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Atlantic City Urban Area Transportation Study

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TO THE OFFICIALS AND CITIZENS OF THE ATLANTIC CITY URBAN AREA:

It is with pleasure that we present this report entitled, ATLANTIC CITY URBAN AREA TRANSPORTATION STUDY

The Atlantic City Urban area is unique in terms of its geographic location and substantial dependence on the tourist industry. Atlantic City is the terminal point for all transportation systems servicing it. The area is highly oriented toward recreation and the convention business and consequently the commercial activity and employment is seasonal. Its jitney type of bus transportation is incomparable with any other form of public transportation in New Jersey.

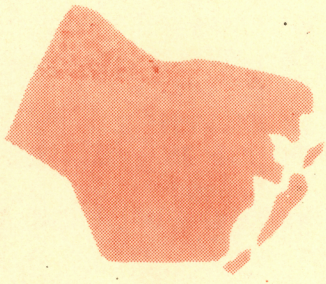
The ATLANTIC CITY URBAN AREA TRANSPORTATION STUDY 1965--1985 highlights major observations based on our extensive urban traffic surveys conducted in 1965 and our 1985 forecasts.

We trust this report will be of value to both public and private decision makers throughout the Atlantic City urban area.

Very truly yours,

Keith Rosser, Chairman
Executive Committee

ATLANTIC CITY URBAN AREA TRANSPORTATION STUDY



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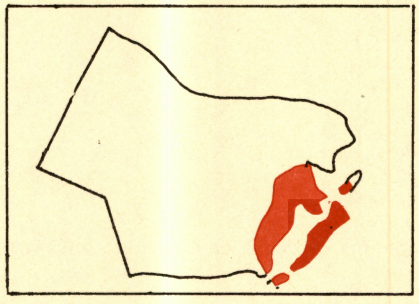

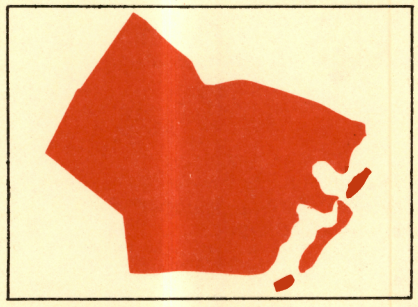

City of Absecon

City of Atlantic City

City of Brigantine

Township of Egg Harbor

City of Linwood

Borough of Longport

City of Margate

City of Northfield

City of Ocean City

City of Pleasantville

City of Somers Point

City of Ventnor

Atlantic County

Cape May County

New Jersey Department of Transportation

In Cooperation With

U.S. Department of Transportation, Federal Highway Administration

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introduction

The Atlantic City Urban Area Transportation Study (ACUATS) is an inter-governmental cooperative effort geared toward solving regional planning problems related to land use and transportation planning. The study is described under AREA DEFINED. As testament to this cooperative effort, an agreement was signed in 1965 by twelve Municipal, two County, and two State agencies. In addition, the Federal Government through the Federal Highway Administration is financially participating in the Study.

The purpose of ACUATS is twofold:

1. **"To devise a workable, acceptable and adaptable plan to guide land use and transportation development in this area for the next 10 to 25 years.**
2. **To establish a continuing, comprehensive planning process for the area in order to assure that the plan is kept current."**[1]

Consistent with the spirit of cooperation, by agreement, an Executive Committee, a Local Cooperating Board and a Technical Planning Committee have been created.

The Technical Planning Committee advises both the Local Cooperating Board and the Executive Committee regarding methods, techniques, procedures, standards, ideas and concepts concerning possible solutions to technical problems related to land use and transportation planning.

The Local Cooperating Board is responsible for reviewing all matter relative to planning policy prior to presentation to the Executive Committee. As such, the Local Cooperating Board functions as an advisory Board to the Executive Committee.

The Executive Committee determines planning policy and "accepts and expends funds" in accordance with the twofold purposes of this Study.

The creation of the Atlantic City Urban Area Transportation Study fulfills an important Federal requirement in that it will insure that this area will continue to be eligible to receive Federal Aid. Section 9 of the Federal Aid Highway Act of 1962 states in part that:

> "After July 1, 1965, the Secretary shall not approve under section 105 of this title ANY PROGRAM FOR PROJECTS IN ANY URBAN AREA of more than fifty thousand population unless he finds that such projects are based on a continuing comprehensive transportation planning process carried on cooperatively by States and local communities in conformance with the objectives stated in this section."

While ACUATS is primarily concerned with transportation planning, its findings will not be limited to serving only those governmental agencies directly involved in transportation work. The 1962

Federal-Aid Highway Act has been interpreted by the U.S. Federal Highway Administration to include in the transportation planning process, the procedures and working arrangements by which short and long range highway and transportation plans are soundly conceived and developed. In addition, the Bureau recognizes that transportation and land use plans must also be continuously evaluated in a manner that will:

1. **"Assist governing bodies and official agencies in determining courses of action and in formulating attainable capital improvement programs in anticipation of community needs and**
2. **guide private individuals and groups in their planning decisions which can be important factors in the pattern of future development and redevelopment."**[2]

The transportation planning process is based on the collection, analysis, and interpretation of urban planning data concerning existing urban conditions and historical urban growth; the establishment of community goals and objectives; and the forecasting of future urban development. This planning process includes the preparation and dissemination of pertinent information needed by official agencies in their consideration of local planning proposals and local improvement programs, and for the encouragement of public understanding and support. The transportation planning process involves specifically the preparation of recommendations concerning the scheduling and financing of highway improvements. This process also requires close coordination with local master planning programs, local urban renewal programs, and revisions of local ordinances and regulations.

The U.S. Federal Highway Administration requires that the following basic elements be included in the Study:

1. **Economic factors affecting development.**
2. **Population.**
3. **Land use.**
4. **Transportation facilities including those for mass transportation.**
5. **Travel patterns.**
6. **Terminal and transfer facilities.**
7. **Traffic control features.**
8. **Zoning ordinances and related municipal controls.**
9. **Financial resources.**
10. **Social and community value factors, such as, preservation of open space, parks and recreation facilities; preservation of historical sites and buildings; environmental amenities; and aesthetics.**

This report is intended to present the results of the 1965 inventories and to provide a general description of the ACUATS area with respect to land use, transportation, and related socio-economic factors. Included in this report are projections for 1985 and recommendations for improvements and additions to the transportation system in the study area.

CHAPTER I



HISTORICAL BACKGROUND

Area Defined

The urbanized portion of the Atlantic City Standard Metropolitan Statistical Area (SMSA) is delineated by the cordon line as shown on Map I-1. The cordon line, which encompasses the area under study, begins in the south at Corson's Inlet and runs northward on the municipal boundaries of Ocean City, Somers Point, Linwood and Northfield. It leaves the general boundary lines at Pleasantville to include the overflow of urban development located in adjacent Egg Harbor Township. The line then follows the Absecon boundary to Brigantine Inlet. Thus, the cordon line encompasses the urbanized portions of the SMSA as outlined in 1960 by the United States Bureau of the Census, with the exception of the developed area west of Pleasantville.

The 12 municipalities in the region shown on Map I-1 have been the subject of intensive investigation. Historically, this area was comprised of only three townships: Egg Harbor Township, Galloway Township and Upper Township. Egg Harbor Township dates back to 1695, Galloway Township to 1774 and Upper Township to 1723.

In 1854 Atlantic City was established as an independent municipality; the land coming from both Egg Harbor and Galloway Townships and consisted of approximately five square miles. In the late 1800's and early 1900's the other 11 municipalities were created out of the original three townships.

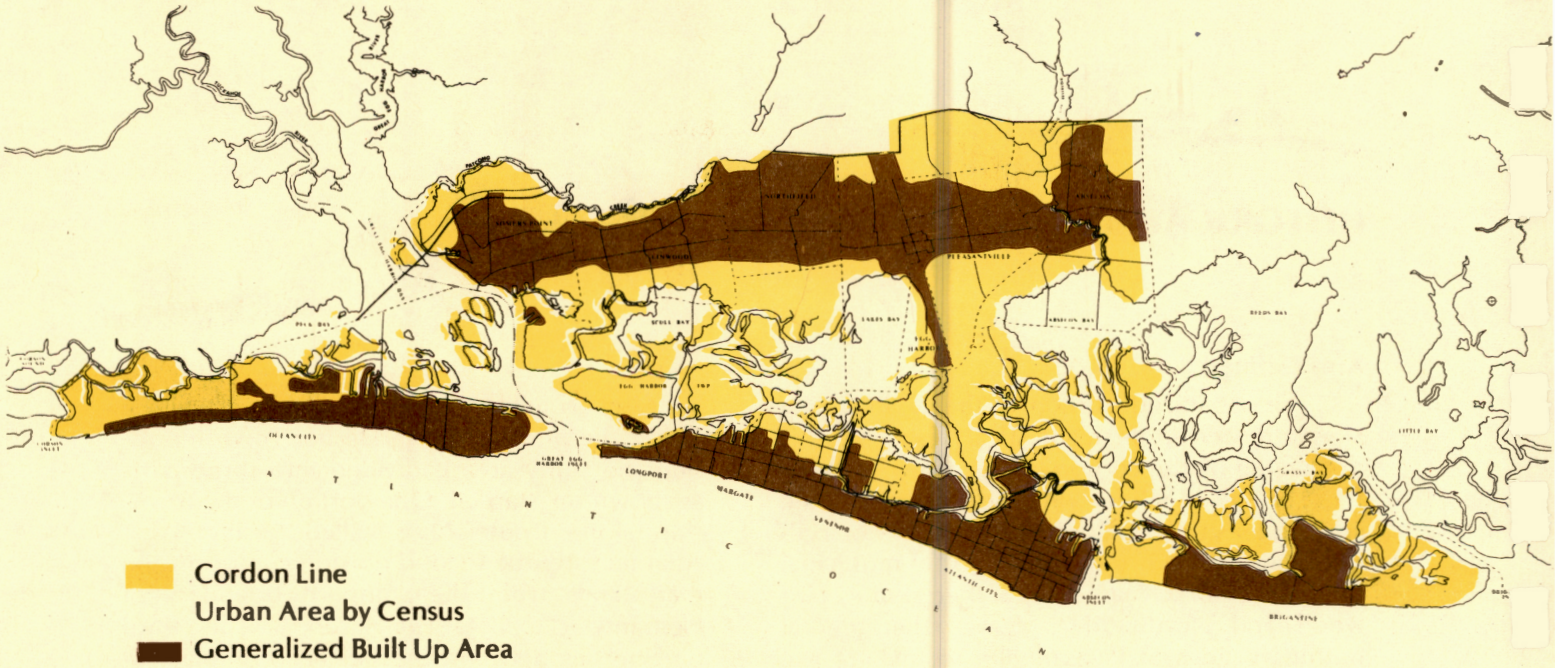
Map I-2 shows the current study area between 1870 and 1905. By 1905, the exterior regional boundary of the present Urban Area was established.

It is noteworthy that throughout this stage, the portion of Egg Harbor Township consisting of marshland lying between the Island and the mainland, remained as a residual and was not annexed by any of the adjacent municipalities. Today the portion of Egg Harbor Township inside the study area is divided into three parts as shown on Map I-1. One portion of the township along Route 40 is called locally, West Atlantic City; the second portion comprises the marshlands from the southern boundary of Pleasantville to Great Egg Harbor Bay; the third portion lies between the western boundary of Pleasantville and the cordon line.

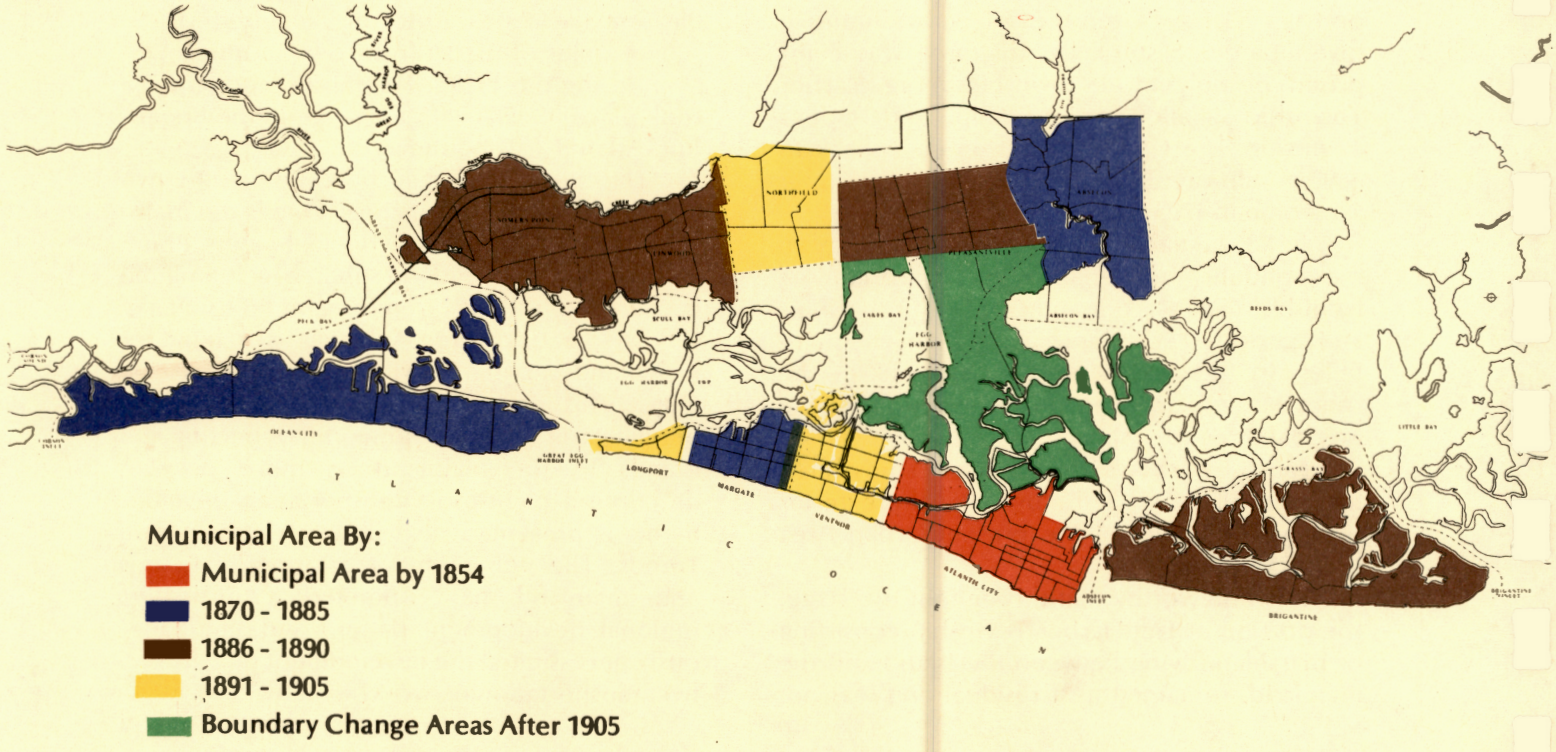
The study consists of approximately 60 square miles in land area. While the outer boundaries of this land area have remained constant since 1905, changes have occurred internally as in the case of Atlantic City, where approximately seven square miles were added in 1910. In addition, Egg Harbor Township regained two square miles from Northfield. Pleasantville and Absecon acquired three square miles of marsh from Egg Harbor Township during the 1920's. The most recent change took place in 1964 with a change in the Brigantine-Atlantic City boundary.

The study area may be divided into two separate geographic subareas. One is the mainland subarea from Absecon to Somers Point, and the other is the Island subarea including the barrier beach islands from Brigantine to Ocean City. Separating these subareas is a band of marshland varying in width from three to six miles. This natural barrier has resulted in a unique transportation network connecting the islands to the mainland. A more detailed description of historic transportation developments is presented next under Transportation Trends. The geographic separation of islands and mainland has promoted a distinctive regional development pattern and simultaneously necessitated the development of a distinctive transportation network.

MAP 1–1
ATLANTIC CITY S.M.S.A.



MAP 1–2
MUNICIPALITY FOUNDING DATES



Transportation Trends

The highway system in the region developed from trails that connected seasonal hunting grounds of the native Indians. By such trails it used to take a South Jersey Indian three days to go to Philadelphia. Most early land travel was by horseback because the trails were narrow, whereas transportation along the shore was by boat.

The earliest "highway" was the old Shore Road from Leeds Point to Somers Point, opened for travel in 1717. Its width is unknown, but a road act adopted by the Province of New Jersey created road widths for main highways at six rods or 99 feet.[3] It was necessary to clear away underbrush to lessen the likelihood of robbery, a fairly common nuisance of the times in this region.

Because of the numerous streams in the area, ferries became an important part of the early transportation system. These ferries were large "flat-bottom" scows, propelled by rope or cable and operated by land owners. Fares charged were:

> **One person—2 pence; man and horse—4 pence; wagon, two horses and their riders—2 shillings, 6 pence (62 cents).**[4]

Boats were used to convey passengers from the mainland to the coastal islands. This means of crossing the bays was the only one until the building of the railroad bridge to Atlantic City in 1855.

By 1800, farms had been carved out of forests, villages established, trade and industry had begun. From 1800 to 1850, the shore area continued to rely on horses and waterways for travel. It was during this period, however, that newer modes of travel were gaining popularity.

A census taken in 1830 enumerated the number of horse vehicles for Gloucester County. Atlantic County was then a part of Gloucester County, containing one fourth of its population. The figures for Gloucester County:

> **235 riding chairs, gigs, sulkies and dearborns**
> **30 chaises, coaches and phaetons**
> **967 covered wagons**
> **6 stages, two and four horses**[5]

In the book *Jersey Shore* by Harold Wilson, a description is given of a stagecoach journey from Absecon to Philadelphia. In 1840, the stage left Absecon between three and four in the morning, stopping for passengers en route. It traveled along Shore Road to Somers Point and then back to Mays Landing. Breakfast was eaten in Mays Landing at eight o'clock and horses were changed there. In its journey west, the stage passed Weymouth, Pennypot, Folsom, Winslow, Blue Anchor Tavern and Cross Keys. This bumpy and dusty ride over a meandering route closely followed the Great Egg Harbor River so that water was available for both horses and passengers for the greater part of the trip. This stage route is still quite evident today as part of the county road system. Dinner was served at three o'clock at Long-a-Coming (Berlin); then, on through White Horse, Haddonfield and on a gravelled pike; later the White Horse Pike, into Camden; then by ferry into Philadelphia. The fare from Absecon to Philadelphia was $5.00. In the third quarter of the 19th century the fare from Absecon to Camden was $1.50, reduced to compete with the new railroad.

In Mitchell's *Traveller's Guide Through the United States, 1836,* stage, steamboat, canal and railroad routes are listed. On page 36, mileage and stopover points on Route 141 from Philadelphia to Absecon are presented as follows:

FROM PHILADELPHIA TO ABSECON, N.J.

To	Miles between Stops	Miles from Philadelphia
Camden, N.J.	1	7
Haddonfield	6	7
Longacoming	9	16
Mays Landing	26	42
Somers Point	12	54
Bargaintown	4	58
Smith Landing	6	64
Absecon	6	70

A trip from Philadelphia to Atlantic City by Oyster Wagon or Jersey Wagon in 1843 illustrates a few of the travel conditions of the times. The

wagon's springs were "cumbrous contrivances of unyielding wood so constructed as to make riding a weariness to flesh and spirit."[6] Mosquitoes and greenhead flies made many meals of the travelers. The roads were in such condition as to inspire the following verse by an observer in 1851:

> **"The roads are not passable**
> **Not even jackass-able**
> **And those who will travel 'em**
> **Should turn out and gravel 'em."**[7]

By 1850, the era of stagecoaches and waterways was ending. The growth of railroad networks decreased the patronage on both stagecoach and riverboat lines. This change of mode in transportation caused a shift in many occupations and gave stimuli to many others.

On July 1, 1854, a Camden and Atlantic Railroad train traveled across the South Jersey flatland from Camden to Absecon in two and one-half hours. A year later a railroad bridge was completed joining the mainland and Atlantic City. Other businessmen then began to realize the potential of the shore area.

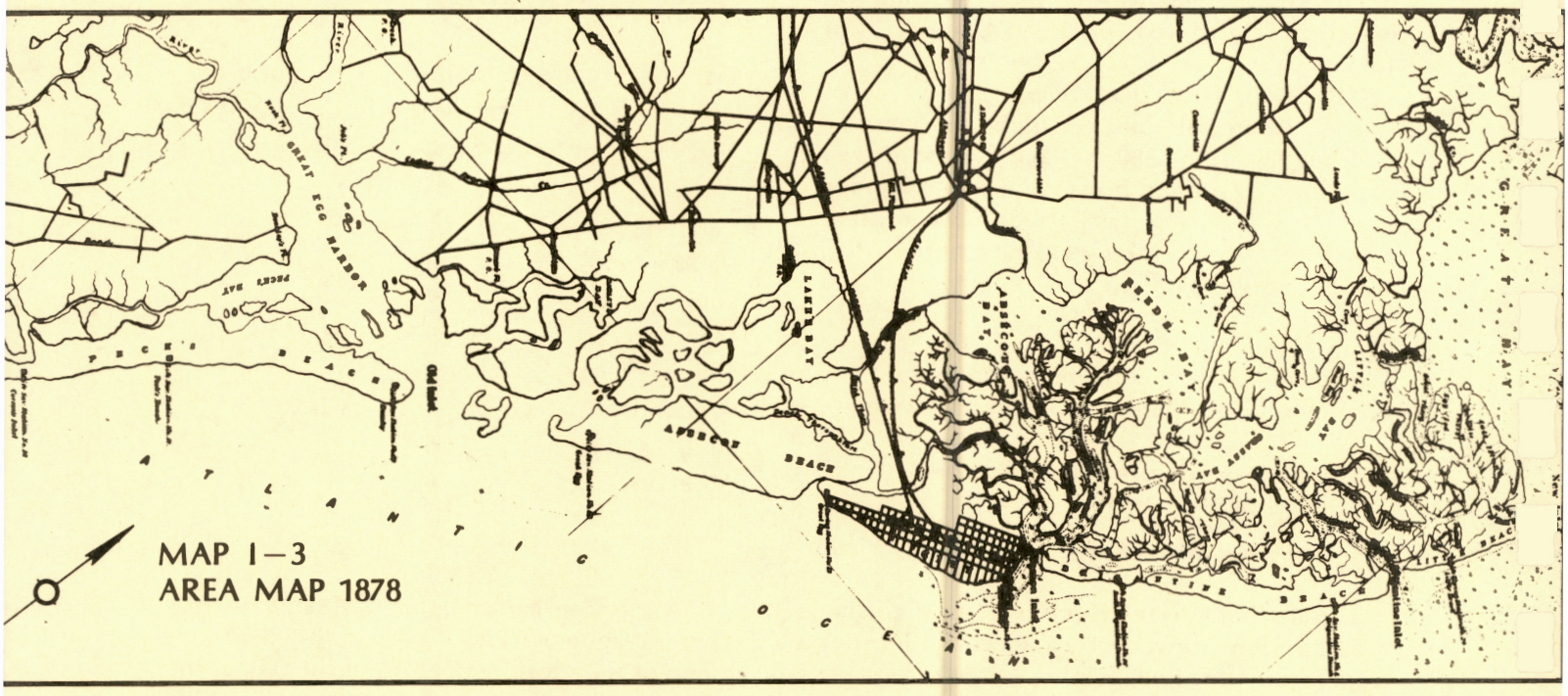
In 1853, Jesse and David Lake of Pleasantville obtained a charter allowing them to build a toll road from Pleasantville to Atlantic City. The expected cost of the road was $20,000 to $30,000. From the beginning they ran into difficulties in construction. The meadows were almost impassable for horse-drawn vehicles. Places were found where soft muck extended to a depth of 100 feet. It became necessary to lay cedar poles crosswise for a foundation and to support these poles with sunken pilings. In hauling materials for construction, wagon wheels and horses hoofs sank deep in the muck. This difficulty, lack of money and other obstacles made it impossible to complete the road until nearly two decades later. The final cost of the road was $120,000 instead of the estimated $20,000.[8]

Still others built a Narrow Gauge Railroad, in 1877, from Camden to Atlantic City laying the 54 miles of track in 98 days.

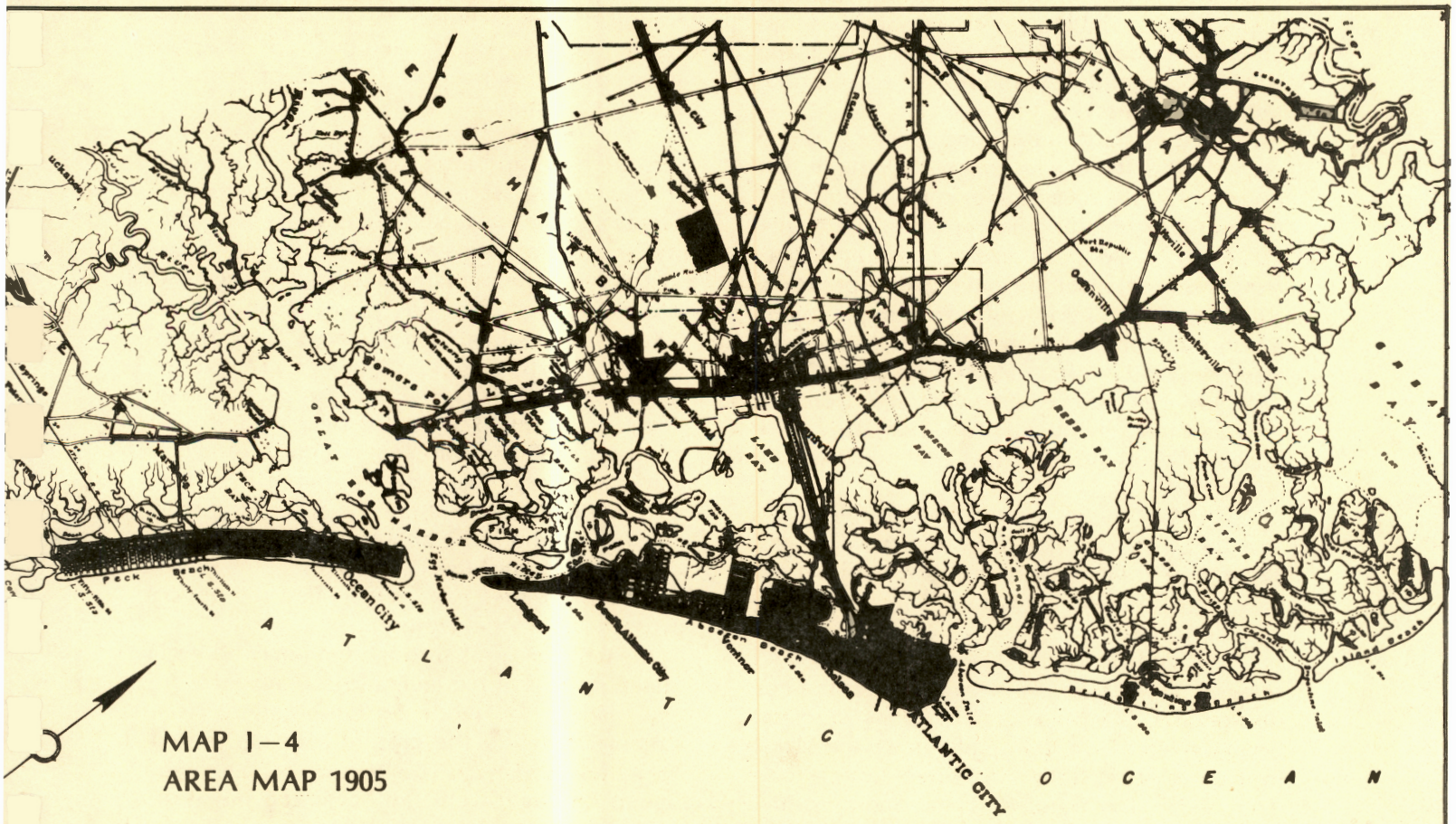
Competition between railroads was keen. Round trip fares dropped from $3.00 to $1.00, making it possible for most people to afford a trip to the shore.

Walt Whitman, traveling from Camden to Atlantic City by train in 1879, wrote "The whole route . . . has been literally made and opened up to growth by the railroad . . . bringing information and light into dark places, opening up trade, market purchases, newspapers, fashions, visitors, etc."[9]

The Camden and Atlantic Railroad and the Narrow Gauge Railroad were Atlantic City's lifeline supplying the region with men and materials faster and more efficiently than previous modes. A map of the region, Map I-3, drawn in 1878, delineates these railroads and also shows



MAP I—3
AREA MAP 1878



MAP I–4
AREA MAP 1905

the transportation network of the mainland. Conspicuous by its absence is the toll road running over the meadows from Pleasantville to Atlantic City. Its date of completion is a point of argument with many authorities assigning 1870 as the completion date.

A gridiron street pattern and several railroad spurs in Atlantic City are shown on Map I-3. Although the majority of the streets at that time existed on paper only, future development was determined by this street plan. The original street pattern constituted the framework around which present-day Atlantic City has grown. In contrast to Atlantic City, growth on the mainland was not controlled by a road plan. The existing road system on the mainland evolved as a natural response to urban growth. The original settlements of Absecon, Mt. Pleasant, Risleyville, Bakersville, Leedsville, and Somers Point, were developed at crossroads then in existence. Subsequent development of the mainland road system gained impetus by the need to connect existing pockets of development with the hinterland.

