W.P.

Coastal Zone Management Program

DEPARTMENT OF

Urban Planning and Policy Development

COASTAL ZONE

INFORMATION CENTER

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS
Campus at New Brunswick

SCHOOL OF URBAN AND REGIONAL POLICY • Kilmer Campus • New Brunswick • N.J. 08903

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Going to the Beach: Recreational Travel in Northern New Jersey

Richard K. Brail
Anders Markstedt

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With the assistance of members
of the Graduate Planning Workshop, Fall 1981
Thomas Gatti
Elkins Green
David Hojsak
You-Wen Hsieh
Sumita Gupta

Department of Urban Planning and Policy Development
School of Urban and Regional Policy
Kilmer Campus
Rutgers University
New Brunswick, New Jersey 08903

EXECUTIVE SUMMARY

This project, Going to the Beach: Recreational Travel in Northern New Jersey, has focused on the utilization of beaches in Monmouth and Ocean County by northern New Jersey residents. The study examined both the demand for beach use and the supply of sites available. To better understand the nature of the beach use a license plate survey was done in Summer, 1981 which recorded over 4,000 plates.

The study has drawn a number of conclusions about both the nature of demand and the potential solutions to improving access to beaches during the summer months. The analysis of the license plate data clearly indicates the strong relationship between distance to the beach site from the residence and participation in beach activities. Using a participation quotient concept (described in Chapter Five), the chief users by a wide margin of the beaches in Monmouth and Ocean Counties are these two counties. Other counties, particularly Hudson, Union, and Middlesex, are heavy users.

A subsequent analysis of 42 communities in northern New Jersey confirms the relationship between distance and participation. However, this analysis also finds very weak relationships between participation and community income or ethnicity. Based on this analysis, the discrimination which exists in getting to the beach is distance-based. People are

unwilling to travel on heavily-congested roads a long distance on a summer weekend day. Correspondingly, a study done of arrival times at two beaches which close when full, Sandy Hook and Island Beach, indicates that people from both near and distant counties arrive at about the same time. This means that visitors from more distant counties rise early and drive far in the hope of getting there before the parking lot closes.

The study also examined the structure of different beach communities and explored community attitudes toward the day beach visitors. There is the general distinction between the "no-no's" and "go-go's," communities which either encourage or discourage both outside visitors and development.

The transportation policy and planning recommendations of this study are cognizant of both the demand and supply elements. They are: (1) the development of a recreational travel organization, (2) the integration of the transportation delivery system, and (3) the creation of an information dissemination function. The recreational travel organization would be a public/private venture which would have research, consulting and development functions. The integration of the transportation delivery system would particularly involve the development of extensive charter bus

operations, the targeting of selected beach communities, and the involvement of paratransit, particularly taxis. The information dissemination function would involve the creation of toll-free telephone lines and the use of radio stations for beach and traffic condition announcements, and the better dissemination of beach and transportation system literature.

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CHAPTER ONE

Introduction

The Purpose of the Study

The density of development of the New Jersey coastline indicates its desirablity. Unfortunately, the congestion often associated with going to the beach has made the trip less than pleasant for many. The issue is further compounded by the geographic distribution of the beaches in New Jersey and by local policies which control and limit access to these beaches. There are few beach access points in northern New Jersey above the Raritan Bay. Those beach goers from Bergen, Passiac, Essex, Union or Hudson Counties must travel south in search of the beach. The waterways bordering their counties are heavily industrialized, particularly with energy facilities such as refineries, loading and unloading depots, and storage areas.

Of necessity, these beach goers go south to the ocean. Assuming that they can brave the traffic and actually make it to beaches in Monmouth or Ocean Counties, the fun is not over. If they are able to arrive early enough they might get into Sandy Hook National Recreation Area or Island Beach State Park. Or they may decide to go to one of the local communities, assuming space and the purchase of a daily beach pass. Of course, the town might only sell a weekly

pass at a high cost but, if you want to get to the beach, you must pay.

The Structure of the Study

This study examines beach sites in Monmouth and Ocean Counties in terms of current use by day visitors. In the following chapters both supply and demand issues are presented. In Chapter Two there is discussion of a general perspective on recreational travel, with particular focus on market segmentation and the planning process which could be applied to recreation.

In Chapter Three an overview of recreational travel in New Jersey is presented. There have been a number of surveys on beach recreation in New Jersey and they present an interesting picture of the nature of the demand. Chapter Four presents a historical perspective on recreational travel in Monmouth and Ocean Counties. There was well-developed waterborne recreational travel in the nineteenth century, and these excursion steamers were followed by an extensive trolley system in the twentieth century. Unfortunately, there are few options to the automobile today in going to the beach.

To better determine the nature of travel demand a license plate survey of 4,000 automobiles was done at selected beach locations. The results of the survey are

discussed in Chapter Five. There are clear differences in terms of who travels to what beach, and these are outlined. As suggested earlier, both supply and demand elements are important to the study. Interviews in various beach communities and analysis of beach access policies clearly indicate there are significant differences in local attitudes to the daily beach visitor. In Chapter Six a conceptual framework for understanding variations in beach community structure is outlined. The distinctions between the "no-no's" and the "go-go's" among beach communities are made. Also, a typology of the spatial structure of the different commuities is developed.

In the final chapter the current transportation system is outlined and potential future options presented. The various options are discussed and an alternatives analysis presented. It is clear that there are options to the automobile as well as ways to use the auto better.

This study focuses on the beaches in two counties in New Jersey. It is an attempt to point out the issues surrounding beach travel to this area of New Jersey. Clearly, there are more beaches to study and more transportation questions to address. However, that work is for another time and place.

CHAPTER TWO

A General Perspective

Introduction

The development of an understanding of recreational travel behavior and transportation alternatives is important to this study. A wide body of knowledge has evolved over time which focuses on recreational travel behavior. Much of this literature is grounded in the travel and tourism industry, including transportation carriers such as airlines, travel agents, hotel and motel owners, and state tourism promotion offices. While recreational travel has occasionally received serious academic study the bulk of the work has been industry driven. Obviously, because of this orientation the bulk of the research has focused on getting and keeping tourists at vacation sites. Hence, there is a predominance of analysis of future travel demand and the subsequent effect on the various industry sectors -- room demands, airline travel, and the like.

Correspondingly, the focus has not been on the societal implications of the choice of travel mode or destination. Nor has the focus been on the distribution of access to different groups in society. With few exceptions, which we will point out, detailed analysis of alternative transportation options to the automobile has not been done. An

interesting recent study of transit options for coastal recreation was done by Banks, Stutz and Jabbari (1982) in California. In general, however, there has been little interest in transit and paratransit alternatives to the automobile or airline. Before examining the literature in more detail it is important to understand the definitional basis to the field.

A Definitional Framework

The literature distinguishes between travel and tourism. Tourism refers to discretionary recreational activities which occur away from home, usually at least 50 miles from the doorstep, and will often include overnight stays. These activities will involve travel by a variety of modes to the destinations selected. Any urban transportation planning text, such as Stopher and Meyburg (1975), points out the variety of trip purposes which travel can assume. These include work, school, personal business, shopping and social-recreation trips.

Travel, then, consists of all trip purposes. Studies which focus on long distance travel, such as the National Travel Survey, will include more than recreationally-focused trips made as tourist activities. It is not always clear whether one is capturing tourism in travel estimates. For

example, how many tourists traveling to the shore are mixed with workers returning home on the Garden State Parkway on a summer afternoon? Simple traffic counts which do not differentiate trip purposes, origins, or destinations cannot clearly present the nuances of travel demand. For example, the 1976 origin and destination study of the Garden State Parkway sponsored by the New Jersey Highway Authority did not ask about trip purpose. This very extensive survey is useless for recreational travel planning purposes.

Basic traffic counts can distort statistics greatly. One southeastern national park has tremendously high visitor-day counts almost solely as a result of a commuter highway running through it carrying workers to and from jobs. Since the visitor-day counts for the National Park System are based on vehicle counts multiplied by an assumed persons per vehicle, the problem is further compounded. Work trips have a lower person per vehicle number (1.2, approximately) than non-work trips (1.8), and much lower than recreational trips, where 3 or higher is common. This southeastern park is clearly overstating its visitors as measured by vehicular entries if it is assumed that there are 3 persons per vehicle.

Our study of recreational access to beaches in Ocean and Monmouth Counties will focus on the day user. A number of beach communities have been identified in these two

counties. These communities will be studied as well as the visitors who frequent these beaches.

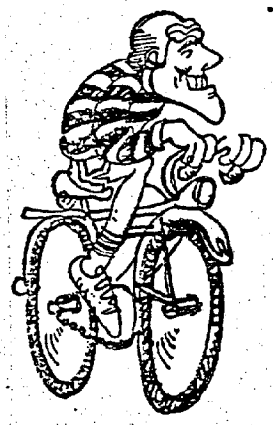
Market Segmentation

One of the clearly defined issues emerging in travel demand research is the segmentation of the existing and projected market. Recent work has defined a variety of types of individuals and groups who will consume different kinds of activities. For example, work done in Michigan for the Travel Bureau has defined a set of recreational consumer types through analysis of long-distance travel data (Bryant and Morrison, 1980). The statistical analysis identified four active recreational types -- "young sports," "winter/water," "outdoorsman/hunter," and "resort." Additionally, two passive types were identified, "sightseer," and "nightlife." These six types are shown in Exhibit 2-1. The information was used to target groups for advertising campaigns and general marketing strategies.

A segmentation approach to day visitors of New Jersey beaches would uncover different user groups. Although such analysis is not possible in this study, the general outline of such an approach can be outlined. Basically, such a system would: (1)identify the various groups by activity preferences, (2) determine the level of participation, (3)

EXHIBIT 2-1

Various Recreational Types
(Bryant and Morrison, 1980)

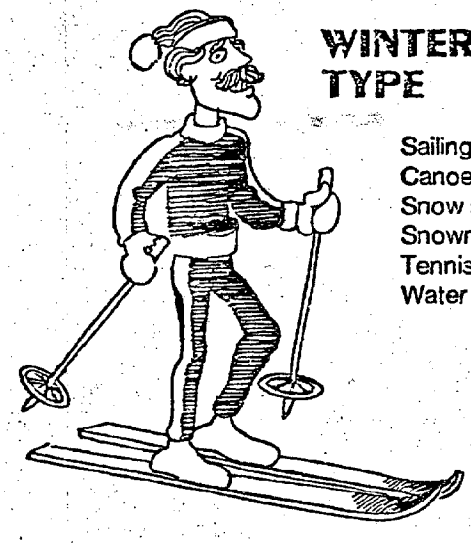


YOUNG SPORTS TYPE

Bicycling
Canoeing
Camping
Hiking
Horseback Riding
Swimming
Tennis

OUTDOORSMAN HUNTER

Power boating
Fishing
Hunting
Ice fishing
Snowmobiling

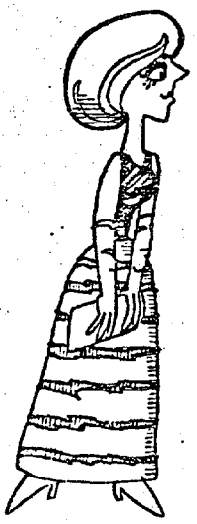


WINTER/WATER TYPE

Sailing
Canoeing
Snow skiing
Snowmobiling
Tennis
Water skiing

RESORT TYPE

Golf
Tennis
Casino gambling



SIGHTSEER TYPE

Seeing natural resources
Seeing historical sites
Culture-concerts/plays
art shows
Man-made attractions
Museums
Special festivals

NIGHTLIFE ACTIVITIES

Professional sports
Major amusement parks
Man-made attractions
Nightclubs & restaurants
Casino gambling

determine the preferred attributes of both travel modes and destination sites for the different groups, and (4) match these preferences with available modes and sites in the study area. Depending on the goals of the project the segmentation process may extend beyond the state boundaries. Such an analysis could assist the planning and promotional efforts of the tourist office at a state or local level in targeting potential visitors.

The market segmentation approach identifies the various groups with identifiable recreational interests. If participation rates of these groups for the various activities could be developed, then the basis for a transportation planning appraoch to recreational travel would be established. In fact, it would be the first step -- trip generation. The matching of the users with the available facilities would lay the groundwork for the distribution of trips to these sites. These two steps of the urban transportation planning process -- generation and distribution --are followed by the determination of the modal split and the assigning of vehicles to actual roadways.

A Recreational Travel Planning Approach

The focus of this study is on recreational travel demand. In particular, there is a need to examine the role which various travel modes can play in getting potential

users to the beach. It is obvious that the vast majority of trips have been and will be made by automobile. It is also true that there are situations where public transit and paratransit options are very appropriate. These specialized situations can be characterized as follows:

1. Densely populated activity centers
2. Large amounts of travel between concentrated origins and destinations

It becomes immediately obvious that beach communities are densely populated in summer. However, the seasonal nature of beach travel makes the planning and development of viable alternatives to the automobile difficult. Ideally, public transit and paratransit operations for seasonal beach use would be drawn from equipment underutilized during that period. For example, the transportation into the Mt. McKinley National Park in Alaska is provided by school buses which are idle during the summer. Of course, Mt. McKinley is only accessible in summer, so potential conflicts in vehicle use are avoided.

This study will initially focus on defining current travel patterns to the beach and analyzing the structure of local communties. Then the study will examine the potential for alternative transportation modes to serve northern New Jersey beach communties. In terms of the analysis the traditional urban transportation planning process is important.

This process involves four distinct steps which form the basis for both planning and policy. Trip generation refers to how many people will decide to go on a particular kind of trip during some time period. For example, how many people from Hudson County will decide to go to the beach on a given day? As suggested earlier, travel researchers have become interested in segmenting the market. Unfortunately, this interest has not carried over sufficiently to transportation planning. While work has emerged on what kinds of people travel for different reasons the information is still primitive. This study will be able to quantify in gross numbers how many beach visitors will travel to selected northern New Jersey beaches. However, a serious market segmentation approach is beyond the scope of this study.

Given that we can determine the number of beach visitors from a particular geographic area, then trip distribution focuses on the destinations selected. For example, how many visitors from Hudson County will go to Sandy Hook National Recreation Area in Monmouth County? The traditional transportation planning study done in an urban area would use origin and destination studies to provide the appropriate information on current travel. These studies could either be home interview surveys or roadside inquiries. Because of cost constraints, this study will use a license

plate survey at selected beach communities. Unfortunately, without detailed origin and destination studies which capture both travel and demographic characteristics the current picture cannot be comfortably extrapolated to the future.

Essentially, without a market segmentation approach which looks at the demographic characteristics of users, the development of policy is difficult. Given the dynamics of demographic change within the State of New Jersey a picture of travel flows in 1981 to beaches may or may not be accurate for 1991. License plate surveys do not allow the actual questioning of respondents about their family status, ethinicity income, education or attitudes. To compensate for this deficiency statistics were gathered at the community level and analyses run. We have attempted to introduce demographic characteristics by aggregating the individual travel patterns to the community level. In Chapter Five both the results of the license plate survey and the community demographic analysis are detailed.

The analysis of alternative modes of recreational travel is an important element of our work, and, as presented in Chapter 7, has been structured to encompass both current and future options. Traffic assignment is the final step of the transportation planning process. Traffic flows are assigned to highway links in the study area. We

will not focus directly on assignment in this study. There is little money for new highway construction in the next decade and the main focus will be on the reconstruction of existing roadways.

There are, however, two areas which we will touch on in this study which are assignment questions. First, we will discuss the impact of access on beach community development when we examine community structure in Chapter 6. Second, there are serious questions about traffic flows within beach communities and park areas. In Chapter 7 we will examine paratransit alternatives within communities. There may be good reason to look into taxis, vans and other options for beach communities during crush periods.

Meshing Supply and Demand

This research report will discuss both the demand for day beach use and the supply of communities to which visitors will travel. At this time the combination of market forces and local public policy define the current origins and destinations of beach visitors. It is clear that there is great demand for beach use by both local residents and by visitors. This is easily evidenced by the early closing times of the both Island Beach and Sandy Hook on weekends. Many of us living in northern New Jersey have either

directly experienced or know of the great "adventure" of going to the beach on weekends in summer. It is not uncommon to spend four hours in the car trying to get to the beach.

Robert Caro in the biography of Robert Moses, The Power Broker, talks of the search for beaches by New York City residents on Long Island. Caro says:

> So when the families of New York City reached Long Island, they found the milk and honey sour indeed....
>
> As the families drove, they could see on either side of them, through gates set in stone walls or through the openings in wooden fences, the beautiful meadows they had come for, stretching endlessly and emptily to the cool trees beyond. But the meadows and trees were not for them. The gates would be locked and men carrying shotguns and holding fierce dogs on straining leashes would point eastward, telling the families there were parks open to them "farther along."... Later, in Oyster Bay Town and Huntington, they would come to parks,... policemen would wave them on, explaining that they were reserved for township residents. There were, the policemen shouted, parks open "further along."...
>
> The more persistent, who determined to head east until they discovered someplace to swim or picnic, found the road becoming worse and worse. They would see Long Island villagers sitting on the fences and laughing at the families who, because of engine overheating or in a desperate try at a piece of grass, pulled off the road. The line of cars was so solid, the radiator of one almost touching the tailgate of the one before it, that, once out of line, it was hard for a car to get back in -- and it was fun, the villagers said, to watch them try. (Caro, 1974: pp. 153-154)

The quote from the Caro book indicates that the issue of beach access is not new. However, there are two

differences between the 1920's and the 1980's. First, there is no Robert Moses to propose new roads, bridges and beach facilities. Second, there is little public willingness to pay for these facilities. Instead, we are faced with limited resources and limited beach access.

The policy implications of scarce resources are great. Assuming that the objective is to improve access to beach facilities, then ingenuity is important. How can we shift the existing structure to improve beach access? The strategy is simple. There must be the best possible matching of supply and demand. For example, there is a large private paratransit operation in Red Bank. Is there some way to involve this system in improving beach access? Or, what is the prospect of using radio or telephone to inform potential visitors about highway or beach conditions? Is there a role for charter bus operators outside the Atlantic City destination.

By examining the alternatives carefully, a clear determination can be made. Broadly sketched, this project will do alternatives analysis on travel options to the beach. However, the analysis will be preceded by a broad discussion of the nature of beach communities and the current travel to them.

CHAPTER THREE

Recreational Demand in New Jersey

An Overall Perspective

In the Statewide Comprehensive Outdoor Recreational Plan (SCORP , 1977), prepared by the New Jersey Department of Environmental Protection under the Green Acres Program, it is concluded that an ever increasing number of individuals are visiting New Jersey recreation facilities.

> In New Jersey, the growing demand for outdoor recreation has in many instances surpassed the capacity of the existing facilities, this has caused over-crowding at facilities, people to be turned away at recreation sites and determined individuals traveling much greater distances in pursuit of recreation opportunities. (SCORP, Chapter 6)

During the summer months, July and August 1981, close to three million people visited state recreation facilities managed by the Division of Parks and Forestry, (New Jersey Department of Environmental Protection, 1981). This number is expected to grow with increasing family income, increasing leisure time, and the need to escape the pressures of work and urbanized areas. The pressure is particularly high close to population centers, where competition for open space is greatest.

In planning for recreation, a number of policy questions have to be addressed. First of all, to what extent should the public sector engage in planning for recreation. Why can it not be left to the private market to develop recreation areas where the demand is sufficient? According to existing

land use theories, a private market develops land according to "the best use" theory: the use which is assumed to generate the most profit to an entrepreneur. One such example in New Jersey is the predominance of heavy industry along the northern shore. It seems apparent that recreational activities were not judged to generate sufficient land revenues in this area, to offset the proximity of the New York market. Another example is Island Beach State Park. If developed by real estate interests, as was originally planned, it would be a much greater revenue producing property.

We can define certain objectives which cannot be satisfied by a private market approach alone:

1. Recreation of natural habitats and cultural values
2. Equalization of recreational access among all state residents
3. Minimization of average travel distance

In planning for recreation, we need knowledge to understand travel behavior of different groups. For example, what is the travel pattern generated by a specific park location? Why are people turned away from parks closing because of overcrowding? Are park entrance fees discouraging visits by less affluent groups of the population? Does the lack of public transportation exclude segments of society from certain recreational facilities? This chapter presents an overall perspective which looks at some of these questions. We will focus on beaches as a source for recreational opportunities. We will examine the current research in

order to bring more clarity to the issues, specifically with regard to travel patterns and the questions of equity.

The Demand For Beach Facilities

A number of studies have been carried out to estimate the demand for recreational facilities in New Jersey. This demand is considered to be dependent on the participation rate for a recreational activity. Participation rates are usually expressed as a number of activity days per year for the studied population.

One method to establish these rates is by studying a representative sample of the population. This can be accomplished by conducting home interviews for a sample of the entire population, where the respondents are asked how often they take part in a certain activity. Another way to obtain the sample is by questioning people on the site - for example, people on the beach. Results from these two surveying techniques are not easily comparable, as is illustrated by the following example.

Assume that a home survey shows that 25 percent of the population visits the beach once a year, 25 percent twice a year, 25 percent three times a year and 25 percent four times a year. Another survey, taken on the beaches, yields 10 percent, 20 percent, 20 percent and 40 percent, respectively, because the probability is greater of encountering a person who visits the beach more frequently.

Site surveys are also difficult to compare with each other because the site selection may differ. If beach

visitors are interviewed at Sandy Hook, the findings might be different than if people on all New Jersey beaches are interviewed.

The time of the survey is also an important factor. The U.S. Bureau of Outdoor Recreation (1973) estimated an increase in the demand for outdoor swimming of 13 percent between 1972 and 1978. Beach activities also show seasonal variations, with most of the activity concentrated during the summer months (Ocean County, 1979 and the Eagleton Poll, 1981). Furthermore, outdoor activities are highly dependent on the weather; a dry and hot summer will attract more beach-goers than a cool and rainy summer. Exhibit 3-1 below shows yearly attendance figures for some parks in the Tri-State area from 1963 to 1973.

Attendance figures can vary as much as 15 percent between two consecutive years, which makes it difficult to detect long-term increases of a few percent each year. It is also interesting to note that the New Jersey beach attendance increase is very low in comparison with the increase in attendance experienced within the National Park System.

For the New Jersey beaches, attendance increased only 10 percent between 1964 and 1973. In the National Park System, the increase was 93 percent. In Cape Cod alone, the increase was more than 150 percent. This suggests that crowding of the beaches close to population centers will force people, who can afford higher travel costs, to seek their recreational experience at a more distant location. Such a hypothesis is

EXHIBIT 3 - 1

Attendance at Various Parks, 1963-1973

Park	Number (000's)	Percent of 1973 Numbers									
	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Total National Park System	216,000	98.2	98.0	79.8	76.0	70.0	64.8	61.7	56.3	51.7	47.6
Cape Cod	4,743	104.0	88.3	84.0	85.0	73.3	64.1	58.7	48.6	39.0	--
Cape Hatteras	1,711	104.0	99.1	74.6	66.7	63.9	58.3	66.2	63.6	62.5	51.0
Robert Moses	2,756	88.6	91.4	86.6	78.5	73.1	63.3	73.5	61.7	46.5	--
Jones Beach	3,393	87.0	87.8	97.2	88.3	92.8	84.4	92.1	90.0	86.5	--
Sandy Hook	468	113.9	124.4	174.3	143.6	115.6	146.8	154.5	116.0	106.4	87.8
N.J. Beaches	3,353	98.6	87.4	103.0	97.6	99.2	98.4	103.0	91.7	90.4	--

Source: Kuperstein, 1978.

supported by the findings of Heatwole and West (1980). Among the visitors to Coney Island, less than 5 percent have incomes over $24,000. At Jones Beach, which is less accessible for people from the New York area, more than 22 percent of visitors claimed incomes higher than $24,000. More significantly, Jones Beach was chosen by 22.5 percent for its clean overall physical environment. Coney Island was chosen by 47.9 percent because of easy accessibility. However, the ideal beach characteristics cited by Coney Island visitors were "clean overall physical environment" (47.6 percent) and clean sand (11.6 percent). The corresponding figures among the Jones Beach visitors were 22.5 percent and 3.4 percent. Surprisingly, easy accessibility was considered by 19 percent to be an ideal beach characteristic among Jones Beach visitors. (Heatwole and West 1980) Thus, there seems to be a discrepancy between what type of beach people would visit ideally and the beach they choose in reality. This conclusion also was drawn by Cutter, Nordstrom and Kucma in their study of New Jersey beaches. Cleanliness and a natural environment are the most important "ideal" beach characteristics, but beaches are selected based on a perception of convenience. (Cutter, Nordstrom and Kucma 1979)

In all, it is difficult to compare beach-related surveys. The variety is displayed in the chart below in Exhibit 3-2. Of the 10 reports, two are based on home interviews, five surveys were conducted on the beaches, and three en route from the beaches--for example, on trains.

EXHIBIT 3 - 2

Various Surveys Done

Study	Year of Survey	Type of Survey[a] No. of Records	Sample Group	Data: Origin/ Dest.	Data: Modal Split	Data: Socio-economic
National Park Service Gateway Transportation Access Study (1975)	1974	Site Questionnaires[b] n=2200	Visitors at Gateway Parks	Yes	Yes	Yes
National Park Service Gateway Transportation Study Assessed Alternatives (1976)	1975	License Plate Survey n=1000	Visitors at Sandy Hook	Yes	No	No
New Jersey DEP. Statewide Comprehensive Outdoor Recreation Plan (1977)	1976	Home interviews and some site interviews n=2600	Residents from N.J. and bordering counties in Pa. and N.Y.	No	No	Yes
New York Sea Grant Heatwole and West (1980)	1977	Site interviews on N.Y. beaches n=2900	Visitors at beaches in Staten Island and Long Island	Yes	Yes	Yes
New Jersey DEP New Jersey 1977 Beach Shuttle Experiment (1979)	1977	Site interviews n=3000	Users of the Shuttle Bus Service for Island Beach	Yes	No	No
Ocean County New Jerseyans' vacations A Statewide Survey by The Eagleton Poll 1979	1978	Home Interviews n=1000	Residents of New Jersey	No	No	Yes

EXHIBIT 3 - 2 (continued)

Study	Year of Survey	Type of Survey No. of Records[a]	Sample Group	Data: Origin/ Dest.	Data: Modal Split	Data: Socio-economic
Proceedings, The Coastal Society, (Nov. 1979) Cutler, Nordstrom, Kucma	1979	Site interviews n=600	Visitors at N.J. Sample Beaches	Yes	Yes	Yes
New Jersey Department of Labor and Industry by the Eagleton Poll (1981)	1979-1980	Site Interviews n=2550	Visitors at N.J. attractions	Yes	No	Yes
Monmouth County Tourism Survey (1980)	1980	Site Interviews n=700	Visitors at Monmouth County beaches	Yes	Yes	Yes
N.J. Transit Summer Service '80' Project Evaluation (1981)	1980	Questionnaires[b] n=1050	Weekend riders on North Jersey Coast Line	Yes	No	Yes

a. Numbers rounded

b. Questionnaires filled out by the respondent and handed back at the exit.

Transportation Modal Choice to the Beach

Origins and Destinations

Eight surveys included questions about origins and destinations In Addition, the SCORP study calculated origin/destination partly based on site interviews. Unfortunately, with the exception of the National Park System Studies, the results are given on a state or sub-state level. Access to the raw data from the Eagleton Poll (1981) made it possible to create subsets of data, which included only beach visitors in the study area. This Eagleton Study is Report 6 in Exhibit 3-3 and is referred to as "Eagleton (beach)," consisting of 387 interviews. The results from the New Jersey Department of Environmental Protection (1977) and the New Jersey Transit (1981) studies will be discussed under "Transit Options."

From the other studies in Exhibit 3-3, more conclusions can be drawn. Most beach visitors are New Jersey residents. Of the 20 to 25 percent who are from out-of-state, the majority are from New York and Pennsylvania. Ocean County beaches receive more visitors from Pennsylvania than do Monmouth County beaches. Very few visitors are from the southern section of New Jersey. Not surprisingly, South Jersey residents primarily use beaches in Atlantic and Cape May counties (Eagleton Poll, 1981).

A comparison on a county level is shown in Exhibit 3-4. Counties with a large number of beach-goers are Bergen, Essex, Middlesex, Monmouth and Union counties. However, according to the Monmouth County report (1980), the origins differ from one beach to another. A well-known beach resort such as

EXHIBIT 3-3

Origin and Destination Table for Beaches in New Jersey

Report	Origin (percent)							Destination
	New Jersey				Outside New Jersey			
	Total	North [a]	Central [b]	South [c]	Total	New York	Pennsylvania	
National Park Service								
Sandy Hook 1974	84	37	46	1	11	7	---	Sandy Hook
Sandy Hook 1975	90	39	47	2	10	5	---	Sandy Hook
New Jersey DEP [d]								
SCORP Statewide [d]	55	---	---	---	45	---	---	N.J. Beaches
SCORP Monmouth/Ocean	59	---	---	---	41	---	---	Monmouth & Ocean Counties
Island Beach	87	---	---	---	13	---	---	N.J. Coastline
New Jersey Transit	47	---	---	---	53	53	---	N.J. Coastline
Monmouth County	78	---	---	---	22	15	3	Monmouth County Beaches
New Jersey DLI and Eagleton Institute								
North Shore	75	34	26	15	25	11	12	Monmouth & Ocean Co. Attractions
Beach								
Total	77	35	35	8	23	9	10	Monmouth/Ocean Co. Beaches
Ocean County	72	33	27	12	28	9	13	Ocean Co. Beaches
Monmouth County	83	30	46	7	17	8	6	Monmouth Co. Beaches

Sources: Eagleton Poll,1981; Monmouth County,1980; National Park Service,1975,1976; S.C.O.R.P.,1977; N.J.Dept. of Environmental Protection,1981; New Jersey Transit,1981.

Footnotes:

a. Bergen,Essex,Hudson,Morris,Passaic,Sussex,Union,Warren Counties
b. Hunterdon,Mercer,Middlesex,Monmouth,Somerset Counties
c. Atlantic,Burlington,Camden,Cape May,Cumberland,Gloucester,Ocean,Salem Counties
d. Salt water swimming was the activity surveyed.

EXHIBIT 3-4

Origin of New Jersey Visitors to Beach Locations by County

County of Origin	Destination[a] (percent) Sandy Hook I	Sandy Hook II	Monmouth County I	Monmouth County II	Ocean County
Atlantic	0	0	**	0	0
Bergen	7	5	9	5	10
Burlington	0	0	**	0	3
Camden	1	0	**	0	2
Cape May	0	0	**	0	0
Cumberland	0	0	**	1	0
Essex	10	9	14	11	4
Gloucester	0	0	**	0	0
Hudson	4	5	**	2	5
Hunterdon	0	0	**	1	1
Mercer	1	0	**	5	7
Middlesex	15	16	16	15	13
Monmouth	27	28	27	20	4
Morris	4	2	**	2	3
Ocean	1	0	**	5	6
Passaic	4	3	**	3	4
Salem	0	0	**	1	0
Somerset	2	2	**	5	2
Sussex	0	0	**	0	0
Union	10	12	14	8	8
Warren	0	0	**	0	1

Sources: Sandy Hook I -- National Park Service, 1976
Sandy Hook II -- National Park Service, 1975
Monmouth County I -- Monmouth County, 1980
Monmouth County II -- Eagleton Poll, 1981
Ocean County -- Eagleton Poll, 1981

Footnotes:
a. The "**" indicates that the county was not included in the survey.

Asbury Park attracts 35 percent of all visitors from out-of state, while Bradley Beach attracts only 15 percent of non-state visitors.

Therefore, results will depend largely on the sample site selection. Uncertainty about the data makes it difficult to draw conclusions. Nonetheless, some hypotheses can be formulated:

1. Well-know beaches attract a higher percentage of far-away visitors.
2. People living close to the beach will select the closest beach to a higher degree than people living far from the beach.
3. The farther a person lives from the beach, the less likely he is to visit the beach.

If these hypotheses are true, they have implications for policy decisions affecting the shore. For example, a rapid population growth in Monmouth and Ocean counties will result in more local visitors on beaches within the study area. Visitors from other counties will travel more frequently to reach less crowded beaches in southern New Jersey. The costs and benefits of this increase in travel could be compared with expanding beach areas through dredging and filling in new sand.

The results for the SCORP study (1977) are not supported by the on-site surveys. The percentage of out-of-state visitors is expected to be lower because the SCORP survey included southern New Jersey where the proportion of out-of-state

visitors to major attractions is about 50 percent during the summer months (Eagleton Poll, 1981).

However, SCORP (1977) also estimated demand by county and the given estimate of about 40 percent out-of-state visitors in Monmouth and Ocean counties is twice as much as suggested by the other reviewed surveys. The error stems from the methodology, which employs participation rates based on state averages. In areas where real participation rates are low, the figures become inflated. In effect, the proportion of visitors from far away will be greatly exaggerated if this type of model is used. The SCORP study (1977) covered a lot of recreational activities where this methodology is appropriate, but for activities located at a few discrete points, the chance of error is greater.

Mode of Travel

Four of the surveys report mode of travel. Of these, the National Park System study of Sandy Hook (1975) does not give useable data about modes other than the automobile because the modal split was found to be 99 percent in favor of the automobile. The automobile is confirmed as the primary mode of travel in both the Monmouth County study (1980) and by Heatwole and West (1980). Exhibit 3-5 below gives the modal split for some beaches in the region. For beaches in New Jersey, the auto is the dominant mode of travel. The only exception in this case is Asbury Park, where 13 percent arrive by train. This figure was checked with traffic counts on the North Jersey Coast Line and origin/destination tables from the

EXHIBIT 3 - 5

Mode of Travel to Beaches in New York and New Jersey

Beach	Mode (Percent)								
	Walk	Train	Subway	Bicycle	Bus	Automobile	Other	Non-Automobile	Total
Riis Park					14.9[d]	84[a]			16
Great Kills					2.2[d]	93[a]			7
Jamaica Bay					3.2[d]	90[a]			10
Sandy Hook					0.0[a]	98[a]			.2
Coney Island[b]	14.1		49.0	0.9	7.3	26.7	2.0		73.3
Orchard Beach[b]	3.1		3.9	1.6	28.7	53.8	8.9		46.2
Riis Park[b]	1.7		1.5	0.3	9.0	80.2	7.3		19.8
Great Kills[b]	1.9		0.0	4.3	10.9	82.6	0.3		17.4
Jones Beach[b]	0.6		0.1	0.6	3.4	92.7	2.6		7.3
Asbury Park[b]	N/A	13.0	.0	N/A	7.0	74.0	N/A		26.0
Avon[c]	N/A	3.0	0.0	N/A	N/A	96.0	N/A		4.0
Belmar[c]	N/A	1.0	0.0	0.0	0.0	98.5	0.0		1.5
Long Branch[c]	0.0	0.0	0.0	0.0	0.0	100.0	0.0		0.0
Manasquan[c]	N/A	N/A	0.0	N/A	N/A	97.0	N/A		3.0
Sandy Hook[c]	N/A	0.0	0.0	N/A	N/A	95.0	N/A		5.0
Spring Lake[c]	N/A	N/A	0.0	N/A	N/A	88.0	N/A		12.0

Sources: a: NPS 1975; b: Heatwole and West 1980; c: Monmouth County 1980;
d: New York Department of City Planning 1979; N/A: Not Available

New Jersey Transit 1981 survey. An estimated 250 people take the train to Asbury Park on a nice weekend day. This is 12.5 percent of the estimated peak day allocation on the Asbury Park beach, which corresponds well with the measured 13 percent above.

Public transit as a mode of travel is more common on the New York beaches. Forty-nine percent of visitors to Coney Island arrived on the subway, while 29 percent of visitors to Orchard Beach came by bus. These figures indicate that the availability of alternatives to the automobile will affect the modal split. If public transit is available to the beach, people who do not have access to a car are able to go there. But not many car owners will switch mode even if public transit becomes available.

