

**MASTER PLAN REPORT**  
**Washington Crossing**  
**State Park**  
**Mercer County, New Jersey**

final draft

MASTER PLAN REPORT

for

WASHINGTON CROSSING STATE PARK

MERCER COUNTY, NEW JERSEY

11 AUGUST 1972

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11 August 1972

2902-1

SUBJECT: Washington Crossing State Park  
Interim Master Plan Report DBC #8098

Mr. Alfred W. Wensley  
Administrator/State Architect  
State of New Jersey  
Department of the Treasury  
Division of Building and Construction  
West State and Willow Streets  
Trenton, New Jersey 08625

Attention: Mr. Wallace Jordan

Dear Mr. Wensley:

Pursuant to your Order No. 8098 dated 13 December 1971, we have prepared a Master Plan Report for the development of the lands at Washington Crossing State Park. We submit our report herewith.

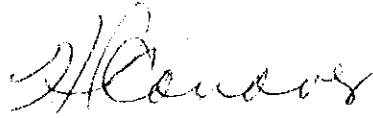
The Master Plan Report includes a detailed analysis of the park and its surround, the natural and cultural phenomena, together with maps and charts to illustrate graphically the basic factors which governed our recommendations. It is intended that the report be a body of factual information from which policy decisions and development programs can be made.

We have recommended a Tripartite Park of Passive, Active and Historic Site functions; with the latter being given emphasis and priority. This is predicated on the need for protecting, preserving and educating the public to that portion of our cultural heritage which was enacted at this site. Many encroachments have been made on the site by public roads and utilities. Therefore, it is of paramount importance that a continuing liaison be established among the parties concerned.

We would at this time like to express our appreciation for the opportunity to assist you in this important project.

Very truly yours,

CHAS. T. MAIN, INC. & JOHN G. REUTTER ASSOCIATES

A handwritten signature in cursive script, appearing to read "H. S. Conover".

H. S. Conover  
Associate Member of the Firm

HSC/beb

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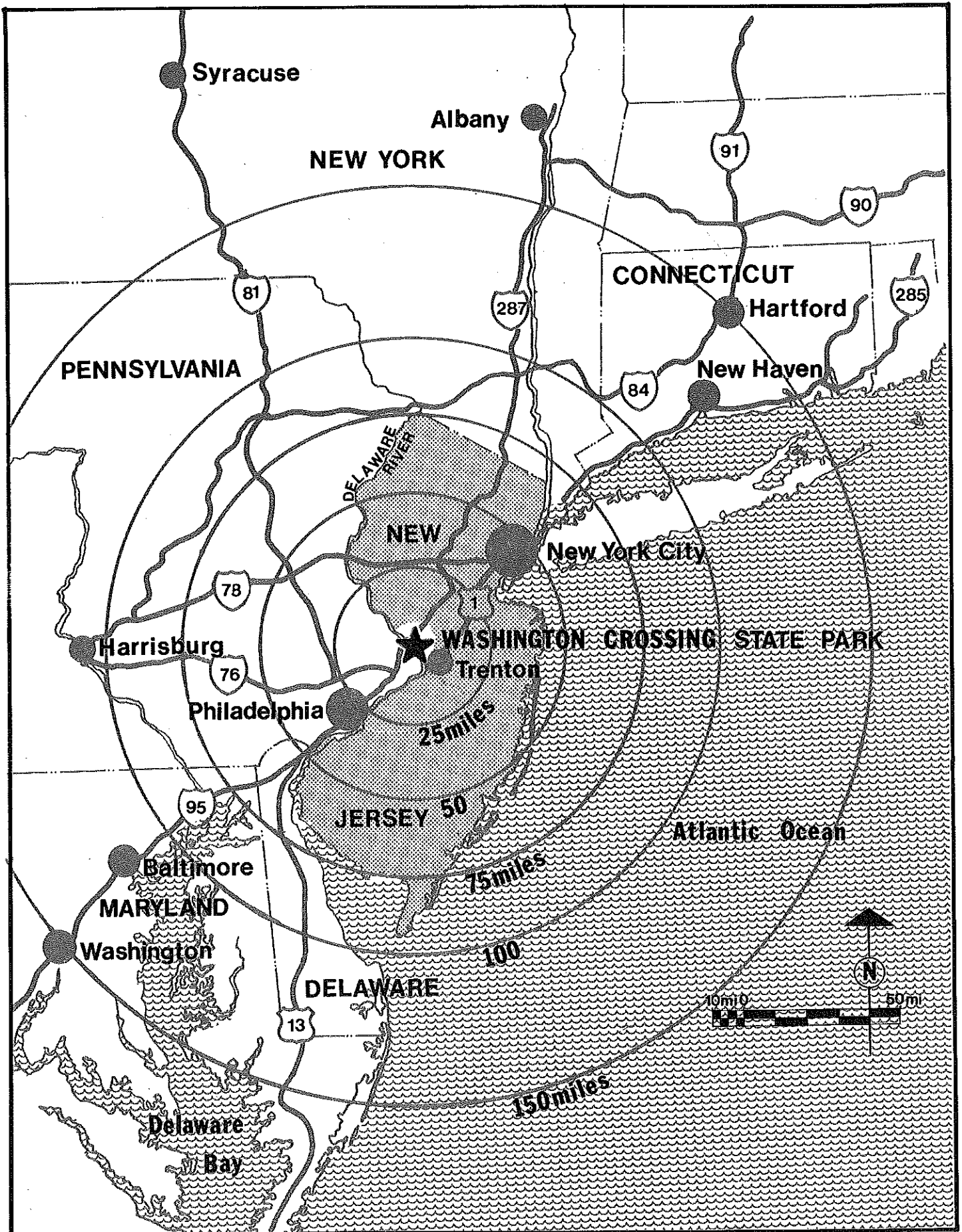
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*Bibliography and Appendix to be included with final report.*

## PREFACE

The historic significance of the McKonkey Ferry and the role it played in the War for Independence was recognized undoubtedly long before the original 400 acres of land was set aside in 1910. The responsibility for protecting and preserving this area, one of New Jersey's prime historic sites, is a responsibility of the State. However there are other parties which affect the well being of the park namely, Penn Central Railroad, N. J. Bureau of Water Supply, N. J. Department of Transportation, Delaware River Joint Toll Bridge Commission and the Washington Crossing Association.

With the approaching Bicentennial Celebration comes a heightened awareness of this responsibility to show the populace those structures which still exist and possibly to reconstruct facilities of those which do not. Time as well as our industrial society have obviated some, and obliterated other, portions of the site. It is only through a concerted effort that some aspects of the site can be amended, whereby a semblance of the original can be appreciated by those who will come for the celebration and afterwards. To this end this study solicits the indulgence and cooperation of the Interstate Agency, the two States and their various agencies, and the historic organizations. Not all parties involved share similar obligations, but each party has the same *raison d'etre*: the crossing and its historic significance. Therefore, it is paramount to recognize the validity of the maxim that the whole is greater than its parts and also, that for lack of a part, the whole would not be as great nor complete.



## INTRODUCTION

As is stated in the New Jersey SCORP Report Number 3, "The State's primary responsibility tends to lie with the acquisition and development of large areas for hunting and fishing, camping, and other low to medium intensive forms of recreation, plus the preservation and conservation of large tracts of land to insure their effective management as a part of the natural process."

"As a general rule-of-thumb, the higher the level of government, the greater the percentage of open space holdings that should remain relatively undeveloped and held primarily for conservation purposes." pp. 8

MAIN-REUTTER concur with this policy statement. However, in this area of the State, it is questionable whether the pressures of suburbanization can be guided sufficiently (as they need to be) to protect or ensure a viable public open space program predicated on a natural resources base which identifies those areas or features which are irreplaceable. There is a tremendous need for this type of planning guidance at the County/township level, which is not being met. The lack of effective planning is evident as one reviews the existing and proposed land uses in the park surround.

In lieu of a viable County/township natural-resources based open space-recreation program, the State government must assume the responsibility in assuring that Washington Crossing State Park is not left to be an island of green in a sea of suburbia. If this fate should befall this state park, the purposes and goals set forth in SCORP will become mere platitudes.

The inherent limitations and capabilities of the land in the park surround for an open space-recreation program must be recognized, appreciated, and sympathetically worked with if expensive remedial measures are not to be an added responsibility to the public.



# URBANIZING AREAS IN NEW JERSEY

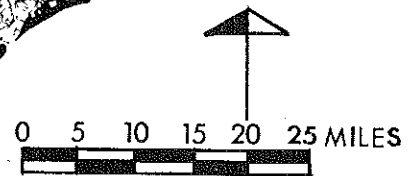
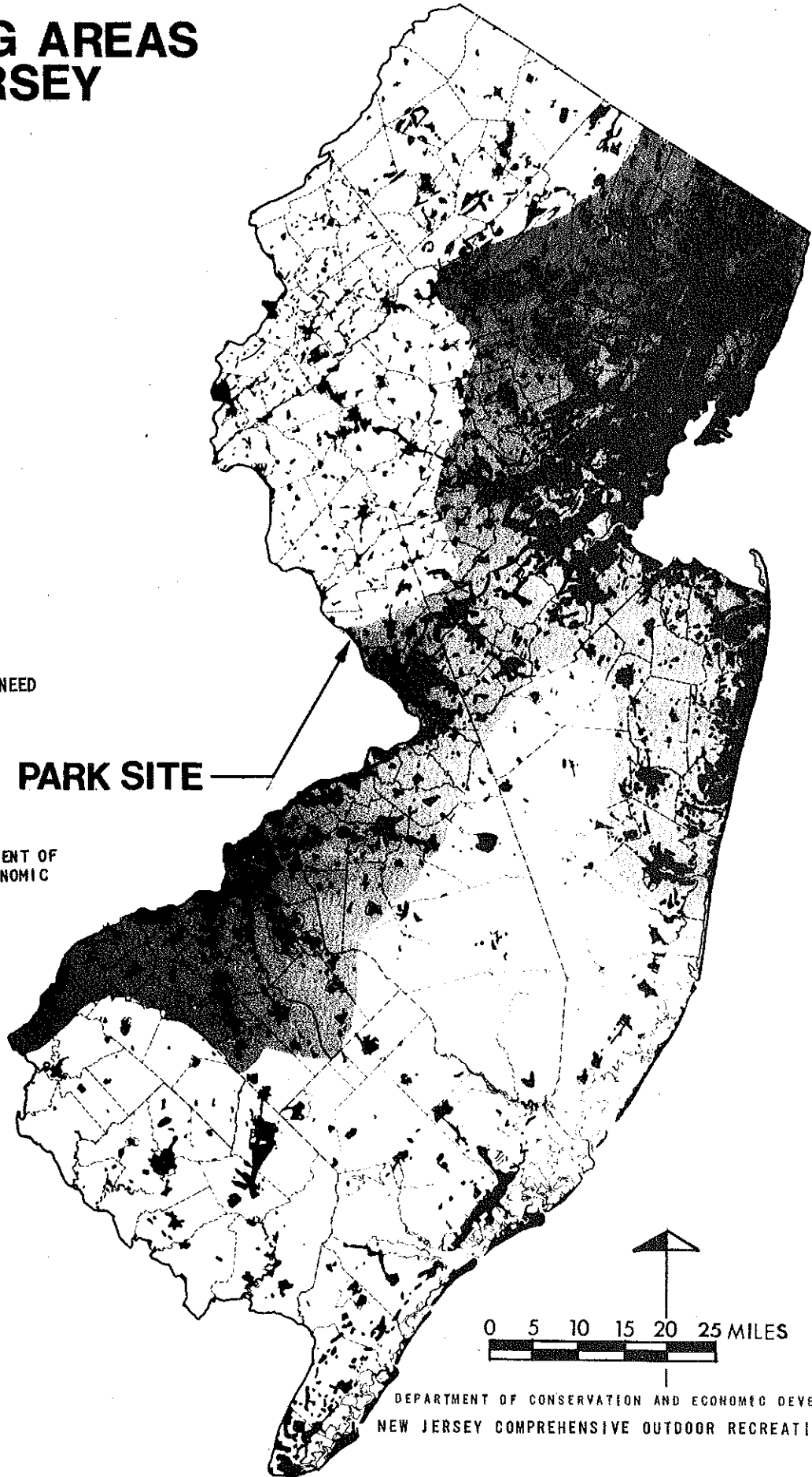
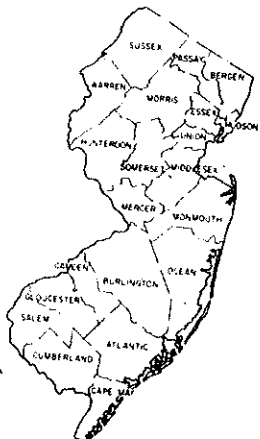
## LEGEND

- DEVELOPED LAND AREA  
IN NEW JERSEY 1960
- DEVELOPING AREA  
CRITICAL OPEN SPACE NEED

**PARK SITE** →

## SOURCE:

ADAPTED FROM DEPARTMENT OF  
CONSERVATION AND ECONOMIC  
DEVELOPMENT MAPS.



DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT  
NEW JERSEY COMPREHENSIVE OUTDOOR RECREATION PLAN

### Open Space Concept

Recreation-open space programs have effected only lately the semblance of a unified approach. Newly formed, the Jacobs Creek Watershed Association is seeking means to preserve lands along the watercourse to provide wild-life habitat and thus broaden the recreation experience in this area.

### REGIONAL CONTEXT

The major urban corridor extending from New York to Philadelphia, part of the East Coast megalopolis is just south of the study area. The combination of expansive industrial complexes and the ease of bulk transfer-commuter traffic over Interstate Highways perpetuates suburban sprawl within the study area.

### Stimulus of the Federal Highway Program

Scatterization of suburbs, rural residences, research parks and expansive industrial plants has been given impetus by new roads created by the Federal Highway Program. Thus the program has diminished the contrast of urban to rural and encouraged speculation in land values through taxation on potential land use rather than on existing land use. The impact of I-95 three miles south of the park site continues to manifest itself in accelerated suburbanization.

### Taxation and Zoning

It is questionable whether Federal taxation and local tax assessment practices will provide the necessary impetus to the creation of any large public open spaces or interconnecting public open spaces that would be capable of providing both passive and active types of public recreation. Not all lands are suited equally for suburbanization. Those which are not

suited should be accounted for on the County Zoning Plan. Normally these areas will follow the surface drainage pattern (creeks and streams) and provide the best opportunity to ensure an adequate method of handling storm water runoff, while at the same time affording linear parks with passive recreation use capability.

This tool of land planning is predicated on the identification of areas of soils which are inherently limited in their suitability for permanent human habitation and conversely are suited for wetland wildlife habitat. Mapping of soils for various purposes recently has been accomplished by the USDA SCS for the Mercer County Soil and Water Conservation District thus making the identification of a portion of the potential linear recreation-open space program which should augment the State's park program.

#### Base Data

For this study MAIN-REUTTER has used U.S.G.S. mapping in combination with the U.S.D.A. S.C.S. soils mapping units for its base data. This has been reinforced with more detailed topographic mapping on areas currently owned by the State.

Cultural resource data has been compiled from various books and articles relating to the historic events of the War for Independence in this area. Field observations and consultations with local historians, various experts and agencies have rounded out the data gathering process.

#### PURPOSE AND GOALS

The State of New Jersey has charged the Department of Environmental Protection, Division of Parks and Forestry with the task of protecting and preserving unique and significant natural and cultural phenomena and to make them available to the public by such means as will not destroy or degrade

these phenomena. The Division also may acquire and develop lands solely for recreation. Of paramount importance in Mercer County is the identification and cataloging of the natural and cultural sites. Further expansion of the urban corridor between Philadelphia and New York obviously will be at the expense of the remaining open spaces.

Historically, recreation-open space as now thought of has not been planned primarily because urban growth has been piecemeal, incremental and parochial in responsibility. There is an obvious need for public open space in the County. The State responsibility, as already mentioned, is to provide quality recreation: that is, low population density in relation to the total land holding. Therefore, it is a charge of this report to ascertain the proper relationship of the cultural and/or natural phenomena and the type and location of compatible recreation facilities.

DEFINITION: A STATE PARK IS:

- 1) an area more than 500 acres.
- 2) possesses unique or significant natural and/or archaeological-historic features worthy of preservation.
- 3) be of such configuration and/or adjacent to compatible lands uses whereby recreation now and in the foreseeable future will be possible in a natural environment.
- 4) has, or possesses the potential for development into dominant natural resources acreage in relation to active use recreation acreage in the proportion of approximately 2/3: 1/3 respectively.
- 5) located so as to allow ancillary and complimentary open space-recreation holdings and programs of private parties and governmental bodies.

RECREATION USES compatible within the basic and proposed resources of the area.

Passive recreation: hiking, biking, horseback riding, boating (without motor), fishing (various), golf, family-type picnicking, nature study, and day camps.

Intermediate: depending on configuration and extent of the capability of soils - Self-contained picnic areas with common recreation center.

Active use recreation: dependent on areal distribution of suitable soils: swim pools with associated recreation activities, group picnicking, family and group camping.

Historic site recreation: Point or linear historic sites are unique unto themselves. The authenticity of the site and related spaces should be maintained and/or developed for access by the public in such a manner that its significance is projected clearly. Interpretive programs and centers should be accomplished tastefully where they will assist the visitor to understand more fully the import of the site(s).

OPEN SPACE-RECREATION: A FUNCTION OF ACCESSIBILITY

One-way distances for certain types of outdoor recreation (1)	
after school and during the day for mothers with small children	less than 1 mile, preferably less than 1/2 mile (20 minutes' walk)
after work, for adults seeking special opportunities	up to five miles
one day outing	20-50 miles (farther, if traffic is light and attractive areas are not available nearer).
weekend outing	100-150 miles

(1) Economics of Outdoor Recreation - Clawson & Knetsch, 1966.

METHODOLOGY utilized in analyzing the recreation potential of the park site includes both the natural resource base and the social resource base. Components of the bases are analyzed for their compatibility and desirability for inclusion in more than one scheme. Through this process it is possible to determine the IDEAL OPEN SPACE-RECREATION COMPLEX: The goal of the park master plan.

Gross recreation potential is determined by the suitability of the site for both active use and passive use types of recreation which can be provided appropriately within the definition of a State Park.

#### NATURAL RESOURCE BASE

Included are:

- 1) water resources, drainage basins, areas of high groundwater, swamps, ponds, perennial streams, rivers and flood plains.
  - 2) geology - significant rock outcrops, fault zones, type of and depth of bedrock.
  - 3) soils limitations - poorly drained soils naturally suited for passive recreation and/or wildlife purposes.
  - 4) topography - areas with more than 10% slope characteristic, because they:
    - a) present difficulties in constructing active use recreation facilities.
    - b) are subject to greater soil erosion, and
    - c) because of the two foregoing negative factors these areas are usually wooded (a positive factor).
  - 5) ridges and promontorys with views and/or vistas.
  - 6) type and distribution of vegetative cover.
- (the foregoing are considered the prime natural resources.)

7) extent and distribution of well drained soils with potential for active use recreation facilities .

8) definition of the genus locus of the study area .

#### SOCIAL RESOURCE BASE

1) archaeologic and historic sites (point and linear types), their present condition and suitability for inclusion in a state park .

2) lands suitable for active use recreation within 1/2 mile (20 minutes' walk) of the prime natural resource base (a positive factor) .

3) lands suitable for active use recreation that are within 1/2 mile (20 minutes' walk) of existing or proposed residential developments (negative factor) .

4) audio-visual intrusions on the park .

5) compatibility of existing land uses in the study area .

6) proposed developments (particularly highways) within the study area .

The various items in these two categories delineate the areas of passive use recreation (prime natural resources) and areas suitable for active use recreation and thus determine the natural carrying capacity for outdoor recreation .

Recreation use space standards (instant),

Prime natural resource areas -----	1/2 person per acre
Active use recreation areas -----	10 persons per acre
Outdoor historic site recreation -----	10 persons per acre
Indoor historic site recreation -----	20 persons per acre

Criteria used in determining the natural carrying capacity for recreation.

Passive use recreation areas:

- 1) Peripheral buffers 300 feet deep for audio-visual protection of the park interior and to provide wildlife habitat.
- 2) Internal buffers around prime natural resource - 300 feet deep for audio-visual protection of streams, rivers, ponds, lakes and to provide wildlife habitat.
- 3) All flood plains, areas of poorly drained soils and those areas with seasonal high groundwater.
- 4) All areas with 10% or more slope character.
- 5) All areas with less than 10% slope character which are less than 300 feet broad.
- 6) All areas with mature woods one acre or larger.
- 7) All areas of unique geologic significance.

Active use recreation areas:

- 1) Areas of less than 10% slope character that have well-drained soils and are not less than 300 feet broad.
- 2) Areas within 1/2 mile of prime natural resources.
- 3) Areas further than 1/2 mile from residential development.

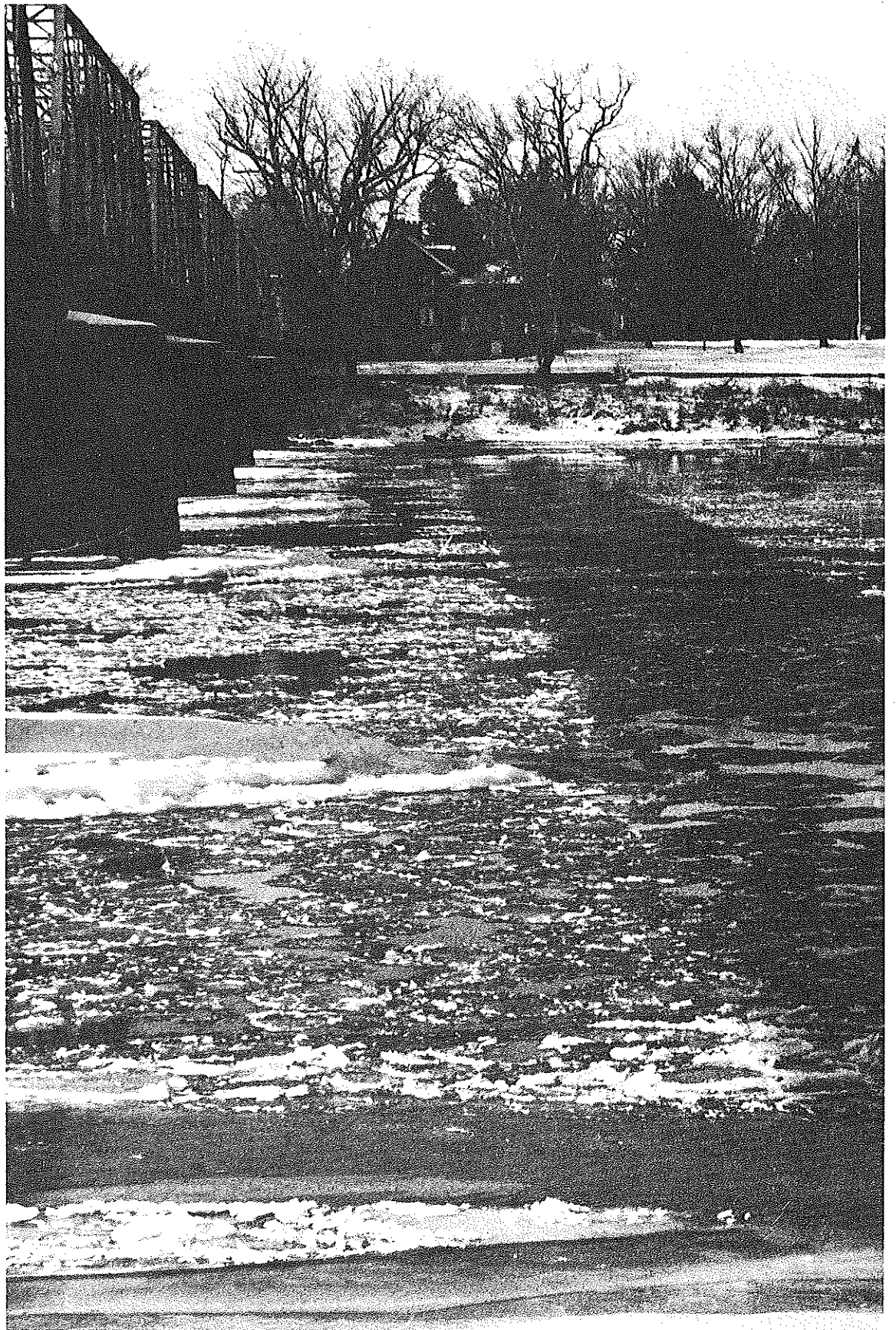
Cultural features which may affect either recreation use category are: Archaeologic and historic sites, roads and highways, public utilities and compatibility of adjacent land uses.

With these criteria the existing park and its surround was analyzed to determine:

- 1) The validity of the holding for various recreation-open space purposes,



- 2) The suitability/compatibility of the existing facilities ,
- 3) Formulate a plan which will determine the areal extent of the various recreation facilities , thus guaranteeing a quality recreation experience for an optimum park user population, and
- 4) Proposed action program to meet the Bicentennial Celebration deadline .



# SUMMARY

## SUMMARY

Washington Crossing State Park is located on the shore of and inland from the Delaware River some seven miles above Trenton. In 1910 four hundred acres were set aside to commemorate the site at which the Continental Army commanded by General Washington crossed the river on the McKonkey Ferry and Durham boats on the eve of Christmas Day 1776. In the following ten days the course of the War for Independence changed from desperation to hope of success. The ferry and Durham boats were used several times for the troop movements.

Frederick Law Olmsted and the Park Commissioners of New York City both submitted plans for the commemorative park development; neither plan was implemented fully.

The passage of time has witnessed drastic changes to the original site. Modes of transportation have severed the river landing from the upland portion of the park, and have obliterated the route which the troops followed.

Diverse interests and responsibilities of the several parties concerned with the site have, over the years, allowed these incursions to be perpetrated. The park, as it existed prior to the Green Acres Program, was (and still is) the manifestation of piecemeal and parochial attempts in park planning. The Green Acres Program has allowed for the purchase of some 400 acres, primarily three farms.

## RIVERFRONT PARKLANDS

At present the park consists of a riverfront section of some 17 acres. It is divided from the main body of the park (some 780 acres) by a transportation-utility corridor (Penn Central Railroad, Delaware and Raritan Canal, State Route 29, together with the normal compliment of electric and telephone lines).

The Nelson House (now listed on the National Register of Historic Sites) was restored only recently to its colonial appearance. It is located at the southerly edge of the site in unfortunate juxtaposition with the access road to the bridge across the Delaware River. Family picnicking is the prime recreation use of this area. Vehicular access is gained from either end on public roads. Control for park purposes is obviated.

The Delaware River Joint Toll Bridge Commission operates the bridge which replaced the McKonkey Ferry. Currently they are beginning a study for the replacement of this antiquated structure. Other bridges across the river are three miles south (Scudders Falls) and seven miles north (Lambertville). At present no consideration has been given to the re-establishment of a ferry service as an integral part of the historic site, rather than creating another bridge. MAIN-REUTTER recommends that the approaches be removed, the bridge be dismantled to below low water level and the Commission undertake the construction and maintenance of a ferry service, similar to the original, as part of the cooperative venture to recreate as much as possible of this historic site.

Currently the strip of land adjacent to the D & R Canal is encouraged for recreation through the provision of minor parking and some picnic tables. The recreation potential of this area will be diminished by the reconstruction of Route 29. Traffic both on the highway and railroad pose significant safety hazards, therefore MAIN-REUTTER recommend that only passive use recreation activities be permitted in the area. Activities include hiking, biking, fishing and canoeing on the Canal.

#### UPLAND PARKLANDS

The upland portions of the park are bounded generally by State Route 29, Church Road, and County Routes 579 and 546. Inholdings occur on the first

three roads. Suburban residential development (rather than rural residential) is the rule in the park surround. This type of land use, per se, is incompatible with the functions of a state park. It undoubtedly will affect the quality of and type of recreation facilities in the park negatively.

The upland portion of the village of Titusville is the most significant case in point of incompatibility. Inholdings between the existing park along State Route 29 must be acquired to allow for proper and full utilization of the parklands. They are considered parkland for the purposes of this report.

The McKonkey (Inn) House and barn (Flag Museum) are the nucleus of the historic park. Three picnic areas, a tree nursery and the park maintenance center also exist on the original holding. A nature center, housed in a former residence is located centrally to the entire holding. A few centrally located inholdings are considered park lands for the purpose of this report. The Phillips Farm off Route 579 is used for large group activities such as dog shows and camporees. The so-called Bear Tavern is physically separated from the park by Routes 579 and 546. The original park holding has extensive well manicured lawns, whereas the recent acquisitions vary from woods and long abandoned fields to fields which were recently cultivated.

The existing recreation facilities (picnicking, nature center and historic site) accommodate the following:

Riverfront Parkland	300 persons
Upland parkland (nature center and Historic)	<u>1,000</u> persons
TOTAL	1,300 persons approx.

Analysis of this section of the park, utilizing the standards set forth in the Introduction, shows that two water courses have eroded the landform and separate the area into three gently rolling peninsulas. The shale bedrock

condition is evident along the lower reaches of the streams; it varies from near surface to  $\pm 6'$  depths under the shallow and generally well-drained soils of the parklands.

Surface water supplies in the area are negligible and unsafe without treatment. The lack of a public sewer system forces all residences to supply their own sanitary sewage system as well as potable water supply. Wells must be drilled to aquifers in the shale-limestone bedrock, if the Delaware River water carried in the D & R Canal is not to be utilized. Wells drilled to the Stockton Formation produce moderate to large supplies of groundwater.

Vegetative cover on the parklands varies from recently cultivated, through transitional stages to isolated stands of second growth forest. Reforestation with evergreen species has occurred on some parklands. Wildlife habitat is limited to Openland and Upland species of birds and animals. The existing park nature center acts as a refuge for a fairly large deer herd which migrates from Baldpate Mountain during the hunting season. A small herd is resident to the park at present.

The gross recreation carrying capacity of the proposed park; utilizing the criteria of well-drained soils with less than 10% slope characteristic, without tree cover and inside the 300 foot peripheral buffers is as follows (Including those inholdings essential to full park development):

Active use recreation	- 280 acres @ 10 pers/acre	2,800 persons
Passive use recreation	- <u>880</u> acres @ $\frac{1}{2}$ pers/acre	<u>440</u> persons
TOTAL	1,160 acres (instant) TOTAL	3,240 persons

Thus the natural ratio of active-passive acreage is 1:3.

Through the necessity to transfer lands to the Nature Center in order to create and maintain its viability, and with the identification of the Historic Site Recreation the passive recreation acreage is increased at the expense of the

of the active recreation acreages.

Adjusted Gross Carrying Capacity

Historic Site Recreation	136 acres @ 10 pers/acre	1,360 persons
Active Use Recreation	115 acres @ 10 pers/acre	1,150 persons
Passive Use Recreation (include Nature Center)	<u>635</u> acres @ $\frac{1}{2}$ pers/acre	<u>320</u> persons
TOTAL	886 acres (instant) TOTAL	2,830 persons

Active Recreation: Passive Recreation Ratio 1:3.5

Anticipated potable water demand @ 10 gallons/person:

Historic Site Recreation	10,000 gpd
Active & Passive Rec.	<u>25,000</u> gpd
TOTAL	35,000 gpd

THREE PART PLAN

MAIN-REUTTER recommends the adoption of a three function park development, historic site, active use (family and group picnicking, amphitheater and transient camping) and passive use (nature center, buffer zones and natural areas, biking and hiking trails, and nature study. The identification of these separate areas will reinforce the necessity of different development and management programs, whereby a quality recreation experience will be guaranteed to a predetermined number of people. It is pragmatic, but true, that an infinite number of people cannot be handled in any type of facility without degradation of both facility and users. The design attendance figure for the various recreation facilities is comparable to the maximum number of persons who safely can be in a swim pool or attend an auditorium at one time; codes of public health and safety are promulgated to this end.

The recreation activities for the proposed park are grouped into three categories, active, passive and historic-site related. These three categories embrace a wide range of recreation experiences in the natural environment and appropriate to a state park. The historic-site related recreation activities are prime determinants for space allocation.

#### HISTORIC SITE RECREATION - BOR CLASS VI

The historic park site is basically the area from the river to the so-called Bear Tavern and from Steel Run to County Route 546. The existing development in this area is an unrelated mixture of recreation, historic, plant nursery, service and transportation functions. These facilities came into existence when the value of preserving the historic past was diluted by the fact that the events were more contemporary. Additionally concepts of how to preserve, what to preserve, and the manner in which it will be made available to the public have recently changed dramatically. Today historic sites of the Revolution are cherished more and the need for appropriate settings in which to view and comprehend that era are appreciated more fully.

Essential to appreciating the historic significance of the park is visitor participation. The opportunity to walk the route of the Continental Army and to ride a facsimile of McKonkey's ferry and visit the buildings of the time. Geographically these recreation activities involve the river area at the ferry crossing and the launch-landing areas of the Durham boats. It also includes the roads leading to the landings on either side of the river. Politically such a recreation experience now involves the Delaware River Joint Toll Bridge Commission and the states of New Jersey and Pennsylvania and their agencies.

MAIN-REUTTER recommends the parties involved recognize the interrelatedness of jurisdictions over this national historic site and the necessity of cooperation



in order that each part may contribute to the whole. Only through cooperative action will the public be furnished a complete recreation experience at this historic site.

A number of encroachments prevent the complete re-creation of the original site, however several measures can be taken to ameliorate the incongruities. Essential to the scheme is the re-establishment of a ferry service and the re-creation of the lanes leading from the landings to some logical point at a reasonable distance. Implicit to this basic scheme are efforts to mitigate incongruous and incompatible land uses in the park surround to guarantee the quality of the recreation experience.

An interpretive center for the park visitors is essential to their appreciating the historic significance of the "10 days that changed the world"; the several crossings and battles in the area. Consideration is given herein to the relocation of several contemporary farmhouses and outbuildings within the historic parksite to enlarge the recreation-education experience.

