept Plan/Assessment of Alternatives," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1979 "Historic Resource Study," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1980 "Eastham Area, Supplement to the Assessment of Alternatives Development Concept Plan," Cape Cod National Seashore, Massachusetts, Denver Service Center.

-- "Hunters Information." Cape Cod National Seashore, Massachusetts, Wellfleet, MA.

-- "Statement for Management," Cape Cod National Seashore, Massachusetts, Wellfleet, MA.

1981 "Analysis of Water Resource Management Alternatives with Environmental Assessment," Cape Cod National Seashore, Massachusetts, Office of Scientific Studies, North Atlantic Region, Boston, MA.

-- "Development Concept Plan, Transportation Analysis, Eastham," Cape Cod National Seashore, Massachusetts, Denver Service Center.

1985 "Land Protection Plan," Cape Cod National Seashore, Massachusetts.

1986 "Draft Traffic Engineering Safety Improvement Study, Chickamauga and Chattanooga National Historic Park," Georgia and Tennessee, Denver Service Center.

PECCIA, ROBERT, AND ASSOCIATES

1985 "Traffic Engineering Safety Improvements Study," Grand Teton National Park, Wyoming, Helena, Montana.

STATE OF CALIFORNIA BUSINESS AND TRANSPORTATION AGENCY

1978 "Planning and Design Criteria for Bikeways in California," Department of Transportation.

STRAHLER, ARTHUR N.

1966 "A Geologist's View of Cape Cod." Garden City, N.Y.: American Museum of Natural History Press.

TRURO CONSERVATION COMMISSION

1984 "Town of Truro Open Space Plan," Truro, Massachusetts (draft).

URBAN BIKEWAY DESIGN COLLABORATIVE

1976 Cyclateral Thinking: An Atlas of Ideas for Bicycle Planning. Grant DOT-05-60007, U.S. Department of Transportation, Federal Highway Administration, and U.S. Environmental Protection Agency. Shea Brothers Printing, Cambridge, MA.

WELLFLEET CONSERVATION COMMISSION

1984 "Town of Wellfleet Open Space Plan," Wellfleet, Massachusetts (draft).

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