A map of this same region drawn in 1905 (Map I-4) illustrates the development that had taken place since 1878. By this time municipal boundaries had been established and street patterns were greatly elaborated. The old settlement names of Mt. Pleasant, Risleyville, Bakersville, and Leedsville were replaced by the municipal names known today.

Atlantic City was booming. The population grew to 28,000 year-round residents by 1900. Property in that year was valued at $50,000,000. The travel time by train from Camden to Atlantic City was 44 minutes, an average of 74.4 miles per hour. The passion for speed reached its peak in 1920. A survey conducted that year indicated that of the 16 fastest trains in the world, 13 were in service to Atlantic City.[10]

At the turn of the century the automobile and bus began to exert influence on the trans-

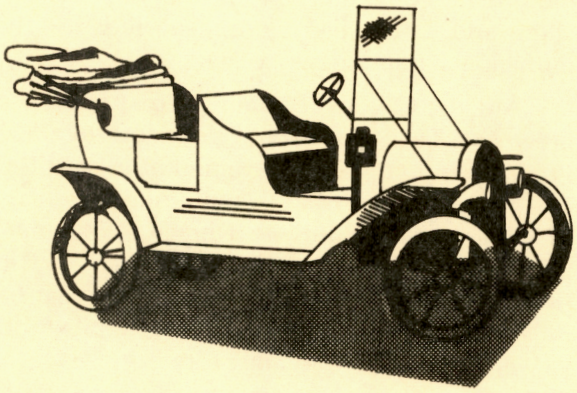
portation scene. As the railroad replaced the stagecoach, so did the automobile and bus supplant the railroad. The bicycle, the trolley, and later the automobile revolutionized transportation to the shore.

The popularity of cycling grew rapidly in early 1900's. It became more convenient and therefore more pleasurable to travel short distances by cycle rather than by horse and buggy. Gradually, cycle clubs evolved making longer trips more enjoyable through group participation. Organized cycle clubs, exerting a certain amount of influence, were credited with having stretches of the White Horse Pike gravelled in 1896. By 1900, a cyclist could travel from the Camden ferry to Atlantic City over fairly good roads. The record time was two hours and 47 minutes.[11]

Another means of conveyance in this era was the street car. The first street railway in the area, consisting of two cars and four horses, began to operate in Atlantic City during the middle 1860's.[12]

The first electric trolley was run on Atlantic Avenue in 1889. A fare of six cents was the cost to the rider. The horse-drawn trolleys were able to make ten trips a day up and down the island, but the electric trolley increased service to 16 trips a day. The trend for faster and more frequent service continued until 1950, when the trolleys on Absecon Island were making 276 trips in 24 hours.[13]

The automobile first made its appearance at the shore in 1889. These autos were electric, followed by gasoline powered cars. Their impact on the shore area has been widespread, affecting not only existing road conditions and transportation facilities, but also other economic factors which in turn have affected development, agriculture, population growth, social and community values, etc.



One problem faced by automobile owners was the need for better roads. Most of the early improvements were made at county expense. Gradually the State assumed more responsibility for road maintenance, and in 1917, the State Highway Department was created, under the direction of a State Highway Commission. Initially the legislature designated 15 routes as the State Highway system, one of these was the White Horse Pike. The legislature provided that existing highways could be used and permitted the Commission to lay out, construct, and repair new roads over acquired rights-of-way. With the State supplying funds, the road network in the shore area improved. Paving of gravel roads, and the construction of modern, timesaving routes have exemplified the period from the 1920's to the present.

Man's progress through time may be evaluated in light of the technological advances he has made in his mode of transporation. From colonial times to the present man has passed from the Indian trail to the multi-lane high-speed highway; from the horse and buggy to today's automobile.

From the past it has been learned how one form of transporation becomes outdated and makes room for modern, more convenient means of travel. Today's problem is to evaluate the present transporation system and to allow progress without strain.

Recreation and convention industry

Atlantic City, by 1850, was already a popular fishing village. The combined efforts of horse and ferry were necessary to reach this island of sand six miles at sea. Visitors were transported to Atlantic City's meadow edge by regular stagecoach routes and from there, ferried across the bay by the numerous crafts that plied the waters of this area. Two major arteries into the resort, the White Horse Pike and the Black Horse Pike, derived their names from the color of horses that pulled the competitive stagecoaches serving the southern New Jersey area.

With the introduction of rail transportation, a conductor, having grown weary of the seat cushions sprinkled with sand, proposed a remedy. Talking to property owners in Atlantic

City who had a similar grievance, he persuaded them to present a petition to City Council. This petition resulted in the passage of the following resolution:

> **"That the city build a boardwalk along the beach from Congress Hall (Massachusetts and Pacific) to the Excursion House (between Missouri and Mississippi). That said walk be 10 feet wide; that the boards be laid lengthwise; that the Committee be instructed to proceed with the erection of the walk immediately; that the Ordinance Committee be instructed to draft an ordinance prohibiting erection of any bath house or shanty or building of any kind within 30 feet of the walk; and none on the ocean side except by permission of the Council."**[14]

The boards were laid on rows of posts projecting about 18 inches above the sand. The walk was built in sections which could be moved and stored away during the winter months. Most historians acknowledge the boardwalk and the railroad as the major catalysts in Atlantic City's growth.

Patronage to the shore increased rapidly with many tourists deciding to become year-round residents. Within five years, the population grew to twice the pre-boardwalk population. Within ten years the resort had ten times the number of permanent inhabitants it possessed prior to the Civil War.[15]

Atlantic City's growth during this period influenced development in the surrounding area. The adjacent communities began to grow in the last quarter of the 19th century, reaching a peak rate of growth in the 1920's. This peak is attributable to better transportation systems and the population overflow from Atlantic City. By 1900, Ventnor, Margate, Longport and Ocean City had been established and had grown to sizable summer communities. Brigantine's development was stunted by a severe storm in 1903 which destroyed the railroad connection. New bridges, subsequently constructed, promoted growth in Brigantine.

Development of the mainland communities was primarily stimulated by existing transportation routes. The main route was Shore Road from Absecon to Somers Point as previously cited.

In 1900, Atlantic City started a promotional drive, seeking to bring still more visitors to the area. Advertisements appeared in 60 newspapers through 20 major cities. Information bureaus were opened in New York City, Chicago, St. Louis, Toronto and Montreal. These bureaus informed the public of the recreational opportunities available to those who visited Atlantic City. Because of this publicity, hotel owners soon found it profitable to remain open all year. Heated rooms became one attraction to draw visitors in the off-season. Another attraction was the encouragement given to large conventions. Today Atlantic City annually does an average of $60,000,000 in convention business.[16]

In addition to a mild climate and adequate rooming facilities to draw conventioneers, the city bought land and constructed an auditorium to house a wide variety of convention business in 1929. Convention Hall, one of the largest buildings in the world without roof posts or pillars, measures 675 feet long by 351 feet wide, with a ceiling height of 135 feet. It was built to accommodate a number of varied activities. Football, hockey, baseball, soccer, and other games as well as intercollegiate track meets, rodeos, circuses, and ice skating revues are a few of the events held in the Hall.

Service to the visitor is the area's main industry. Palatial hotels, motels and the Convention Hall adapt to almost any purpose. Just as important is the transportation service offered. The rolling chairs on the boardwalk and the jitneys on the streets are unique.

Starting in 1887, the rolling chair became a part of the boardwalk scene. Originally used by invalids, the popularity of the "baby buggy with wheels" grew until today 1,640 rolling chairs are licensed for use on the boardwalk.

The jitney is a unique mode of transportation derived from the French word "jeton", a small coin or token.[17] Present-day jitneys are small buses which hold a maximum of ten passengers. The first regular line ran along Atlantic Avenue in 1915 and charged a five-cent fare. By law the number of jitney franchises is limited to 190. These jitneys are privately owned by individual businessmen who bear the cost of maintenance and in turn profit by the fares collected. The city exercises little control over the jitneys other than collecting an annual $75 mercantile fee from each driver. Control is maintained by the jitney drivers themselves who form the Jitney Men's Association of Atlantic City. Through the executive committee the association makes its own rules and sets schedules under which the drivers work.

Atlantic City's physical arrangement and climate are not dissimilar from that of many other seashore resorts. The factors which made

the off-shore island unique, and therefore so attractive to the visitor, were unusual in themselves. A railroad starting at Camden and ending on a "sand bar", wooden planks laid over sand, chairs with rollers, and a fairyland of gigantic buildings established Atlantic City as the nation's playground.

Population changes

The previous discussion of the area's historical development in terms of municipal incorporations and transportation, is related to the twelve municipalities population expansions since 1880.

As noted previously under *Area Defined*, only a portion of Egg Harbor Township is within the study area. Since the Bureau of the Census does not publish separate population data for that portion of Egg Harbor Township, this section omits Egg Harbor Township.

The Bureau of the Census data shown on Table I-1 illustrates that in 1880 Absecon and Atlantic City had populations of 507 and 5,477 respectively. In 1890, Linwood, Somers Point, and Ocean City had populations of 536, 191 and 542 in that order. During the 1900's Brigantine, Longport, Margate and Pleasantville had populations of 99, 80, 69 and 2,182 respectively, while the populations of the above municipalities increased moderately and steadily. By 1910, all municipalities were increasing in population.

Some of the latter municipalities mentioned had a late start in their population expansion because they had not become incorporated places until very late in the 1890's. Ventnor in 1903 and Northfield in 1905 were the last municipalities to become incorporated.

A gradually increasing rate of growth was experienced by almost all the municipalities until 1920 and 1930 when they reached their peaks in population expansion. By 1940, the region's municipal populations were decreasing slightly until 1950 and 1960 when they started to stabilize. Table I-2 and Graph I-1 depict percentage changes which occurred in each municipality from 1880 to 1960.

Absecon's population growth rate decreased to −1.2 percent during the 1880 - 1890

TABLE I−1.
1880 THROUGH 1960 MUNICIPAL POPULATIONS, ACUATS REGION

ACUATS Municipalities	Years								
	1880	*1890*	*1900*	*1910*	*1920*	*1930*	*1940*	*1950*	*1960*
Absecon	507	501	530	781	702	2,158	2,084	2,355	4,320
Atlantic City	5,477	13,055	27,838	46,150	50,707	66,198	64,094	61,657	59,544
Brigantine	—	—	99	67	12	357	403	1,267	4,201
Egg Harbor Twp.	—	—	—	—	—	—	—	360	608
Linwood City	—	536	495	602	638	1,514	1,479	1,925	3,847
Longport Boro	—	—	80	118	100	228	303	618	1,077
Margate	—	—	69	129	249	2,913	3,266	4,715	9,474
Northfield	—	—	—	866	1,127	2,804	2,848	3,498	5,849
Pleasantville	—	—	2,182	4,390	5,887	11,580	11,050	11,938	15,172
Somers Point	—	191	308	604	843	2,073	1,992	2,480	4,504
Ventnor City	—	—	—	491	2,193	6,674	7,905	8,158	8,688
Ocean City	—	452	1,307	1,950	2,512	5,525	4,672	6,040	7,618
ACUATS REGIONAL POPULATION	5,984	14,735	32,908	56,148	64,970	102,024	100,096	105,011	124,902

*NOTE: The Study Area became an Urban S.M.S.A. in 1950.
SOURCE: U.S. Department of Commerce, Bureau of the Census
Census of Population 1880 through 1960

TABLE I–2. 1880 THROUGH 1960 PERCENT MUNICIPAL POPULATION CHANGE, ACUATS REGION

ACUATS Municipalities	Percent Population Change By Decades							
	1880-90	*1890-00*	*1900-10*	*1910-20*	*1920-30*	*1930-40*	*1940-50*	*1950-60*
Absecon	–1.2	5.8	47.4	–10.1	207.4	–3.4	13.0	83.4
Atlantic City	138.4	113.2	65.8	9.9	30.6	–3.2	–3.8	–3.4
Brigantine	–	–	–32.3	–82.1	2875.0	12.9	214.2	231.6
Linwood	–	–7.6	21.6	6.0	137.3	–2.3	30.2	99.8
Longport	–	–	47.5	15.2	128.0	32.9	104.0	74.3
Margate	–	–	87.0	93.0	1069.9	12.1	44.4	100.9
Northfield	–	–	–	30.1	148.8	1.6	22.8	67.2
Pleasantville	–	–	101.2	34.1	96.7	–4.6	8.0	27.1
Somers Point	–	61.2	96.1	39.6	145.9	–3.9	24.5	81.6
Ventnor City	–	–	–	346.6	204.3	18.4	3.2	6.5
Ocean City	–	189.2	49.2	28.8	119.9	–15.4	29.3	26.1

period. From 1880 to 1920, Absecon's growth rate fluctuated until it reached a peak of 207.4 percent in the 1920 - 1930 period. This increase was the highest ever experienced by Absecon. However, Absecon also experienced substantial population growth during the 1950 to 1960 decade.

Atlantic City's population growth follows an unusual pattern in that its peak period was in 1880 - 1890 with a 138.4 percent increase. Following this time Atlantic City's rate began to decline until 1920 - 1930, when the population increased by only 30.6 percent, while the population of most of the other municipalities increased by well over 100 percent during the same period. From 1930 to 1960, Atlantic City's growth rate fell below 1 percent and decreased to –3.4 percent in 1950 - 1960.

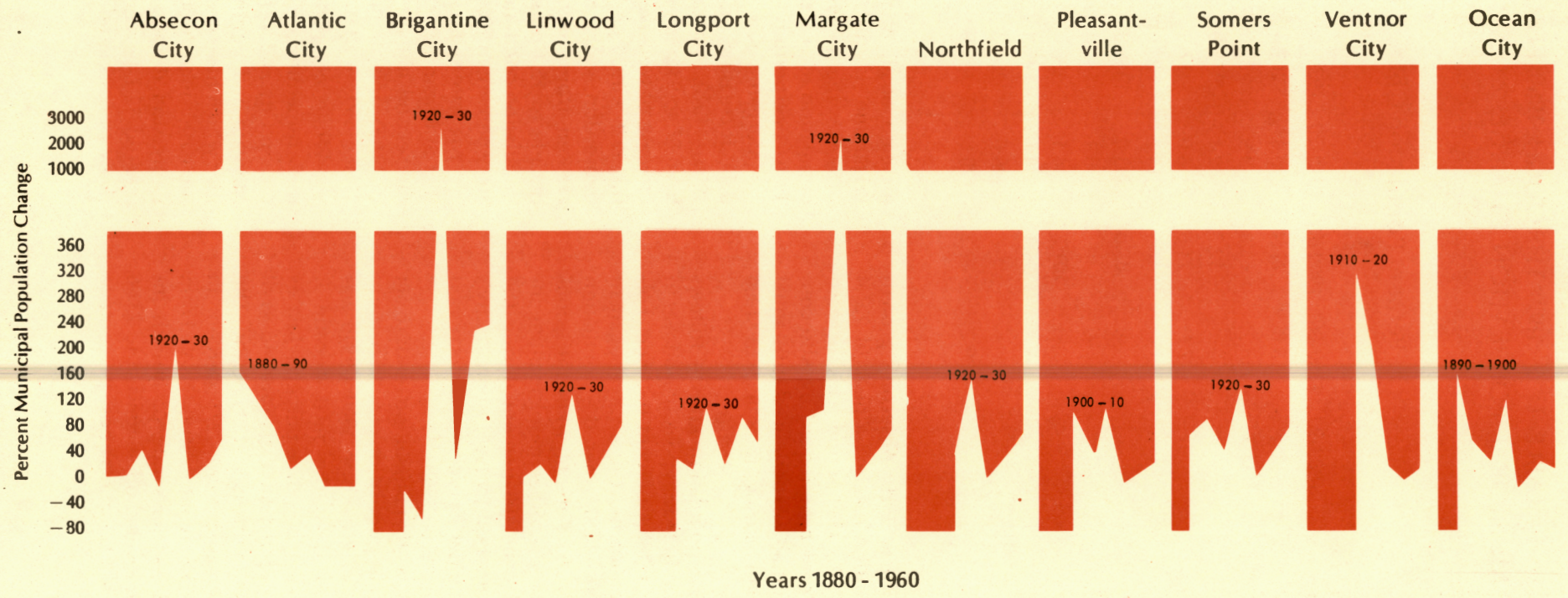
Graph I-1 shows that *Brigantine* tends to act independently in its population growth pattern. Brigantine's rate of growth in 1900 - 1910 was –32.3 percent, and in the next decade it dropped drastically to –82.1 percent. Just as dramatic is its population expansion to well over 2000 percent in the 1920 -1930 period. The growth rate decreased from 2875 percent in 1920 - 1930 to 12.9 percent in 1930 - 1940. From 1940 to 1960, Brigantine's rate of growth increased and then leveled off somewhat to 231.6 percent in 1950 - 1960, the largest percentage increase of all Atlantic County municipalities. Brigantine is the only municipality in the ACUATS region with its greatest percent of population increase during the 1920 - 1930 and 1950 - 1960 period.

Margate's rate of growth, though continually increasing, has not been constant. From 1900 - 1910, Margate's growth rate increased from 87 to 93 percent in 1910 - 1920. A dramatic increase of well over 1000 percent took place in the 1920 - 1930 period. During the 1930 - 1940 depression years Margate's growth rate decreased from 1069.9 percent in the previous decade to 12.1 percent. From 1940 to 1960, the population continued to increase with a gain of 100.9 percent in 1950 - 1960.

Margate's rate of growth closely parallels that of Brigantine, classifying Margate as having the second highest percentage increase in the ACUATS region during the 1920 - 1930 and 1950 - 1960 decades.

When comparing Margate with some of the remaining municipalities as Linwood, Ocean City and Ventnor, there is evidence that Margate and Ventnor are the only municipalities which have had a steady rate of population increase since 1930. During the 1930 - 1940 depression decade, Margate and Ventnor increased 12.1 percent and 18.4 percent respectively as compared to decreases of 2.3 percent

GRAPH I–1.
A COMPARISON BETWEEN MUNICIPAL GROWTH RATES, ACUATS REGION



in Linwood and 15.4 percent in Ocean City in the same time period.

Ocean City and *Linwood* also experienced increased growth rates during the 1940 - 1960 period, but their rates of growth lagged slightly behind that of Margate. Ocean City's population increased 29.3 percent in the 1940 - 1950 decade and 26.1 percent in the 1950 - 1960 decade. In the same light, Linwood's population increased 30.2 percent in the 1940 - 1950 decade and 99.8 percent in 1950 - 1960. During the same period of time, Ventnor's rate of growth declined from 18.4 percent in 1930 - 1940 to 3.2 percent in 1940 - 1950. It increased slightly to 6.5 percent in 1950 - 1960.

The municipalities of *Longport, Northfield, Pleasantville* and *Somers Point* display similar population behaviors and parallel each other closely in that their rates of growth reached their highest percentage increase between 1920 and 1930. From 1930 to 1960, the growth rates declined slightly and leveled off in 1960.

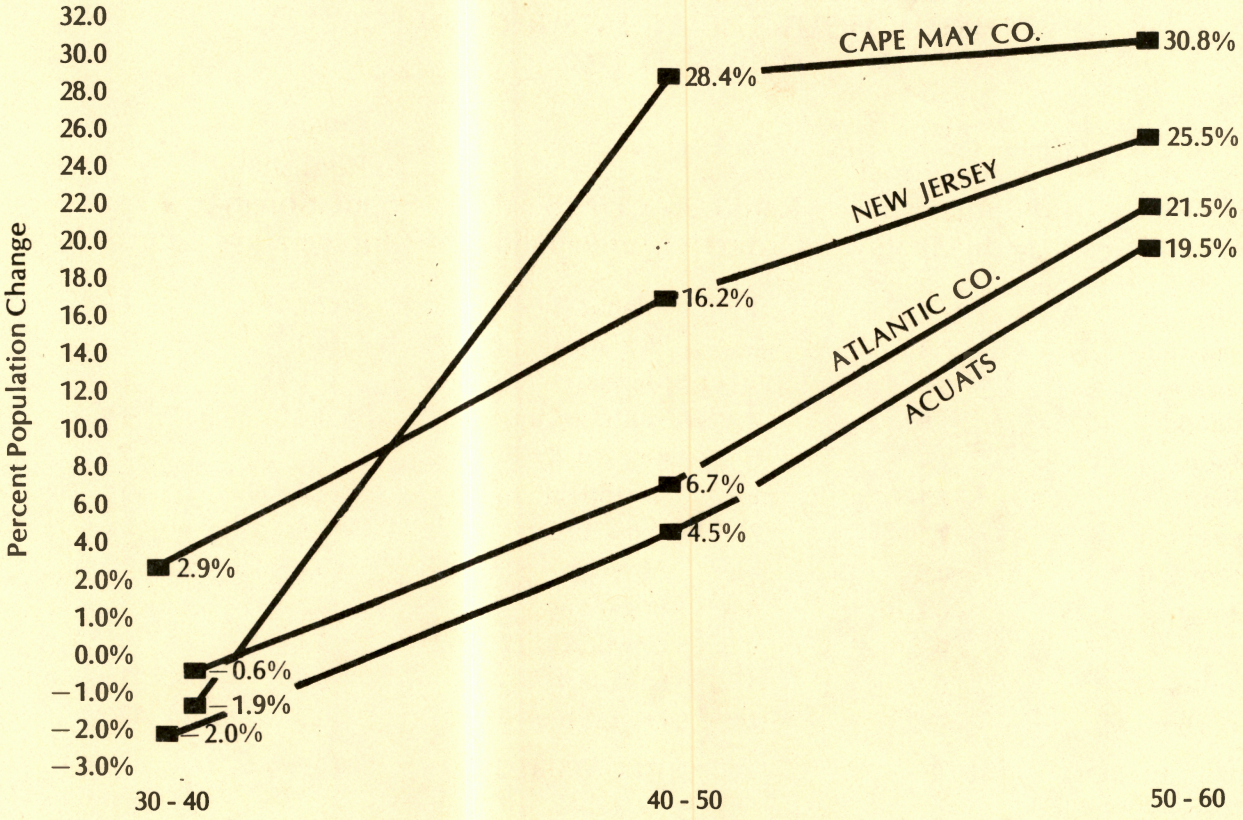
Regional Growth Rates

Looking at the entire area, it is evident (Graph I-2) that the Atlantic City Urban Area's rate of growth between 1930 and 1940 declined with a net population loss of 1.9 percent. During 1940 - 1950, a moderate growth rate of 4.5 percent is shown. The rate of growth between 1950 and 1960 was relatively high in comparison with the 1930 - 1940 or 1940 - 1950 rates.

Atlantic County, during the 1930 - 1940 period, showed a rate of growth of −0.6 percent. The trend for 1940 - 1950 was an upswing of 6.7 percent and for 1950 - 1960 it was 21.5 percent. Atlantic County's population trend closely parallels ACUATS.

A comparison of Cape May County's to ACUATS' rate indicates that Cape May's rate started 0.1 percent below ACUATS' rate during the 1930 - 1940 period. In 1940 - 1950, Cape May County increased at a most rapid rate to 28.4 percent, giving a spiral effect, from −2.0 percent in the 1930 - 1940 decade. This is a dramatic

GRAPH I−2. A COMPARISON OF REGIONAL GROWTH RATES BETWEEN NEW JERSEY, ATLANTIC COUNTY, CAPE MAY COUNTY, AND ACUATS AREA



increase of 30.4 percent over a twenty year span (1930 - 1950) when compared to ACUATS increase of 6.4 percent covering the same period of time. Cape May County's rate of growth experienced its greatest increase between 1930 - 1940 and 1940 - 1950 decades where ACUATS experienced its greatest change during the 1940 - 1950 and 1950 - 1960 decades.

New Jersey experienced a population gain of 2.9 percent during the 1930 - 1940 decade. In contrast to Atlantic County, Cape May County and ACUATS, New Jersey's rate of growth increased instead of decreased during the 1930 - 1940 period. In 1940 - 1950, New Jersey accelerated at a rate of 16.2 percent whereas ACUATS increased only 4.5 percent. During the 1950 - 1960 years, New Jersey increased less rapidly to 25.5 percent compared with an ACUATS rate of growth of 19.5 percent indicating a 9.3 percent increase for New Jersey and a 15.0 percent increase in the rate of growth for ACUATS during the twenty year span of 1940 - 1960. New Jersey parallels ACUATS rate of growth at a slightly more accelerated rate than Atlantic County.

Population Growth of Municipalities

There is evidence that Atlantic City's population dominance started as early as 1880 as shown on Table I-1.

In 1880, Absecon and Atlantic City were the only two municipalities which were shown to have a population since the Federal Census of Population did not publish information on the few families which may have been living throughout the remaining municipalities.

It is evident from Table I-3 that while nine of the 12 municipalities in the study area have shifted rank order positions, Atlantic City, Pleasantville and Somers Point have retained their 1910 rank order in 1960 of 1st, 2nd and 7th, respectively.

Thus, in spite of Atlantic City's recently declining population, it still retains population dominance and is the central city of the region.

As outlined in the preceding pages, existing development is primarily a result of the growth of the recreation and convention industry. Therefore, the transportation network and land uses have developed accordingly. Growth in the

TABLE I—3. DISTRIBUTION OF MUNICIPAL POPULATIONS THROUGHOUT THE ACUATS REGION FOR 1910 AND 1960

1910 ACUATS Municipalities	1910 % Regional Population in Municipality	1910 Rank Order	1960 ACUATS Municipalities	1960 % Regional Population in Municipality	1960 Rank Order
Atlantic City	82.2	1	Atlantic City	47.7	1
Pleasantville	7.8	2	Pleasantville	12.1	2
Ocean City	3.5	3	Margate	7.6	3
Northfield	1.5	4	Ventnor City	7.0	4
Absecon	1.4	5	Ocean City	6.1	5
Linwood	1.1	6	Northfield	4.7	6
Somers Point	1.1	7	Somers Point	3.6	7
Ventnor City	0.9	8	Absecon	3.4	8
Longport	0.2	9	Brigantine	3.3	9
Margate	0.2	10	Linwood	3.1	10
Brigantine	0.1	11	Longport	0.9	11
Egg Harbor Twp.	—*	—*	Egg Harbor Twp.	0.5	12
ACUATS REGION	100.0%		ACUATS REGION	100.0%	

*No data collected in 1910
SOURCE: 1910 and 1960 Census of Population

past has occurred with little or no formal planning. However, the State and local officials have realized that under present conditions of rapid change in mobility and population and the possibility of a shorter work week, conditions in this area could become chaotic without coordinated planning. The various studies outlined in Chapter II were designed to secure data relative to existing conditions in order to provide a basis for future projections which will aid in the selection of a plan for future development.

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CHAPTER II

DATA COLLECTION, STUDY DESIGN AND ACCURACY CHECKS 1965

In general, the methods and procedures used in this Study are the same as those accepted by the Federal Highway Administration for transportation studies throughout the United States. Some minor revisions of the standard procedures were made in order to adapt the methodology to the pecularities of the Atlantic City region.

The most significant unusual aspect of this area is the seasonal influence. Because of this, all data were collected to represent an average summer weekday rather than an average day of the year. The summer weekday was chosen instead of the weekend because a transportation system geared to free flowing traffic on the relatively few summer weekends would not be the most sound engineering design.

Types of Surveys Made

Generally, two types of data collection surveys were made: those dealing with comprehensive planning elements and those dealing with travel and transit. This division was not exact; some of the planning elements were collected in the travel inventories, but processed separately.

The methodology used for the following surveys is discussed in this chapter:

1. **Land Use Inventory**
2. **External Travel Survey**
3. **Internal Travel Survey**
4. **Companion Studies**
   a. **Travel Time**
   b. **Traffic Counting**

Survey Zones

The Study Area was subdivided into small geographic zones for data collection and analysis. The zones are generally coincident with census tracts (wherever tracts have been delineated by the U.S. Bureau of the Census) or with tax districts as they appear on municipal tax maps. Many of these tracts were subdivided by zonal boundaries to facilitate a more detailed analysis of the various survey data. These zones are shown on Map II-1.

All data collected in the surveys were keyed to these geographic zones. That is, population, land use, auto ownership, employment, income, and travel patterns were totalled for each of the 126 zones in the study area. To expedite traffic analysis, three of these zones were combined with adjoining areal analysis units. Since the zones are subdivisions of the municipalities, data were also aggregated at the municipal level.

Land Use Study Design

The Land Use Inventory was conducted on a lot and parcel basis. The survey data were collected from two sources—field investigation and aerial photographs. A field inventory was conducted for all non-residential uses. The remainder—residential and vacant land—was determined from aerial photographs (1" = 400').

The field inventory procedure was a standard listing type using a field form for each block. Individual parcels were listed on this form by address, with the use or uses for each lot recorded for coding.

All detailed land use data were manually summarized at the block level (artificial blocks were created for un-subdivided parcels). The block level data were punched on tabulating cards for further summarization. The block level cards allow the flexibility of making summarizations by tax district survey zone, or municipality.

The results of the Land Use Inventory are discussed in Chapter III.