#### PROPOSED HISTORIC PARK DEVELOPMENT

MAIN-REUTTER proposes that Washington Crossing State Park have only one normally used vehicular access point off Route 29. This involves the abandonment of Brick Yard Road and the existing park roads. The main park road will be located so as to service the various park activities. Access to the historic park will be nearest the main park entry. The parking for this area will be designed to accommodate the normal recreation load (200 cars and 10 buses. Additional parking for the Bicentennial Celebration will utilize the amphitheater parking lots.

MAIN-REUTTER proposes that the integrity of the historic site be protected from other types of recreation activity and incongruous land uses. The effects of some of these intrusions, particularly the transportation corridor, can only be ameliorated. A portion of Route 29 will be reconstructed at a

lower elevation to permit the construction of a pedestrian-park vehicle overpass with a ramp down to a bridge across the Canal. Electric and telephone utilities will be underground. Safety devices will be constructed at the railroad for the protection of park visitors. Another ramp will be constructed down to the vicinity of the Nelson House and the ferry landing.

All visitors to the historic park will be admitted through the interpretative center which it is hoped will be the focal point of the State's efforts to orient the public to the key role New Jersey played in the War of Independence.

It is anticipated that the displays currently in the Flag Museum will be incorporated into this new facility. Space allocations are dependent on the functions and types of displays programmed; these have not been formulated to date. Essential elements which should be incorporated into the facility are: an orientation program of the McKonkey Ferry and related lands and the importance of their functions in the war. The incorporation of the Flag Museum displays, additional displays of uniforms worn and weapons used, and an area for the sale of post cards and mementoes. Public rest rooms and possibly coin-operated food and beverage vending machines or a snack bar together with diversified resting and waiting areas will be provided.

From the interpretative center people will be encouraged to walk the length of Continental Lane to the ferry service, as well as reconstructed Bear Tavern. MAIN-REUTTER recommends that the land uses of the period be reinstated; fields, meadows, orchards, and animals in paddocks. This entails the reconstruction of farm buildings at the McKonkey (Inn) House, relocation and/or construction of the "Bear Tavern" within the main body of the historic park, and possibly relocating another farmhouse and outbuildings into the historic park.

Visitors would be encouraged to vary their walk to view the farms and outbuildings. Park personnel dressed in period costumes would perform labors of that era. A group of militiamen would travel the route and cross on the ferry. A horse-drawn trailer could be provided for visitor use along Continental Lane. Riverfront areas will be used for picnicking, hiking, biking and quiet contemplation. No active use recreation activities will be encouraged along the canal.

#### ACTIVE AND PASSIVE RECREATION - BOR CLASSES II & III

The portion of the park not utilized for the historic site is recommended to be developed to a variety of recreation activities compatible with the goals of state parks.

Access to these facilities would be from the park entry on Route 29 and the contact station. A single spine road, with spurs off to various recreation facilities is designed for economy in construction and efficient park control.

A new nature center building will be located centrally to service the trail systems. The building will be specially designed to allow for flexibility in programming the wide variety of education displays. The design and fireproof construction will protect the displays from mishap and vandalism. The amphitheater and related facilities will be upgraded in the same location to have a maximum capacity of 1000 persons, with a 200 car parking lot.

A forty acre area off Route 579 will be maintained as a meadow for use by large organizations. Parking area for this type of meeting may be utilized for the Bicentennial Celebration. A one hundred unit transient camping area will be constructed in the Northwest corner of the park.

The foregoing facilities will create and maintain an environment in which

nature will be dominant and the maximum number of people in attendance will be prescribed to guarantee a high quality nature based recreation experience.

PRIORITIES IN DEVELOPMENT

PRIORITY ONE: Acquisition of inholdings along Route 29 by eminent domain.

R. C. Church (relocate to Bear Tavern Site)

U. S. Post Office (relocate within Titusville)

Concrete vault Manufacturer (relocation efforts optional)

The Lambert parcel (relocation efforts optional)

Cafe and Gas Station at Junction of Rt. 29 and Rt. 546 (relocation efforts optional)

No cost estimate.

PRIORITY TWO: Construction of sanitary system, potable water supply, park road system and first phase plantings.

Total estimated cost \_\_\_\_\_

PRIORITY THREE: Construction of the Interpretive Center Complex.

Total estimated cost \_\_\_\_\_

PRIORITY FOUR: Construction of Route 29 pedestrian-park vehicle overpass, appurtenances, ferry service and cul de sac at river street.

Total estimated cost \_\_\_\_\_

PRIORITY FIVE: Construction of family and group picnic areas, which will allow priority six.

Total estimated cost \_\_\_\_\_

PRIORITY SIX: Construction of historic inn, farmhouses and related fields.

Total estimated cost \_\_\_\_\_

PRIORITY SEVEN: Construction of nature center Building, Amphitheater and appurtenances to each.

Total estimated cost \_\_\_\_\_

PRIORITY EIGHT: Construction of transient camping facility.

Total estimated cost \_\_\_\_\_

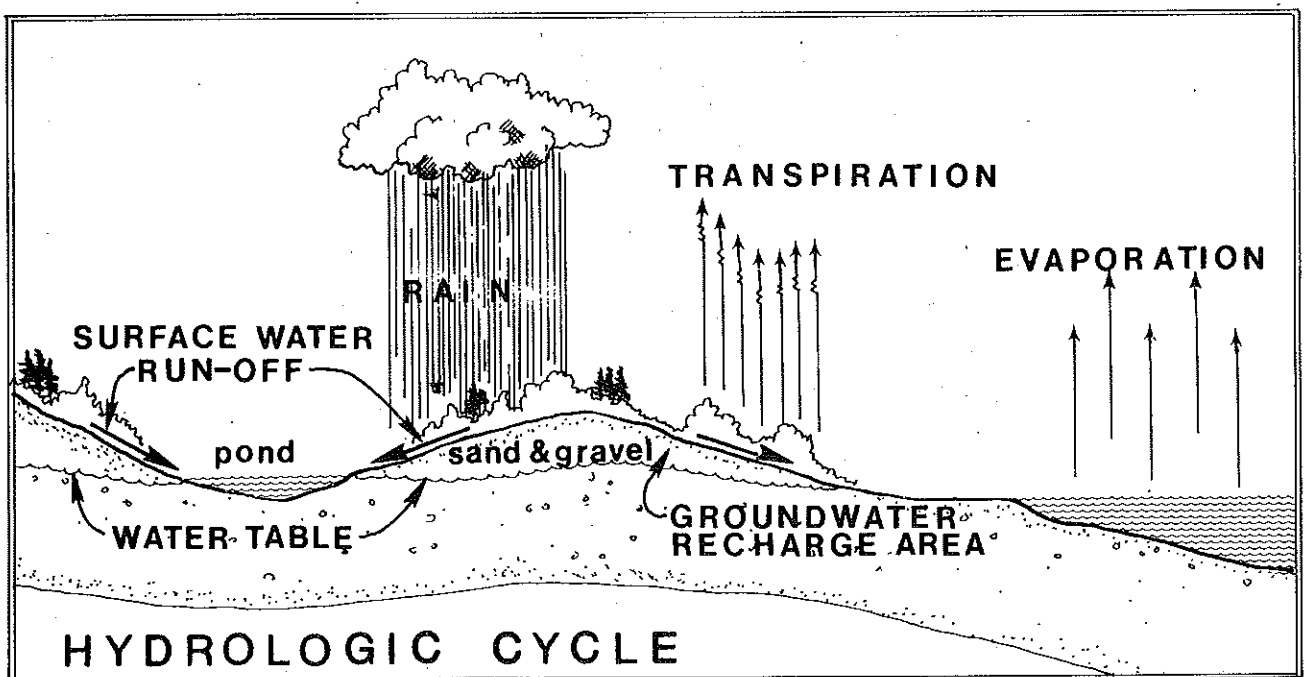


# NATURAL RESOURCES

## HYDROLOGY

The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil, and underlying rocks, and in the atmosphere is called hydrology. Of all the physical characteristics found on any recreational site the presence or absence of water affects the recreational potential more than any other feature.

The hydrologic cycle involves the movement of water in various forms initially from the ocean and other water bodies, to the land and finally back to the ocean. In its simplest form the cycle begins when water evaporates into the air from various water bodies. The water vapor is then carried by air masses and under the proper conditions the vapor is condensed to form clouds. When precipitated water is dispersed in several fashions, some is retained by the soil (ground water), some is immediately evaporated into the air again, some is retained by plants (part of this is lost through transpiration) and the remainder is surface water; it is in this form that the hydrologic cycle repeats itself. Although the cycle appears to be a smooth process, in actuality the process is very erratic due to many factors including the snow-melt factor and percolation variables.

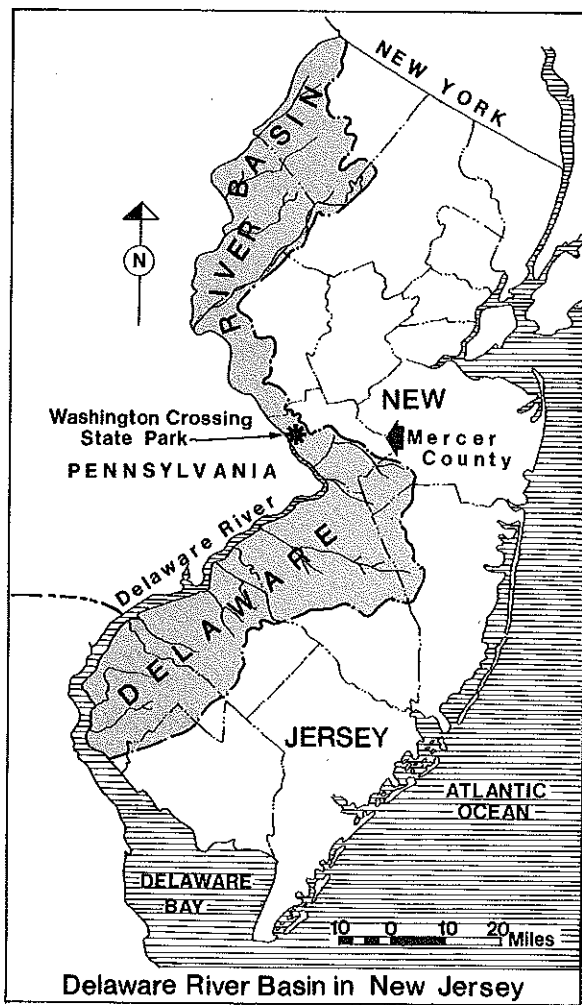


The site of Washington Crossing State Park is located within the Delaware River Basin which is bordered on the east by the Raritan River Basin. The only surface water of any consequence on the site is the Delaware River. There are two small streams in the park but these are subject to seasonal conditions and are fed primarily by surface runoff. At this particular location ground water is of more significance.

The area of the site is underlain by unconsolidated non-marine sedimentary rocks created during the Triassic period in Geologic History. These rocks are part of the Newark group and located in the Stockton Formation. The Stockton Formation is composed of red and gray arkose sandstone inter-

bedded with shale and is considered an excellent source for moderate to large supplies of groundwater. This formation is considered the most reliable aquifer in Mercer County and may yield 152 gallons per minute from large diameter wells.

The ground water table condition is shallow throughout the county. The actual amount of recharge to the aquifers is small because of relatively small storage spaces in the rock formations. Groundwater travels only a few inches or feet per day from high intake to low discharge areas and usually the distance between intake and discharge is small.

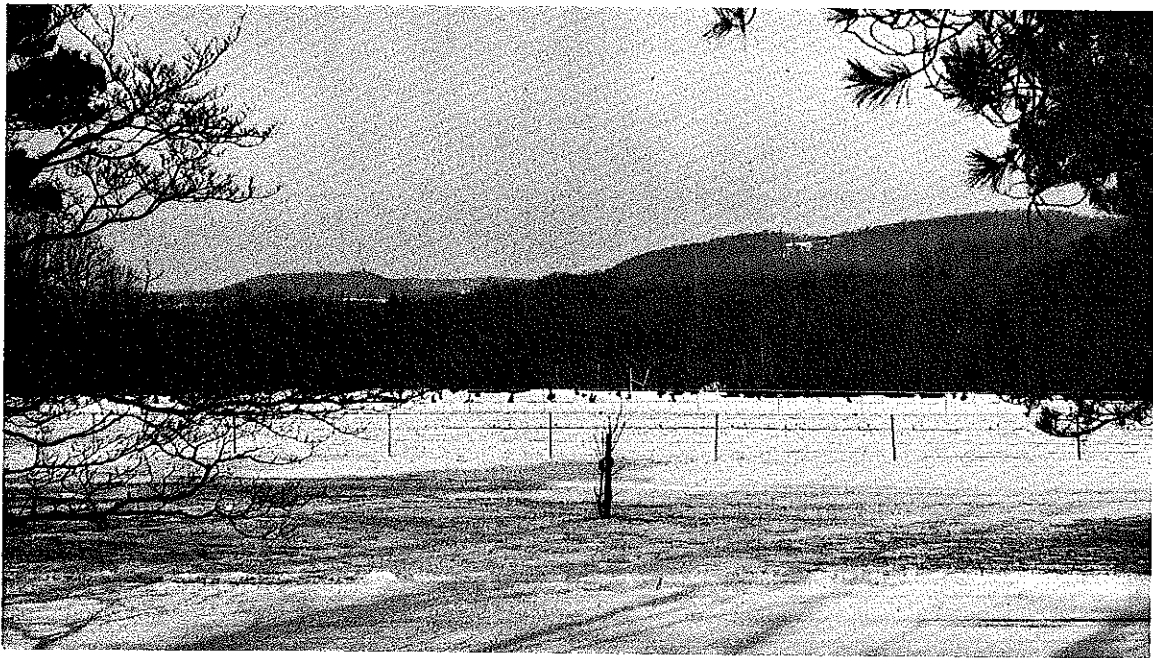


Even though there is more precipitation in the summer the water table is highest during the spring when vegetation has a lesser effect on the amount of water retained in the soil. According to Special Report 19 issued by the New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, most of the ground-water in Mercer County is excellent for domestic, industrial, and agricultural use, however sometimes it becomes necessary to remove some iron or adjust the pH of the water.



## PHYSIOGRAPHY

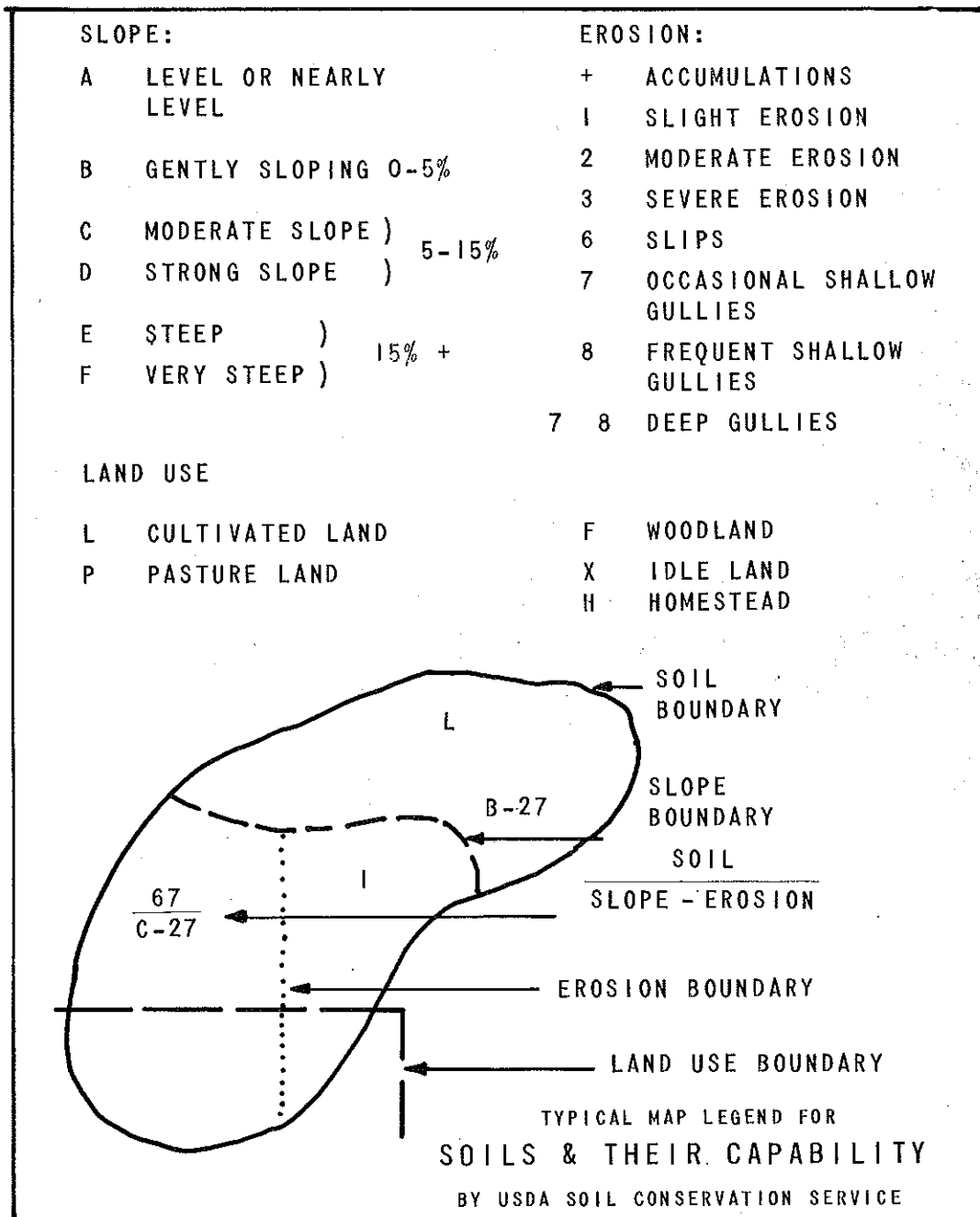
The Piedmont region includes the northern half of Mercer County in which the study area is located. It is characterized by rounded hills and broad valleys. Hills in this region usually are elongated in form and run from northeast to southwest in direction. The study area is located in a large alluvial flood plain. The only major topographic feature in close proximity are Baldpate Mountain and Strawberry Hill. Other hills are usually less than 500 feet above sea level.



*Baldpate Mt. from park*

SOILS

The SCS has mapped the park study area in sufficient detail to identify some sixteen different soil types. Soil type boundaries as mapped probably are accurate to plus or minus 100 feet with an areal accuracy within five or ten percent. The SCS mapping includes such information as an indication of soil type, six categories of slope type, eight classifications of erosion and five land use categories. Note diagram "Soils & Their Capability" as being typical of soils mapping.



The characteristics of the soils on the park have been analysed to determine where and how extensively the area can be developed. The ease of constructing buildings, roads, parking lots, playfields and related facilities is dependent on the capability of soils to support such development. Soils also have been analysed for their capability for reforestation and wildlife habitat.

The soils in the study area are composed of sediments deposited by erosion and alluvial deposition by the Delaware River. The eroded sediments are classified in the Newark Group. Alluvially deposited soils are some of the best agricultural soils to be found in New Jersey. On the site the soils are basically composed of various types of loams ranging in depth from  $\frac{1}{2}$  foot to  $6\frac{1}{2}$  feet before reaching bedrock. Those soils are generally well drained.

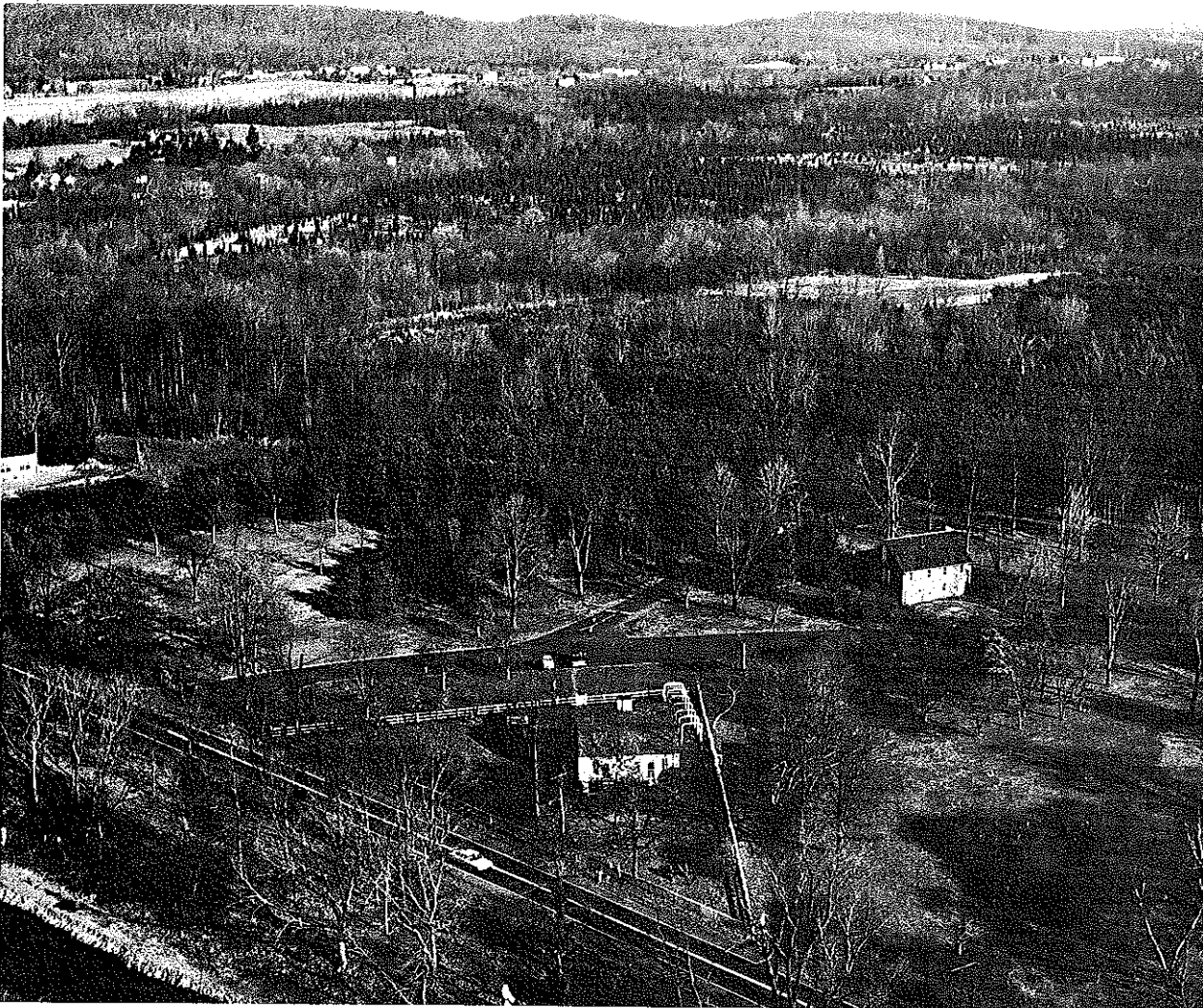
From the soil survey conducted by the Soil Conservation Service of the United States Department of Agriculture the following conclusions are reached:

1. Depth of bedrock ranges from a minimum of  $\frac{1}{2}$  -  $1\frac{1}{2}$  feet in Klinesville shaly loam to  $3\frac{1}{2}$  - 6 feet in Birdsboro loam.
2. The construction of buildings with basements will be limited moderately to severely throughout the site.
3. On site sewerage disposal will be limited moderately to severely.
4. Birdsboro loams, Readington and Abbottstown silt loams, and Tiog fine sandy loam are suited best for lawns and landscaping with only slight limitations.
5. Development of roads and parking lots would be limited only moderately on Birdsboro loams and Penn shaly silt loams.
6. The best soils for athletic fields would be Birdsboro loams, Penn shaly silt loams, and Reaville silt loams.

7. Picnic and park areas are best located on Birdsboro loams, Penn shaly silt, Readington Abbottstown silt loam, Reaville silt loam, and Bucks series.

## VEGETATION

Originally the vegetation in the study area was primarily deciduous. At present the vegetation is approximately 50% planted to evergreens. Most of the native vegetative cover is concentrated in the steep slope areas (10% or over) near the streams that traverse the site. However, some substantial stands of deciduous trees occur in areas with a slope characteristic of less than 10%. In the study area the topography is not dramatic: trees and shrubs help to create the character of the landscape. Vegetative cover also provides habitat for birds and animals; it helps to stabilize the soil, and it provides protection for the soil from the climatic elements particularly wind rain, and sun.



*Aerial view of park, McKonkey House in foreground*

## FISH & WILDLIFE

Existing natural features in the study area nurture many types of wildlife including deer , small game animals and birds . Fishlife is limited primarily to the Delaware River and the Delaware and Raritan Canal. Along the banks of the Delaware, herring, shad, and small-mouth bass are sought by fishermen. The canal is stocked annually by the State Department of Fish and Game with trout. However, neither of these may be classified as prime fishing areas .

The existing big game wildlife association in the vicinity of Washington Crossing State Park is dependent on the wooded areas and fields of both the park and the areas of Baldpate Mountain.

90-100% of the wildlife habitat in the park site has been altered since colonial times . The following are the various plant associations that could be introduced or re-established for wildlife habitats .

Grain and seed crops are grain-producing or seed-producing annual plants; such as corn, sorghum, wheat, oats, barley, millet, buckwheat, soybeans, or sunflowers .

Grasses and legumes are the domestic perennial grasses and herbaceous legumes that are established by planting and that furnish food and cover for wildlife . The grasses include fescue, brome grass, bluegrass, timothy, redtop, orchardgrass, reed canarygrass, and panicgrass . The legumes include alfalfa, clovers, and trefoils .

Wild herbaceous upland plants are native or introduced grasses and forbs (including weeds) that provide food and cover for upland wildlife . These plants include bluestem, indiagrass, wild ryegrass, oatgrass,

pokeweed, strawberry, lespedeza, beggarweed, wild bean, nightshade, goldenrod, and dandelion.

Hardwood woody plants are nonconiferous trees, shrubs and woody vines that produce fruits, nuts, buds, catkins, twigs for browse, or foliage used extensively as food by wildlife. These plants commonly become established by natural processes, but sometimes they are planted. They include oaks, beech, cherry, hickory, sassafras, hawthorn, dogwood, viburnum, maple, birch, poplar, grape, honeysuckle, blueberry, green-brier, other briars, autumn-olive, and multiflora rose.

Coniferous woody plants are cone-bearing trees and shrubs that are used by wildlife mainly as cover. Some of them also furnish food in the form of browse, seeds, or fruitlike cones. These plants commonly become established through natural processes, but sometimes they are planted. They include spruce, pine, white-cedar, hemlock, balsam fir, red-cedar, juniper, and yew.

Wetland plants are annual and perennial, wild, herbaceous plants that grow on moist to wet sites; they do not include submerged or floating aquatic plants. These plants furnish food or cover mostly for wetland wildlife. They include smartweed, wild millet, spike-rush and other rushes, sedges, burreed, wildrice, rice cutgrass, and cattails.

Shallow water developments are impoundments or excavations for controlling water. Generally, the water is not more than 6 feet deep. Control structures include low dikes and levees, shallow dug-out ponds, level ditches, and devices to control the water level in marshy drainageways or channels.

Excavated ponds are dug-out ponds or combinations of dug-out areas and impoundments held by low dikes. To be suitable for fish, they require

an ample supply of water. Ponds that are suitable for fish are built on nearly level land, have a surface area of at least one-fourth of an acre, have an average depth of 6 feet over at least one-fourth of their acreage, and have a dependable source of water of suitable quality. Areas subject to frequent overflows are rated not suitable. The N. J. Department of Environmental Protection, Division of Fish, Game and Shell Fisheries has surveyed the park site, and has found it unsuited for construction and maintenance of farm ponds.

#### KINDS OF WILDLIFE

Openland wildlife consists of birds and mammals that normally live on cropland, pastures, meadows, lawns, and other areas of open land where grasses, herbs, and shrubby plants are growing. Examples are quail, pheasants, meadowlarks, field sparrows, doves, cottontail rabbits, red foxes, and woodchucks.

Woodland wildlife consists of the birds and mammals that normally live in wooded areas where hardwood trees and shrubs and coniferous trees and shrubs are growing. Examples are ruffed grouse, towhees, thrushes, vireos, scarlet tanagers, gray squirrels, red squirrels, gray foxes, white-tailed deer, and raccoons.

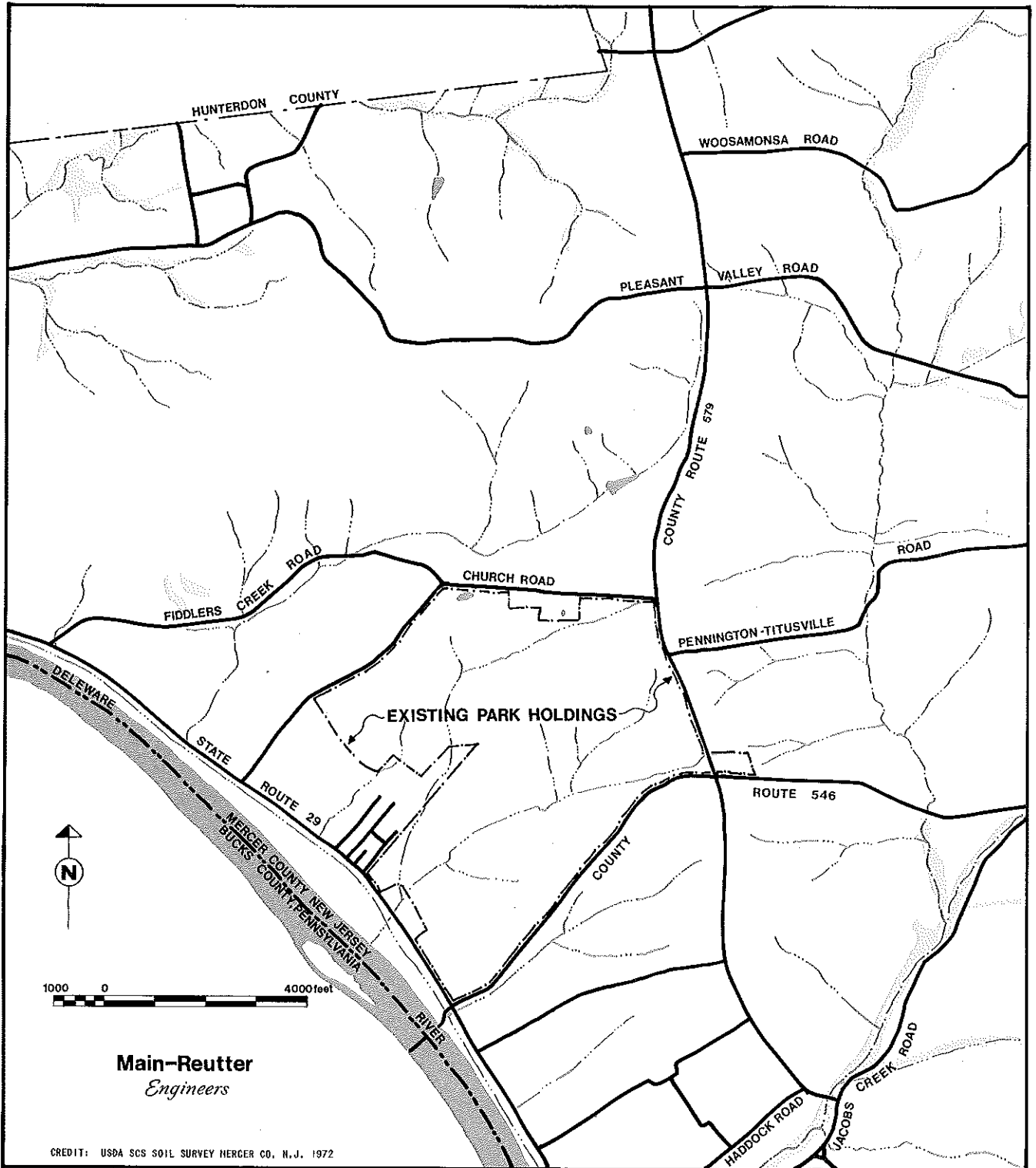
Wetland wildlife consists of the birds and mammals that normally live in wet areas, such as ponds, marshes, and swamps. Examples are ducks, geese, herons, minks, muskrats, and beavers.

There is a definite lack of extensive areas with wetland wildlife habitat potential on the park site; based on SCS interpretations. Fiddlers Creek and Jacobs Creek drainage areas form the nucleus of a wetland wildlife habitat in the park surround.





## CLIMATOLOGY

The State of New Jersey has a varied climate often referred to as "a continental type". Because of the Appalachian Mountains in the northern part of the state and the Atlantic Ocean on the south and east sides, significant weather changes occur in the various sections of the state. Winters are rather cold with temperatures dropping into the teens and during the month of January the minimum average temperature varies from 22°F in the north to 28.1° along the coast. Summers are generally warm, sometimes hot, with temperatures averaging above 80° in all parts of the state during the month of July. New Jersey is also one of the wettest areas in the country with the precipitation for one year ranging from 40" to 51". The precipitation is fairly evenly distributed through the year, although there are fewer cloudy and rainy days in the summer than the winter. The rain during the summer is more intense, often in the form of thundershowers, and this equalizes the numerous days of inclement weather during the winter. August is the rainiest month. The average depth of frost in the study area is approximately one foot. The prevailing winds are from west to east, and play an important role in creating the cold winters and warm summers. The growing season lasts approximately 195 days, from April 16 to October 28; however, frosts have been recorded as late as May 12 and as early as October 11.