The National Park System 1976 study revealed that only one percent of the people who had access to a car chose another mode of transportation when traveling to Jacob Riis Park, where 15 percent of visitors arrive by public transit. For Sandy Hook, the same figure was .3 percent. Therefore, it must be considered unlikely that increased transit service to the New Jersey beaches will affect the people already going there by car. Instead, it has the potential of making it possible for people who now are denied access to the beaches to get there. Of course, if such a program were carried out on a grand scale, a secondary effect could be that auto users may change their travel pattern to avoid beaches served by public transit and subsequently become crowded.

The New Jersey Transit survey (1981) concluded that

among riders taking advantage of the half-fare program on weekends, the majority were from New York. Because transit options mostly appeal to people who do not have access to a car, this is no surprise. According to the survey, only one out of five persons interviewed on the train used the car as a primary daily transportation mode. (How many of those had access to a car during the day of the interview is unknown.) The North Jersey Coast Line originates in New York and passes through Hudson, Essex, Union, Middlesex, Monmouth, and Ocean counties. In New Jersey, the auto ownership is higher than in New York City. While more than half of the households in New York do not own an automobile, only one out of 10 households in the suburban ring of the metropolitan area lack a car. (U.S. Bureau of the Census 1972 in Brail and Hughes, 1977) The effect of these differences is that the transit market is actually larger in Manhattan than in the New Jersey counties, despite a smaller population.

In 1970, more than 600,000 employees living in Manhattan traveled to work without a car. In Hudson, Essex, Union and Middlesex counties combined, the figure was no more than 360,000. (Tri-State Regional Commission 1973 in Brail and Hughes 1977)

The "Summer '80 Service" on the North Jersey Coast Line did attract a number of passengers who had access to a car. About 20 percent of those riding had a car available. This figure is consistent with the 1975 study by the National Park Service of the Gateway facilities. However, the percent of total visitors who took the train is small. In Asbury Park, for example, 12.5 percent of the visitors arrived by train. This means that less than 3 percent of all visitors (20 percent of 12.5 percent) chose rail when a car was available.

Socioeconomic Data of Beach Visitors

Socioeconomic data have been collected in five studies of New Jersey beaches. Those interviewed were asked such things as profession, education, income, race, sex and age. For the purpose of comparing the studies, the income and age variables have been selected. Again, the difficulties in making comparisons must be emphasized. The interviews were conducted at different locations, at different times, and by different individuals. In addition, selected income groups and age groups vary. The income variable is further complicated by adjustments to income as a result of inflation. Therefore, income groups were adjusted and expressed in 1980 dollars. An income adjustment approach was developed from Current Population Reports by using growth factors of median household income. The following figures were used:

From 1974 to 1980	growth factor	1.715
From 1975 to 1980	growth factor	1.594
From 1976 to 1980	growth factor	1.469
From 1977 to 1980	growth factor	1.350

From 1978 to 1980 growth factor 1.234

From 1979 to 1980 growth factor 1.117

The percentage of beach visitors for various income groups is expressed in a cumulative graph (Exhibit 3-6), which offers a comparison of different income groups. The cumulative graph can be used for clarification purposes in which the sample curve is compared to a set of ideal or normative graphs. For example, in geology, cumulative sieve curves form the basis for classifying different types of soils.

In our case, we have used the updated New Jersey income distribution as a norm. Thus, the graphs should be interpreted according to Exhibit 3-7. It can be clearly seen that beach goers in general are more affluent than the New Jersey population. The only exception to this overall assessment is the Monmouth County study where the survey shows a cut-off of income at about $25,000 and a greater proportion of visitors than expected from state-wide averages who are above the line in the $15,000 to $25,000 range.

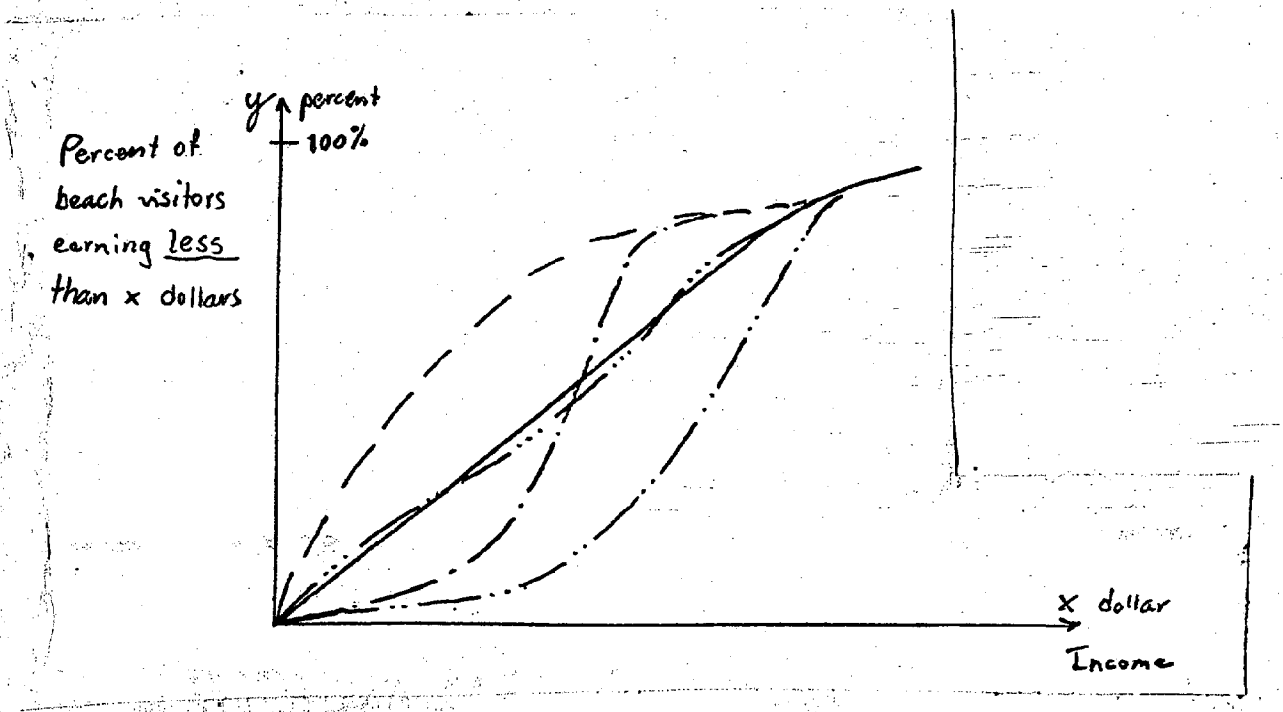
Of course, the surveys do not cover the same beaches making the comparisons difficult. Nevertheless, the exhibit does show that low income households are less likely to visit the beach than other income groups. Both Eagleton and the Sandy Hook surveys confirm this finding, as do the research of Heatwole and West (1980) and Flaschbart (1978).

The age of visitors was surveyed also. Exhibit 3-8 shows the distribution of ages and can be interpreted the same

EXHIBIT 3-6

A Generalized Relationship

between Income and Use



Beaches favored by:

- Low-income groups
- Middle-income groups
- High-income groups
- All groups
- New Jersey income distribution

EXHIBIT 3-7

Income Distribution, New Jersey Beaches

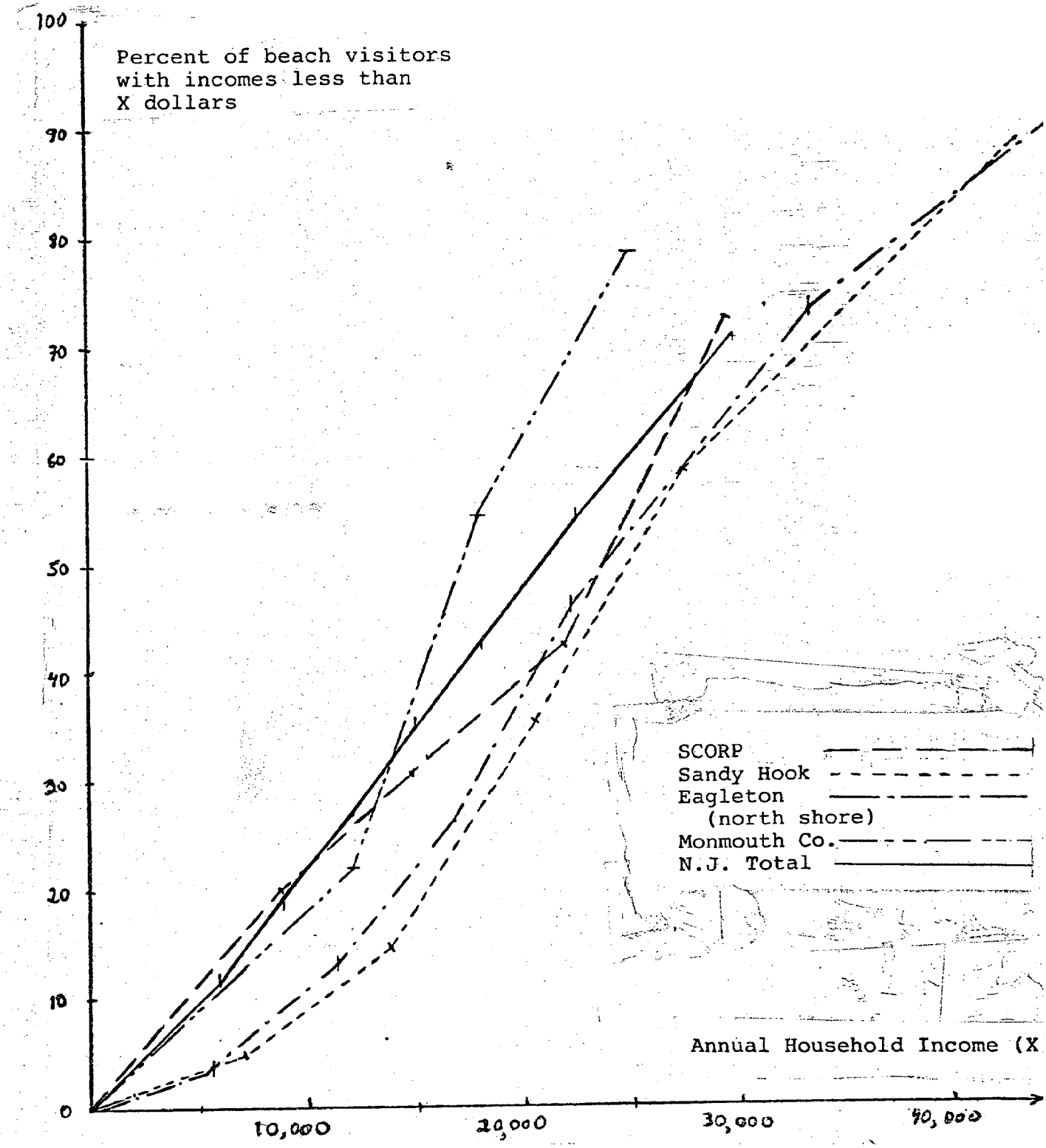
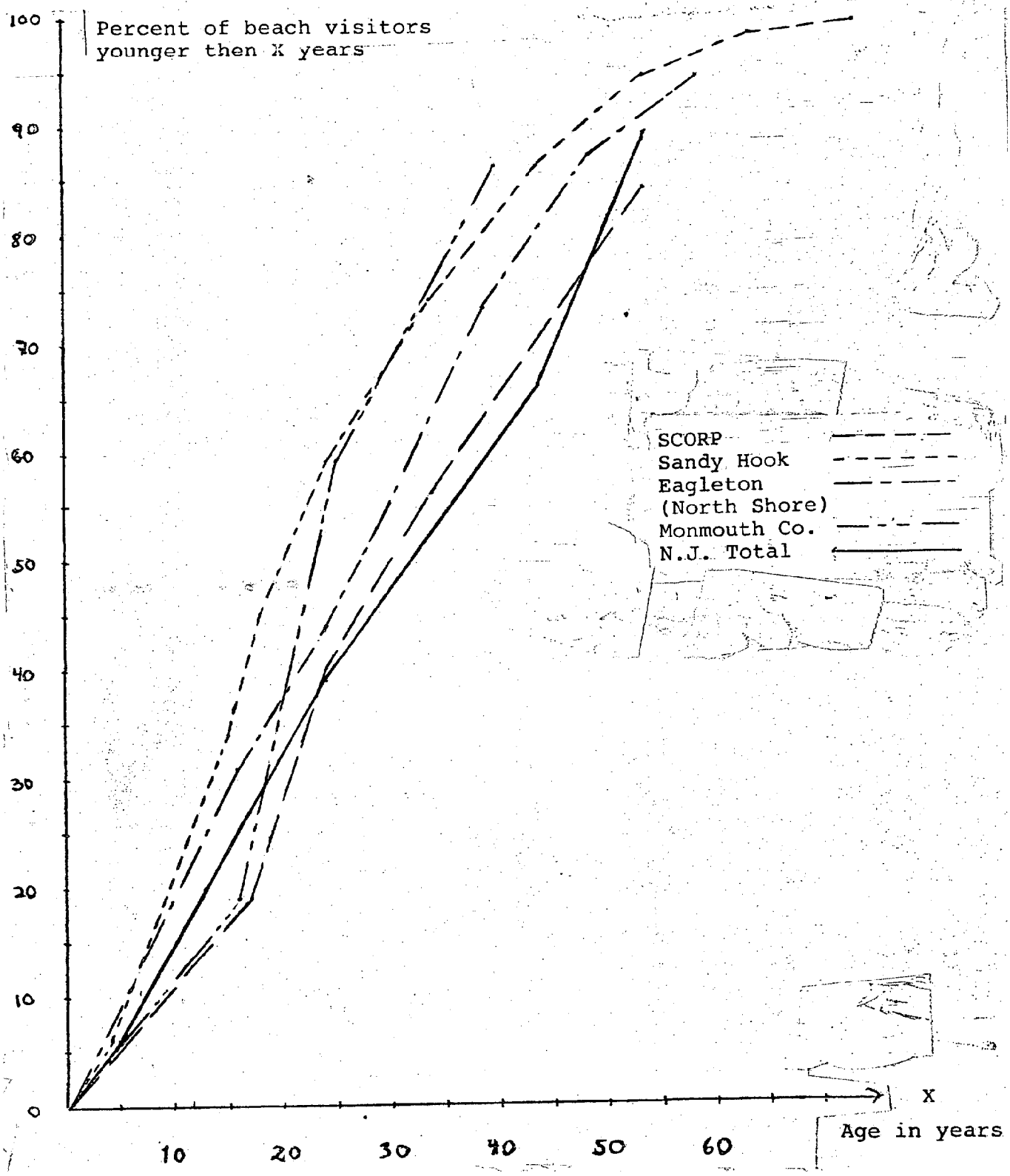


EXHIBIT 3-8

Age Distribution, New Jersey Beaches



way as the cumulative income graph. It is evident that young people use the beach more frequently than older persons. However, the median age varies from about 20 years in the Monmouth County 1980 study to about 30 years in the SCORP (1977) study. Considering the fact that the median age is higher among visitors to the North Shore than to Cape May, this difference is not explained by differences in sample sites. Instead, it proves the importance of careful sampling in order to obtain unbiased data.

CHAPTER FOUR

A Historical Perspective

Introduction

New Jersey, one of the earliest settled colonies in America, has developed into a prosperous, attractive, growing state along the eastern seaboard. Its history reveals a detailed and interesting past which became the foundations of New Jersey's present. Tourism along the New Jersey shore area has become one of the most prosperous industries in the state. Several shore resorts developed early in New Jersey's history and remain today. Significant developments in transportation have had tremendous effects on the evolution of these Jersey shore resorts and play major roles in their future.

This chapter discusses the development of the northern New Jersey shore area and how this development was affected by various transportation systems. The chapter is presented in two parts. First, a brief history of Ocean and Monmouth Counties is discussed, giving an interesting overview of how various communities in these counties developed. Secondly, a history of the transportation systems in Ocean and Monmouth Counties is presented, pointing out how various modes of travel affected development patterns in these counties.

The Development of the Area

The first settlements along the North Jersey shore were located on the Highlands above the Raritan Bay. Even with its

rugged topography, the Highlands had permanent settlers by 1664 and a year later 100 families lived on or near the heights. On the other side of the Bay streams of vessels passing Sandy Hook made a lighthouse imperative. Work started in 1792, and the light flashed seaward for the first time on June 11, 1864. Sandy Hook's exposed position also made it a logical spot for military emplacements. Construction of Fort Hancock was started there before the Civil War and completed by 1893 when the government began testing smokeless powder on Sandy Hook.

Just as the Indians had done for centuries, the first colonial vacationers to the Jersey Shore came to hunt and fish. However, the shore soon became a place to go to relax during the summer, and by 1765 a boarding house had been opened on Tucker's Beach, south of Long Beach Island. Resort towns grew rapidly as the railroad moved down the coast. The New York and Long Branch Railroad changed Monmouth County's character from a distant place for a selected few to an area accessible to nearly all.

Ocean County's seaside resorts also sprung up beside the railroads in the 1870's. Point Pleasant Land Company started selling lots in 1870, the same year that a group of Philadelphia Quakers founded Beach Haven. Seaside Park began as a Baptist religious resort in 1876 and a Methodist camp meeting came to Island Heights in 1878. Bay Head, started in 1883, became very fashionable, luring bathers from as far away as Washington. A railroad built on Long Beach Island in 1885 provided the potential for resorts strung along that long, narrow island.

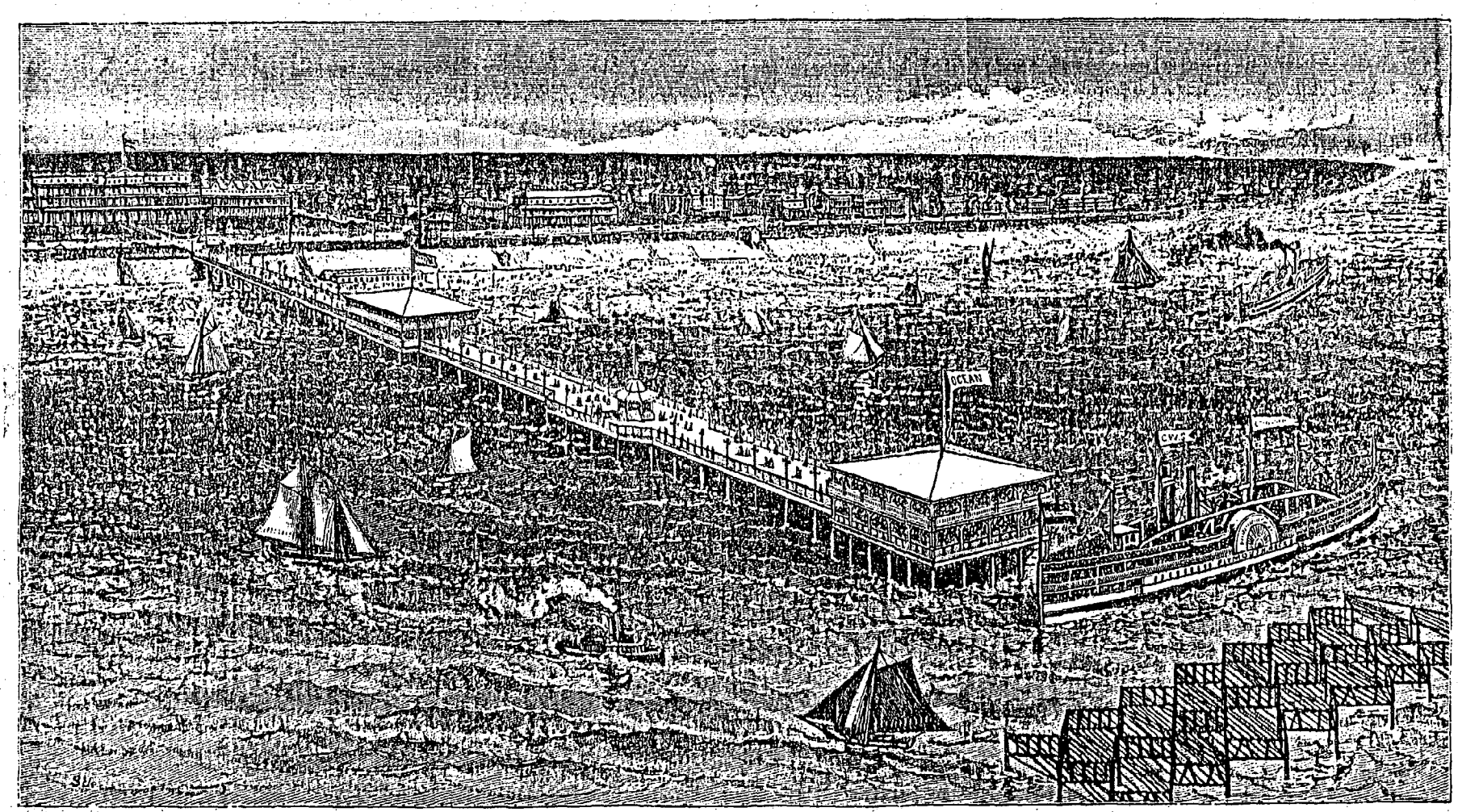
Founding fathers had different reasons for establishing their resort towns. Some wanted amusement centers with large boardwalks and extensive commercial development; others wanted religious retreats. Still other resort communities were developed as exclusive havens for the wealthy.

The first, and for many years the finest, amusement center along the North Jersey shore was Long Branch, which attracted its first summer vacationers in 1788 and grew steadily in stature until 1850. In New Jersey, only Cape May could claim to be comparable as a resort. By the 1860's, Long Branch was recognized as American's foremost resort. Exhibit 4-1 shows a drawing of Long Branch in 1872. Fashionable visitors flocked to the hotels and private estates. Ulysses S. Grant established his summer capital here in 1896, beginning a tradition that brought six succeeding presidents to the area for their summer holidays. It was to Long Branch that President James A. Garfield was brought after being shot in Washington in July, 1881, and it was here that he died two months later.

In the 1890's many of Long Branch's wealthy vacationers began their exodus outward to nearby developing communities. They now preferred to vacation in the Elberon and West End sections of the city, and in Sea Bright, Monmouth Beach, Allenhurst, and Deal south of the city. Still, Long Branch fought back during the 1920's when a surge of prosperity rolled up and down the entire Jersey Shore. By then the clientele was increasingly middle-class.

EXHIBIT 4-1

A Scene of Long Branch in 1879



(Moss, 1966)

Down the coast in Ocean County, the advent of the automobile resulted in the establishment of Seaside Heights as an amusement center. In 1909 the first road started southward from Point Pleasant; and by 1911 the thin highway travelled through Seaside Heights and reached Seaside Park. Two years later a long wooden bridge carried automobile traffic across Barnegat Bay to Seaside Heights from Toms River.

President Calvin Coolidge dedicated the new Delaware River Bridge between Camden and Philadelphia in 1926. The span, then the longest suspension bridge in the world, was seen as a short cut to South Jersey prosperity. Property along the shore shot up in price as soon as work began on the bridge, as everyone waited for the stream of vacationers from Philadelphia to roll across the new bridge. The five Cummings brothers from Philadelphia took advantage of this improved access to the shore by choosing to develop the exact spot where Cranberry Inlet has ceased to flow a century before. Along with the Manhasset Realty Company, the Cummings developed Seaside Heights, converting acres of moss-covered dunes into building lots just in time to take advantage of the new roads and bridge. Seaside Heights eventually outstripped all its peninsula neighbors in size, largely because the bridge from Toms River conveniently landed Philadelphian motorists in town before they had a chance to look elsewhere. Seaside Heights also proved the value of a commercial boardwalk, frowned on in most other Bay Head-to-Seaside Park towns.

There were towns in both Monmouth County and Ocean County which were established as religious retreats. The best known of these resorts is Ocean Grove. The Grove has never deviated from its original aim to provide a quiet community where those who seek Methodist inspiration can find it (Cunningham, 1958: 56). The barrenness of the North Shore attracted the Ocean Grove Camp Meeting Association in 1896. Except for Long Branch, not more than 100 persons lived on the beaches between Shark River and Atlantic Highlands. One family lived in what is now all of Ocean Grove and Asbury Park. Ocean Grove grew rapidly. By 1891 as many as 6,000 people attended a single camp meeting service. Two years later the Reverend Elwood Stokes broke grounds for the Ocean Grove Auditorium.

The Grove never clashed openly with Long Branch. That remained for one of its sons, James A. Bradley, a self-made New York brush manufacturer, who in 1870 came for a rest at Ocean Grove and wound up buying 500 acres of briars on the north side of Wesley Lake. Bradley named his wretched and uninhabited wilderness Asbury Park, in honor of Bishop Francis Asbury, first Methodist bishop in the United States (Cunningham, 1958:53). Bradley immediately took up battle with Long Branch. He also fought to keep Asbury Park exactly as he planned. However, when the city threatened condemnation in 1903 he sold his holdings east of Ocean Avenue. The city administration then pushed to develop its beachfront by improving its boardwalk, and in 1905 built a boardwalk arcade.

Railroad statistics for Asbury Park and Ocean Grove in 1883 illustrated how the area had grown. As many as 103 trains ran daily, bringing in as many as 8,000 people in a single day, and 600,000 people for the summer. This is even more remarkable in view of the fact that trains were not permitted to stop on Sundays in either place.

Atlantic Highlands is another shore resort community which was established as a camp meeting town. Originally named Bay View, Atlantic Highlands was laid out by the Leonard family (for whom Leonardo is named) in 1880. Atlantic Highlands, said the founders, existed for lofty reasons unlike those excursion resorts, "which were largely beer gardens, frequented by roughs and pickpockets." One of the Leonards said in 1881 that the Highlands camp meeting would be on such a scale as to "throw Ocean Grove out of business" (Cunningham, 1958:43). Atlantic Highlands never did throw Ocean Grove out of business. Even after the New York and Atlantic Highlands Railroad was built in 1883, few came to Atlantic Highlands for its camp meeting. Clamming became the main commercial activity.

Happy times came to the Bay area during the first two decades of the twentieth century. The bay resorts, paced by Keansburg, found vacationers much more profitable than clams. Some towns built boardwalks, some enlarged their beaches, and some inaugurated promotional activities. During Prohibition some local clammers turned businessmen disagreed with the law so violently that they decided to

bring in illicit rum as their protest. This led to the establishment of the Atlantic Highlands Association, formed in 1923, to put an end to "bootleggers, gangsters, and gunmen" (Cunningham, 1958:44).

In Ocean County, Seaside Park was established in 1870 by members of the Baptist Church. The Baptist called Seaside Park, "a place for rest and ease at moderate expense and free from the blighting influences of immorality, drunkenness, and Sabbath discretion" (Cunningham, 1958:77). Not as many people came to Seaside Park as the Baptists had hoped, and the camp meeting idea died. However, the foundations of a quiet residential community stood firm, and even today Seaside Park remains relativly sedate.

Many of the rich who settled on the Morris and Somerset hills turned to the Jersey Shore to escape the summer heat. They built fine homes at Deal, Elberon, Rumson, Spring Lake, and at the other shore communities which became exclusive retreats for the wealthy. Millions of dollars were poured into huge homes between 1890 and 1910. Mansions were constructed like Solomon P. Guggenheim's 100-room "Aladdin's Palace," James A. Hearn's one million dollar scale reproduction of Shakespeare's home at Stratford-on-Avon, Nellie Fern Jones' Deal showplace, which later became Frank Hague's home, and Arthur Hargan's Deal Conservatoire (Cunningham, 1958:54).

Sea Bright gained fame in a different way. An 1889

guidebook called it, "one of the gayest resorts on the coast." Its Lawn Tennis and Cricket Club, sporting the colors of the Zingaree Cricket Club of England, started its invitational tennis tournaments in 1884, and continued except for two wars until 1949 (Cunningham, 1958:53-54).

In Ocean County, the wealthy began settling at Bay Head and Mantoloking in the late 1870's. Mantoloking was established in 1878 by Captain John Arnold and his Sea-Shore Land and Improvement Company. Captain Arnold knew whom he wanted to attract. He laid over the entire tract with imported inland soil to grow grass. The project cost money; it also attracted money. The exclusive seed of Mantoloking was sown in the first load of topsoil dumped on the sand (Cunningham, 1958:78). Princetonians established Bay Head in 1879, and it quickly became a summer vacation place for many of Princeton University's faculty.

While new resort communities grew along the Jersey Coast, what may have been the greatest shore development of all never got off the drawing board. An announcement in 1926 said that buyers for Henry Phipps, partner of Andrew Carnegie in Pittsburgh steel ventures, had purchased everything from Seaside Park to Barnegat Inlet. The plan was to construct an exclusive private development on Island Beach. However, the 1929 business crash doomed the projected Island Beach development. In 1930 Mr. Phipps died, at 90 years of age and as the Depression continued only a few squatters called

Island Beach home. The State had talked of buying Island Beach for approximately 30 years without concrete action. Finally, in 1952 $2,730,000 of state money snatched Island Beach intact out of the grasp of a real estate company planning a large-scale venture similar to what had been planned in 1926.

Early Travel

As New Jersey developed during the colonial period, several "post-roads" were cleared through the State, providing direct routes to the dominant commercial and cultural colonies of New York and Philadelphia. Horse and wagon, as well as stagecoaches, were the major forms of transportation along these trails. These roadways mainly served settlements in the western portion of the state and did not extend to the Jersey shore area.

As a result, villages that were established along the Jersey shore developed into "self-contained" communities. However, as agricultural production grew, transportation links to the western portion of New Jersey as well as links to other shore settlements arose.

Stagecoach lines were established during the 1750's between Sandy Hook and communities in present day Camden, Burlington, and Ocean Counties. The "Jersey wagon," a covered wagon capable of carrying 12 people plus luggage and drawn by 4 to 6 horses, was the dominant form of transportation for individual travelers. Larger wagons carried freight.

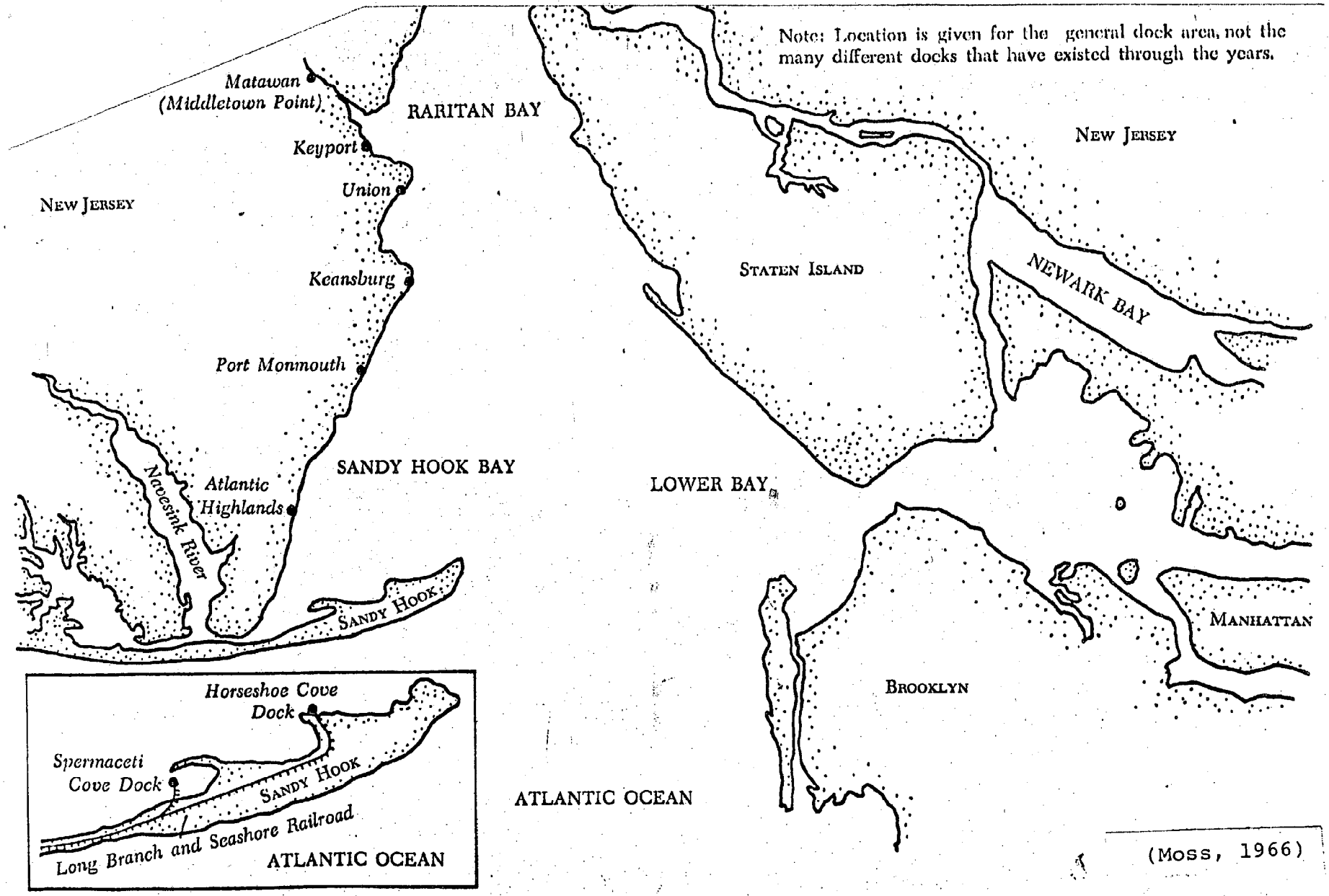
Stage lines were expanded in the late 1790's and early 1800's reaching Tuckerton, Toms River, Freehold, and Long Branch. In 1823, a stage line was established to accommodate vacationers to Manahawkin. These vacationers were mainly hunters whom found grouse plentiful in Manahawkin and frequently revisited the area.

Parts of Sandy Hook, Keyport, and Port Monmouth were final destinations of the early stage lines. There, sail boats, later replaced by steamboats, completed the journey to New York by sailing across Raritan Bay. The linking of overland travel by wagon and oversea travel by sail boats across the Bay was the dominate form of transportation in the area until the coming of the railroad.