ESTELL MANOR
CORBIN CITY
ATLANTIC CO.
GAS. MAY CO.
UPPER TOWNSHIP
EGG HARBOR TOWNSHIP
HAMILTON TWP.
GALLOWAY TWP.
PORT REPUBLIC
BURLINGTON CO.
MULLICA RIVER
ATLANTIC CO.
TUCKAHOE RIVER
GREAT EGG HARBOR RIVER
GREAT EGG HARBOR BAY
SOMERS POINT
NORTHFIELD
PLEASANTVILLE
ABSECON
EGG HARBOR TWP.
LAKES BAY
ABSECON BAY
REED'S BAY
HAMMOCK COVE
PERCH COVE
LITTLE BAY
GRASSY BAY
MAINWALER BAY
SCULL BAY
SHELTER ISLAND BAY
PECK'S BAY
CORSON'S SOUND
CORSON'S INLET
GREAT EGG INLET
ABSECON INLET
BRIGANTINE INLET
OCEAN CITY
LONGPORT
MARGATE
VENTNOR
ATLANTIC CITY
BRIGANTINE
ATLANTIC OCEAN
(Strathmere)
UPPER TWP.
MAP 11–1
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
ZONE MAP
MAP SCALE
0 ½ 1 1½ 2 MILES
39° 18' N
74° 48' W
39° 22' N
74° 44' W
39° 26' N
74° 40' W
39° 30' N
74° 36' W
39° 34' N
74° 32' W
39° 14' N
39° 10' N
74° 28' W
74° 24' W

TABLE II–1. OCCUPIED DWELLING UNITS

	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	Total	Year-round	Seasonal	Temporary
Single-Family	1,490	4,060	2,194	1,404	1,898	454	2,278	10,946	3,045	3,714	906	5,642	38,030	30,184	6,710	1,136
Two-Family	56	374	41	52	58		230	2,764	1,035	523	41	3,754	8,928	5,105	2,629	1,194
Multi-Family	22	304		10	127		564	8,021	792	371		1,693	11,904	8,605	2,197	1,101
Hotel					14		134	16,644	12		102	2,254	19,160	1,816	2,301	15,043
Motel	496	57			208	540	356	5,119	181	492	36	574	8,059	69	141	7,848
Rooming House	26	113			1	11	42	4,859	112	15		1,361	6,540	1,650	1,776	3,114
Institution			6		7	49		219	40		80	103	505	465		40
Trailer		70				11							81	81		
Other	11	70		10			21	279	81			130	603	287	163	153
TOTAL	2,102	5,049	2,241	1,477	2,311	1,064	3,625	48,850	5,298	5,114	1,165	15,511	93,808	48,262	15,918	29,628
Year-round	1,605	4,830	2,231	1,466	1,914	460	1,872	22,681	3,654	3,074	636	3,839	48,262	—	—	—
Seasonal		129	10	10	207	97	1,101	4,803	1,351	1,418	452	6,340	15,918	—	—	—
Temporary	496	90			190	508	653	21,366	294	622	77	5,332	29,628	—	—	—

NOTE: Totals do not check due to rounding.

Internal Survey

In this phase of the study, information on trips within the urban area was obtained by interviewing a pre-selected sample of residents in their homes, hotels, motels and guest houses to determine a representative daily travel pattern.

ACUATS is physically divided into two subregions, the island communities and the mainland communities. These areas are separated by several miles of tidal mud-flats and waterways.

The island area is generally characterized by a high percentage of part-time population, a high density of dwelling units, a large number of transient facilities, few manufacturing industries, and a limited supply of usable land. The mainland generally has opposite characteristics, although there is a degree of dependence on tourist facilities and service type industries.

A ten percent sample of residential units was selected for the mainland municipalities and a five percent sample for the island municipalities. The samples per municipality were based on an inventory of the dwelling units. The result of this inventory indicated a total of 94,000 occupied units. The municipality breakdown of the dwelling units and samples are shown on Table II-1.

A stratified five or ten percent clustered sample of all transient units was also made from an inventory of all hotel, motel, guest houses and rooming houses in the study area. This procedure distributed the sample by location, type of facility, and size of the facility. The results of this inventory and samples are shown in Table II-1.

The pre-selected dwelling unit and transient unit samples were assigned to trained interviewers in a manner that would produce a representative cross section of average summer weekday travel by each occupant of a household or transient unit for every zone within the study area. This included all trips made as an auto driver, or as an auto, truck, taxi, bus, rail or jitney passenger. In addition to trip origin and destination, the interviewer obtained trip purpose, hour of travel, mode of transporation, number of autos owned, number of persons in the family or transient unit, their occupation and family income. For auto trips, the interviewer obtained vehicle occupancy, type of parking used and the trip purpose.

It was found from these interviews that 380,000 person trips were made on an average summer weekday during the period of survey. The distribution of these trips is shown in Table II-2.

To complete the study of movements of people and vehicles, it was necessary to obtain data concerning trucks and taxicabs. A 20 per-

TABLE II—2. INTERNAL-PERSON TRIP DISTRIBUTION BY MODE AND PURPOSE

	Purpose							
Mode of Travel	*(1) Home Base Work*	*%*	*(2) Home Base Non-Work*	*%*	*(3) Non Home Base*	*%*	*(4) Total*	*%*
Auto Driver	38,269	51.5	110,485	44.5	35,030	60.9	183,784	48.4
Auto Passenger	11,390	15.3	108,610	43.8	19,270	33.5	139,270	36.7
Bus Passenger	8,240	11.1	10,312	4.2	1,573	2.7	20,125	5.3
Truck Passenger	322	0.4	22	—	286	0.5	632	0.2
Taxi Passenger	918	1.2	3,691	1.5	126	0.2	4,735	0.3
Jitney Passenger	9,207	12.4	15,015	6.0	1,250	2.2	25,472	6.7
Walk to Work	5,974	8.1	—	—	—	—	5,974	1.6
TOTAL (Mode of Travel)	74,322	100.0	248,135	100.0	57,535	100.0	379,992	100.0
TOTAL (Purpose)	74,322	19.6	248,135	65.3	57,535	15.1	379,992	100.0

cent sample of trucks and taxis registered in the study area was selected from motor vehicle registration records. Trained interviewers visited the owner or driver of each of the sample trucks and obtained a record of their movements on a preselected weekday. This record included for each trip, the origin, destination, time of day of the trip, the commodity that was carried and the gross weight. It was found that on an average summer weekday, a total of 35,000 trips were made by trucks operating in the study area.

Trip origin, destination, and travel time for each trip for each of the taxi samples was obtained from the driver's trip log. It was found that on an average summer weekday 6,600 trips were made by taxis operating in the area, of those, 4,700 were revenue producing trips.

External Survey

The external survey provided information on the movement of vehicles that were entering, leaving or passing through the study area. Interview stations were located on state highways, county roads and local streets at 16 points where they crossed the cordon line. Vehicles moving in both directions were stopped and interviewed at each station. The interviewers obtained from each driver the trip origin, destination, vehicle type, number of occupants and trip purpose. These interviews were used to develop trip data for the 104,000 vehicles that crossed the cordon on an average summer weekday.

Drivers were interviewed on all roads crossing the cordon line with ASWD (average summer weekday) traffic volumes in excess of 1200 vehicles. Traffic flow on these roads included 95 percent of all traffic entering or leaving the cordon area. Major highways with two-way volumes in excess of 1000 vehicles between 9:00 p.m. and 5:00 a.m. were interviewed for 24 hours; all others were interviewed for 16 hours (5:00 a.m. to 9:00 p.m.).

Companion Studies

Closely related to origin-destination surveys are studies of current traffic counts on the arterial system. These counts provide a base for other studies relating to traffic movement and indicate trends in traffic development when repeated at periodic intervals.

Traffic volume counts were made at approximately 110 locations within the study area. These counts were made by automatic traffic recorders for a minimum of 48 hours at each location. Many of these counts were directional. Map II-2 shows all machine count locations and the ASWD volumes at these points.

Hourly classification counts, indicating number of passenger cars, trucks of various sizes, and buses, by registration (in state or out of state), were made for 16 hours (5:00 a.m. to 9:00 p.m.) at all external interview stations and screen line stations during the period of survey. Forty-eight hour machine counts were also made at both the external interview stations and the screen line locations. The volume and classification counts are necessary to evaluate the completeness and validity of the origin-destination data when traffic assignments are made by computer to present arterial system, and to check the adequacy of the network to which these assignments are made.

Speed studies were made over arterial streets and highways comprising the major thoroughfare system within the study area. Average travel times for each route were determined by the "floating car" method in which the test car passes one car for each car that passes it. This assures the average speed of the test car approximates the speed of the traffic stream. At least six trips were made over each route with average speeds computed for both peak and off-peak hours. A weighted average speed based on one peak and two off-peak hours was used in obtaining the 24-hour average summer weekday speed. Maps II-3 and II-4 show the peak hour speeds and the composite 24-hour speeds for the principal routes in the study area.

Public Transit Survey

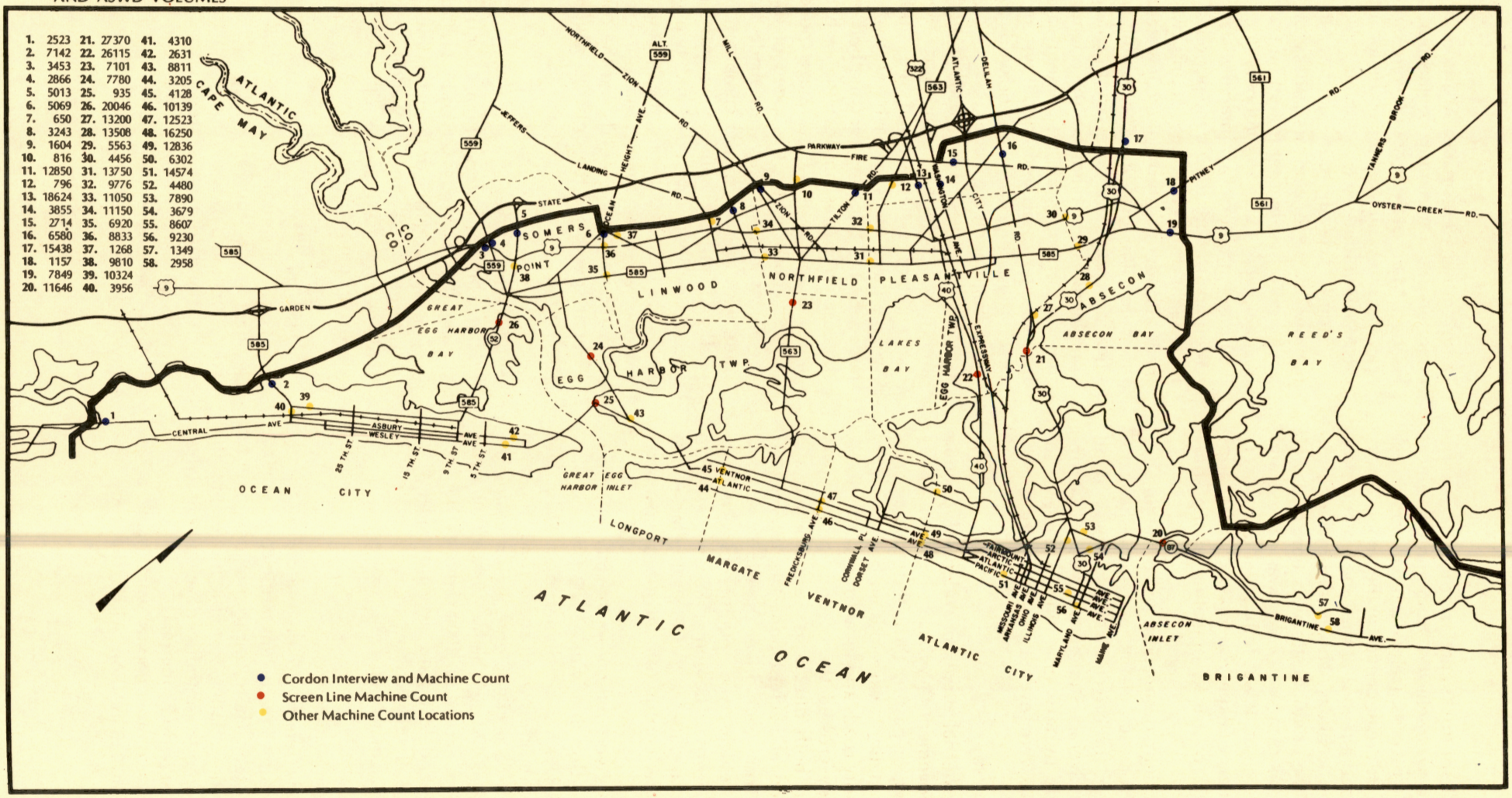
An initial inventory of mass transit facilities showed that the area is served by a railroad line, several local and long distance bus lines, and the world renowned jitney. In addition to these facilities one major airline operates from the airport at Pomona.

1. Local Bus Service

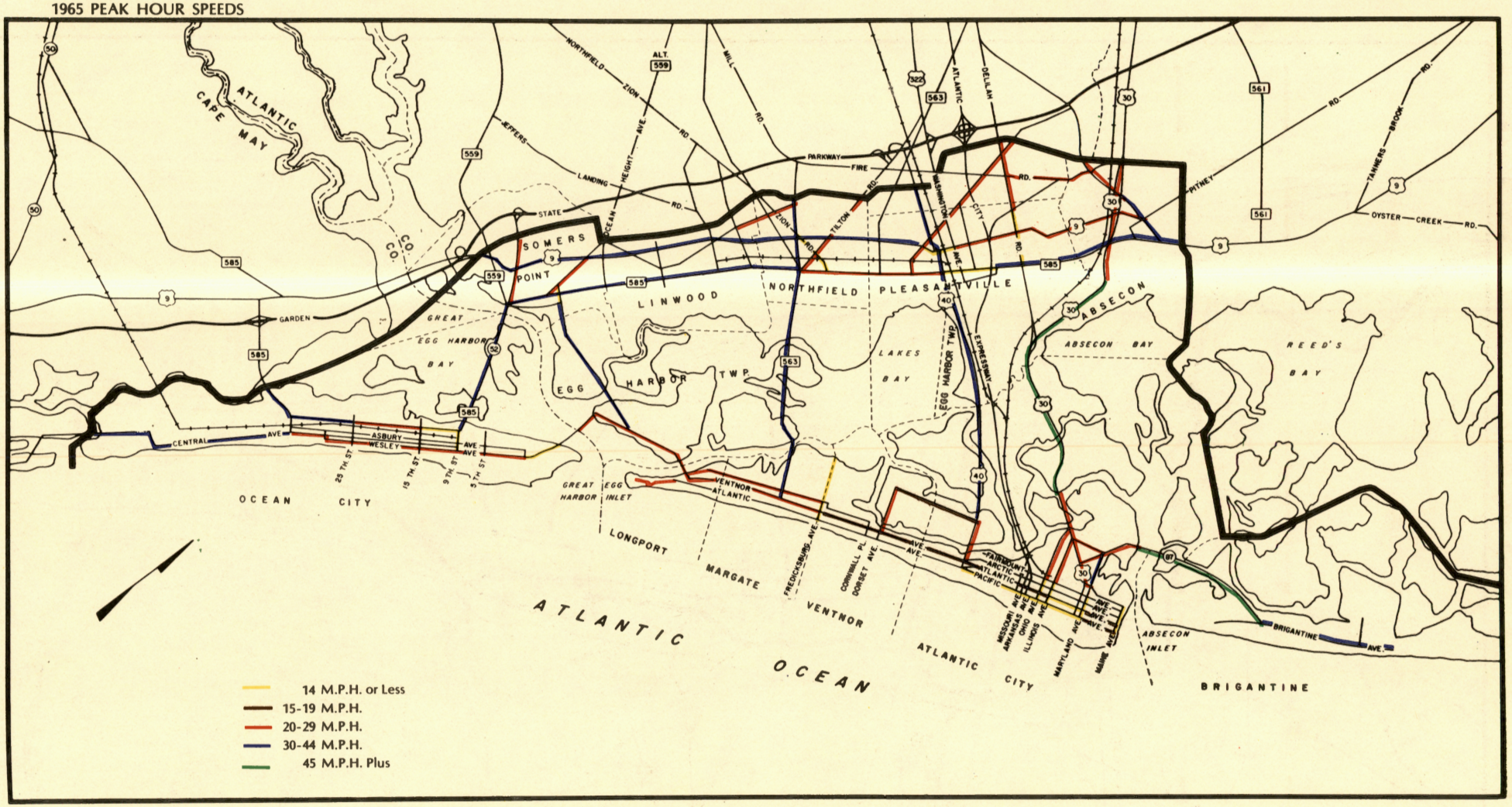
Local bus service is available in all 12 municipalities in the study area. Map II-5 shows the routes operated by the various companies.

A standard type survey, using an interviewer on sample buses, was conducted to collect passenger data, running times, and headways for measuring the local bus service in

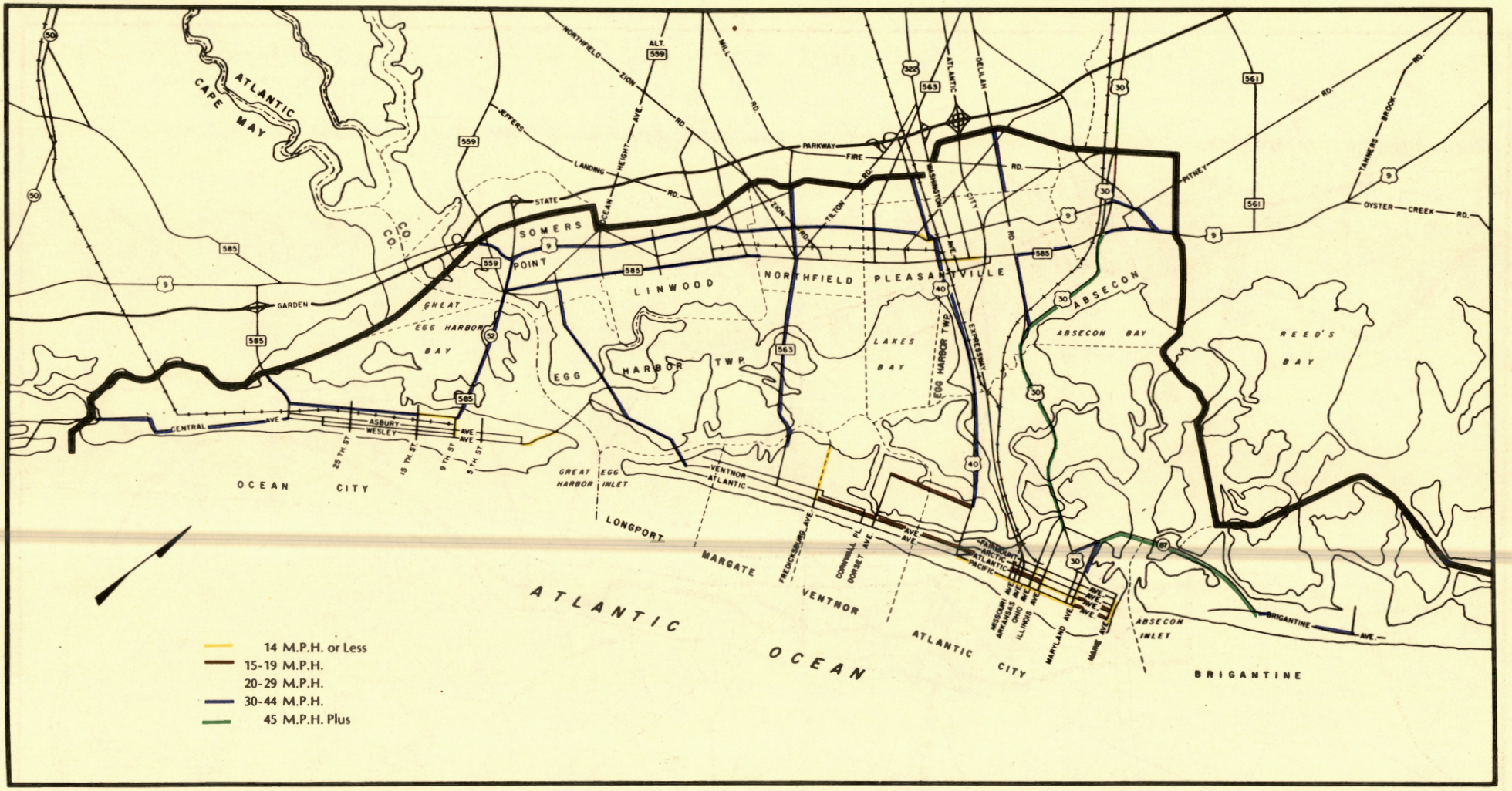
MAP 11–2
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
MACHINE COUNT LOCATIONS
AND ASWD VOLUMES



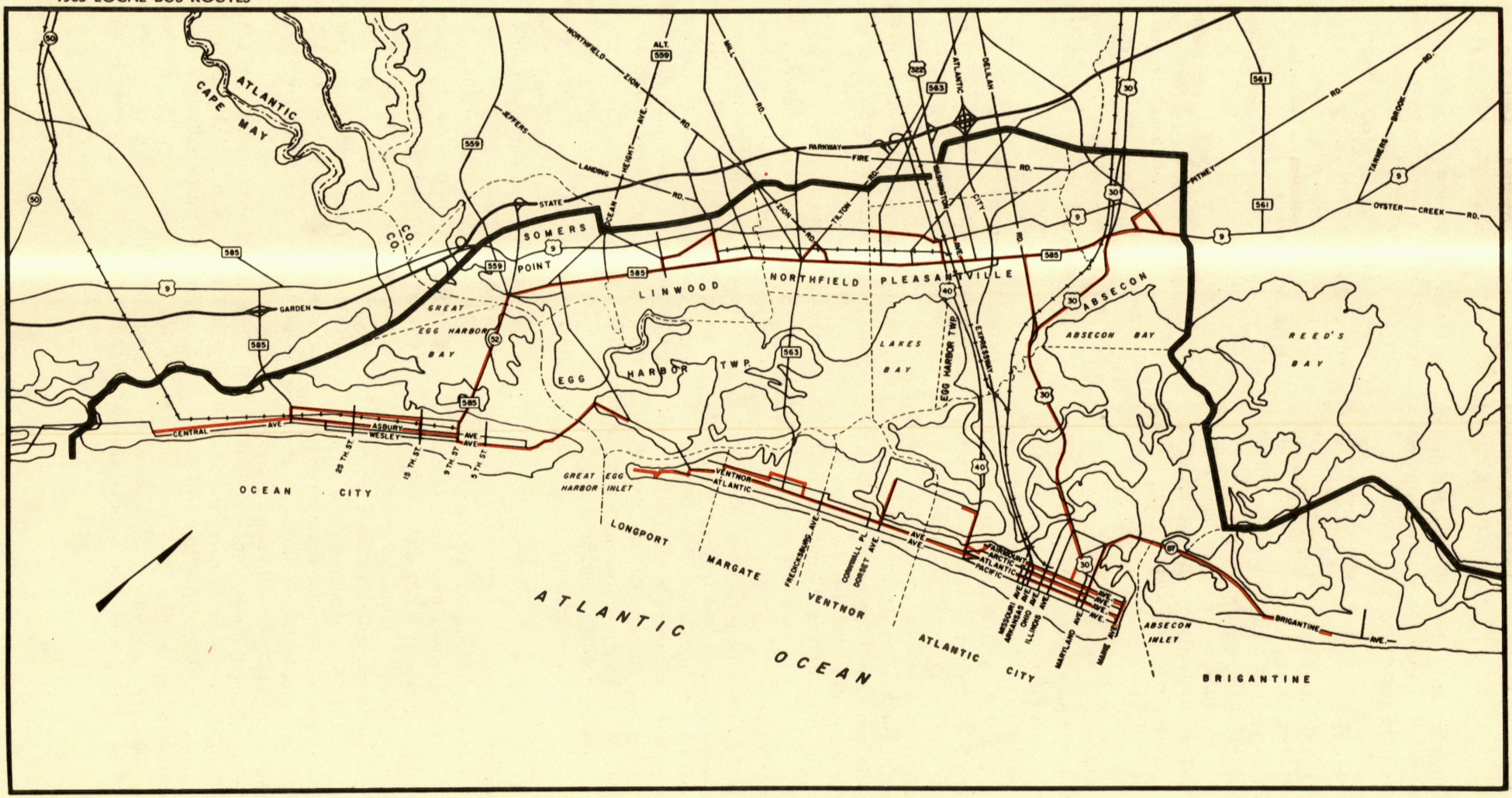
MAP 11–3
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 PEAK HOUR SPEEDS



MAP 11–4
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965, 24 HOUR SPEEDS



MAP 11–5
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 LOCAL BUS ROUTES



the area. In addition to the field collected data, fare and other passenger information was secured from the operating companies.

2. Jitney Service

Map II-6 shows the jitney route in Atlantic City. A detailed, 24 hour passenger loading and unloading survey was made during the months of July and August. Since the capacity of jitney is limited to ten passengers, it was possible for the interviewers to determine the exact loading and off-loading points for each passenger riding the sample vehicles.

3. Rail and Long Distance Bus Service

Map II-7 shows the rail and long distance bus routes in and out of the area. These routes provide service to New York, Philadelphia, Wilmington, Baltimore and Washington. All data concerning these modes of transportation were obtained from secondary sources. It was deemed unwise to field collect these data since no practical method showed promise of improving the accuracy of the secondary sources. The data were provided by the companies operating the long distance rail and bus lines.

4. Air Service

Map II-8 shows the location of all airports within the cordon area. Investigation disclosed that in addition to the area's main airport at Pomona, other facilities are Bader Field in Atlantic City, and the municipal airport in Ocean City. With the exception of Pomona airport, only one small airline operates from Bader Field. Practically all other activity is limited to light, private aircraft.

Travel Analysis

The only practical method of analyzing the volume of data obtained in a comprehensive study of this order is by the use of mechanical tabulation and other computer procedures.

All data were punched on cards for computer processing. A special package of programs were utilized to provide the desired output. Resulting tabulations included zone-to-zone and municipality-to-municipality movements by all modes of travel. Other tabulations prepared show trip generation and attraction by zone. A series of tables relating to travel movements appear in Chapter III.

The 1965 vehicular movements were assigned to the existing arterial network by means of traffic assignment computer programs. In these programs, vehicles were routed through the network from origin to destination by the shortest time path. By processing existing travel movements, daily traffic flow on all links in the arterial network was determined.

Network Selection

Facilities included in the arterial network are:

(1) The major highways, roads and streets carrying two-way volumes in excess of 5,000 vehicles per day.

(2) Routes on which the 16 external interview stations were located.

(3) Minor roads or streets required for the interchange of traffic on the major arterial routes.

The network mileage breakdown by jurisdictions is shown on Table II-3.

Network Inventory and Capacity

Road inventory data were available from Department of Transporation records so that capacities of links in the network could be calculated. The hourly capacities of the network links are shown on Map II-9.

Accuracy Checks

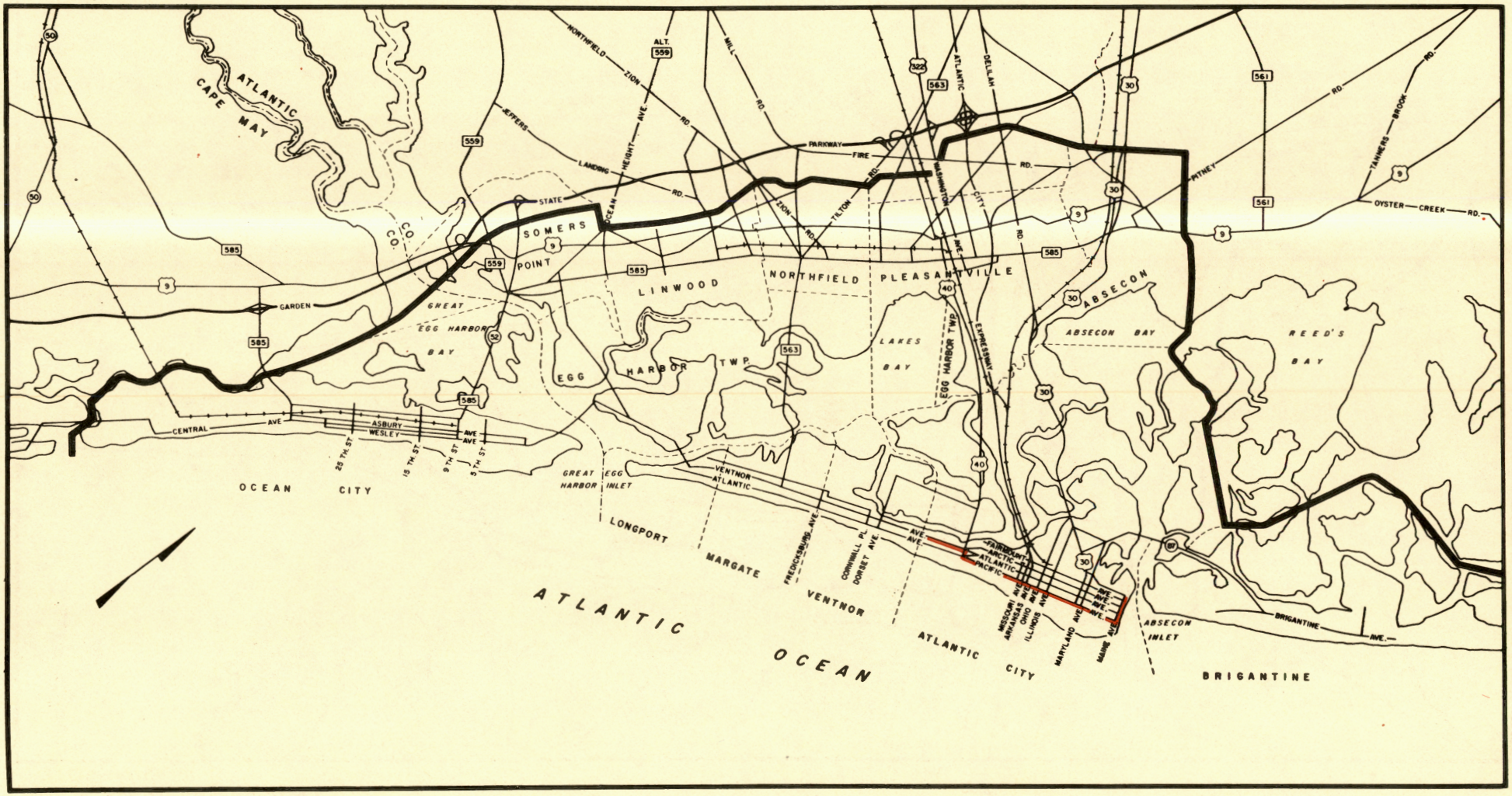
The Home Interview Survey collected 1965 data on population. Following the data reduction process all zonal populations were summarized to yield municipal totals. These totals were checked for accuracy against the 1930-1960 municipal population figures published by the U.S. Bureau of Census and extrapolated to 1965.