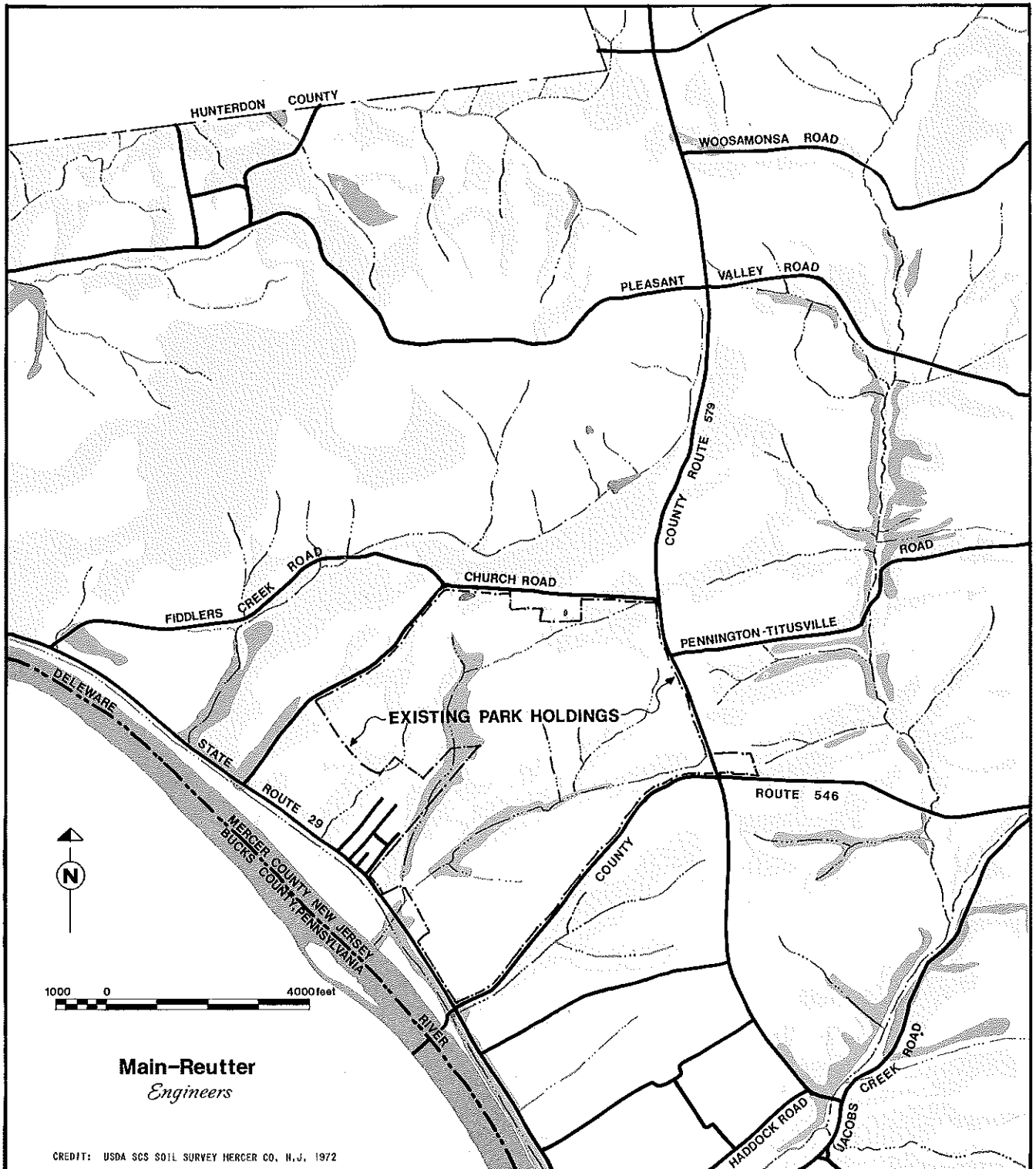


**SUITABILITY FOR WETLAND WILDLIFE**

-  WELL SUITED
-  SUITED

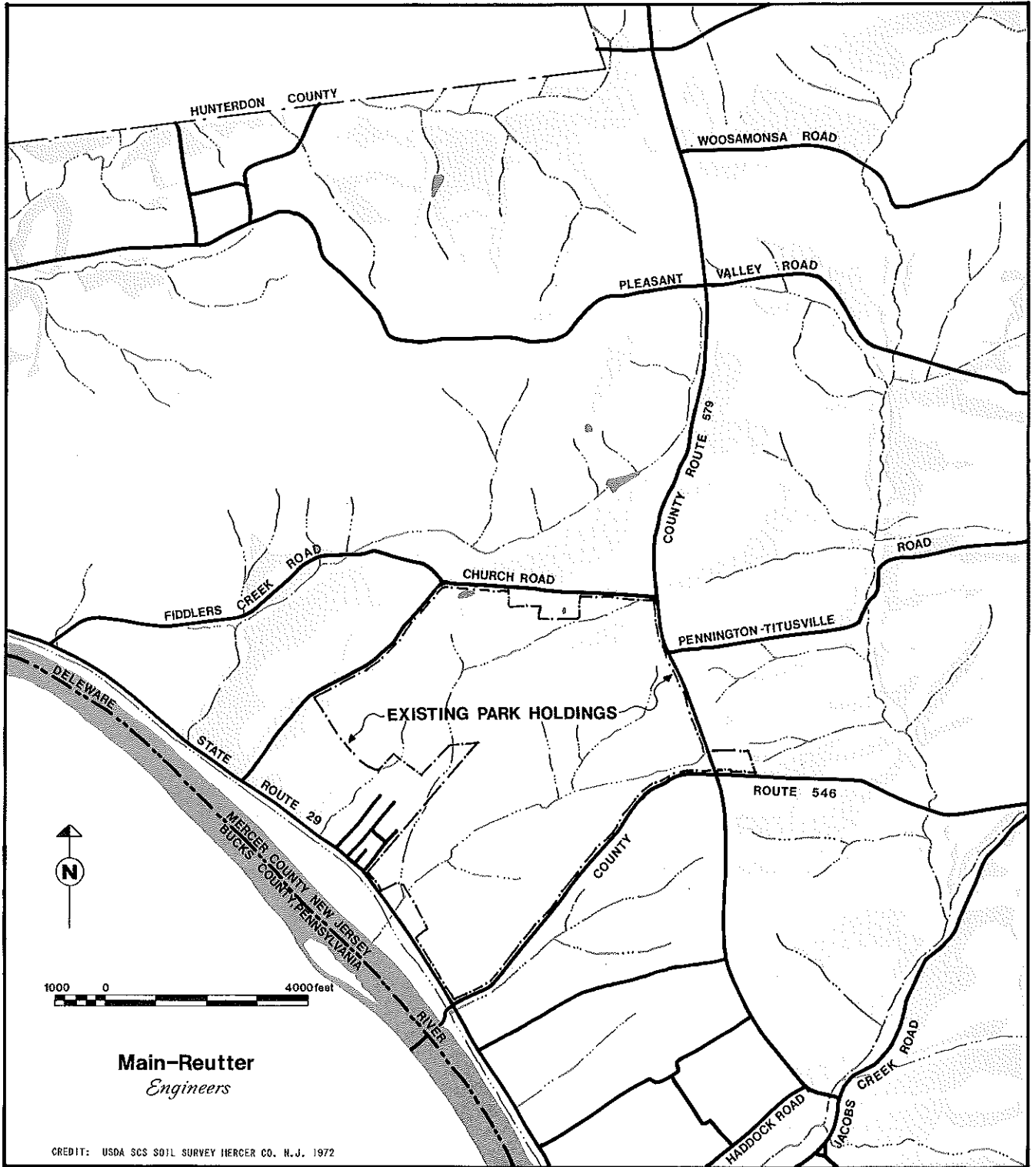
**WASHINGTON CROSSING STATE PARK**

-  UNSUITED



**SUITABILITY FOR WOODLAND WILDLIFE**





**SUITABILITY FOR OPENLAND WILDLIFE**



WELL SUITED



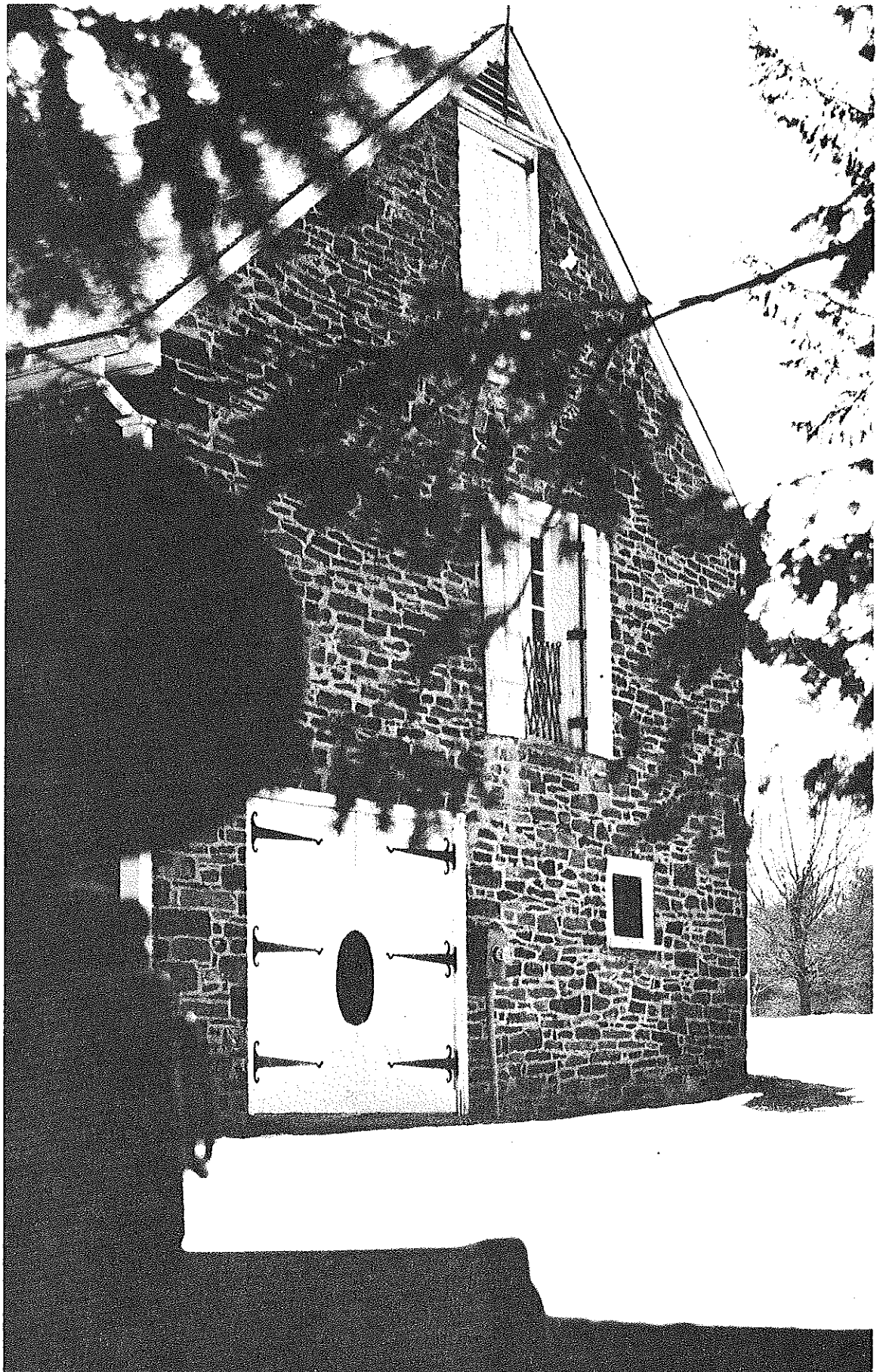
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SUITED

CREDIT: USDA SCS SOIL SURVEY MERCER CO., N.J., 1972

**Main-Reutter**  
*Engineers*



# SOCIAL RESOURCES

HISTORY: WASHINGTON CROSSING STATE PARK

In July of 1776 the British fleet landed a large army commanded by General William Howe on Staten Island, New York. Only a small body of water separated this large British Army from the Continental Army and their commander, General George Washington, in their position on Brooklyn Heights on Long Island. Both commanders were intent on putting a quick finish to the war with a decisive victory here in New York.

One of Washington's Officers, Israel Putnam had devised a plan to destroy Howe's troops. Putnam convinced Washington and his staff to deploy a large force of riflemen in wooded areas surrounding the British landing area on Long Island. From their hidden positions it was felt that these riflemen would be able to wound and kill a large number of the first wave of British troops to land. Then the Americans expected to retreat and lure the King's troops into a trap at Brooklyn Heights.

Unfortunately a large force of British and Hessian regulars were able to out flank the American riflemen and attack them from the rear. The British troops attacking the Americans in close combat with fixed bayonets literally tore the untrained Continentals apart. Then to add to the misery of Washington and his staff Howe withheld his troops from advancing toward Brooklyn Heights, brought ashore his large assault artillery to blast the Americans from their position and again outflanked the position.

Many men and officers among the riflemen were killed, wounded and captured; but this was just a beginning. Washington immediately retreated to Manhattan. Then Fort Washington and Fort Lee on the Hudson were captured; and soon the remnants of the entire Continental Army was in retreat through New Jersey, toward Pennsylvania.

The American cause at this point was in the midst of a great set back. However, many historians claim that things could have been much worse, in fact the war might have been ended, if Howe had attacked south into New Jersey rather than New York. The only opposing force in New Jersey was a small army of farmers and militiamen commanded by General Hugh Mercer and these untrained troops would have been no match for the British Army General Howe commanded. If New Jersey had been taken the two major cities in the colonies, New York and Philadelphia would have been severed from one another. Thus defense of the colonies would have been divided into two smaller forces that could have been easily destroyed by the British.

Washington and his staff felt retreat after their losses in New York was the only means of gaining time to regroup and prepare for the British attack. In pursuit of the Americans was a large British force commanded by Lord Charles Cornwallis who had a well established reputation for ferocity and military intelligence. Cornwallis had orders from General Howe to put a quick end to Washington, his army, and the revolution. Fortunately for the Continental Army Cornwallis was restrained by Howe at the Raritan River. Since Cornwallis could not press the pursuit, Washington and his army managed to cross the Delaware River into a position of relative safety in Bucks County, Pennsylvania. To further insure their safety, Washington ordered his troops to collect all the boats (for approximately 70 miles along the Delaware) up and down the river from where they had crossed. Thus frustrated Cornwallis had to wait for an expected freeze so that he might march his troops across the Delaware River on the ice.

Again thinking that the American cause was crushed Howe stationed garrisons of British and Hessian troops along the Delaware River in Trenton, Bordentown, and other key locations to keep the American troops in check while the British Army went into winter quarters.

On December 7, 1776, when the Continental Army crossed the Delaware at Trenton Ferry the army was much smaller and far less confident than when they had waited on Brooklyn Heights for Howe. Many of the American soldiers had left for various reasons. Some had been killed or wounded, many had been captured, some deserted and the period of enlistment had terminated for others. This left but a small American Army insufficiently clothed and fed to face the severe winter and the British.

Washington directed his officers to encourage the remaining soldiers to stay and to recruit as many new soldiers as possible from the surrounding area, offering promises of increased pay and bonuses. Even with the arrival of men from General Gates' and General Lee's commands the Continental Army totaled only a few thousand men. What could such a small force hope to do against the far superior British forces?

The closest British garrison to Washington's encampment was Trenton a small town of approximately 130 houses. Here was stationed a force of Hessians commanded by Colonel Johann Gottlieb Rahl. Rahl commanded several regiments of infantry reinforced by a company of Jagers, and approximately 20 British Dragoons. The total Trenton garrison amounted to almost 1,300 men, nearly all Hessians, who were greatly feared by the Continentals.

On the Pennsylvania side of the Delaware, Washington established his headquarters initially at the home of Thomas Barclay, a local merchant. Here with his staff he began to evaluate their situation and what must be done to turn the tide of the war to the favor of the Americans. Washington not only had the British to contend with, but many Tories and as well spies who were selling information to both sides. These spies were familiar with the activities of the Continental troops and informed the British of Washington's every move. Rahl received eight such warnings by late Christmas night.



It was at this time, when the Continental Army's esprit de corps was at its lowest, that Thomas Paine published the now famous article "Crisis" in the Pennsylvania Evening Post on December 19, 1776. Legend has it that Paine wrote part of his manuscript beside a fire during Washington's retreat. The text began "These are the times that try men's souls. The summer soldier and the sunshine patriot, in this crisis, shrink from the service of his country, but he that stands it now, deserves the love and thanks of man and woman." Washington ordered the "Crisis" to be read to the troops and it was published throughout the colonies with the intent of instilling new hope and desire for victory into the American Cause.

They were a truly "American" army encamped in Bucks County, Pennsylvania. There were representatives from almost all the colonies and all walks of life. John Glover was there with his fishermen from Massachusetts, General Billy Smallwood was there with his Maryland Rifles, a company of Pennsylvania German farmers and many other companies of all sorts of men made up the army that was to save the colonies and gain their independence from England.

Washington next moved his quarters to the Keith House, near the Mc Konkey Ferry on the Pennsylvania side of the Delaware River. Washington decided to attempt a three pronged attack. One force under his command would cross at Mc Konkey's Ferry and proceed south to attack Trenton. Another column (Pennsylvania militia) commanded by General Ewing was to cross just below Trenton and secure the stone bridge over the Assanpink Creek; thereby cutting off the retreat of Rahl's troops. The third prong under the direction of Colonel Cadwalader was to cross the Delaware below Bristol and attack one or more Hessian garrisons commanded by Count Von Donop.

Because of the importance of secrecy in Washington's daring plan he chose to cross the Delaware during the hours of darkness when he would be unseen. Christmas night, December 25, 1776 was selected as the best date to cross the Delaware and attack the Hessians. Washington and his staff felt they would catch the Hessians off guard, after the Christmas celebration.

As mentioned before the British received almost daily reports from spies on the movement of the American forces. On December 25, 1776 Colonel Rahl received information that an attack on his garrison was impending and he put his men on alert. Fortunately for Washington and his army, a small group of Americans (no one knows exactly who) attacked the Hessians early on Christmas evening but were easily driven off. Rahl was convinced that this was the attack about which he had been warned.

The first group to cross the river was the Virginia riflemen under General Stephen and they were spread out in a large semi circle to protect the landing area. This defensive perimeter included the New Jersey counterpart of Mc Konkey's Ferry House and what is today known as the Nelson House. At one point due to the danger of ice flows, driving winds and snow, Glover in charge of the ferrying operation, suggested they turn back and try some other time. However, Washington was determined and insisted they cross that night, and so they did, even though it took several more hours to bring the entire army across than Washington had allowed for and he knew he would soon lose the darkness and probably the element of total surprise.

The march began about 3 o'clock on the morning of December 26, 1776. From the landing area the American Army proceeded (along "Continental Lane") two miles due east to the locality now known as the Bear Tavern and then south toward the hamlet of Birmingham. At the cross-roads in Birmingham Washington divided his army. One half commanded by Washington and General Greene took the Pennington Road and the other, commanded by General Sullivan, took the River Road.

Because of the poor weather conditions, (the snow had changed to freezing rain) and the conditions of the troops, both groups of Washington's army proceeded slowly at approximately 2 miles per hour. Through the mud and rain these men marched until just minutes before 8 A.M. Then Captain Thomas Forrest met a local farmer, sympathetic to the American cause, who pointed out a Hessian sentry and guard house to General Washington. When Washington requested the removal of these two obstacles, two of his aides Captain William Washington and Lt. James Munroe cut down the sentry and proceeded to attack the Hessian guard house (belonging to the Howell family). The soldiers within the house fled and sounded the alarm in Trenton.

At this point Washington's column headed by Captain Forrest with his two light field pieces poured into the sleeping hamlet of Trenton. Soon the shouts and cheers of Washington's troops filled the streets and they were almost immediately joined by Sullivan's forces (led initially by Colonel Johnny Stark of Vermont). The Hessians ran out of their quarters still half asleep and attempted to form-up on Third and King Streets. The German troops were highly disciplined in group tactics but could not react as individuals and all attempts to form their ranks and stand their ground failed. At one point Rahl managed to rally a large group (several hundred) of his soldiers in a pasture off Quaker Lane and it seemed he might turn the day in favor of the British. Due to the rain, there were few rifles in working condition on either side. One of the Pennsylvania riflemen had managed to keep his powder dry and mortally wounded Colonel Rahl. Without Rahl at their head, most of the Hessians lost heart and retreated to the orchard where the attack had started. Their retreat was stopped and escape cut off by several detachments of colonials which surrounded the milling confused Hessians. The Americans soon became the victors. Over 900 Hessians, many small arms and six brass field pieces were captured by the Continentals. During the early part of the battle 400 to 500 of the enemy escaped south to Bordentown, because General Ewing was unable to cross the Delaware and prevent retreat from Trenton.

Only two American lives were lost (frozen to death), while the Hessians lost 37 including Colonel Rahl. After collecting their booty and attending to their immediate needs, the Continental Army regrouped. With Washington leading the Americans escorted the captured Hessians back to their several camps in Pennsylvania.

The news of this battle shocked the world. How could such an ill-equipped, ill-trained, ill-fed, and ill-clothed army defeat what were considered some of the best soldiers in the world. It seems to boil down to the fact that in their desperation a feeling of desire and unity rose among all the American rebels that could not be overcome by the better trained and equipped soldiers of the King, and these rebels from Vermont, New York, Maryland and the rest of the colonies were determined to make their land free from tyranny and foreign rule.

The number of troops involved was small, the men killed or wounded negligible but, the Battle of Trenton in the magnitude of unity and spirit formed within the people of the colonies by this victory rates with Waterloo or any of the great battles of all time. This battle revived a dying self-confidence and instilled a determination that would last beyond this turning point of the war.

## Transportation

Historically, New Jersey has been the transportation corridor between Philadelphia and New York. Peter Kalm, the Swedish naturalist, wrote the following observations in 1750.

"The cataracts of the Delaware near Trenton and of the Schuylkill at some distance from Philadelphia make these rivers useless further up the country in regard to the conveyance of goods either from or to Philadelphia. They must therefore be carried on wagons or carts. It has therefore already been thought of making these two rivers navigable (for greater distances and) for larger vessels."

p. 27

"October the 28th, 1750 Trenton is a long narrow town, situated at some distance from the Delaware River, on a sandy plain; it belongs to New Jersey, and they reckon it thirty miles from Philadelphia. . . . . Our landlord told us that twenty-two years ago (1728), when he first settled there, there was hardly more than one house; but from that time on Trenton has increased so much that there are at present nearly a hundred houses. . . . . The inhabitants of the place carried on a small trade with the goods which they got from Philadelphia, but their chief income consisted in attending to the numerous travellers between that city and New York, which are usually brought by the Trenton yachts between Philadelphia and Trenton. But from Trenton to New Brunswick, the travellers go in wagons which set out every day for that place. Several of the inhabitants however subsist on the transportation of all sorts of goods, which are sent every day in great quantities, either from Philadelphia to New York, or from there to the former place. Between Philadelphia and Trenton

all goods are transported by water, but between Trenton and New Brunswick they are carried by land, and both these means of transportation belong to people of this town.

We continued our journey in the morning; the country through which we passed was for the greatest part level, though sometimes there were some long hills; some parts were covered with trees, but by far the greater part of the country was without woods; on the other hand I never saw any place in America, the city excepted, so well peopled. An old man, who lived in the neighborhood and accompanied us a short distance, assured me however that he could well remember the time when between Trenton and New Brunswick there were not above three farms, and he reckoned it was about fifty and some odd years ago. During the greater part of the day we saw very extensive cultivated fields on both sides of the road, and we observed that the country generally had a noticeable declivity towards the south. Near almost every farm was a spacious orchard full of peaches and apple trees, and in some of them the fruit had fallen from the trees in such quantities as to cover nearly the whole surface of the ground." p. 117, 118

"May the 31st, 1751 About noon I left Philadelphia and went on board a small yacht which sails continually up and down upon the river Delaware, between Trenton and Philadelphia. We sailed up the river with fair wind and weather. Sturgeons leaped often a fathom into the air. We saw them continuing this exercise all day, till we came to Trenton." p.320, 321

"Towards night, after the tide had begun to ebb and the wind had subsided, we could not proceed, but dropped our anchor about

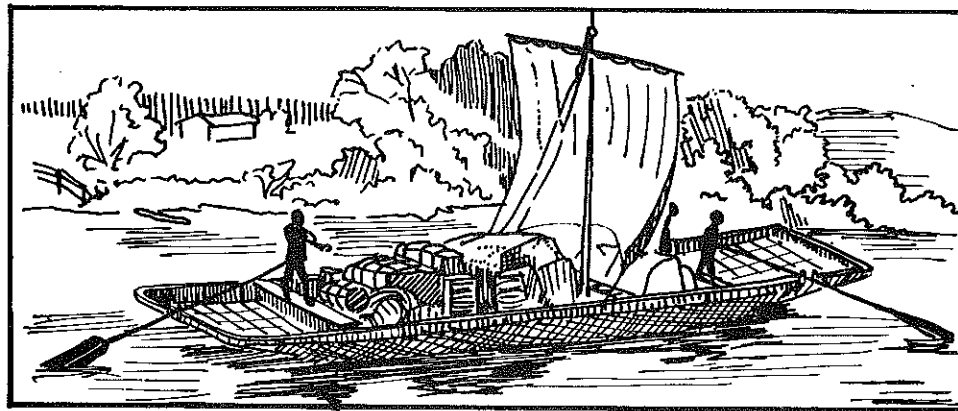
seven miles from Trenton, and passed the night there. . . . .

June the 2nd, 1751 This morning we left Trenton and proceeded towards New York. We rode in an ordinary open wagon which in stony places came near shaking liver and lungs out of you, otherwise the better class people travel with their own horses whether they ride in a wagon or chaise, or on horseback; the latter is the more common method of travelling. . . . . The fields were sown with wheat, rye, corn, oats, hemp, and flax. In several places we saw very large pieces of ground planted with hemp." p. 322

Travels in North America

by Peter Kalm, edited by Adolph B. Benson

Dover Publications, Inc., New York 1966.

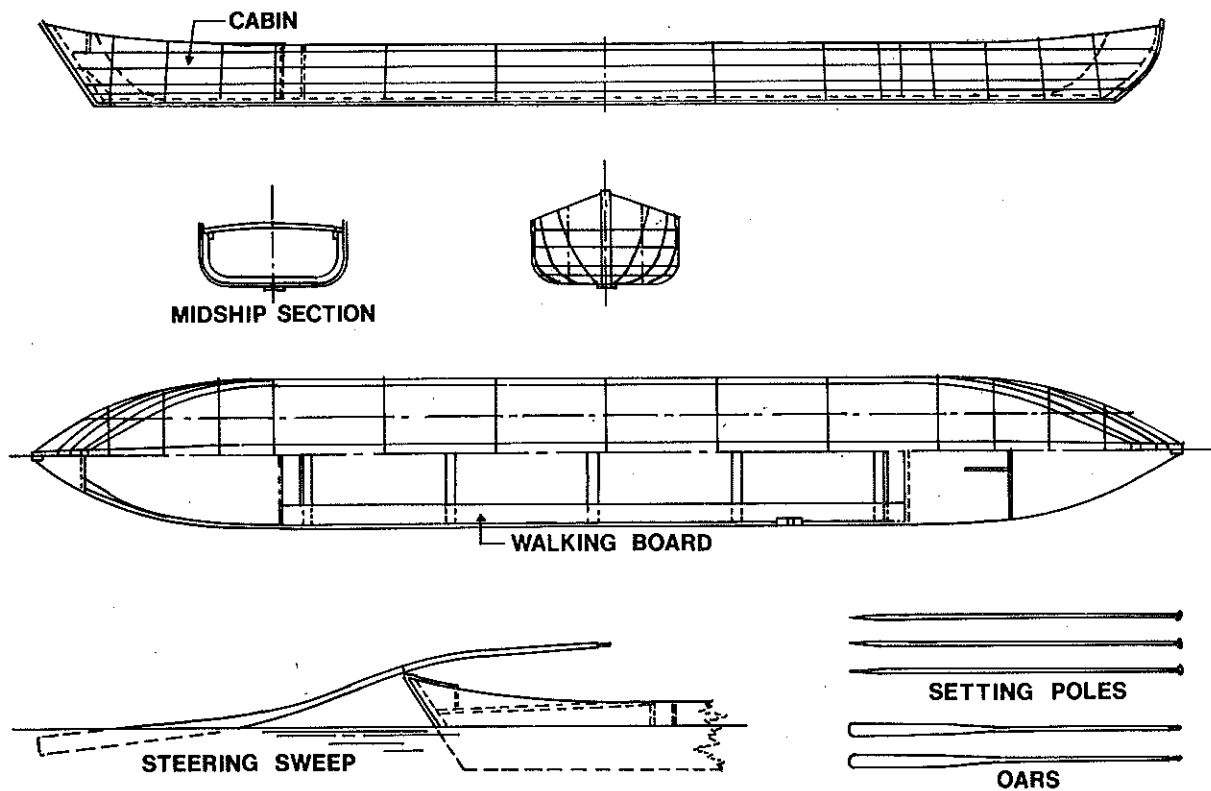


**PISCATAQUA RIVER GUNDALOW**

Ferries were located at various points along the Delaware. In the park study area the ferry is now remembered as the McKonkey Ferry although it was owned, and in earlier times known as Johnson's Ferry. The design of the ferry has not been authenticated; however it would have been large enough to accommodate a conestoga wagon and team of six horses. Two methods of controlling the ferry were used in that era. One had lines

strung from both banks with connecting lines/pulleys. Through the use of poles for pushing and/or shifting the angle of the craft, thus making use of the current, the ferry moved from shore to shore.

The other common design for ferries involved the construction of an anchor in midstream. A wooden crib with a rope to the ferry was filled with stones, thus providing an anchor from which the ferry swung like a pendulum utilizing the current of the river for momentum.

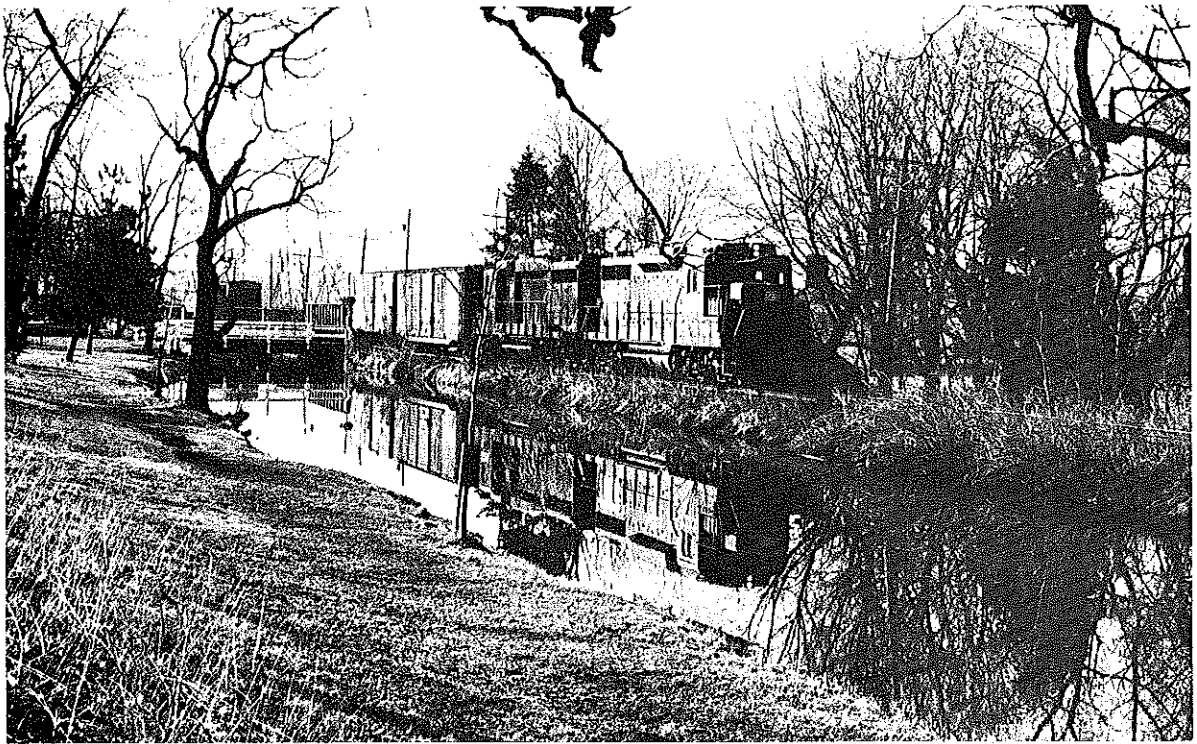


### DURHAM BOAT OF THE DELAWARE RIVER

SCALE 1/8" = 1'

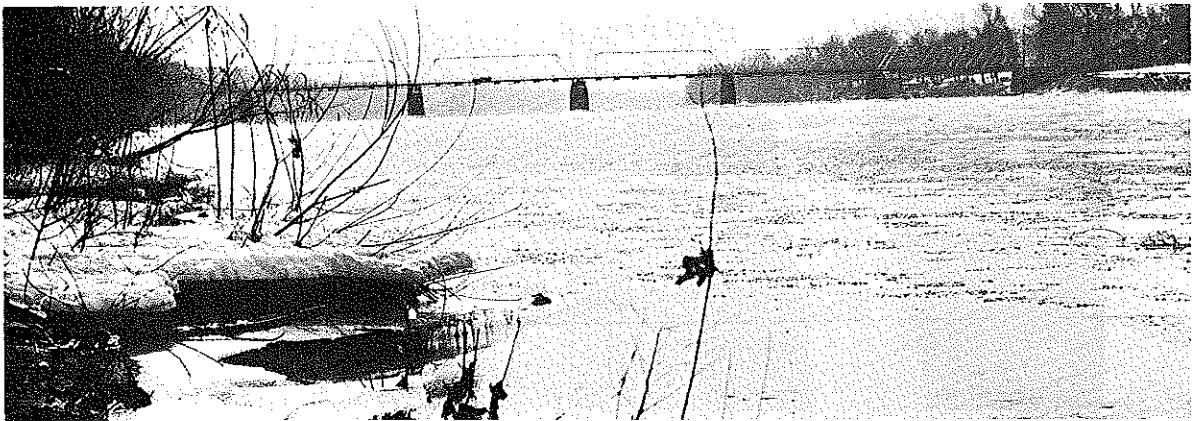
The Durham boats were designed for hauling pig iron from the Durham Mill near Bethlehem. They were primarily guided by a long sweep on the "down-river" run. Iron rings used in moving the Durham boats upstream at the rapids have been found recently.