The steamboat was a particularly impressive transportation mode during the 19th century in the Monmouth County area. After the Civil War the steamboats moved from freight to predominantly carrying passengers. In Exhibit 4-2 the major docking areas for steamboats are detailed. According to George R. Moss (1966), more than 125 steamboats were in service in the waters touching Monmouth County. One major trip was the weekend excursions from New York to Long Branch (Exhibit 4-3). Boats traveled from Manhattan through New York Bay, across Raritan Bay and the Atlantic Ocean, to Long Branch. The Winslow Homer scene (Exhibit 4-4) captures the elegance of the Long Branch visitors. The famous Ocean Pier lasted only two years, from 1879 to 1881, and was followed by the Iron

EXHIBIT 4-2

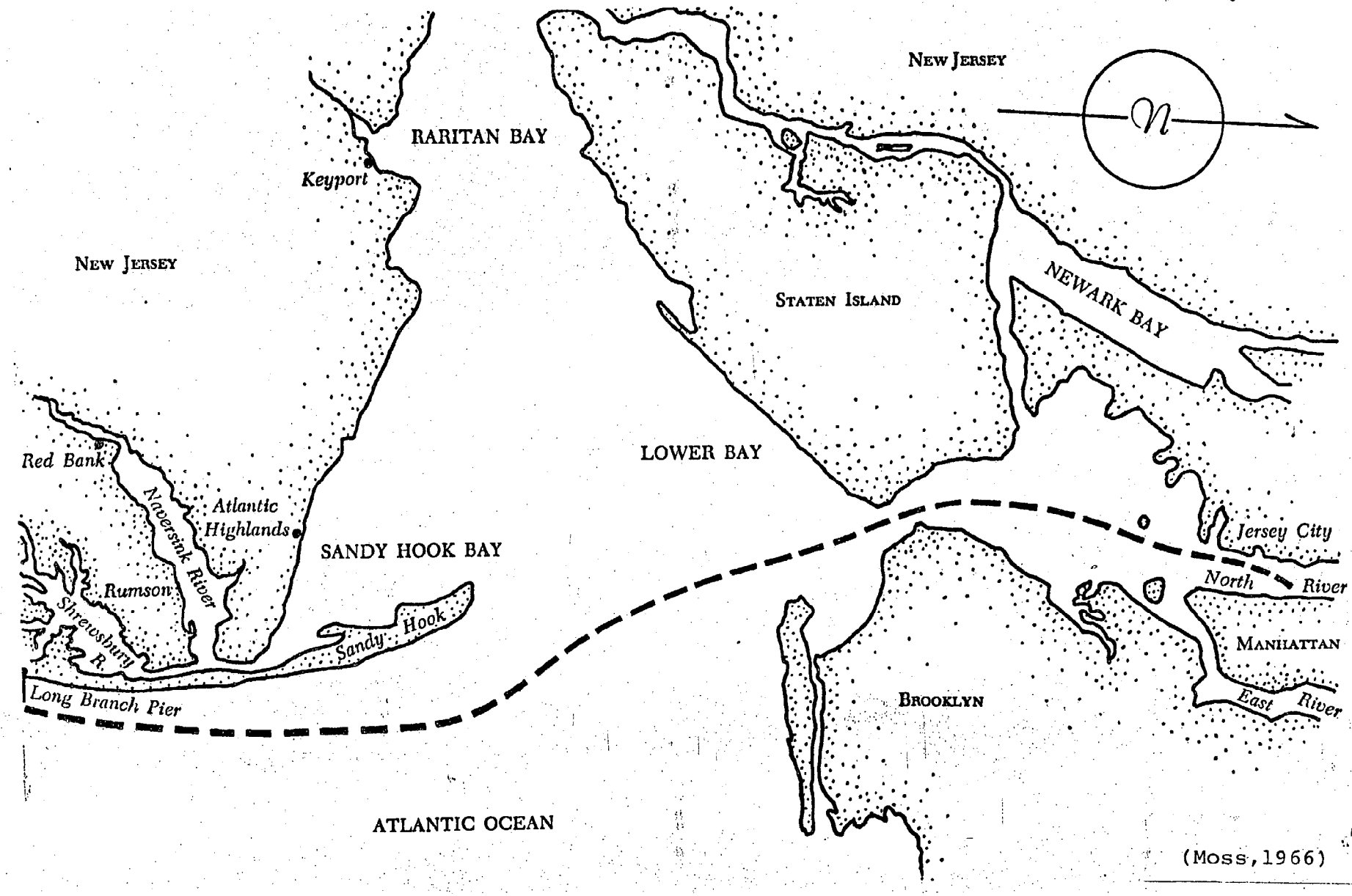
Major Steamboat Landings in Monmouth County



(Moss, 1966)

EXHIBIT 4-3

The Outside Run from New York to Long Branch



(Moss,1966)

EXHIBIT 4-4

A Scene of Long Branch by Winslow Homer

(Moss, 1966)

Pier (1881-1908). Exhibit 4-5 shows the Ocean Pier and Exhibit 4-6 outlines the sometimes unhappy consequences of an ocean voyage. In Exhibit 4-7 the unloading of an excursion steamer is detailed. Exhibit 4-8 shows life below decks.

Railroads

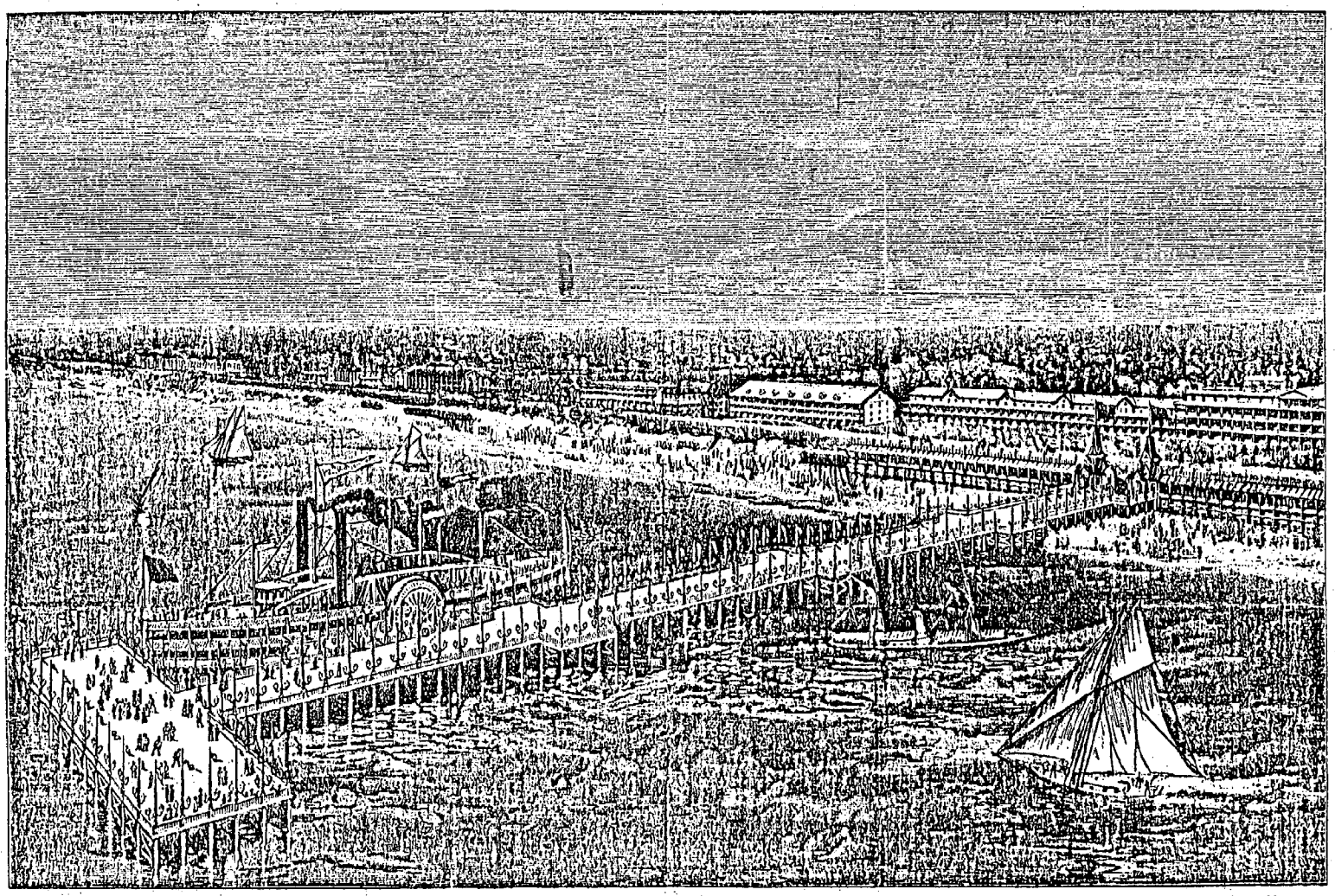
Railroad transportation did not reach the Jersey shore area until the late 1850's. Rail service to the western and central portions of the State were established during the early 1820's. However, with the shore area growing in population, and a continued growth in agricultural production, the demand for improved transportation systems to the shore area was met twenty years later.

The first rail lines to the shore area traveled to the southern communities in present-day Atlantic County. The first rail line completed in 1854 extended from Camden to Absecon Bay. In 1855, a railroad bridge was constructed from the mainland at Absecon to the Sea Island (Atlantic City). This bridge carried the first rail line to the Jersey shore area.

In addition to the demand for improved freight transportation, residents of the shore area sought to attract travelers from the Philadelphia region to the shore area. Transportation networks at the time were primarily designed to provide travel routes to and from the New York area with less emphasis on the Philadelphia region. No beaches were near Philadelphia, while New Yorkers were able to visit the beaches on Long Island.

EXHIBIT 4-5

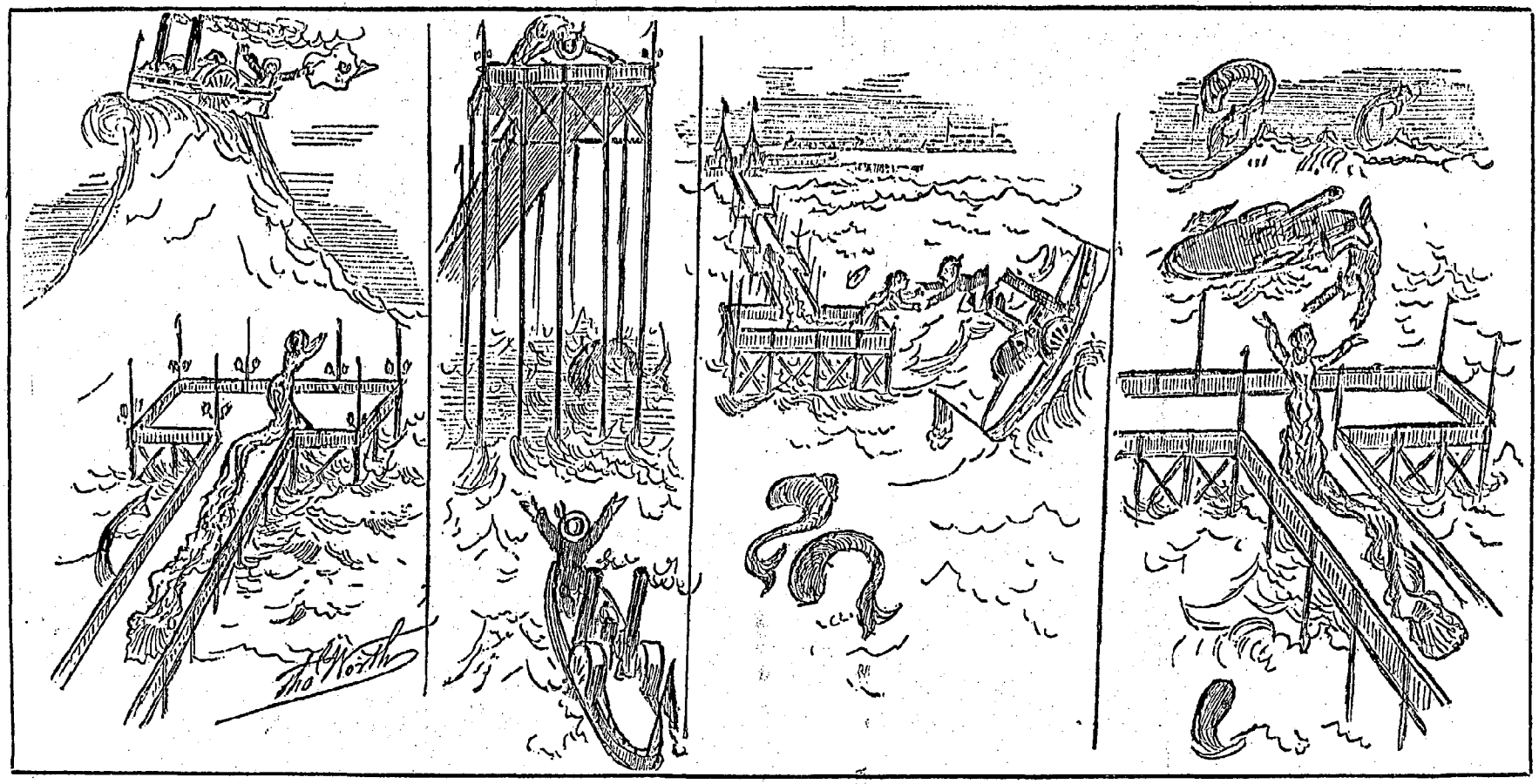
The Ocean Pier at Long Branch, 1879



(Moss, 1966)

EXHIBIT 4-6

A Cartoon from Harper's Bazaar, 1879



ADOLPHUS GOES TO LONG BRANCH TO MEET HIS LADY-LOVE, BUT CAN'T—THE NEW PIER IS SO UNGETATABLE ON ACCOUNT OF THE WAVES.

LOW TIDE—"SO NEAR, AND YET SO FAR."

A DESPERATE EFFORT TO LAND.

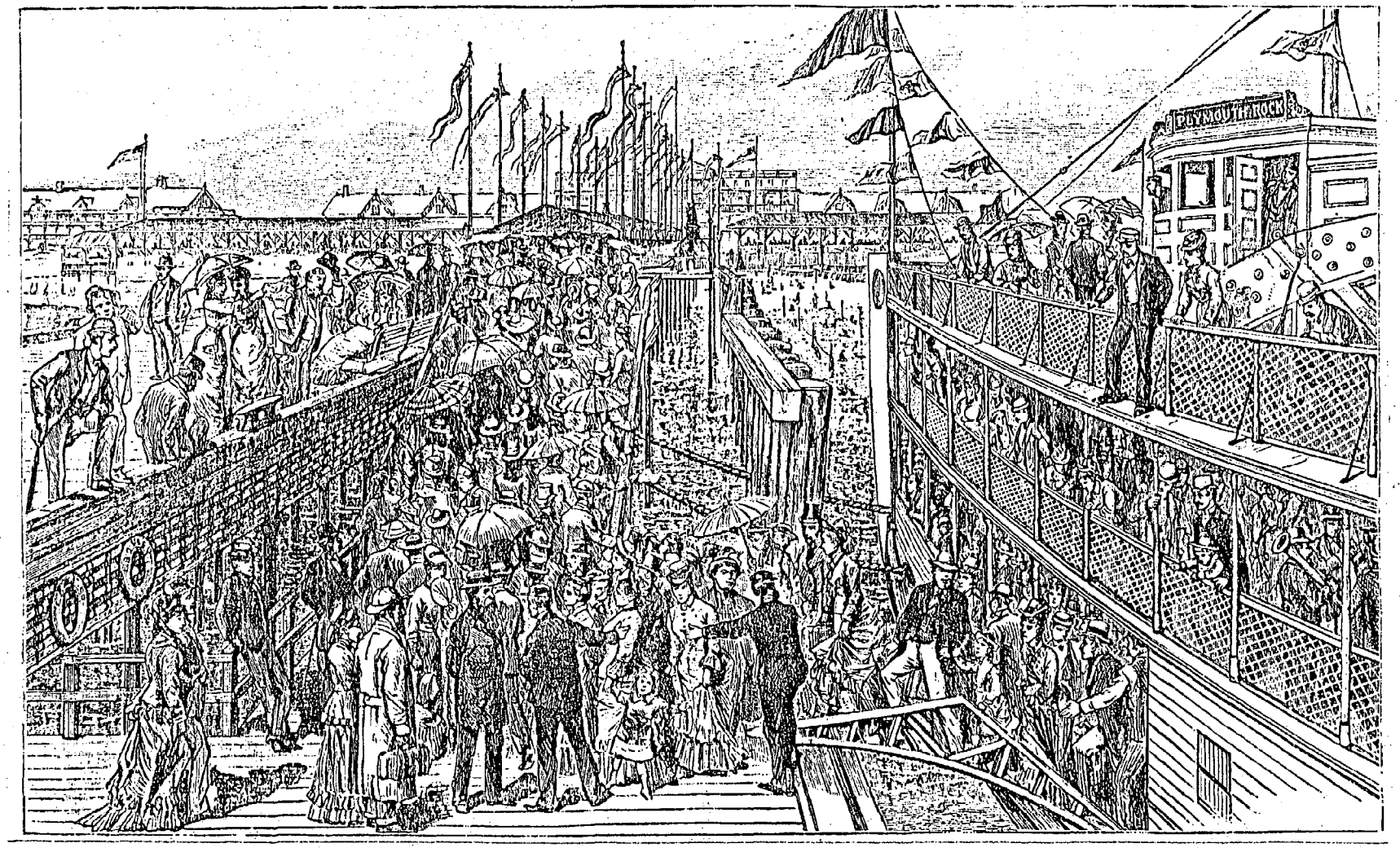
TO ARMS! TO ARMS! "NONE BUT THE BRAVE DESERVE THE FAIR."

A ROMANCE OF THE LONG BRANCH PIER.

This situation occurred sometimes. (Moss,1966)

EXHIBIT 4-7

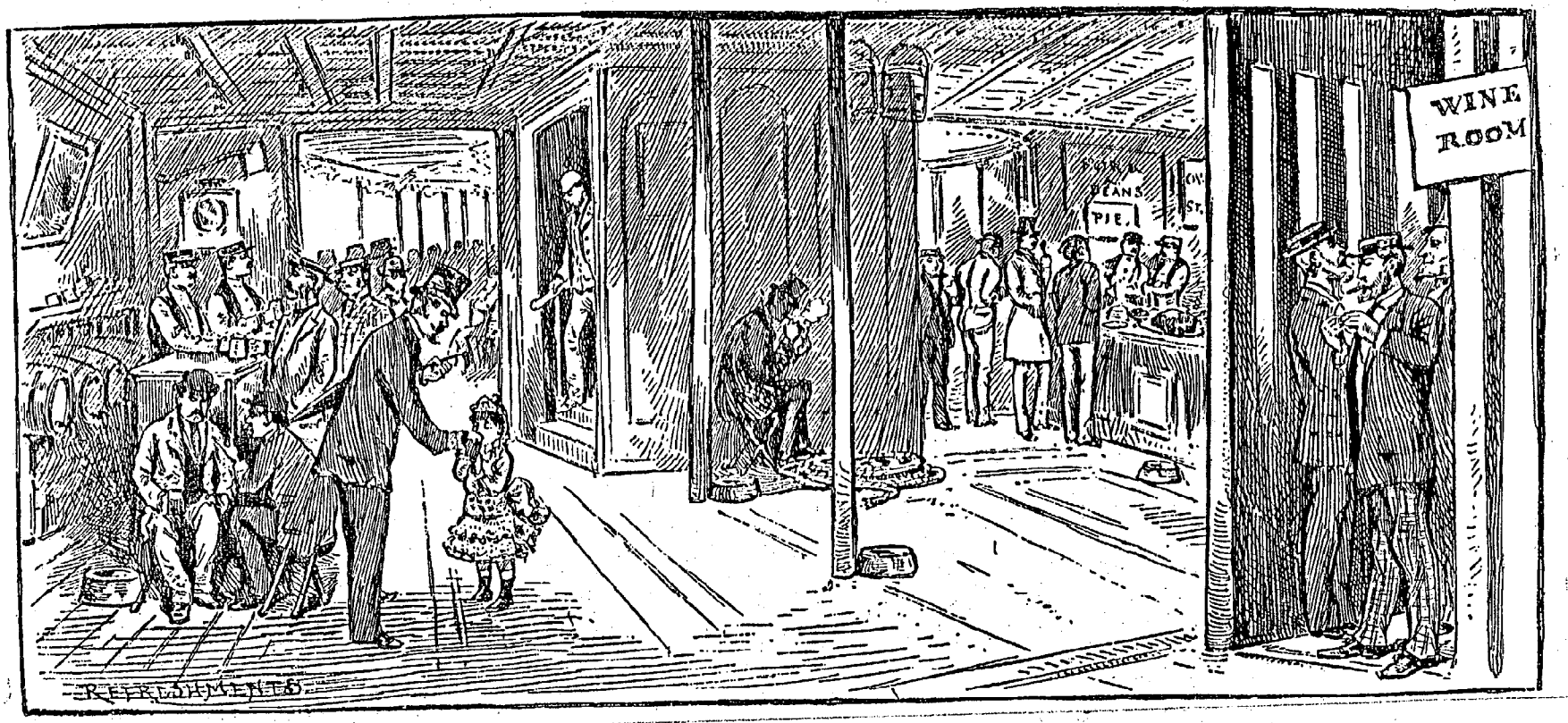
The Arrival of the Plymouth Rock, 1879



(Moss, 1966)

EXHIBIT 4-8

Life below Decks on the City of Richmond



(Moss, 1966)

Thus, efforts emerged to improve access to the New Jersey coast from Philadelphia. Several railroad companies were chartered by the State Legislature to operate between Philadelphia and Atlantic City. Competition among these carriers forced many into bankruptcy. The Reading Railroad and Pennsylvania Railroad emerged as the chief railroad companies operating to Atlantic City.

The discovery of marl, a rich lime fertilizer in the Monmouth/Ocean County region, was an additional contributor to developing rail lines in this area. Agricultural production was the major economic force in southern Jersey. Fertilizer was needed throughout this area to meet the growing demand for food as population grew.

Several small rail companies were organized between 1861 and 1879, with the Delaware Bay and Raritan Railroad, chartered in 1854, becoming the largest. Rail lines were established through the interior of Monmouth, Ocean Counties and portions of Atlantic County. The original route of the Delaware Raritan Railroad was started in 1855. It began at Keyport, traveled east to Port Monmouth, and then south to Toms River, Mays Landing, and Cape May Point. At its northern terminus, Port Monmouth, a pier was constructed in 1856 to accommodate sea vessels from New York which were met by the railroad.

During the early 1860's, Delaware Raritan Railroad extended into Middletown Township, Red Bank, and Eatontown where a spur was constructed to Long Branch. In 1867, the

railroad went into bankruptcy and was reorganized as the New Jersey Southern Railroad. The final expansion of rail service was completed in the 1870's with rail lines reaching Vineland, Bridgeton, and Delaware Bay. The great economic panic of 1873 forced the New Jersey Southern into bankruptcy. However, in 1879 the Central Railroad of New Jersey leased the company and continued operations.

As a direct response to increased agricultural production in the Freehold area, the Monmouth County Agricultural Railroad was chartered in 1867. A rail line from Freehold to Keyport was completed in the 1880's. In addition, a large pier was built at Keyport on the Raritan Bay to accommodate anticipated increase in freight transportation. This line was later taken over by the Philadelphia and Reading line.

The New York Long Branch Railroad, chartered in 1868, and rechartered in 1869 as a part of the New Jersey Central Railroad, was the rail line that best served the sea-coast region of Monmouth County. This line was established to capture the majority of trade with the New York area. After arriving from the Long Branch area, goods were ferried from Port Monmouth across Raritan Bay to New York. Later, much of this traffic was re-routed to an all rail network to the New York area via Jersey City.

Another rail line, established in 1863, was constructed to better serve the immediate seashore area. The Long Branch Seashore Railroad traveled from a point on Sandy Hook south

to Long Branch. During the laying of the tracks, some difficulties with the Federal Government were encountered. Due to the government's purchase of land on Sandy Hook for a military base, a question of the rail lines terminus was subject to controversy. This was resolved, and the tracks were laid. In 1865, the rail line extended down the sea-island to Long Branch.

> So close to the Ocean beach in some places, according to an account written two decades later, "that the surf blends with the rattle of the cars and the shirk of the locomotive whistle; and at times in high tides, the waves have washed over the track." (Wilson, 1953:487).

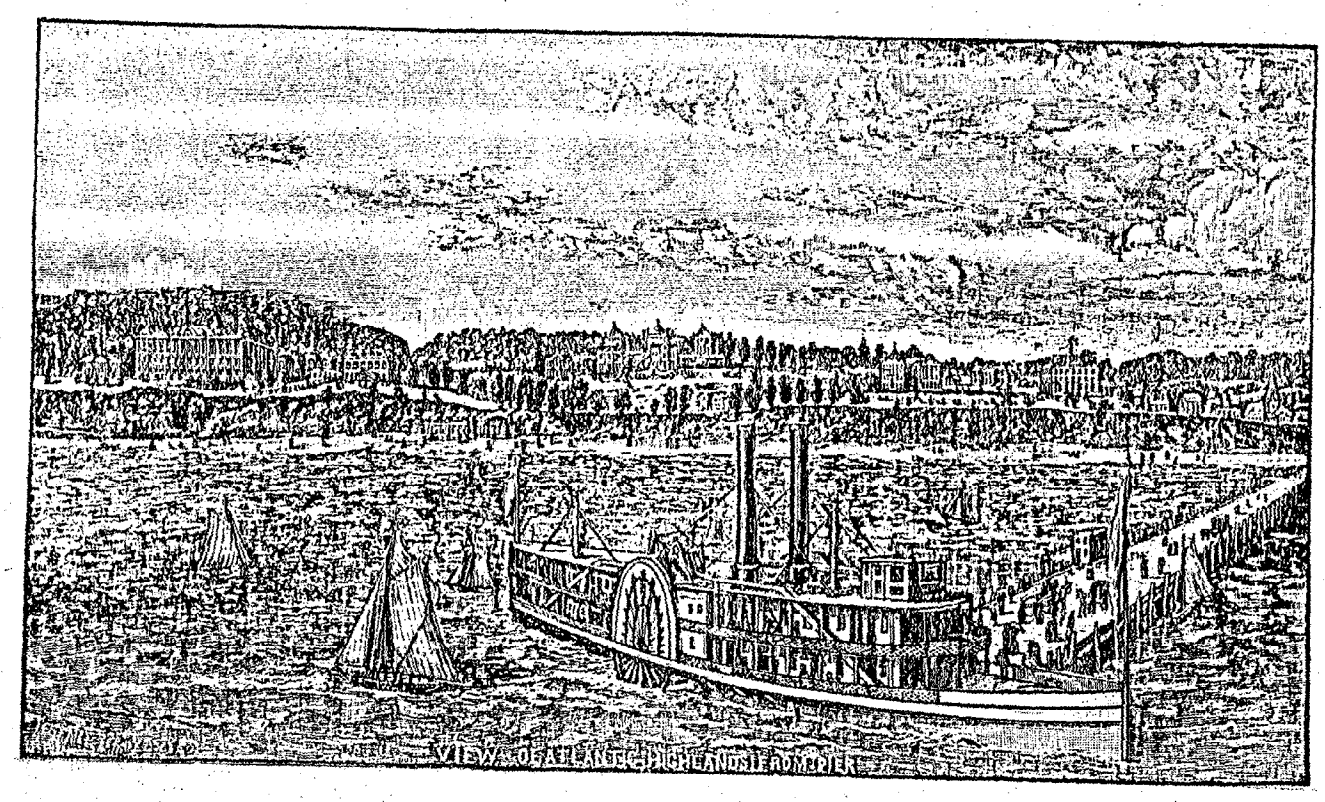
Steamboat service to Bay View (Atlantic Highlands) from New York began in 1879. This service was established for New York "boatstrippers" -- early vacationers to the shore area (Exhibit 4-9). As Bay View increased in popularity, people began buying summer cottages in the area. Finally in 1883, a rail line with connections at Red Bank was constructed. With the railroad service, Bay View became a strong competitor to Long Branch as an ocean resort.

In Ocean County, the Delaware Raritan Railroad provided rail service. Ironically, the line did not reach the shore area or the county seat at Toms River. Stage lines to Freehold, where trains traveled to New York through the Amboys, provided a transportation link to New York.

In 1883, a rail line was constructed to reach Island Beach. This line was a continuation of a line built in 1881 out of Camden and later extended through the Pine Barrens to Toms River. From Toms River, the line crossed Barnegat Bay by trestle to

EXHIBIT 4-9

Docking at Atlantic Highlands, 1884



(Moss, 1966)

Island Beach were Seaside Heights developed. From Seaside Heights the line extended north along Island Beach through Lavallette, Chadwick, and Mantoloking where it connected with the Long Branch Railroad.

Early railroading was not a pleasant, nor safe journey. Speeds of the first trains were from 15 to 20 mph. The danger of the journey was centered upon the fact that only a single through track was constructed. Several sidings existed where on-coming trains would have to back into in order to let another pass. Schedules were developed to allow time for incoming trains to reach a siding so that outgoing trains could pass. The telegraph improved this situation by sending word of incoming trains. In addition to the danger, the ride itself was loud, uncomfortable, and smoke-filled. The first trains used wood as fuel, which was extremely smokey and annoying to the passengers.

The late nineteenth century and early twentieth century was the "heyday" of the railroads in the shore area. However, with the coming of automobiles, trucks, and buses and the improvement of the roadways, railroad service went into decline. The reduction in steamboat service was initially a result of the railroad and finally a result of the automobile.

Early Efforts for Improved Roadways

Parallel to the development of rail lines in the shore area were efforts to improve and expand the roadway system. This was done through the development of "turnpikes." Private

entrepreneurs, with an interest in improving the transporting of their goods, were contracted to construct and maintain roadways. Travelers of these roadways were required to pay a specified toll (per mile of travel) at "toll gates" constructed on the roadways. At this time in history, no State or Federal aid was available for such public improvements.

The era of turnpikes in the shore area began during the 1850's. Turnpike construction in other parts of the state had ended during the same era. By the 1870's several turnpikes were constructed in the shore counties. The first was a roadway from Keyport to Florence. Monmouth County developed the most extensive turnpike system in the shore area, with Ocean County developing a smaller system. Atlantic County also had an extensive system with the development of the White Horse and Black Horse Pikes running toward Philadelphia.

Turnpikes, built at this time, were approximately 16 feet wide and were part wooden plank and part gravel. They cost approximately $1,800 a mile. The floor was usually made of three inch thick planks laid crosswide to the road. These planks rested on wooden "stringers" buried lengthwise in the road bed. To reduce wear, the planks were covered with a thin layer of sand or gravel. When the price of lumber was too costly, the roadway was simply gravel. The turnpike era was not long lasting. However, it did lay the foundation for capital outlay allocated specifically for roadway construction. Moreover, it made roadways usable year-round, since harsh weather conditions previously made many early dirt roads unusable.

Turnpike development experienced several obstacles during the latter years of its era. Travelers felt maintenance did not justify the tolls. The State of New Jersey fixed the tolls in 1849 at one cent per mile. However, in 1865, these rates were increased to 1 1/2 cents per mile for a single horse, and additional charges for more horses. Weather conditions still forced many of these toll roads to be unpassable. Finally, by the late 1870's, toll booths were removed and turnpikes became publicly owned, with each municipality responsible for maintenance.

A growing concern for improved roadways had developed in the latter years of the 1870's. Not only was this concern directed at the turnpikes, but an expansion of free public roads was also sought. As a result of this growing concern, in 1892 the State legislature passed the State Aid Road Law, which provided funds allocated to the County governments for the "betterment of public roads." The respective Counties were to survey their municipalities and develop plans for utilizing macadamized, telford stone, gravel, oyster shell, or other good material which would make roadways smooth and travelable year round. Plans for proposed roadways were submitted to the State Commissioner of Public Roads for approval. Upon approval, one-third of the cost were paid by the State Treasury.

By 1901, Monmouth County had only 37.2 miles of improved roads. The major portion of State aid funds were used to buy the turnpikes in the County. In addition, twenty miles of

turnpike roadways were purchased, costing approximately $40,000, independent of state aid. No roadways were completed in Ocean County during this period. However, ten miles near Lakewood were under construction. Not until the introduction of the automobile was the roadway network extensively improved.

The Twentieth Century

The early years of the twentieth century saw the railroad, the steamboat, and the horse as the dominant forms of transportation. An increasing concern for better passenger transportation, rather than freight, highlighted this new era. Bicycles began to rise as a major form of local transportation competing with the horse and buggy. Several bicycle clubs were organized in Asbury Park, Long Branch and the Atlantic Highlands.

Significant developments in transportation during this century had crucial impacts to the shore area. The introduction and expansion of the automobile and state highway systems had major effects on the development of the shore area. Also the early years of the twentieth century saw the development of trolley systems in Ocean and Monmouth Counties.

Streetcars and Trolleys

An important means of local transportation which eventually spread into neighboring municipalities was the trolley, or street car. The foundation of this system was developed during

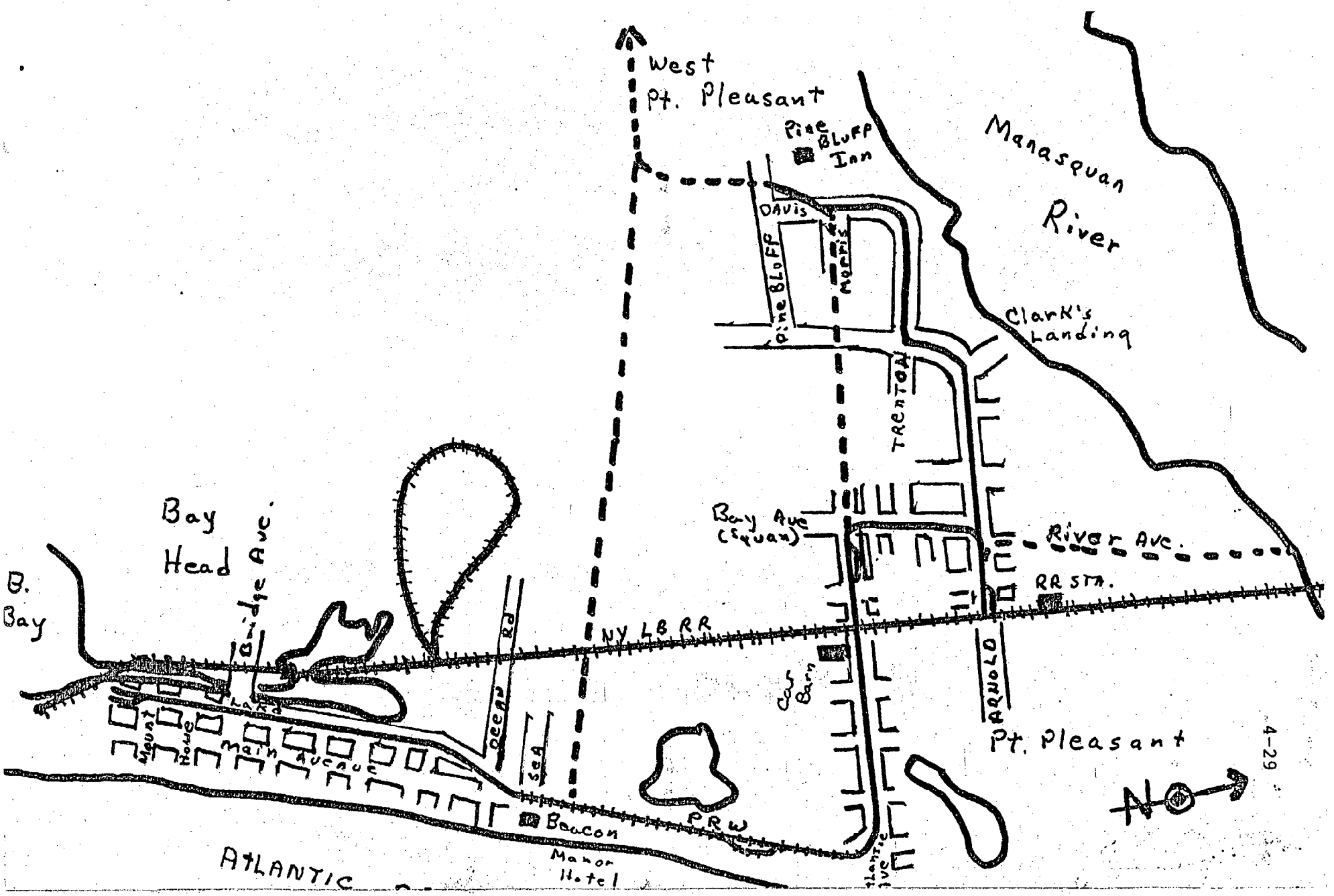
the latter years of the nineteenth century, with the use of horse-drawn trackless omnibuses and horse-cars (later mule cars). These vehicles resembled stage coaches but were somewhat larger and were limited to local transportation needs.