The accuracy checks utilized the historic trend line method of analysis whereby municipal population data between 1930 and 1960 were plotted on semilogarithmic paper as shown in Chart II-1.

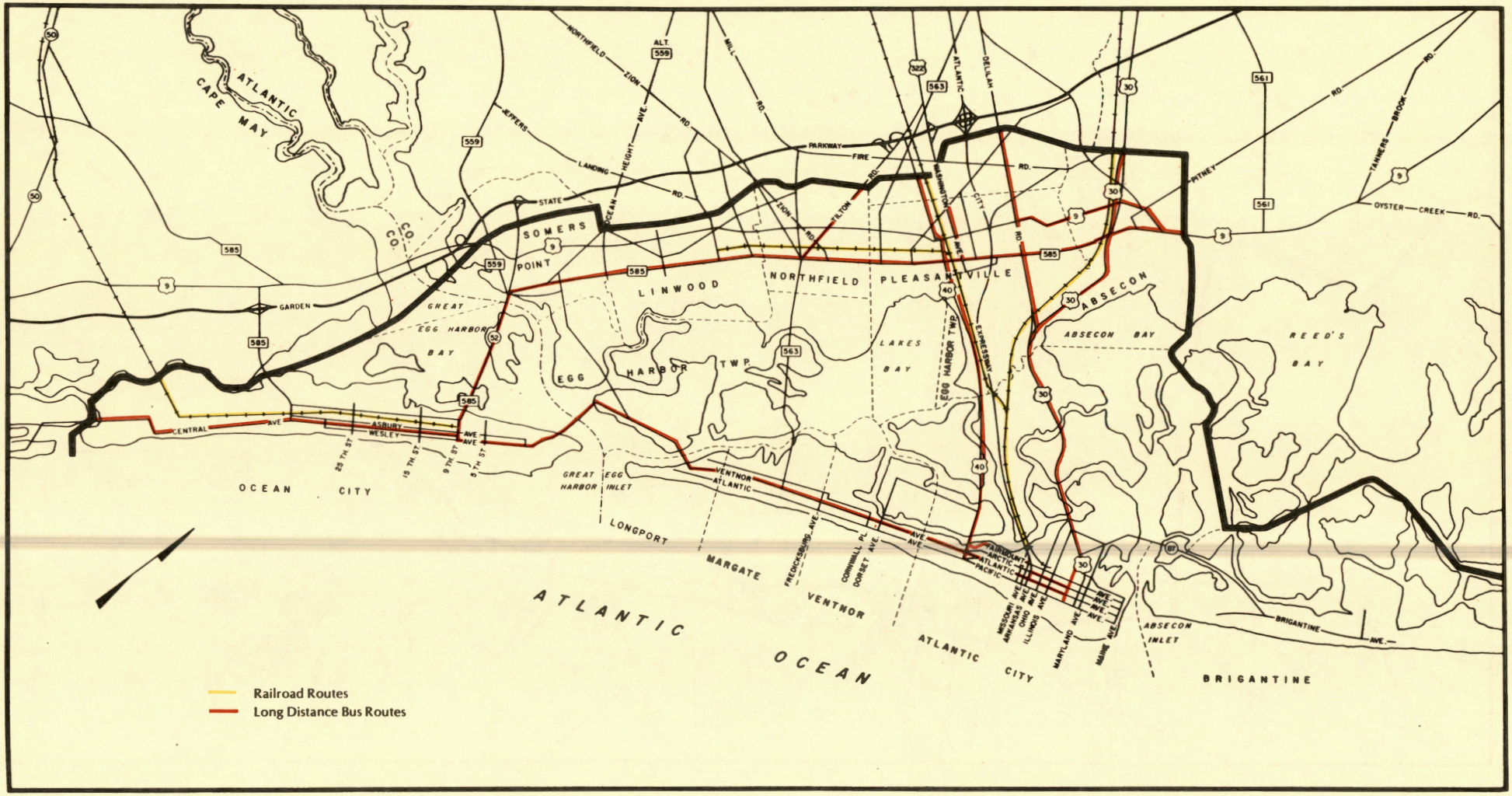
The ACUATS 1965 municipal population findings were plotted on the same graph for comparison. In addition, 1965 municipal population estimates prepared by the Department of Conservation and Economic Development, Research and Statistics Section, provided a useful guide for checking the ACUATS population estimates. Both estimates are shown on Table II-4.

In many instances, the ACUATS and Research and Statistics 1965 population estimates agreed closely, especially in Absecon, Atlantic City, Linwood, Margate, Pleasantville and Somers Point. Notable exceptions were Brigantine, Longport, Northfield, Ventnor and

MAP 11–6
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 JITNEY ROUTE



MAP II–7
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 RAIL AND LONG DISTANCE
BUS ROUTES



MAP 11–8
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 AIRFIELD FACILITIES

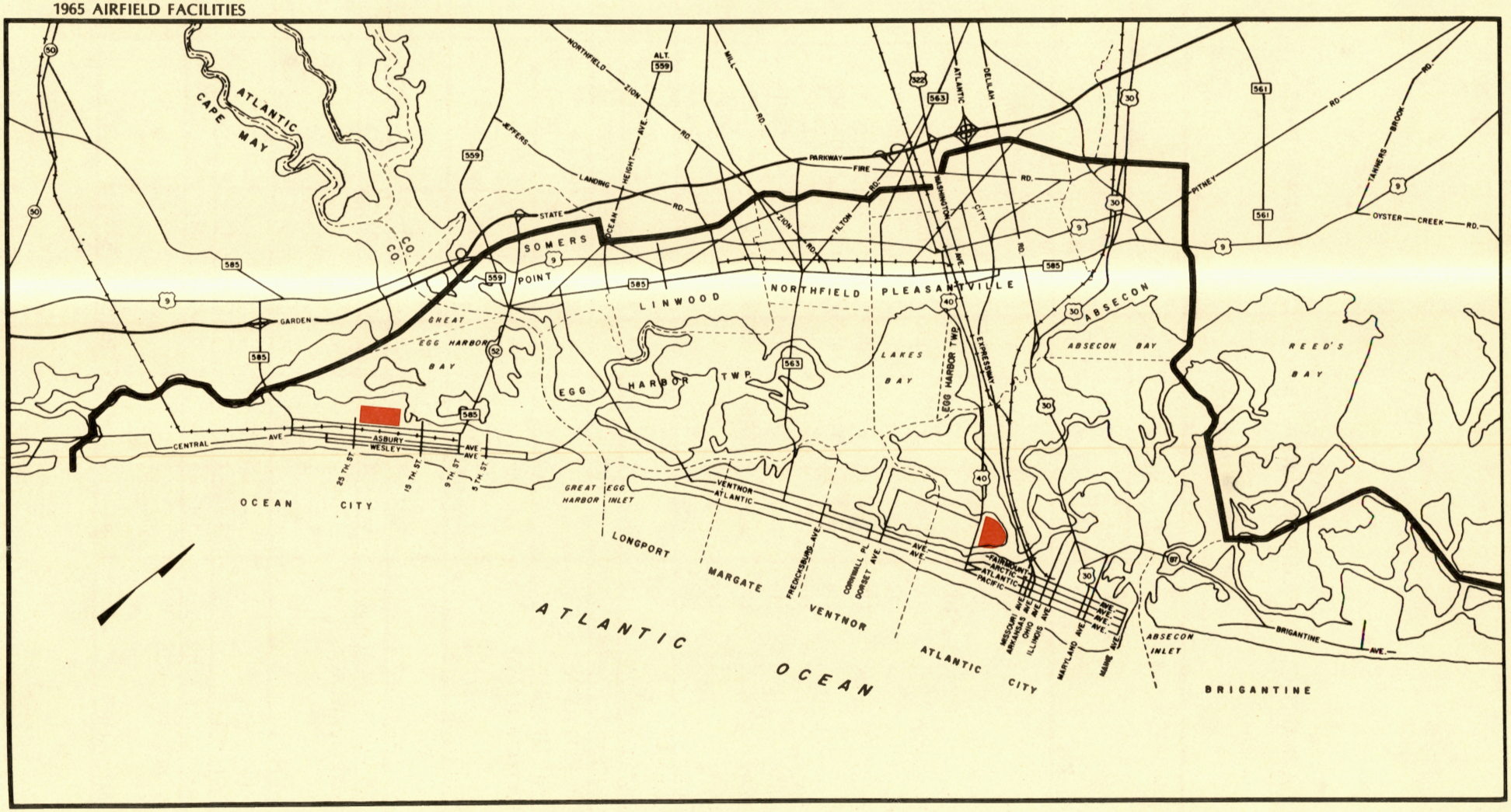
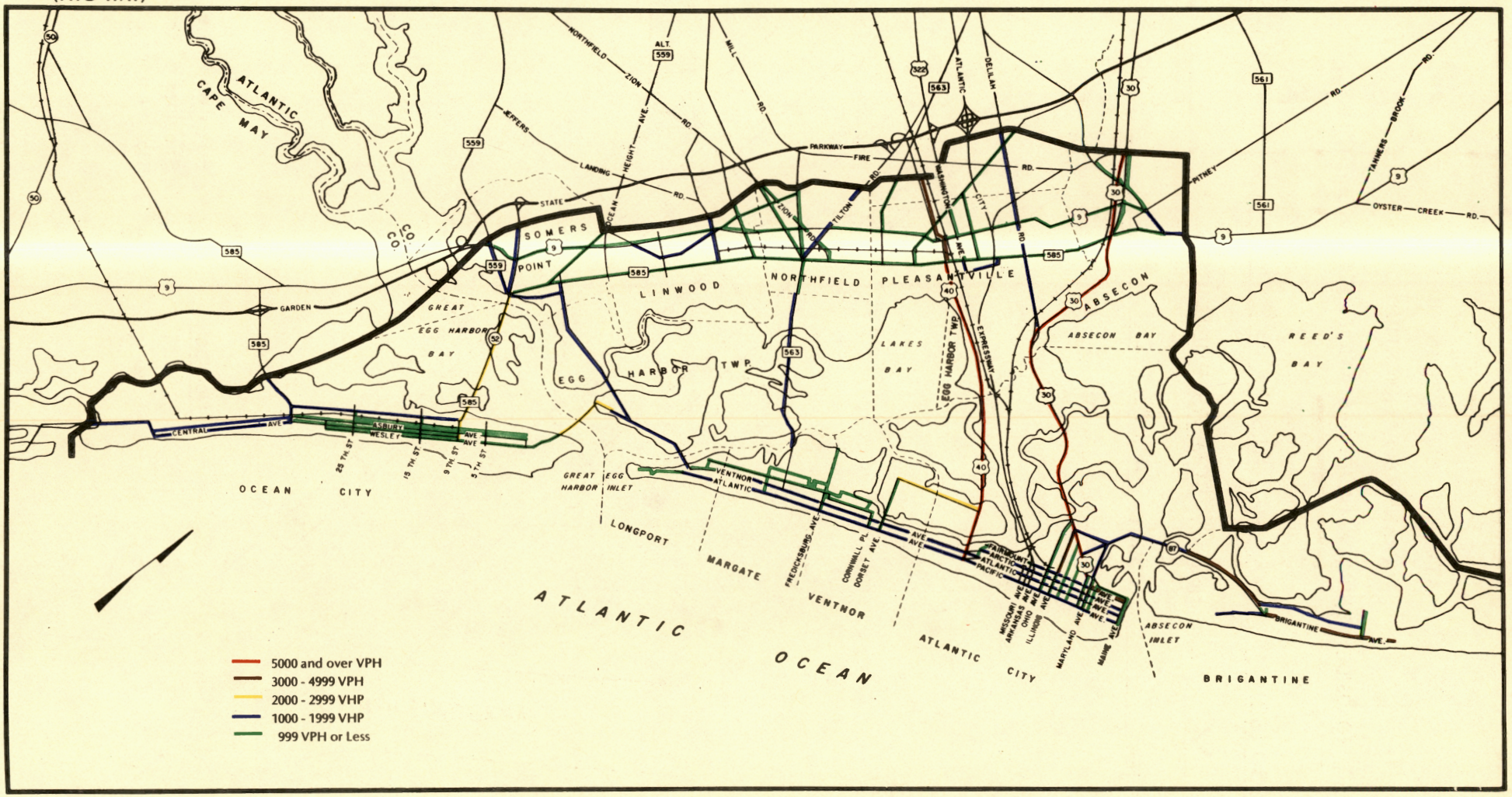


TABLE II–3
ATLANTIC CITY URBAN AREA TRANSPORTATION STUDY

MILEAGE

Municipality	Code	State Highway		County Road			
		F.A.P.	Non F.A.P.	F.A.S.	Non F.A.S.	Municipal Streets	Total
Absecon	101	6.37	0.92	0.48	7.58	28.63	43.98
Atlantic City	102	6.32	1.42	0.71	0.39	101.48	110.32
Brigantine	103	–	–	–	4.82	46.88	51.70
Egg Harbor Twp.	108	2.45	–	4.59	5.96	16.19	29.19
Linwood	114	2.53	–	–	3.87	28.85	35.25
Longport	115	–	–	0.77	–	12.76	13.53
Margate	116	–	–	1.69	0.87	36.58	39.14
Northfield	118	1.97	–	1.76	6.18	32.82	42.73
Pleasantville	119	4.41	–	1.99	5.59	53.10	65.09
Somers Point	121	2.26	1.18	3.03	2.75	35.09	44.31
Ventnor	122	–	–	2.48	–	30.31	32.79
Ocean City	509	1.93	–	1.07	6.11	94.84	103.95
TOTAL MILEAGE WITHIN STUDY AREA		28.24	3.52	18.57	44.12	517.53	611.98
TOTAL MILEAGE		31.76		62.69		517.53	611.98
ARTERIAL NETWORK WITHIN STUDY AREA		31.76		62.69		68.33	162.78
% NETWORK MILEAGE OF TOTAL MILEAGE		100%		100%		13%	27%
STUDY AREA		ATLANTIC COUNTY					
TOTAL MILEAGE		26.31	3.52	17.50	38.01	422.69	508.03
NETWORK TOTAL MILEAGE		26.31	3.52	17.50	38.01	52.54	137.88
% NETWORK MILEAGE OF TOTAL MILEAGE		100%	100%	100%	100%	12%	27%
STUDY AREA		CAPE MAY COUNTY					
TOTAL MILEAGE		1.93	–	1.07	6.11	94.84	103.95
NETWORK TOTAL MILEAGE		1.93	–	1.07	6.11	15.79	24.90
% NETWORK MILEAGE OF TOTAL MILEAGE		100%	–	100%	100%	19%	24%

MAP 11–9
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
PRACTICAL HOURLY CAPACITY
(TWO WAY)



FORM AC –5

ATLANTIC CITY URBAN AREA

TRANSPORTATION STUDY

ROADSIDE INTERVIEW SURVEY — STATION LOCATION SKETCH

AADT 1550 (62) LOCATION U.S. 9 NO. 3

INTERVIEW ✓ MUNICIPALITY SOMERS POINT CITY

NON-INTERVIEW _____ COUNTY ATLANTIC N.J.

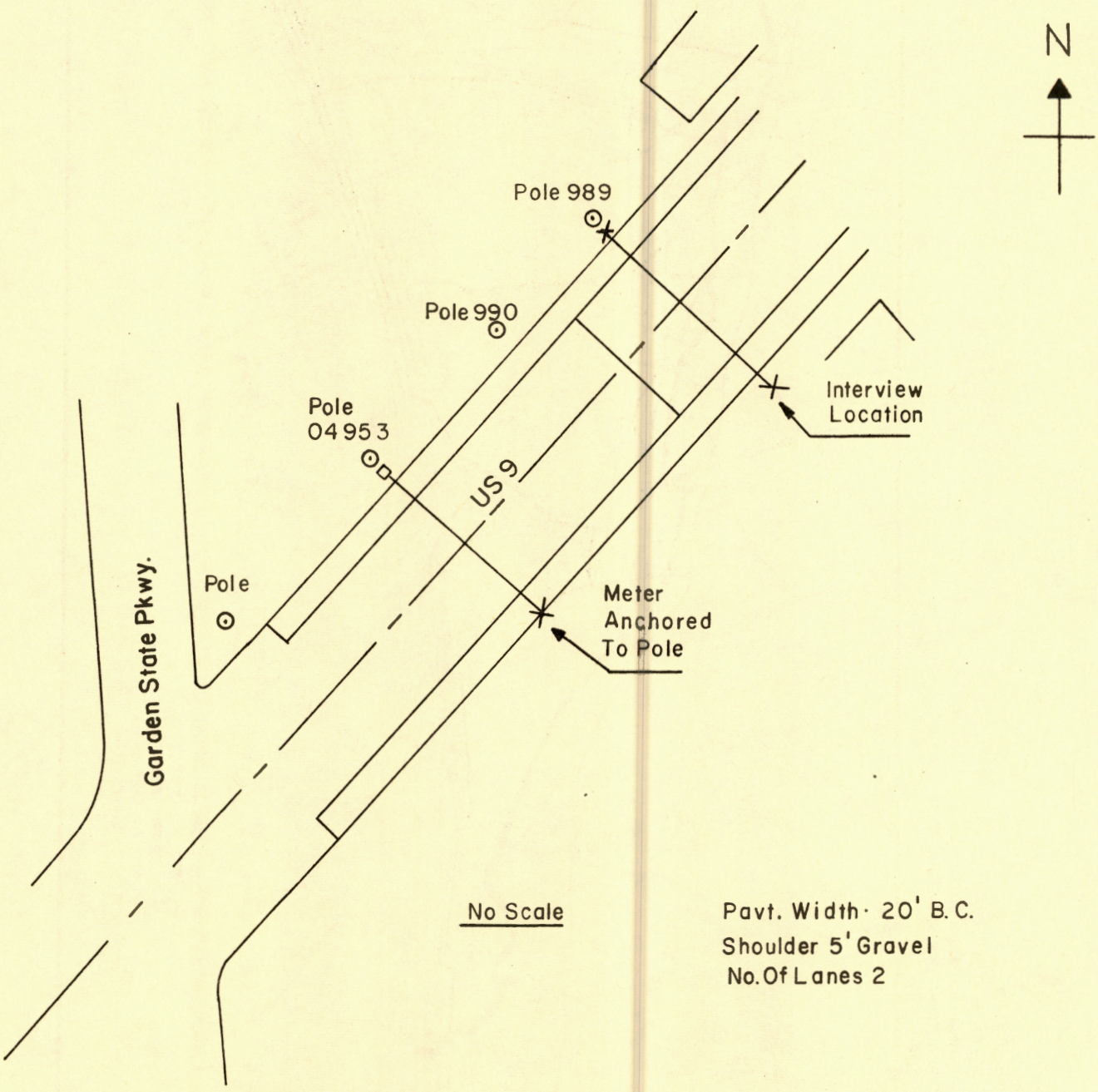
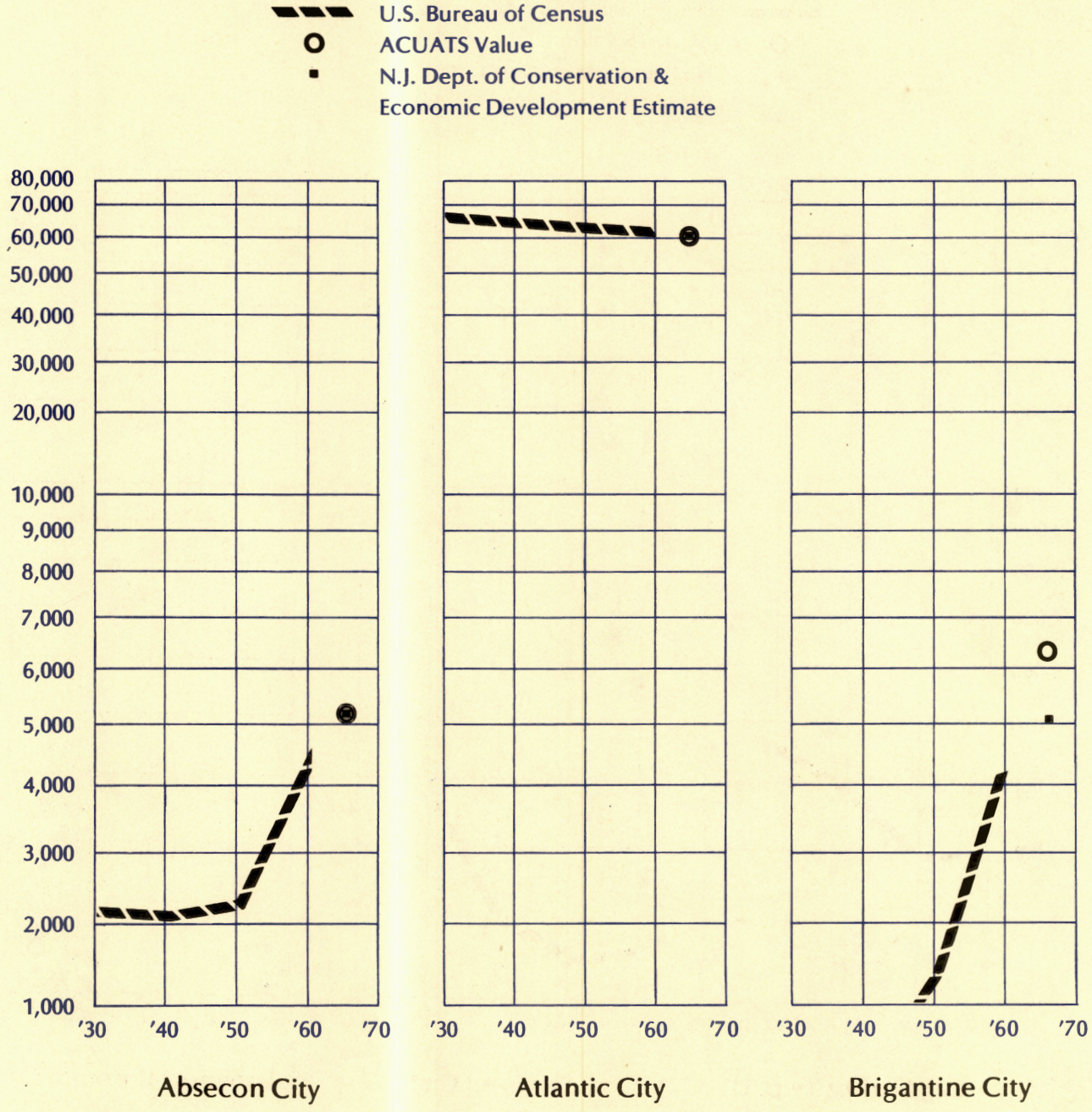