*Penn Central Railroad & R. & D. Canal*

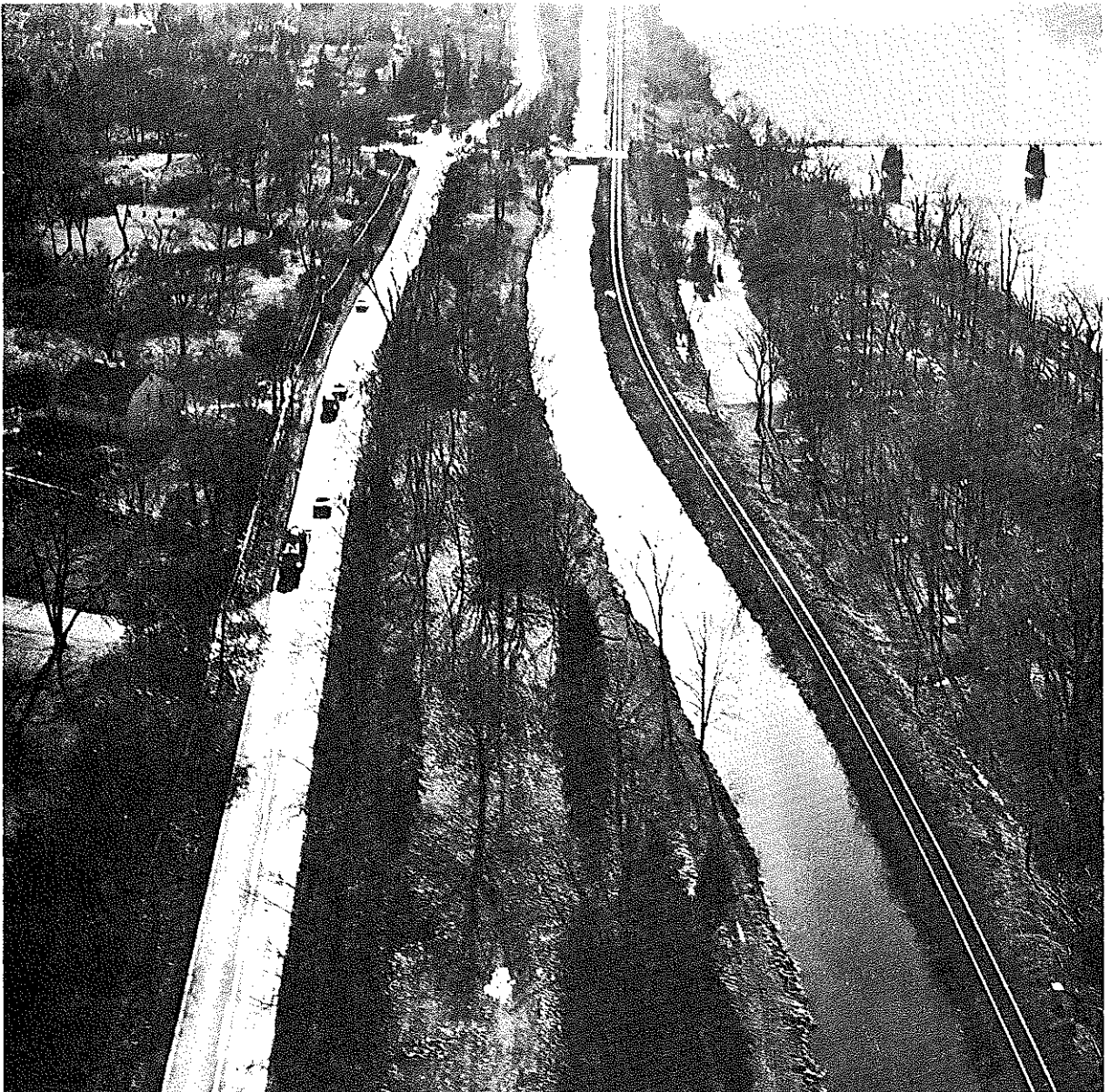
The advent of the canal systems for moving goods, generated the construction of the Delaware and Raritan Canal in 1838; it runs through the park site. At the time the railroad was constructed on one shoulder of the canal, it was used as part of the potable water system for at least the Trenton area. At present the canal functions in this same capacity, carrying some 75 million gallons per day to industries and manufacturers along the canal.



*Bridge at Washington Crossing*

Technological advances related to both the railroad and motor car generated the construction of State Route 29 through the site, as well as the construction of the bridge across the river. The Delaware River Joint Toll Bridge Commission (DRJTBC), an interstate agency, was authorized to maintain and/or replace the various ferries on the river with bridges.

The result of the various changes in mode of transportation have affected the park site adversely, separating the riverfront park from the upland section.

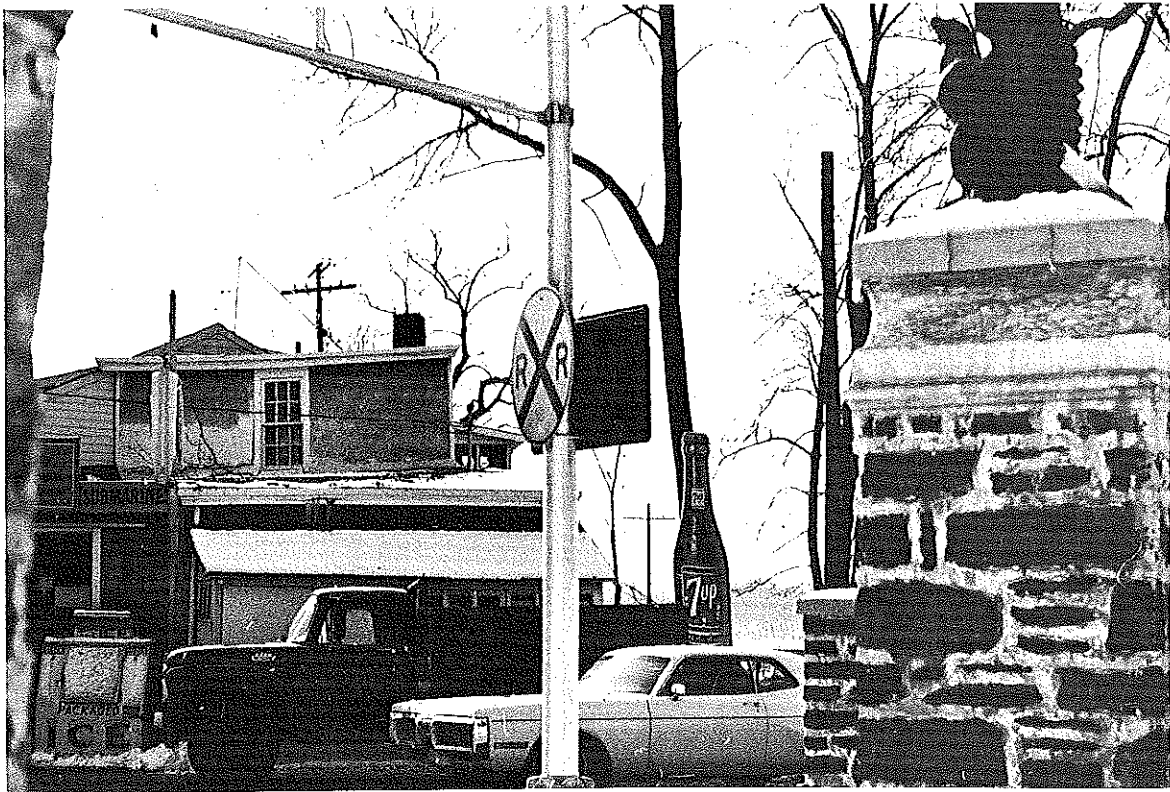


*Transportation - utility corridor through park*

Manifestations of the Federal Highway Program in this area, involve the Scudders Falls Bridge (DRJTBC) and Route I-95. State Route 29 has been reconstructed for increased capacity between I-95 and Trenton. The resulting ease in transportation of goods and commuting is encouraging speculative housing developments and the location of industry in Hopewell Township and the park surround. Planned improvements for Route 29 north of Scudders Falls Bridge are scheduled currently for 15-20 years hence. At present the route is designated a "scenic route." Any plans for "improvements" to the roads in or around the park which utilize federal funding are obligated to make environmental impact statements and to show alternate route alignments.



*Junction of State Route 29 & County Route 546*



*Approach to bridge from State Route 29*

### LAND USES

Man's physical and visual impact in the study area has been accelerated by the various means of transportation. The irregular landform adjacent to the river precluded any extensive farming such as exists on the Pennsylvania side. Farming now is concentrated on the upland areas; the side-slope of the river and floodplain at Titusville are in various stages of urban-suburbanization.



*Junction of County Routes 546 & 579*

The park surround has changed from one of compatible land uses (farms and rural residences) to incompatible land uses (1/4 acres urban and 1/2 - 1 acre suburban residences). As pointed up in the plans, pp. the park site stands almost completely surrounded by single family residences (a social parameter). There are still potential corridors to significant physical features (Baldpate Mountain and Jacobs Creek Drainage Reserve) which qualify for State/County/Township open space programming.

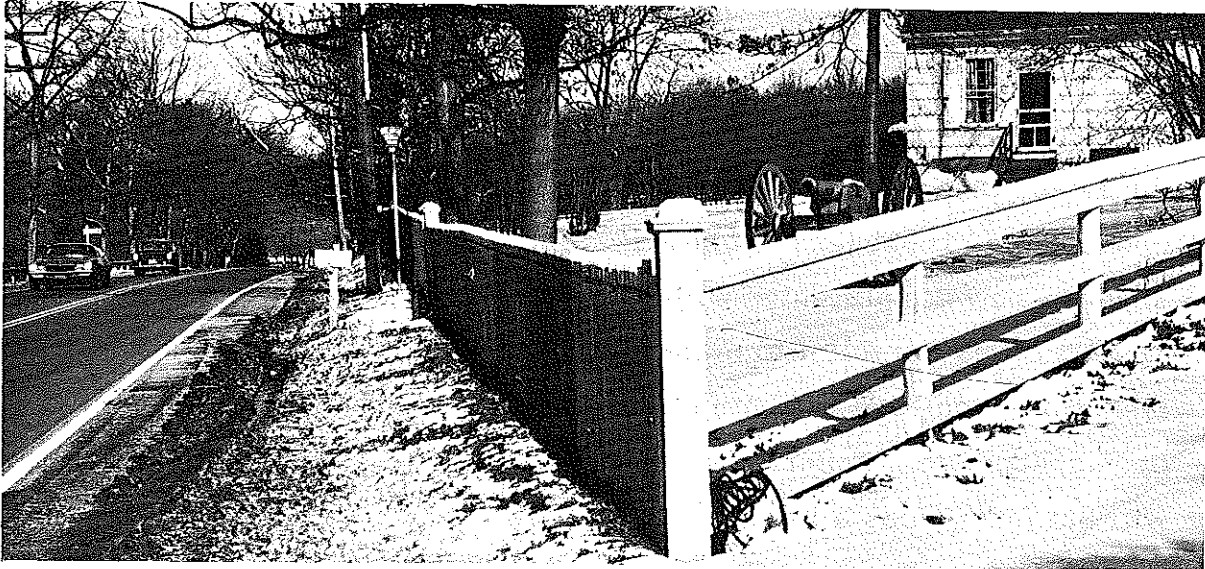
Neither Hopewell Township nor Mercer County have effective zoning ordinances, thus there is no way to guide development and still preserve open space. Local taxation based on the "highest and best use" philosophy is now complimented with the Farmland Assessment Act of 1964. The Act offers tax relief to owners of lands who wish to perpetuate their lands in agricultural or horticultural uses. However, if these potential open spaces are not preserved, with minimal public access, the park will not function as a bona fide state park.



*Junction Brickyard Road & Church Road*

## AUDIO-VISUAL INTRUSIONS

Audio-visual intrusions to the park are manifest in the State and County roads on three sides of the park, the commercialism along Route 29 and the traffic on the railroad. The worst conditions are in the transportation corridor which separates the riverfront park and the upland portions.



*State Route 29 & McKonkey House*

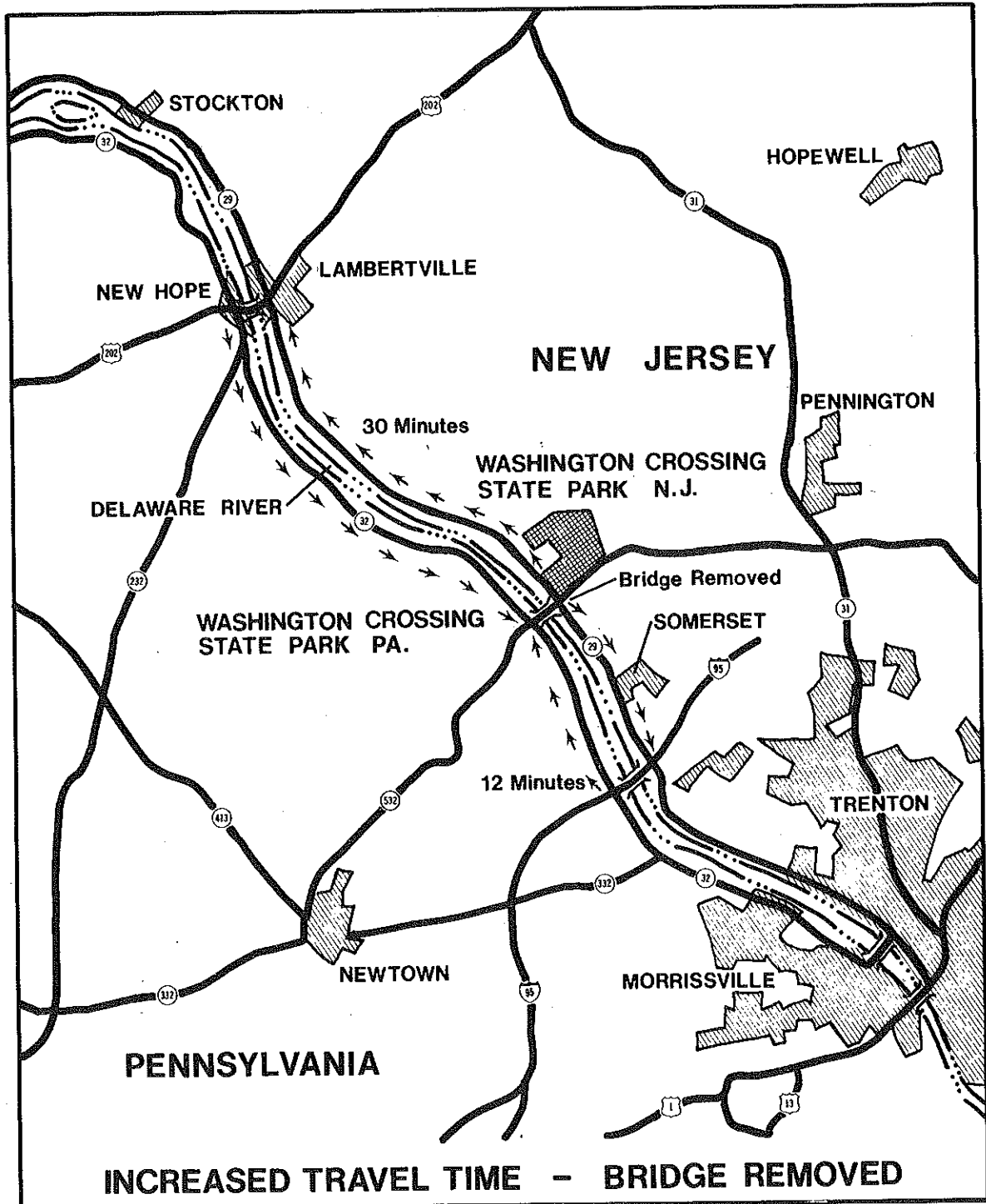
## BRIDGE

It should be borne in mind that any upgrading in the volume of traffic on the bridge will affect adversely an already much diminished recreation experience. For the purpose of this report it is imperative to pursue the ramifications of recreating as much as possible of the site to its 1776 condition.

## BRIDGE ACROSS RIVER

The bridge across the river is a definite audio-visual intrusion on the parks on both banks of the river. In weighing the importance of this historic site and its restoration, consideration has been given to the positive and negative effects of removing the existing obsolete bridge. Commission records indicate that 883,440 cars crossed the bridge in 1971.

There will be inconvenience for those residents in the area by an increased travel time. Travel time by car from one approach to the bridge to the other would be 12 minutes (6 miles @ 30 mph) via Scudders Falls Bridge and 30 minutes (14 miles @ 30 mph) via New Hope-Lambertville Bridge.



This inconvenience to the motorist is small when weighed with site restoration benefits and the tremendous recreation experience afforded by the proposed ferry service.

The construction of a pedestrian oriented ferry service between the two historic parks (N. J. and Pa.) would be followed by the dismantling of the existing bridge and abutments. Implicit in this cooperative action is the synergism effected by the efforts of the three parties involved. The historic park concept/plan must be agreed upon and the respective responsibilities assumed.



### Studies and Programs Currently in Progress

Jacobs Creek Watershed Association is a citizens group interested in preserving open space, creating wildlife habitat, and impoundments along the creek and areas for passive recreation pursuits. The group has just formed and is interested in qualifying for Ford Foundation monies to preserve the natural environment. A definite program has not as yet been formulated: the existence of this citizens group could assist immeasurably in promulgating a County/Township Open Space Program to complement a similar State program in the park study area.

Delaware River Toll Bridge Commission: this interstate agency is negotiating currently for funds to design and reconstruct the bridge across the river. Michael Baker Jr., Inc., Engineers, Beaver, Pa., has been selected to perform the study with a latitude of one thousand feet on either side of the present location. It is incumbent on the parties involved, if federal funds will be used, to file an environmental impact statement. The various Federal Highway Acts of 1962, 1966, & 1968 demand that alternate routes be studied particularly where park lands are concerned. To the end of creating a viable and expanded park experience the monies for the study of necessity should include the feasibility of constructing a ferry service which would be compatible to the period and an integral part of the recreation experience of an historic park.

State Highway Department: does not foresee any need of upgrading the capacity of Route 29 earlier than 15-20 years. The compatibility of any upgrading will have to be assessed for its impact on a National Historic Site and park lands.

Mercer County, Hopewell Township Sewer District: some few years previous the problem of samitary wastes was investigated. The vast extent of the system to service the suburban sprawl of the area proved to be too expensive at present. No action on such a program has been undertaken to date either to impliment the plan or to halt the proliferating suburbs.

Mercer County Zoning and Recreation-Open Space Program: the County at present does not enforce its zoning regulations, nor is a recreation-open space program in existence.

Mercer County Bicentennial Committee: is chaired by Senator Wm. Schluter; the complete program has not been disclosed to date.

## EVALUATION OF THE EXISTING RECREATION EXPERIENCES

Any evaluation must recognize immediately the barrier presented by the transportation-utility corridor and the incongruity of some recreation facilities and service functions existing in the historic park area. These factors negate and diminish any possibility of simulating an historic environment which would provide a unique recreation experience. The three historic buildings: Nelson House, McKonkey (Inn) House, and Bear Tavern, form the limits of the historic area. They are separated visually and physically; thus presenting a fragmented historic recreation experience. The McKonkey (Inn) House and the Flag Museum are the nucleus of the existing park.

### NELSON HOUSE

Now acknowledged more generally as a waiting station for the ferry, it was restored in 1930 to its original proportions. At present, a section is used as a comfort station. The main body of the structure is unused. It is listed on the National Register of Historic Sites. The recreation value consists of viewing the exterior of the house, reading the historic plaque on the side of the building and peering through the windows, if the shutters are not closed.

A picnic area is located along the bank of the Delaware River as well as parking areas for some 30 cars - 280 persons for instant use. A comfort station as well as the sanitary facilities in the Nelson House service the area. The manner in which the sanitary wastes are disposed of in this area are unknown. A common road runs through this section of the park connecting with a street in Titusville; thus making control of this area impossible. A previous attempt at closing the road to through traffic was met with objections by the residents of Titusville.

The recreation values picnicking in proximity to the river and the views are positive, except when a train passes on the railroad and destroys any nature oriented recreation experience. Extraneous traffic to and from Titusville presents a hazard to the visitor and a control problem for management. The audio-visual attraction of traffic on the bridge could be replaced with a genuine recreation experience by reconstructing the ferry service across the river. There are audial intrusions on the area during the use season from State Route 29.

#### DELAWARE AND RARITAN CANAL

It is one of the chief conveyors of potable water to the Raritan River Basin area. It's recreation potential for fishing is dependent on annual replenishing of trout by the Division of Fish, Game and Shellfisheries. The fish in turn are dependent on the quality of this water taken from the Delaware River. Boating and canoeing on the canal is limited because of the low clearances under the numerous bridges. The recreation experience is also negated by the passage of trains on the railroad. A commerical boat rental exists in Titusville.

#### MCKONKEY (INN) HOUSE

Sometimes acknowledged as a colonial tavern-guest house, it is operated by the Washington Crossing Association. An upper room of the structure was used by General Washington as he waited for the full compliment of his troops to assemble on the New Jersey shore. The building has authentic furnishings. Tours are conducted daily to groups of not more than twelve persons at time intervals of twenty to thirty minutes at peak periods. A charge is made for entry to the house.

Attendance at the McKonkey (Inn) House for the period 1 July, 1969 through 30 June, 1970 was 85,977 persons. Records are incomplete for 1971.

The house and gardens create the only vestige of the environment of '76 in the park. Once inside the house, the audio-visual intrusions of State Route 29 can be set aside. During normal visiting house the traffic is both seen and heard, thus preventing full appreciation of the garden.

#### FLAG MUSEUM

One of the outbuildings of the McKonkey (Inn) House contains a display of flags of the various colonial regiments, some uniforms of the period, and dioramas of the relevant battles. An admission donation is accepted by the Washington Crossing Association. Recently a well was drilled and now supplies potable water to both the museum and the McKonkey House. Sanitary wastes are handled by means of a septic tank and drainfield, which was constructed in the 1960's.

The stone barn has been suitably adapted for the displays, however a building designed with fewer architectural constraints would be of benefit both to the displays and the visitor. The barn more logically should be used as part of the outbuildings of the tavern-guest house complex.

#### CONTINENTAL LANE

It is logical that the lane serviced the fields on either side originally, as well as providing access from the river crossing to the Trenton-Pennington Road. The exact alignment probably cannot be authenticated, however, this does not affect its recreation potential adversely. The lane is much overgrown with trees, and is passable only on foot. By restoring the lane to its original use for foot, horse and wagon traffic, the visitor would be able to more fully comprehend the environment in which the events of '76 took place.

#### BEAR TAVERN

The Erskine Map recording the activities of the Revolution in this area makes note of a school house on the location of Bear Tavern. This casts doubt on

the credibility of both the name and function of the structure. The building largely was destroyed by fire and subsequently was rebuilt. At present it is unoccupied and partially used for storage. At present the building has no recreation value. Its location on a busy intersection precludes its being incorporated into the historic park development. Relocating the structure to an appropriate location in the historic park, and restoring it as a tavern-guest house would serve to expand the recreation experience, albeit at the expense of historical accuracy.

#### PARK ROADS

A drive-through recreation experience is afforded by the park drives which parallel Continental Lane. The several auto access points make control of the park well-nigh impossible. Picnicking for family and groups is offered in three centralized locations for some 900 persons: 260 cars instant use. Comfort stations-shelters and lawn areas for informal games are located at each area. An overlook for viewing the river exists adjacent to Route 29. The paths and plantings of the original design have been modified and/or fallen into disuse. A small arboretum exists in the southwest quadrant of the park.

Park attendance peaks in the spring season and then subsides. It is surmised that recreation facilities on the coast take precedence during the summer and into fall. Picnicking dominates the existing facilities.

Both the drive-through park and picnicking are incompatible facilities, if the historic park is to re-create the environment of '76. These facilities can be relocated elsewhere within the park where the visitor is still within walking distance of the historic park.

### THE AMPHITHEATER

The amphitheater is operated during the summer season by the Washington Crossing Association. Seating capacity is 900 persons. The Association would like to improve the general conditions seating (1000 persons), the staging, the parking area and the sanitary facilities.

Although this type of facility is not typical of a state park, it does exist. The anticipated expansion should be considered the ultimate size, in the interest of maintaining a state park rather than an outdoor theater. Improvements to the facility must be kept simple and rustic, in keeping with recreation in a natural environment.

### THE NATURE CENTER

The nature center has been functioning at the park since the Green Acres Program purchased the additional holdings. The orientation of the program is to all aspects of nature study. The facility is extremely popular, particularly with school groups during the academic year. An existing system of trails for nature observation and study is independent of other trails for horseback riding/snowmobiling. Parking at the nature center accommodates some thirty cars.

This type of recreation facility/activity is most compatible with the goals and purposes of state parks. It is doubly rewarding because of the immediate recreation experience and the long term benefits of educating the public to the natural environment, thus fostering appreciation of state parks. This facility is integrally related to open spaces ancillary to the park, open space corridors between these related areas must be maintained to assure the continued viability of both.

### OPEN FIELDS

Open fields of "Phillips Farm" are used annually by the Trenton Dog Show. Other organized groups have used this same area for camping. The furnishing of sanitary facilities as well as the repair of damage is incumbent on the users. The area is used for Fourth of July celebrations.

By its very nature a state park should have sizeable open areas, these logically are better related to a facility such as a nature center. However, if these areas are to be used by hordes of people, then obviously the traffic, sanitary and management problems of the gathering, as well as the temporary and permanent effects to the center and study area must be considered for the degree of compatibility.

Instant use capability of the existing park is approximately 1,300 persons. Total park attendance for 1971 is estimated at some 280,000 persons.



MAIN-REUTTER concludes that in Washington Crossing State Park and the study area, the natural physical features and limitations to recreation as well as the social parameters dramatically affect the suitability of the site for passive, active and historic site recreation activities.

The *raison d'etre* for creating the park, the site of the river crossing and related roadways have been destroyed or altered in large measure. The ferry and landings no longer exist. The road leading from the landing at the river has been obliterated by the transportation-utility corridor. For years a bridge has replaced the ferry.

Commemorative plans proposed in the 1910's imposed new land uses. These plans and amendments have supplanted the agrarian land uses. Today the upland areas which were fields are a combination of lawns, reforested areas with foreign tree species, paved park roads, forestry nurseries, picnic areas and scenic overlooks.

Except for three buildings, everything has disappeared. At present one must have an exceptionally vivid imagination, and already be educated to the historical events in order to gain some appreciation of how the site appeared in 1776.

The increasingly rapid changes in the area surrounding the park further dilute and/or obliterate the rural atmosphere. The sameness of the trimmed lawns, and ornamental plant introductions in and out of the park belie the lifestyle of '76 and its veracity.



# DESIGN SYNTHESIS

DESIGN SYNTHESIS

Parameters used in identifying the natural (gross) recreation carrying capacity of the park are as follows:

Passive use recreation areas:

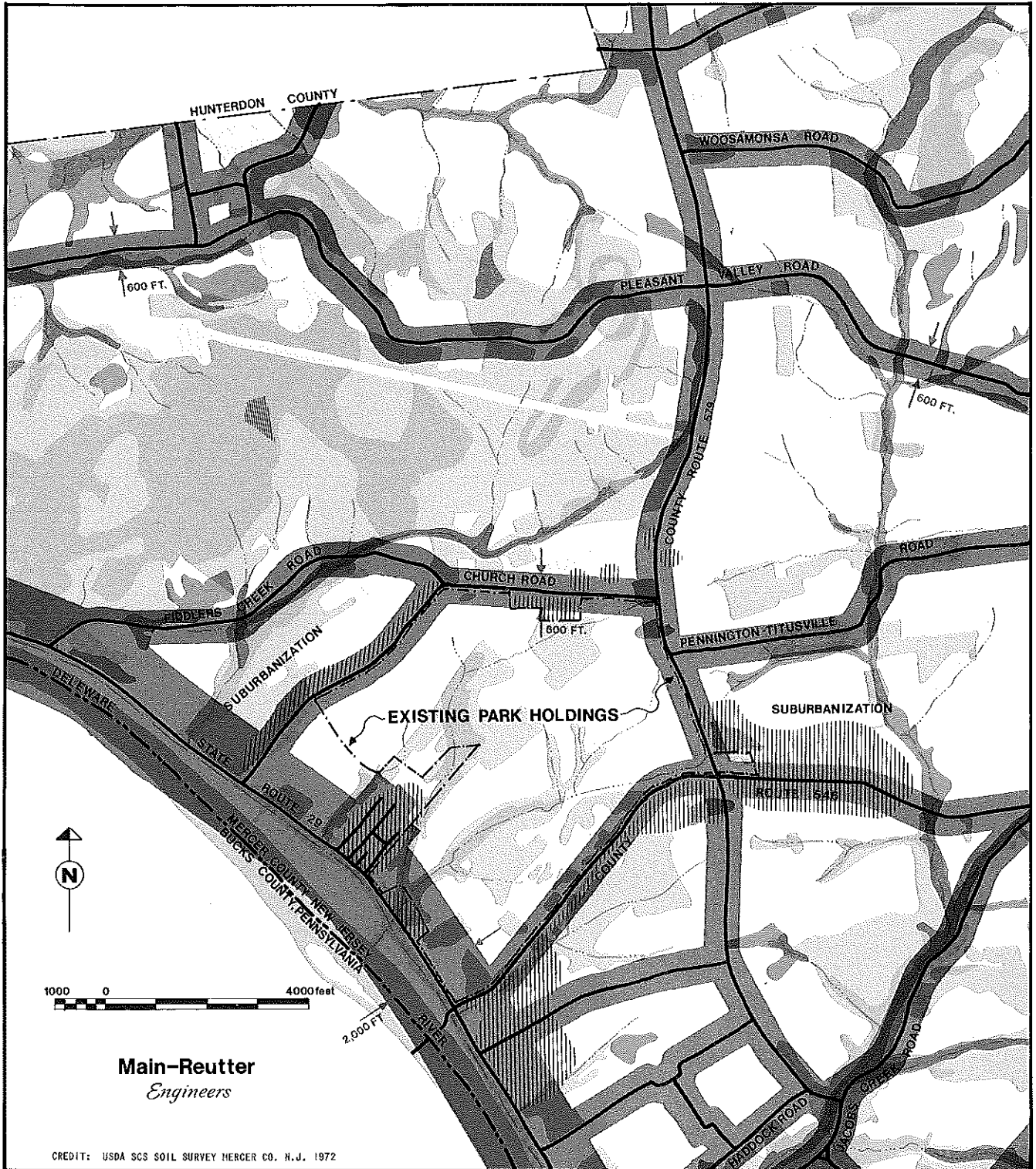
- 1) Peripheral buffers 300 feet deep for audio-visual protection of the park interior and to provide wildlife habitat.
- 2) Internal buffers around prime natural resource - 300 feet deep for audio-visual protection of streams, rivers, ponds, lakes and to provide wildlife habitat.
- 3) All flood plains, areas of poorly drained soils and those areas with seasonal high groundwater.
- 4) All areas with 10% or more slope character.
- 5) All areas with less than 10% slope character which are less than 300 feet broad.
- 6) All areas with mature woods one acre or larger.
- 7) All areas of unique geologic significance.

Active use recreation areas:

- 1) Areas of less than 10% slope character that have well-drained soils and are not less than 300 feet broad.
- 2) Areas within 1/2 mile of prime natural resources.
- 3) Areas further than 1/2 mile from residential development.