The first street car rail system in the shore area began operations in the middle 1860's in Atlantic City. This was much earlier than the development of trolleys in Monmouth and Ocean Counties which began in late 1800's and continued through the 1920's. In Ocean County, a number of trolley systems developed in the 1890's and continued to operate until 1919. First, there was the South Jersey Street Railway Company, which lasted two summers in Point Pleasant, 1894 and 1895, before going bankrupt. It ran on 1.2 miles in Point Pleasant. The Bay Head and Point Pleasant Street Railway Company (1896-1902) was able to provide electricity to Bay Head, but unable to negotiate a trolley line. Finally, in 1903 the Point Pleasant Traction Company was formed, and extended the existing trackage into Bay Head, approximately three miles (Exhibit 4-10). Residential development did occur along the trolley line which provided a direct route to the early resort, Bay Head. Another trolley system served Long Beach Island, and by 1901 reached all points on the island, from Barnegat City to Beach Haven. These trolleys served the respective areas up to about 1919, when competition from automobiles forced their abandonment.

Monmouth County surpassed all other shore Counties in developing a trolley system. Routes extended along the Atlantic

EXHIBIT 4-10

The Point Pleasant Traction Company (Eid,1977)



shore, and along Raritan Bay. In 1887, the first electric street railway in New Jersey, The Sea Shore Electric Railway, was built at Asbury Park (Exhibit 4-11). This railway began at the railroad station and extended eastward. By 1895, the entire line was electrified with routes reaching north to Deal Lake, and south to Avon-by-the-Sea. (Exhibit 4-12). Further expansion between Pleasure Bay and Asbury Park permitted direct connection by steamer to New York City (Exhibit 4-13).

Long Branch's early trolleys were horse-car lines which started operation in 1870. An extensive street trolley service was established within the city limits, with outside connections to Red Bank and Eatontown. In 1889, a spur was added to Pleasure Bay, and the entire line was electrified.

Perhaps the greatest contributor to Monmouth County's extensive trolley system was the development in Keyport. The first long line in the County was built in 1891 from Keyport to Matawan. Sixteen horses and fourteen horse-cars were employed by the company. A single car was drawn by two horses, which traveled along a modified rail line. A line was also completed between Atlantic Highlands on Raritan Bay, southward through Red Bank to Long Branch on the ocean (Exhibit 4-14). In 1901, the line was electrified. By 1909, trolley service was available from Keyport to Perth Amboy. Service was also extended along the ocean through Atlantic Highlands, reaching Highland Beach in 1911. By 1923, these lines ceased operations due to the automobile, jitney, and bus competition.

EXHIBIT 4-11

Sea Shore Electric, 1887
(Eid, 1979)

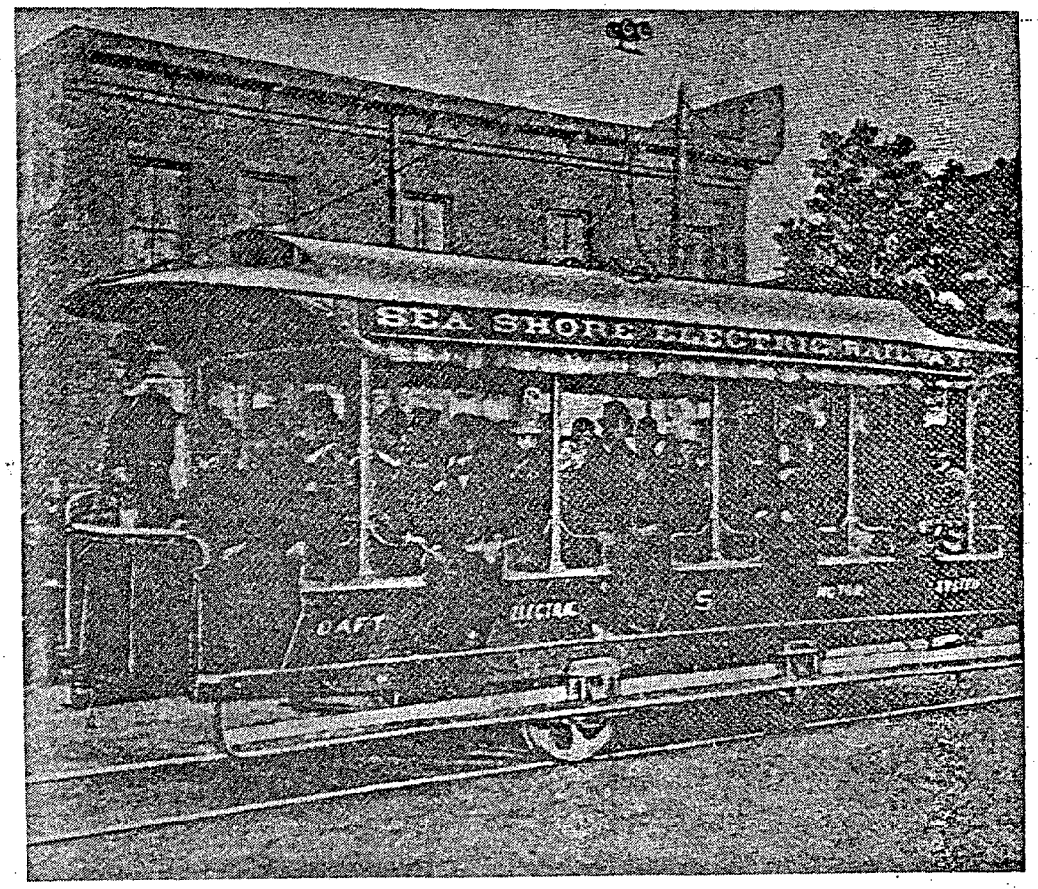


EXHIBIT 4-12

Deal Lake Bridge, 1915

Asbury Park, 1925
(Eid,1979)

EXHIBIT 4-13

A Schedule from 1898
(Eid, 1979)

ATLANTIC COAST
ELECTRIC R.R.CO.

ON AND AFTER AUGUST 1, 1898.

TIME TABLE FOR THROUGH CARS

GOING SOUTH.

Leave Pleasure Bay For Asbury Park, [illegible] a. m., and every ten minutes till 12.00 p. m.

Leave Broadway, Long Branch, for Asbury Park, [illegible] a. m., and every ten minutes till 12.20 p. m. On all trips leave Elberon fifteen minutes later than Broadway time.

SUNDAYS.

Leave Pleasure Bay, For Asbury Park, 7.00 a. m., and every twenty minutes till 9.00 a. m., then every ten minutes till 12.00 p. m. All cars leave Broadway for Asbury Park, ten minutes after Pleasure Bay leaving time.

GOING NORTH.

Leave Cookman Ave. and Main St., Asbury Park, For Broadway, Long Branch, 5.20, 5.40, 6.00, 6.20 a. m., and every ten minutes till 11.20 p. m. For Pleasure Bay, 6.30 a. m., then every ten minutes till 11.20 p. m. For Pleasure Bay boats to New York, 6.25, 6.30 a. m., and 2.15, 3.15, and 4.00 p. m. For Iron Pier boats to New York—Transfer at Broadway—11.20 a. m., and 5.20 p. m.

SUNDAYS.

Leave Cookman Ave. and Main St., Asbury Park, for Broadway, Long Branch, And Pleasure Bay, 7.00 a. m., and every twenty minutes till 8.40 a. m., then every ten minutes till 11.00 p. m. For Pleasure Bay boats to New York, 3.15, 3.30, 3.45, and 4 p. m. For Iron Pier Boats to New York, 11.20 a. m., and 5.20 p. m.

On all trips leave Deal Lake Bridge 15 minutes later than Cookman avenue, leave Elberon 25 minutes later than Cookman avenue.

Belt Line Cars in Asbury Park, run every 5 minutes in either direction from 6 a. m. till 12 p. m.

BELMAR DIVISION.

Leave Cookman Ave. and Main St. for Belmar, at 6.00, 6.15, 6.30, 6.45, 7.00, then every 7 minutes till 11.00 p. m., then 11.15 and 11.30 p. m.

Leave Belmar, 15 minutes later than the above.

For Pleasure Bay boats to New York—6.15 a. m., 2, 3, and 3.45 p. m.
For Iron Pier Boats to New York—11.00 a. m., and 5.05 p. m.

SUNDAYS.

START ONE HOUR LATER.

For Pleasure Bay boats to New York—3, 3.15, 3.30 and 3.45 p. m.
For Iron Pier boats to New York—11.00 a. m., and 5.05 p. m.

Excursion or Single Trip Tickets between Asbury Park and New York, via either New York and Long Branch Steamboat Co. (at Pleasure Bay) or the Iron Steamboat Co. (Broadway, Long Branch), are on sale at the office of the Atlantic Coast Electric R. R. Co., Main Street Car Depot and Interlaken Car Depot.

FARES.

Asbury Park to New York and return, via Iron Steamboat Co., ... Sundays, $1.00; Week days, 80c
Asbury Park to New York, single, via Iron Steamboat Co., ... Sundays, 60c.; Week days, 50c
Asbury Park to New York and return, via New York and Long Branch Steamboat Co., from Pleasure Bay, 80c
Asbury Park to New York, single, via New York and Long Branch Steamboat Co., from Pleasure Bay, 50c
Asbury Park to Interlaken, Allenhurst or Deal, ... 5c
Asbury Park to Elberon, ... 10c
Asbury Park to West End, Long Branch or Pleasure Bay, 15c
Asbury Park to Belmar, ... 5c

TICKETS, in packages, at [illegible] for sale by the conductors, good on any division.

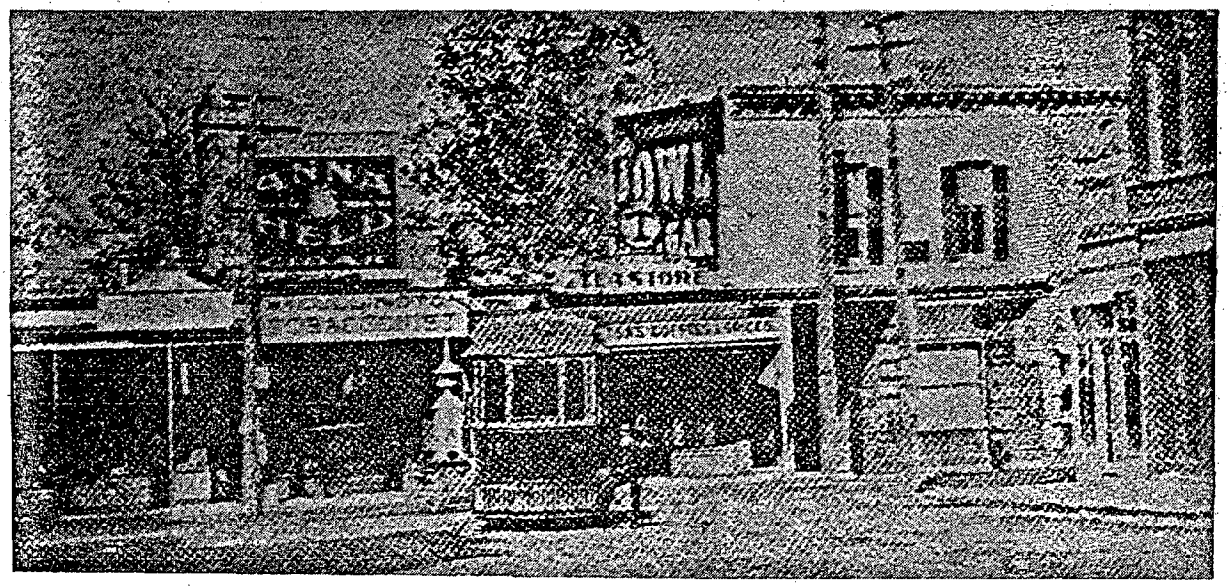
At night, through cars between Asbury Park and Pleasure Bay, carry green light; cars between Broadway, Long Branch, and Pleasure Bay carry red light. Belt Line cars in Asbury Park carry red light. On Saturdays, Sunday afternoons, and on Firework's display nights, cars run every five minutes, to and from Pleasure Bay.

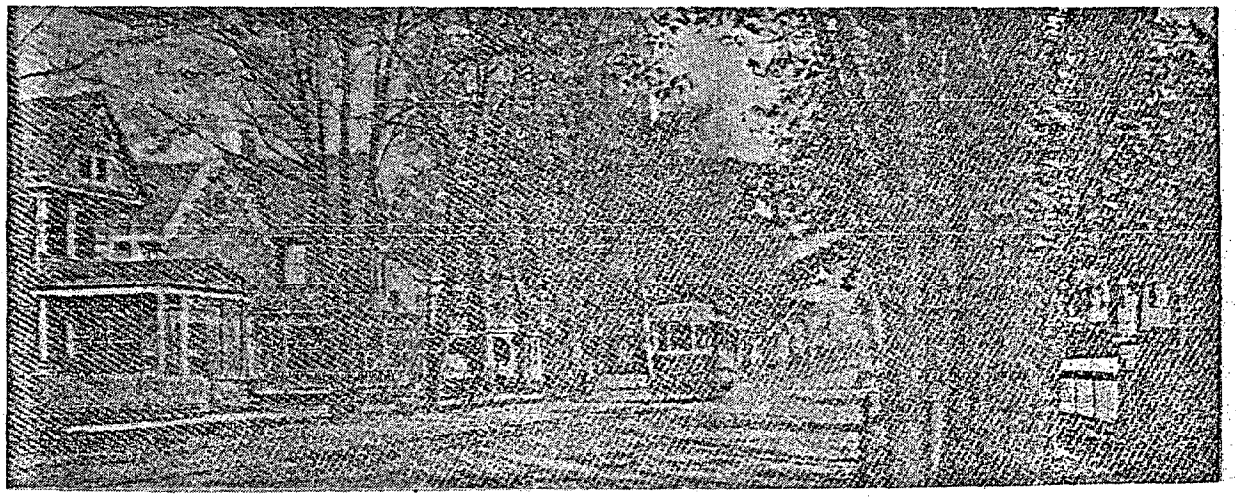
In addition to the regular schedule, extra cars will be run as the travel may require.

Office: Interlaken Car Depot.

EXHIBIT 4-14

Trolleys in Red Bank
(Eid, 1980)





Trolley service was a major contributor to the development of shore communities.

> The trolley brought facilities for transportation by comparatively quick and reasonable means to scores of communities that were touched by the railroads. It speeded the growth of many overlying sections and thus aided the development of the area and the establishment of new villages. (Wilson, 1953:812).

Even though trolleys had significant influences on development patterns in the shore area, their impact was short lived. They ceased to operate in the early 1930's, after experiencing boom and bust conditions for 50 years. For example, in 1900 only 7 of the 57 trolley companies operating in New Jersey paid dividends.

The Age of the Auto

> In many respects the automobile and the truck changed life in the shore counties even more than the railroad fifty years earlier. By the turn of the century, the automobile with gasoline motor was being seen at the shore and from then on it increasingly affected the lives of all who lived in the shore area. (Wilson, 1953:819).

The first appearance of the automobile in the shore area was in Atlantic City in the fall of 1899. At the same time automobiles also were seen in Long Branch, Monmouth County. These early cars were called "electrics," powered by storage batteries that needed frequent recharges from an electric plant. Only a few of these electrics existed, and were imported from Europe; gasoline powered automobiles began to appear shortly after the "electrics." By 1904, automobiles were seen in Atlantic City and Asbury Park. The introduction of the automobile had a significant impact on society in the

shore area.

> The automobile offered opportunities for a new type of recreation for shore visitors, "touring." It also provided a new means of contact between the shore and the metropolitan areas of interior New Jersey, New York, and Philadelphia. (Wilson, 1953:823).

Several shore communities, in Monmouth County organized grand "touring parties" called "tally ho's." Car owners and their families would get together and form a procession traveling through various communities. In addition several early car races were organized in Asbury Park and Long Branch, beginning in 1908.

By 1920, cars were a common sight in the shore area. However, the majority of visitors still came by rail. With the number of cars growing, the need for more and improved roadways was greatly enhanced. As vehicle registrations and licensing fees increased, state revenues grew, enabling the state to initiate programs to meet the need for more and better roadways. The State's early effort to improve the road system focused only on maintaining existing roadways. No extensive new construction was proposed. In 1912, the State began a state highway system, by taking over several existing routes.

Ocean County began roadway improvements in 1904 with funds appropriated through the Board of Chosen Freeholders. Roadways capable of carrying automobiles were extended throughout the County, including the entire length of Long Beach Island. In the mid-1920's, residents of Ocean County asked the State to build a paved roadway from Asbury Park

to the Philadelphia-Camden metropolitan area. The U.S. Navy, which had established an air station in near-by Lakehurst, also supported this proposal. In 1930, this roadway was completed, and in 1936, it was extended from Lakehurst to Trenton. This was one of the earlier State actions to develop a highway system in Ocean County.

Monmouth County developed the greatest network of improved roadways in the State. Early efforts began in 1900, with the first concrete road extending from Freehold south to Adelphia completed in 1913. This was claimed to be the first concrete roadway in the entire State. By 1928, Monmouth County had more mileage of state highway (27 miles) than any other county.

Since travelers from northern New Jersey and the New York metropolitan area were composed mostly of summer guests, additional state highways were constructed in Monmouth County to accommodate this flow. Route 34, specially designed for this flow from northern New Jersey, was completed in 1928. It is interesting to note that the recognition of the special transportation needs of the shore communities -- the need for summer access -- was recognized in the 1920's.

During the early years of the 1900's and continuing until the 1930's, extensive roadway construction, initiated by the State and local municipalities, laid the foundations for today's highway system. This effort peaked in 1954 when the Garden State Parkway was completed through Monmouth and Ocean Counties. Shore counties in southern New Jersey

greatly benefited from this roadway; however, Monmouth and Ocean Counties obviously benefited as well. The automobile has brought, and continues to bring, millions of people to the shore area during the summer months. It is exactly this issue of recreational access which even today requires study.

Summary

The evolution of transportation systems in the New Jersey shore area had direct impacts to development in this area. Early forms of transportation were improved as a result of economic pressure centered upon expansion of freight facilities. Agricultural production and latter production of glassware in the shore area resulted in extended stage lines and roadway improvements.

Early railroads had a key role in fostering the development of shore area resorts when they began to emphasize passenger traffic rather than freight traffic. This was a result of growing resorts which developed in Asbury Park, Long Branch, and Bay View.

Finally, the automobile had the greatest impact to the shore area by bringing millions of travelers each summer to the beach resorts.

CHAPTER FIVE

Travel to Monmouth and Ocean County Beaches

The Survey Approach

In Chapter Three our present knowledge of travel to the New Jersey shore was reviewed. This knowledge is by no means comprehensive. It is difficult to compare the various studies of beach use because of variations in methodology, survey sites, and purpose. Because of this lack of reliable and comparable data it was decided to conduct a survey which would help to answer some of the issues raised in this report. More specifically, it was important to know:

1. The origin and destinations of New Jersey beachgoers. Are certain beaches more popular than others? Is distance a factor in determining participation rates?

2. The socioeconomic backgrounds of beach goers. For example, are poor people less likely to go to the beach than more affluent groups? Is there any relationship between ethnicity and beach visitations?

3. The propensity of people to travel together. What is the occupancy rate of vehicles coming to the beach?

4. The temporal characteristics of beach users? Do people who live further away arrive later at the beach?

Of these four research questions, the second one focusing on socioeconomic differences is treated in the literature (Flaschbart, 1978; Heatwole and West, 1980;

SCORP, 1976). It is the question which is least answerable in the survey approach used in this study -- a license plate investigation. In a license plate survey observers are placed at selected sites where they record plate numbers. The on-site license plate number is used to determine the origins and destinations of the trips. It is assumed that the vehicle trip originated at the home address of the traveler and the destination is where the license plate number was recorded.

Home, roadside and beach interviews were considered and rejected because of resource constraints. The license plate survey can cheaply and quickly provide basic information which can answer questions about the origins, destinations and distance of travel. However, license plate surveys cannot directly answer questions about the socioeconomic characteristics of beach users. This study will utilize already exisiting materials coupled to a study of community demographics and participation rates to answer questions on the backgrounds of beach seekers. In this way, some preliminary conclusions can be drawn about the relationships between beach use and socioeconomic characteristics.

Data was also collected on the auto occupancy and beach arrival times. While limited to only a few beaches, the information does provide important information to answer the third and fourth questions posed above.

The Origins and Destinations of Beach Visitors

Origin and destination studies are a traditional component of urban transportation planning methodology. These studies analyze from where and to where trips are made within the study area. In this research on recreational travel, the destinations will be a particular beach and the zones will be counties and communities in New Jersey. It is important to take the population size of the sending zone into account. We may discover, for example, that 35 percent of visitors to Sandy Hook arrive from Essex County. Is this percentage high because Sandy Hook is very popular in Essex County or because many people live in the county?

For this study we have developed a new concept in presenting participation rates which takes into account both the size of the sample taken at the beach location and the population size of the sending area. We have chosen to call this measure the "participation quotient." Based on the location concept found in urban economics, the participation quotient is a ratio of percentages. The participation quotient (PQ) can be expressed as follows:

$$PQ = \frac{V_{i,s} / V_{i,t}}{P_s / P_t}$$

where: $V_{i,s}$ Number of surveyed visitors to site i from sending area s

$V_{i,t}$ Total number of surveyed visitors to site i

P_s Population of sending area s

P_t Total population of all sending areas

The participation quotient is a useful device for determining which sending areas have a greater proportion of visitors to the different beach locations. If the quotient is greater than one then the participation rate of the sending community is greater than the overall average participation rate of all communities in the state to that beach location. Essentially, the participation quotient identifies sending areas which use a particular facility more than the statewide average. The quotient is a ratio of percentages. For example, of the 565 visitors to Sandy Hook on a Sunday, 90, or 15.9 percent, came from Essex County. In 1980, Essex County contained 11.5 percent of the state population. The participation quotient is 1.38 (15.9 percent / 11.5 percent). Essex County sends more than the statewide

average number of residents to Sandy Hook.

Exhibit 5-1 shows the 10 sites in Monmouth and Ocean Counties which were surveyed. These beaches were selected because of popularity and geographic distribution. A total of 3,067 license plates were recorded on weekend days in Summer, 1981. Also, an additional 1,302 plates were recorded on weekdays at three locations -- Island Beach, Seaside Heights and Sandy Hook. In general, the plate numbers were collected at parking lots, or at park entrances for Sandy Hook and Island Beach, as automobiles arrived at the beach locations during the morning hours. In those situations where the parking lot closes when full, at Island Beach or Sandy Hook, additional plates were collected in the afternoon when the beach opened again.

In Exhibit 5-2 the participation quotients of all surveyed sites and counties are listed. Note than the participation quotient of Essex County to Sandy Hook is, indeed, 1.38. This set of participation quotients is based on 3,067 automobile license plates taken at the 10 sites on weekends in the summer of 1981.

Based on existing research and intuitive judgment we might expect to find an inverse relationship between participation rates and distance to the beach. Households from counties which are more distant from the beach would be

EXHIBIT 5-1

Beach Sites,
License Plate Survey

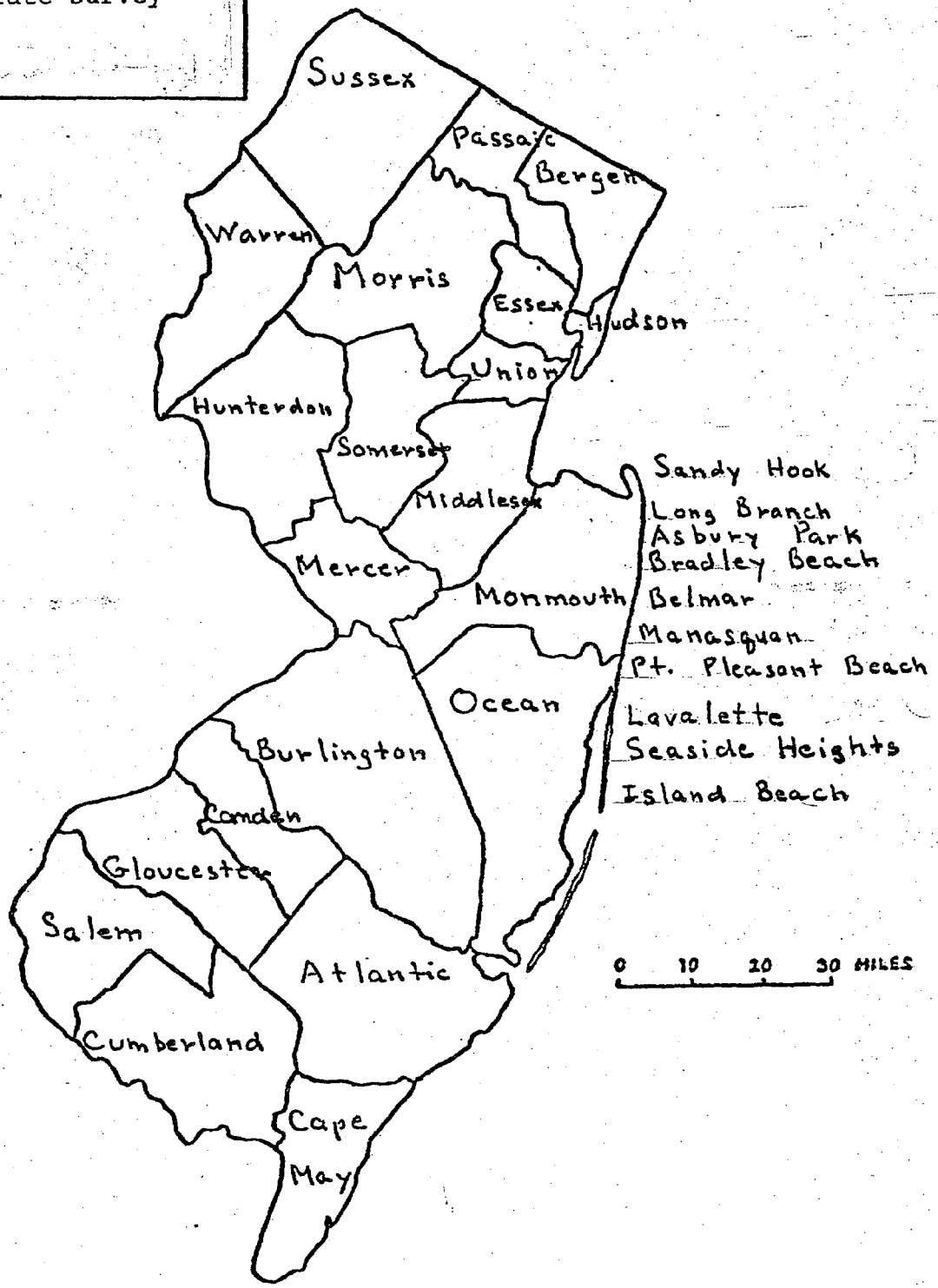


EXHIBIT 5-2

Participation Quotients by Site and County,
Weekend Day, 1981
(N = 3,067)

	SITE									
COUNTY	LONG BRANCH	POINT PLEASANT	LAVALETTE	SEASIDE HEIGHTS	ISLAND BEACH SP	BELMAR	BRADLEY BEACH	ASBURY PARK	MANASQUAN	SANDY HOOK
ATLANTIC	0.23	0.00	0.16	0.00	0.00	0.00	0.00	0.35	0.00	0.00
BERGEN	0.84	0.85	1.66	1.13	0.70	0.73	0.71	1.42	0.90	0.56
BURLINGTON	0.25	0.08	0.59	1.45	0.81	0.08	0.00	0.19	0.12	0.11
CAMDEN	0.19	0.06	0.06	0.05	0.23	0.00	0.00	0.07	0.05	0.19
CAPE MAY	0.00	0.00	0.37	0.00	0.15	0.00	0.00	0.00	0.27	0.16
CUMBERLAND	0.34	0.00	0.00	0.19	0.18	0.00	0.00	0.26	0.00	0.10
ESSEX	1.99	0.42	1.01	0.77	0.64	0.69	0.76	1.13	0.45	1.38
GLOUCESTER	0.00	0.00	0.00	0.13	0.12	0.00	0.21	0.00	0.00	0.07
HUDSON	2.24	0.86	0.88	0.85	0.40	0.61	1.69	1.72	0.40	1.45
HUNTERDON	0.00	0.68	0.35	0.29	1.40	0.00	0.00	1.18	0.26	0.15
MERCER	0.14	1.16	0.20	2.20	3.19	0.30	0.14	0.56	0.58	0.17
MIDDLESEX	0.90	1.20	1.13	1.26	1.28	2.52	0.72	0.92	2.07	1.75
MONMOUTH	2.48	1.54	0.79	0.35	0.68	5.06	5.45	3.00	5.00	3.76
MORRIS	0.11	1.17	0.60	0.86	1.63	0.15	0.63	0.59	0.72	0.58
OCEAN	0.52	5.34	3.36	3.40	2.91	0.71	0.49	0.20	1.10	0.23
PASSAIC	1.60	1.47	1.37	0.95	1.26	0.48	1.34	1.22	0.70	0.73
SOMERSET	0.00	1.03	1.20	1.48	1.69	1.06	0.21	0.67	1.22	0.64
SUSSEX	0.00	0.00	0.53	1.08	0.95	0.26	1.47	0.29	0.00	0.45
UNION	1.33	1.24	1.33	1.04	1.14	1.64	1.27	1.29	1.43	1.76
WARREN	0.00	0.35	1.81	1.78	0.87	0.73	0.51	0.41	0.00	0.46

NOTE: SALEM COUNTY HAD NO VISITORS TO THE BEACHES ABOVE IN THIS SURVEY.

expected to visit the beach less frequently than those closer. Exhibit 5-3 ranks the county participation quotients for the ten sites. Distance is clearly an important factor. For all beach sites the highest participation quotients are either Monmouth or Ocean Counties. These are followed by the populous counties of northern New Jersey -- Union, Middlesex, Hudson, Essex, Passaic and Bergen. Occasionally, the more rural counties such as Somerset, Warren or Hunterdon will be ranked. The effect of population size of the county has been controlled in these quotients. The clear implication is that distance does matter in beach selection. The sites are listed in Exhibit 5-3 from north to south. The counties with the highest quotients move south also. While the site furthest north, Sandy Hook, has Monmouth and Union as the highest participating counties, Island Beach State Park at the southern end is visited most by Mercer and Ocean.

Socioeconomic Factors

The Approach

The license plate survey does not permit testing of the effect of socioeconomic factors on participation rates. However, by changing the unit of analysis from individuals to municipalities, a wider range of variables can be examined. This is accomplished by assigning to each munici-

EXHIBIT 5-3

Ranking of Participation Quotients
By Site and County,
Weekend Day, 1981
(N = 3,067)

SITES	COUNTY	PARTICIPATION QUOTIENT
SANDY HOOK	MONMOUTH	3.76
	UNION	1.76
	MIDDLESEX	1.75
	HUDSON	1.45
	ESSEX	1.38
LONG BRANCH	MONMOUTH	2.48
	HUDSON	2.24
	ESSEX	1.99
	PASSAIC	1.60
	UNION	1.33
ASBURY PARK	MONMOUTH	3.00
	HUDSON	1.72
	BERGEN	1.42
	UNION	1.29
	PASSAIC	1.22
	HUNTERDON	1.18
	ESSEX	1.13
BRADLEY BEACH	MONMOUTH	5.45
	HUDSON	1.69
	SUSSEX	1.47
	PASSAIC	1.34
	UNION	1.27
BELMAR	MONMOUTH	5.06
	MIDDLESEX	2.52
	UNION	1.64
MANASQUAN	MONMOUTH	5.00
	MIDDLESEX	2.07
	UNION	1.43
	SOMERSET	1.22
	OCEAN	1.10

EXHIBIT 5-3
(continued)

SITES	COUNTY	PARTICIPATION QUOTIENT
POINT PLEASANT BEACH	OCEAN	5.34
	MONMOUTH	1.54
	PASSAIC	1.47
	UNION	1.24
	MIDDLESEX	1.20
	MERCER	1.16
LAVALLETTE	OCEAN	3.36
	WARREN	1.81
	BERGEN	1.66
	PASSAIC	1.37
	UNION	1.33
	MIDDLESEX	1.13
	ESSEX	1.01
SEASIDE HEIGHTS	OCEAN	3.40
	MERCER	2.20
	WARREN	1.78
	SOMERSET	1.48
	BURLINGTON	1.45
	MIDDLESEX	1.26
	BERGEN	1.13
	SUSSEX	1.08
	UNION	1.04
ISLAND BEACH STATE PARK	MERCER	3.19
	OCEAN	2.91
	SOMERSET	1.69
	MORRIS	1.63
	HUNTERDON	1.40
	MIDDLESEX	1.28
	PASSAIC	1.26
	UNION	1.14

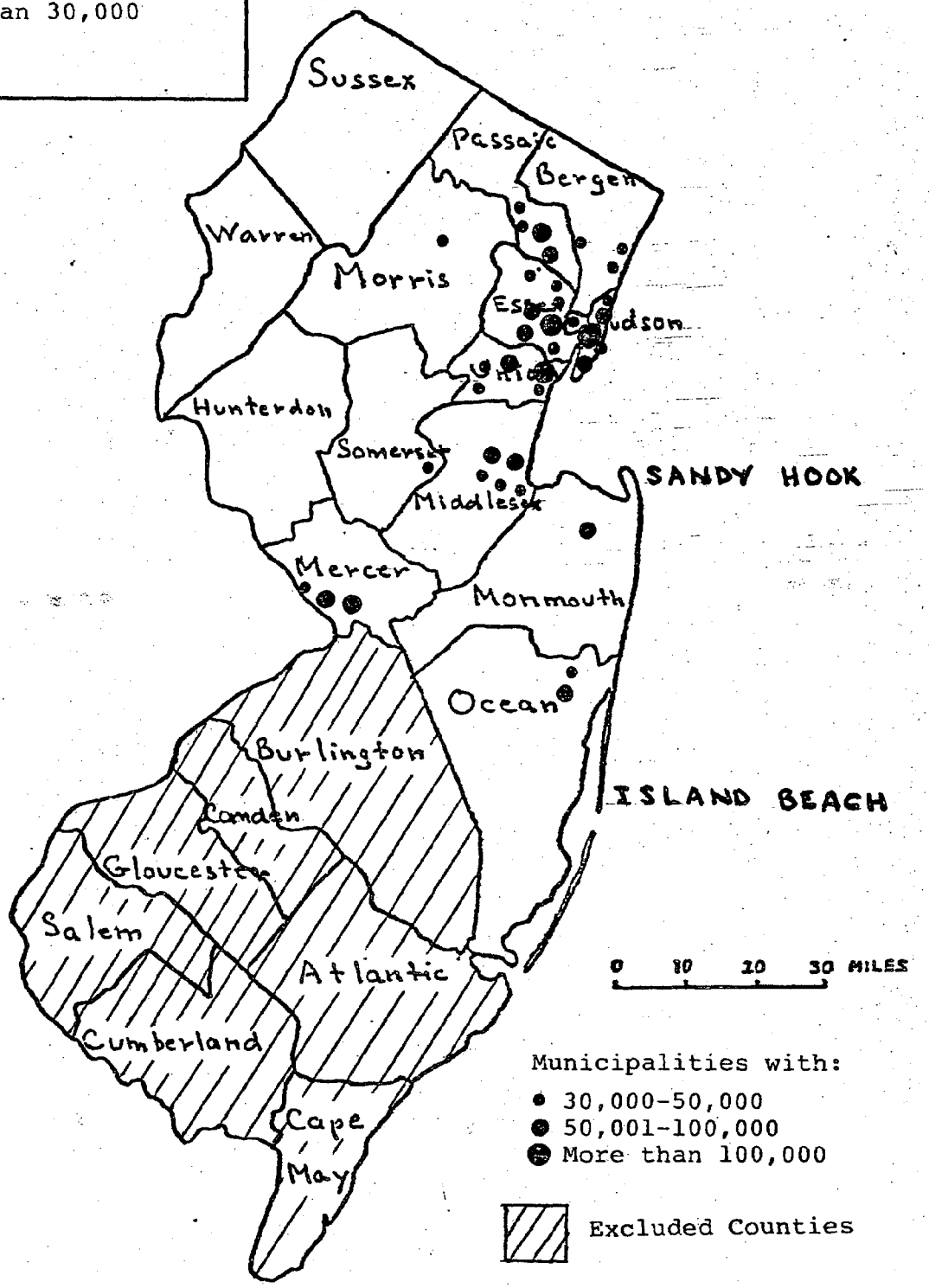
pality in the study a set of socioeconomic characteristics, including income and ethnic variables.