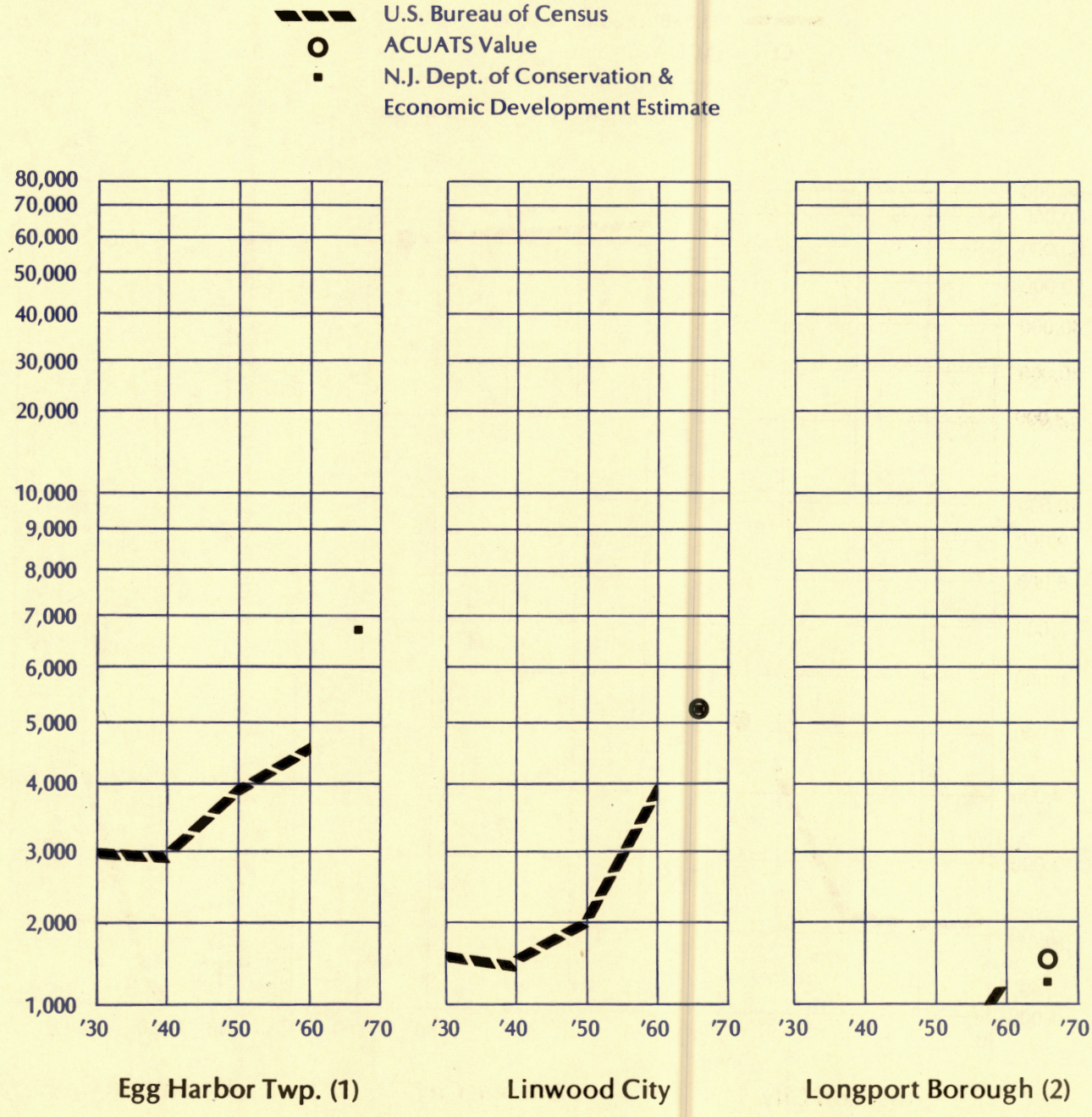
CHART II-1

1965 TREND LINE MUNICIPAL POPULATION CHECKS



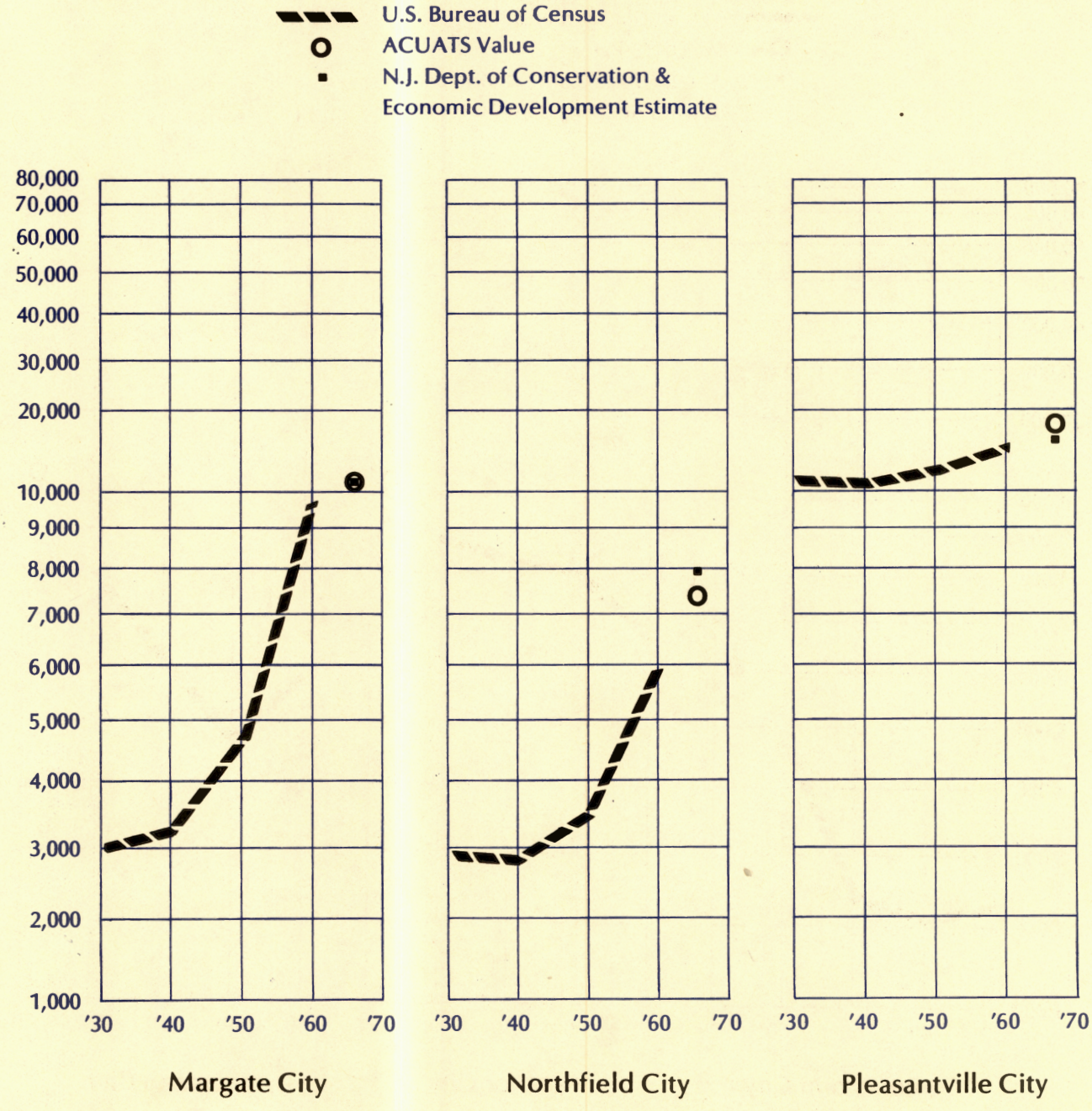
Source: U.S. Census

CHART II-1 (cont'd)
1965 TREND LINE MUNICIPAL POPULATION CHECKS



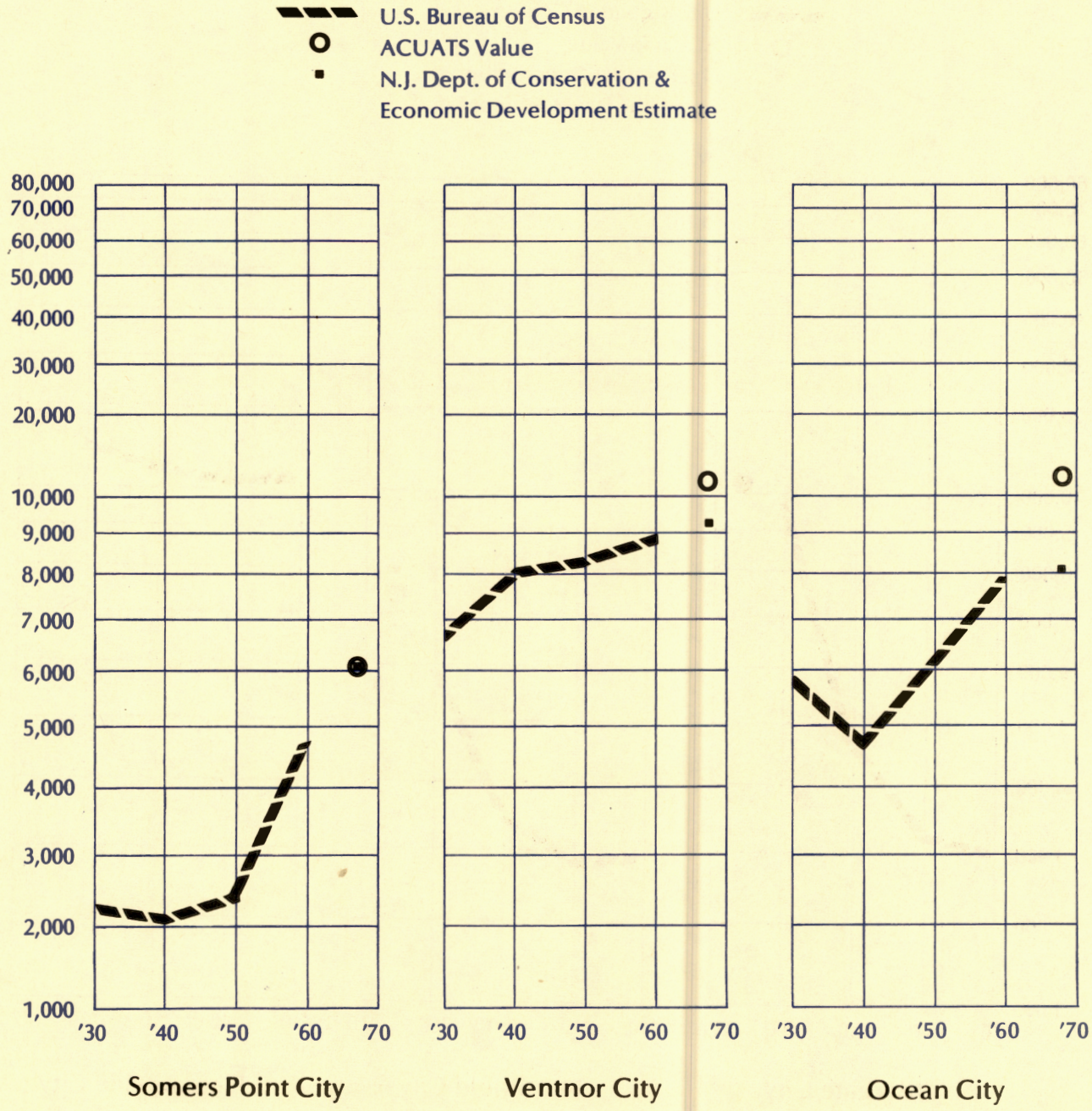
Source: U.S. Census

CHART II-1 (cont'd)
1965 TREND LINE MUNICIPAL POPULATION CHECKS



Source: U.S. Census

CHART II-1 (cont'd)
1965 TREND LINE MUNICIPAL POPULATION CHECKS



Source: U.S. Census

TABLE II–4

A COMPARISON BETWEEN 1965 A.C.U.A.T.S. PERMANENT MUNICIPAL POPULATION ESTIMATES AND 1965 NEW JERSEY DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT MUNICIPAL POPULATION ESTIMATES

Municipality	1965 A.C.U.A.T.S. Permanent Municipal Population Estimates	1965 New Jersey Department of Conservation and Economic Development's Municipal Population Estimates
Absecon City (51)	5,279	5,220
Atlantic City (58)	59,586	61,520
Brigantine City (57)	6,094	4,780
Egg Harbor Twp. (Portion in ACUATS Area–56)	1,226	N.A.
Linwood City (54)	5,138	5,120
Longport Borough (61)	1,583	1,060
Margate City (60)	10,399	10,110
Northfield City (53)	7,649	8,000
Pleasantville City (52)	15,805	15,660
Somers Point City (55)	6,107	6,110
Ventnor City (59)	10,820	9,070
Ocean City (62)	11,189	7,770
Total	140,875	134,420

SOURCE: New Jersey Department of Conservation and Economic Development, Research and Statistics Section, RESEARCH REPORT No. 144, POPULATION ESTIMATES, 1965, Trenton, New Jersey, February 1966.

Ocean City.

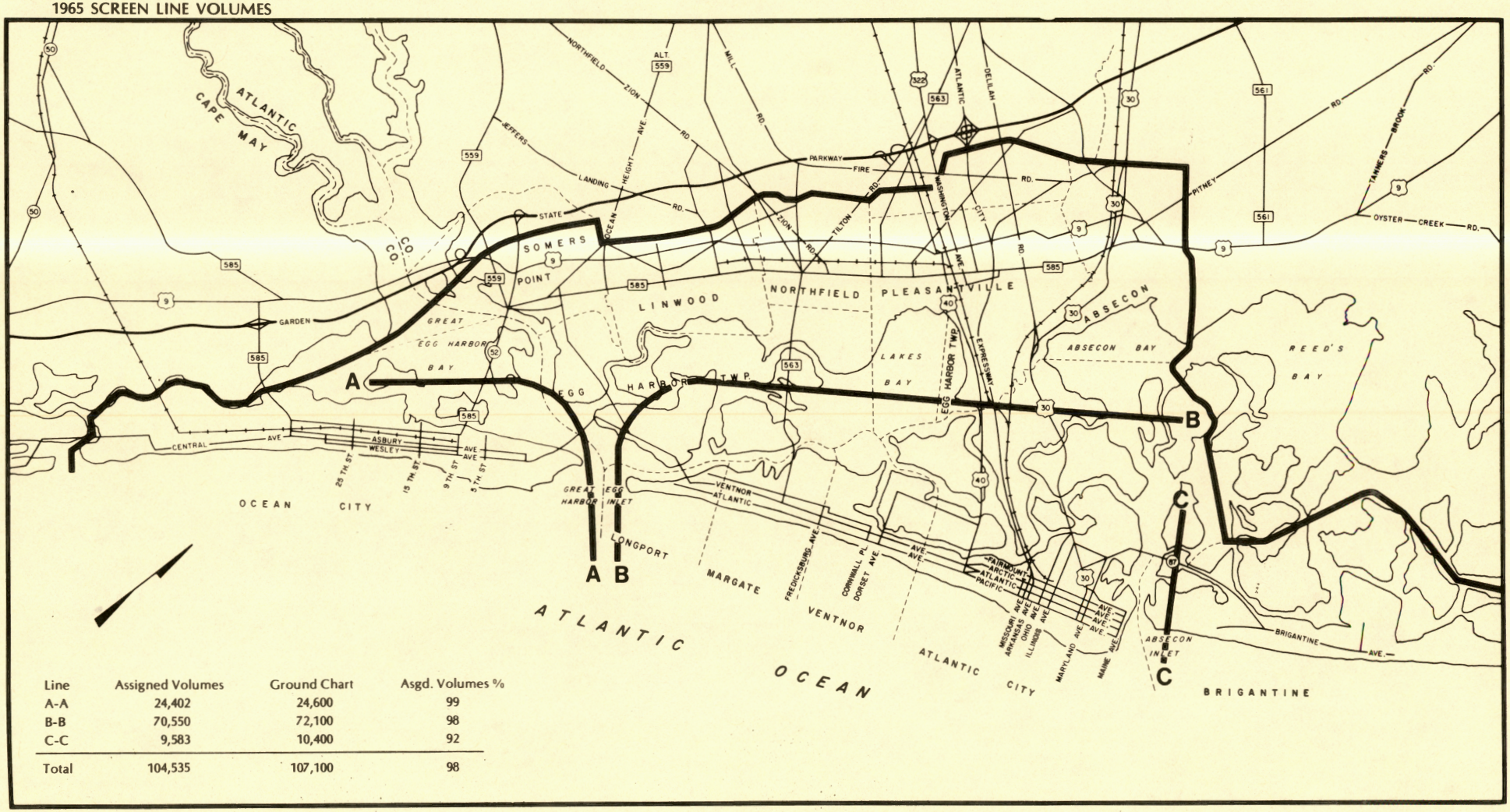
In the case of Brigantine and Longport, the ACUATS population estimates fell on the historic trend line. In order to resolve variations between the 1965 ACUATS estimates and the indicated trend lines in Northfield, Ventnor and Ocean City, the data files were rechecked. A field check was conducted to update the data files for additional construction during the summer of 1965. The checks indicated that a complete geographical coverage was obtained and that the 1965 population and household data obtained were reasonable and realistic.

In order to verify the accuracy of the taxi sample, a check was made of the Atlantic City Police Department taxi licensing records. The number of taxis in Atlantic City registered with the state agreed with the city taxi license figure within five vehicles.

The accuracy of the travel data revealed by the study was also checked. This was accomplished by comparing a summary of reported vehicular trips crossing a screen line with actual ground counts made along the line during the interview phase of the study. The tidal mudflats and waterways dividing the study area were used as a screen line because they had a minimum number of crossings. The expanded survey data accounted for 98 percent of the actual recorded volume of automobile, trucks and taxis crossing the screen line on an average summer weekday. Of the 70,000 vehicles crossing the major screen line, nearly 45,000 were attributable to the External Survey. A comparison of the screen line data is shown in Map II-10.

Results of these accuracy checks support the premise that geographical coverage, sample selection and expansion factors for all phases of the study were valid and reasonable; therefore, the travel data herein described accurately reflect the average summer weekday person and vehicle trips during the period of survey.

MAP 11–10
ATLANTIC CITY URBAN AREA
TRANSPORTATION STUDY
1965 SCREEN LINE VOLUMES



Line	Assigned Volumes	Ground Chart	Asgd. Volumes %
A-A	24,402	24,600	99
B-B	70,550	72,100	98
C-C	9,583	10,400	92
Total	104,535	107,100	98

CHAPTER III

1965 STUDY FINDINGS

Population

It is important to point out that population information was collected by the U.S. Bureau of the Census in April of 1960, when there were negligible numbers of seasonal and temporary residents present in the study area. The ACUATS population information was gathered during the summer of 1965 and included permanent, seasonal and temporary residents. The seasonal residents reside in the area during the summer months and usually own or rent a cottage for the season. The temporary residents are short term vacationers who remain in the area for a period of less than one month.

Data zones with high concentrations of seasonal residents, 0.5 percent or greater, are located along the Atlantic Ocean on Brigantine, Absecon and Ocean City Islands. Only 17 of 40 data zones on the mainland contain seasonal populations of 0.1 percent or more. It can be concluded that the mainland communities are primarily occupied by year-round residents.

Family Income

Family income data were collected during the Home Interview Survey and represent the combined income of working residents in each dwelling. These dwellings may be permanently, seasonally or temporarily occupied.

In contrast to the ACUATS family income data, the Bureau of the Census family income data has a more limited definition for family income. That agency defines a family as consisiting of "two or more persons living in the same household who are related to each other by blood, marriage, or adoption; all persons living in one household who are related to each other are regarded as one family."[1]

Because of differences in definitions, the ACUATS and the Bureau of the Census family income data are not comparable.

1960 Family Income

The level of family income in an area is a significant economic indicator. It reveals something about the relative prosperity and well-being of the population. In order to present a comparison between ACUATS and the State of New Jersey, 1960 Census data are presented in Table III-1. This Table shows the distribution of families in specified income ranges. Family Income for ACUATS does not compare favorably with that of New Jersey.

The income distribution of ACUATS demonstrated a large portion (48 percent) of families with 1960 incomes of less than $5,000. Only 27.8 percent of all families in the State of New Jersey had 1960 incomes of less than $5,000.

Table III-1 shows that ACUATS has proportionally more families in the lower income classes and fewer families in the upper income classes than New Jersey. This distribution is also reflected in the 1960 median family incomes which were $5,172 for the study area and $6,786 for the state.

1965 ACUATS Family Income

The income data collected during the ACUATS 1965 Home Interview Survey includes family income for year-round, seasonal and temporary residents. A majority of temporary residents, however, declined to reveal their income; therefore, the median family income was computed for year-round and seasonal residents only. This data displays a wide variation in median family income among the 12 municipalities. Table III-2 illustrates median family income distribution.

Longport is most prominent with a median family income of over $10,000 the highest median family income in the study. Ocean City and Margate have median family incomes ranging between $8,000 to $9,999 per family.

TABLE III—1
1960 PERCENT DISTRIBUTION OF FAMILIES IN SPECIFIED INCOME CLASSES FOR A.C.U.A.T.S. REGION AND THE STATE OF NEW JERSEY

Income Class	A.C.U.A.T.S Region (1) 1960 Percent Families In Income Class	New Jersey (2) 1960 Percent Families In Income Class
Under $ 1,000	4.9	2.8
$ 1,000—$ 1,999	7.8	3.8
2,000— 2,999	10.7	4.9
3,000— 3,999	11.7	6.8
4,000— 4,999	12.9	9.5
5,000— 5,999	11.6	12.8
6,000— 6,999	9.7	12.0
7,000— 7,999	7.7	10.4
8,000— 8,999	6.0	8.5
9,000— 9,999	4.0	6.5
10,000— 14,999	8.5	15.1
15,000— 24,999	3.1	5.2
25,000 and over	1.4	1.7
TOTAL	100.0	100.0
Median Family Income	$5,172	$6,786

(1) Source: 1960 U.S. Census of Population, PC (1) 32C, N.J., Table 76.
(2) Source: 1960 U.S. Census of Population, PC (1) 32C, N.J., Table 65.

TABLE III—2
1965 A.C.U.A.T.S. MEDIAN INCOME PER FAMILY FOR SEASONAL AND PERMANENT RESIDENTS BY MUNICIPALITY

Municipality	Median Income
Absecon City	$ 7,477
Atlantic City	4,708
Brigantine City	7,468
Egg Harbor Twp. (portion in Region)	4,458
Linwood City	7,144
Longport Borough	10,790
Margate City	8,183
Northfield City	6,263
Pleasantville City	5,480
Somers Point City	7,784
Ventnor City	7,192
Ocean City	9,436

Atlantic City and that portion of Egg Harbor Township which lies in the study area have the lowest median family income, ranging between $4,000 and $4,999. Pleasantville and Northfield have median family incomes within the range of $5,000 to $6,999. The remaining municipalities of Absecon, Brigantine, Linwood, Somers Point and Ventnor have median family incomes that range between $7,000 and $7,999.

Median family income is higher along the resort coast line (with the exception of Atlantic City) than it is on the mainland. The reason for this is the high influx of seasonal population to the resort area and the comparatively low influx of seasonal population to the mainland.

Auto Ownership

One of the best indicators of probable street and highway usage is the number of vehicles owned by the residents in the area under study. The results of the Home Interview Survey yielded data concerning auto ownership in the Atlantic City Urban Area.

Table III-3 shows the number of vehicles owned by the year-round residents in the study area. It is of value to analyze auto ownership in terms of the average number of vehicles per household. In 1965, there were 88 cars owned by each 100 families or an average of 0.88 vehicles per household. The distribution of cars per year-round household is shown in Table III-4.

The seasonal families in the area generally have more vehicles available per household while the temporary visitors have fewer cars per household than year-round people. The number of vehicles based inside the study area in the summer is nearly double those available on a year-round basis.

1960 Ratio of People Per Dwelling

Ratios of people per dwelling are crucial statistics in land use forecasting. More specifically, they are important links in the forecasting process whereby regional population forecasts are converted to dwelling units. These dwellings, in turn, are directly related to future residential land consumption.

The ratio of people per dwelling is derived by dividing the total population living in a particular area by the total number of dwelling units in that area. This ratio can be calculated for municipalities or survey zones, and both summaries have been made.

It should be noted that the persons per dwelling unit ratio differs from the population per household ratio and the size of family compiled by the Bureau of the Census. In the Census data, average population per household is obtained by dividing the population in households by the number of families. The "size of family" figure does not include unrelated individuals. Table III-5 presents a comparison of these ratios. The average population per household in 1960 for the State of New Jersey was 3.27 and the ratio of persons per dwelling for the State was 3.03.

Chapter I indicated that the area has historically been influenced by the seasonal resort trade. This seasonality is also reflected in the ACUATS ratio of persons per dwelling unit.

Table III-6 presents the people per dwelling ratio encountered in ACUATS and selected municipalities in New Jersey. These selected municipalities were chosen on the basis of population density and are comparable to the respective ACUATS municipalities. As an example, Longport with a 1960 population density of 2,447.7 persons per square mile and a 1960 ratio of 1.14 persons per dwelling unit may be compared to Park Ridge in Northern New Jersey with a density of 2,476.4 persons per square mile and a ratio of 3.40 persons per dwelling unit. All other municipalities have been similarly matched by population density.

Table III-6 illustrates that ratios of persons per dwelling unit in the ACUATS municipalities were generally lower than those of the selected municipalities in New Jersey. The principal difference between ACUATS and the selected municipalities is the fact that the ACUATS municipalities contain a mixture of seasonally and year-round occupied dwellings, while the selected inland communities contain only year-round occupied dwellings.

When the 1960 permanent population residing in the ACUATS communities was divided by the mixture of seasonally and year-round occupied dwellings, a low ratio of persons per dwelling unit resulted. A notable example is Ocean City which had a dwelling unit ratio of 0.66. This extremely low figure reflects the effects of the large number of seasonally occupied dwelling units.

Persons Per Dwelling Occupied

Table III-7 presents a comparison between 1965 seasonally occupied dwellings and the 1965 ratio of permanent residents per dwelling unit.

TABLE III–3

Municipality	1965 Number of Autos Owned*
Absecon	2,378
Pleasantville	5,567
Northfield	3,146
Linwood	2,090
Somers Point	2,685
Egg Harbor Township	558
Brigantine	2,290
Atlantic City	10,804
Ventnor	3,776
Margate	4,207
Longport	721
Ocean City	4,555
TOTAL	42,808 (Year Round)

Autos owned by seasonal and temporary residents	40,197
Grand Total autos based in the area in the summer	83,005

*Municipal breakdown for year round only

TABLE III–4

Municipality	1965 Autos Per Household*
Absecon	1.48
Pleasantville	1.15
Northfield	1.41
Linwood	1.43
Somers Point	1.40
Egg Harbor Township	1.28
Brigantine	1.22
Atlantic City	.48
Ventnor	1.03
Margate	1.37
Longport	1.13
Ocean City	1.19
OVERALL	.88

*Year Round Only

TABLE III–5
A COMPARISON BETWEEN POPULATION PER HOUSEHOLD AND RATIO OF PERSONS PER DWELLING FOR A.C.U.A.T.S. MUNICIPALITIES AND THE STATE OF NEW JERSEY

A.C.U.A.T.S. Municipalities	1960 Average Population Per Household (1)	1960 Ratio of Persons Per Dwelling (2)
Absecon City	3.26	2.91
Atlantic City	2.75	2.40
Brigantine City	3.21	1.41
Linwood City	3.42	3.15
Longport Borough	2.70	1.14
Margate City	3.12	2.14
Northfield City	3.38	3.43*
Pleasantville City	3.28	2.96
Somers Point City	3.19	2.52
Ventnor City	2.80	1.95
Ocean City	2.69	0.66
State of New Jersey	3.27	3.03

Source: U.S. Department of Commerce, Bureau of Census, Census Reports; HC(1) No. 32, N.J., PC (1) 32C, N.J., PC (1) 32D, N.J., PC (1) 32B, N.J.

(1) The U.S. Census Bureau calculates the Average Population Per Household by dividing the population in households by the number of households.

(2) The A.C.U.A.T.S. Ratio of Persons Per Dwelling is derived by dividing the total municipal population by the total number of dwellings.

*Difference due to institutions.

TABLE III–6
A COMPARISON OF 1960 PERSONS PER DWELLING RATIOS BETWEEN A.C.U.A.T.S MUNICIPALITIES AND SELECTED NONSEASONAL MUNICIPALITIES IN NEW JERSEY

A.C.U.A.T.S. Municipalities	1960 Ratio Of Persons/ Dwelling	1960 Population Density Persons/ Square Mile	Selected New Jersey Municipalities	1960 Ratio Of Persons/ Dwelling	1960 Population Density Persons/ Square Mile
Absecon City	2.91	735.9	Woodcliff Lake	3.51	731.2
Atlantic City	2.40	4,995.3	Hawthorne Borough	3.10	4,926.4
Brigantine City	1.41	665.8	Chatham Township	3.52	659.0
Linwood City	3.15	929.2	Montvale Borough	3.34	924.8
Longport Borough	1.14	2,447.7	Park Ridge Borough	3.40	2,476.4
Margate City	2.14	6,358.4	Ridgefield Park Township	3.12	6,350.5
Northfield City	3.43	1,643.0	Livingston Township	3.80	1,651.7
Pleasantville City	2.96	2,615.9	Clark Township	3.80	2,605.8
Somers Point City	2.57	1,103.9	Glassboro Borough	3.61	1,110.8
Ventnor City	1.95	4,365.8	Waldwick Borough	3.80	4,372.9
Ocean City	0.66	1,360.4	Mountain Lakes Borough	3.78	1,345.7

Source: U.S. Department of Commerce, Bureau of Census, Census Reports: HC (1) No. 32, N.J., PC (1) 32C, N.J., PC (1) 32D, N.J., PC (1) 32B, N.J.

TABLE III–7

A COMPARISON BETWEEN 1965 PERCENT SEASONALLY OCCUPIED DWELLINGS AND 1965 NUMBER OF NON-SEASONAL PERSONS PER DWELLING

Urbanized Atlantic City S.M.S.A. Municipalities	1965 Per Cent Dwellings Seasonally Occupied	1965 Number of Non-seasonal Persons Per Dwelling*
Absecon City	0.00	3.29
Atlantic City	17.41	2.16
Brigantine City	37.03	2.05
Linwood City	0.00	3.48
Longport Borough	41.54	1.45
Margate City	34.57	2.31
Northfield City	0.00	3.41
Pleasantville City	2.60	3.18
Somers Point City	9.76	2.88
Ventnor City	26.99	2.16
Egg Harbor Township (Part)	17.41	2.20
Ocean City	62.99	1.10

*Including Seasonal and Non-Seasonal Dwellings.

Both seasonally and permanently occupied dwelling units were included in the number of dwelling units used to determine the ratio of permanent residents per dwelling unit.

The table also indicates that municipalities with no seasonally occupied dwelling units have the highest ratios of persons per dwelling unit. For municipalities with seasonal dwellings; as the percentage of seasonal dwellings increases, the ratio of persons per dwelling decreases.

1965 ACUATS Ratio of Persons Per Dwelling For Year-Round, Seasonal and Temporary Residents

Table III-8 presents a comparison of three ratios for year-round, seasonal and temporary persons per occupied dwelling. These rates were individually applied in the residential land use projection process when projected future populations were converted to dwelling requirements for year-round, seasonal and temporary occupancy.

1965 Dwelling Units by Occupancy Type

Table III-9 presents the occupied dwelling unit distribution as a percentage of the total number of occupied dwellings in each municipality. Of interest is the fact that Atlantic City, Egg Harbor Township and Ocean City had more than half of their dwellings seasonally or temporarily occupied. More than 90 percent of the occupied dwellings in Linwood, Northfield and Pleasantville were occupied year-round.

1965 Occupied Dwelling Units by Type

The number of occupied dwelling units can also be summarized by dwelling type. Table III-10 presents this distribution. The largest type was the single-family residence, comprising 40.5 percent of all occupied units. The second largest type was the hotel with 20.4 percent of all occupied dwelling units. The third largest type was the multi-family dwelling or apartment accounting for 12.7 percent of all units.

Of the 19,160 hotel units, 87 percent or 16,644 units were located in Atlantic City and 11 percent in Ocean City. The remaining two percent were scattered throughout the island communities.

In the area, one of the major enterprises is the operation of hotels, motels, and rooming houses. One of this study's findings is the rate of occupancy of these transient quarters. Following is a breakdown of occupied and vacant rooms in the area:

OCCUPIED ROOMS	**33,759**	**64%**
VACANT ROOMS	**18,810**	**36%**
TOTAL ROOMS	**52,569**	**100%**

Of the available hotel, motel and rooming house rooms 64 percent were actually rented on an average weekday in the summer season. This rate may increase to over 90 percent during the weekend peak periods.

Employment – 1965 Number of Jobs

The employment statistics are based on the number of home-based work trips collected in the home interview survey. They represent the number of people gainfully employed during the average summer weekday. The number of jobs and their location throughout the area by survey zone provide a basis for projecting both the number of future jobs and their probable locations.

In 1965 there were 42,971 summer weekday jobs in the study area. Of these jobs, 25,879 or 60.2 percent were located in Atlantic City. There were 4,130 jobs or 9.6 percent in Ocean City, 3,217 jobs or 7.5 percent in Pleasantville and 1,775 jobs or 4.1 percent in Margate.

Table III-11 presents the distribution of weekday jobs by municipality.

Land Use

The land use analysis was conducted at two levels: geographic and quantitative.

The geographic level of analysis is accomplished through the generalized land use map which displays the functional areas in the study. Since the land use approach to traffic estimation asserts that person and vehicle movements are a direct function of land use, the land use analysis is a vital planning tool having a direct bearing on transportation requirements. The term "land use" in this study refers to the kind of activity taking place on a given parcel of land. The movement of people and vehicles takes place because of the geographic distribution of activities on the land.