Recreation use space standards (instant),

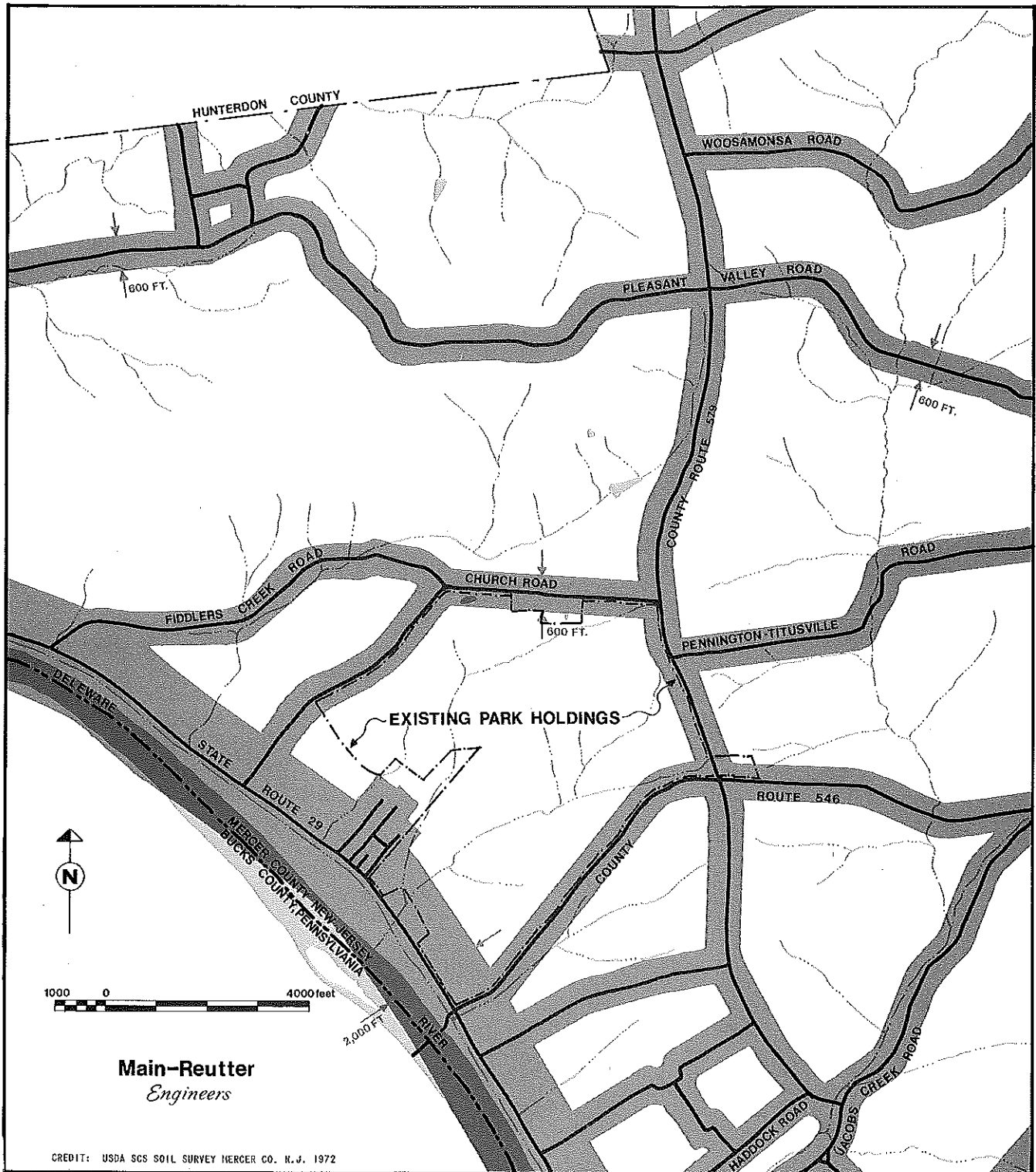
Prime natural resource areas -----	1/2 person per acre
Active use recreation areas -----	10 persons per acre
Outdoor historic site recreation -----	10 persons per acre
Indoor historic site recreation -----	20 persons per acre



**WASHINGTON CROSSING STATE PARK**

**DESIGN SYNTHESIS**

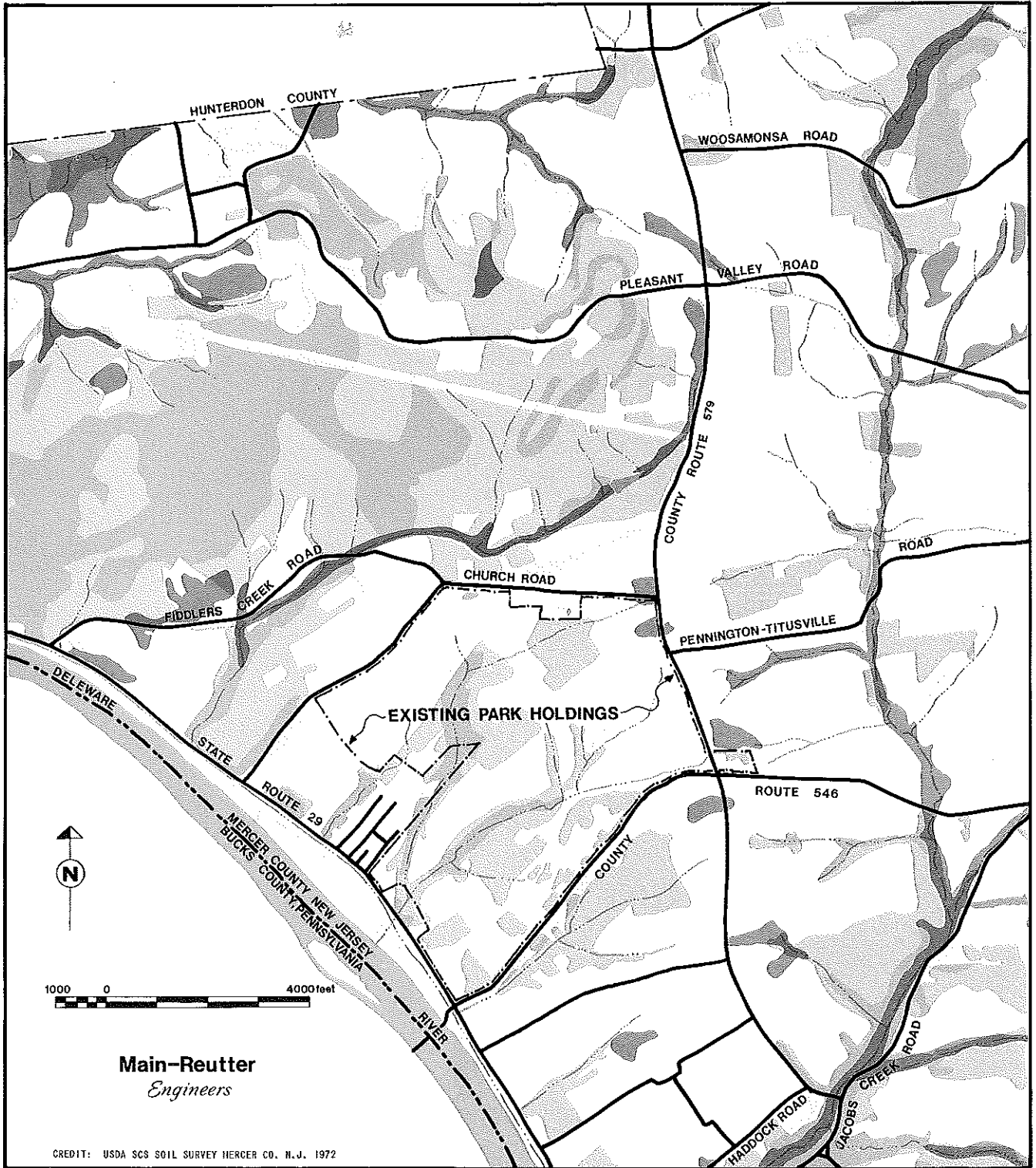
- |   |                         |   |   |   |                |
|---|-------------------------|---|---|---|----------------|
|  | SLOPES GREATER THAN 10% |  | AUDIO-VISUAL LIMITATIONS                  |  | FOREST COVER   |
|  | POORLY DRAINED SOILS    |  | AREAS SUITABLE FOR INTENSE RECREATION USE |  | RIVERS & PONDS |





**SOCIAL PARAMETERS**



 **AUDIO-VISUAL LIMITATIONS**

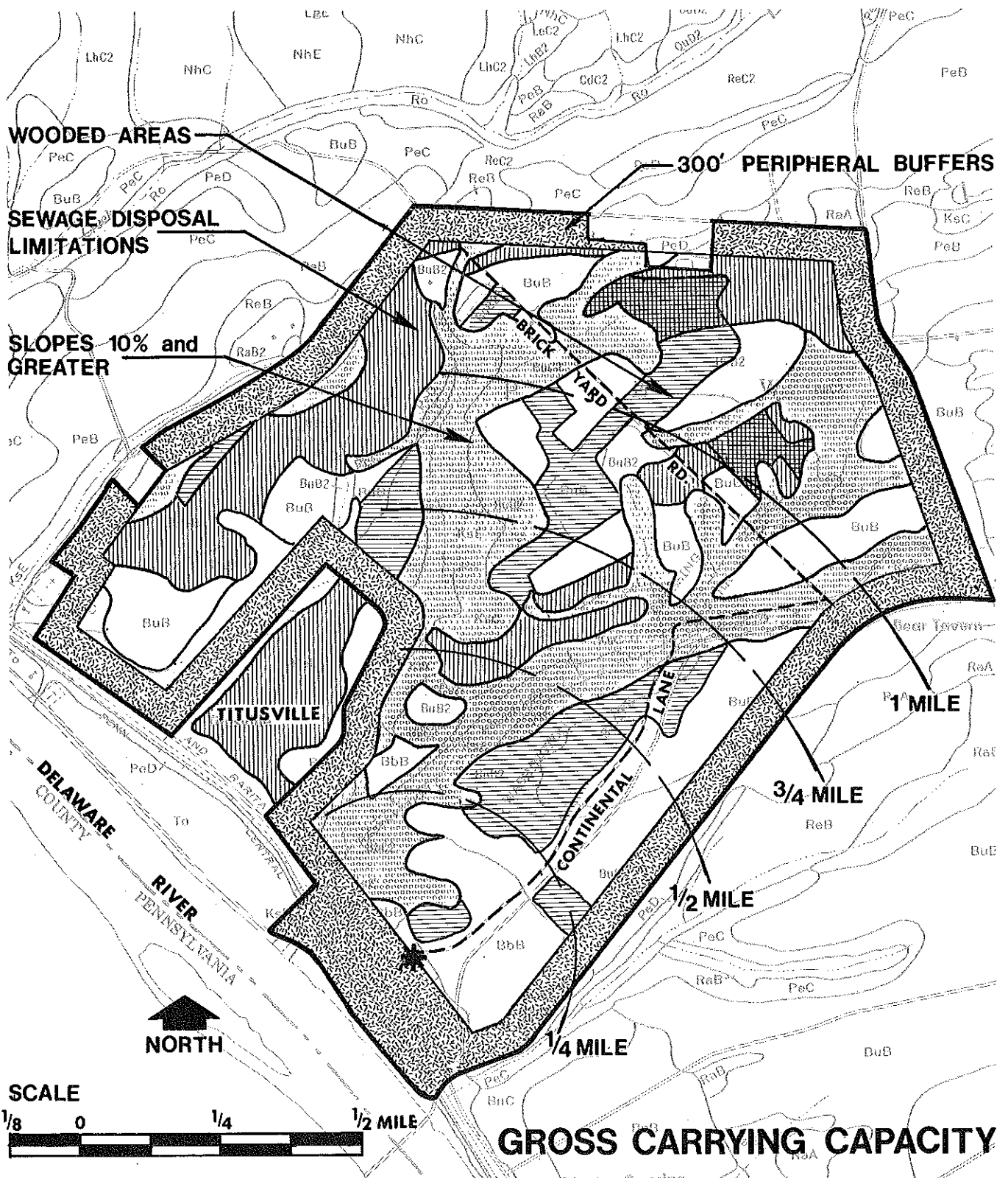
 **RIVERS & PONDS**



**PHYSICAL FEATURES & LIMITATIONS**

-  SLOPES GREATER THAN 10%
-  POORLY DRAINED SOILS

-  FOREST COVER
-  RIVERS & PONDS



ALL PARK AREAS ARE WITHIN A 20 MINUTE WALK OF SOME PUBLIC ROAD

### GROSS RECREATION CARRYING CAPACITY

The gross recreation carrying capacity of the proposed park; utilizing the criteria of well-drained soils with less than 10% slope characteristic, without tree cover and inside the 300 foot peripheral buffers is as follows (Including those inholdings essential to full park development):

Active use recreation	-	340 acres @ 10 pers/acre	3,400 persons
Passive use recreation	-	565 acres @ $\frac{1}{2}$ pers/acre	<u>287</u> persons
TOTAL		905 acres (instant) TOTAL	3,687 persons

Thus the natural ratio of active-passive acreage is 1:3.

### ADJUSTED GROSS RECREATION CARRYING CAPACITY

Essential to the viability of Washington Crossing State Park, because of its intermediate size and the relationship of incompatible land uses, is the relationship of other public and private recreation-open space holdings. Only a few of these vital open space links are possible to create, through purchase or negotiated agreements. As shown on the plan: "Adjusted Gross Carrying Capacity," the links will connect the park with the privately owned Baldpate Mountain - Strawberry Mountain, and the Jacobs Creek Drainage Reserve. The former is a significant natural physical feature worthy of preservation through State ownership; the latter natural physical feature is being planned currently by a group of landowners and interested citizens along the water course. MAIN-REUTTER strongly urges the State, County and Township to initiate the needed action to make these vital open space connections a reality, while the opportunity exists. This is shown graphically on the plan Wildlife Habitats/Capability on page B-19 and the plan Adjusted Gross Carrying Capacity.

Because the historic site and related recreation activities are of paramount consideration, all the well-drained soils areas on the southern edge of the park are considered for that unique purpose. The streams, their sideslopes,



**BUFFERS & NATURE CENTER**

**OPEN SPACE CONNECTION - TYPICAL**

**ACTIVE USE RECREATION  
115 acres**

**MEADOWS  
80 acres**

**potential  
BICENTENNIAL  
PARKING  
25 acres**

**DELAWARE COUNTY**

**TITUSVILLE**

**1 MILE**

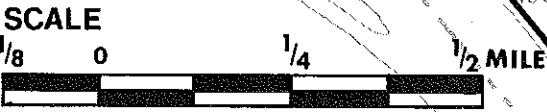
**3/4 MILE**

**1/2 MILE**

**HISTORIC SITE RECREATION  
136 acres**

**1/4 MILE**

**ADJUSTED  
GROSS CARRYING CAPACITY**



**ALL PARK AREAS ARE WITHIN A 20 MINUTE WALK OF SOME PUBLIC ROAD**

the poorly-drained soils areas and the wooded areas form the buffers which structure the park still further. As shown on the plan: "Adjusted Gross Carrying Capacity," the areas with limitations to on-site sewage disposal further delimit the areas which are most suitable for active use recreation activities. MAIN-REUTTER recognize the validity of the need for ancillary open space (the connecting links with Baldpate-Strawberry Mountain and Jacobs Creek Drainage Reserve) for the nature center as the logical reason for devoting this northeast section of the park to this passive use recreation activity.

The location of the active use recreation area is predicated on the possible necessity of having on-site sanitary waste disposal, and the compatibility of picnicking and the amphitheater with the nature center and the historic park.

In consideration of the greater park attendance during the Bicentennial Celebration and the related parking-transportation problems, MAIN-REUTTER strongly recommends tendering options to purchase the area designated on the plan. It is envisioned that a shuttle bus service would be contracted to accommodate the visitors during the Bicentennial Celebration. This same area is planned for expansion of the transient camping area.

It is expected that attendance at the Bicentennial Celebration will be similar to the Tercentenary, at which the attendance doubled during the celebration and diminished only half of the increase the following year. Therefore, a total of 560,000 persons can be expected during the Bicentennial Celebration (even though none of the recommended recreation facilities are constructed).

The three inholdings along State Route 29 (concrete products manufacture, U. S. Post Office and Roman Catholic Church) vitally affect the organization, possible development, and the continued viability of the park. To this

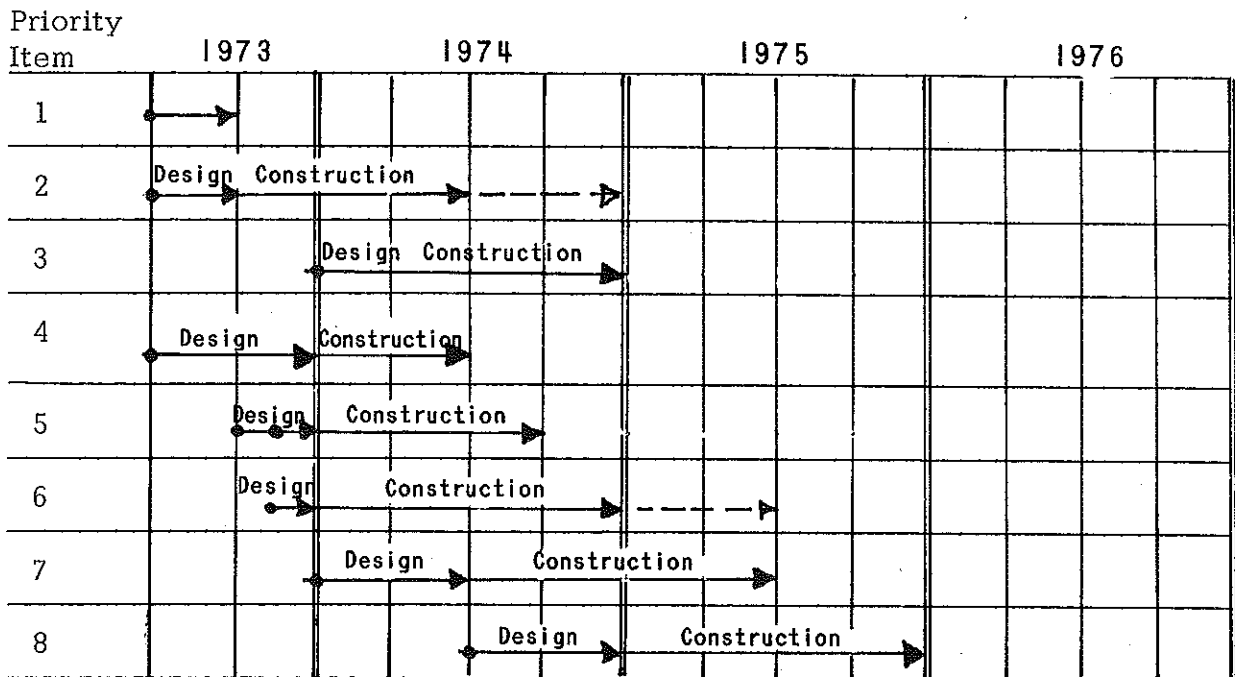
end they are considered part of the State park holding.

Adjusted Gross Carrying Capacity

Historic Site Recreation	131 acres @ 10 pers/acre	1,310 persons
Active Use Recreation	115 acres @ 10 pers/acre	1,150 persons
Passive Use Recreation (include Nature Center)	<u>632</u> acres @ $\frac{1}{2}$ pers/acre	<u>316</u> persons
TOTAL	905 acres (instant) TOTAL	3,046 persons

Active Recreation: Passive Recreation Ratio 1:3.5

DEVELOPMENT SCHEDULE



## DEVELOPMENT PRIORITIES

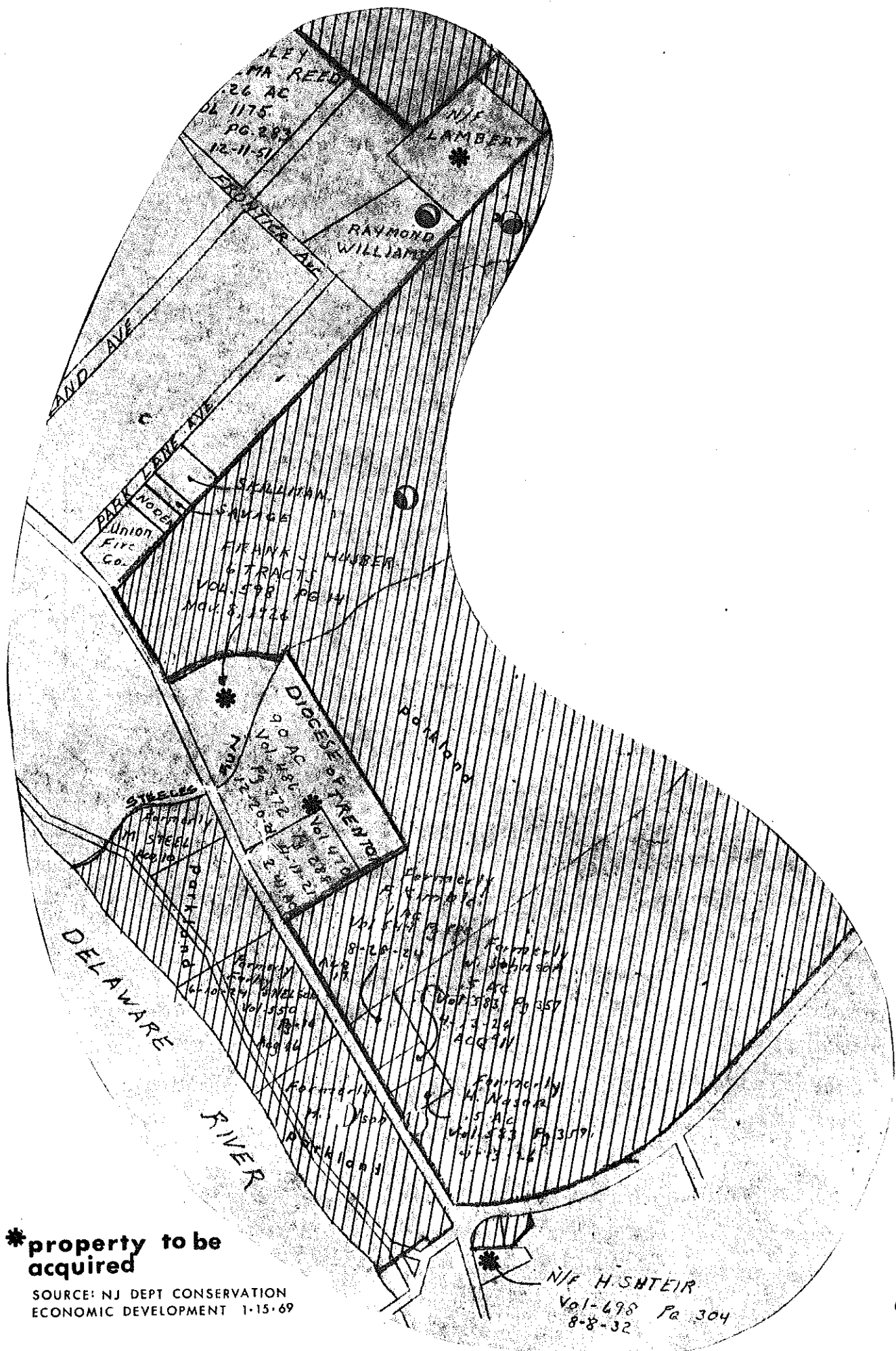
### Priority One: Land Acquisition

The functioning of the park is basic to the acquisition of the inholdings on the east side of Route 29.

As illustrated by the proposed development plan, key elements of the plan must be located along Route 29. Owing to the residential nature of the areas surrounding the park it would be incongruous to propose the park entry to be on any of the surrounding streets. This factor must be coupled with the reconstruction of Route 29 adjacent to the McKonkey House which will involve considerable funding and construction time, all of which is designed to alleviate the present congestion on this route. The acquisition and reconstruction is recommended as a positive move toward ensuring the viability of the park while accommodating the present modes and volumes of traffic through a state park which has national historic importance.

MAIN-REUTTER recommend that consideration be given to the costs attendant on relocating the Roman Catholic Church to the site of the so-called Bear Tavern in exchange for this parcel. An alternative solution would be an outright financial transaction. Since use of the church is vehicle oriented, this translocation should prove to be of minimal inconvenience to the parishioners, allowing that sentimental considerations can be assuaged.

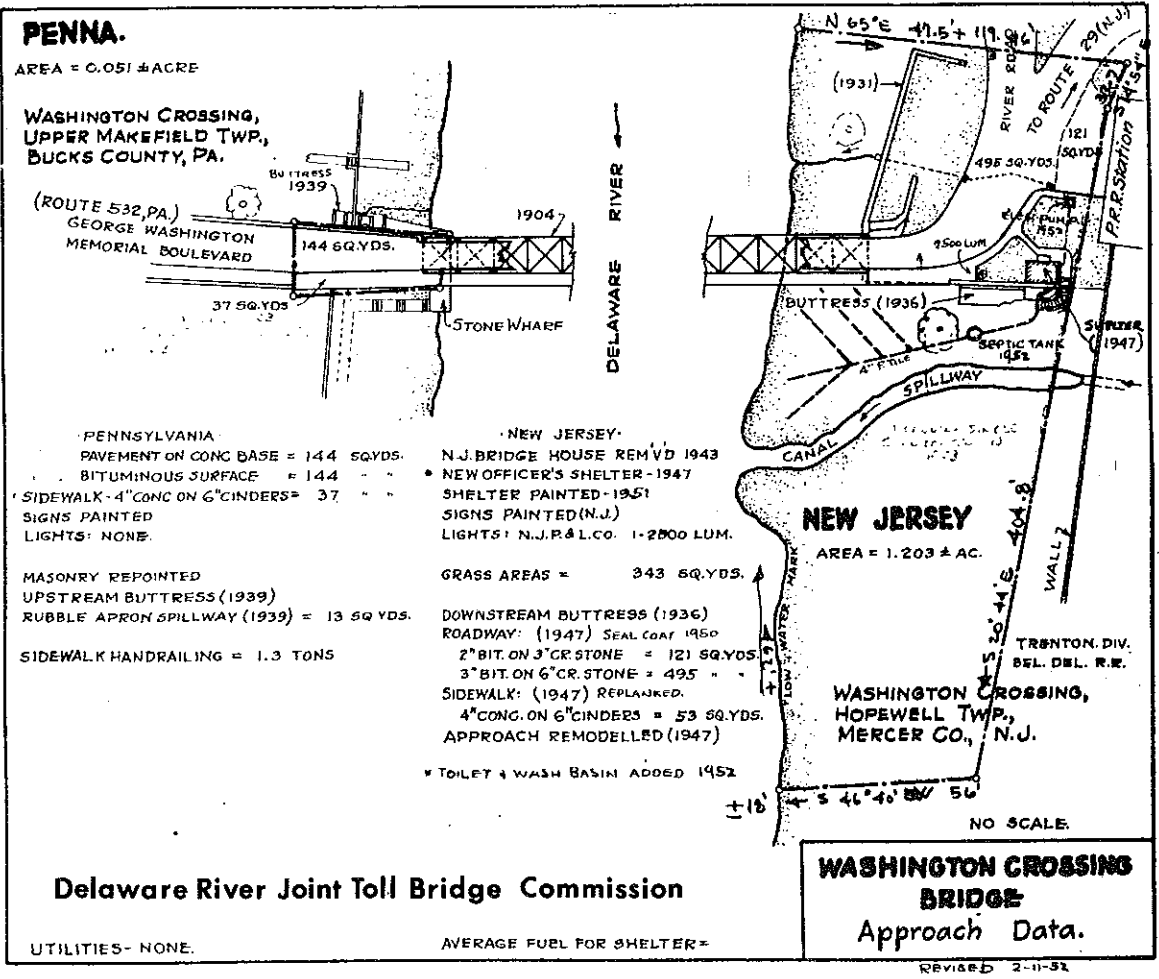
As regards the U. S. Post Office - Titusville, it is recommended that the facility be relocated with reference to creating a town center of the public oriented facilities which is lacking at present. The concrete vault manufacturer should be an outright financial transaction with relocation efforts being optional. Purchase of the Lambert parcel at the end of Park Lane Avenue should be accomplished to allow for greater flexibility in the design of the access road to the transient camping.



\*property to be acquired

SOURCE: NJ DEPT CONSERVATION  
ECONOMIC DEVELOPMENT 1-15-69

N/F H. SUTER  
Vol-698 Pg 304  
8-8-32



Pending a resolution of the bridge study in favor of constructing the ferry, consideration must be given to the cooperative redevelopment of the lands owned by the Delaware River Joint Toll Bridge Commission to create the most amenable recreation experience with plantings of trees and shrubs.

Additional consideration must also be given to purchase of the lands south of the intersection of Route 29 and Route 546 for the purpose of ensuring a compatible environment in proximity to the ferry landing and the Nelson House. The existing structures, a cafe and gas station, would be demolished and the area suitably planted with trees and shrubs.

The net result of acquiring the four parcels is provision of the necessary space for park functions and the guarantee of better vehicular performance on this section of Route 29.

In regard to the Witzman Property, MAIN-REUTTER recommends that options for purchase be tendered with the owners whereby accommodations can be provided for the anticipated attendance at the Bicentennial Celebration. No cost factors can be applied to the necessary proceedings and taking title to the properties mentioned.

Priority Two: (four part) Sanitary system, potable water supply, park road system and first phase plantings.

Part One: Sanitary System

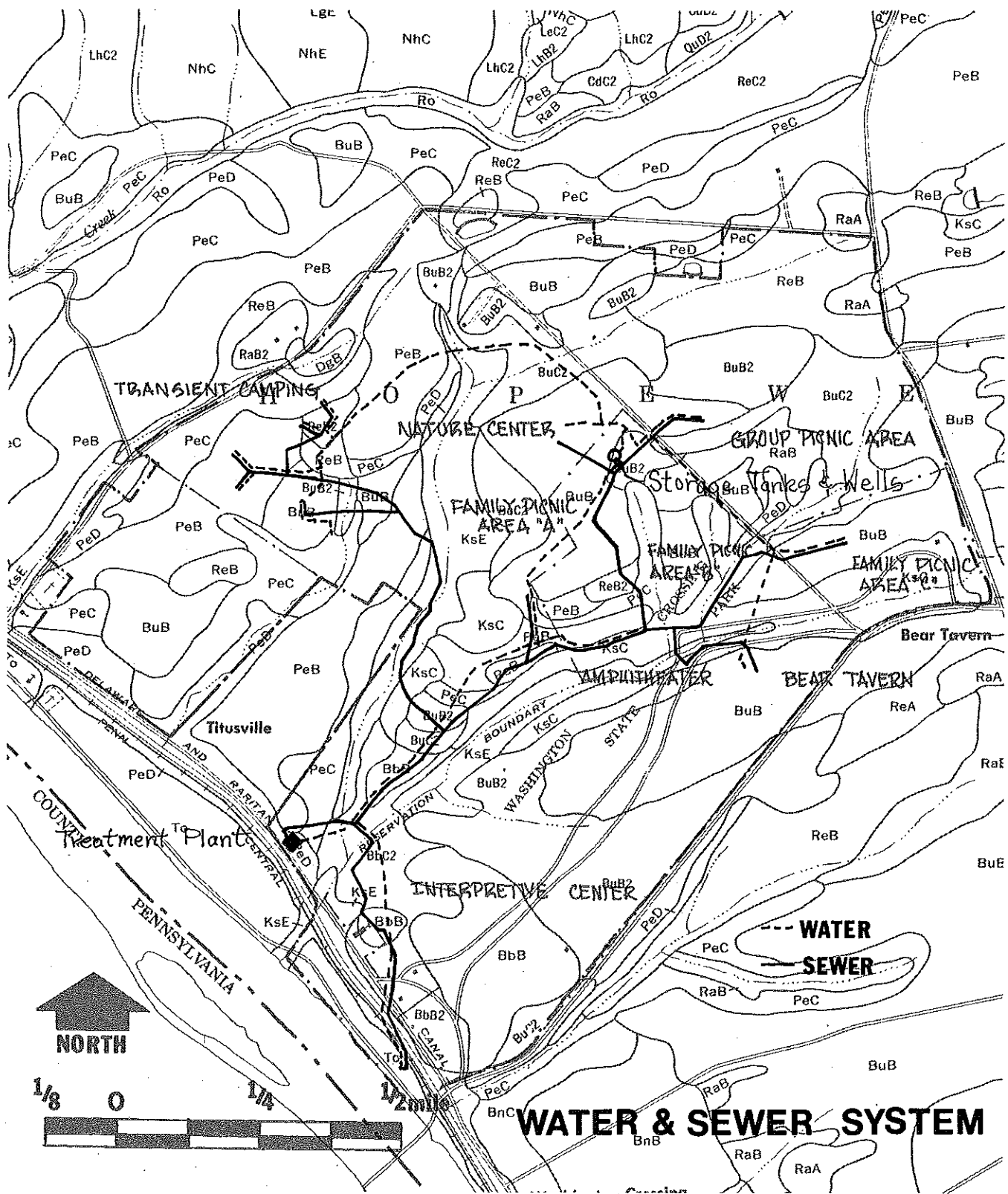
As with all planning efforts, the envisioned population density and uses must be defined and considered at the onset. Within the context of the already stated recreation functions, population densities and anticipated development patterns of the suburban park surround, a sanitary system must be designed with planned obsolescence in mind. This system must be able to be incorporated into the proposed township sewage system which tentatively programs a collector line parallel to Route 29. Major portion of the sewer system is gravity. At least two lift stations will be required. Treatment plant will be constructed on site of the extended aeration activated sludge process, 190 pound BOD loading. Treated effluent will be discharged into Steele Run.

Order of magnitude estimated costs:	Collector system	\$375,000
	Plant and site	<u>185,000</u>
	TOTAL	\$560,000

Part Two: Potable Water

Potable water demand is anticipated in the magnitude of 35,000 gpd, exclusive of fire protection. Wells will be driven into the Stockton Formation. The system will include surface water storage tank and a combination gravity and pressure boosted distribution system.

Order of magnitude estimated costs:	Distribution system	\$250,000
	Supply storage & Pumping	<u>100,000</u>
	TOTAL	\$350,000



**WATER & SEWER SYSTEM**



### Part Three; Park Road System

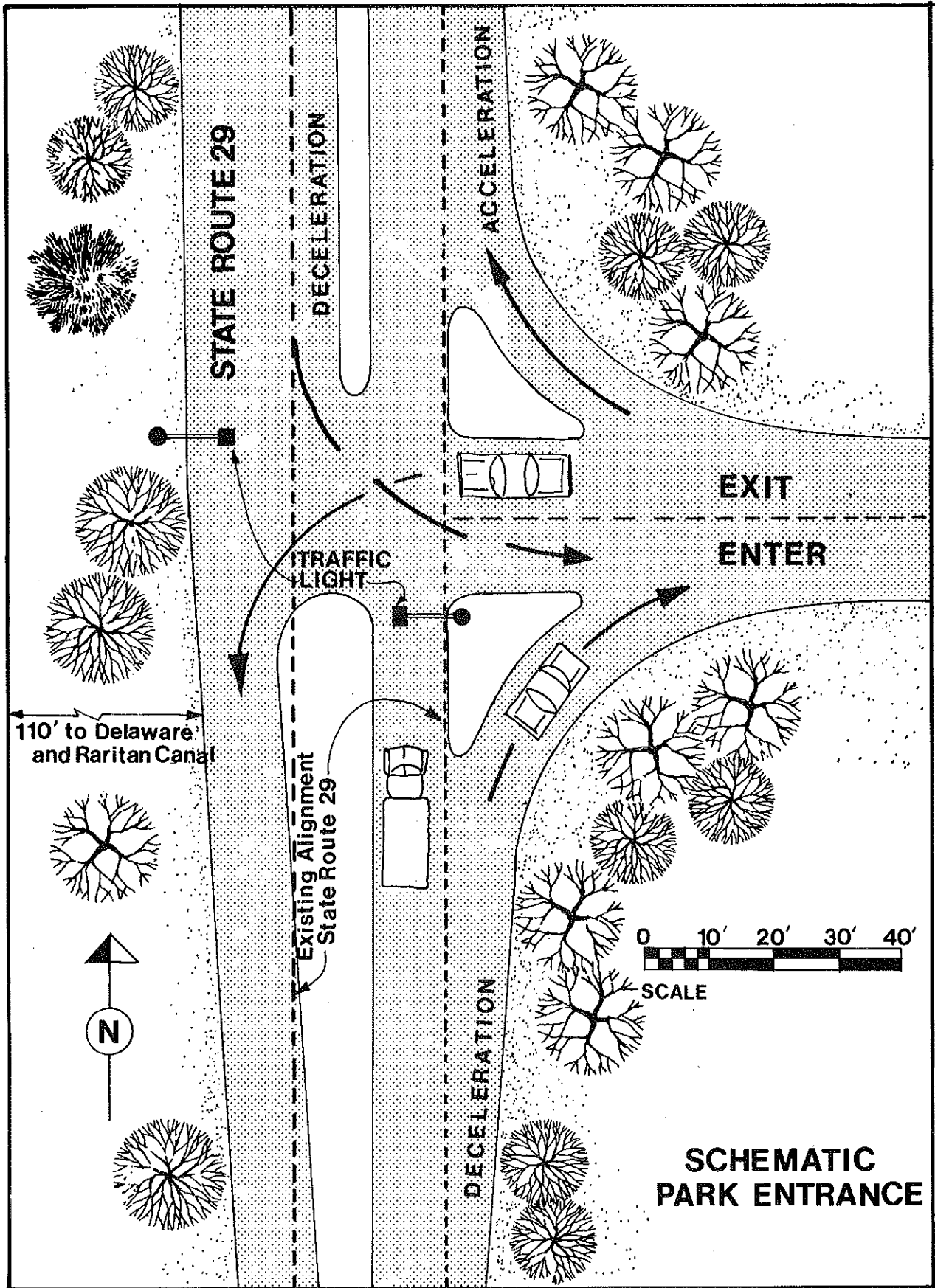
Basic to the park development scheme is access by private auto to all recreation activities, except those in the historic park. The desired quality recreation experience and the management of the recreation population is related to the number of vehicles permitted at a given facility. Means of access to and egress from the recreation facility is used as a guarantee that the facilities are not over used.