Using multiple regression analysis, we will predict the participation quotient of selected communities as a function of a set of community socioeconomic characteristics and the distance of the community to the beach site. An obvious danger must be mentioned. By using community aggregate data rather than individual household information we must be careful not to impute community characteristics to individual behavior. For example, we will not know whether low-income people go to the beach, only whether or not low-income communities send a higher or lower number of visitors to the beach than the statewide average. Maybe the few higher-income households in the low-income community go to the beach frequently, while the bulk of the community does not go at all.

In order to examine the relationships between variables, cities had to be selected based on data availability. The criteria used was population size. All cities in northern New Jersey which had more than 30,000 people in the 1980 census were included in the sample (Exhibit 5-4). Cities over 30,000 in the southern part of the state were excluded because inhabitants tend to go to beaches further south than the study area of this project. This procedure

EXHIBIT 5-4

Sample Municipalities
Northern New Jersey
(Municipalities in 1980 with more than 30,000 inhabitants)



may exclude some smaller cities with high participation rates; on the other hand, it excludes many artificially high participation rates caused by single automobiles arriving from very small communities.

The Analysis

The data for the 42 cities was analyzed to determine the relationships between participation and a number of predictor variables. Information was collected on five demographic variables: (1) average household income, (2) average per capita income, (3) percent of the population below the poverty rate, (4) the percentage of Black population and (5) the percentage of Hispanic population. The data was derived from the U.S. Census. Also, distance was calculated from the community to the beach sites using the expected shortest path in terms of length. Obviously, the travel times can vary widely depending on time of day and day of week. In this sense, the distances are assumed to be relative indicators of the friction of travel as perceived by the prospective beachgoer. Three distances were calculated. The distance of all communities to Sandy Hook and, alternatively, to Island Beach State Park was estimated. Subsequently, these two distances were averaged to produce a third estimate.

The participation quotient was used as the dependent

variable. All ten sites were examined using correlation and regression analysis. In general, it was assumed that participation in going to the beach would increase:

1. when the community was closer to the beach site
2. when there was a lower poverty rate
3. when there was higher average household or per capita income

However, no assumptions were made about the relationship of the participation quotient to the percentage of Black or Hispanic populations. It should be remembered that the participation quotient takes the population of the community into account in the formula, so that there was no need to adjust for population size of the community in the analysis.

The correlation matrix of the variables included in the analysis is shown in Exhibit 5-5. The values in the matrix are the product-moment correlation coefficents, also known as "r", which range between -1 and +1. The higher the value the greater the linear relationship between the variables. The sign of r indicates the direction of relationship. For example, the r between the average household income of the community (HHY) and the poverty rate (PR) is -.89. This indicates a very strong linear inverse relationship between these two variables. In other words, the higher the household income in a community the lower the expected poverty rate -- an intuitive result. However, the correlation coef-

EXHIBIT 5-5
Correlation Matrix, 42 Communities in New Jersey

VARIABLE	POP	HHY	PCY	PR	DSH	LDSH	DIB	LDIB	DAV	LDAV	PB	PH	PQLB	PQPP	PQLV	PQSS	PQIB	PQBL	PQBB	PQAP	PQMN	PQSH
POP	1.00	-.41	-.46	.54	-.06	-.04	.01	.03	-.02	.00	.43	.11	.16	-.11	-.07	-.01	-.09	-.14	-.10	-.09	-.24	.06
HHY		1.00	.85	-.89	-.07	-.15	.03	.03	.00	-.04	-.48	-.51	-.29	.16	.23	-.03	.08	.29	-.03	-.24	.37	.16
PCY			1.00	-.81	.12	.06	.23	.18	.22	.17	-.43	-.50	-.34	.04	.11	-.11	.03	.14	.08	-.15	.17	-.02
PR				1.00	.00	.05	.04	.08	.02	.07	.59	.52	.31	-.29	-.20	-.05	-.15	-.21	-.03	.22	-.28	-.07
DSH					1.00	.96	.51	.38	.79	.76	.01	.04	-.13	-.16	-.06	.01	.10	-.47	.00	.00	-.35	-.61
LDSH						1.00	.47	.34	.74	.73	.06	.06	-.10	-.10	-.08	.04	.12	-.43	.04	.01	-.28	-.71
DIB							1.00	.96	.93	.93	.06	.18	.13	-.41	.04	-.48	-.47	-.22	.32	.35	-.36	-.09
LDIB								1.00	.85	.88	.12	.18	.16	-.46	.02	-.56	-.56	-.15	.32	.37	-.31	.01
DAV									1.00	.99	.04	.14	.03	-.36	.01	-.34	-.29	-.36	.23	.25	-.40	-.32
LDAV										1.00	.10	.16	.06	-.41	-.02	-.37	-.34	-.34	.25	.28	-.41	-.31
PB											1.00	-.03	.14	-.31	-.19	-.13	-.07	-.13	-.27	.14	-.17	-.11
PH												1.00	.55	-.20	-.23	-.11	-.24	-.13	-.05	.25	-.21	.05
PQLB													1.00	-.08	.07	-.14	-.35	.01	.01	.26	.07	.33
PQPP														1.00	.14	.29	.42	.16	-.11	-.31	.41	-.35
PQLV															1.00	-.04	.07	-.01	.20	.00	.16	.37
PQSS																1.00	.81	.17	-.03	-.07	.25	-.12
PQIB																	1.00	.04	-.26	-.29	.17	-.29
PQBL																		1.00	-.05	-.04	.44	.21
PQBB																			1.00	.41	-.03	.20
PQAP																				1.00	-.02	.20
PQMN																					1.00	.15
PQSH																						1.00

POP: POPULATION
HHY: AVERAGE HOUSEHOLD INCOME
PCY: AVERAGE PER CAPITA INCOME
PR: COMMUNITY POVERTY RATE
DSH: DISTANCE TO SANDY HOOK
LDSH: LOG OF DISTANCE TO SANDY HOOK
DIB: DISTANCE TO ISLAND BEACH SP
LDIB: LOG OF DISTANCE TO ISLAND BEACH
DAV: AVERAGE DISTANCE TO BEACHES
LDAV: LOG OF AVERAGE DISTANCE TO BEACH
PB: PERCENT BLACK IN COMMUNITY
PH: PERCENT HISPANIC IN COMMUNITY

PQLB: PQ, LONG BRANCH
PQPP: PQ, POINT PLEASANT
PQLV: PQ, LAVALETTE
PQSS: PQ, SEASIDE HEIGHTS
PQIB: PQ, ISLAND BEACH SP
PQBL: PQ, BELMAR
PQBB: PQ, BRADLEY BEACH
PQAP: PQ, ASBURY PARK
PQMN: PQ, MANASQUAN
PQSH: PQ, SANDY HOOK

WHERE PQ: PARTICIPATION QUOTIENT

ficient between household income and average distance to the beach sites from the communities is zero (rounded to two digits), meaning there is no relationship. This indicates that the spatial distribution of communities over 30,000 in New Jersey is such that higher income communities are not generally closer to the beach sites than lower income communities.

The correlation matrix can explore some potentially interesting interrelationships between the variables. A particularly interesting analysis can be done examining the relationships among beach sites. For example, the correlation coefficient between the participation quotients at Seaside Heights and Island Beach State Park is .81. Communities sending visitors to the state park also send visitors to Seaside. The license plate surveys for these two sites were taken on different days so that the same cars are not being counted. The only other high correlation (over .5) among beach site visitation is the r of .64 between Belmar and Manasquan.

From the correlation matrix four independent variables were selected as predictors of participation at each of the beach sites. Since there were extremely high correlations between household income, per capita income, and poverty rate, one was selected as an indicator of income -- the

household income variable. The percent Black population and percent Hispanic population were selected also. Finally, a distance measure was selected, either from the community to Sandy Hook, Island Beach, or an average of the two, depending on the location of the beach site.

These four independent variables were run against the ten beach sites using a multiple regression analysis. The results are shown in Exhibit 5-6. For each beach site the important predictor variables are shown, ranked by order of importance. The beta value is the standardized regression coefficient, and indicates the relative importance of the variable in predicting participation. The beta coeffficients are standardized to take out the effect of the different units of measurement, such as miles or dollars. For example, for the Point Pleasant beach site the distance variable (beta= -.345) is more important than the percent of the community population which is Black (beta= -.289) in predicting participation. The sign indicates the direction of the relationship, similar to the correlation coefficient r. The B coefficient is the regression coefficient of the regression equation. Only those predictor variables which are statistically significant at the .10. .05, .01 or .001 levels are included in the equation.

The R-square of the total equation is the percent of explained variation from all the variables listed for the

EXHIBIT 5-6

Important Predictors of Participation
By Beach Site

BEACH SITE	VARIABLE	BETA	B COEFFICIENT	SIGNIFICANCE LEVEL	R-SQUARE TOTAL EQUATION	SIGNIFICANCE TOTAL EQUATION
LONG BRANCH	PERC'T HISPANIC	.546	5.511	.001	.298	.001
	INTERCEPT		.965			
PT. PLEASANT	DISTANCE(1)	-.345	-.049	.05	.212	.01
	PERCENT BLACK	-.289	-2.570	.05		
	INTERCEPT		4.080			
LAVALETTE	NONE					
SEASIDE HEIGHTS	DISTANCE(2)	-.560	-5.106	.001	.313	.001
	INTERCEPT		10.141			
ISLAND BEACH SP	DISTANCE(2)	-.565	-4.937	.001	.319	.001
	INTERCEPT		9.953			
BELMAR	DISTANCE(1)	-.356	-.043	.05	.127	.05
	INTERCEPT		3.234			
BRADLEY BEACH	PERCENT BLACK	-.499	-3.228	.05	.229	.05
	HOUSEH'D INCOME	-.434	.00009	.01		
	PERC'T HISPANIC	-.328	-2.538	.08		
	DISTANCE(1)	.294	.030	.05		
	INTERCEPT		2.186			
ASBURY PARK	NONE					
MANASQUAN	DISTANCE(1)	-.403	-.037	.01	.298	.001
	HOUSEH'D INCOME	.368	.00007	.01		
	INTERCEPT		1.493			
SANDY HOOK	DISTANCE(3)	-.712	-7.728	.001	.506	.001
	INTERCEPT		13.492			

NOTES:
(1) AVERAGE DISTANCE OF COMMUNITIES TO BEACHES
(2) LOG OF DISTANCE TO ISLAND BEACH STATE PARK
(3) LOG OF DISTANCE TO SANDY HOOK

particular beach site. Thus, there are four predictor variables for Bradley Beach which altogether predict 22.9 percent of the variability in participation among communities. Interestingly, distance alone predicts 50.6 percent for Sandy Hook. The final column of the exhibit indicates the statistical significance of the total equation.

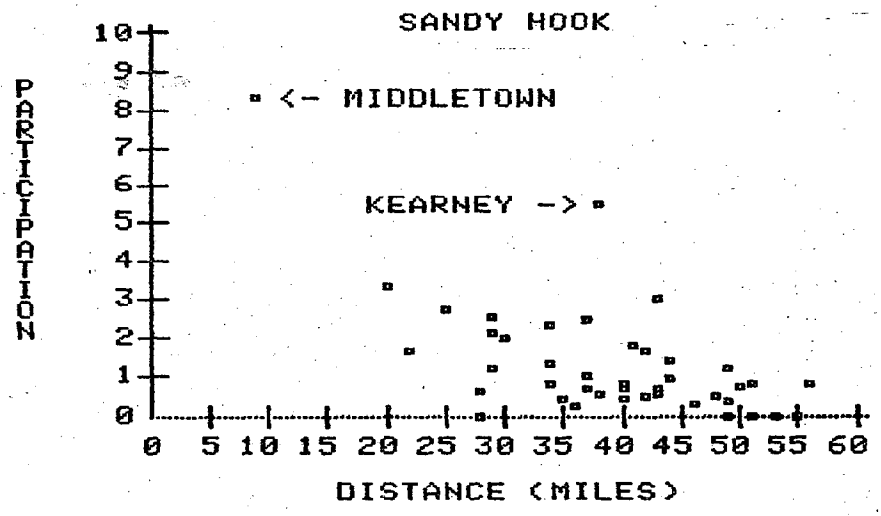
The results of Exhibit 5-6 show the variation among beach sites in the importance of the different predictor variables. There are several conclusions which can be drawn from this analysis. First, distance is the most important variable in predicting participation rates among communities. Distance is a significant predictor for 7 of the 10 beach sites, and the most important predictor for 6 of these. This is not a surprising result, but is important for policy purposes. It means that among communities over 30,000 in New Jersey distance does affect travel to the beach on summer weekends. However, based on these results the exact importance of distance varies widely among beach sites. For example, distance is extremely important in predicting travel to Sandy Hook, while only minimally important for Bradley Beach. The relationship between distance and participation for Sandy Hook is shown in Exhibit 5-7.

Earlier, it was suggested that there was no relationship between the distance of the communities to the beach

EXHIBIT 5-7

Relationship between Distance and Participation,

Sandy Hook



sites and the average community income. The correlation coefficent in Exhibit 5-5 between household income and any of the distance measures -- to Sandy Hook, Island Beach or an average to all beach sites -- is very low. For example, the coefficient is zero between average distance and household income. This means that higher income communities are neither generally closer or further away from the beach sites than lower income communities. It is also true that household income is not generally related to participation. In Exhibit 5-6 household income is important for only two beach sites -- Manasquan and Bradley Beach. However, while there is a positive correlation between income and participation for Manasquan, there is an inverse relationship for the Bradley Beach site. Higher income communities are less likely to send travelers to Bradley Beach according to these results.

A note of caution is important. The Bradley Beach equation is suspect. The equation indicates that participation increases as the percentage of Black and Hispanic populations decrease and as distance increases. Since income and percent Black or percent Hispanic are inversely related in the correlation matrix (Exhibit 5-5), we would expect that there would be a positive correlation between participation at Bradley Beach and income. In fact, there is a negative correlation between these two variables in the

equation. Also, it is counter-intuitive to expect a positive relationship between distance and participation, where there is more travel from communities further away. Yet, the equation shows this.

There is the clear relationship between participation and distance. There is much less in the way of a relationship for household income in this data, although other studies have shown that low income households are less likely to visit the beach than other income groups (Flaschbart, 1978; Heatwole and West, 1980; Eagleton Poll, 1981). Ethnic variables also are only weakly related to participation with a few exceptions. Long Branch shows a relatively strong relationship between participation and communities with a high percentage of Hispanics. Alternatively, at Point Pleasant there is a moderate relationship between participation and communities with a lower percentage of Blacks. Overall, however, there is little to justify any conclusion about income or ethnicity regarding participation at these ten beach sites in northern New Jersey. Correspondingly, there is a strong relationship between distance and participation.

Age of Vehicle as a Social Indicator

The data set included age of the vehicle as one of the

variables. It is tempting to assume a relationship between the age of the vehicle and the owner's income. If beaches were visited by identical socioeconomic groups, we would expect the age distribution of the visiting vehicles to be similar among the different sites. This is not the case as shown in Exhibit 5-8 and Exhibit 5-9. In Exhibit 5-8 the distribution of vehicle ages of the 10 beach sites shows that there are differences. Fully one-half of the vehicles surveyed in Point Pleasant were 1978 model years or newer. In Long Branch, by contrast, only 30 percent were 1978 or newer. These differences appear when examining the older vehicle population as well. Fully 17 percent of automobiles surveyed at Sandy Hook were 1969 or earlier model years. Only 8 percent of the cars visiting Lavalette were as old.

In Exhibit 5-9 the different beaches are ranked in terms of the average age of the vehicles surveyed. Lavalette, Point Pleasant and Manasquan had the "newest" vehicles in the survey while Sandy Hook, Long Branch and Seaside Heights had the "oldest." In contrast to the federally-run Sandy Hook, Island Beach State Park was visited by relatively newer vehicles. The differences in the average ages of the vehicles is moderately significant. The difference between the first ranked site, Lavalette and the last ranked site, Sandy Hook, is two years. There are varia-

EXHIBIT 5-8

Age of Vehicles of Visitors
to Beach Sites

SITE	TOTAL	MODEL YEAR 1978-ON NO.	PCT.	1974-1977 NO.	PCT.	1970-1973 NO.	PCT.	BEFORE '70 NO.	PCT.
LONG BRANCH	173	52	.301	56	.324	46	.266	19	.110
PT. PLEASANT	264	132	.5	67	.254	37	.140	28	.106
LAVALETTE	252	115	.456	74	.294	42	.167	21	.083
SEASIDE HEIGHTS	545	193	.354	163	.299	129	.237	60	.110
BELMAR	264	116	.439	74	.280	45	.170	29	.110
BRADLEY BEACH	183	69	.377	70	.383	27	.148	17	.093
ASBURY PARK	225	82	.364	83	.369	41	.182	19	.084
MANASQUAN	344	150	.436	112	.326	53	.154	29	.084
SANDY HOOK	1174	398	.339	368	.313	208	.177	200	.170
ISLAND BEACH	945	438	.463	262	.277	151	.160	94	.099
TOTAL	4369	1745		1329		779		516	

EXHIBIT 5-9

Ranked Average Age of Vehicles

to Beach Sites
(N = 4,369)

Site	Average Model Year
Lavalette	1975.7
Pt. Pleasant	1975.5
Manasquan	1975.5
Bradley Beach	1975.4
Island Beach	1975.4
Belmar	1975.1
Asbury Park	1975.1
Seaside Heights	1974.6
Long Branch	1974.4
Sandy Hook	1973.7

tions in vehicle ages and, possibly the incomes of visitors, among sites.

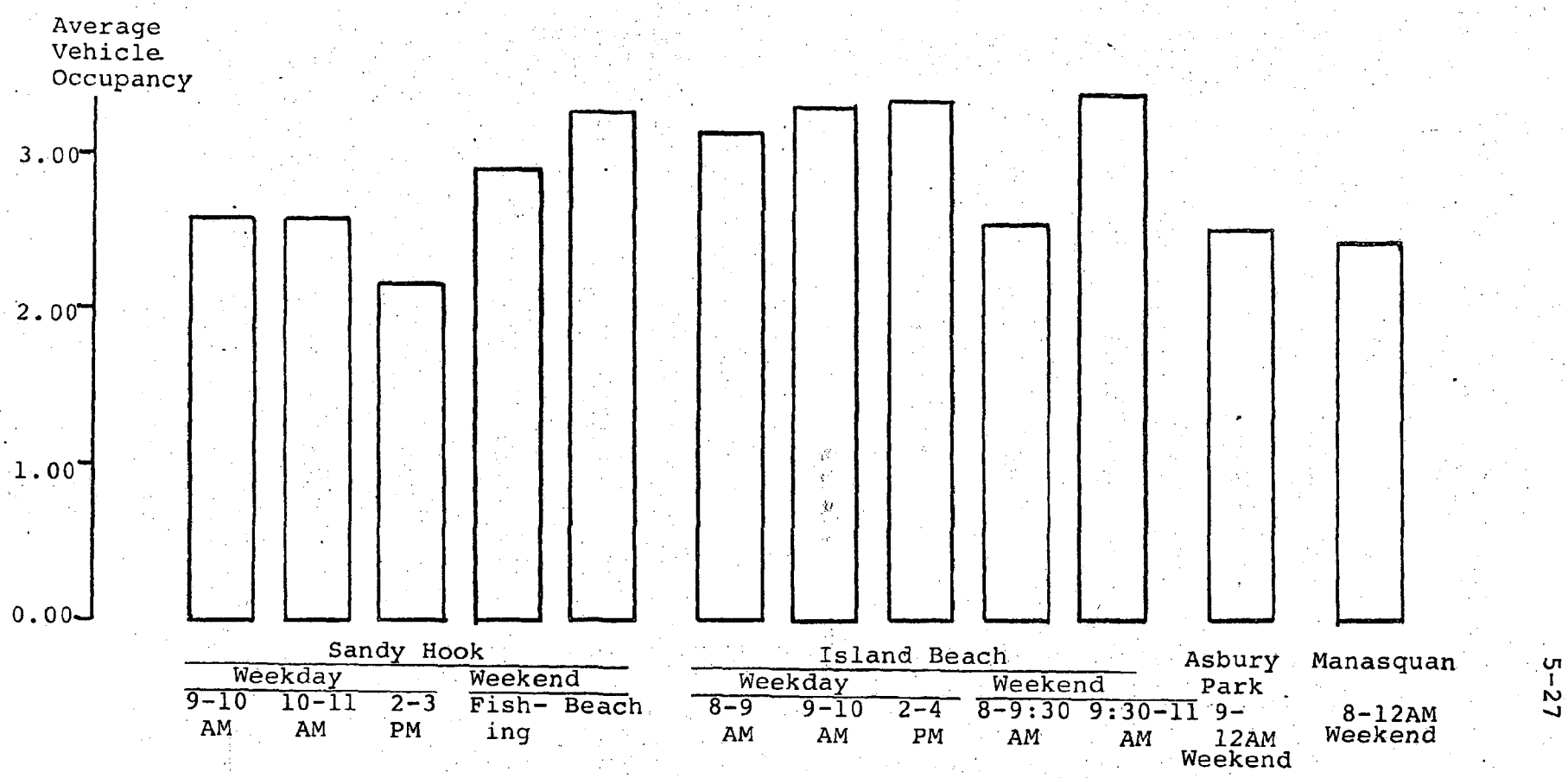
Occupancy Rates and Time of Arrival

The number of persons in each vehicle was recorded at four sites -- Asbury Park, Manasquan, Island Beach State Park and Sandy Hook -- at the same time and location as the license plate survey. In Asbury Park and Manasquan licenses were recorded and the number of persons counted as the vehicle parked before the visitors went to the beach. At Sandy Hook and Island Beach counts were taken on weekends as well as on weekdays. The time of arrival was also recorded at these two sites. The results are shown in Exhibit 5-10. Island Beach State Park and Sandy Hook have the highest occupancy rates, about 3.3 persons in each vehicle, compared to Manasquan and Asbury Park where the vehicles carried about 2.5 persons. These differences are statistically significant at the .05 level.

One explanation can be offered for the differences between the beaches -- fee policy. Sandy Hook is a free beach and Island Beach charges a flat fee per vehicle, where other beaches charge per person in addition to parking fees. For a large family or set of friends it becomes economical to visit Island Beach or Sandy Hook.

EXHIBIT 5-10

Auto Occupancy Rates, Selected Beaches



The day of the week seems to make a difference in occupancy rates at Sandy Hook. On the surveyed weekday, the occupancy rate was considerably lower, about 2.8 persons per vehicle. It was observed that many families arrived with only one parent, the other parent presumably was working. However, there were no significant differences in occupancy rates between weekday and weekend at Island Beach.

Our arrival time analysis (Exhibit 5-11) indicates that there is no clear pattern between distance and median arrival time. All counties using Island Beach on the sampled weekend day had median arrival times between 9:00 and 9:38 AM. The earliest were Bergen and Middlesex. Monmouth and Ocean Counties, closest to Island Beach, had arrival times in the middle of the distribution. A similar pattern is apparent at Sandy Hook. Morris and Essex have the earliest median arrival times while Monmouth County, the closest county, is in the middle of the distribution. Interestingly, Ocean County has the earliest arrival time on weekdays at Island Beach, indicating some relationship between arrival time and distance at non-peak times.

It has already been suggested that there is a relationship between distance and participation. It seems that those who do decide to go to beach sites that close when full will leave early enough to get in. Visitors from distant counties simply get up earlier to make certain that they can get into

EXHIBIT 5-11

Median Arrival Time of Visitors
to Sandy Hook and Island Beach by County[1]

County	Sandy Hook Weekend AM	Sandy Hook Weekend PM	Island Beach Weekend[2] AM	Island Beach Weekend[2] PM	Island Beach Weekday AM
Atlantic	9:30	12:30[3]	9:30	2:35	9:45
Bergen	9:51	3:15	9:00	2:54	10:18
Burlington	-	-	9:20	2:40	-
Essex	9:46	1:00[3]	9:16	3:11	10:13
Hudson	10:07	12:40[3]	9:05	3:18[3]	-
Hunterdon	-	-	9:38	3:15[3]	-
Mercer	-	-	9:16	3:11	10:31
Middlesex	10:17	2:15	9:04	3:11	10:00
Monmouth	10:17	2:09	9:16	3:00	10:02
Morris	9:45	-	9:12	3:06	-
Ocean	-	-	9:21	3:03	9:08
Passaic	10:08	1:30[3]	9:25	2:40	9:37
Somerset	10:45	12:30[3]	9:18	3:17	10:08
Union	10:21	2:00[3]	9:08	3:18	10:18
Warren	-	-	-	-	9:45

1. Ten or more visitors
2. Park closed from 11 AM to 2 PM
3. Less than five sampled visitors

Sandy Hook or Island Beach. If they do not get up early enough they do not go.

Conclusion

There is a distinct connection between beach visitation and distance. There is, at best, a slight or moderate relationship between visitation and demographic variables, particularly income. There is also some evidence that there is little relationship between the wealth of a community and proximity to the these ten northern New Jersey beach sites: the higher income households do not generally live closer to the beach.

The dramatic relationship between distance and participation in beach activities does mean, however, that discrimination does exist. Those who live further away, poor or rich, do not use the beach as much as those who live closer. Clearly, there is the need to examine what transportation alternatives would reduce the friction of travel for those who are more distant.

CHAPTER SIX

Beach Communities in Monmouth and Ocean Counties

An Overall Framework

The New Jersey shoreline has a great variety of beaches that can satisfy people with diverse needs and preferences. The beaches range from the unexploited Island Beach State Park to the highly commercialized beach and amusement center of Seaside Heights. It is important to be aware of this diversity and also to understand why these differences exist. Without such knowledge, attempts to improve access to recreational facilities may target inappropriate communities.

Our intention in this chapter is to introduce a typology for beach communities within the study area. By discussing types of communities rather than individual towns, it is possible to distinguish patterns of development, to better understand and conceive the effect of planning on the communities, and to simplify analysis of planning proposals.

The basis for a typology has to be chosen with care. Communities can be grouped together in a number of ways--for example, size, income or political dominance. Our typology is based on the spatial structure of the community because we believe that this represents the synthesis of a number of important factors. Among these factors are history and tradition, population characteristics, local policies and accessibility.

In this chapter, the analysis has been divided in two sections. First, we explain how various factors influence each other and, ultimately, the physical development pattern

within the communities. Second, we identify the types of beach communities found.

The Factors at Work

In order to explain differences in the spatial structure of municipalities in the shore area, we propose a theoretical model that can help us understand the dynamics. Such a conceptual framework is suggested in Exhibit 6-1. Local policies are formed by the residing population. However, the community is affected by events occurring at county, State and Federal levels. We have labeled these outside influences "historical/environmental factors." Among these, changes in accessibility are important. Local policies will guide development in conjunction with the private sector. The real estate market is sensitive to changes in accessibility as well as population characteristics of the communities, such as income and racial composition.

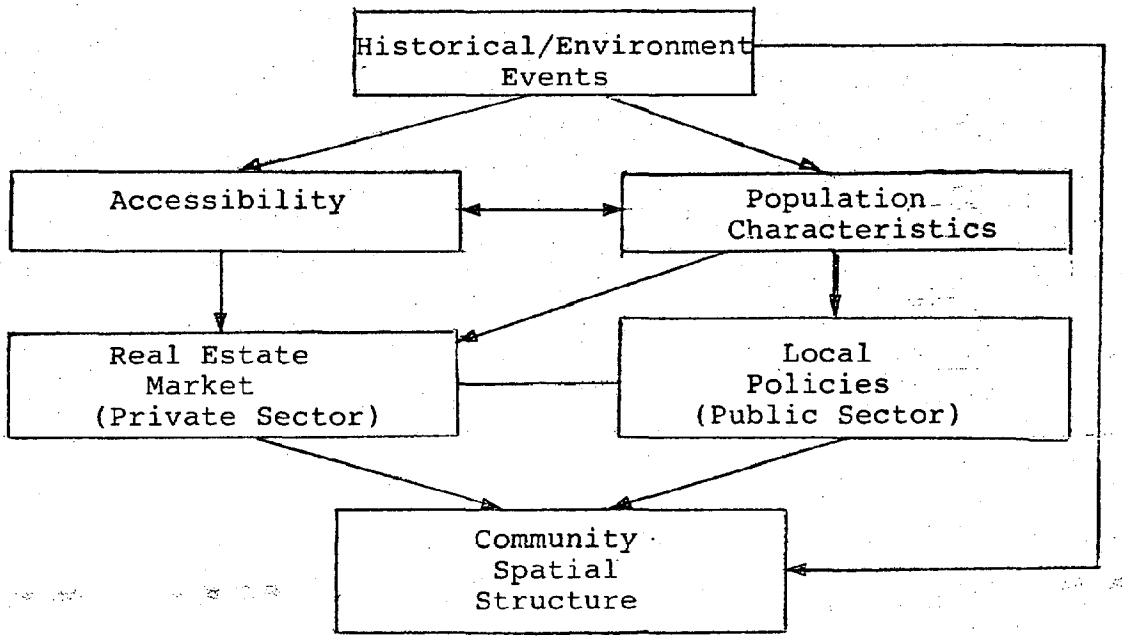
Local Policies

Interviews with public officials in shore communities reveal that local policies have a strong influence on the physical development of the beaches. These policies toward beach access and development pressures can broadly be classified into the following:

1. The beach is open to all.
2. The use of the beach by outsiders is restricted. For example, part of the beach may be set aside for residents only.
3. The use of the beach is for the exclusive use of the residents.

EXHIBIT 6-1

A Conceptual Framework,
Determinants of Community Spatial Structure



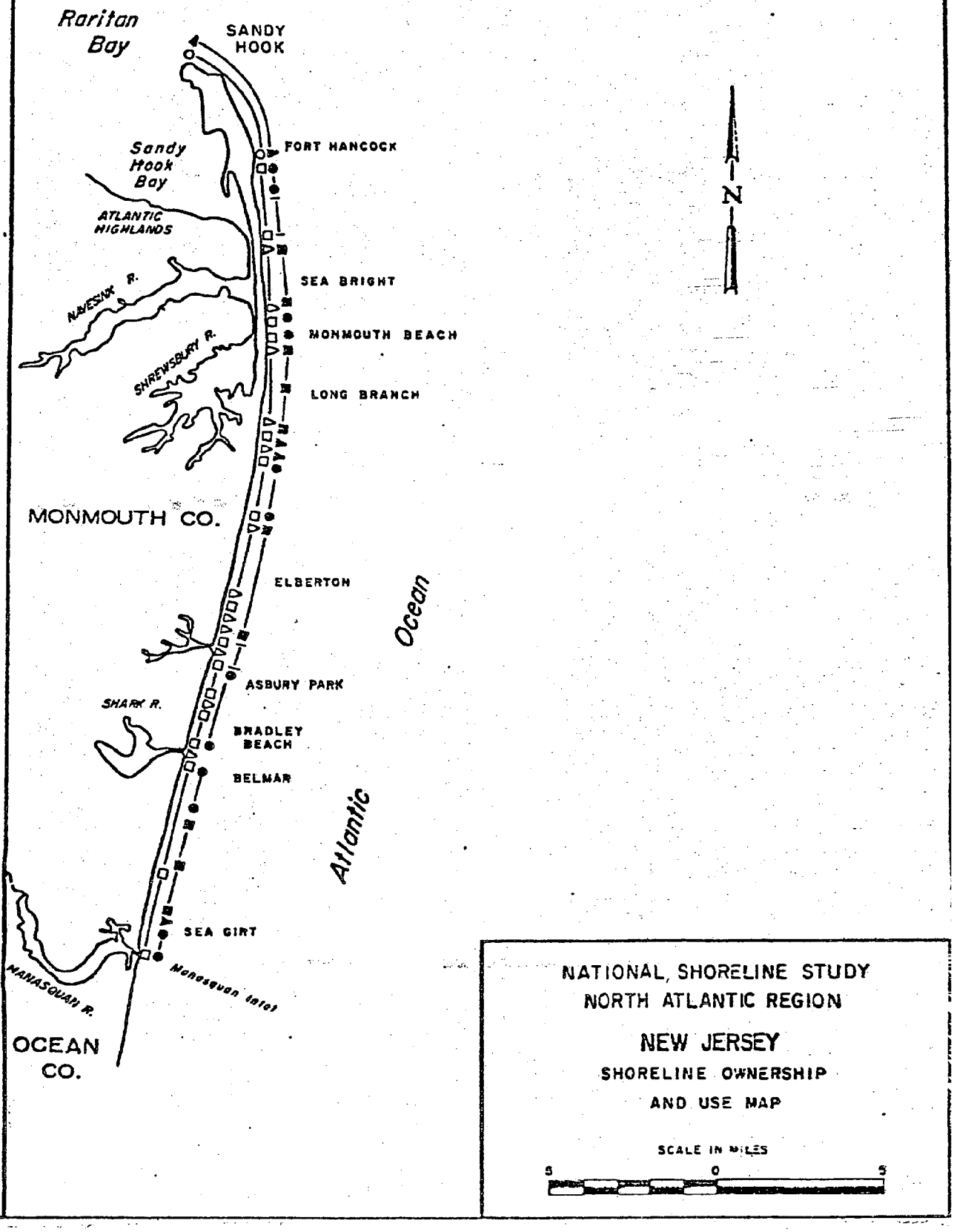
The amount of publicly owned beach varies between the municipalities. Our analysis will focus only on publicly owned beach developments and privately owned beaches which are open to the public. In Exhibit 6-2, 1971 usage and ownership is shown on a map. Exhibit 6-3 indicates to what extent the communities are restricting the use of the beaches in terms of frontage. Not counting Sandy Hook, which is federally owned, or Island Beach State Park, roughly fifty percent of the shoreline is inaccessible to the public because of user restrictions.

Why is it that some municipalities try to attract more beach visitors while others try to keep them away? Increased beach attendance is a two-edge sword for the community. On one hand, it stimulates the local economy. On the other hand, it creates problems for the residents -- crowding, crime, littering, among others. Municipal expenditures go up for street cleaning, beach maintenance and law enforcement. In Seaside Park, extra police during the summer cost the residents $117,000 per year, or more that $100 per family per year.