The quantitative level of analysis is concerned with land use measurement in acres. This analytical approach determines "how much" land is devoted to each use. The quantitative analysis is vital to the traffic projection process when quantities of land used for different purposes are correlated with the amount of traffic generated. In addition, the quantitative

TABLE III–8
1965 A.C.U.A.T.S. RATIO OF PERSONS
PER DWELLING FOR YEAR ROUND, SEASONAL
AND TEMPORARY RESIDENTS BY MUNICIPALITY

Municipality	Ratio Of Year Round People Per Year Round Dwelling	Ratio Of Seasonal People Per Seasonal Dwelling	Ratio Of Temporary People Per Temporary Dwelling
Absecon City	3.29	–	1.65
Atlantic City	2.63	2.54	2.26
Brigantine City	3.26	3.60	4.04
Egg Harbor Township (Portion in Region)	2.67	2.12	2.92
Linwood City	3.50	4.05	–
Longport Borough	2.49	3.81	3.35
Margate City	3.38	4.25	3.67
Northfield City	3.43	2.05	–
Pleasantville City	3.27	3.00	2.48
Somers Point City	2.57	5.01	–
Ventnor City	2.96	3.73	4.17
Ocean City	2.92	3.82	3.51

TABLE III–9
1965 A.C.U.A.T.S. PERCENT DISTRIBUTION OF
YEAR ROUND, SEASONAL AND TEMPORARY
DWELLING UNITS IN EACH MUNICIPALITY

Municipality	Percent Municipal Dwellings Year Round Occupied	Percent Municipal Dwellings Seasonally Occupied	Percent Municipal Dwellings Temporarily Occupied
Absecon City	76	0	24
Atlantic City	46	10	44
Brigantine City	52	30	18
Egg Harbor Township (Portion in Region)	43	9	48
Linwood City	99	1	0
Longport Borough	54	39	7
Margate City	60	28	12
Northfield City	99	1	0
Pleasantville City	96	2	2
Somers Point City	83	9	8
Ventnor City	70	25	5
Ocean City	25	41	34
TOTAL A.C.U.A.T.S. REGION	51	17	32

TABLE III–10
1965 A.C.U.A.T.S. OCCUPIED DWELLING UNIT DISTRIBUTION BY STRUCTURE TYPE

Dwelling Unit Type	Total A.C.U.A.T.S Number of Dwellings	Percent Dwellings
Single Family	38,030	40.5
Two Family	8,928	9.5
Multi-Family	11,904	12.7
Hotel	19,160	20.4
Motel	8,059	8.6
Rooming House	6,540	7.0
Institutions	505	0.5
Trailer	81	0.1
Other	603	0.7
TOTAL A.C.U.A.T.S. REGION	93,810	100.0

TABLE III–11
1965 DISTRIBUTION OF JOBS BY MUNICIPALITY

Municipality	Number of Jobs By Municipality	Percent Distribution Of All Jobs Located In Each Municipality
Absecon City	800	1.9
Atlantic City	25,879	60.2
Brigantine City	932	2.2
Egg Harbor Township (Part in Region)	775	1.8
Linwood City	1,105	2.6
Longport Borough	158	0.4
Margate City	1,775	4.1
Northfield City	1,471	3.4
Pleasantville City	3,217	7.5
Somers Point City	1,434	3.3
Ventnor City	1,293	3.0
Ocean City	4,130	9.6
TOTAL	42,971	100.0%

analysis is of importance when economic factors are examined. The synthesis of land use and economic data aid in converting future employment projections to future commercial and industrial land consumption.

The two approaches of analyzing land use are geared toward solving two different planning problems.

The quantitative analysis is used for projecting the amount of land expected to be consumed in the future. It does not, however, determine the geographical location of expected development.

The land use map forms a basis for determining where new urban growth is likely to take place because growth generally takes place on accessible vacant land. Thus, the geographic analysis is a locational analysis. The regional zoning analysis is also presented in this chapter. It materially aids in locating projected land use types and is a vital part of the locational analysis.

Since the geographic and quantitative analyses are designed to solve different land use problems, the methodologies employed and the data presentations are different. The geographic analysis is presented on a map while the quantitative analysis is presented in tabular form.

Land Use Categories of the Generalized Land Use Map

The ACUATS Land Use survey data has been processed for both geographic and quantitative analysis. The geographic analysis utilizes the following land use definitions:

Residential:

All dwellings and group quarters are included in this category.

Commercial:

Wholesale and retail trade activities such as restaurants, motels and hotels, construction, repairs and personal services are included in this category.

Public:

This category consists of local, state and federal government facilities. To be specific, the following are included in this class: schools, sewage and water facilities, administration buildings, parks and playgrounds, public beaches, and transportation and parking facilities.

Quasi-Public:

Included are religious organizations, private clubs, private and parochial schools, golf courses, swimming clubs, charitable services and other similar activities.

Light Industry:

This category includes manufacturing plants which do not constitute a hazard to the neighboring properties and have a low nuisance level. Among the industries in this class are the following: clothes manufacturing, printing and publishing, communications and associated industries, and manufacture of professionally tooled instruments.

Heavy Industry:

This classification covers the realm of nuisance industries which may present hazards to adjacent properties. Industries engaging in chemical, metal, rubber, and plastic production are included.

Vacant:

All land not currently devoted to urban uses is considered vacant.

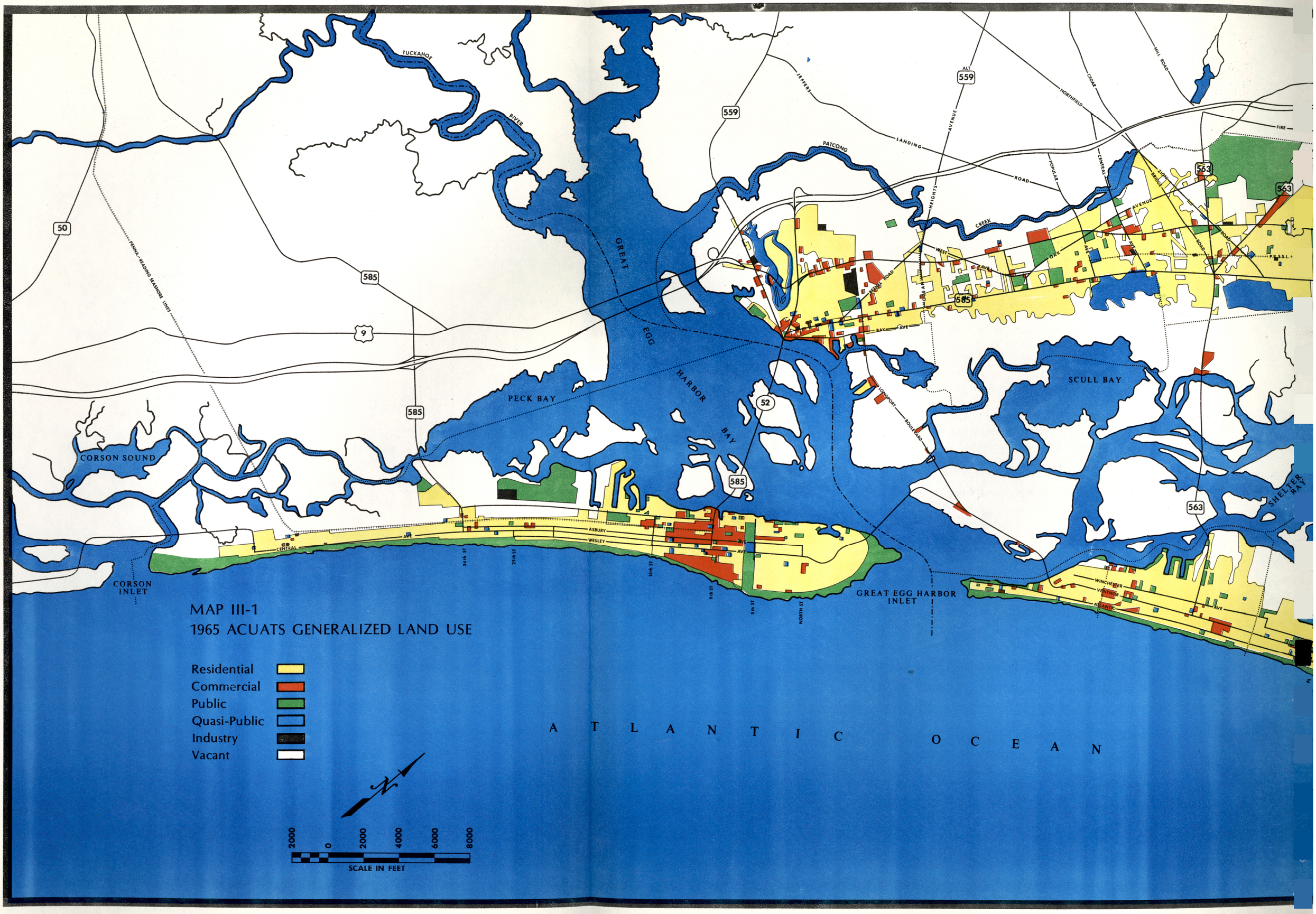
Geographic Land Use Analysis:

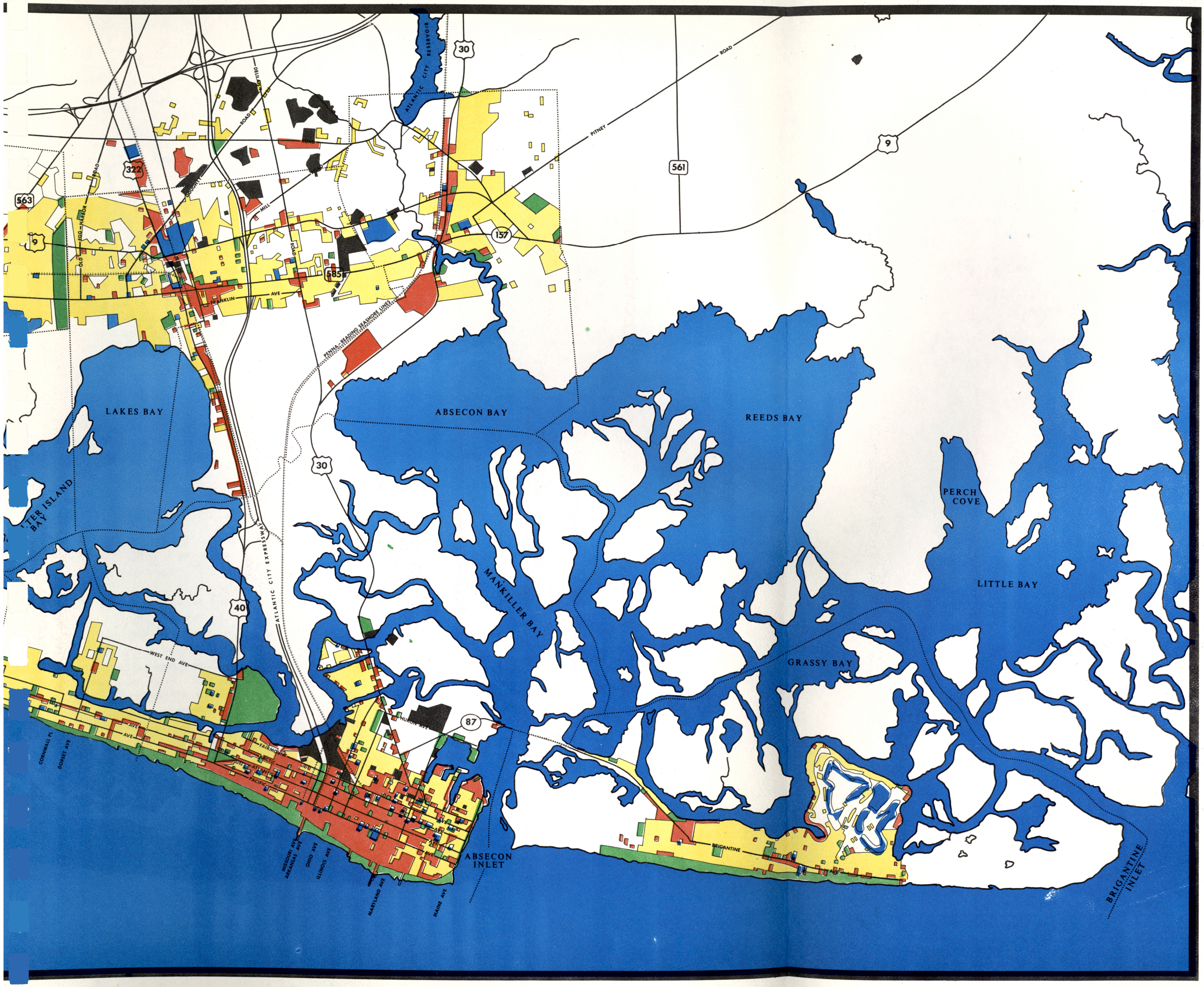
Both the mainland and island communities have definite residential environments.

The residential pattern of the mainland communities is exhibited in a semi-continuous north-south band, irregularly gridded by strip commercial development. The island municipalities, with the exception of Ocean City, tend to have resort-type uses along the ocean front and continuous east-west residential development to the north.

The largest and most intense commercial district in the area is located in Atlantic City. Here the central business district (CBD) dominates from Florida to New Jersey Avenues and from the Boardwalk to Baltic Avenue. Beach front blocks are predominantly commercial from the Absecon Inlet to Boston Avenue. Because of the shape of the island and the ease of travel in east and west directions, the CBD is similarly elongated.

A second well defined CBD is in Ocean City where two small commercial areas parallel each other. One stretches from 7th to 14th Avenues and from the Boardwalk to Ocean Avenue. The other is located two blocks farther northwest and runs from 6th to 14th from Central to Haven Avenues. By examining the detailed land use data it is evident that these


TUCKAHOE
RIVER
GREAT EGG HARBOR
PECK BAY
CORSON SOUND
CORSON INLET
GREAT EGG HARBOR INLET
SCULL BAY
SHELTER BAY
ATLANTIC OCEAN
PENNA.-READING SEASHORE LINES
50
9
585
559
52
563
ALT
JEFFERS
LANDING
ROAD
PATCONG
CREEK
AVENUE
HEIGHTS
BRIDGE
POPLAR
CENTRAL
CEDAR
NORTHFIELD
HILL ROAD
FIRE
OAK
WEST
BAY
LONGPORT
BOULEVARD
ASBURY
WESLEY
CENTRAL
34th ST
25th ST
15th ST
9th ST
5th ST
NORTH ST
WINCHESTER
VENTNOR
ATLANTIC
P.R.S.S.L.
MAP III-1
1965 ACUATS GENERALIZED LAND USE
Residential
Commercial
Public
Quasi-Public
Industry
Vacant
2000
0
2000
4000
6000
8000
SCALE IN FEET



ATLANTIC CITY RESERVOIR
30
PITNEY ROAD
9
561
322
563
9
DELILAH ROAD
DOUGHTY ROAD
MILL ROAD
OLD EGG HARBOR ROAD
157
585
FRANKLIN AVE
PENNA-READING SEASHORE LINES
LAKES BAY
ABSECON BAY
REEDS BAY
30
PERCH COVE
LITTLE BAY
MANKILLER BAY
40
ATLANTIC CITY EXPRESSWAY
WEST END AVE
GRASSY BAY
87
HURON AVE
FAIRMOUNT
ARCTIC
ATLANTIC
PACIFIC
CORNWALL PL
DORSET AVE
MISSOURI AVE
ARKANSAS AVE
OHIO AVE
ILLINOIS AVE
MARYLAND AVE
MAINE AVE
ABSECON INLET
BRIGANTINE
BRIGANTINE INLET

commercial areas have distinctly different orientations. The one in the center of the island is a year-round commercial area while the other is recreation oriented.

The mainland has three well developed commercial areas. These areas have one common denominator: all are located on highly traveled, east-west routes. Commercial uses located on these traffic routes are referred to as strip commercial developments and are found along Route 30 in Absecon, Route 40 in Pleasantville and Route 52 and Mays Landing Road in Somers Point. In addition to these, scattered commercial properties are found throughout many residential neighborhoods where they serve the day to day needs of the population.

The Pleasantville CBD is the most intensely developed of the three mainland commercial areas. This CBD is several blocks wide at the intersection of Shore Road and Route 40 and narrows in an east-west direction from that location.

In contrast to the CBD's, the public and quasi-public land is scattered throughout the area. It is important to note that most beaches are in public ownership. The largest quasi-public uses are golf courses (located in *Somers Point, Linwood, Northfield and Brigantine).* Other large quasi-public uses are the cemetery in Pleasantville and the large area used by Holy Spirit High School in Absecon.

Industrial land is almost nonexistent in the study area. Industry in Atlantic City is limited to the area bounded by Mediterranean and Bacharach Boulevard. Isolated industrial areas on the mainland include sand and gravel pits and junkyards.

The remaining land area is vacant. The area which separates the islands from the mainland contains the largest concentration of vacant land. The "Physical Characteristics" section discusses in detail the quality of vacant land as a potential for future urban growth.

Quantitative Land Use Analysis

The quantitative land use analysis consists of areal measurements of all land use types. The data from the land use survey of 1965 were compiled on a two digit system according to the *Standard Land Use Coding Manual* of the Urban Renewal Administration and the Bureau of Public Roads. This manual is designed to standardize coding for land use data collection. By reducing this to a one digit level of land use detail, seven categories were employed in designating the dominant uses for ACUATS. These seven generalized land use categories are as follows: (1) residential, (2) trade, (3) services, (4) cultural, entertainment and recreation, (5) transportation, communications, and utilities, (6) agriculture, and (7) vacant land. The area calculations include developed and vacant land but exclude water areas.

Residential

The most intensive residential zones are found on the islands. These zones stretch through Ventnor, Margate, Longport and part of Ocean City. As available vacant land became scarce in Atlantic City, this residential development satisfied the need for additional living space.

For various reasons an overall lighter density exists on the mainland. The larger vacant areas located in mainland survey zones contribute statistically towards lowering residential densities. In addition, residential development of more recent vintage is of the low density variety. In instances where densities are relatively high on the mainland a detailed examination shows that these survey zones contain major subdivisions.

Trade and Services

The previously mentioned CBD's are especially important and the Atlantic City CBD is the most highly developed. The area with the highest percentage of land used for commercial purposes is bounded by Pacific and Baltic Avenues and Missouri and Maryland Avenues.

The Ocean City CBD is located at the intersection of Route 52 and Asbury Avenue. As the distance from the Ocean City CBD increases, the intensity of commercial use declines.

In percentage of commercial land, the Absecon CBD is less intense than the Atlantic City, Ocean City, and Pleasantville CBD's. The CBD in Pleasantville is reflected by the small sub-zones which define the limit of intensive commercial development. The CBD in Somers Point is also well defined.

Whereas the above CBD's show a close correlation between land use and percentage of land used for commercial purposes, zone 53030 in Northfield is an exception. This zone contains a shopping center as well as strip commercial uses along Route 563. Because strip commercial

uses are not geographically concentrated, the land use map does not indicate a high percentage of land devoted to commercial uses.

Cultural, Entertainment and Recreation

The beach itself is considered park land in most communities and is in public ownership. Although only about half of the beach area in Ocean City is owned by the city, all of the beach area is opened to public use.

Whereas the island communities have access to the beaches, the mainland communities provide recreational opportunities with golf courses and other large areas such as Birch Grove Park in Northfield. In survey zones with five to ten percent recreational land, a mixture of recreation oriented uses are found. For example, the high density zone in Margate bordering the Intercoastal Water Way has a concentration of marinas. Zones on the mainland contain a variety of parks, playgrounds, commercial golf courses, and driving ranges.

Recreational Land Uses "Seasonal" vs. "Non-Seasonal"

This report has pointed out the many differences between seasonal and non-seasonal municipalities. These differences were pointed out in the person per dwelling ratios, the difference between year-round, seasonal and temporary population and in other statistics. By analyzing the extent of "cultural, entertainment and recreation" land use in ACUATS and the Philadelphia metropolitan area, a significant difference in land utilization exists.

A total of 1799 acres of land in the study area is devoted to "cultural, entertainment and recreation" land use representing 12.3 percent of all developed land. This developed land excludes vacant land, and land under water. The "cultural, entertainment and recreation" land use in the Philadelphia metropolitan area represents 6.5 percent of the developed land. Compared with that metropolitan area, ACUATS has almost twice as much of its developed land in the "cultural, entertainment and recreation" land use category.

This statistic may also be expressed as a ratio of acres per 1000 residents. Using this measurement, the 1960 ratio of acres per 1000 residents in the Philadelphia metropolitan area is 4.7[2] and for ACUATS 12.8 acres. When the total amount of ACUATS land in "cultural, entertainment and recreation" is divided by the combined year-round, seasonal and temporary residents, this area had a 1965 ratio of 6.6 "cultural, entertainment and recreation" acres per 1000 residents.

The fact that ACUATS shows a higher percentage of its urbanized land area to be in the "cultural, entertainment and recreation" category and a higher ratio of recreation acreage per 1000 residents than the Philadelphia area indicates the difference between ACUATS and a non-seasonal metropolitan area.

Transportation, Communications, and Utilities

This category does not have a corresponding map symbol on the Land Use Map even though it covers 15 percent of the area. The primary reason for this is that the majority of the land area recorded as this use is land devoted to street, utility, and railroad rights-of-way.

Agriculture

Distribution of land used for agricultural purposes is limited to the mainland communities. Only 1.51 percent of all land in ACUATS is used for agriculture.

Vacant Land

Chart III-1 is a pie-diagram and shows the percentage distribution of land uses for ACUATS. The largest use consists of vacant land —accounting for 61 percent of the area. The transportation, communication, and utility land and the residential land each occupy 15 percent of the area. The remaining nine percent is devoted to commercial, industrial, public and quasi-public uses. The study area can best be described as a residential resort area. Table III-12 presents the total acreages by land use category for the area.

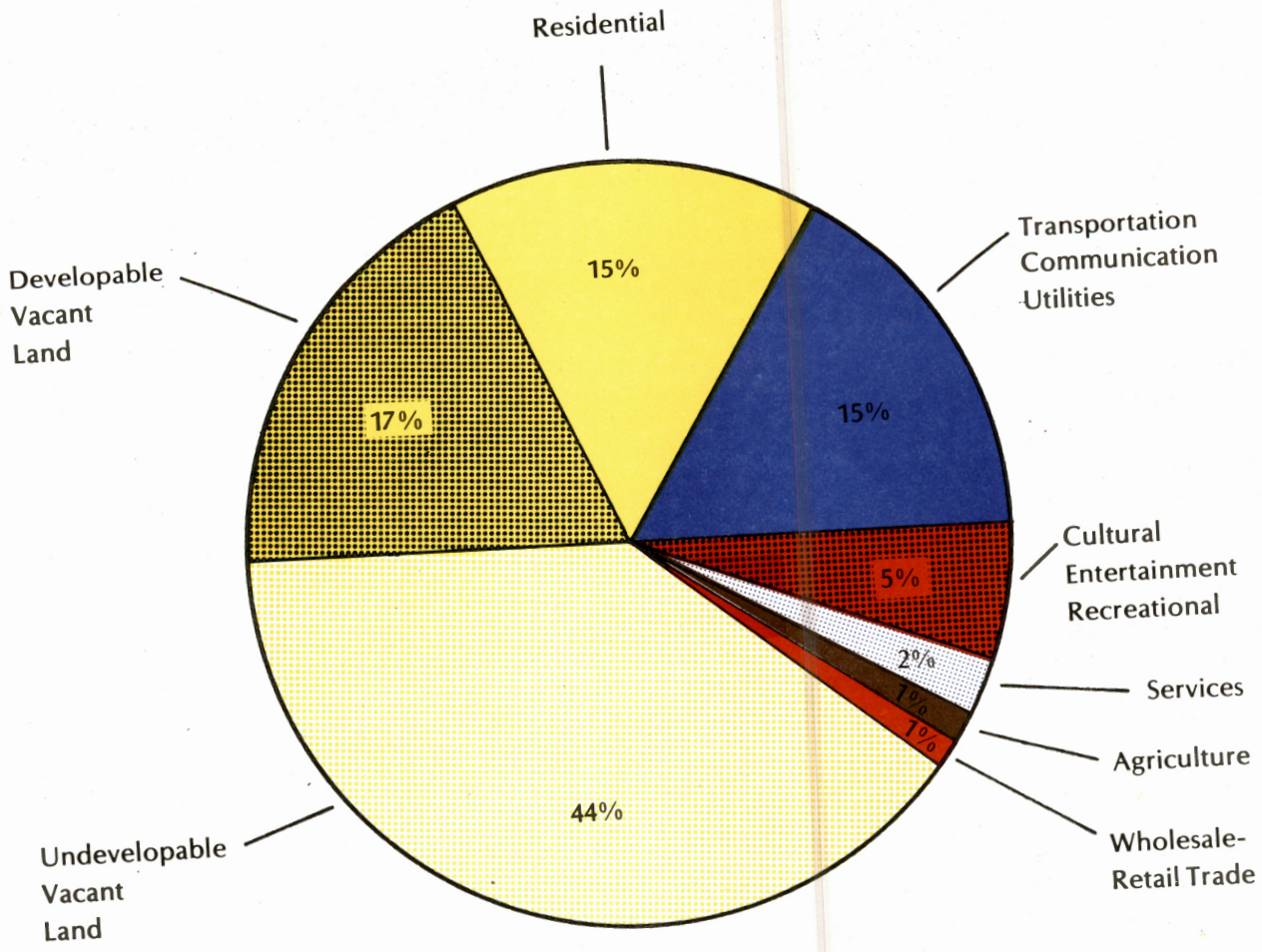
Regional Zoning Analysis

The New Jersey Municipal Zoning Enabling Act, R.S. 40:55—30 to 40:55—51 inclusive, permits local municipalities to exercise the power to zone. This zoning power is used to carry out the following purposes:

> **. . . to lessen congestion in the streets; secure safety from fire, flood, panic and other dangers; promote health, morals or the general welfare; provide adequate light and air; prevent the overcrowding of land or buildings; avoid undue concentration of population. (R.S. 40:55—32)**

In order to prepare realistic land use projections for the area, all 1965 municipal zoning

CHART III–1
1965 A.C.U.A.T.S PERCENT DISTRIBUTION OF GENERALIZED LAND USES BY B.P.R. CODES EXCLUDING WATER AREAS



Source: A.C.U.A.T.S. Land Use Survey – 1965

TABLE III–12
1965 A.C.U.A.T.S. LAND USE AREAS BY MUNICIPALITIES
(IN ACRES)

Municipality	Residential 10	Manufacturing 20	Manufacturing 30	Transportation, Communication, Utilities 40	Trade 50	Services 60	Cultural Entertainment Recreation 70	Agriculture 80	Vacant Land And Water Areas 90	Total Acres
Absecon	557.39	.32	8.88	519.14	25.66	58.90	50.64	69.12	2,453.83	3,745.93
Pleasantville	726.17	8.60	1.19	708.90	39.53	161.27	50.84	73.78	1,928.05	3,694.63
Northfield	601.67	.36	2.15	291.09	66.32	92.28	497.47	81.61	741.55	2,377.34
Linwood	575.84	3.23	.13	297.52	9.04	55.53	172.45	63.56	1,318.04	2,492.58
Somers Point	439.62	.48	3.28	480.16	44.19	31.08	171.87	45.61	1,368.54	2,586.15
Egg Harbor Twp.	202.38		1.21	296.39	28.37	35.28	38.61	249.35	4,765.70	5,614.87
Brigantine	387.16	.39	.13	389.69	5.55	17.01	245.89	.02	3,258.67	4,303.16
Atlantic City	784.02	14.96	4.13	1,150.02	162.71	154.38	298.23	3.85	4,431.54	7,004.66
Ventnor	292.21	.04	.02	325.96	4.47	15.22	56.35	.78	593.89	1,289.37
Margate	379.52	.18		312.37	8.99	15.51	87.25		135.85	939.69
Longport	103.12			87.46	1.30	3.51	9.29		26.65	231.42
Ocean City	865.74	.84	.09	866.09	40.38	51.74	120.86	.20	2,581.17	4,535.14
Total Acres	5,914.84	29.40	21.21	5,724.79	436.51	691.71	1,799.75	587.88	23,603.48	38,814.94
Total Percent	15.23	.07	.05	14.74	1.12	1.78	4.63	1.51	60.81	

ordinances were collected and analyzed. It is important to note that while all 12 municipalities had enacted zoning ordinances prior to 1965, Margate, Egg Harbor Township, Somers Point and Atlantic City were in the process of revising their ordinances.

As expected, the local ordinances contained a wide variety of zoning terminology to meet local conditions. Since many of the ordinances were enacted prior to 1940, amendments have been made and the ACUATS zoning analysis has incorporated these amendments.

In order to analyze the broad range of ordinances existing in the area, compatible ACUATS zoning categories were established. In fitting the local zoning ordinances to the ACUATS categories, a system was devised which coverted the local zoning maps into one uniform regional zoning map.

The local ordinances studied were of the "cumulative" type (*where each zoning district permitted all uses allowed in the more restrictive districts).* The most restrictive zone is the single-family residential district followed by the two-family residential, multi-family residential, commercial and industrial districts.

In the process of converting the local zoning districts into the generalized ACUATS zoning categories, the least restrictive local zoning provisions were used. In other words, a local two-family residential zoning district would be assigned to the ACUATS two-family residential district even though single-family residential use was permitted in that district. A local commercial zoning district would be assigned to the ACUATS commercial zone even though residential uses were permitted by the local zoning ordinance. A local industrial zoning district would be assigned to the ACUATS industrial district.

Land Zoned Residential

Nearly three-fourths of ACUATS is zoned RESIDENTIAL. These residential districts vary from single-family to high-rise apartments and have densities of four families per acre to over 100 families per acre, respectively. By comparing the original minimum lot size requirements with those included in the latest municipal amendments, a trend toward larger minimum lot sizes is evident. Original minimum lot sizes, for example, were generally 16 feet wide and 100 feet deep. Recent zoning amendments require 10,000 square feet as the minimum lot size. Requiring larger minimum lot sizes is one method of meeting the objectives in the New Jersey Municipal Zoning Enabling Act.

Land Zoned Commercial

Commercial land use types vary widely throughout the area. Neighborhood shops, business districts along major arteries and at intersections, and large commercial complexes typify the commercial uses. Fourteen percent of the ACUATS land area is zoned for these commercial types. Of this 14 percent, one percent is zoned for neighborhood business, nine percent for general business, and four percent for intensive business.

Twenty-three percent of Atlantic City is zoned commercial. Since Atlantic City is dependent upon the tourist trade, the percentage of land zoned commercial seems in line with the needs of the community.

An anomalous situation exists in Somers Point where the zoning map permits 49 percent of the land to be used for commercial uses. Situated adjacent to residential Linwood, (*with only two percent of the land zoned commercial),* and located across the bay from Ocean City, Somers Point appears to be compensating for the lack of shopping and entertainment facilities for a large portion of the seasonal and non-seasonal population.

The commercial land uses are related to the shifting patterns of residential land use. As people in the center city move to the suburbs the demand for related services also shifts. Somers Point, Northfield, Pleasantville and Ocean City anticipated this change by zoning vacant land near residential areas for commercial uses. This decentralization results in several commercial nuclei on the mainland. These centers are becoming commercial satellites to the dominant Atlantic City central business district.