Dead end System: Essentially the system is a spine with a series of dead end roads terminating at the various recreation facilities. There is little opportunity for the "drive through experience" which was commonly planned in the past.

Parking lots are designed to accommodate a prescribed number of cars. No overflow parking is provided, thus it is possible to guarantee a quality recreation experience. This concept of design load of recreationists for each facility is intended to assist in the general management of the park. Most parks include parking space for peak day attendance, in most instances these parking lots are slowly changed into regular usage. The accompanying increase of recreation density usually means a lessening of the recreation experience in a number of ways.

Historic Park Access: The road system permits easy free access to the historic park area. A no-charge policy of admittance to the general historic park has been adopted. Admittance fees may be imposed to special displays to defray the costs involved. The parking lot is designed for incremental use, if desired. The size of the lot is diminished visually through the use of generous use of trees and shrubs in the dividers.

Contact Station: Access to all other recreation facilities will be monitored at the contact station. Here the park visitor is greeted and furnished information.



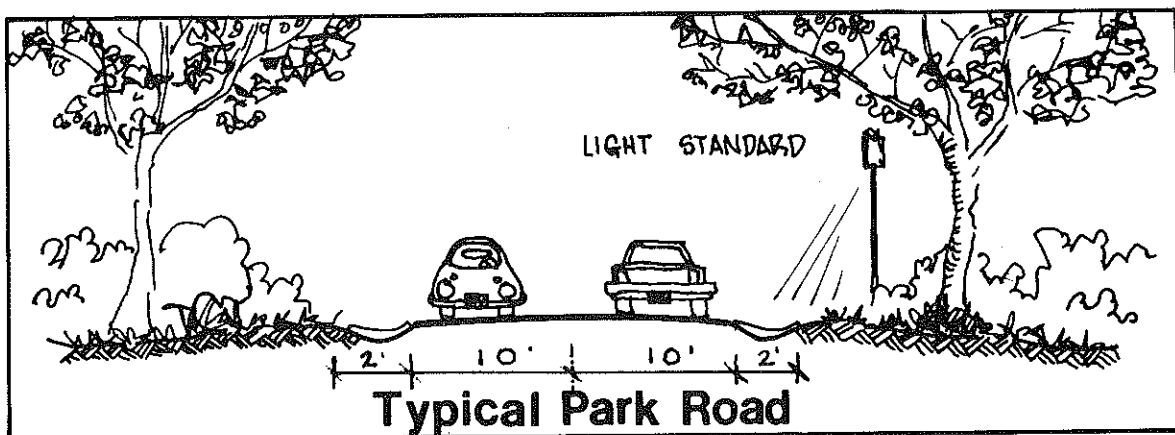
regarding the recreation facilities which are available. During the camping season the station will be manned on a twenty-four hour basis. Park use fees will be collected at this point.

Estimated construction cost, includes utilities \$ 26,000

Road Design Criteria: Park roads will be all-weather type with bituminous surfacing. Curbs and/or guard rails will be used at the park entrance up to the contact station. From this point curbs and/or guard rails will be used only when safety dictates and control is necessary. The desired goal is to make the park as natural appearing as possible. Speeds on park roads will be designed for 15 mph: The horizontal and vertical alignment must reflect this thinking. Curvilinear road alignment in sympathy with the landform and cognizant of the necessity to save groves of valuable trees is axiomatic to the planning approach used. Order of Magnitude Est. Costs: \$1,200,000 (parking lots & camping excluded)

Street furniture, such as signs and lighting, where necessary, should be unobtrusive in color and of simple tasteful design. Costs will be dependent on a developed program. (Lighting of the outdoor theater and in the parking lot, also to Historic park, if an auditorium is included in the program.)

Parking Lots: At family and group picnic areas parking lots will be curbed to ensure the design capacity of the facility. Fifty car lot capacity will be designed to accommodate bus traffic, if management chooses to reserve part of the facility for a group(s).





Part Four: First Phase Plantings

Basic to the concept of a state park is the verdure of trees and shrubs to ensure recreation in a natural environment. Those areas which were purchased under the Green Acres Program are largely devoid of shade trees. The creation of the peripheral vegetative buffers and planting of shade trees in the picnic areas are the first phase of a continuing planting program.

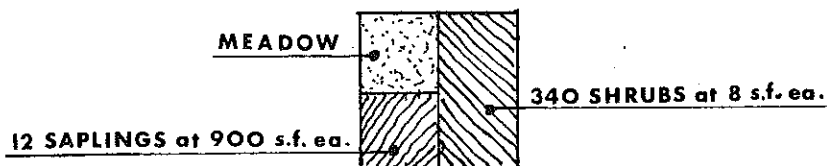
Peripheral Buffers: A three-hundred foot wide band around the entire park is to be devoted to a wide variety of trees, shrubs and herbaceous materials which will create an audio-visual buffer and provide habitat for small animals and birds. The design of the buffers must accommodate a meandering bike trail, which will be utilized also by small park vehicles during the on-going planting program and for park patrol. The use of volunteer labor (Girl and Boy Scout and other youth service groups) should be encouraged on an annual basis.

Seedling trees and shrubs will form the bulk of the plantings: Out of each acre planted one quarter acre will be devoted to sapling trees. Sapling trees should be planted under contract or by park personnel.

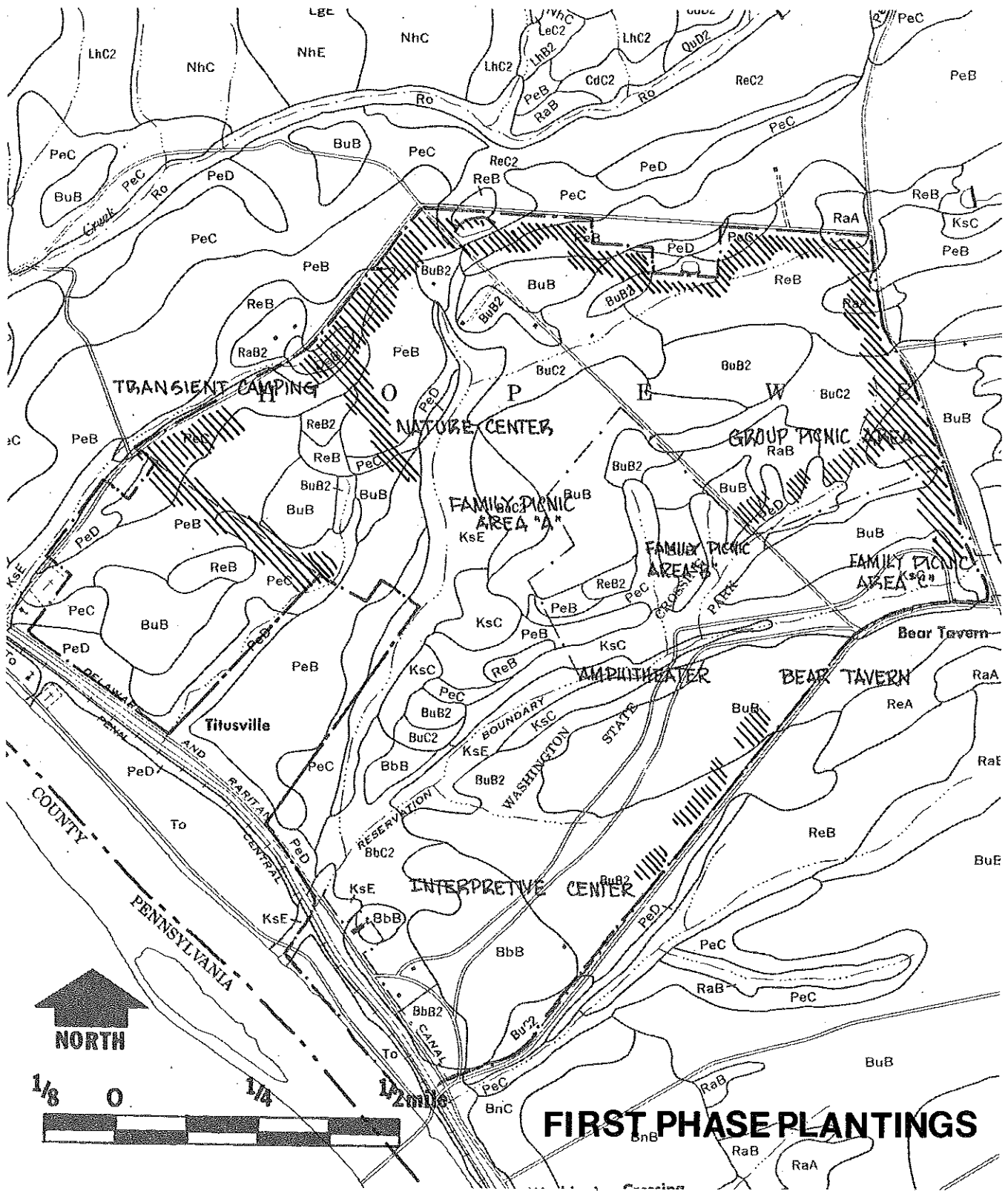
Anticipated costs per acre of peripheral buffer:

seedling stock \$50/1000	one man: 1000 seedlings/day	pay \$40/day
sapling stock \$ 25/ea.	one man: 40 saplings/day	pay \$40/day

TYPICAL ACRE

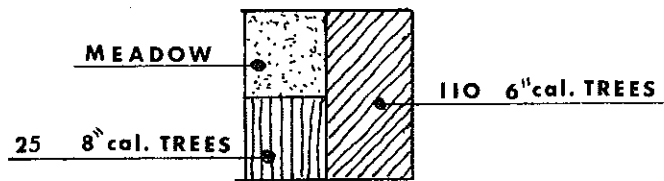


Typical cost per acre - \$340. Total Acres 80 = \$27,600.



Picnic area plantings: Half of the group picnic area and two of the family picnic areas are largely devoid of shade producing trees. In order to provide shade in a reasonable period of time larger sized trees must be planted.

Some crowding over the years must be anticipated and some trees must be culled periodically to maintain the health and vigor of the stands. Theoretical area to be planted: 300 feet surrounding the parking lots or 90,000 s.f.



6" caliper trees, space allocation 225 s.f. cost/tree \$ 300. in place.

8" caliper trees, space allocation 900 s.f. cost/tree \$ 500. in place.

TOTAL COSTS: Group picnic area \$ 45,500.

2 family picnic areas \$ 91,000.

TOTAL \$136,500.

### Priority Three: Interpretative Center Complex

Essential to the full comprehension of the "ten days that changed the world" (the various battles of Trenton and Princeton) is the necessity to educate the visitor in an interesting and meaningful way. At present the means to accomplish this goal are largely absent.

Various components of the interpretive center complex include: an outdoor arrival space wherein by plan or diagram, the visitor(s) is made aware of the various parts of the historic park. This same area will be used for milling and waiting and therefore should have sun-rain shelters and adequate seating.

Indoor areas for diorama(s) or other audio-visual means to present an encapsulated history of the events which preceeded the initial crossing of the Delaware and the subsequent series of battles. Interior auditorium space to accommodate groups of one hundred fifty persons at one time. Audio-visual presentation to be self-automated to minimize staff requirement.

A museum area with necessary workrooms, which is geared to military equipment of the day, flags, uniforms and weapons of various units. Reference Appendix A for more detailed suggestions on functional and spatial relationships of small museums. Construction of the interpretative center complex is to be fire-proof, entirely artificially lighted, and air conditioned for the preservation of the artifacts and the comfort of the visitors.

An area devoted to the purchase of post cards and mementoes of the historic park, an admission fee to the center could be taken at this point. Comfort facilities for the general public are to be external to the museum-interpretive center and preferably off the entry courtyard. Architectural treatment to be simple and employ a limited palette of quality materials of enduring substance.



A terrace for viewing the river is to be related to the arrival space and possibly be positioned over the snack bar-restaurant on a lower level, which is also oriented to the view of the river.

Eating facilities are to be separated physically from the museum interpretive functions. Capability to serve snacks and quick meals. The program should be predicated on a small restaurant with coin operated vending machines to augment counter service and used during slow periods. Indoor eating area geared to off-season and foul weather use. Ancillary outdoor eating areas geared to the greater attendance normally accompanying fair weather. Picnic type tables related to the shade of trees and arbors.

Exterior pedestrian circulation designed to accommodate the handicapped and perambulators. Alternate routes to include steps. Exterior spatial relationships must provide for separation of entry court-viewing terrace activities and the outdoor dining area. A transition space is required between the entry court and the re-created historic park. The design of pedestrian ways and milling areas must provide a comfortable sense of proportion and diversity of spaces to accommodate crowds.

The development of a detailed site program must show cognizance of the value of working with the site and topography, saving trees and planting of new trees for effect during the celebration.

Estimated construction costs dependent on resolving a design program.

Priority Four: Overpass on Route 29 and appurtenances, include ferry service

Since it is impossible to eliminate any of the various components of the transportation corridor, a lessening of the impact of the most noxious is desirable. Traffic on Route 29 is the most serious and constantly disruptive factor in creating and maintaining the desired accessibility between facilities and quality in the recreation experience. The desired result is the greatest audio-visual separation possible between the park visitor and the traffic on Route 29. By reconstructing Rte. 29 at an elevation comparable to the railroad, it is possible to get sufficient headroom for the overpass. The design which is recommended does not permit increased traffic through the addition of traffic lanes, but it does accomplish more efficient use of the same space by eliminating conflicting traffic movements.

It is anticipated that ledge will be encountered in excavation which will lessen the costs of constructing extensive retaining walls; although excavation costs will increase. Estimated costs of the structure \$1.5 million. Consideration must be given to construction of the collector sewer line. The impression created by the length of the overpass on the motorist is rated secondary (because of the short duration of the experience) to the need to create the most pleasant space possible for the park visitor on the overpass. Therefore the overpass must be sufficiently broad to accommodate bands of trees and shrubs on either side of the park road-walkway. Sideslopes along the highway and the canal are to be planted and ledge conditions are to be planted with vines. All plantings are intended to lessen reverberation of traffic noises, and to create a leafy canopy for the pedestrian. Estimated costs of replanting the overpass and ramps:

45,000 s.f. trees 100 s.f. 1/3 area - 150 trees @ \$  
shrubs 25 s.f. 2/3 area - 1200 shrubs @ \$  
(in place)

Bridge over the Delaware and Raritan Canal

The visual quality of the bridge must be in sympathy with the design of the revolutionary period, however, steel pilings and girders are anticipated as being the solution to a difficult construction site. Headroom for canoeists may dictate a suspended-type bridge of construction. Wooden planking is highly desirable and is to be given priority for surfacing. Construction permits and all phases of the design must be coordinated with both the Penn Central Railroad and the N.J. Bureau of Water Supply, in order to maintain the services of both utilities. Estimated costs dependent on subsoil investigation and resultant design criteria.

Guardarms and signals at Penn Central Railroad

The railroad although not extensively used does create a tremendous audio-visual intrusion and a definite safety hazard when trains pass. Because of the infrequent use it is deemed acceptable to coordinate the design and construction of appropriate safety and warning devices for this crossing with the Penn Central Railroad.

Construction costs to be negotiated with the railroad.

Ramp from railroad to the Nelson House

It is anticipated that this ramp will be constructed with a portion of the excavation of the overpass on Route 29. Sideslopes are to be top-dressed with two or more feet of topsoil to assure quick establishment of trees and shrubs.

Area to be planted approx. 30,000 s.f.

1/3 trees, 8-10' @ 100 s.f. ea.	100 trees @ \$	\$
2/3 shrubs, 2-3' @ 25 s.f. ea.	800 plants @ \$	\$
	Total	\$

Surfacing on both Ramps

Exposed peastone aggregate concrete, 4" thick with welded wire mesh reinforcing throughout, expansion joints 20' o.c. 14 feet wide x 500 feet long x 4 inches - say 111 c.y. \$7,200

Split Rail Fencing on Ramps 1,000 l.f. @ \$5. \$5,000

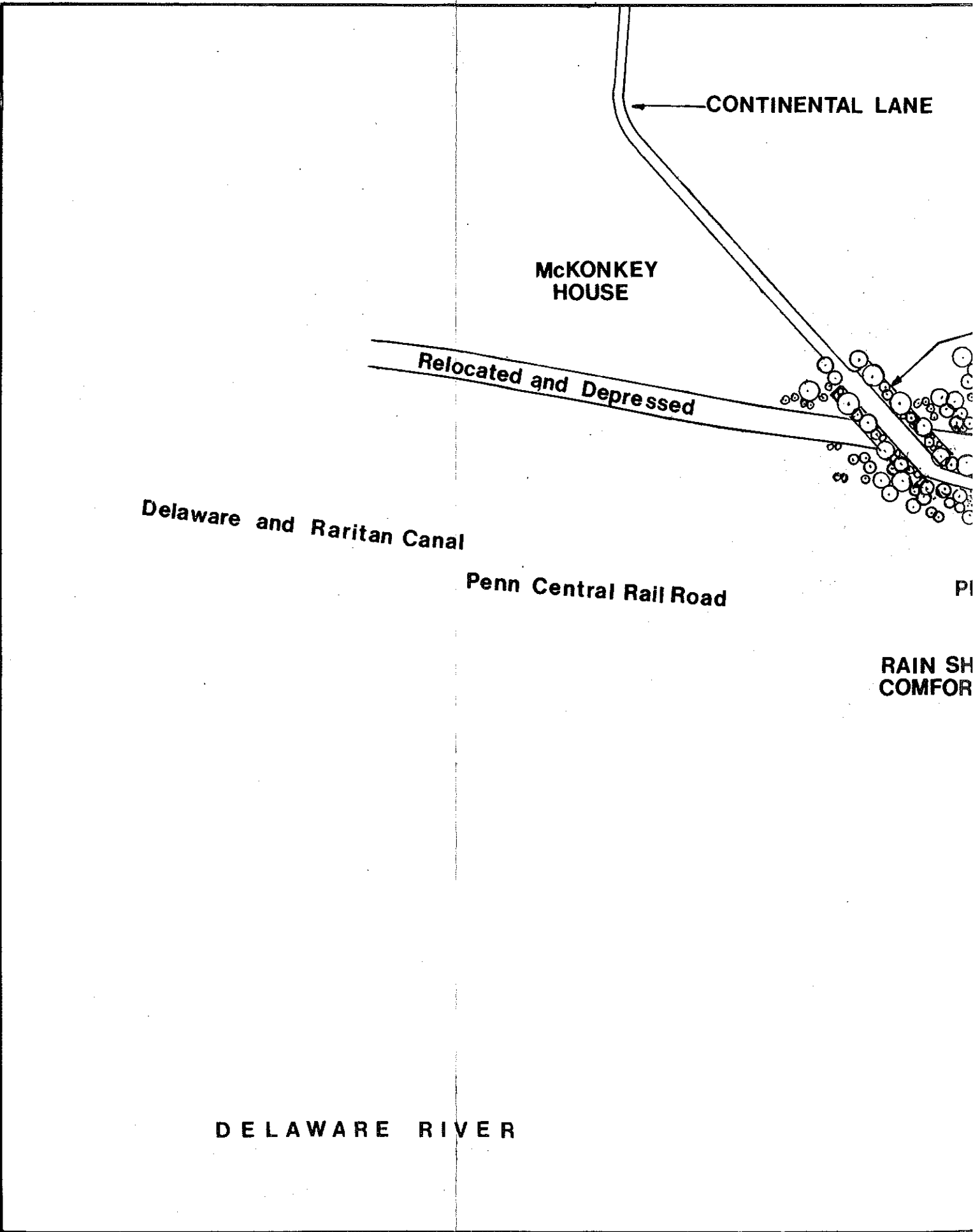
Ferry Service on the Delaware River

For the purpose of this report it must be assumed that the bridge owned and operated by the Delaware River Joint Toll Bridge Commission will be dismantled and not be reconstructed. The outcome of the current study for a proposed bridge at approximately the same location is presently not known. However, with the proximity of new vehicular bridges up and down stream, the removal of the bridge will serve to enhance not only the authenticity of the ferry site, but will be the touchstone which guarantees that the ferry service will be the causative factor for the parks on either side of the Delaware River.

Much research is yet to be done on the type and number of ferrys that may have operated at this location. The entire ferry project will be under the jurisdiction of the Delaware River Joint Toll Bridge Commission. Estimated costs are dependent on the formulation of a design program and the sanction of both state legislatures.

Riverfront Park Redevelopment

With the construction of the overpass, bridge and ramps, and the ferry service, it is necessary to close the road which now traverses this area, and to remove the parking area (part of which is destroyed in the ramp construction). The construction of a cul-de-sac on park property as a terminus to River Street is a convenience to the abutting property owners. It is appreciated that the cul-de-sac is a pedestrian park entry, undoubtedly



CONTINENTAL LANE

McKONKEY HOUSE

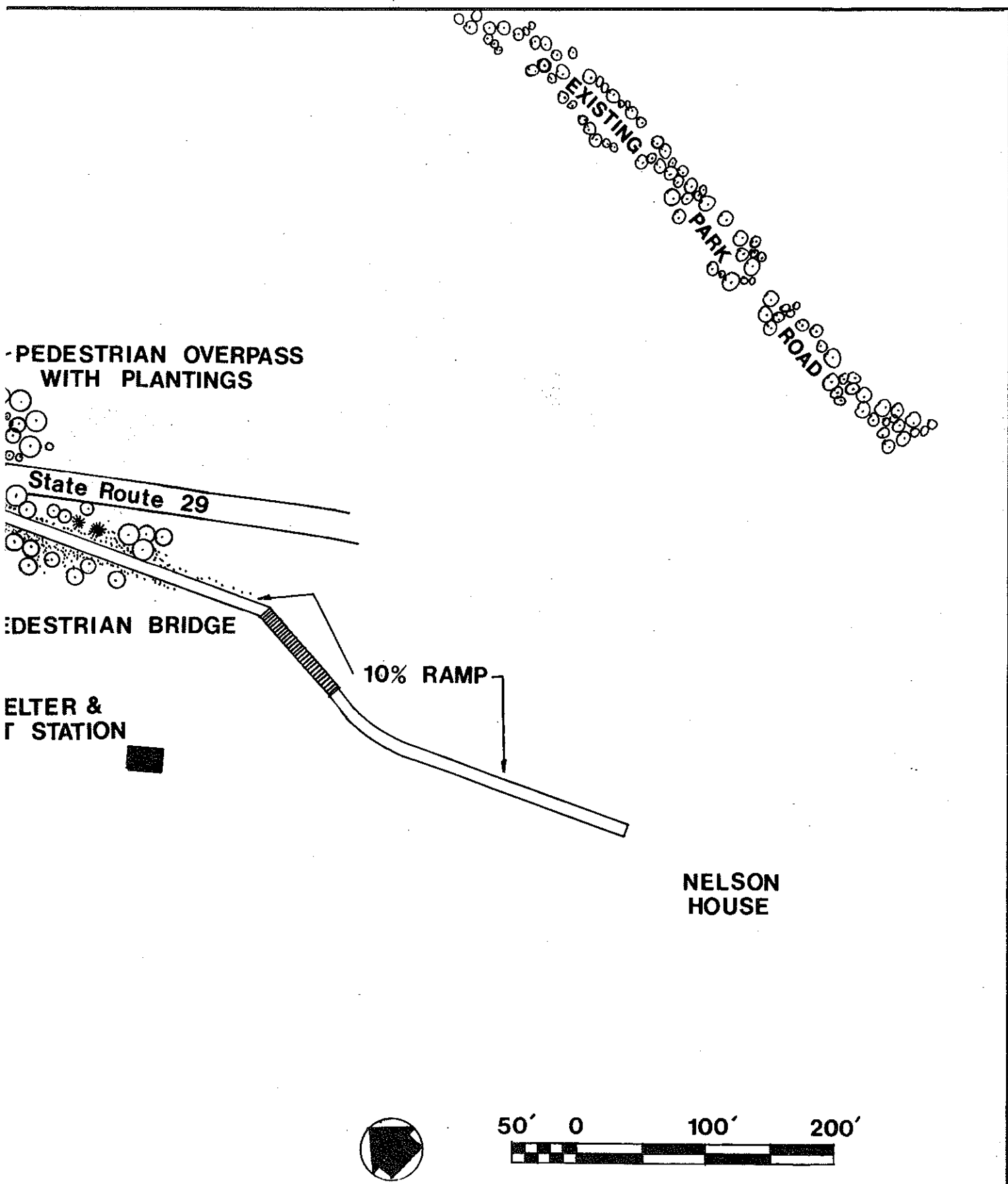
Relocated and Depressed

Delaware and Raritan Canal

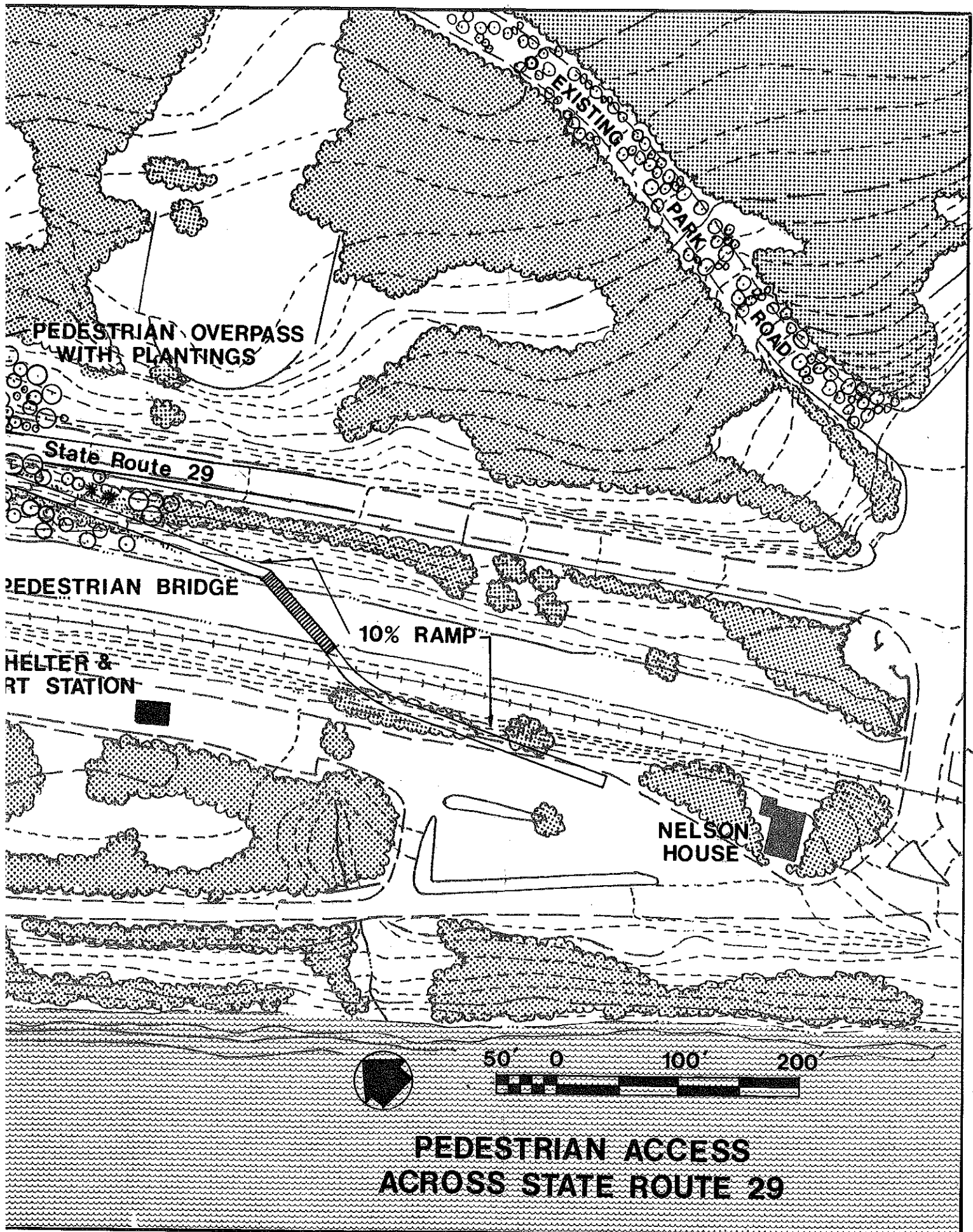
Penn Central Rail Road

RAIN SH  
COMFOR

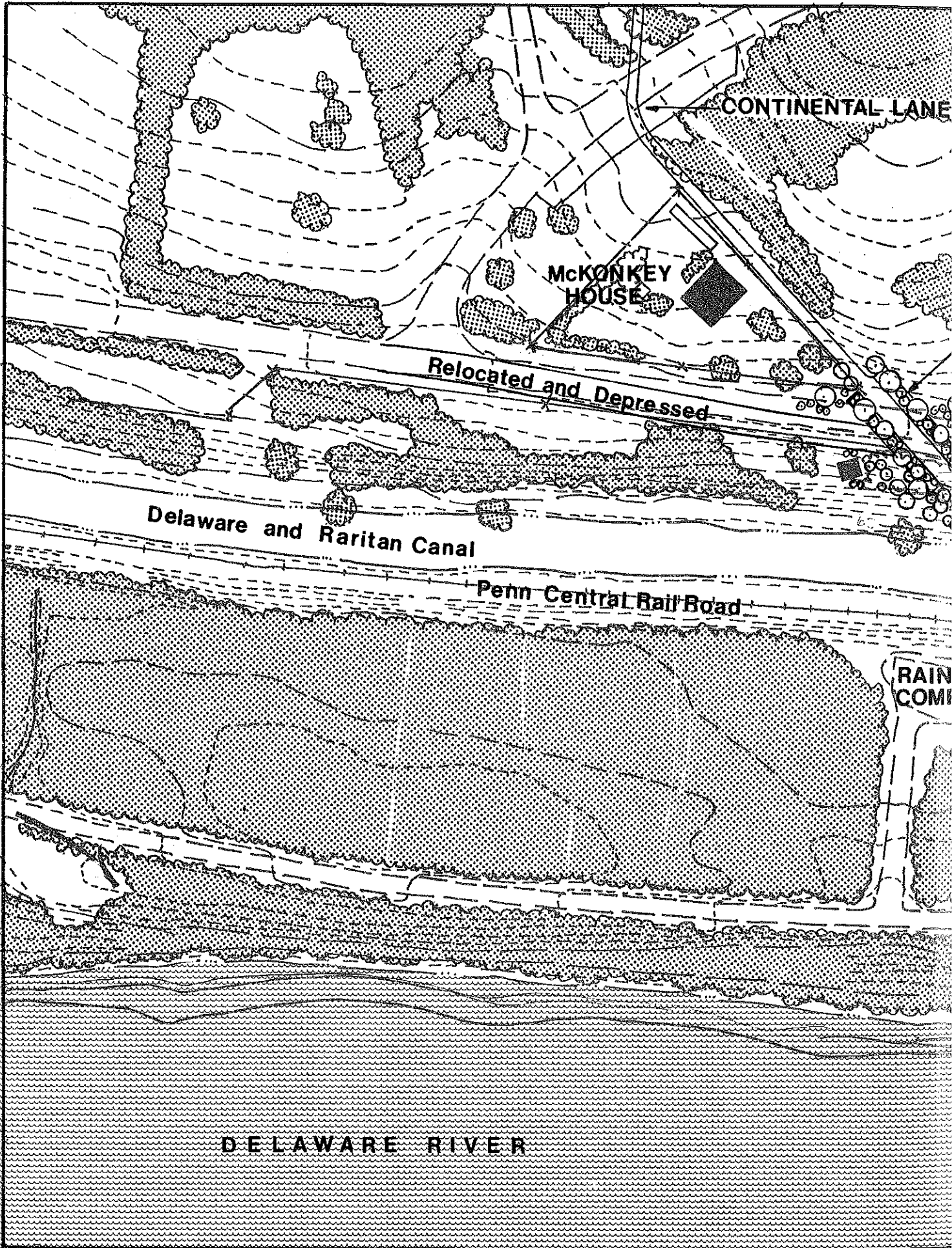
DELWARE RIVER



**PEDESTRIAN ACCESS  
ACROSS STATE ROUTE 29**



**PEDESTRIAN ACCESS  
ACROSS STATE ROUTE 29**



CONTINENTAL LANE

McKONKEY HOUSE

Relocated and Depressed

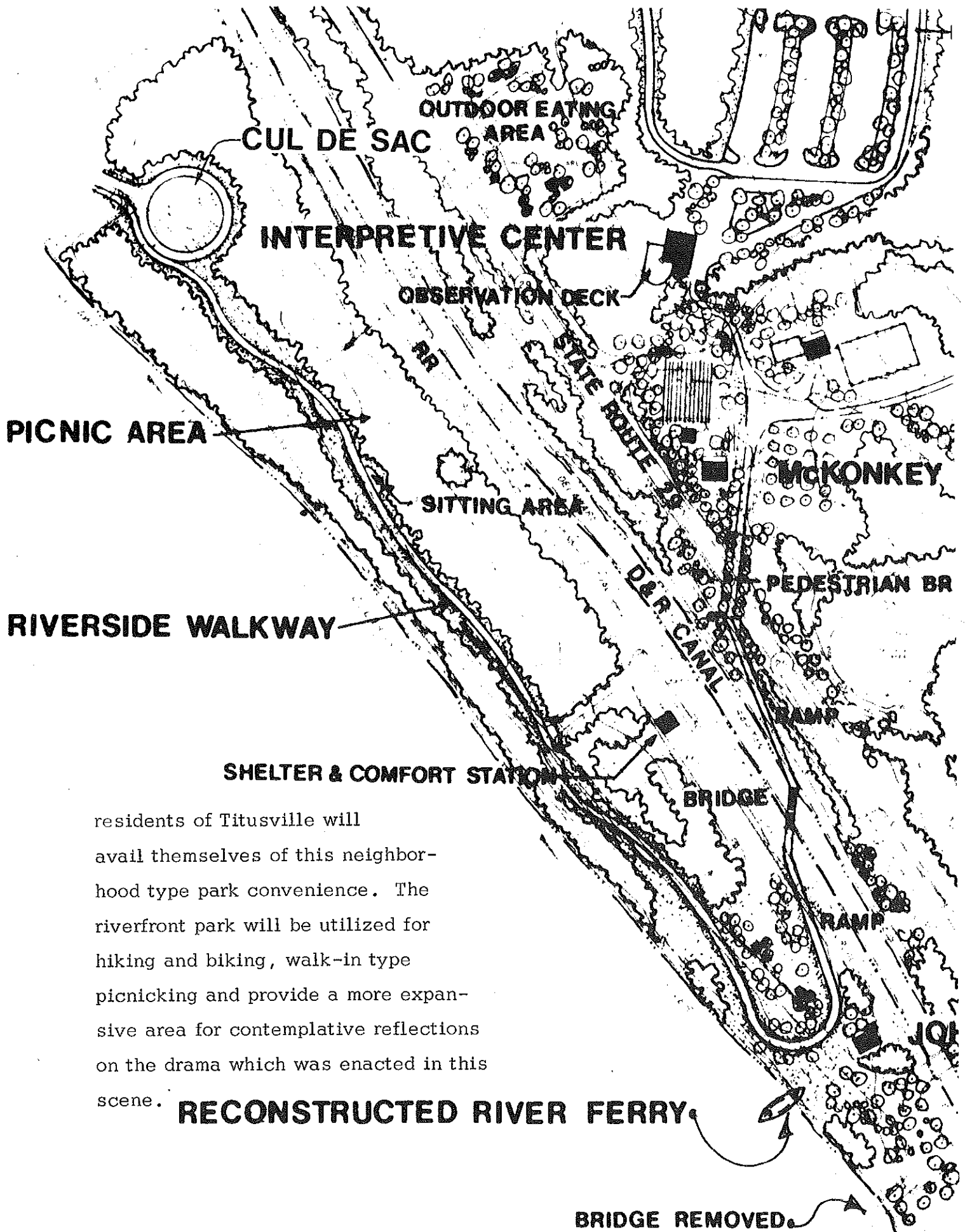
Delaware and Raritan Canal

Penn Central Rail Road

RAIN COMI

DELAWARE RIVER





residents of Titusville will avail themselves of this neighborhood type park convenience. The riverfront park will be utilized for hiking and biking, walk-in type picnicking and provide a more expansive area for contemplative reflections on the drama which was enacted in this scene.