In short, these costs for an increased number of visitors to the beach will be detrimental for some residents. Meanwhile, other residents, particularly those with local commercial interests, will benefit. Political tension in the community between the "No-no's" and the "Go-go's" is created. The latter group, represented by the local "beach industry" and its employees, will typically favor development, while the "No-no's" want to restrict growth and change. High beach fees are opposed by the "Go-go's" but considered a

EXHIBIT 6-2

Shoreline Ownership and Use Map
(U.S. Army Corps of Engineers, 1971)



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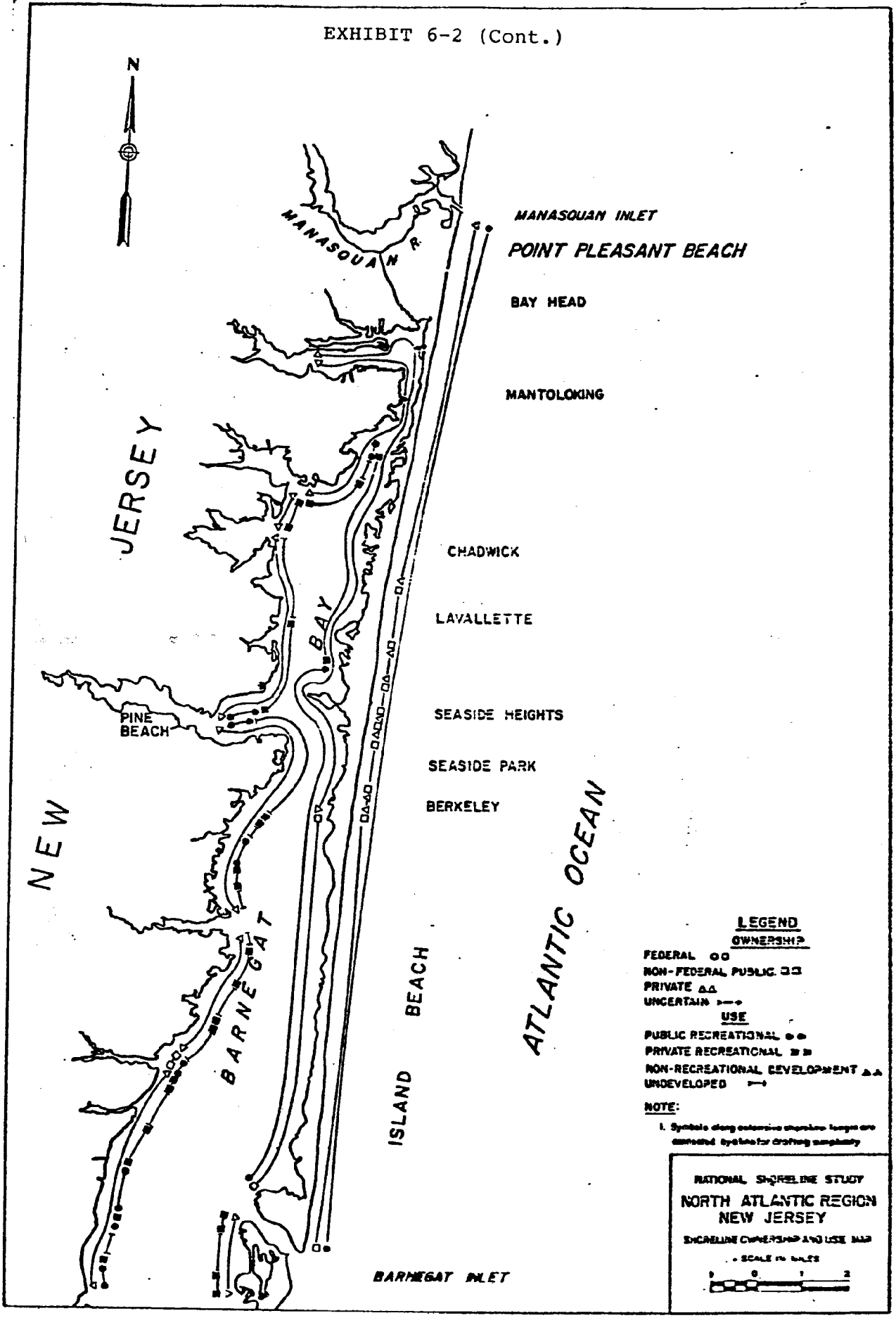


EXHIBIT 6-3

Shoreline's Ownership and Useage
(Length of Shoreline in feet)

Municipality	Federal	Public		Private		Total
		Open	Restricted	Open	Restricted	
Sea Bright	-	1,170	-	-	18,330	19,500
Monmouth Beach	70	1,877	-	-	6,495	8,440
Long Branch	-	6,195	3,554	809	12,181	22,739
Deal	-	600	976	-	6,924	8,500
Allenhurst[a]	-	-	-	-	1,766	1,766
Loch Arbour	-	130	-	300	585	1,015
Asbury Park	-	5,280	-	-	-	5,280
Ocean Grove	-	-	-	3,100	-	3,100
Bradley Beach	-	5,000	-	-	-	5,000
Avon-By-The-Sea	-	2,850	-	-	-	2,850
Belmar	-	-	-	7,400	55	7,455
Spring Lake	-	8,300	2,700	-	-	11,000
Sea Girt	-	4,937	-	-	636	5,573
National Guard	-	2,100	-	-	-	2,100
Manasquan	-	5,100	-	200	-	5,300
Point Pleasant Beach	-	-	-	5,200	3,630	8,830

EXHIBIT 6-3
(Cont.)

Municipality	Federal	Public		Private		Total
		Open	Restricted	Open	Restricted	
Bay Head	-	-	-	-	6,600	6,600
Mantoloking	100	-	60	-	11,140	11,300
Brick Township	-	-	200	-	9,271	9,471
Dover Township	-	1,394	-	1,800	9,408	12,602
Lavallette	-	6,850	-	-	-	6,850
Seaside Heights	-	4,000	-	-	-	4,000
Seaside Park	-	8,500	-	500	-	9, 00
Berkeley Township	-	1,010	-	1,406	405	2,821
Total	170	65,293	7,490	20,715	87,426	181,094

Source: U.S. Army Corps of Engineers, 1971.

[a]No questionnaire received. Appears to be all private.

necessary means to win the support of the "No-no's".

Population Characteristics

Interviews with officials indicated a strong resistance to development in communities with a high per capita income and a low level of beach-related commercial activities. Strong encouragement for development is found in communities where the local economy is highly dependent of the number of beach visitors. This is the case in communities that have a low per capita income, where residents can not afford the luxury of keeping the beach for themselves, and with a large beach compared to the number of residents. Given the figures in Exhibit 6-4 it is understandable that the Borough of Spring Lake, where the per capita income was $10,470 in 1977, is less interested in attracting visitors than residents in Asbury Park where the per capita income was less than half that amount, of $4,791. In Asbury Park the income from the beach industry is needed; in Spring Lake residents would rather keep the beach to themselves than generate municipal revenue.

An indicator of beach industry activities is given by figures for retail sales. Exhibit 6-5 gives retail sales per capita in the years 1953 and 1977. Both Long Branch and Asbury Park compared favorably with the rest of the state in 1954. At that time, Asbury Park had retail sales per capita that were more than three times as high as New Jersey in general. Long Branch was 20 percent higher than the state. Between 1954 and 1977 retail sales per capita grew 220 percent in Monmouth County, while sales in Asbury

EXHIBIT 6-4

Economic Characteristics of Beach Communities
1970, 1977

Municipality	Per Capita[a] Income 1977	Percent[b] Families with Income less than Poverty Level	Percent[b] Families with Income $15,000 or More
Allenhurst	7,444		
Asbury Park	4,791	17.0	10.4
Avon-By-The-Sea	7,585		
Belmar	6,090	9.2	21.5
Bradley Beach	4,699	13.2	12.9
Deal	11,852		
Loch Arbour	7,519		
Long Branch	6,132	9.6	19.5
Manasquan	7,162	3.2	26.4
Monmouth Beach	9,034		
Neptune (Ocean Grove)	5,337		
Sea Bright	7,300		
Sea Girt	11,416		
Spring Lake	10,470	1.7	50.0
Lavallette	6,761		
Point Pleasant Beach	6,515	6.3	26.2
Seaside Heights	5,832		
Seaside Park	5,409		
New Jersey	6,492	6.1	29.5
Monmouth County	6,576	5.9	31.7
Ocean County	5,518	6.7	17.2

Source: [a]New Jersey Department of Labor and Industry, 1980

[b]U.S. Census of the Population, 1970

EXHIBIT 6-5

Retail Trade in Beach Communities
1954-1977

Municipality	No. of Establishments 1954	1977	Percent Change	Total Sales (Millions) 1954	1977	Percent Change	Per Capita Sales (Thousands) 1954	1977	Percent Change
Asbury Park	548	229	-58%	58.4	67.2	+ 15%	3.4	4.0	+ 18%
Belmar	140	110	-21	16.0	47.0	+197	3.1	7.5	+142
Bradley Beach	97	50	-48	6.1	11.5	+ 89	1.5	2.6	+ 73
Long Branch	392	258	-34	31.8	66.0	+108	1.21	2.0	+ 65
Manasquan	94	126	+34	7.9	36.5	+362	2.0	6.6	+230
Neptune (Ocean Grove)	165	141	-15	10.4	66.2	+537	0.48	3.1	+546
Spring Lake		65			8.2			1.9	
Point Pleasant Beach	122	131	+ 7	11.0	49.7	+352	2.8	9.2	+229
Monmouth County	3,742	4,175	+12	324.3	1,681	+418	0.97	3.1	220
Ocean County	1,536	2,624	+69	128.1	1,115	+771	1.18	3.2	170
New Jersey	64,919	59,566	- 8	6,145	24,287	+292	1.0	3.3	+230

Sources: U.S. Census of Business, 1954; U.S. Census of Retail Trade, 1977; U.S. Census of the Population 1960; 1980 Directory, Monmouth County

Park only increased 15 percent and in Long Branch only 65 percent. During this same period, the consumer price index increased 124 percent.

The relative decline of retail sales can partly be explained by a decrease of income generated by the tourism industry. It is also a result of the restructuring of the retail trade, where large shopping malls were constructed at the expense of local businesses. The tremendous growth of retail sales in Neptune Township is probably a result of this centralizing trend. This type of developement proves to be especially detrimental to beach communities. Large shopping malls are not located near the ocean for reasons of geography. Instead, they are located as far away from the ocean as possible without allowing a competitor to locate between itself and the ocean. Thus, the mall can dominate a larger sector of the market.

Accessibility

A prerequisite for large retail centers is accessibility through an adequate transportation system. Traffic congestion prevails in most beach communities during the summer: this factor may contribute to the selection of new shopping facilities away from this congestion. Another reason for the relative decline of the northern beach communities is the impact of the Garden State Parkway. The Parkway increased the access to an entire range of beaches, spurring development in Manasquan and Point Pleasant Beach which maintained high retail sales per capita through the period from 1954 to

1977 (Exhibit 6-5).

Changes in accessibility do have an important effect on physical development. Accessibility shifts can be opposed or encouraged by the local communities. This is illustrated in the model. A present problem is the congestion of the Garden State Parkway, and local voices have been raised to increase the capacity of this highway to accomodate the traffic flows.

Real Estate

In the model we also propose that the type and amount of new construction or renovation depends on the expectations of the real estate market in terms of profitibility. The real estate market tends to favor high-income white communities which may explain disinvestments in Long Branch and Asbury Park. Exhibit 6-6 gives the present population of the beach communities within the study area and the percentage of minority groups. With the exception of Long Branch and Asbury Park and, to some degree Belmar, the beach communities are white. Between 1970 and 1980 the number of housing units in New Jersey increased by 16 percent overall. The communities that increased their housing units more than 16 percent in our study area were Monmouth Beach, Sea Bright, Belmar, Seaside Park and Lavallette (Bureau of Census, 1970,1980).

EXHIBIT 6-6

Demographic Characteristics, 1980

Municipality	Total Population	Minority Population Black	Minority Population Other	Total Minority (percent)	Population (65+) (percent)
Allenhurst	912	1	1	-	19.9
Asbury Park	17,015	8,535	628	53.8	-
Avon	2,337	9	15	-	-
Belmar	6,771	385	87	7.0	19.1
Bradley Beach	4,772	88	210	6.2	18.2
Deal	1,952	7	122	6.6	-
Loch Arbour	369	5	-	-	-
Long Branch	28,819	6,014	1,601	25.5	11.1
Monmouth Beach	3,318	17	26	1.3	-
Manasquan	5,354	6	51	1.0	18.5
Neptune	28,366	-	-	-	19.5
Sea Bright	1,812	44	23	3.7	-
Sea Girt	2,650	1	3	-	-
Spring Lake	4,215	10	38	1.1	-
Point Pleasant Beach	5,415	56	20	1.4	19.9
Lavallette	2,072	-	11	-	-
Seaside Heights	1,802	2	18	1.1	-
Seaside Park	1,795	2	5	-	-
Ocean County	346,083	9,439	4,622	4.1	18.6
Monmouth County	503,173	42,985	10,929	10.7	-
New Jersey	7,364,158	924,786	312,000	16.8	11.2

Source: U.S. Census of the Population 1980. Table 1, Persons by Race and Spanish Origin and Housing Unit Counts.

Historical Events in the Larger Environment

The model also suggests the importance of external events. These are defined as sudden changes in the socioeconomic, political or physical environment beyond the control of the local community. The importance of changes in accessibility in shaping physical structure has already been discussed. Consider, for example, the construction of the Garden State Parkway. Changes in state and federal legislation have also affected the built environment. For example, when Prohibition ended, Seaside Heights acquired about thirty liquor licenses while the less thirsty residents of Seaside Park decided that three or four licenses would be enough for their community. Today, it would be impossible for Seaside Park to develop as many bars and saloons as Seaside Heights even if the residents found that desirable because present state legislation sets a limit on the number of liquor licenses, based on population.

Another example are storms and hurricanes which have a very direct and negative effect on the built environment. The rebuilding after a storm is dependent on federal, state and local policies prevailing at the time of the damage. A change in federal policies regarding flood insurance, which has subsidized development on the barrier islands, would affect the real estate market in the study area.

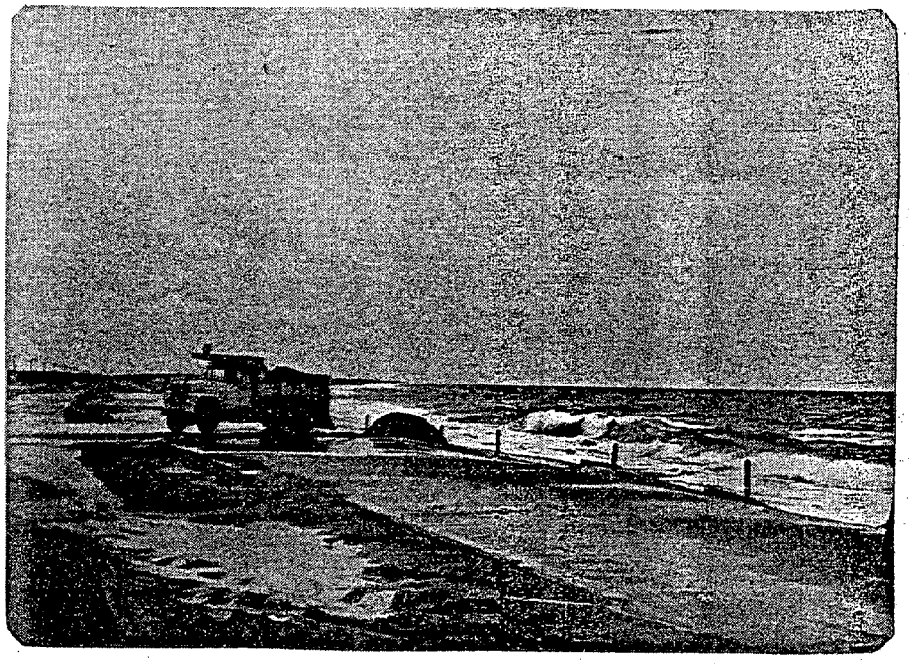
According to geologists with the Department of Environmental Protection in New Jersey, the barrier islands are not suitable for permanent construction. Although not a barrier island, Sandy Hook was breached in Fall, 1981, and claimed two of the four traffic lanes of the access road (Exhibit 6-7). However, state attempts to limit the development of the barrier islands have been opposed by a variety of interest groups, including, local residents, politicians, merchants and developers.

Classifying the Beach Communities

We have discussed how various factors have influenced the nature of physical development in the beach communities. Accessibility and local policies have been among the factors which shaped the built environment. In order to propose changes in land use or transportation it is necessary to be familiar with the present physical development of the beach communities and the existing local policies regarding land use.

Local policies

Interviews were conducted with officials in several beach communities: Long Branch, Asbury Park, Belmar, Spring Lake, Manasquan, Point Pleasant Beach, Lavallette, Seaside Park and Seaside Heights. An effort was made to interview both public officials and individuals representing the commercial activities -- for example, the chamber of commerce.



Sandy Hook, Fall 1981. Repair of Access Road

Through the interviews it was possible to develop an understanding of the community's view of the beach as an economic resource and attitudes toward development. There were clear differences in the attitude expressed. In Seaside Heights the tourism industry was considered extremely important. Fully 6,000 people are employed during the summer in Seaside Heights. In Point Pleasant one official was quoted as saying there was an "overall feeling of enjoyment of having visitors in town." In Asbury Park the interviews indicated strong support for increasing the number of vacationers. In contrast, Manasquan residents abhor the weekend crowds and are reluctant to increase the number of overnight visitors. The community in Lavallette feels that the number of visitors is sufficient, while Spring Lake residents express the attitude that the town is getting crowded and more visitors would not be desirable.

Physical Environment

All the beach communities were visited and the spatial pattern observed and photographed. In studying the development of the beach areas, it was noted that the different levels of commercial activities along the beach front among communities fell into distinct patterns. Based on this finding, the beach municipalities were clarified in four categories, as shown in Exhibits 6-8 to 6-11. While there is no commercial development in Type I communities, Type IV areas are characterized

EXHIBIT 6-8

Type I Beach Areas

Design Elements

Beach
Sand dunes
Trees and shrubs, possibly historical buildings

Local Policies

Two contradictory policies are present. One is to preserve the natural habitat and protect the environment from humans. The other is to provide recreational opportunities. To satisfy these dual requirements the number of visitors is restricted.

Areas

Island Beach State Park
Sandy Hook National Recreation Area

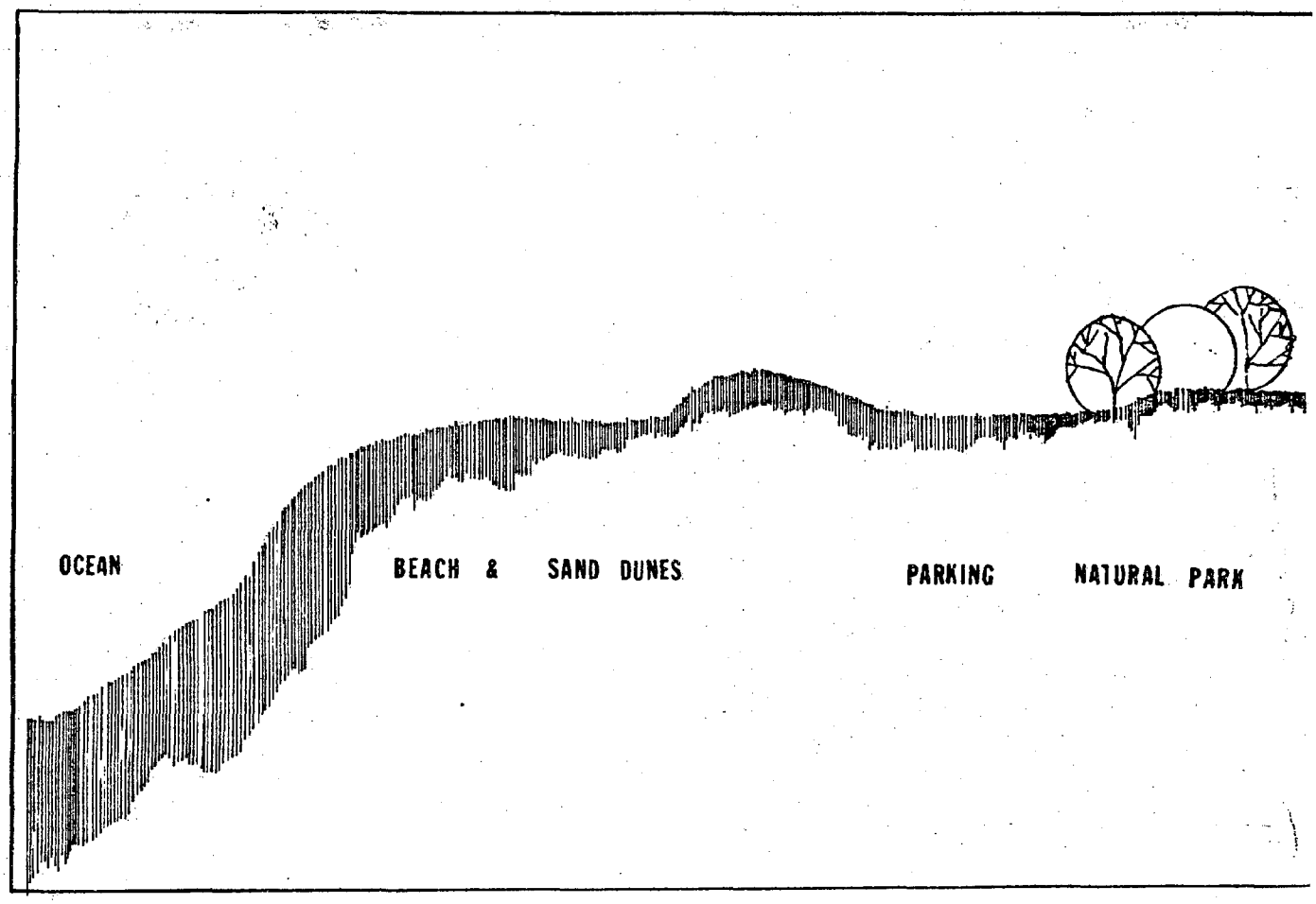


EXHIBIT 6-9

Type II Beach Areas

Design Elements

Beach and boardwalk
Parking and road
Residential development

Spatial Pattern

The residential development runs parallel to the beach. The access road may be either parallel or perpendicular to the beach.

Local Policies

The beach is seen as a means of residential recreation. Use by non-residents is often limited by limited parking space, no daily beach badges, or exclusion from beach areas.

Areas

Monmouth Beach
Ocean Grove
Lavallette
Seaside Park
Sea Bright
Deal
Allenhurst
Loch Arbour
Spring Lake
Sea Girt

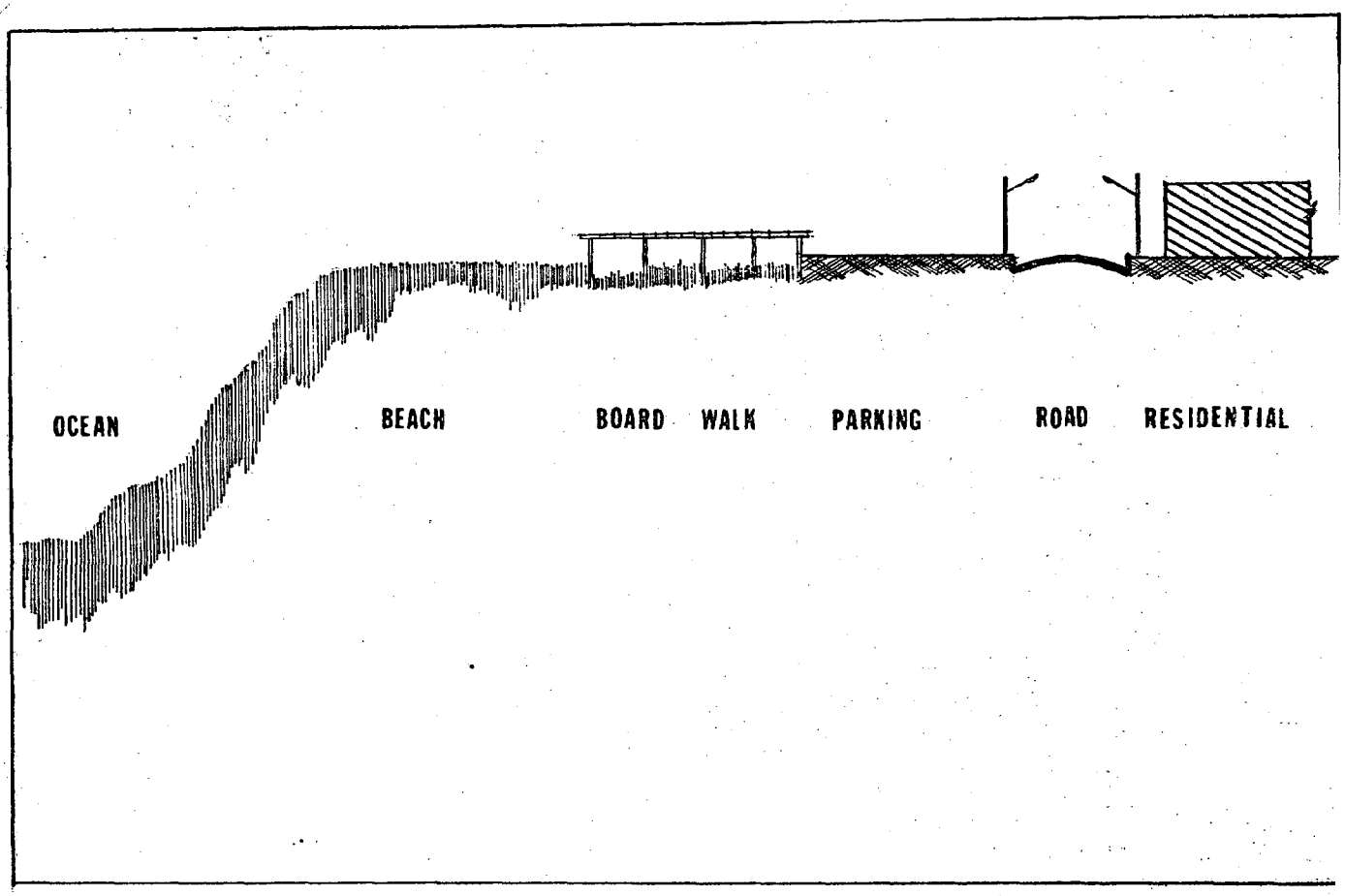


EXHIBIT 6-10

Type III Beach Areas

Design Elements

Beach and boardwalk
Parking and road
Residential and commercial Development

Spatial Pattern

Similar to Type II, except that commercial development occurs along the oceanfront. However, the level of development is moderate, and includes hotels, motels, and restaurants.

Local Policies

These communities do not have a strong policy toward beach use. The beaches are generally public with no restrictions.

Areas

Bradley Beach
Avon
Belmar

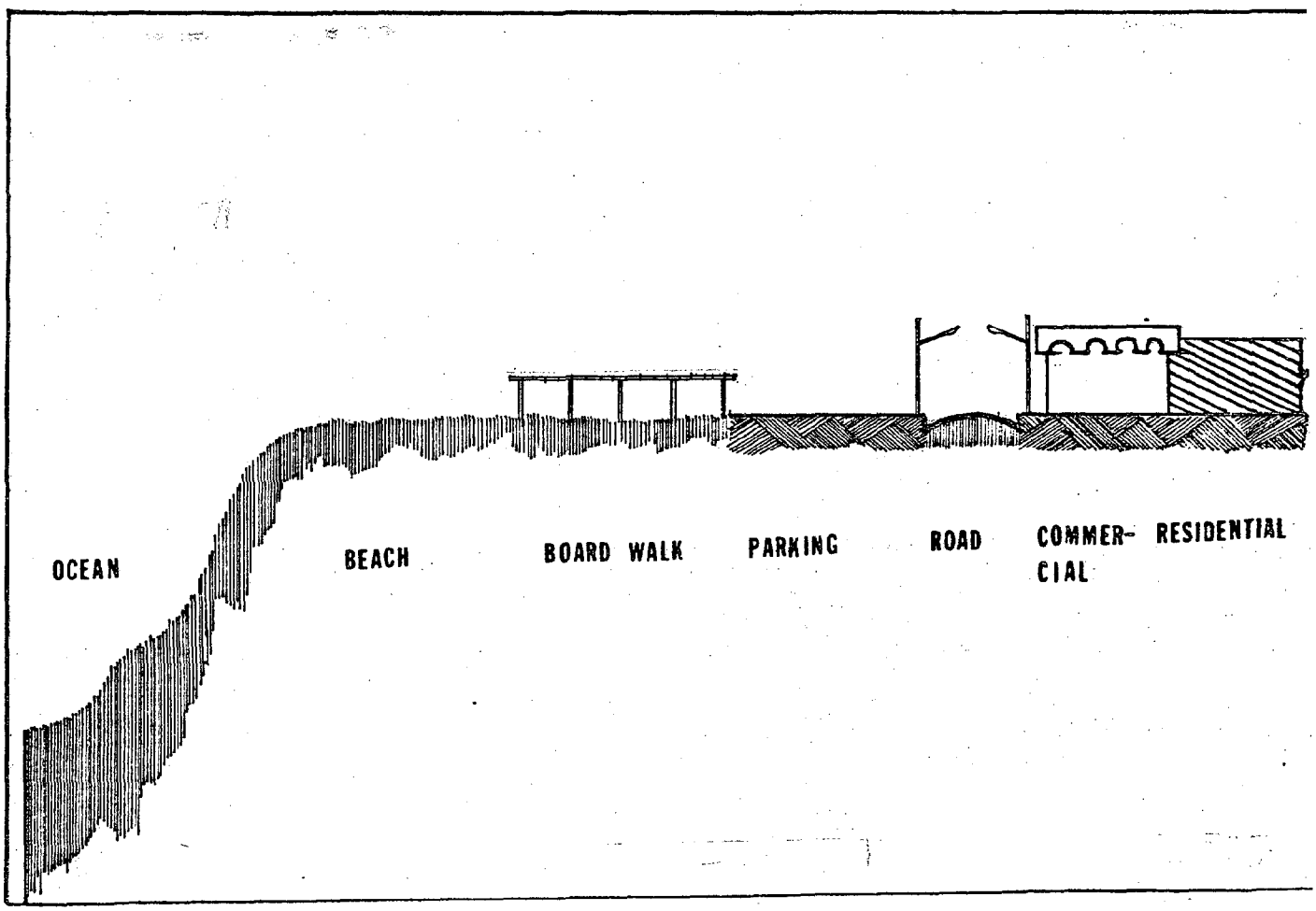


EXHIBIT 6-11

Type IV Beach Areas

Design Elements

Beach, boardwalk and amusements
Parking and road
Residential and extensive commercial development

Spatial Pattern

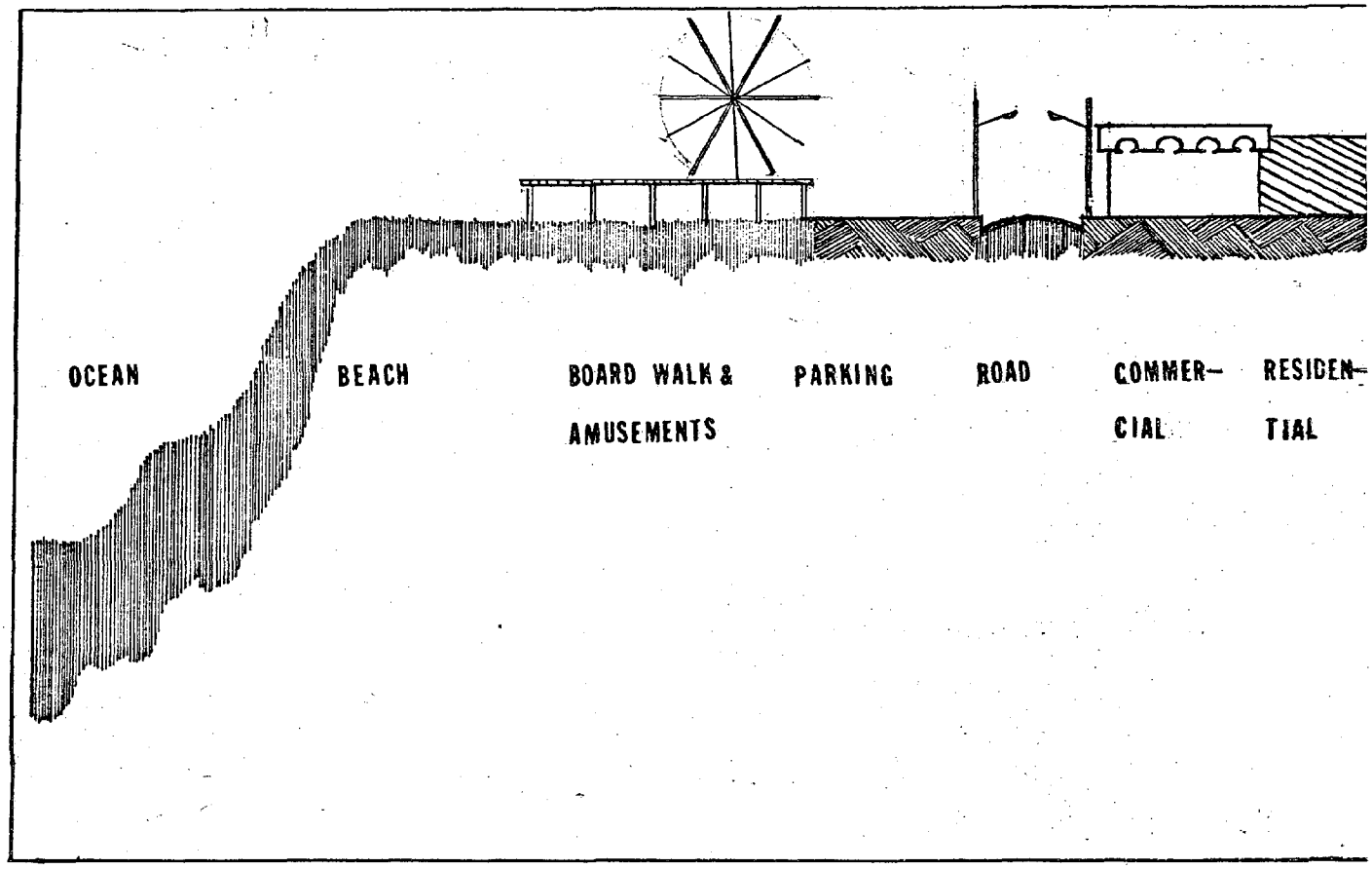
The boardwalk found in Type II and III communities has developed a commercial center with shops and amusements in Type IV. Also, there are large parking areas and commercial activities bordering the boardwalk.

Local Policies

Type IV communities favor development of the beach areas as an economic resource. Day visitors are encouraged and efforts are made to attract visitors, include advertising and promotions.

Areas

Long Branch
Asbury Park
Manasquan
Seaside Heights
Point Pleasant Beach



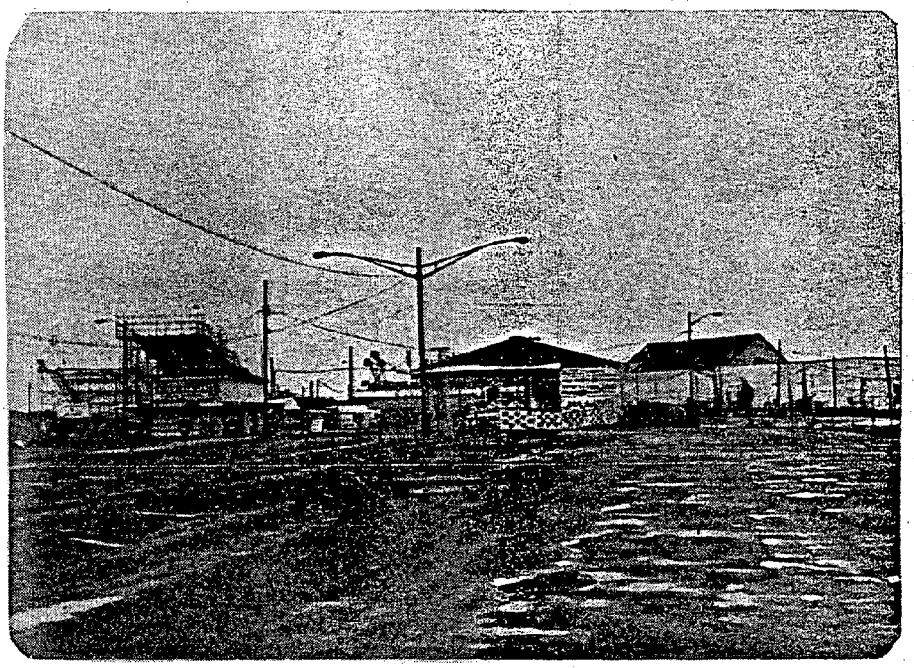
by large numbers of commercial establishments along the beach.