Land Zoned Industrial

Twelve percent of the ACUATS land area is zoned for industry. Unlike the residential or commercial districts, much of the industrially zoned land is concentrated in a few municipalities. Only Atlantic City, Linwood, Ocean City and Pleasantville have land zoned for industry. Atlantic City has the largest amount of industrially zoned land, accounting for 65 percent of all industrially zoned land in the study.

Pleasantville has 19 percent of all industrial land, Linwood 14 percent, and Ocean City two percent.

Zoning Summary

Table III-13 presents the distribution of land by detailed zoning classes. It should be noted that not all residentially zoned land will be readily developable because much of it consists of marine tidal marsh.

TABLE III—13
1965 A.C.U.A.T.S. PERCENT DISTRIBUTION OF ZONED LAND

Zoning Class	1965 Percent Distribution Subtotal	Total
Residential		73
Single Family	32	
Two Family	26	
Multi-Family	14	
High Density Residential	1	
Commercial		14
Neighborhood	1	
General	9	
Intensive	4	
Industrial		12
Light Industry	10	
Heavy Industry	2	
Dedicated Public Land		1
A.C.U.A.T.S TOTAL		100%

Schedule of Limitations

An analysis of zoning in the ACUATS region is concerned with the location of zoning districts and the extent of the subdivision design standards. The ACUATS zoning map locates these districts. The various zoning ordinances include many types of regulations. One regulation, the minimum lot size, is essential in projecting future growth on vacant land. The extent of subdivision design standards, specifically minimum lot size requirements, is presented in the Schedule of Limitations, Table III-14.

The data presented in this table reveal the minimum lot size requirements generally become larger when moving from center city to the suburbs. Certain Ordinances did not use minimum lot sizes to set subdivision standards. Among the 12 municipal zoning ordinances analyzed, Somers Point, Egg Harbor Township and Atlantic City had no minimum lot size requirements. In Atlantic City in Zones "C" and "D" the lot limitation was optional. Egg Harbor Township has a Planned Waterfront Communities ordinance where the minimum lot size varies according to certain incentives offered by developers to balance and plan for community growth. The average minimum lot size was calculated to be 14,400 square feet.

The minimum lot sizes presented in the table will be used in the Residential Land Use Forecasting Process when residential holding capacities are calculated.

Physical Characteristics

Basic knowledge of the physical characteristics in the area is necessary for the land use projection process. Without this knowledge accurate geographic forecasts of future land development will not be possible, especially in this area where a large percentage of the vacant land is marine tidal marsh with very poor drainage and building support characteristics.

In order to develop a comprehensive background on the limiting physical factors likely to influence future development, it is necessary to understand a few basic principles of land formation and geologic forces.

Geologic History

New Jersey has four major geologic provinces. Each province was formed during a specific time in the geologic history of the earth. The Coastal Plain, of which ACUATS is a part, is the youngest of these geologic provinces. Its time of formation stretches over a period of 130 million years. This geologic time period is generally known as an age of sea movements when the Atlantic Ocean moved inland and back, and the New Jersey coast was raised and lowered relative to sea level.

As a result of the sea movement, layers of sediments were deposited on New Jersey's Coastal Plain. These sediments are tilted toward the southeast and continue under the Atlantic Ocean. A total of 18 segments comprise this geologic layer cake.

TABLE III—14
SCHEDULE OF LIMITATIONS

Municipality	Zoning District	Minimum Lot Size
Absecon City	Residential	10,000 SQ. FT.
Atlantic City	"A" & "B" Residence	3,000 SQ. FT.
	"C" & "D" Residence	N/A
	"E" (a)	3,000 SQ. FT.
	"E" (b)	Land Area/D.U. = 1,750 SQ. FT.
	"E" (c)	Land Area/D.U. = 215 SQ. FT.
Brigantine City	"A", "B" & "C" Residence	2,200 SQ. FT.
	"D" Residence	900 SQ. FT.
Egg Harbor Township	Planned Waterfront Communities	
	*Average lot size varies according to certain incentives offered by developers such as church sites, playground areas, etc.	* 14,400 SQ. FT.
	Non-waterfront Communities	14,000 SQ. FT.
Linwood City	Dwelling A Zone	10,000 SQ. FT.
	Dwelling B Zone	7,500 SQ. FT.
Longport Borough	Single Dwelling	5,000 SQ. FT.
	Multiple Dwelling	5,000 SQ. FT.
Margate City	AA Single Dwelling	4,000 SQ. FT.
Northfield City	1 & 2 Family Residence	10,000 SQ. FT.
Ocean City	Single Family	4,500 SQ. FT.
	2 Family	3,500 SQ. FT.
	Waterfront	5,000 SQ. FT.
Somers Point	Dwelling A	N/A
	Dwelling B	800 SQ. FT.
	Dwelling C	N/A
	Dwelling D	N/A
	Dwelling E	5,000 SQ. FT.
Pleasantville City	Residence	7,500 SQ. FT.
Ventnor City	R—1	7,500 SQ. FT.
	R—1—B	4,800 SQ. FT.
	R—2	4,000 SQ. FT.
	R—3	2,000 SQ. FT.
	R—4	2,000 SQ. FT.
	R—5	2,000 SQ. FT.

Geologic Formations

The area contains the outcrop of only one of the 18 Coastal Plain segments, namely the Cohansey Formation. This formation is composed of stream deposited quartz sand and varies in thickness from 100 to 250 feet.

New Jersey has known four glacial periods, which are times of ice advance, and four interglacial periods or times of ice retreat. As the ice melted during the interglacial periods rivers flowed across the Coastal Plain to the Atlantic Ocean and deposited gravel. Some of these gravel deposits are still found in the ACUATS region. Two such interglacial gravel formations lay on top of the Cohansey. The oldest of these deposits is the Bridgeton Foundation. This took place during both the Aftonian or first interglacial age and the Kansan or second interglacial age. The other and youngest deposit is the Cape May Formation. This occured during the Sangaman or fourth interglacial age.

The Marine Tidal Marsh and the Beach Sand and Gravel belong to the most recent geologic epoch.

Geomorphology

Geomorphology is the study of land forms and the forces that have created these forms. Of particular importance to ACUATS are those geologic forces influencing both the barrier beaches and the marshes. Two types of geologic forces are operative which will materially change the physical characteristics of the study area in the long run. One of the forces operative on the mainland is fluvial action, primarily steam erosion. The particles washed down from the mainland are deposited on the flood plains of the streams and in the tidal marsh areas. The other force is the tidal action of the Atlantic Ocean which erodes the beaches and deposits the sand out at sea.

While these forces may take hundreds of years to complete their cycle, it should be pointed out that less than one hundred years ago Brigatine and Absecon Islands each consisted of two separate parts.

Another recent example of rapid development occured at the Brigatine Inlet. When Brigatine Boulevard was constructed in the 1920's, the main channel was blocked causing the flow of water to shift to secondary channels. Subsequently, beach development occured at this end of Brigatine Island.

Perhaps one of the most spectacular examples of beach formation is illustrated by the location of Atlantic City's historic light house. When originally constructed in 1857, this light house stood on the water's edge. Today, the light house stands approximately 1,000 feet inland at Rhode Island and Pacific Avenues, two blocks from the beach.

The study area has a setting best described geomorphologically as a coast line of emergence. In terms of long range planning, it is important to realize that the natural course of geologic development for a coast such as ACUATS' is the filling in of tidal marshes with a relative movement of the coastline seaward. In other words, establishment of more land characterizes a coastline of emergence.

The Soils of the Study Area

The soil is the top most part of the geologic formation and is related to the underlying geology. Six soil types exist in the study area and are discussed in detail below. Of particular importance to the land use forecasting process are the following soil characteristics: *(1) parent formation, (2) land forms, (3) soil type, (4) drainage conditions, and (5) support characteristics.*

Soil Types

AM-12: This soil type is related to the Cape May and Bridgeton formations. The part of the soil related to the Cape May Formation occupies low terrace or sloping areas along stream beds, while the part related to the Bridgeton Formation is located on the interstream or higher parts of the area. The soil itself is a silty sand and gravel of the Sassafras Series. It has good to excellent drainage conditions, and its support characteristics are also good to excellent. *THIS SOIL IS SUITABLE FOR FUTURE DEVELOPMENT WITHOUT ADDITIONAL IMPROVEMENTS.*

AM-23: This type of soil is also related to the Cape May and Bridgeton Formations. Topographically found in undulating to rolling hills and also on low curved or winding ridges. The soil itself is a uniform sand and silty sand with some gravel scattered through it. It belongs to the Sassafras Series and has excellent to very poor drainage depending on the depth of the water table. The support characteristics are good to excellent. *WHERE THIS SOIL IS WELL DRAINED IT WILL BE SUITABLE FOR FUTURE*

DEVELOPMENT WITHOUT ADDITIONAL IMPROVEMENT.

M-67: This soil is related to the Cohansey Formation. It is located in flat areas and has poor to imperfect drainage conditions because of the low land form and high ground water table. Its composition is a clay and sandy clay with poor support characteristics. *IN ITS PRESENT CONDITION THIS SOIL IS NOT SUITABLE FOR DEVELOPMENT.*

MB-3: This type is related to the beach sand and gravel formation on the off-shore bar and related islands. It consists of fine quartz sand with some gravel and shell fragments. Its drainage conditions range from poor to excellent with good support characteristics. *WHERE THIS SOIL EXCEEDS TWO FEET ABOVE MEAN HIGH TIDE IT IS SUITABLE FOR DEVELOPMENT WITHOUT ADDITIONAL IMPROVEMENT.*

MTM: This is the Marine Tidal Marsh which is located behind the off-shore bar. The marsh area consists of highly compressible silt which ranges from two to 15 feet. The drainage conditions are very poor and so are the support characteristics. *THIS SOIL IS NOT SUITABLE FOR DEVELOPMENT IN ITS PRESENT CONDITION.*

Fill: Fill is primarily found on reclaimed marshland and has improved drainage. Building support is sometimes questionable because of its unstable base of marsh land. Approximately six square miles of land have been filled and much of it has been developed.

Soil Drainage Conditions and Support Characteristics

Drainage conditions are very important in an area of sandy soils and relate directly to support capabilities. Sandy soils provide good building support. Up to a point this support capacity increases with increasing moisture content. Thus, areas which range from imperfect to excellent drainage would have good support conditions. Areas ranging from imperfect to poor would have a questionable support ability. Existing development has taken place mainly on land areas with good support characteristics. Approximately 17 percent of this "good" land is left for development.

By combining the land use and physical characteristics findings, a statement concerning the amount and quality of vacant land can be made. The entire area contains 83.72 square miles which include both land and water areas. Of this total, 23.10 square miles consist of water, and 60.62 square miles consist of land.

Looking at Chart III-2, which deals with the land area alone, 23.90 square miles or 39 percent of the area is currently developed and 36.72 square miles or 61 percent is vacant. These 36.72 square miles of vacant land include land in the marshes as well as on the mainland.

This physical characteristic analysis shows that 10.45 square miles or 17 percent of the area consists of readily developable vacant land. The remaining 26.43 square miles or 44 percent consists of poorly drained vacant land and is considered "undevelopable". It should be noted that while the "undevelopable vacant land", in its present condition, will not be able to support future urban growth, this land can be reclaimed and is potentially usable for development.

Travel Patterns

Travel in the area is best described in terms of person trips, vehicle trips, and transit trips. It is also possible to analyze trips by purpose. Since a trip is defined as movement from one point to another, it is possible to discuss, for example, the number of home-to-work trips per day between Pleasantville and Atlantic City, or between any other pair of zones or municipalities. We may describe the above example by the number of automobile trips, the number of bus passengers, or the total number of persons making such trips.

Tables III-15 through III-22 indicate the number of trips between municipalities by mode of travel for the purposes indicated. This is called an Origin and Destination (O-D) Table. The tables presented here are the results of the ACUATS surveys made during the summer of 1965. Detailed tables at the zonal level are not presented, but are available.

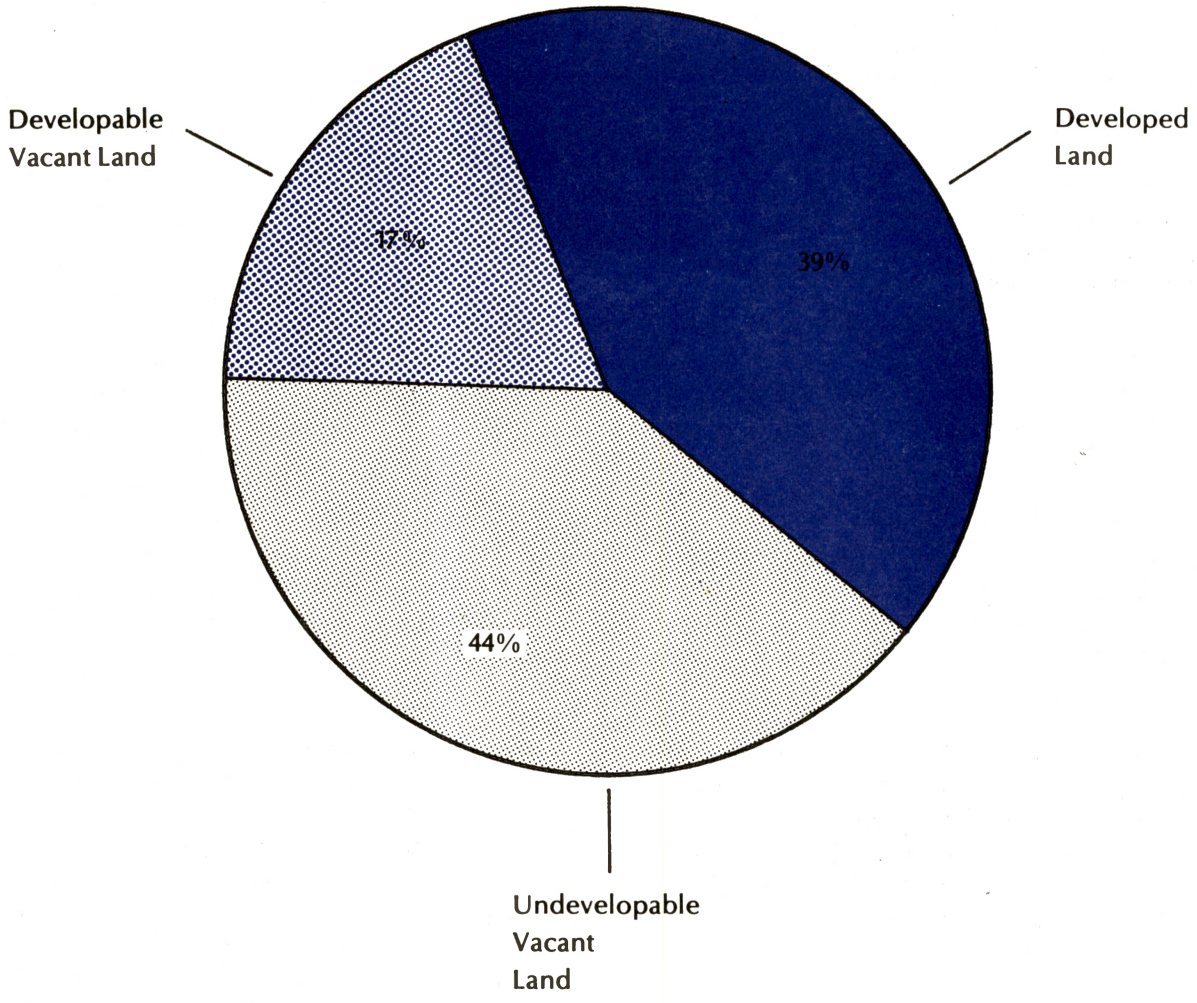
The Atlantic City area exhibits an abnormal daily travel pattern during the summer season. The traffic flow on the main arteries remains relatively high all day rather than tapering off in midday between two peak periods.

The sections that follow present the findings pertinent to the components of travel, i.e., external trips, internal trips, etc.

Auto Trips (Internal)

Within the cordon area there were 183,784 auto trips or 80 percent of the total internal vehicle trips. The municipality breakdown by origin and destination is shown in Table III-15.

CHART III–2
1965 A.C.U.A.T.S. PERCENT DISTRIBUTION OF DEVELOPABLE AND UNDEVELOPABLE VACANT LAND AND DEVELOPED AREA



Atlantic City produced 51,843 or 28 percent of the total internal auto trips, of which 32,421 or 18 percent had both origin and destination within Atlantic City.

Ocean City produced 43,580 or 24 percent of the total internal auto trips of which 38,366 or 21 percent had both origin and destination within Ocean City.

Truck Trips (Internal)

A total of 35,132 internal truck trips were made on an average summer weekday or 15 percent of the internal vehicle trips in the study area. Of all the internal truck trips, 15,494 or 44 percent originated in Atlantic City, and 39 percent had both origin and destination in Atlantic City.

External-Internal Trips:

There were 9,065 external to internal (two-way) truck trips or 9 percent of the total external-internal (two-way) vehicle trips.

Total Trips:

There were 44,000 total truck trips or 13 percent of the total vehicle trips in the study area.

Transit Trips (Internal)

A total of 50,335 transit passenger trips were made on an average summer weekday or 13 percent of the 380,000 internal person trips in the study area.

Bus Trips:

There were 20,125 bus passenger trips which represented 40 percent of the total transit passenger trips and 5.3 percent of the internal person trips in the study area. Atlantic City produced 13,426 bus passenger trips, or 68 percent, of the total bus passenger trips.

Taxi Trips:

There were 4,738 taxi passenger trips which represented 9.5 percent of the total transit passenger trips and 1.2 percent of the internal passenger trips in the study area.

Jitney Trips:

There were 25,472 jitney passenger trips which represented 50 percent of the total transit passenger trips and 6.7 percent of the internal passenger trips in the study area.

Origins and destinations of the transit trips by municipality are shown in Tables III-18, III-19, III-20 and III-21.

Personal Trips (Internal)

There were a total of 379,995 internal trips made on an average summer weekday. The distribution by mode and purpose was shown in Table II-2. The municipality breakdowns by origin and destination and mode are shown in Tables III-15, III-16, III-17, III-18, III-19, III-20, III-21, III-22 and III-23.

Atlantic City produced 135,377 or 36 percent of the person trips, of which 96,629 or 26 percent had both origin and destination in Atlantic City.

Ocean City produced 89,252 or 24 percent of the person trips, of which 78,188 or 21 percent had both origin and destination in Ocean City.

Assigned Traffic Volumes

The 1965 average summer weekly vehicular movements obtained from the origin-destination study were assigned to the existing arterial network by the minimum time path method. In these assignments two-way traffic flow was simulated based on the assumption that drivers seek minimum time paths; consequently, speeds were adjusted to produce the most realistic traffic assignment.

The assigned network volumes for all arterial roads or streets having assigned two-way volumes in excess of 1,000 are shown on Maps III-2 to III-5.

External Trips

In the Study, 103,929 vehicle trips had either origin or destination or both outside the study area. Of these, 97,685 vehicle trips, or 94 percent, had only origin or destination outside the study area. The municipality and external breakdown are shown in Table III-24. The remainder of the vehicle trips crossing the cordon line, 6,244 vehicle trips or 6 percent, were through trips, having both origin and destination outside the study area. The station breakdown is shown on Table III-25.

Visitor Person Trips

The external to internal phase of the study recorded 84,226 visitor person trips. The counties adjacent to the study area, Atlantic and Cape May, produced 47,968 visitor trips with destinations in the study area or 57 percent of

TABLE III–15
INTERNAL AUTO DRIVER TRIPS–ALL PURPOSES
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon		4,047	715	283	104	57	162	163	1,506	65	11		73	7,186
2. Pleasantville		730	5,700	1,334	586	429	590	172	2,187	72	288	44	243	12,375
3. Northfield		259	1,452	3,086	780	529	301	63	1,256	183	220	41	396	8,566
4. Linwood		93	488	858	2,061	838	117	21	553	102	140	125	312	5,708
5. Somers Point		69	391	563	807	4,684	100	23	712	124	442	138	2,221	10,274
6. Egg Harbor Twp.		119	650	300	125	111	383	11	921	123	65		87	2,895
7. Brigantine		170	139	63	21	35	46	8,600	2,582	63	42	21	62	11,854
8. Atlantic City		1,619	2,056	1,253	570	846	804	2,621	32,421	4,468	3,634	509	974	51,775
9. Ventnor		66	74	221	123	169	123	41	4,424	4,348	1,814	199	181	11,783
10. Margate		22	247	229	182	356	43	21	3,783	1,784	7,172	644	424	14,907
11. Longport			12	52	115	126	11	21	557	125	765	918	179	2,881
12. Ocean City		73	289	503	366	2,112	87	41	941	211	412	179	38,366	43,580
TOTAL		7,267	12,213	8,745	5,840	10,292	2,767	11,808	51,843	11,668	15,005	2,818	43,518	183,784

TABLE III–16
INTERNAL AUTO PASSENGER TRIPS ALL PURPOSES
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon		2,233	364	229	22	56	218	299	1,123	22	22		75	4,663
2. Pleasantville		364	2,712	1,011	350	245	234	202	1,189	135	139	23	112	6,716
3. Northfield		174	1,113	1,635	609	442	118	42	617	187	164	112	441	5,654
4. Linwood		34	316	605	1,301	381	65		212	10	21	198	274	3,417
5. Somers Point		22	243	489	340	2,733	44	35	313	41	212	201	2,172	6,845
6. Egg Harbor Twp.		66	308	174	65	53	280	32	1,400	73	33		207	2,691
7. Brigantine		330	179			44	32	6,879	2,434		44		21	9,963
8. Atlantic City		1,344	1,206	622	196	446	1,282	2,549	20,837	2,809	2,215	595	1,080	35,181
9. Ventnor		34	52	277	82	12	93		2,838	2,763	1,532	190	192	8,065
10. Margate		44	118	142	52	117	11	63	2,303	1,470	4,376	251	533	9,480
11. Longport			35	113	187	178	11		466	142	313	597	116	2,158
12. Ocean City		75	102	542	263	2,214	208	44	1,080	301	380	191	39,037	44,437
TOTAL		4,720	6,748	5,839	3,467	6,921	2,596	10,145	34,812	7,953	9,451	2,358	44,260	139,270

TABLE III–17
INTERNAL TRUCK PASSENGER TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon		34												34
2. Pleasantville			47			12		35						94
3. Northfield			12				11							23
4. Linwood								10						10
5. Somers Point				12										12
6. Egg Harbor Twp.			12	11			65							88
7. Brigantine														
8. Atlantic City			35		10			219						264
9. Ventnor								20						20
10. Margate														
11. Longport														
12. Ocean City													87	87
TOTAL		34	106	23	10	12	76	284					87	632

TABLE III—18
INTERNAL JITNEY PASSENGER TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon														
2. Pleasantville														
3. Northfield														
4. Linwood														
5. Somers Point														
6. Egg Harbor Twp.														
7. Brigantine														
8. Atlantic City									25,472					25,472
9. Ventnor														
10. Margate														
11. Longport														
12. Ocean City														
TOTAL									25,472					25,472

TABLE III—19
INTERNAL BUS PASSENGER TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon			23						212	11				246
2. Pleasantville		23	34	20	21				470			21	22	611
3. Northfield			10			32			144				10	196
4. Linwood			31			12			76				42	161
5. Somers Point				20	12				101				120	253
6. Egg Harbor Twp.									57					57
7. Brigantine								42	324					366
8. Atlantic City		112	438	144	107	56	54	440	8,378	1,510	1,882	62	309	13,492
9. Ventnor		11							1,459	81	103			1,654
10. Margate									1,775	145	87			2,007
11. Longport			21						185					206
12. Ocean City			22	10	31	120			245				448	876
TOTAL		146	579	194	171	220	54	482	13,426	1,747	2,072	83	951	20,125

TABLE III—20
INTERNAL TAXI PASSENGER TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon														
2. Pleasantville			59	12	10		12							93
3. Northfield			23											23
4. Linwood														
5. Somers Point						23								23
6. Egg Harbor Twp.														
7. Brigantine									116					116
8. Atlantic City									4,087	102	19			4,208
9. Ventnor									81					81
10. Margate									19		87			106
11. Longport														
12. Ocean City									22				66	88
TOTAL			82	12	10	23	12		4,325	102	106		66	4,738

(Home Interview Source)

TABLE III – 21
TOTAL TRANSIT PASSENGER TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon			23						212	11				246
2. Pleasantville		23	93	32	31		12		470			21	22	704
3. Northfield			33			32			144				10	219
4. Linwood			31			12			76				42	161
5. Somers Point				20	12	23			101				120	276
6. Egg Harbor Twp.									57					57
7. Brigantine								42	440					482
8. Atlantic City		112	438	144	107	56	54	440	37,937	1,612	1,901	62	309	43,172
9. Ventnor		11							1,540	81	103			1,735
10. Margate									1,794	145	174			2,113
11. Longport			21						185					206
12. Ocean City			22	10	31	120			267				514	964
TOTAL		146	661	206	181	243	66	482	43,223	1,849	2,178	83	1,017	50,335

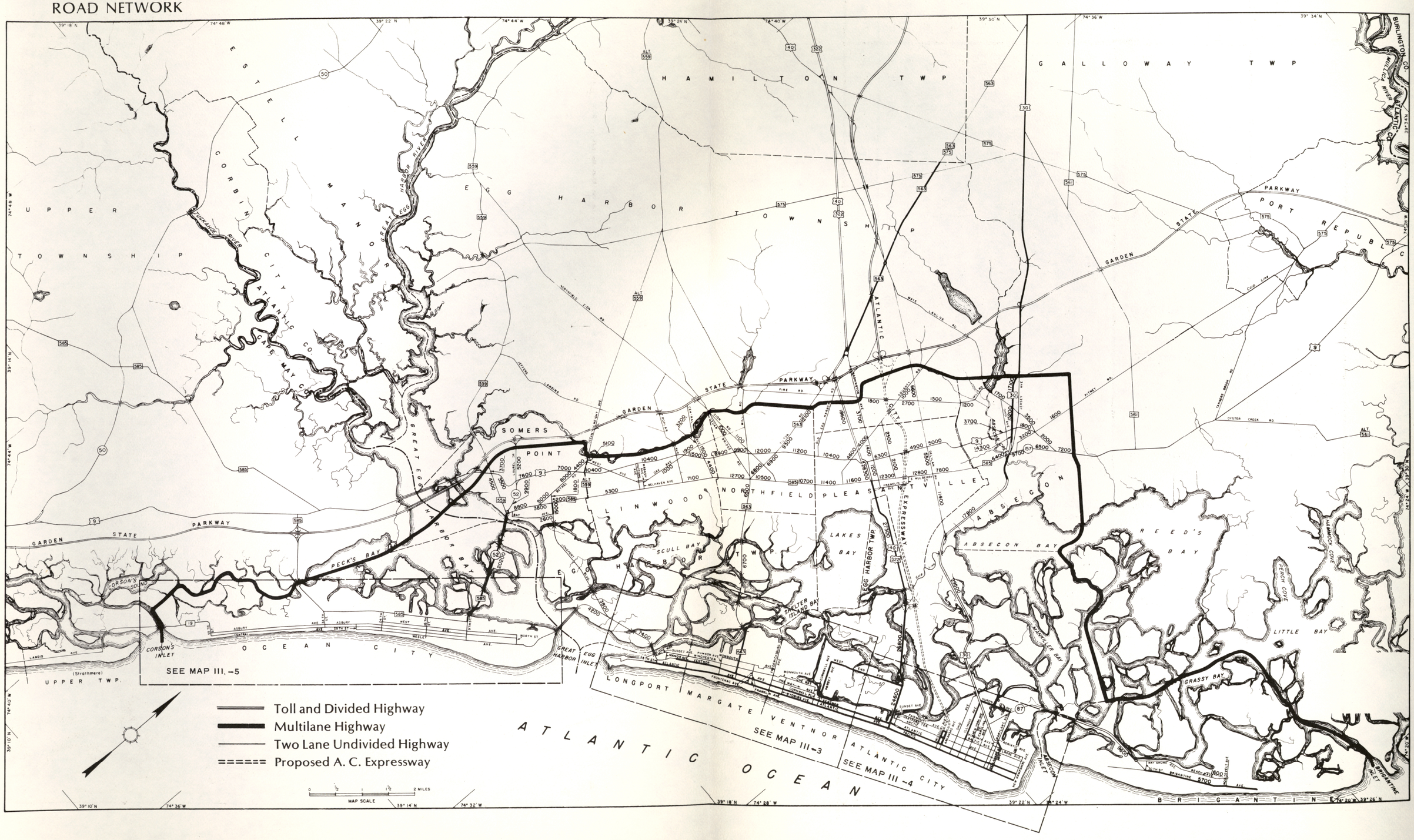
TABLE III – 22
INTERNAL WALK-TO-WORK TRIPS
1965

Destination	Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon		11												11
2. Pleasantville			94											94
3. Northfield														
4. Linwood					94									94
5. Somers Point						35								35
6. Egg Harbor Twp.														
7. Brigantine								105						105
8. Atlantic City									5,215					5,215
9. Ventnor										41				41
10. Margate											174			174
11. Longport												21		21
12. Ocean City													184	184
TOTAL		11	94		94	35		105	5,215	41	174	21	184	5,974