**RECONSTRUCTED RIVER FERRY.**

**BRIDGE REMOVED.**

Priority Five: Family and Group Picnic Areas

Picnicking is the most popular recreation activity at the existing park. All the facilities are located on the original historic park holding, and therefore must be relocated to ensure proper park control and maintenance activities related to the component recreation facilities. The new locations will be constructed so as to permit a radial pattern of use from the parking lot and comfort station. Three hundred feet is considered the maximum distance family parties will carry their gear and refreshments. This is considered the intense use area and is to be 75% tree shaded. An additional three hundred feet beyond the intense use area is devoted to a mixture of meadows for informal play activities, where the topography permits, and with copses of trees and shrubs of the interior buffers and natural areas. This latter area is considered for extensive recreation use. A similar activity pattern is envisioned for the group picnic area.

Family picnic comfort station-rain shelter

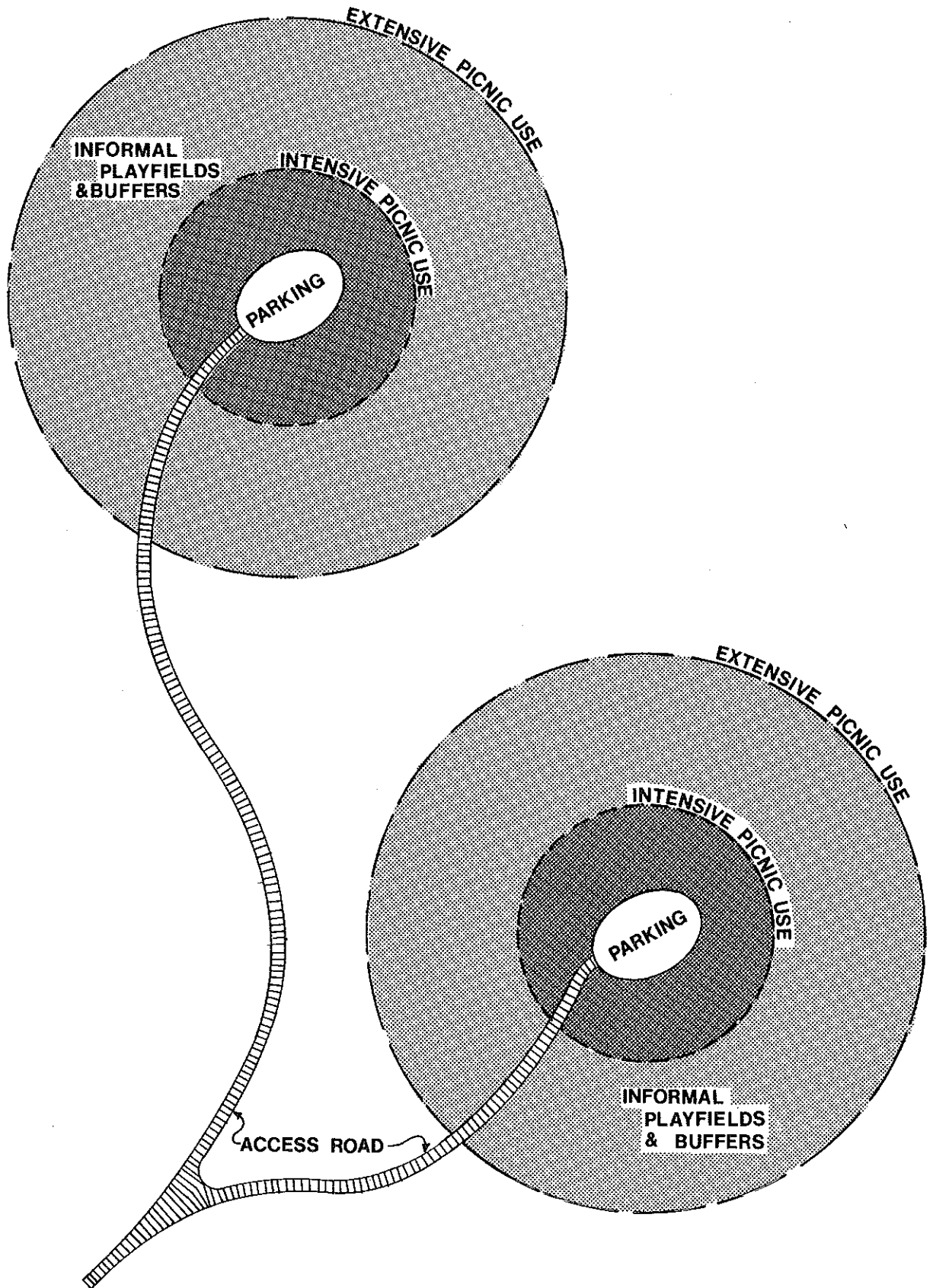
	comfort facilities	
	W	M
lavs	2	2
w.c.	4	2
urinals		2

In addition to the space allocation for the comfort facilities space must be provided for the utility core, storage of supplies and cleaning equipment. Depend-

end on further delineation of the program, enclosed space for coin-operated vending machines may be necessary.

Broad eaves or roof overhangs are to be designed as emergency shelter in sudden rains for 20% (35 persons) of the recreation population. Related deck area must coincide or be greater. Architectural treatment is to be simple and employ a restrained use of durable materials for permanence and low maintenance.

Estimated cost (each) building, decks and utility connection. \$55,000.



SCALE  
 100 0 1 2 300 feet

**DIAGRAMMATIC FAMILY  
 PICNIC AREAS**

Group Picnic Pavilion (200 persons)

Functional requirements, sun-rain shelter for 100% of recreation population. 2,000 s.f. storage area for equipment (chairs, etc.) grill or barbecue, minimal kitchen and food preparation areas, comfort facilities.

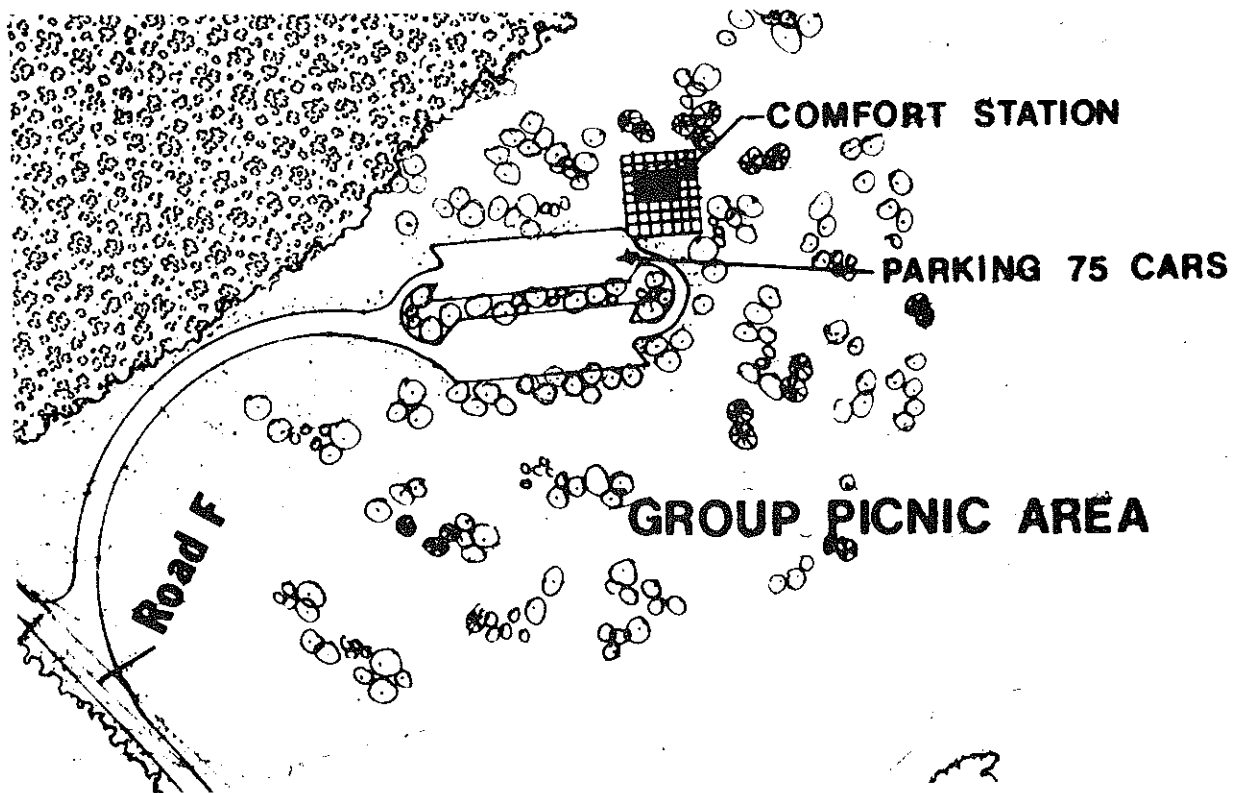
	W	M
lavs	2	2
w.c.	4	2
urinals		2

Additional deck space, approximately thirty feet square for dancing and/or similar activities.

Preparation of approx. two acres of lawn are for informal games, and selective clearing in existing woods approx. one acre.

Estimated construction costs, building, exterior work and utility connection

\$175,000



Priority Six: Historic Inn, Farmhouses and Related Fields

Basic to the reconstruction of the environment of the Revolutionary Period is the relocation of existing recreation facilities to more appropriate and functional areas outside of the historic park area.

As shown on the plan, there are three basic elements on the upland portion of the historic park. 1) McKonkey House and reconstructed related buildings, including the barn (flag museum).

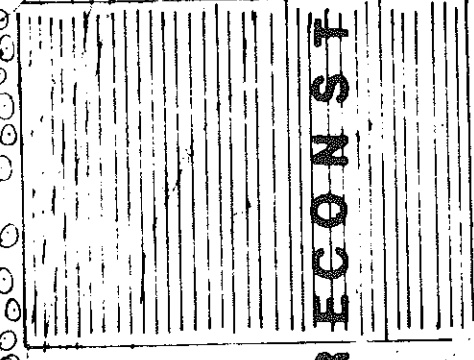
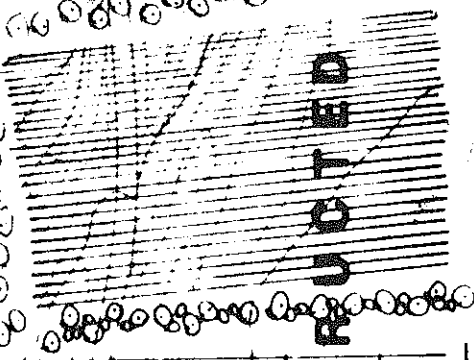
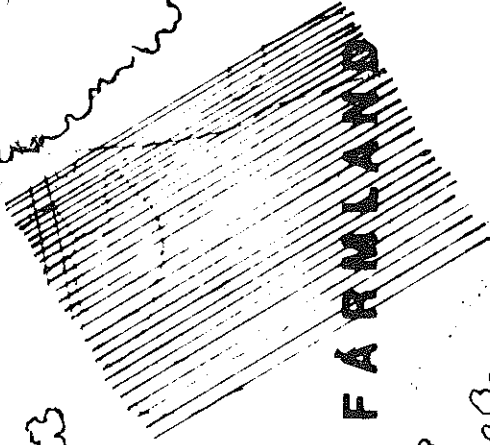
2) A reconstructed inn (Bear Tavern or facsimile) at the east end of Continental Lane, to act as an attraction and goal to the park visitor.

3) A reconstructed farmhouse and outbuildings, rather centrally located on the upland area, but removed from Continental Lane. It is intended that the park visitor have the option to return to the interpretive center complex by a different route, via farmlanes, and past the Farmhouse.

Pending further research on the extent of the McKonkey House outbuildings and its relation to the Nelson House, it may be possible that the development program alters to accommodate two farms, one being the terminus of the walk along Continental Lane. There is one old farmhouse on the existing park property, and others in the surrounding country, which should be considered for inclusion in the program.

Much opposition to a foreshortened Continental Lane and a relocated Bear Tavern can be expected from historical purists. However, pending factual evidence to support their claims, the merits of the proposed changes and additions which will greatly enhance the total recreation experience in the historical area and should not be deleted from the planning regimen. Accommodation to historical accuracy should be accepted by the program where possible and noted by plaque or monument where not practical because of irreconcilable factors.

R I C  
P A R K



R E C O N S T R U C T E D C O L O N I A L F A R M L A N D

Much sophisticated work has already been accomplished in presenting historical structures by organizations such as Plymouth Plantation and Old Sturbridge Village in Massachusetts and Colonial Williamsburg in Virginia, as well as others. Since only farmhouses and inns existed on the site at the time of the crossing, the task of reconstructing becomes less extensive but more difficult to authenticate.

The aforementioned organizations can serve as models for managerial purposes and probably could be called upon for methods of researching and allied problems.

Appendix B "Notes from Peter Kalm" are included by way of shedding light on the period from the vantage point of a botanist-chronicler. Kalm's interests were confined to botany, and are germane to the subject. Reference Appendix B for fencing, crops and fruits of the period, modes of transportation and the visual quality of the landscape.

From a financial viewpoint it seems unlikely at present that some form of public mini-transit can be provided within the historic park. However, the design of pedestrian ways, primarily Continental Lane should be reconstructed to accommodate both pedestrians and slow moving vehicles such as a horse-drawn trailer. Adequate benches along the lane are to be provided for resting and contemplation. Split rail, or other type of fencing and paddocks are to be included in construction costs. Sheep and cattle will be used for keeping meadows, pastures and orchards mowed.

Estimated costs must include removal of the bituminous roads which exist.

Estimated costs pending resolution of the program.

Priority Seven: Nature Center Building and Appurtenances, Amphitheater & Appurtenances.

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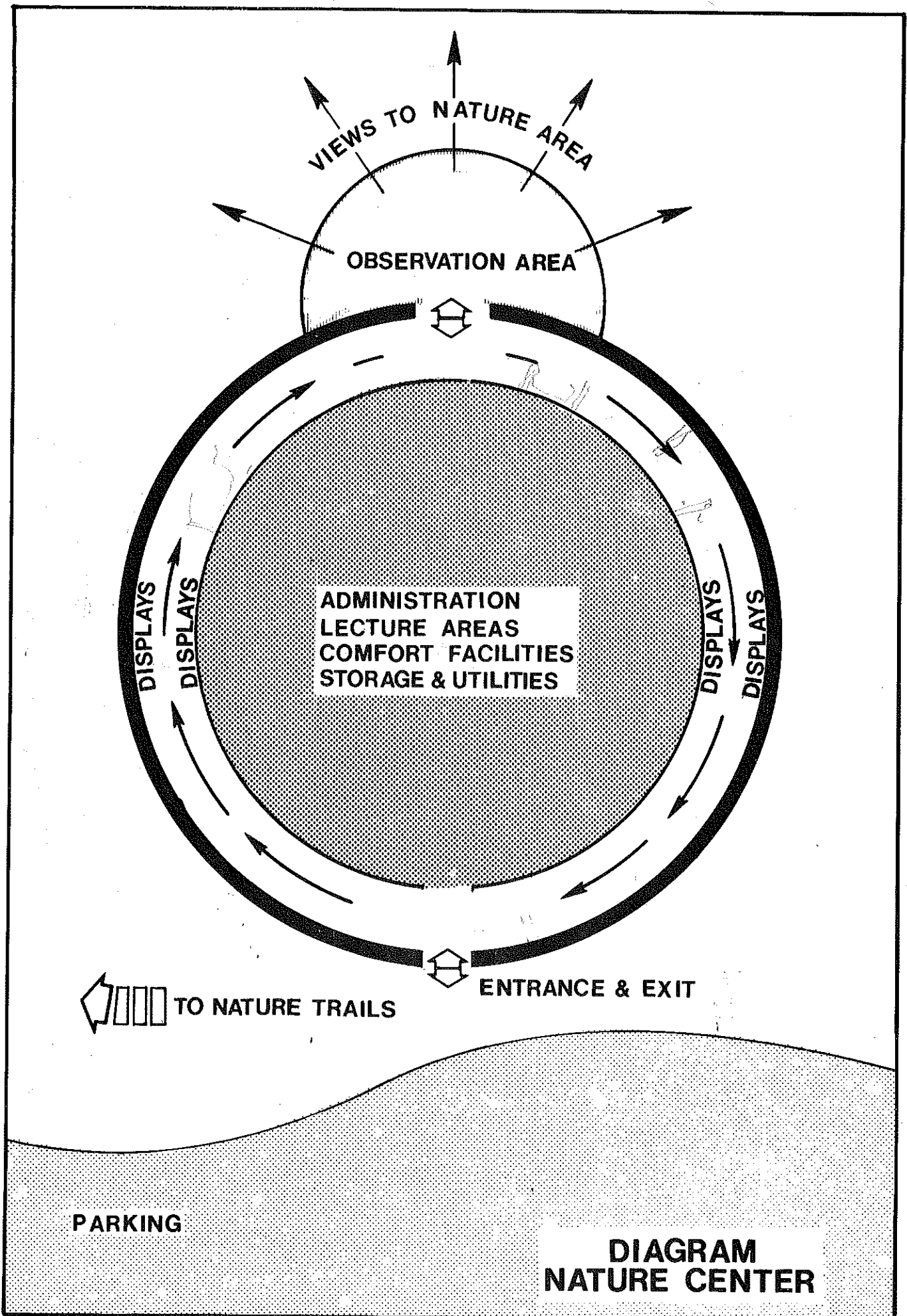
NATURE CENTER

The goal of the nature center is education. The key to successful operation and planning are the personnel and their attitudes on areas and modes of instruction. The use of the existing nature center has been hampered by lack of an adequate building. However, even this drawback has not deterred interest or enthusiasm as attested to by the popularity of the facility. Nevertheless, the wealth of collections of various types cannot be displayed properly, protected, nor stored when it is deemed desirable to make a seasonal change. Damage and/or destruction by fire and vandalism is an everpresent threat to the existing facility.

The proposed structure will be fire and vandal resistant and must allow for optimum flexibility in display. In order to gain the greatest display space the classroom, workroom and storage areas are placed centrally, and surrounded by the display space. The use of clerestory and/or skylights for illumination is desirable in the display and workroom areas. Artificial illumination can be used elsewhere. Space must be provided for rainy day programs, when all activities must be held indoors. Accommodations for two classes of thirty pupils each. Postcard and memento counter and waiting-milling foyer. Comfort facilities off foyer. Enclosed outdoor observation room. Design for year-round occupancy.

Estimated cost dependent on resolving design program.





AMPHITHEATER & APPURTENANCES

The existing amphitheater has largely been sponsored and constructed by the Washington Crossing Association: They are able to attract name performers and productions are successful. The natural land-form does not admit of a much larger facility, however a slight expansion to 1000 person capacity (from 900) can be accommodated reasonably on the existing site.

In addition to revamping the seating, the stage, actors' quarters, public comfort facilities, and concession all must be upgraded. To date this type of construction cost has been borne largely by the Association. However, in light of the possible use in the Bicentennial Celebration some negotiation of financial responsibility on the part of the state is in order.

The parking facility is planned to be used for peak attendance days at the historic park, and therefore the costs should be borne by the State. First class construction; curbs and bituminous surfacing. Parking capacity 200 cars.

Low level illumination in the parking lot and on the park road is desired to contrast with the "house lighting" of the theater. No permanent accommodations are to be provided for sudden rain storms lest they detract from the natural environment. Canvas tents during the season would be permissible. Comfort facilities - general public

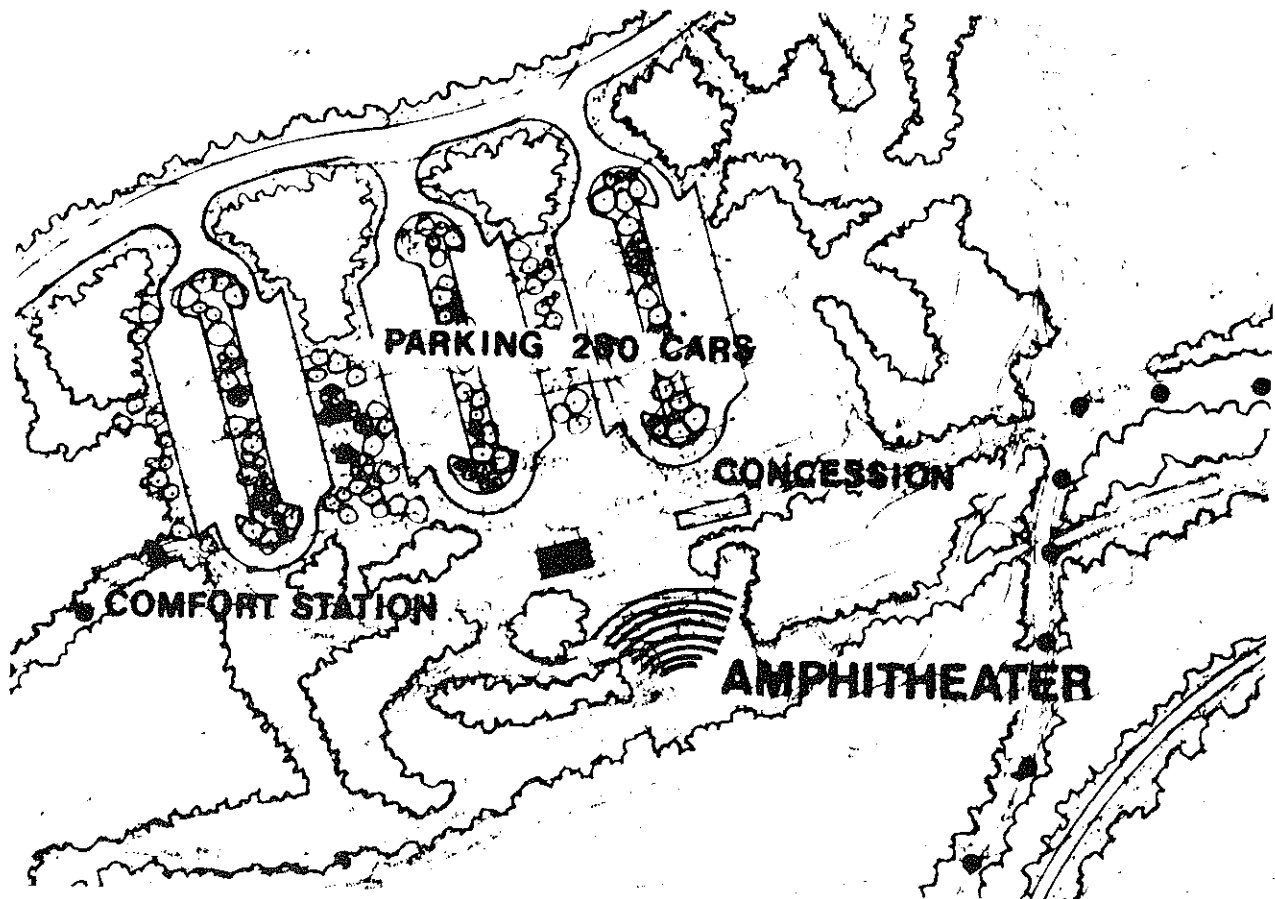
	Women	Men
Lav	4	4
W.C.	5	4
Urinals		4

One mop sink. Three drinking fountains in facility.

In addition to the rest rooms, the structure will have a utility room for storage of supplies, cleaning equipment and a mop sink. Simple architectural treatment of the building and a restrained use of materials of durable quality which will achieve low maintenance is desired. Minimal paved deck space adjacent to the comfort facility, peastone walks where practicable.

New plantings for the parking lot and approach walks. Approximately 30,000 S.F. 1/3 to trees - 2/3 to shrubs.

100 trees (100 S.F.) 10-12' @	\$150.00	\$15,000
1250 shrubs (16 S.F.) 2-3' @ (in place)	\$ 20.00	25,000



### Priority Eight: Transient Camping

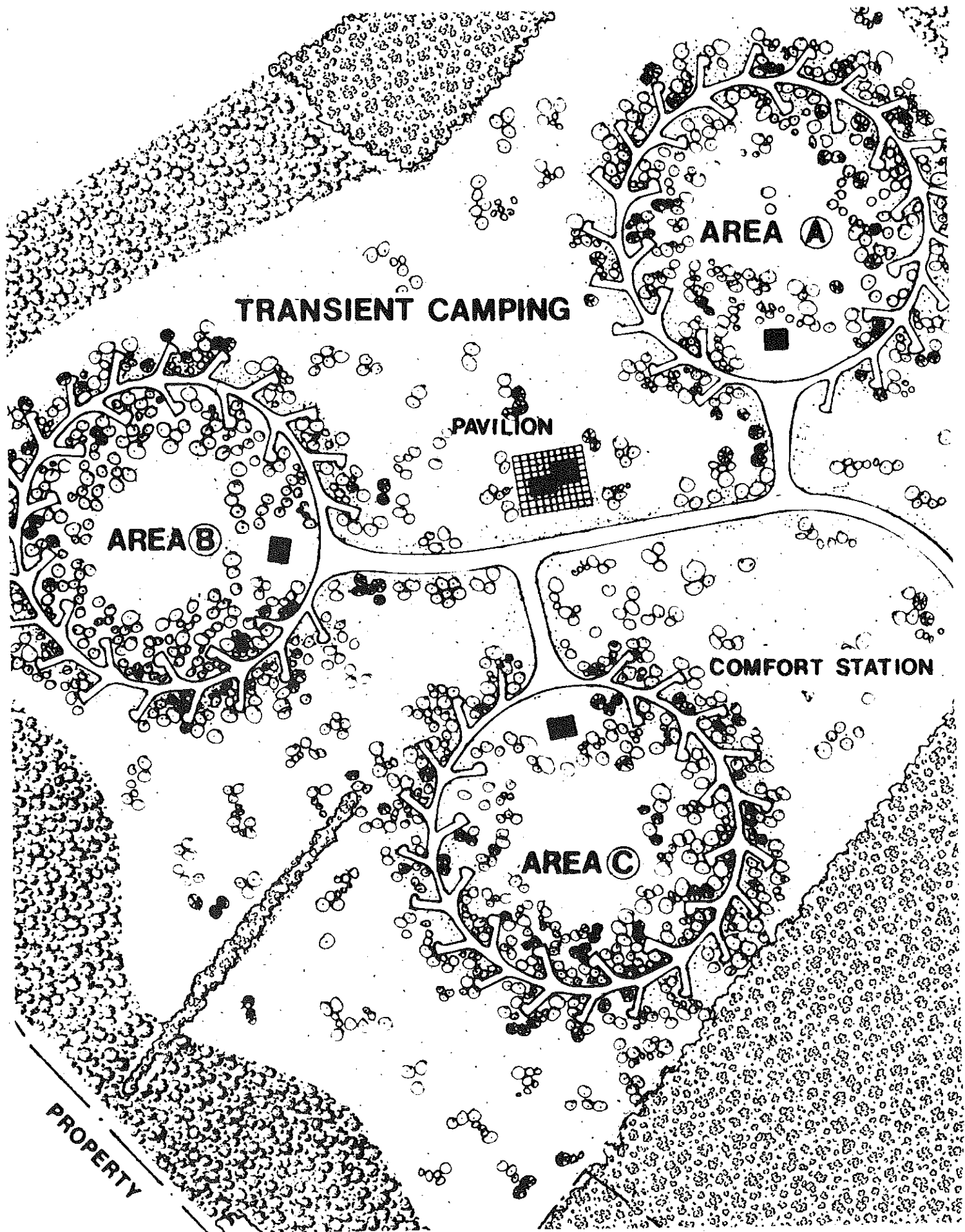
Nearest accommodations for transient camping in proximity to the park in Pennsylvania are some twenty miles distance and in New Jersey they are some fifteen miles distant. Owing to this lack of transient camping in proximity to the park, minimum number of campsites which have proven operationally practicable are planned for the northwest corner of the park. Expansion of this facility, if any, should be to the west on the Witzman property.

One hundred sites in a tripartite loop plan with approximately 33 units each will be serviced with a comfort station-wash house. Each site will be designed so that no living area will be closer than 50' from its neighbor. Each spur will be equipped with concrete parking pad and extension for a living area with picnic table, water, sewer and electric connections at each site. Common to all three loops will be the community pavilion for day and night time gatherings and a coin-operated vending area. A tot-lot and spray pool may be included. The proximity of stores and shops in Titusville and others in the park surround provide easy access for the purchase of staples.

A sanitary waste dumping station will be constructed.

Extensive plantings of trees and shrubs will be necessary to provide shade and privacy for the campers.

The state operates a fifty unit campground at Bull Island which is less than fifteen miles distant.