Some of the communities in the study fall between these two extremes. We have classified these as either Type II or Type III communities. Thus, towns like Seaside Park and Spring Lake, Type II communities, are more developed than Island Beach State Park but much less built-up than Seaside Heights. More developed than the Type II communities are towns like Belmar and Bradley Beach: these have been classified as Type III communities. A perusal of Exhibits 6-8 to 6-11 shows the classification of the communities within the study area, and the spatial pattern and design elements and local policies attributed to each type.

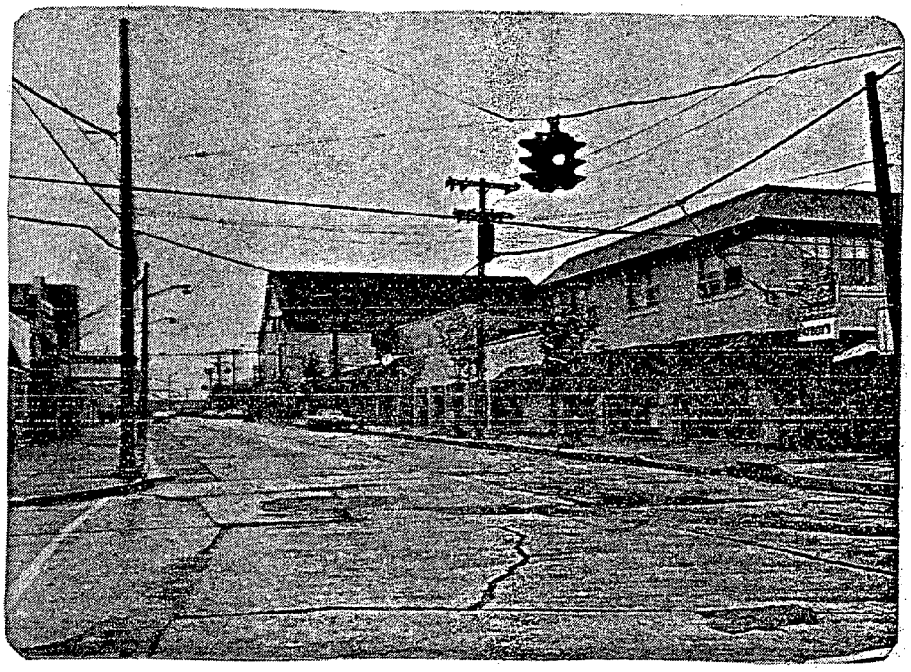
In some situations the classification is not all that clear. For example, Long Branch (Type IV) has much in common with the Type III communities. Avon is, in many respects, a Type II community. Even though its physical development is similar to Belmar and Bradley Beach, the standard of housing is higher in Avon and the beach fee is a dollar higher than for these neighboring beaches. Parts of Seaside Park are constructed as a type IV community. Photographs from various communities are shown in Exhibits 6-12 to 6-16.

In general, local policies coincide with the physical development of the beach areas. Communities which express a positive feeling towards visitors have a more developed beachfront. In contrast, communities which are reluctant to allowing more visitors display a more residential character.

EXHIBIT 6-12



The parking lot



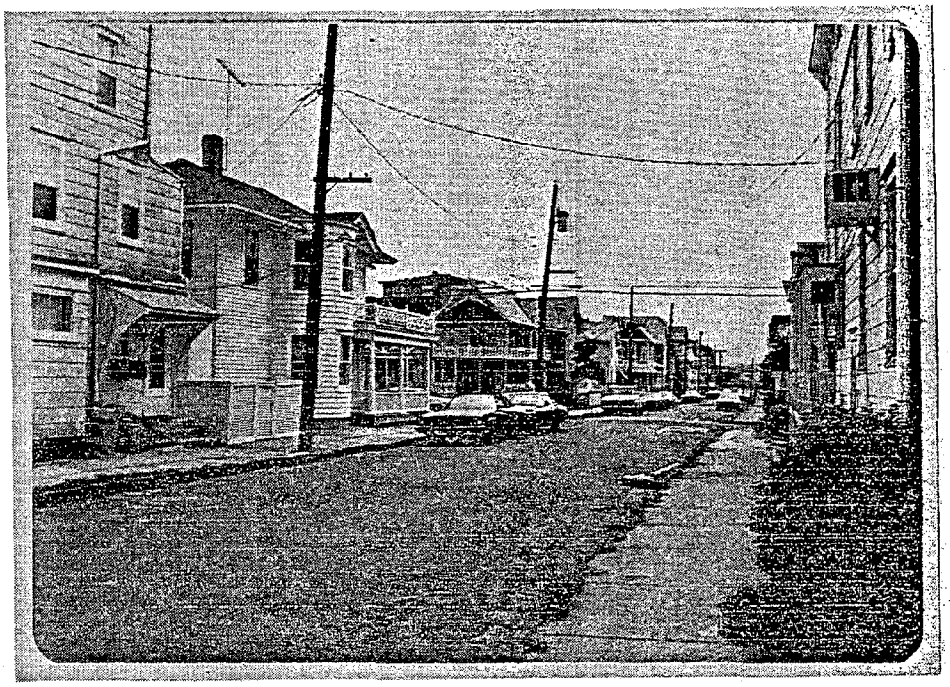
The downtown
Keansburg, popular in the past
Fall, 1981

EXHIBIT 6-13

The boardwalk

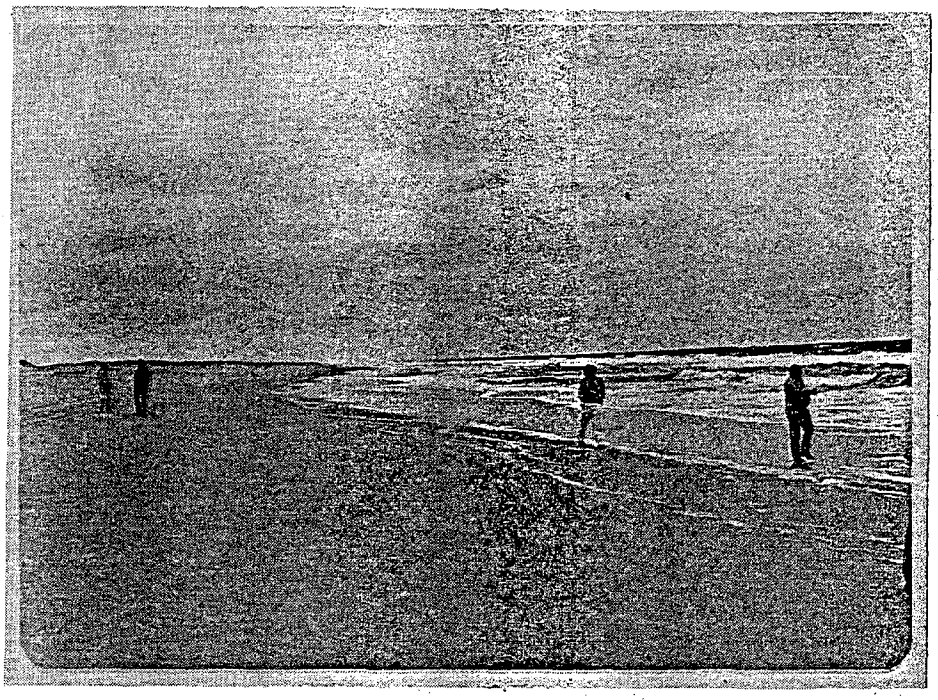
Downtown
Seaside Heights, popular today
Fall 1981

EXHIBIT 6-14

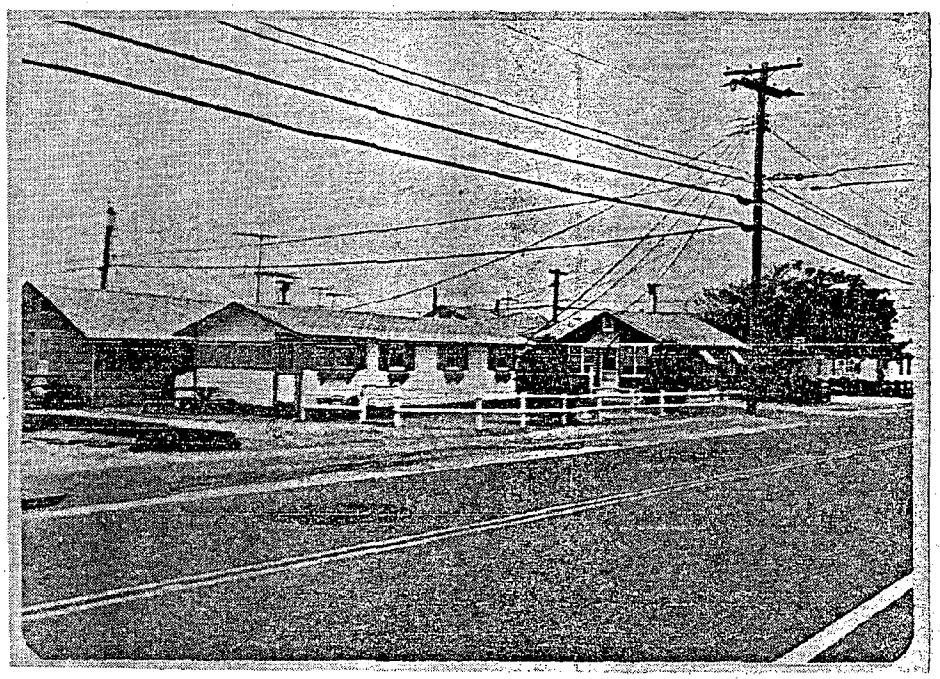


An older beach community
Ocean Grove
Fall, 1981

EXHIBIT 6-15



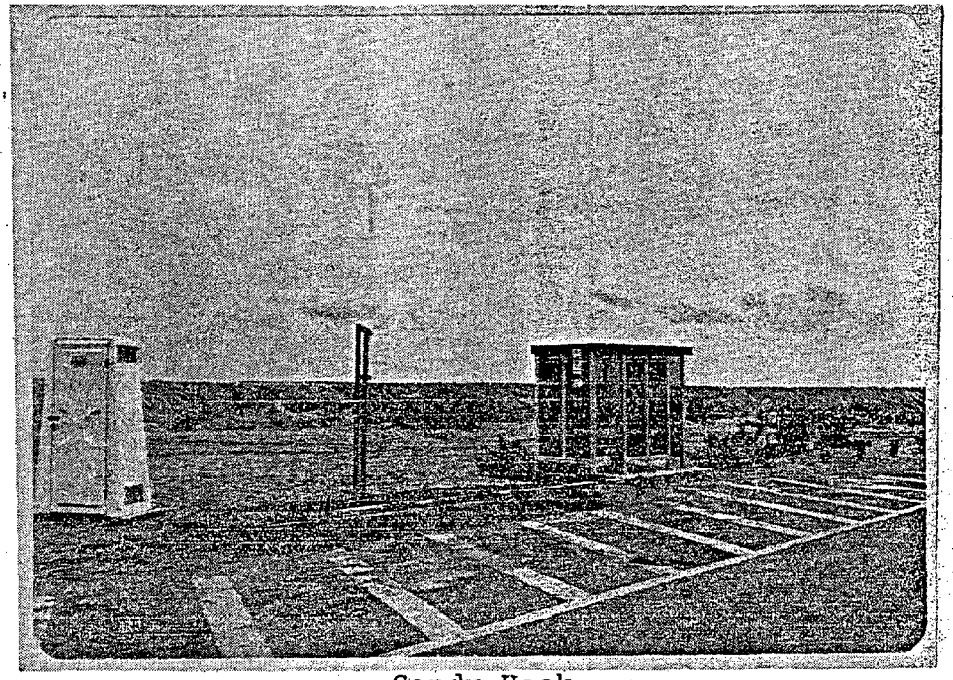
The splendor of Island Beach



A typical newer beach community
Fall, 1981

EXHIBIT 6-16

Near Keyport
A reminder of foregone opportunities



Sandy Hook
What exists today
Fall, 1981

An exception in this respect, apparently, is Manasquan which has a high level of commercial development, but a negative attitude towards visitors. This indicates a shift of local policies over time. One explanation is that many rental units have been converted to permanent homes. These residents have no interest in competing with more visitors for the limited beach space.

It should be pointed out that such a classification scheme has to be rough and cannot account for the nuances that exist among communities. The main purpose of the chapter is however to illustrate the dynamics of the physical changes of the built environment in the shore area. Any policy recommendations at the state level suggesting general solutions for the shore area should recognize the existing differences between beach communities and subsequently foresee, depending on the community, both different reactions to the proposal and different outcomes should the recommendations be implemented.

Implications for Public Policy

The beach communities depend to various degrees on the income from the beach industry. This industry and subsequently the communities will be affected by policy decisions which affect the number of visitors. Examples of such decisions include governmental subsidies for beach maintenance or replenishment, regulations concerning beach fees, and construction of new roads or improvements in public transit.

From the viewpoint of the state, the beaches are

a recreation resource which should be accessible to as many state residents as possible (New Jersey Beach Access Study Commission, 1977). The local point of view will vary from one community to another. However, if the present trend of converting summer houses to permanent homes continues, it seems likely that there will be less room for day visitors. At the same time, the demand for beach activities is projected to increase. Overall, the combination of permanent conversion and increased tourist demands will put enormous pressure on a few locations along the coast and may push day vistors further south. Ironically, the growth of casino gambling in Atlantic City has put great development pressures on southern New Jersey coastal communities.

Another problem is that the quality of conveniently located beach resorts has deteriorated. One of the interviewees explained how his family moved their beach trips from Keansburg to Long Branch to Asbury Park to Belmar to Seaside Heights as the quality of the beaches decreased and and travel times became shorter to the more remote beaches. The economy of these deteriorated beach communities does not allow for the investments that would be necessary in order to increase their attractiveness.

Many communities expressed interest in spreading the number of visits both over the year and throughout the week during the summer season. There is excess capacity in the developed beach communities in lodging, restaurants, and commercial facilities during a large part of the year. For example, out of 600 business licenses in Seaside Heights

only 150 are operating the year around. Policy recommendations should therefore address not only peak day problems, but also the specific problems of the off-season.

CHAPTER SEVEN

Transportation Alternatives Analysis

Introduction

Before any recommendations can be made to improve recreational access to the shore communities of Monmouth and Ocean counties, an inventory of existing transportation services must be made to determine if these could be incorporated into any recommendations made by this study group. This chapter will focus on current passenger rail, bus and taxi service that is provided to the communities in the study area. This information will be used to develop an alternatives analysis as a basis to presenting a series of policy and program recommendations.

Current Transportation Services

Rail Service

New Jersey Transit Corporation (NJ Transit) and Conrail provide passenger rail service from New York City to the two-county study area. This service, known as the North Jersey Coast Line (NJCL), is provided on a year-round daily basis. As of January, 1983 NJ Transit will assume operation of the rail line from Conrail. The termini of the NJCL are Pennsylvania Station in New York, and Bay Head in Ocean

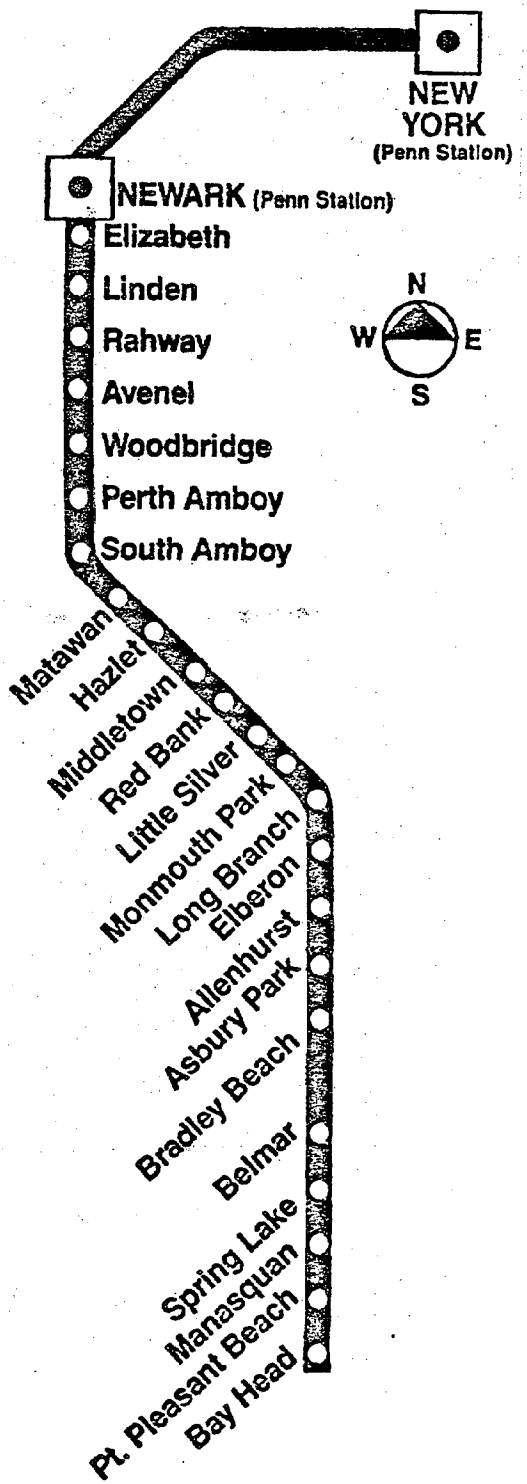
County. There are fourteen stops in Monmouth County, and two in Ocean County. The North Jersey Coast Line rail stops along the shore are: Long Branch, Elberon, Allenhurst, Asbury Park, Bradley Beach, Belmar, Spring Lake, Manasquan, Point Pleasant Beach and Bay Head. Major stops outside of the two-county study area include Pennsylvania Station in Newark, Elizabeth, Linden, Rahway, Woodbridge, Perth Amboy, South Amboy, and Red Bank. The station stops and current fares are shown schematically in Exhibit 7-1.

At Newark's Pennsylvania Station connections are made to Jersey City, Hoboken, mid-Manhattan and the World Trade Center via the Port Authority Trans-Hudson (PATH) rapid transit trains. Transfers can also be made to NJ Transit and Amtrak trains that operate along the Northeast Corridor. Stops on the Northeast Corridor line south of Rahway where it meets the NJCL include Metuchen, Metro Park, Edison, New Brunswick, Princeton Junction and Trenton.

The NJCL is primarily a commuter line for those who live in Monouth and Ocean counties and work in Newark and New York City. Based on the schedule dated April 25, 1982, weekday service includes fifteen daily trains between Bay Head and New York. In addition two trains are scheduled from New York to Bay Head late in the evening. On Saturdays and Washington's Birthday, eleven trains make the trip between Bay Head and New York with two additional trains

EXHIBIT 7-1

NORTH JERSEY COAST LINE



Fares (Effective July 1, 1981)

PLEASE PURCHASE TICKETS BEFORE BOARDING TRAINS
If ticket offices are open an additional charge of $.50 to $1.00 is made when fare is paid on the train. If your local station ticket office is not open, no additional charge will be made.

Between New York and	One-Way	1-Day Round Trip	Weekly	Monthly	10 Trip
Avenel	$3.05	$4.25	$26.75	$85.00	$29.00
Woodbridge	3.15	4.45	28.00	89.00	30.00
Perth Amboy	3.55	5.05	30.75	98.00	33.75
South Amboy	3.85	5.35	32.25	103.00	36.75
Matawan	4.35	6.15	35.25	115.00	41.50
Hazlet	4.65	6.45	36.50	118.00	44.25
Middletown	5.05	7.15	37.25	122.00	48.00
Red Bank	5.55	7.75	38.00	123.00	52.75
Little Silver	5.75	8.05	38.00	123.00	54.75
Long Branch	6.15	8.65	38.50	126.00	58.50
Elberon	6.45	9.05	38.50	126.00	61.50
Allenhurst	6.65	9.35	38.50	126.00	63.25
Asbury Park	6.85	9.55	39.25	129.00	65.25
Bradley Beach	6.95	9.75	39.25	129.00	66.25
Belmar	7.15	9.95	40.50	132.00	68.00
Spring Lake	7.35	10.35	40.50	132.00	70.00
Manasquan	7.65	10.65	41.25	134.00	72.75
Point Pleasant	7.85	10.95	42.25	138.00	74.75
Bay Head	7.95	11.15	43.00	139.00	75.75

Between Newark and	One-Way	1-Day Round Trip	Weekly	Monthly	10 Trip
Avenel	$1.80	$2.50	$15.50	$50.00	$17.00
Woodbridge	1.90	2.70	15.75	54.00	18.00
Perth Amboy	2.30	3.30	19.50	63.00	21.75
South Amboy	2.60	3.60	21.00	68.00	24.75
Matawan	3.10	4.40	24.00	80.00	29.50
Hazlet	3.40	4.70	25.25	83.00	32.25
Middletown	3.80	5.40	26.00	87.00	36.00
Red Bank	4.30	6.00	26.75	88.00	40.75
Little Silver	4.50	6.30	26.75	88.00	42.75
Long Branch	4.90	6.90	27.25	91.00	46.50
Elberon	5.20	7.30	27.25	91.00	49.50
Allenhurst	5.40	7.60	27.25	91.00	51.25
Asbury Park	5.60	7.80	28.00	94.00	53.25
Bradley Beach	5.70	8.00	28.00	94.00	54.25
Belmar	5.90	8.20	29.25	97.00	56.00
Spring Lake	6.10	8.60	29.25	97.00	58.00
Manasquan	6.40	8.90	30.00	99.00	60.75
Point Pleasant	6.60	9.20	31.75	107.00	62.75
Bay Head	6.70	9.40	33.25	110.00	63.75

during the summer. On Sundays and major holidays, eight trains are scheduled, with an additional two during the summer months.

The NJCL has been criticized for providing poor service. This criticism has some basis to it since the trains' cars are old and dirty. Many of the rail cars date back to the 1920's. This is to change in the near future. The NJCL is undergoing a modernization process that is being carried out by NJ Transit. A part of this was completed in April 1982 when the electrification of the line from South Amboy to Matawan was completed. From Matawan to Bay Head diesel locomotives are used. Present plans incluce the electrification of the line down to Long Branch, and a time schedule for completion is currently under study. The electrification will reduce the number of time-consuming switches between diesel and electric locomotives.

In conjunction with this electrification project, seventeen push-pull modern rail cars have been ordered from Bombardier Inc. of Canada, which will operate on the NJCL. These cars will be delivered by 1983. New locomotives were also recently purchased from General Motors.

Scheduled Bus Service

In addition to the regularly scheduled train service

provided by NJ Transit, the shore communities of Monmouth and Ocean counties are served by a variety of regularly scheduled bus routes. There are a number of bus companies that provide bus service to the shore. This bus service can be broken down into two major categories: year-round and summer-only service. Summer service refers to the period between Memorial Day and Labor Day. These two categories can be further divided into two sub-categories: regional and local service. Regional service operates both inside and outside the two-county area. Local bus operations stay within the two-county area.

Regional Year-Round Service -- Service from outside Monmouth and Ocean Counties is provided by Asbury Park-N.Y. Transit Company, North and South Jersey Bus Company (Domenico Bus Company), Lincoln Transit Company, New York-Keansburg-Long Branch Bus Company and Transport of New Jersey (TNJ). (Exhibit 7-2) Points of origin of this regional year-round service include Philadelphia, Camden, New York City, Newark, Jersey City, Elizabeth, Linden and Perth Amboy. Asbury Park is the most frequent destination. Toms River and Manahawkin are destinations where connections can be made to the Seaside Heights/Seaside Park area and Long Beach Island. This connecting service, which is provided by TNJ, is only available during the summer months, however.

EXHIBIT 7-2

Regional Year-Round Bus Service

Destination	Origin and Stops	Carrier	Frequency
Asbury Park	Jersey City South Amboy Keyport Middletown Eatontown Red Bank Deal	North&South Jersey Bus Co. (Domenico Bus Co.)	Daily
Asbury Park	Newark	TNJ (Route 130)	Daily
Pt. Pleasant Manasquan Sea Girt Belmar Avon Bradley Beach Asbury Park	Philadelphia Camden Moorestown Mt. Holley	TNJ (Route 117)	Daily
Asbury Park Spring Lake Sea Girt Manasquan Pt. Pleasant	New York City Red Bank Eatontown Long Branch	Asbury Park-N.Y. Transit Co.	Daily
Toms River[a] Manahawkin[b] Atlantic City	New York City Jersey City Newark Elizabeth Linden Perth Amboy East Brunswick Freehold	TNJ/Lincoln Transit (Route 119)	Daily
Sandy Hook Sea Bright Long Branch	New York City Keyport Union Beach Keansburg Atlantic Highlands	New York-Keansburg-Long Branch Bus Co.	Daily

[a] Connections to Seaside Park and Seaside Heights

[b] Connections to Long Beach Island, including Ship Bottom, Brant Beach and Beach Haven.

Regional Summer-Only Service -- Five bus companies provide summer service (Exhibit 7-3). These include Boro Busses Company, Consolidated Shore Lines, Suburban Transit Corporation, Mercer Metro and TNJ. Summer regional points of origin include Philadelphia and Allentown, Pennsylvania, and Paterson, Clifton, Passaic, Newark, Plainfield and Trenton in New Jersey. The great majority of the regional summer routes have Asbury Park or Seaside Heights as their destinations. Other summer-only route destinations include Beach Haven, Seaside Park and Point Pleasant Beach.

Local Year-Round Service -- Three systems provide local service on a year-round basis -- Boro Busses Company, Monmouth Bus Lines and the Ocean County Rural Transportation Program (Exhibit 7-4). Asbury Park, again, is the most frequent destination. Boro Busses and Monmouth Bus Lines provide the service to Asbury Park. Points of origin include Red Bank, Long Branch, Point Pleasant Beach, Freehold and Manasquan. Boro Busses also provide service between Red Bank and Long Branch, Red Bank and Sea Bright, and Red Bank and Highlands. The Ocean Country Rural Transportation Program provides year-round service between Manahawkin and the communities along Long Beach Island. This service is operated by Ocean County and is subsidized by the U.S. Department of Transportation's Urban Mass Transit Administration (Section 18 grants), New Jersey Transit, and

EXHIBIT 7-3

Regional Summer-Only Bus Service

Destination	Origin and Stops	Carrier	Frequency
Asbury Park	Allentown, PA Bethlehem, PA Easton, PA Phillipsburg Clinton Annandale Lebanon White House Somerville Bound Brook New Brunswick South River Old Bridge Matawan Keyport Red Bank Ft. Monmouth Long Branch	Boro Busses Co.	Daily (May 23-Labor Day)
Asbury Park Lavallette Pt. Pleasant Beach	Paterson Clifton Passaic Bloomfield East Orange Newark Union Linden Rahway Sayreville Keyport Red Bank Eatontown	Consolidated Shore Lines (Route 200)	Daily
Asbury Park	Plainfield S. Plainfield New Brunswick East Brunswick	Suburban Transit Co.	Weekends & Holidays (July 4 - Labor Day)
Seaside Heights	Trenton White Horse Circle Allentown, NJ	Mercer Metro	Weekends & Holidays (Memorial Day - Labor Day)
Seaside Heights Seaside Park	Philadelphia Camden	TNJ (Route 109)	Daily
Sandy Hook	Plainfield S. Plainfield New Brunswick East Brunswick	Suburban Transit Co.	Weekends & Holidays (July 1 - Labor Day)

EXHIBIT 7-3 (Continued)

Destination	Origin and Stops	Carrier	Frequency
Seaside Heights	Paterson Clifton Passaic Allwood Brookdale Bloomfield East Orange Newark Irvington Union Roselle Park Linden Rahway Brielle Pt. Pleasant Beach Normandy Beach Lavallette	Consolidated Shore Lines (Route 300)	Daily
Beach Haven	Philadelphia Camden Marlton Medford	TNJ (Route 125)	Daily (June 27, 1981 - Sept. 7, 1981)

EXHIBIT 7-4

Local Year-Round Bus Service

Destination	Origin and Stops	Carrier	Frequency
Sea Bright	Red Bank	Boro Busses	Mon.-Sat.
Long Branch	Red Bank	Boro Busses	Mon.-Sat.
Asbury Park	Red Bank	Boro Busses	Daily
Highlands	Red Bank	Boro Busses	Mon.-Sat.
Asbury Park	Long Branch	Monmouth Bus Lines	Daily
Asbury Park	Long Branch	Monmouth Bus Lines	Daily
Asbury Park	Freehold	Monmouth Bus Lines	Daily
Asbury Park	Manasquan	Monmouth Bus Lines	Daily
Asbury Park	Pt. Pleasant Beach Brielle Manasquan Sea Girt Spring Lake Hts. Belmar Avon Bradley Beach Neptune Ocean Grove	Monmouth Bus Lines	Daily
Spring Lake	Asbury Park Neptune Bradley Beach Avon Belmar	Monmouth Bus Lines	Daily
Brigantine Refuge	Barnegate Lighthouse Harvey Cedars Ship Bottom Manahawkin Brant Beach Beach Haven	Ocean County Rural Transportation Program	Mon.-Fri. (off-season) Tues.-Sat. (summer

the County. This service is part of the rural bus transportation program that operates within Ocean County. The purpose of the program is to provide bus service to rural communities in the county which previously had no mass transit service and to link these communities to the urbanized areas of Toms River and Lakewood.

Local Summer-Only Service -- Only TNJ provides additional summer scheduled operations (Exhibit 7-5). TNJ operates two routes which provide connections from the New York City-Atlantic City line (Route 119) to the shore. Connections from this TNJ/Lincoln Transit-operated route are made at Manahawkin and Toms River. From Toms River, daily connections can be made to Island Heights, Seaside Heights and Seaside Park. From Manahawkin, daily connections can be made to Beach Haven, Ship Bottom and Brant Beach. In Exhibit 7-6 the various bus operation options are outlined in matrix form.

TNJ also operates a shuttle bus between Toms River and Island Beach State Park. Known as the Island Beach Shuttle, this special service has operated on weekends and holidays from the first weekend in the summer through Labor Day since 1977. This shuttle is operated from the park-and-ride lot located just off Exit 81 of the Garden State Parkway. There are signs on the Parkway that guide

EXHIBIT 7-5

Local Summer-Only Bus Service

Destination	Origin and Stops	Carrier	Frequency
Seaside Heights Seaside Park	Toms River Island Heights	TNJ	Daily
Beach Haven Ship Bottom Brant Beach	Manahawkin	TNJ	Daily
Island Beach State Park Seaside Heights	Toms River (Exit 81 GSP)	TNJ (Island Beach Shuttle)	Weekends & Holidays (June 21-Labor Day)

EXHIBIT 7-6

Matrix of Bus Company Operations, Ocean and Monmouth Counties

Bus Companies	STOPS	Origin	R	REGIONAL BUS LINES															TOWNS/CITIES
				New York	New York	Philadelphia	Newark	Long Branch	Jersey City	Paterson	Allentown, PA	Trenton	Plainfield	Philadelphia	Point Pleasant	Toms River	Toms River		
NY/Long Branch				●	●														Keyport
				●	●														Union Beach
				●	●														Keansburg
				●	●														Atlantic Highlands
				●	●														Highlands
				●	●								○						Sandy Hook
				●	●								○						Sea Bright
NY/Asbury Park			R	●	●			●			○		○						Long Branch
			R		●			●	○		○		○						Deal
			R		●	●	●	●	○	○	○		○						Asbury Park
			R		●	●		●		○									Spring Lake
			R		●	●		●		○									Sea Girt
			R		●	●		●		○									Manasquan
			R		●	●		●		○					○				Point Pleasant
										○		○			○				Dover
										○		○		○	○	✪			Seaside Heights
												○		○	○	✪			Seaside Park
																			Island Beach Park
TNJ														○				✪	Beach Haven
														○				✪	Long Beach

● Daily Bus Lines

○ Summer & Weekends only

✪ Indirect Bus Lines

R Railroad

motorists to the lot. The shuttle's destinations are Seaside Heights and Island Beach State Park. The fare is 50 cents per person, which includes guaranteed admission to Island Beach State Park. The shuttle operates between 9AM and 6PM every half-hour, or more frequently when needed. Similarly, the National Park Service operates a shuttle bus from Sandy Hook which connects to the local bus line in Highlands.

Taxicab Service

There is a myriad of taxicab companies that operate in Monmouth and Ocean counties (Exhibit 7-7). They are primarily concentrated in the coastal areas. These areas happen to have the highest population concentrations in the counties. For the most part, these companies tend to be "mom and pop" operations, consisting of only one or two taxis, which operate on a part time basis. Some of the larger companies offer 24-hour service. However, there is only one company in Ocean County that operates on a 24-hour basis.

Ridership figures are hard to obtain. None are available for Ocean County, and the figures obtained for Monmouth County are from a survey conducted in 1977 by the Monmouth County Planning Board staff. This survey enumerated the taxicab operations in the county, along with the number and types of vehicles, and the estimated number of

EXHIBIT 7-7

Taxicab Companies, Monmouth and Ocean Counties 7-15

Company	Operations Base
Monmouth	
A & A Beach Radio Cab	Union Beach
Aberdeen Taxi	Keyport
Airport Taxi	Tinton Falls
Airport Wheels	Red Bank
Area Cab	Union Beach
Asbury Park Radio Cab Corp. & Yellow Cab	Asbury Park
B & A Taxi Service	East Keansburg
Bayshore Taxicab	Keansburg
Blair's Taxi	Manasquan
Blue Jay Taxi of Old Bridge	Morganville
Buddy's Taxi	Keansburg
Chapman's Taxicab Service	Atlantic Highlands
Checker Cab Co.	Long Branch
Coast City Cab	Avon
Cole's Taxi Service	Keyport
Co-op Cabs	Hazlet Township
De Luxe Taxi Service	Red Bank
Eatontown Yellow Cab	Eatontown
Eugene's Taxi Service	Keansburg
George's Red Star Cab	Matawan
Harry's and Mae's Taxi	Keansburg
Hazlet Radio Cab	Hazlet Township
Hill's Taxi Service	Englishtown
Holmdel Taxi	Keyport
Independent Taxi Owners' Assoc.	Asbury Park
Jim's Taxi	Morganville
Keyport Taxi	Keyport
Lake Taxi Corp.	Asbury Park
Long Branch Yellow Cab	Long Branch
Maguire Taxi Service	Leonardo
Marie's Taxi	Aberdeen Township
Middletown Taxi Company	East Keansburg
New Parkertown Taxi	Highlands
New Schrewsbury Taxi of Tinton Falls	Tinton Falls
The Owl Taxi Service	Asbury Park
P.T. Cab Company	Red Bank
Packard Cab	Long Branch
Paramount Cab Inc.	Long Branch
Patsy's Taxi Service	Matawan
Red Bank Boro Taxi	Red Bank
Red Bank Taxi	Red Bank
Seaview Cab Co.	Long Branch
Tom's Taxi	Port Monmouth
Towne Taxi	Matawan
United Taxi Service of Red Bank	Red Bank
Yellow Cab Taxi Service	Red Bank

Company	Operations Base
Ocean County	
A American Taxi Service	Dover Township
A-1 Community Taxi	Dover Township
Aamber Taxi Co.	Toms River
Ace Taxi	Brick Township
Apollo Taxi	Dover Township
Bay Beach Cab Co.	Manahawkin
Briggs Taxi Service	Pt. Pleasant Beach
Cannon Taxi Service	Barnegate
Circle Taxi	Brick Township
Courtesy Taxi & Limousine Service	Howell Township (Monmouth)
Easy Taxi	Lakewood
Eveready Taxi Co.	Lakewood
George's Taxi	Howell Township (Monmouth)
Gypsy Cab Co.	Pt. Pleasant Beach
Jet Taxi Service	Dover Township
Lacey Transportation Co.	Lacey Township
Lakehurst Taxi	Lakehurst
Leisure Hack Service	Brick Township
Lincoln Taxi	Lakewood
Monnie's Yellow Cab Service	Dover Township
Monnie's Yellow Cab Service	Seaside Heights
Mystic Island Taxi	Tuckerton
Point Pleasant Cab	Pt. Pleasant
Reliable Taxi Co.	Lakewood
Toms River Taxi	Dover Township
Town & Country Taxi	Dover Township
Town Taxi	Lakewood
Yellow Cab Co.	Lakewood

passengers carried in 1977. It is interesting to note that one operator, operating under the names of three companies, carried an estimated 600,000 passengers in 1977. Many respondents to the survey did not provide ridership figures.

The extent of the area served by these companies ranges from purely local service within counties to points outside of the two counties, such as the New York area airports. Service is offered on an exclusive-ride or shared-ride basis, depending on the company. Even though some companies offer limousine service, for the most part they are not innovative and do not offer any unique services. There is one exception, the Yellow Cab franchise located in Red Bank.

Yellow Cab is a paratransit company that operates more than a fleet of taxicabs. The company also owns a fleet of vans which transport special education students for a number of school districts, retarded adults with daily door-to-door fixed-route service, Red Cross dialysis patients, and convalescent home patients. In addition to this, Yellow Cab operates a fleet of cargo vans, a limousine service, the local Rent-a-Wreck car rental franchise and the local Ryder truck rental franchise. The taxicabs and vans are radio-equipped, and the taxi service is unique in that it is exclusively a shared-ride operation. It is this company which carried more than one-half million passengers in 1977. Yellow Cab is spearheaded by Donald Somers, who has been a

trend-setter in the paratransit field.

Yellow Cab is not the only company which provides paratransit services in the study area; however, it is the largest paratransit operation. American Taxi Service, located in the Toms River area of Ocean County, also offers paratransit services in addition to conventional taxi service. American Taxi transports medical patients, senior citizens, special education students, private schoolchildren, and handicapped adults in a variety of vehicles. The majority of American's vehicles are vans. Dial-a-ride service is offered by Stafford Township in Ocean County. This service is for township residents, and has connecting service with conventional transit. Seaside Heights, Seaside Park and Lavallette together own and operate three buses for their residents. They are used three days a week for a dial-a-ride operation that is used mostly by senior citizens.

Future Options

The previous presentation of current transportation providers in the shore communities of the two-county study area indicates that there are a range of transportation options, including rail, bus and taxi operations. We can distinguish three major groups of transit users. One is the

commuter group utilizing regional train service and express buses. Another group are people visiting the beach from the population centers around New York and Philadelphia. These are people who want to go to the beach but do not have or do not choose to use the automobile. The third group are local residents traveling between communities for various purposes such as medical appointments, shopping or jobs.

In the following section various forms of transportation services will be discussed. First, existing modes will be examined, including express, charter and shuttle buses. Second, the potential of more unconventional modes of public transit, paratransit service and jitneys, will be discussed. Finally, the possibilities in modifying the use of the automobile and of combining various modes are mentioned.

Express Bus

Express bus service is defined by Gray and Hoel (1979) as:

> ...provided by fast comfortable buses on long routes with widely spaced stops. It is characterized by higher speed, more comfortable travel, but between fewer points, and sometimes at a higher price than regular buses. Its reliability of service is dependent on traffic conditions along the route.

Express buses have been found to be a suitable mode for commuter service. There are several good reasons why commu-

ters are a good market for express buses. For one, their origin and destination is well defined and trips are made in a predictable pattern. Secondly, the commuters or their employers are able to pay for the service. Other alternatives, such as driving are, in many cases, more costly.

Unfortunately, these conditions do not exist when express buses are used for recreational travel. Instead, there are several reasons why express buses as currently utilized may be unsuitable. First, the markets for daily or weekend recreational travel by express bus are not clearly defined. Market studies would have to be done to carefully delineate the location and level of demand.

Second, the dominant mode of travel for recreational purposes is by automobile. The market viability of express service may well involve a broad-based attempt to encourage current auto users to utilize the operation, as well as the transit dependent population. Express service would have to compete with both the automobile and economic realities. The transit dependents often do not have a great deal of resources, and might not be able to afford a premium service.

Third, trips for recreation are often taken in large groups on a family basis, often with plenty of luggage, picnic baskets, and other necessities. In many cases the automobile is more convenient to use, and households that

have access to a car are not likely to use mass transit for recreation trips (Heatwole and West, 1980).

Fourth, similar to commuter travel, recreational travel is in many cases a one-way flow. For example, everybody leaves for the shore in the morning and returns in the afternoon. Few people are going in the other direction. The buses will go almost empty half of the time. Waiting at the destination for the return trip is an expensive alternative. Ideally, the bus should be used or the driver should find alternative employment during the middle of the day when the bus is not being used. Such agreements exist between the Suburban Transit operation in central New Jersey and some of its bus drivers on the commuter lines to Manhattan.

The bus could also be fully utilized during the off-peak period on some other lines -- for example, in shuttle bus service between the recreation site and a remote park-and-ride lot. There might also be a need for local bus service which could be addressed. An example where such a need existed for transport in the counter-flow direction was discovered in Morris County, New Jersey. Buses to Lake Hopatcong also bring residents of this area to Morristown and other shopping centers (Vavra, 1979).

Charter Bus

In contrast to express buses, charter buses are especially suitable for recreational travel. Charter bus service requires the existence of a pre-formed group, such as senior citizens or a church group, which has a common destination. Since the size of the group is known beforehand, the number of buses which have to be chartered can be optimized to obtain lowest possible cost for the trip. In spite of this, cost per passenger is often high when measured against out-of-pocket costs.

In contrast to express bus service there are no institutional arrangements to subsidize charter operations from public transit funds. Subsidies may be available from other agencies. For example, the Division of Parks and Forestry within the New Jersey Department of Environmental Protection was able to fund the Youth Recreation Opportunity Project in 1977 and 1978 for the purpose of providing camping opportunities and bus transportation for youths from lower and moderate income families (Vavra, 1979).

Analysis of attendance at Sandy Hook in 1980 indicates that about 1.5 percent of visitors arrived by charter buses. The potential for increased charter service could be estimated by comparisons with other similar situations. An interesting example is recreational travel in the Rocky Mountain-Denver area. A U.S. Department Transportation funded study found that of Colorado residents going to

various ski areas the charter bus mode carried between 1.9 and 9.1 percent of visitors, with the higher percentages found in ski resorts a greater distance from the population centers (Chase, Rosen & Wallace, Inc., 1979).

Shuttle Bus

Shuttle bus service is a transportation mode between two points which operates without intermediate stops and often without fixed schedule. The distance between the point of origin and the point of destination is usually small.

For recreational travel in the shore area, shuttle buses can alleviate congested areas and connect certain destinations to existing mass transit. The shuttle bus service to Sandy Hook and To Island Beach State Park has already been mentioned. Another example is shuttle bus service from selected train stations along the New Jersey Coastline as a part of the "Summer Service 80" program.

Paratransit

Paratransit is a term that has, only in recent years, entered the jargon of the transportation field. There is no universal definition of paratransit. However, this mode is generally considered to fall between the extremes of orga-

nized carpools and fixed-route bus services. Rides are shared by passengers with different origins and destinations, and routes are flexible to accomodate passengers with specific origin and destination demands. Lastly, there must be some measure of formality to coordinate and operate the ride-sharing arrangements (Altshuler, 1979).

There are two types of paratransit options that may be feasible for improving recreational access to the shore communities of Monmouth and Ocean counties. Both options could incorporate the use of vans. Below is described the flexible demand-responsive service and hybrid demand-responsive service.

Demand-responsive transportation (DRT) service is a response to customer demands as they occur. Customers contact the transportation provider by telephone to request the service. DRT provides a more direct service between the origins and destinations of the customers than can be provided by conventional transit service. Varying degrees of direct service are provided by the various forms of DRT, with the conventional taxi providing the most direct. The DRT alternatives mentioned here do not provide the same level of directness as the conventional taxi.

The flexible demand-responsive service is also called shared-ride service. With this type of service, trips that have different origins and destinations are grouped

together. The trips are combined to minimize the detours made to pick up or deliver passengers. Service can be provided on a many-to-many basis (many origins to many destinations) or a many-to-one basis (many origins to one destination and vice versa). Vans could be used to transport passengers.

An example of this flexible demand-responsive service is a small-scale service that was established in Batavia, New York in 1971. This four-vehicle service replaced a three-vehicle fixed-route system. In its first year of operation, the DRT system carried 40 percent more passengers than the previous fixed-route system, even though the fare was higher on the new DRT system (Roos, 1979). The DRT system covered 75 percent of its costs from the farebox in its first year of operation, with the average cost per trip being 70 cents. By 1976, there was only a slight fare increase, but the cost per trip increased to approximately $1.50, leaving only 50 percent of the operating costs covered by farebox revenues.

The hybrid demand-responsive service may also be called fixed-route door-to-door service or route deviation service. This involves a system with fixed and flexible route components. The most likely vehicle to be used would be a van. The van would operate along a fixed route and stop, at

specified times, at checkpoints that are located near major activity areas. Even though the van would operate along a fixed route, it could deviate from the route between checkpoints to pick up or drop off a passenger on request. After the passenger has been serviced, the vehicle would return to the fixed route.

An example of this hybrid demand-responsive service is a system that was implemented in Merrill, Wisconsin in 1976 (Roos, 1979). As in Batavia, the system in Merrill has a vehicle that stops at specified checkpoints (eleven of them) at specified times. In addition, doorstep pickup or dropoff service between checkpoints is provided upon request. The fare structure varies, depending on whether the service is provided on a checkpoint to checkpoint basis, checkpoint to doorstep basis (or vice versa) or doorstep to doorstep basis. The door-to-door service is the most expensive. In its first year of operation, this DRT system carried 160 percent more passengers than the previously existing fixed-route system did in its last year of operation. The new service covered 22 percent of its operating costs from farebox revenues, with an average cost per passenger of $1.20.

Since these two DRT options are not on totally fixed-routes, they are quite flexible and cover a wider area than fixed-route public transit. This freedom from route

rigidity and the demand-responsive nature of these options, make them attractive alternatives to the automobile. Access is provided to the transportation disadvantaged, and others, by merely placing a phone call to request the service.

Jitneys

Jitneys are privately owned van-like vehicles that operate on a fixed route without a fixed schedule. Limited to carrying 13 passengers, jitneys resemble buses but are not designed with such amenities as air conditioning or plush seats. The vehicles are designed for durability, with speed and low maintenance emphasized.

Jitney vehicles are not regulated by the New Jersey Department of Transportation since they are not considered "transit" vehicles or public utilities. The limited seating capacity of 13 passengers is one factor which excludes jitneys from state jurisdiction. Also, jitneys do not operate on a fixed schedule and are individually owned. Each driver is normally the owner/operator.

Atlantic City is the only municipality in New Jersey which has a jitney operation. Limited to a direct route along Pacific Avenue from Gardiner's Basin to New Hampshire Avenue and back, jitneys carry a variety of passengers, including many elderly, to and from the growing casino area

in Atlantic City. A 60 cent fare per passenger is charged with a 1/3 discount to the elderly. Nearly 200 individually owned and and operated vehicles provide year round jitney service.

Auto Management Alternatives

Many of the objectives which justify improvement in the public mass transit system can be obtained by actions aimed at reducing some of the negative impacts of automobile traffic. There are three alternatives which can be considered:

Shore-Area Traffic Information -- This option may be the easiest to implement and would benefit both the shore communities and motorists. Under this option, a toll-free telephone number would be used to inform motorists which roadways were congested and which parking areas were at capacity. To make this information more accessible to the public it could also be transmitted over local radio stations. By using this information, motorists would be directed away from traffic backups, avoiding unnecessary delays and reducing congestion.

Park-n-Ride Facilities -- This option would reduce the amount of traffic coming into shore communities, by having motorists park their cars on the fringe of the community and riding to the beach area by shuttle bus or van.

Parking Management Tactics -- Two parking management tactics may be feasible for the study area: (1) residential parking permit programs, and (2) parking pricing tactics. Residential parking permits programs were first initiated in the early 1970's and have become an increasingly popular method of preventing long-term parking by commuters in residential neighborhoods that are close to employment, educational, or recreational centers. Parking pricing tactics which may reduce traffic congestion and parking problems in shore communities could include: increases in parking rates, preferential parking rates for short-term parkers, or preferential parking rates for carpools and vanpools.

An Alternatives Analysis

The various options for providing increased access to the beaches in northern New Jersey can be analyzed using a goals-achievement matrix approach popularized by Hill (1968). The matrix approach allows a variety of policy objectives to be analyzed against different alternatives. In this context, the matrix will be used to examine alternative transportation options for increasing access. It was decided that six different transportation options would be explored. These include: (1) express bus service, (2) charter bus

operations, (3) rail service to beach communities on existing lines, (4) paratransit service, primarily taxis and vans, (5) a park/ride shuttle, and (6) a jitney service, following the Atlantic City example. These options follow directly out of the earlier discussion in this chapter.

These options were analyzed against a set of policy objectives derived from three basic concepts in public sector economics -- efficiency, equity, and economic development -- as well as transportation and political considerations. The efficiency concept is best thought of as a cost minimization approach, particularly given current public sector budget problems. The equity issue centers on the improvement of access to four special groups -- the poor, the elderly, the disabled, and the young. The economic development concept refers to the growth and nurturing of the beach economy.

The transportation objectives center on the improvement of both interregional access among counties and intraregional access within the county and municipalities containing the beach sites, and on the often serious congestion problems. The political considerations focus on the acceptance of local residents of the various transportation options. Our earlier surveys of beach community leaders indicate that there are clear differences in attitudes toward weekend and weekday visitors. There is a decided

preference for more visitors on weekdays than on weekends because of congestion problems.

Two different scenarios are presented in Exhibits 7-8 and 7-9. The first one represents an assessment of the six transportation options from the perspective of a state or regional organization. The second exhibit represents the assumed views of the local beach community toward the various options. Under each option the objectives have been ranked on a three point scale, from 3 (the highest) to 1 (the lowest).

The highest value (3) indicates that the alternative is an excellent way of achieving the objective in the eyes of the targeted client group. For example, for a regional of state agency, such as the department of transportation, express buses are expected to have a strongly positive effect on interregional access (Exhibit 7-8). The value of 2 in the matrix indicates that the option is a good way of realizing the objective. Continuing our example, the express bus is assumed to be moderately important in improving the access of transit dependents. A value of 1 indicates that the alternative has little or no positive effect on objective achievement. For example, express bus service is assumed to have little effect on reducing beach community congestion.

EXHIBIT 7-8

Alternatives Analysis, Regional Perspective

OBJECTIVE	WEIGHT	EXPRESS BUS	CHARTER BUS	RAIL	PARATRANSIT	PARK/RIDE SHUTTLE	JITNEY
IMPROVE INTERREGIONAL ACCESS TO BEACH	3	3	3	2	1	2	1
IMPROVE INTRAREGIONAL ACCESS TO BEACH	1	1	1	1	3	1	2
IMPROVE ACCESS TO TRANSIT DEPENDENTS							
POOR	1	2	3	1	3	1	3
ELDERLY	1	2	3	1	3	1	3
DISABLED	1	2	2	1	3	1	2
YOUNG	1	1	2	1	2	1	2
OPERATE AT REASONABLE COST PER TRIP TO USER	2	1	2	1	2	2	3
REQUIRE PUBLIC SUBSIDY	3	2	3	1	2	2	3
MINIMIZE CAPITAL COSTS FOR HIGHWAYS, TRANSIT VEHICLES, PARKING FACILITIES TO:							
LOCAL GOVERNMENT	1	2	1	2	2	3	2
STATE GOVERNMENT	3	2	2	1	2	1	3
REDUCE REGIONAL CONGESTION	3	2	2	3	1	1	1
REDUCE BEACH COMMUNITY CONGESTION	1	1	1	1	2	2	2
SUPPORT BEACH COMMUNITY ECONOMY	2	3	3	2	2	3	2
ACCEPTABLE TO BEACH COMMUNITY RESIDENTS							
WEEKDAY	1	3	3	3	3	2	3
WEEKEND	1	1	1	1	3	2	3
TOTAL OF WEIGHTS	25	50	57	39	50	42	56

KEY - WEIGHTS OF OBJECTIVES
3 - VERY IMPORTANT
2 - MODERATELY IMPORTANT
1 - MINIMALLY IMPORTANT

KEY - IMPORTANCE OF ALTERNATIVE IN MEETING OBJECTIVE
3 - VERY IMPORTANT
2 - MODERATELY IMPORTANT
1 - MINIMALLY IMPORTANT

EXHIBIT 7-9

Alternatives Analysis, Local Perspective

OBJECTIVE	WEIGHT	EXPRESS BUS	CHARTER BUS	RAIL	PARATRANSIT	PARK/RIDE SHUTTLE	JITNEY
IMPROVE INTERREGIONAL ACCESS TO BEACH	1	3	3	2	1	2	1
IMPROVE INTRAREGIONAL ACCESS TO BEACH	3	1	1	1	3	1	2
IMPROVE ACCESS TO TRANSIT DEPENDENTS							
POOR	1	2	3	1	3	1	3
ELDERLY	1	2	3	1	3	1	3
DISABLED	1	2	2	1	3	1	2
YOUNG	1	1	2	1	2	1	2
OPERATE AT REASONABLE COST PER TRIP TO USER	2	1	2	1	2	2	3
MINIMIZE PUBLIC SUBSIDY	3	2	3	1	2	2	3
MINIMIZE CAPITAL COSTS FOR HIGHWAYS,TRANSIT VEHICLES,PARKING FACILITIES TO:							
LOCAL GOVERNMENT	3	2	1	2	2	3	2
STATE GOVERNMENT	1	2	2	1	2	1	3
REDUCE REGIONAL CONGESTION	1	2	2	3	1	1	1
REDUCE BEACH COMMUNITY CONGESTION	3	1	1	1	2	2	2
SUPPORT BEACH COMMUNITY ECONOMY	3	3	3	2	2	3	2
ACCEPTABLE TO BEACH COMMUNITY RESIDENTS							
WEEKDAY	2	3	3	3	3	2	3
WEEKEND	2	1	1	1	3	2	3
TOTAL OF WEIGHTS	28	51	56	41	64	53	66

KEY - WEIGHTS OF OBJECTIVES
- 3 - VERY IMPORTANT
- 2 - MODERATELY IMPORTANTLY
- 1 - MINIMALLY IMPORTANT

KEY - IMPORTANCE OF ALTERNATIVE TO MEETING OBJECTIVE
- 3 - VERY IMPORTANT
- 2 - MODERATELY IMPORTANT
- 1 - MINIMALLY IMPORTANT

The three cost objectives -- operating at reasonable trip cost, and minimizing both public operating subsidy and capital cost -- should be viewed in a similiar fashion. The values represent a three point scale of the expected negative impact of public expenditures. A value of 3 means that the particular alternative is least costly, or most beneficial, to government and the taxpayer. A value of 2 corresponds to moderate costs, while a value of 1 means that the alternative is an expensive choice which does not minimize public sector costs.

Each objective is also weighted with values of one to three. The greater the weight the more important the objective to the targeted client. It is the weights which differ between the two exhibits. In Exhibit 7-8, a regional perspective is adopted, while a local one is assumed for Exhibit 7-9. In the regional case the relative rankings show charter buses and jitneys to be the most highly ranked, with rail the lowest. The ranking of the jitney is not surprising given its strong showing in improving access to the transit dependents and its cost situation. Jitneys can run with no public subsidy and, in the right situation, can be operated at a relatively low cost per passenger. The charter bus operations do well because they can be more easily directed to serve transit dependents, particularly the elderly, than other options and because they require no subsidy.

The results of the analysis done from the perspective of the local beach communities varies somewhat from the regional situation. The paratransit option becomes a viable option in addition to jitneys and charter buses. Once again, rail is at the bottom of the list. Caution is important in interpreting these results. The choice of objectives, the assessment of how each objective is met by an option, and the weights of the objectives are all worthy of debate. However, the framework does provide the visible criteria upon which the options are ranked. The reader is free to change the values in the matrix, the objectives, or the options: the framework is there.

A Review of the Findings

A number of transportation options have been reviewed in this analysis. Both the existing situation as well as options for future implementation have been reviewed. There are some clear messages from this analysis, which when coupled to information from the earlier chapter, define a policy perspective for state and local actions.

First, there is a clear message that the likelihood of a household living in New Jersey traveling to a northern New Jersey beach is dependent on distance. One is much more likely to utilize the beach if one lives close.

Second, there is relatively little influence of the wealth or ethnicity of the community defining the participation in beach activities from these towns. Of course, beachgoers from these communities may be wealthier or poorer than the community average, or may be of a particular ethnic group. On a policy level, however, based on these findings we cannot say that daily beach visitors are richer or poorer than the average state resident. We can say that for communities over 30,000 neither income nor ethnicity is related to beach participation.

Third, we have suggested that the beach communities in northern New Jersey can be classified into groups based on the amount of development which has occurred. This typology, outlined in Chapter Six, also points to the "no-no's" and "go-go's." The "no-no's" are those communities which are unenthusiastic about daily beach visitors. These are generally those communities which are primarily residential. The "go-go's," on the other hand, appreciate the tourist trade although they may want to redistribute visitors from the busy weekends to the weekdays.

Fourth, we have suggested that certain transportation options may be more viable than others in meeting a set of defined objectives. In particular, we suggest that four transit options seem particularly viable -- jitney, charter buses, paratransit and park/ride shuttles. Both jitneys and

paratransit operations, particularly taxis, focus on the local situation. Charter buses can improve regional access to the beach, while park/ride shuttles can assist both regional travel as well as reduce congestion in the beach community.

However, the exact way of putting together an appropriate system requires a new approach to delivering transportation services in the beach communities. This new approach can be outlined.

A New Approach to Providing Beach Access

There is a need to redefine the relationship between day visitors and beach communities which recognizes the limitations of public sector expenditures and the capacities of the private sector. This new approach contains the following elements:

1. A public/private recreational travel organization
2. An integrated transportation delivery system
3. An information dissemination function

This three part approach to improving beach access is rooted in existing organizations. The important element is, however, the integration of the various pieces into a viable whole.

A Recreational Travel Organization -- The organization

could be initiated at the state level by the Governor, or could be based in a multi-county transportation council. For example, the North Jersey Transportation Coordinating Council has just been created as a replacement to the Tri-State Regional Planning Commission. Such an organization might be the most likely one to coordinate recreational travel planning for northern New Jersey. Alternatively, already existing county tourism bodies could be used. However, the multi-county approach would be best because of the need to coordinate across jurisdictional lines.

Whatever the eventual home, the recreational travel organization should be formed with both public and private members. Already there exists a national travel research council, the Travel and Tourism Research Association, with both public and private members. This organization, along with other groups, can provide necessary background information. Ideally, the initial focus of the recreational travel organization would be on the beach tourism industry. The objectives of the recreational travel group would center on the provision of access to beach communities and the fostering of public and private ventures to improve this access.

Ideally, the recreational travel organization would have access to some limited funds to hire staff and to conduct studies. There are a number of potential funding sources

which could be tapped on a voluntary basis. These include: (1) the charter bus operators, (2) the local beach community taxi operators, (3) the amusement parks and beach concessions, (4) the counties and municipalities on the ocean, (5) the casinos in Atlantic City, (6) the New Jersey Highway Authority which runs the Garden State Parkway, and (7) various state and federal agencies which are involved with recreational travel issues, such as the state tourism agency and department of transportation. In return for contributions the travel group would sponsor an annual survey of recreational travel in New Jersey, advertise various transportation modes for getting to the shore, provide direct consultation to the various contributors, and sponsor seminars on recreational travel issues.

An Integrated Transportation System -- One of the obvious conclusions of the earlier analysis is there are a variety of ways of getting to the beach. However, these options are not integrated into an overall framework. A potential beach visitor from Union County who would like to use transit does not have any sense of how to connect up different modes to get easily from home to the ocean. If the potential visitor finds a suitable bus or train will there be a taxi or shuttle at the other end? An integrated approach to recreational travel would look at the meshing of

supply and demand considerations. For example, there exists a viable paratransit system in Monmouth County which could be integrated with other modes, such as express buses or rail service, to better serve beach visitors.

The integration effort would involve a careful matching of potential supply with the demand. The following steps could be followed to foster this matching.

1. The annual survey sponsored by the recreational travel council would provide information on the geographic and demographic characteristics of beach community visitors. Our work has clearly shown the distribution of daily beach goers to northern New Jersey sites. More work could be done to better pinpoint the geographic distribution of these visitors.

2. An extensive survey of all charter bus operations in New Jersey could be planned and implemented by the recreational travel organization. This survey could assess the interest of the charter operators in expanding coverage to beach communities and determine their capacity to deliver reasonable service. Charter operations can provide targeted service to beach communities which could be very cost-effective.

In the analysis of the beach communities we indicated that there were both "no-no's" and "go-go's." A preliminary list of "go-go's" include Long Branch, Asbury Park, and

Seaside Heights. There may be others, but these three have substantial beach facilities. All have a history of welcoming visitors in the summer, as we pointed out in Chapter Three. It may be possible to target a set of communities for expanded charter operations. It must be remembered, however, that interviews indicated that even the "go-go's" expressed a desire for increased visitors on weekdays and during the off-season, but not on peak summer weekends. It seems that any targeting of a beach community would have to bring a commitment from the municipality that it would have to accept both peak and off-peak charter service. The benefits to the community from off-peak increases in visitors would be balanced by the increased congestion of additional peak visitors. In this way those visitors who were able only to recreate on weekends and chose to go to the beach during the summer would not be disadvantaged.

3. The beach community paratransit system could also be assessed in sufficient detail to determine its contribution to an integrated transportation system. There are multifold examples of vans and buses being used in high activity locations to take visitors from collection points to recreational sites. The Island Beach shuttle which ran from a parking lot near the Garden State Parkway to the Island Beach State Park near Seasides Heights is the most obvious

local example. However, there are others, such as the shuttle buses in both Yosemite and Grand Canyon National Parks which are highly successful options to the automobile in these heavily congested places. There are even examples of local communities developing transit options for high activity periods. For example, Laguna Beach, California offers shuttle bus service to its widely known Festival of the Arts every summer.

There are important distinctions between the Island Beach shuttle and these other examples cited. The service in the national parks is on a daily basis, strongly identified in visitor's minds with the enjoyment of the park, and widely promoted in the park literature. The service in Laguna Beach is run by the city on a daily basis as a fixed route system. This operation runs special service for the summer festival which is heavily advertised.

A successful paratransit effort in the beach communities to both relieve local congestion and to improve access to visitors must be both integrated into the larger transportation system and highly visible to potential users. Occasional visitors need to able to identify and target transit options to the automobile before their trip. It would appear that beach-focused recreational access would best be integrated with a larger on-going paratransit or, even, fixed-route transit option. Thus, an already-existing taxi and van

operation which provides year-round service has local visibility and can run schedules which are more extensive than a summer-only shuttle bus operation. The local visibility is important because even visitors note these services when at the beach community. For example, the jitneys of Atlantic City are famous and known to many occasional visitors. At the other end of scale, the Washington Metro, the new rail rapid system in the nation's capital, is known to all who visit, and to many who have learned about the system from the media.

The integration of a beach-focused shuttle operation into an on-going paratransit system would provide the necessary visibilty and scale of service for successful operation. This shuttle operation could be directed at parking lots outside the congested beach areas, at rail or bus depots, or at drop-off points for beach-focused charter operations. The charter operators, in this situation, might find it advantegous to have multiple origins and destinations. Just as there are multiple scheduled pickup points for charter buses to the Atlantic City casinos, there could be both multiple pick-up and drop-off points to different beach communties. At these drop-off points the local beach community paratransit operations could pick up the visitors and take them to the beach.

An Information Dissemination Function. -- The final piece of this proposed approach is a strengthened information system. It is proposed that two steps be taken to improve information flow between potential beach visitors. First, promotional literature should be developed to advertise the various targeted beach communties and alternative transportation modes to get there. This assumes that substantive work has been done on building the integrated system discussed above. This literature could be distributed by the recreational travel group to beach communities and transit and paratransit operators for subsequent distribution to beach goers.

Second, a toll-free telephone line should be set up to provide information about beach and traffic conditions, and to provide information about transit alternatives. In this way the estimated closing time of Island Beach or Sandy Hook could be disseminated. Also, traffic conditions on the Garden State Parkway, or other beach routes, could be announced. This assumes that the telephone recording presenting this information be updated continually on weekend days. The telephone line could be a powerful way to advertise alternatives to the auto in getting to the beach. It might also be possible to have local radio stations announce beach and traffic conditions, as well as advertise transit alternatives, as public service announcements.

In conclusion, we propose the three-fold strategy of organizational development, integrated transportation services, and information dissemination. It seems possible to develop a financial base to this proposal which could utilize both public and private dollars.

REFERENCES

Altshuler, Alan A., 1979. "The Decisionmaking Environment of Urban Transportation," in Public Transportation Planning, Operations and Management, edited by George E. Gray and Lester A. Hoel. Englewood Cliffs, New Jersey: Prentice-Hall.

Banks, J.H., Stutz F.P. and Jabbari, I., 1982. Coastal Transit Options and Policy, prepared for the Center for Marine Studies. San Diego, California: San Diego State University.

Brail, Richard K. and Hughes, James W., 1977. Transportation. New York Bright Atlas Monograph 24. Albany,New York: New York Sea Grant Institute.

Bryant, Barbara E. and Morrison, Andrew J., 1980. "Travel Market Segmentation and the Implementation of Market Strategies," The Journal of Travel Research, Business Reseach Division, University of Colorado, Boulder, Colorado.

Caro, Robert, 1974. The Power Broker. New York: Vintage Books.

Chase, Rosen and Wallace, Inc., 1979. Denver/Rocky Mountain Recreation Access Study. Prepared for U.S. Department of Transportation, Office of the Assistant Secretary for Policy and International Affairs, Office of Environment and Safety. Report No. DOT-P-79-002. Alexandria, Virginia: National Technical Information Service.

Cunningham, John T., 1958. The New Jersey Shore. New Brunswick, New Jersey: Rutgers University Press.

Cunningham, John T., 1966. America's Main Road. New York: Doubleday.

Cutter, Susan L., Nordstrom, Karl F. and Kuema, Gail A., 1979. "Social and Environmental Factors Influencing Beach Site Solution," Proceedings from the Annual Meeting of the Coastal Society, Newport, Rhode Island.

Eagleton Poll, 1981. New Jersey Travel and Tourism: A Survey of Day Visitors to New Jersey Tourist Attractions. New Brunswick, New Jersey: Eagleton Institute of Politics, Rutgers University.

Eagleton Poll, 1981. New Jersey Travel and Tourism: A Survey of Overnight Visitors to New Jersey, August 1979 - July 1980. New Brunswick, New Jersey: Eagleton Institute of Politics, Rutgers University.

Eid, Joseph, 1977. Trolleys Across the Sand Dunes, The Point Pleasant Traction Co. and the Trenton Lakewood and Seacoast Railway.

Eid, Joseph, 1979. Trolleys in the Coast Cities.

Eid, Joseph, 1980. Trolleys to the Fountain, Monmouth County Electric.

Flaschbart, Peter G., 1978. "Social Groups Impacted by Reduced Beach Access." Proceedings of the American Association of Civil Engineers, "Coastal Zone '80."

Gray, George and Hoel, Lester, 1979. Public Transportation: Planning, Operations and Management. Englewood Cliffs, New Jersey: Prentice-Hall.

Heatwole, Charles A. and West, Nicholes C., 1980. "Mass Transit and Beach Access in New York City," Applied Geography, Vol.70, April.

Hill, Morris, 1968. "A Goals-Achievement Matrix for Evaluating Alternative Plans," Journal of the American Institute of Planners, Vol. 34, No. 1, January.

Kuperstein, Ira, 1978. Gateway Transportation Access, Demand Forecasts, Travel Relationships, and Travel Models. Report prepared for Tri-State Regional Planning Commission, Project No. D191. New York.

Monmouth County Department of Economic Development, 1980. Monmouth County Tourism Survey. Freehold, New Jersey.

Moss, George H., 1966. Steam to the Shore. Locust, New Jersey: Jersey Close Press.

Ocean County Tourism Advisory Council, 1979. New Jerseyan's Vacations: A Statewide Survey. Volume 1: Report and Questionaire. Prepared by the Eagleton Poll. New Brunswick, New Jersey: Eagleton Institute of Politics, New Brunswick, New Jersey.

National Park Service and Administration and Management Research Association of New York City, Inc., 1976. Gateway Transportation Study Assessed Alternatives. Prepared by Transportation and Regional Planning Division, New York Department of City Planning. New York.

National Park Service and the Administration and Management Research Association, New York City, Inc., 1975. Transportation Access Study, Gateway National Recreation Area. Prepared by Transportation and Regional Planning Division of the New York Department of City Planning. New York.

New Jersey Beach Access Study Commission, 1977. Public Access to the Oceanfront Beaches. A report to the Governor and Legislature of New Jersey. Trenton, New Jersey.

New Jersey Department of Environmental Protection, 1979. New Jersey 1977 Beach Shuttle Experiment: Toms River to Island Beach State Park. Division of Marine Services, Office of Coastal Zone Management. Trenton, New Jersey.

New Jersey Department of Environmental Protection, 1981. Summary of Attendance. Division of Parks and Forestry. Trenton, New Jersey.

New Jersey Department of Labor and Industry, 1980. Per Capita Money Income for New Jersey. Division of Labor and Industry. Trenton, New Jersey.

New Jersey Transit Corporation, 1981. Report on Summer Service '80 North Jersey Coast Line. Prepared by Andrea Topper. Maplewood, New Jersey.

New York Department of City Planning, 1979. Transit Service to Gateway Summary Report. Tri-State Project No. D191. New York.

Roos, Daniel, 1979. "Paratransit," Public Transportation: Planning, Operations and Management, edited by George E. Gray and Lester A. Hoel. Englewood Cliffs, New Jersey: Prentice-Hall.

S.C.O.R.P., State Comprehensive Outdoor Recreation Plan, 1977. Trenton, New Jersey : New Jersey Department of Environmental Protection.

Stopher, Peter R. and Meyburg, Arnim H., 1975. Urban Transportation Modeling and Planning. Lexington, Massachusetts: D.C. Heath and Company.

U.S. Army Corps of Engineers, 1971. The National Shoreline Study. Washington, D.C.

U.S. Bureau of the Census, 1954. Census of Business. Washington, D.C.

U.S. Bureau of the Census, 1960. Census of the Population. Table 1: Persons by Race and Spanish Origin and Housing Counts. Washington, D.C.

U.S. Bureau of the Census, 1970. Census of the Population. Table 1: Persons by Race and Spanish Origin and Housing Counts 1980. Washington, D.C.

U.S. Bureau of the Census, 1970. Survey of Housing. Washington, D.C.

U.S. Bureau of the Census, 1977. Census of Retail Trade. Washington, D.C.

U.S. Bureau of the Census, 1980. Census of the Population, Table 1: Persons by Race and Spanish Origin and Housing Counts 1980. Washington, D.C.

U.S. Bureau of Outdoor Recreation, 1973. Outdoor Recreation, A Legacy for America. Appendix A, An Economic Analysis. Washington, D.C.: U.S. Department of the Interior.

Vavra, Mary H., 1979. An Interim Report on Recreation-Related Transportation, New Jersey "6000 Series" Project. Prepared for New Jersey Department of Environmental Protection as part of the Heritage Conservation and Recreation Service's 6000 Series Implementation Assistance Program. Philadelphia: Heritage Conservation and Recreation Service.

Wilson, Harold F., 1953. The Jersey Shore: A Social and Economic History of the Counties of Atlantic, Cape May, Monmouth and Ocean. Three Volumes. New York: Lewis Historical Publishing Company.