**TRANSIENT CAMPING**

**AREA A**

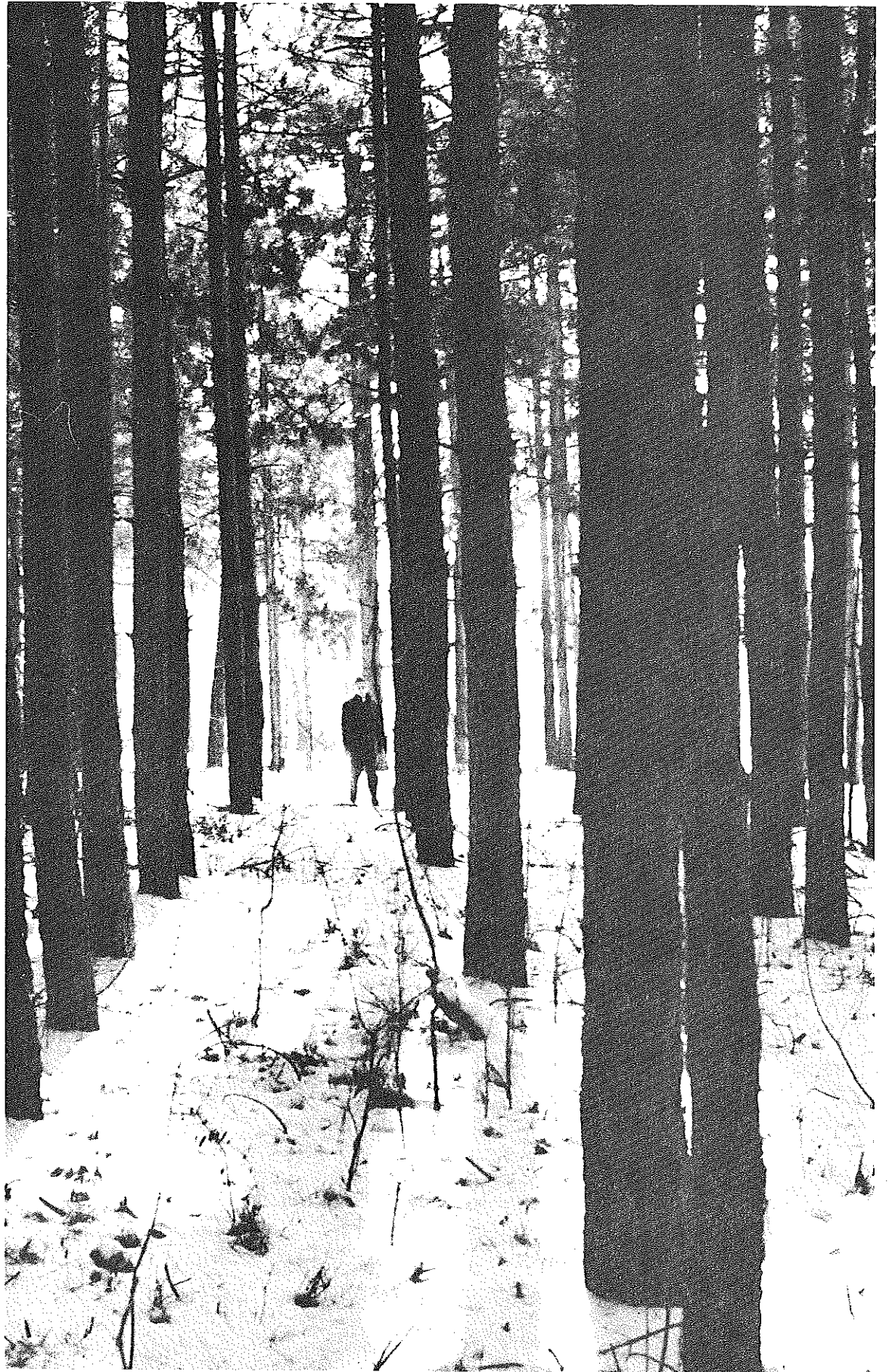
**PAVILION**

**AREA B**

**COMFORT STATION**

**AREA C**

**PROPERTY**



# APPENDICES

**MANAGEMENT - SMALL HISTORY MUSEUMS**

**Appendix A**

## APPENDIX A

Excerpts from "The Management of Small History Museums" by  
Carl E. Guthe

### Page 12

#### Physical Facilities

It is advisable to review the suitability of available and/or new quarters in terms of security, accessibility, space requirements, capital outlay, and maintenance costs.

The primary consideration is one of security. The museum's principal capital assets are its collections. Every practical safeguard against their loss and deterioration should be adopted. The museum building must be of sound construction and should be as nearly fire-resistant as is practical. The danger of unauthorized entry and the cost of insurance premiums may be reduced by having as few doors as possible, each of which can be locked securely. It is inadvisable to use a wooden frame building, in spite of the fact that many small museums are so housed. The factor of security should never be compromised for the sake of securing quarters that are otherwise attractive.

One of the functions of the museum is to render public service.

### Page 13

The amount of floor space needed by the museum is probably the determining consideration in the choice of suitable quarters. The number of square feet needed should not be determined casually. The size of the collections bears a direct relationship to the amount of floor space used. In an active museum the collections will increase steadily and may even double in size in a ten-year period. Adequate provision for such expansion should be



made in reaching an estimate of the amount of floor space the museum will require.

The primary obligation of a museum is to assemble and preserve its collections. The articles must be put somewhere when they are first received. They must then be sorted and inspected to determine the need for cleaning and repairing. Complete records must be made on all of them. There must be room in which to keep in a safe and orderly way the materials not used in the exhibit halls. All these essential activities require floor space.

A serious error is to estimate space requirements solely in terms of public exhibit halls. This is a natural mistake, for the great majority of visitors see only the exhibit halls and do not visit the other rooms of the institution, where most of the daily activities are performed. This lack of distinction between the exhibits and the collections results in crowded display cases, a prodigal and inefficient use of floor space, and an early demand for expansion of quarters.

Page 14

Most of the items in the library collections are filed in the stacks, in an orderly manner so that they may be located easily when called for. The same system is used in a well-organized museum. One-half to three-quarters or more of the materials in the collections are kept in drawers and cabinets in the collection files, not open to the general public, though they are to students and scholars.

A generally recognized rule-of-thumb formula for museum space assignment calls for devoting approximately forty percent of floor space to public

exhibit halls, another forty percent to collection filing rooms and associated work rooms and laboratories, and the remaining twenty percent to staff offices and service and maintenance rooms.

A fortunate small history museum may be occupying an old mansion, having a total floor space of about 3,000 square feet, the equivalent of ten rooms each 15 to 20 feet in size. The most efficient use of these quarters would call for assigning four or five rooms on the first floor, the equivalent of 1,200 to 1,500 square feet, to the public exhibits, and devoting the remainder to the other museum requirements.

The museums that have restricted exhibit halls, and possess ample space for processing, studying, and filing their collections, are among those that most successfully meet museum standards and obligations.

#### Page 15

Two basic principles need to be remembered; the primary obligation of a museum is to guarantee adequate preservation of the collection and effective use of their contents; and the success of an exhibit program is established by attractive and stimulating displays, not by the size of the public exhibit halls, the number of glass cases, or the quantity of individual items shown.

The two remaining considerations in the choice of a home for the museum are financial in character, namely, the capital outlay required and the annual maintenance costs.

The annual cost of maintenance of the property should be estimated before acquiring it. The greater probable frequency of needed repairs in older

buildings may increase this expense. The cost of heating and the charges for public utilities and telephone must be included. The expense of employing permanent and seasonal labor to keep the building and grounds in continuously good condition may be considerable.

Page 21

The Collections

A museum is judged by its collections. Their possession accounts for its existence; their character determines its worth. The character of the holdings in the collections reveals the policies and objectives of the museum.

A museum that professes to be a public institution thereby recognizes that its existence depends upon the good will of the community. It matters not whether it is subsidized by tax funds or supported by the income of a private non-profit educational corporation.

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The transition of the collections from private property to a public trust needs to be recognized fully in formulating the policies and establishing the objectives of the small history museum.

It is equally important to establish the scope of the collections. A disregard of the need for setting limitations upon the subjects dealt with in the collections may result in the accumulation of a much too diversified and fruitless miscellany of objects. It seems reasonable to expect a museum's collections to conform with its objectives.

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The wisest course of action is to make the uncompromising decision that

the scope of the collections shall be limited to materials directly related to the museum's objectives.

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HISTORICALLY SIGNIFICANT OBJECTS

The question immediately arises as to how the relative historical value of an individual article can be established. It seems reasonable to assume that its historical worth is determined by the contribution it makes to the knowledge of history. Considerable confusion has resulted from the failure to apply this criterion critically. There is a mistaken tendency to assign historical importance to the sentimental, romantic, nostalgic, and aesthetic connotations of individual objects.

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The historical value of an article is directly proportional to its physical condition. A complete object in the approximate condition it was in when in normal use clearly reflects the social environment of which it was a part. An attempt to restore such an object to its condition when new tends to destroy some of its usefulness as an historical item.

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The variability inherent in these three criteria—documentation, physical character, and historical association—and the diversity of opinion concerning the interpretation of each of these, prevents the formulation of categorical and detailed rules for determining the historical significance of an object. In the last analysis the usefulness of an object as a means of understanding and interpreting history must be decided by the officials of the museum in whose collections the object is located, through the dispassionate application of these three criteria and in accordance with the

interests and objectives of the institution.

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THE INTERPRETATION

The small history museum is a public institution dedicated to the preservation and interpretation of historically significant objects. The responsibilities inherent in the performance of each of these two functions differ considerably. Yet they are, so to speak, the two faces of a single coin.

The officials of many small museums, convinced that public support and good will are essential to the life of the institution, tend to concentrate upon the many activities connected with the interpretive function. As a result the organization, documentation, and management of the collections are so neglected that the materials in them cannot be identified easily or used effectively.

Interpretation is achieved by using the materials in the collections, while preservation is concerned with assembling, documenting, and caring for them.

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EXHIBITS

Exhibits are the most appropriate and dramatic means of demonstrating that historical objects are first-hand, tangible evidence of former customs, activities, and achievements. Their very existence helps to explain, illustrate, and enliven the community's past experiences. The successful transmission of this message emphasizes the importance of assembling and preserving these historically significant objects for the benefit of future generations as well as the citizens of today. In this way the exhibits

justify the existence of the museum as a public service institution.

The principles to be followed in formulating a satisfactory exhibit program are derived from the concept that museum exhibits are created for the public. Their purpose is to interest, inform, and stimulate visitors and to encourage them to repeat an enjoyable and profitable experience.

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Exhibits must be objective and truthful, and tell their stories without hint of bias or propaganda. Visitors take it for granted that what they see and learn in museum exhibits is accurate, trustworthy, and authentic. The dependability of the information given is a measure of the institution's integrity and, by inference, of that of the entire museum movement. Failure to meet these high standards amounts to the forfeiture of a public trust.

An axiom, derived from the fact that exhibits are still identified with the museum as an institution, is: "Static museums are dead museums." The installation of new exhibits and the rearrangement of materials in existing ones have come to symbolize the vitality of the institution. The changes need not be elaborate or complex. It is sufficient merely to have some change, possibly once a month, certainly once every three months.

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A successful exhibit program should include provision for the regular revision and improvement of existing displays and for the use of temporary exhibits.

Visitors to museum halls should be made to feel welcome. The popular

homes in a neighborhood are those in which visitors feel welcome and at ease. This hospitable attribute is just as valuable to an institution as it is to a family. Visitors to museums should be greeted by an attendant when they enter and made to feel at ease by the interest taken in helping them to get acquainted with the exhibits. The atmosphere should be a friendly one, inviting the visitor to browse at his leisure from one display to the next, contemplating and then evaluating the enjoyment and the message he may derive from each. This hospitable and relaxing environment for the visitor must be planned and arranged, but its success depends upon its ready acceptance as a matter of course.

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Potential visitors must be convinced that they want to see the exhibits rather than enjoy some other leisure-time experience.

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A museum is judged by its exhibits. The exhibit rooms are the show rooms in which the public is made aware of the role the museum can play in community life. The exhibit program is the most valuable and flexible interpretive instrument the institution possesses. Generally speaking, the quality of presentation is far more important than the quantity of time, energy, and funds expended upon its creation. A small group of coordinated and attractive exhibits will do a better job of interpretation than exhibits showing a greater number and variety of objects in poorly arranged displays.

The task of developing a satisfactory exhibit program is not a difficult one. The continuity of exhibits and the organization of the individual displays will be achieved by exercising good taste and imaginative planning seasoned with ingenuity.

**TRAVELS IN NORTH AMERICA, 1750**

by **Peter Kalm**

**Appendix B**



## APPENDIX B

Travels in North America by Peter Kalm

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The cataracts of the Delaware near Trenton and of the Schuylkill at some distance from Philadelphia make these rivers useless further up the country in regard to the conveyance of goods either from or to Philadelphia. They must therefore be carried on wagons or carts. It has therefore already been thought of making these two rivers navigable (for greater distances and) for larger vessels.

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Fruit trees. Every countryman, even a common peasant has commonly an orchard near his house in which all sorts of fruit, such as peaches were now almost ripe. . . . . Here every countryman had an orchard full of peach trees which were covered with such quantities of fruit that we could scarcely walk in the orchard without treading upon the peaches that had fallen off, many of which were left on the ground.

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The orchards have seldom other fruit than apples and peaches. Pear trees are scarce in this province, and those that have any of them have planted them in their orchards. They sometimes have cherry trees, but commonly by the sides of the roads leading to the house, or along the fences. Mulberry trees are planted on some hillocks near the house and sometimes even in the courtyards of the house. The black walnut trees, or *Juglans nigra*, grow partly on hills and in fields near the farmhouses and partly along the fences; but most commonly in the forests. No other trees of this kind are made use of here. The chestnuts are left in the fields; here and there is one in a dry field or in a wood.

Page 47 and 48

September the 21st, 1770

Description of country. The common privet, or *Ligustrum vulgare* L., grows among the bushes in thickets and woods. But I cannot determine whether it belongs to the indigenous plants or to those which the English have introduced, the fruits of which the birds may have dispersed everywhere. The fences and pales are generally made here of wooden planks and posts. But a few good economists, having already thought of sparing the woods for future times, have begun to plant quick hedges round their fields; and for this purpose they take the above-mentioned privet, which they plant in a little bank that is thrown up for it. The soil everywhere hereabouts is a clay mixed with sand and of course very loose. The privet hedges, however, are only suitable for keeping out domestic cattle and other such animals here, for the hogs all have a triangular yoke about their necks, and the other cattle are not very unruly. But in places where the latter seek to break through the fences, hedges of this kind make but a poor defence. The people who live in the neighborhood of Philadelphia are obliged to keep their hogs enclosed.

.....

The fields by the sides of the road were almost all mown and of grain crops only corn and buckwheat were still standing. The former was to be met with near each farm in greater or lesser quantities; it grew very well and to a great length, the stalks being from six to ten feet high and covered with fine green leaves. Buckwheat likewise was quite common, and in some places the people were beginning to reap it.

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Fences. I have already mentioned something about the fences that are usual here. I now add that most of the rails which are put horizontally, and of which the fences in the environs of Philadelphia chiefly consist, are of red cedar, which is here reckoned more durable than any other. But where this could not be obtained either white or black oak supplied its place.

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A Forge. About two English miles beyond Chester I passed by an iron forge, which was on the right by the roadside. . . . . The ore however is not dug here but thirty or forty miles away, where it is first melted in a furnace and then carried to this place. . . . . All the machines were worked by water. The iron was wrought into bars.

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Trenton is a long narrow town, situated at some distance from the Delaware River, on a sandy plain; it belongs to New Jersey, and they reckon it thirty miles from Philadelphia. . . . . Our landlord told us that twenty-two years ago (1728) when he first settled there, there was hardly more than one house; but from that time on Trenton has increased so much that there are at present nearly a hundred houses. . . . . The inhabitants of the place carried on a small trade with the goods which they got from Philadelphia, but their chief income consisted in attending to the numerous travellers between that city and New York, which are usually brought by the Trenton yachts between Philadelphia and Trenton. But from Trenton to New Brunswick, the travellers go in wagons which set out every day for that place. Several of the inhabitants however subsist on the transportation of all sorts of goods, which are sent every day in great quantities, either

Page 50

Fences. Almost all the fences round the grain fields and meadows hereabouts were made of rails fastened in a horizontal direction. I only perceived a hedge of privet in one single place. The fences were not made like ours, for the people here take posts from four to six feet in height and make two or three holes in them, so that there was a distance of a foot or more between them. Such a post does the same service as two (in the Swedish type of fence) and sometimes three poles are scarcely sufficient. The posts were set in the ground at two or three fathoms<sup>1</sup> distance from each other, and the holes in them kept up the rails which were nine inches and sometimes a foot broad and were inserted one above the other in the posts. Such a fence therefore looked at a distance like the hurdles in which we enclose the sheep at night in Sweden. They were really no closer than these, being only destined to keep out the bigger animals such as cows, sheep and horses. The hogs are kept near the farmhouses everywhere about Philadelphia, and therefore this fence does not need to be made tighter on their account. Chestnut trees were commonly used for this purpose, because this wood kept longest against rotting, and a fence made of it could stand for thirty years. But where no chestnut wood was to be gotten, the white and black oaks were taken. Of all kinds of wood that of the red cedar lasts the longest. A very large quantity of it is brought here, for near Philadelphia it is not plentiful enough, and many fences near the town are made of this wood.

<sup>1</sup> A fathom was formerly sometimes only five feet instead of six.

Pumpkins. Several kinds of pumpkins and melons are cultivated here. Originally they were in part cultivated by the Indians and in part brought over by Europeans. Of the pumpkins there is a kind which is crooked at the end and oblong otherwise, and is therefore called a crookneck. They keep almost all winter. There is yet another species of pumpkins which has the same quality. Others again are cut in slices, drawn upon thread, and dried. They keep all the year long, and are then boiled or stewed. All sorts of pumpkins are prepared for eating in different manners, as is customary in Sweden. Many farmers have a whole field of them.

Squashes are a kind of pumpkin which the Europeans got from the Indians, and I have already mentioned them. They are eaten boiled, either with meat or by themselves. In the first case, they are put on the edge of the dish round the meat; they require little care, for in whatever ground they are planted they grow and succeed well. If the seed is put into the fields in autumn it brings squashes the following spring, though during the winter it has suffered from frost, snow and wet.

The calabashes are a kind of gourd, which are planted in quantities by the Swedes and other inhabitants, but they are not fit for eating, and are used for making all sorts of vessels. They are more difficult to raise than the squashes for they do not always ripen here except when the weather is very warm. In order to make vessels of them, they are first dried well. The seeds, together with the pulpy and spongy matter in which they lie, are afterwards taken out and thrown away. The shells are scraped very clean within, and then large spoons or ladles, funnels, bowls, dishes and the like may be made of them. They are particularly fit for holding seeds which are to be sent over sea; for seeds keep their power of vegetating much longer if they be put in calabashes than by any other means. Some

people scrape the outside of them before they are opened, dry them and then clean them within. This makes them as hard as bone. They are sometimes washed to keep their white color.

Buckwheat. Most of the farmers in this country sow buckwheat in the middle of July. It must not be sown later, for in that case the frost ruins it; and if it is sown before July, it flowers all summer long, though the flowers drop and no seed is generated. Some people plow the ground swice where they intend to sow buckwheat; others, only once, about two weeks before they sow it. As soon as it is sown the field is harrowed. It has been found by experience that in a wet year buckwheat is most likely to succeed. It stands on the fields till the frost comes. When the crop is favorable farmers get twenty, thirty, and even forty bushels from a bushel of seed. The Swedish churchwarden Ragnilsson, in whose house we stayed at this time, had obtained such a crop. From the flour they make buckwheat cakes and pudding.

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Rye, wheat and buckwheat are cut with the sickle, but oats are mown with a scythe. The sickles which are here used are long and narrow, and their sharp edges have close teeth on the inner side. The field lies fallow for a year, and during that time the cattle may graze on it.

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Careless Agriculture. The rye grows very poorly in most of the fields, which is chiefly owing to the carelessness in agriculture, and to the poor-ness of the fields, which are seldom or never manured. After the inhabitants have converted a tract of land into a tillable field, which has been a forest for many centuries, and which consequently has a very fine soil, the colonists

use it as such as long as it will bear any crops; and when it ceases to bear any, they turn it into pastures for the cattle, and take new grain fields in another place, where a rich black soil can be found and where it has never been made use of. This kind of agriculture will do for a time; but it will afterwards have bad consequences as every one may clearly see. A few of the inhabitants, however, treated their fields a little better; the English in general have carried agriculture to a higher degree of perfection than any other nation. But the depth and richness of the soil found here by the English settler (as they were preparing land for plowing, which had been covered with woods from times immemorial) misled them, and made careless husbandmen.

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May the 28th

The *Magnolia glauca* was now in full bloom. Its flowers have a very pleasant fragrance, which refreshes the travellers in the woods, especially towards the evening. The flowers of the wild grapevine afterwards took the place of the magnolia. Several other flowers contributed likewise towards perfuming the ambient air.

Dwarf Laurel. The *Kalmia angustifolia* was now everywhere in flower. It grows chiefly on sandy heaths, or on dry poor grounds, where few other plants thrive; it is common in Pennsylvania, but particularly in New Jersey.

Mountain Laurel. The *Kalmia latifolia* was also in blossom. It rivals the preceding one in the beauty of its color; yet though it is conspicuous in regard to the color and shape of its flowers, it is in no way remarkable for smell, such as the magnolia is, for it has little or no smell at all. So equally and justly does nature distribute her gifts; no part of the creation has them all, each has its own, and none is absolutely without a share of them.

Page 320 and 321

May the 31st, 1751

About noon I left Philadelphia and went on board a small yacht which sails continually up and down upon the river Delaware, between Trenton and Philadelphia. We sailed up the river with fair wind and weather. Sturgeons leaped often a fathom into the air. We saw them continuing this exercise all day, till we came to Trenton.

Towards night, after the tide had begun to ebb and the wind had subsided, we could not proceed, but dropped our anchor about seven miles from Trenton, and passed the night there.

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June the 2nd, 1751

This morning we left Trenton, and proceeded towards New York. We rode in an ordinary open wagon which in stony places came near shaking liver and lungs out of you, otherwise the better class people travel with their own horses whether they ride in a wagon or chaise, or on horseback; the latter is the more common method of travelling. . . . The fields were sown with wheat, rye, corn, oats, hemp, and flax. In several places, we saw very large pieces of ground planted with hemp. We saw an abundance of chestnut trees in the woods. They often stood in excessively poor ground, which was neither too dry nor too wet. Tulip trees did not appear on the road; but the people said there were some in the woods. The beaver tree (*Magnolia glauca*) grew in the swamps. It was now in flower, and the fragrance of its blossoms had so perfumed the air, that one could enjoy it before one approached the swamps; and this fine smell likewise showed that a beaver tree was near us, though we did not always see it.



WASHINGTON CROSSING BRIDGE

**Appendix C**

## APPENDIX C

### THE WASHINGTON CROSSING, PENNSYLVANIA-WASHINGTON CROSSING, NEW JERSEY BRIDGE

The first bridge constructed at this location, connected Washington Crossing on the New Jersey side of the river with the Town of Taylorsville, now also called Washington Crossing on the Pennsylvania side. On February 14, 1831, an act was passed by the New Jersey Legislature and concurred in by Legislature of Pennsylvania creating the Taylorsville Delaware Bridge Company. By the provisions of this act, the bridge was to be located at Taylor's Ferry, formerly known as McKonkey's Ferry.

The first bridge was built of timber and remained in service until it was swept away by the freshet of January 8, 1841. At this time, the company appears to have issued promissory notes in the form of script for the purpose of obtaining sufficient funds to repair the loss occasioned by the flood. Records show that all script issued was redeemed by January 19, 1842.

The bridge as rebuilt remained in service until the superstructure was carried away by the flood of October 10, 1903, at which time the masonry was also damaged.

In 1904 the name of the company was changed to the "Taylorsville Delaware Bridge and Washington's Crossing Delaware Bridge Company."

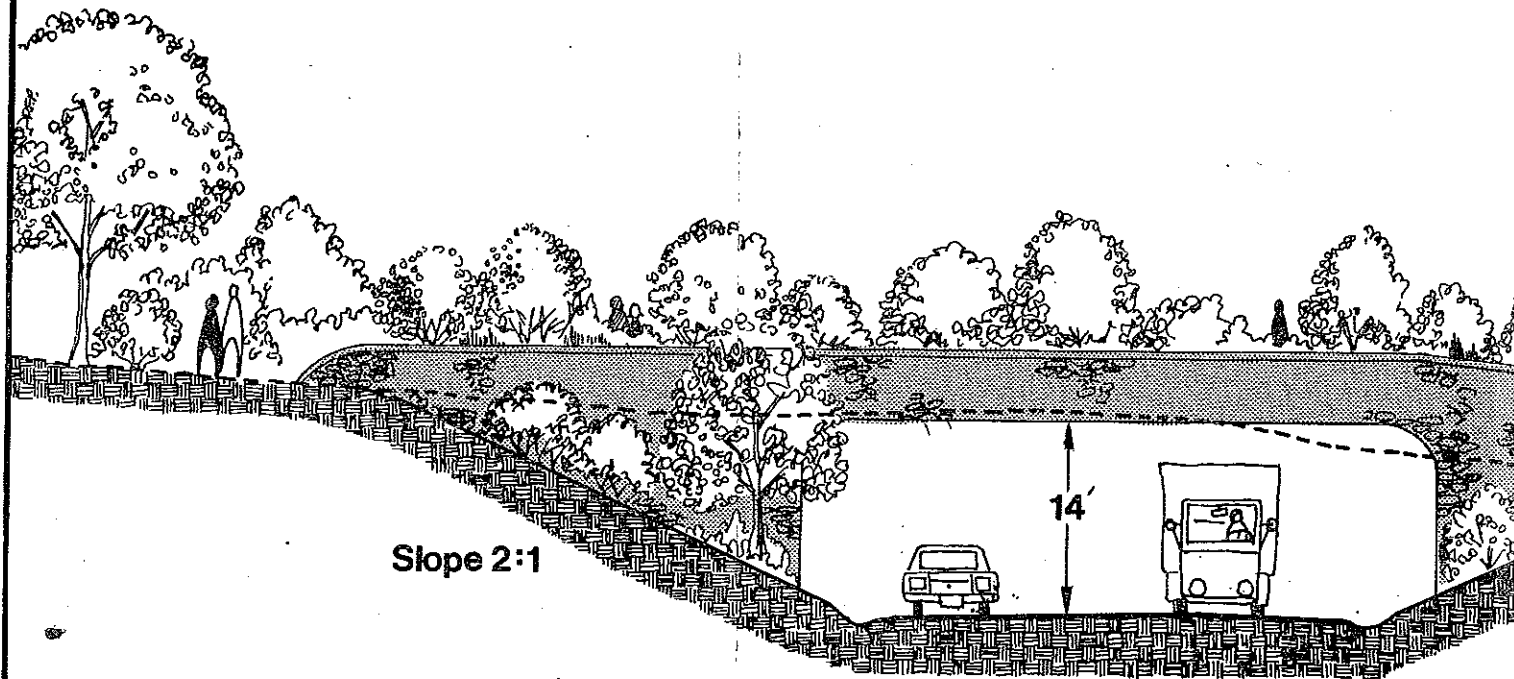
In 1904, the company built a six-span steel superstructure which still stands and is in service today. This bridge was purchased by the Joint Commission for Elimination of Toll Bridges, the forerunner of the present Commission, on April 25, 1922.

The bridge is almost 50 years old and according to modern-day standards

is obsolete. It is limited to the passage of vehicles not over six tons gross weight. The narrow roadway of only 15 feet requires one-way passage while trucks are crossing the structure. At such times traffic is controlled by means of traffic lights at each end of the bridge, operated manually by the bridge officer. State Parks located near each end of the bridge attract many thousands of tourists each year, many of whom cross the structure.

**PROFILE OF BRIDGE**

← **To McKonkey House**

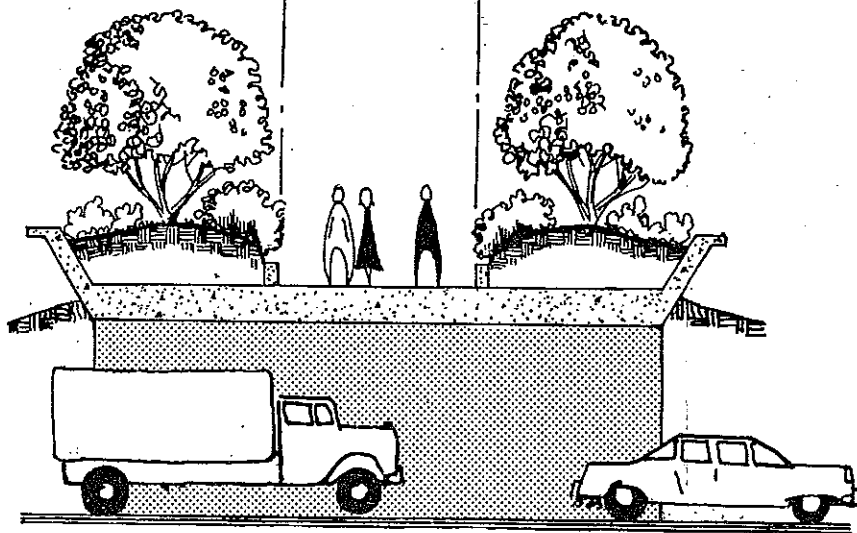


**Slope 2:1**

14'

**Walkway**

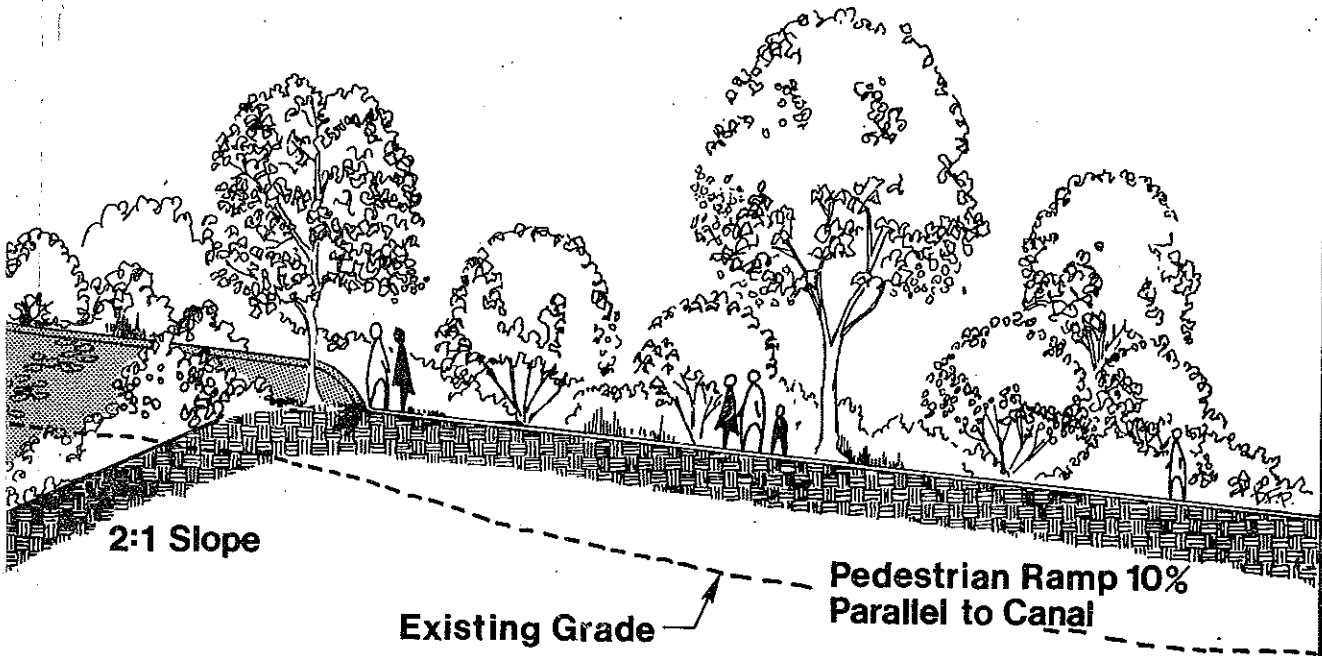
**State Route 29  
Depressed and Shifted West**



**Section Through Bridge**

**AND RAMP**

To Nelson House →



**PEDESTRIAN ACCESS  
ACROSS STATE ROUTE 29**

**MAIN-REUTTER**  
*Engineers*

In 1910 authorization was made to create a park not to exceed 400 acres at Washington Crossing. In 1913 the initial 100 acres were purchased and in 1941 the acreage was increased to 365. Between 1963 and 1973 an additional 419 acres were added under the Green Acres Program. The current holding is 784 acres. Additional parcels of land will be required to complete the master plan for the park.

Because of the historical importance of the park, all efforts are being made by Bureau of Parks Historic Sites Section to research and authenticate the land uses, all types of buildings and appurtenances, as well as the ferry (and landings) which existed in 1776. The efforts for authentic reconstruction of the Colonial Era are intended to educate the park visitor and provide safe and convenient pedestrian access from the Interpretative Center, along Continental Lane across Rte. 29, the D & R Canal and Penn Central Railroad down to the ferry and landing.

Major construction, reconstruction and demolition are involved in executing the plan. Major construction includes the Interpretative Center, which is capable of instantly handling 1000 visitors.

Included in the Interpretative Center are a museum, auditorium, food concession, bicycle concession and comfort facilities. On park visitor days, using a turnover factor of 3, the Interpretative Center can accommodate as many as 3000 persons. The Center would acquaint visitors with the historic events which took place in this area.

Major reconstruction includes depressing Route 29 and constructing a pedestrian overpass, the reconstruction of the ferry(s) and landings, as well as restoring the land uses of that day.

Through these improvements, the park visitor will be afforded safe pedestrian access from the McKonkey (Inn) House down to the reconstructed ferry. Efforts will be made to establish a pedestrian oriented ferry between the New Jersey and Pennsylvania State Parks. The ferry would be reconstructed as close to the 1776 model as possible. The reconstructed ferry would offer the park visitor a greatly enlarged recreation experience, by being able to ride back and forth across the river, as did the people of '76. It is assumed the ferry was capable of handling a wagon and team of six horses.

Although primarily devoted to historical events of that day, the park will also continue to provide family picnicking at three sites for some 500 persons instantly. A group picnic facility for 200 persons will be provided, together with meadows devoted to large group activities.

The existing amphitheater will be rehabilitated to seat 1,000 persons, and be provided with adequate parking.

Construction of a new Nature Center designed to accommodate the ever-increasing attendance will include adequate parking.

Nature and hiking trails will be extended and improved. The peripheral trail systems and park roads can be used by bicyclers who may rent bicycles at the concession at the Interpretative Center.

The transient camping area with 100 sites will provide short-term accommodations for the motoring public who are touring this historic area.

The five phases of park development are designed to restore and create a nature and historically oriented park facility with a prescribed instant recreation population of 2,760 persons.