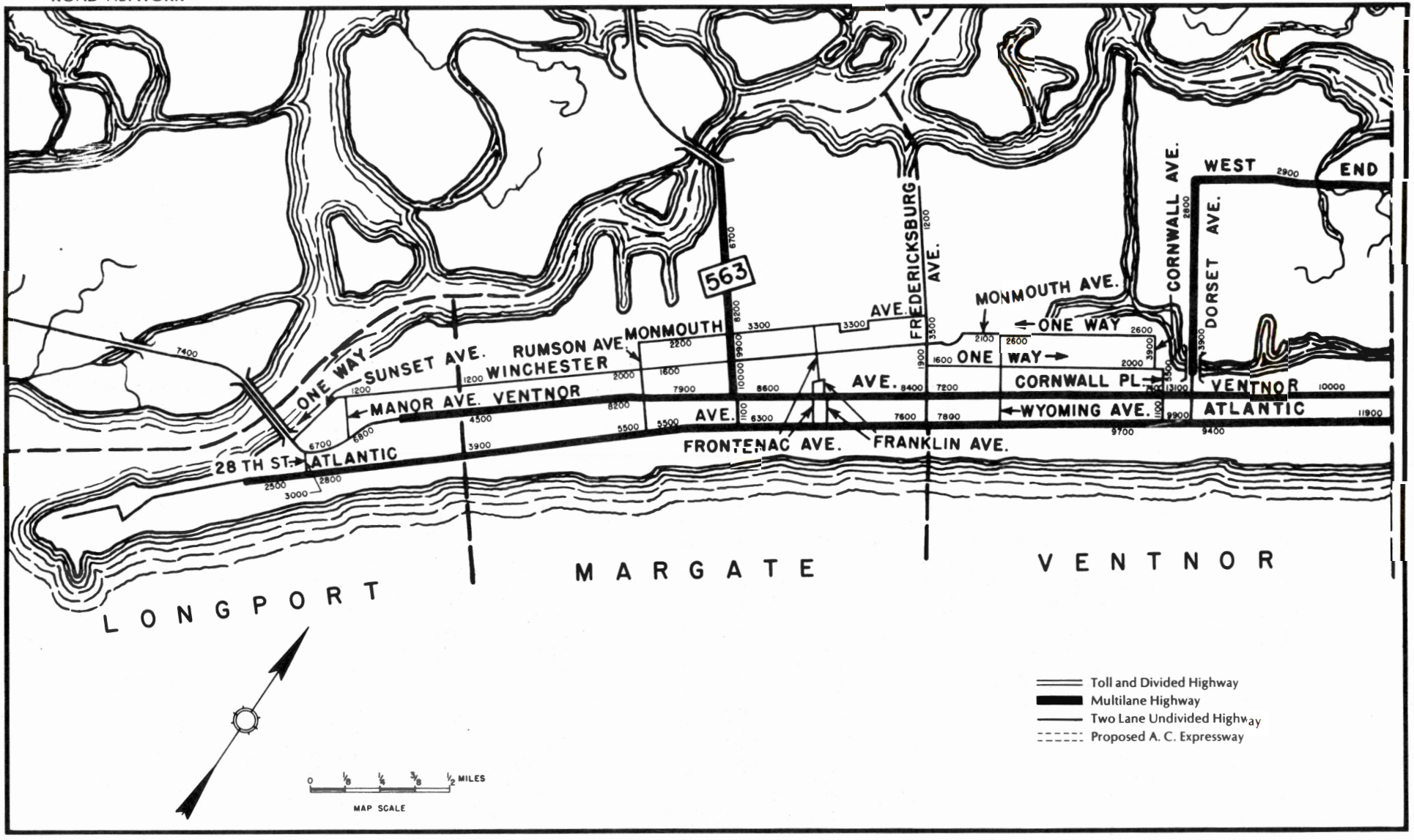
TABLE III–23
TOTAL INTERNAL PERSON TRIPS
1965

Destination / Origin	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Absecon	6,325	1,102	512	126	113	380	462	2,841	98	33		148	12,140
2. Pleasantville	1,117	8,646	2,377	967	686	836	374	3,881	207	427	88	377	19,983
3. Northfield	433	2,610	4,721	1,389	1,003	430	105	2,017	370	384	153	847	14,462
4. Linwood	127	835	1,463	3,456	1,231	182	21	851	112	161	323	628	9,390
5. Somers Point	91	634	1,084	1,159	7,475	144	58	1,126	165	654	339	4,513	17,442
6. Egg Harbor Twp.	185	970	485	190	164	728	43	2,378	196	98		294	5,731
7. Brigantine	500	318	63	21	79	78	15,626	5,454	63	86	21	83	23,392
8. Atlantic City	3,075	3,735	2,019	883	1,348	2,140	5,610	96,629	8,889	7,750	1,166	2,363	135,607
9. Ventnor	111	126	498	205	181	216	41	8,822	7,233	3,449	389	373	21,644
10. Margate	66	365	371	234	473	54	84	7,880	3,399	11,896	895	957	26,674
11. Longport		68	165	302	304	22	21	1,208	267	1,078	1,536	295	5,266
12. Ocean City	149	413	1,055	660	4,446	295	85	2,288	512	792	370	78,188	89,252
TOTAL	12,178	19,822	14,813	9,592	17,502	5,505	22,540	135,377	21,511	26,808	5,280	89,066	379,995

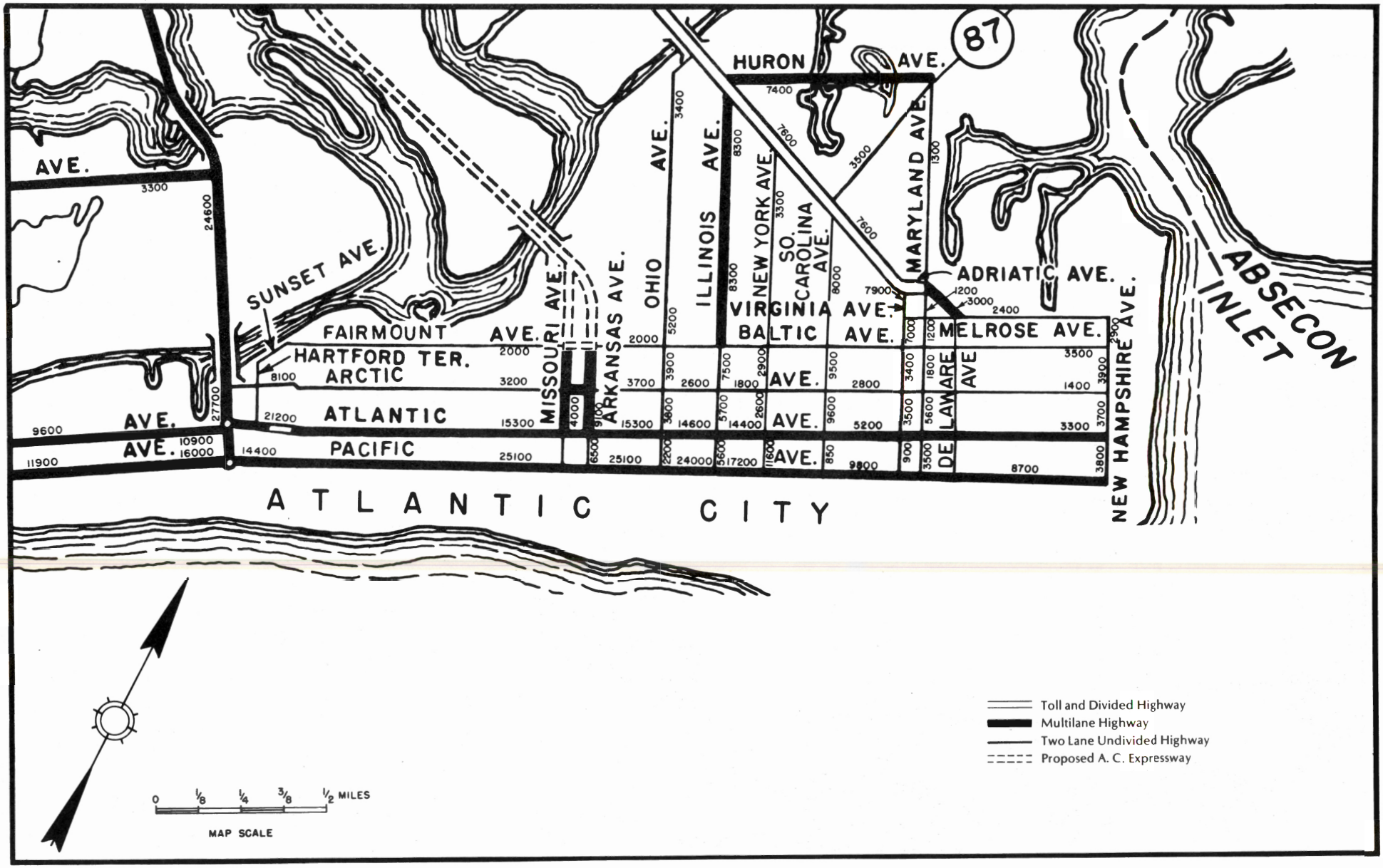
MAP III-2
ASSIGNED TRAFFIC VOLUMES
AVERAGE SUMMER WEEKDAY 1965
HIGHWAY AND ARTERIAL
ROAD NETWORK



MAP III-3
ASSIGNED TRAFFIC VOLUMES
AVERAGE SUMMER WEEKDAY 1965
HIGHWAY AND ARTERIAL
ROAD NETWORK



MAP III-4
ASSIGNED TRAFFIC VOLUMES
AVERAGE SUMMER WEEKDAY 1965
HIGHWAY AND ARTERIAL
ROAD NETWORK



MAP III-5
ASSIGNED TRAFFIC VOLUMES
AVERAGE SUMMER WEEKDAY 1965
HIGHWAY AND ARTERIAL
ROAD NETWORK

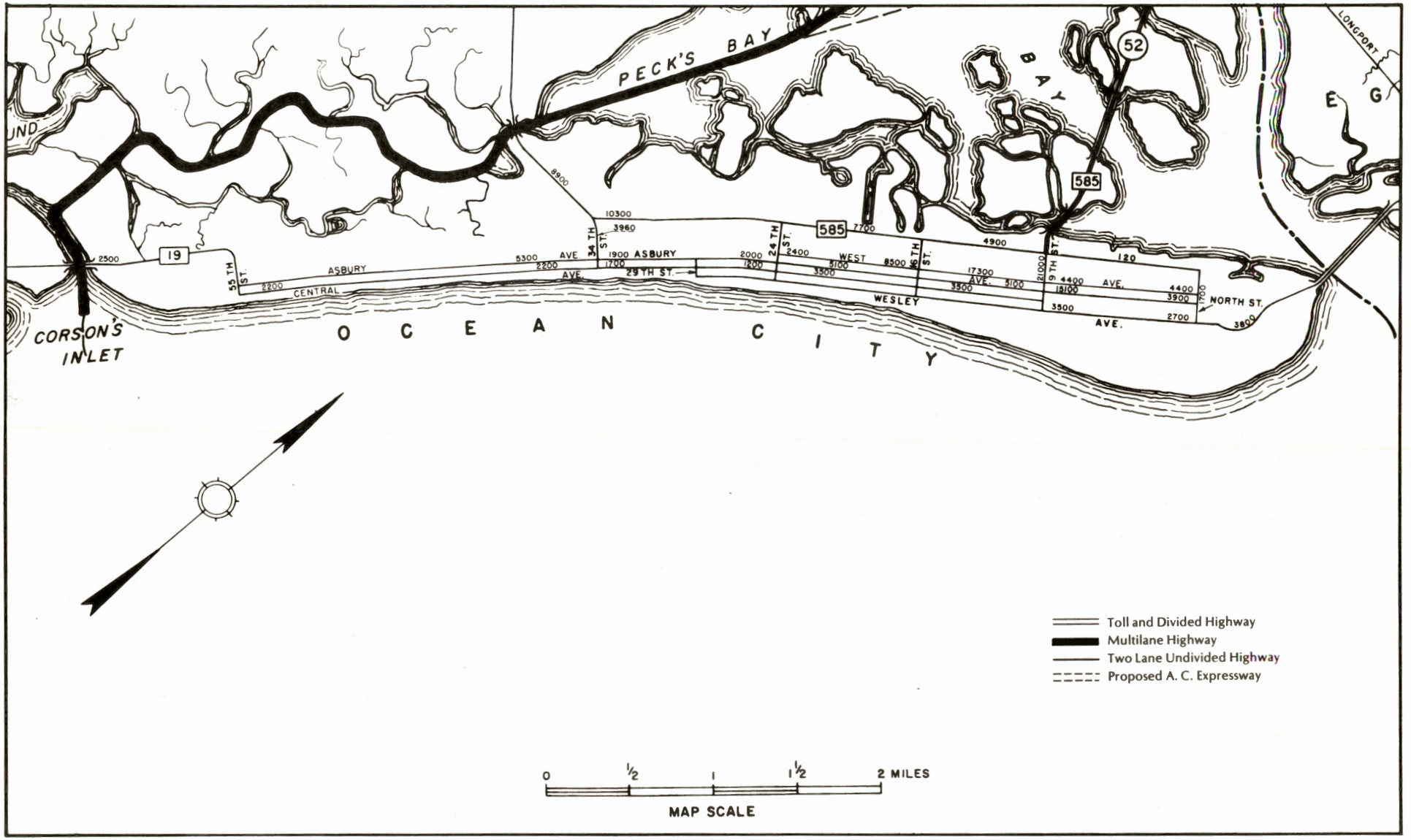


TABLE III – 24
EXTERNAL – INTERNAL – TWO-WAY (ALL VEHICLES)

Destination \ Origin	Station 127	Station 128	Station 129	Station 130	Station 131	Station 132	Station 134	Station 135	Station 137	Station 139	Station 140	Station 141	Station 143	Station 146	Station 147	Station 148	TOTAL
1. Absecon	2	5	37	10		1	36	36	22	130	50	394	490	1,994	592	1,050	4,849
2. Pleasantville	6	42	218	43	1	13	204	393	175	3,509	1,932	221	939	856	256	752	9,560
3. Northfield	7	8	199	25	4	29	702	948	4,324	96	28	9	15	168	90	148	6,800
4. Linwood	7	22	179	61	10	267	1,406	153	1,068	49	14	4	8	92	39	56	3,345
5. Somers Point	29	93	673	820	467	1,460	231	20	585	39	9	3	10	80	12	81	4,612
6. Egg Harbor Twp.	5	7	53	23	17	15	17	20	28	606	72	214	166	107	47	74	1,471
7. Brigantine	19	3	43				8	15	19	102	45	81	744	1,135	27	253	2,494
8. Atlantic City	340	211	741	95	46	41	198	290	529	11,867	1,341	575	3,839	11,479	396	3,074	35,062
9. Ventnor	12	11	114	28	2	27	52	64	479	1,358	53	4	24	164	23	102	2,517
10. Margate	54	30	230	49	13	101	52	106	2,738	360	19	2	30	99	7	117	4,007
11. Longport	20	1	47	26	46	200	12	5	439	37	3		4	16	2	29	887
12. Ocean City	1,627	8,239	386	2,272	4,269	2,703	170	18	1,467	191	25	1	21	294	26	350	22,059
TOTAL	2,128	8,672	2,920	3,452	4,875	4,857	3,088	2,068	11,873	18,344	3,591	1,508	6,290	16,484	1,517	6,086	97,753

TABLE III–25
EXTERNAL–EXTERNAL (ALL VEHICLES)

Destination \ Origin	Station 127	Station 128	Station 129	Station 130	Station 131	Station 132	Station 134	Station 135	Station 137	Station 139	Station 140	Station 141	Station 143	Station 146	Station 147	Station 148	TOTAL OUTBOUND	TOTAL INBOUND	Both
Station 127	1	60	1	25	31	13		1	16	20				13	2	46	229	168	397
Station 128	15	95	30	8	5	4	5		2	1				1		14	180	228	408
Station 129	5	38	5	101	37	81	32	3	40	56	1	1	2	53	11	185	651	595	1,246
Station 130	8	3	82		2		1		1	1	2			3		9	112	157	269
Station 131	41	9	76	4	1		3		4	9		2	2	11	2	22	186	94	280
Station 132	6	2	87	3	1		2	4	1	1		1		3		4	115	111	226
Station 134	1	2	15	2	6	3	3	4	18	3		2		3		5	67	94	161
Station 135	1		8		2	3	5		7			1		3		4	34	27	61
Station 137	20		32	1		1	8	1	3		4	4	1	3		11	89	112	201
Station 139	5		9			1	4	3	6	1	6	16	1	5	5	33	95	187	282
Station 140	3	1	12			1			1	12		1	5	5	2	19	62	37	99
Station 141		2	1	3	4	1			3	19	3		3	15	15	71	140	150	290
Station 143	8	3	14		1	1	1	1		9	6		1	14	9	135	203	89	292
Station 146	31	8	84	4	2	1	20	5	1	8	5	40	13	36	3	76	337	345	682
Station 147		1	11						3	7	1	17	5	19		3	67	55	122
Station 148	23	4	128	6	2	1	10	5	6	40	9	65	56	158	6	38	557	675	1,232
TOTAL INBOUND	168	223	595	157	94	111	94	27	112	187	37	150	89	345	55	675	3,124	3,124	6,248

TABLE III–26
EXTERNAL-INTERNAL VISITOR PERSON TRIPS
1965

Area Code Area	Absecon	Pleasantville	Northfield	Linwood	Somers Point	Egg Harbor Twp.	Brigantine	Atlantic City	Ventnor	Margate	Longport	Ocean City	TOTAL
1. Atlantic County	1,791	3,408	2,498	426	1,076	378	353	5,210	272	432	75	2,379	18,298
2. Camden County	29	68	56	37	72	11	275	2,194	132	486	29	1,694	5,083
3. Cape May County	42	153	343	24	449	32	84	2,696	71	226	91	7,162	13,373
4. Cumberland, Gloucester and Salem Counties	14	82	83	6	100	11	56	1,667	76	88	23	2,300	4,506
5. Burlington and Ocean Counties	110	203	168	16	75	10	79	3,153	64	141	9	703	4,731
6. North Jersey Counties	54	70	34	9	46	8	62	3,346	70	32		631	4,362
7. Canada	38	23	9		21	18	46	1,234	3	12		116	1,520
8. New England States	24	9		6	14	20	5	767	3			62	910
9. New York State	17	26		2	8	15	48	853	83	8	4	177	1,241
10. New York City Metro. Area	52	15	17		10		25	1,591	15	43		190	1,958
11. Pennsylvania	28	36	55	15	90	21	220	5,347	117	345	100	3,495	9,869
12. Philadelphia	32	128	91	32	291	39	463	8,580	569	1,009	217	4,737	16,188
13. Delaware	2	43	2	2	24		42	519	27	1		356	1,018
14. Maryland and District of Columiba	6	9	2	4	20	8	15	1,483	63	5	6	275	1,896
15. Southeastern States		18	19		3		42	297		33		108	510
16. North Central States	40				18		7	340		9	13	167	610
17. Western States							6	104				43	153
TOTAL	2,279	4,297	3,377	579	2,317	571	1,828	39,381	1,565	2,870	567	24,595	84,226

TABLE III–27
GROUPINGS FOR TOTALS OF 1965
RECREATION TRIPS TO ATLANTIC CITY AREA

Group Number	Code Number	Area
1	(1)	Atlantic County
2	(4)	Camden County
3	(5)	Cape May County
4	(6)	Cumberland County
	(8)	Gloucester County
	(17)	Salem County
5	(3)	Burlington County
	(15)	Ocean County
6		NORTHERN JERSEY
	(2)	Bergen County
	(7)	Essex County
	(9)	Hudson County
	(10)	Hunterdon County
	(11)	Mercer County
	(12)	Middlesex County
	(13)	Monmouth County
	(14)	Morris County
	(16)	Passaic County
	(18)	Somerset County
	(19)	Sussex County
	(20)	Union County
	(21)	Warren
7		CANADA
	(22)	Prince Edward Isle
	(23)	New Brunswick
	(24)	Ontario
	(25)	Quebec
8		NEW ENGLAND STATES
	(27)	Maine
	(28)	Massachusetts
8	(29)	New Hampshire
	(30)	Rhode Island
	(31)	Vermont
	(32)	Connecticut
9		NEW YORK STATES
	(33)	New York State (other)
	(34)	Albany
	(35)	Binghamton
	(36)	Buffalo
17		WESTERN STATES
	(57)	Arkansas
	(62)	Louisiana
	(67)	New Mexico
	(71)	Texas
	(74)	Arizona
	(75)	California
	(76)	Colorado
	(77)	Idaho
	(80)	Iowa
	(81)	Kansas
	(83)	Minnesota
	(84)	Missouri
	(85)	Montana
	(86)	Nebraska
	(87)	Nevada
	(88)	North Dakota
	(90)	Oklahoma
	(91)	Oregon
	(92)	South Dakota
	(93)	Utah
	(94)	Washington
	(96)	Wyoming

the total visitor trips.

Philadelphia produced a total of 16,188 person trips or 19 percent of the total visitor trips, of which 8,580 or 10 percent were destined for Atlantic City and 4,737 or 5 percent destined for Ocean City.

Pennsylvania excluding Philadelphia produced 9,869 person trips or 12 percent of the total trips, of which 5,347 or 6 percent were destined for Atlantic City and 3,495 or 4 percent were destined for Ocean City.

All of Pennsylvania produced a total of 26,057 person trips or 31 percent of the total visitor trips.

The tabulation of trips from the external grouped areas to the internal municipalities is shown in Table III-26. For the purpose of tabulating, the external areas were grouped into 17 geographical groups. The areas served by each group are shown in Table III-27.

Volume/Capacity Ratio Analysis

One of the best ways of evaluating the performance and adequacy of a street and highway network is to compare the traffic carried with the theoretical capacity of the various links in the network. The capacities of the links in Atlantic City arterial network were calculated according to established procedures.[3] The assigned traffic volumes were then compared to the capacities by calculating the volume-capacity ratio for each link on the network. These ratios were stratified into groupings which indicate varying degrees of congestion or free-flow.

In addition, at certain times bridge openings increase the delay and congestion on the routes serving the island communities.

SUMMARY OF FINDINGS

The various surveys conducted by the Study have yielded results which heretofore were not available. The statistical data developed by the Study reflect conditions during an average summer weekday in 1965.

1. **At the time of the survey, it was found that 270,000 persons were living or staying in the area on an average weekday. Of these 140,000 were year-round residents and the remainder were seasonal or temporary residents.**
2. **The Study revealed that all residents occupied 94,000 dwelling units.**
3. **Interviews at the cordon line showed that 104,000 vehicles entered or left the study area on an average summer weekday. Nearly 94 percent of these had their origins or destinations inside the cordon area; the other six percent were through trips.**
4. **The internal survey showed that 183,000 auto trips were made within the study area; trucks made 35,000 trips and taxis 6,600 trips.**
5. **The travel patterns in the area did not exhibit the characteristics of a normal urban area. The usual morning and afternoon peak travel periods were not evident in the Atlantic City Area.**
6. **Land uses in the area were not distributed in the proportions expected in most urban complexes. The Land Use Inventory showed that manufacturing is practically non-existent while there was an above average number of cultural, entertainment and recreation facilities.**
7. **The family incomes in the study area were generally lower than those for New Jersey.**
8. **Visitors came to the area from all sections of the United States and Canada. The largest portion came from the Philadelphia metropolitan area.**
9. **The rate of auto ownership in the central city was considerably lower than in the suburban communities.**
10. **The number of jobs available in the area was less than the number of workers, producing an outward commuting pattern.**
11. **Although the present street network serves most of the area adequately, there are several links in the system that are operating above their capacity.**

REFERENCES
CHAPTER III

1. **U.S. Department of Commerce, Bureau of the Cesus,** *U.S. Census of Population, 1960, Detailed Characteristics,* **p. XVII.**
2. *Penn Jersey Transportation Study,* **Vol. I, 1964, pp. A2, A3.**
3. **American Association of State Highway Officials,** *Highway Capacity Manual, 1950.*

CHAPTER IV

SOCIO-ECONOMIC FORECASTS AND TRENDS

Transportation estimates rely heavily on socio-economic data and attendant trends. Socio-economic data for the cordon area were developed for thirteen categories (Table IV-1) some of which will, hopefully, indicate the level of effort and degree of justification with which we should be pursuing the appropriate type of transportation system.

The base year used was 1965; the forecast year 1985. Thus, this twenty year interval was used to predict significant trends.

Results

One significant result was that total population is predicted to increase 26% by 1985. Some of the consequences of this increase will be an increase in dwelling units, a 67% increase in vehicles, and a 35% increase in the vehicle per dwelling unit relationship.

Employment is expected to increase 26% by 1985. The ratio of jobs per year round population will change from 0.305 in 1965 to 0.315 in 1985.

Definitions

The study area is composed of the municipalities of Absecon, Pleasantville, Northfield, Linwood, Somers Point, Egg Harbor Township (Part), Brigantine, Atlantic City, Ventnor, Margate, Longport, and Ocean City.

Some of the terms which will be used throughout the chapter are:

Employment – People holding jobs at place of work
Net Residential Density – Households per acre of residential area
Cordon Line – Line that encompasses the study area

Population

The population of a given area is in and of itself a generative socio-economic factor. To reach conclusions regarding this significant factor, we must first arrive at an acceptable methodology which evinces a certain level of confidence. The 1985 ACUATS estimate is within 1.6% of the 1985 U.S. Bureau of the Census forecast.

Comparing the rate of growth for the same period in the cordon area to the net increase in the state, it is evident that the study area's overall growth rate is below that of the state. The growth of the state during the 1950-1960 decennial period was 25% (2.2% per year); Atlantic County 21.5% (2.0%); the cordon area, 18% (1.7%). In the 25 year period from 1960 to 1985 ACUATS' permanent population is expected to grow at an even slower rate with an increase of 38% (1.3%) during this time span.

This pattern seems to follow the historical trend of Atlantic County. From 1930 to 1960, New Jersey increased in population by 50% (1.4%) but Atlantic County only increased 29% (.8%). In part, this is attributable to the absence of a balanced year round economic base of job opportunities for the permanent population. Table IV-2 provides a detailed listing of census and ACUATS data.

Non-Permanent Population

The seasonal and temporary population of the study area amounted to 48% of the total population for 1965. The projection in 1985 is 50%. Brigantine, Atlantic City, Longport, and Ocean City will have more than 50% of this non-permanent population. Absecon, Pleasantville, Northfield, Linwood, and Somers Point, in the aggregate, have a non-permanent population of 9% for 1985. Egg Harbor is the only mainland community which will have an appreciable amount of non-permanent population – 49%. On Table IV-3 a detailed breakdown of population by municipalities is shown.

Dwelling Units

In 1985, Atlantic City and Ocean City will

TABLE IV–1
CORDON WIDE
1965 TO 1985 FORECAST

Item	1965	1985	Percent Increase
Population (1)	271,873	341,761	25.71
Number of Occupied D.U.'s (1)	93,830	115,529	23.13
Number of Jobs (1)	42,972	54,122	25.95
Median Family Income (2)	6,520	9,567	46.73
Automobiles (1)	83,013	138,325	66.63
Vehicles per Dwelling Unit (1)	.8847	1.197	35.30
Acres of Commercial Land	3,588	4,095	14.13
Acres of Residential Land	5,915	8,596	45.33
Household Size	2.90	2.97	2.41
Net Residential Density-Households/Res. Acre	15.86	13.44	15.26
Population Density-People/Res. Acre	45.96	39.76	–13.49
Persons per Auto	3.274	2.471	–24.53
Employment	42,972	54,122	25.95
Study Area	61 Square Miles		

(1) Year round, seasonal and temporary
(2) Total income in cordon area, year round

TABLE IV–2
POPULATION

	Decennial Municipal Census Population		A.C.U.A.T.S. Year Round		Per Cent Increase		
	1950	1960	1965	1985	1950-1960	1960-1965	1965-1985
New Jersey	4,835,329	6,066,782			25.47		
Absecon	2,355	4,320	5,281	8,447	83.44	22.25	59.95
Pleasantville	11,938	15,172	15,805	22,237	27.09	4.17	40.70
Northfield	3,498	5.849	7,649	9,965	67.21	30.77	30.28
Linwood	1,925	3,847	5,139	7,003	99.84	33.58	36.27
Somers Point	2,480	4,504	6,109	7,881	81.61	35.63	29.01
Egg Harbor Township*	360	608	1,227	2,795	68.89	101.81	127.79
Brigantine	1,267	4,201	6,094	7,649	231.57	45.06	25.52
Atlantic City	61,657	59,544	59,587	61,898	–03.42	0.07	03.88
Ventnor	8,158	8,688	10,821	14,853	6.50	24.55	37.26
Margate	4,715	9,474	10,400	13,522	100.93	9.77	30.02
Longport	618	1,077	1,584	1,763	74.27	47.08	11.30
Ocean City	6,040	7,618	11,193	13,879	26.13	46.93	24.00
S.M.S.A.	105,011	124,902	140,889	171,892	18.94	12.80	22.01
United States	151,326,000	179,323,000			18.50		

*Part of Egg Harbor Township

TABLE IV—2 (Continued)
STATE, COUNTY AND A.C.U.A.T.S
POPULATION AND PERCENT

	New Jersey	Atlantic County	Percent Of Atlantic County To N.J. Population	A.C.U.A.T.S. Population	Percent Of A.C.U.A.T.S. To Atlantic County Population
1930	4,041,334	124,823	3.09%	102,024	81.73%
1940	4,160,165	124,066	2.98%	100,096	80.68%
1950	4,835,329	132,399	2.74%	105,011	79,31%
1960	6,066,782	160,880	2.65%	124,902	77.64%
1930/60	50.11%	20.88%		22.42%	

Source: Department of Conservation and Economic Development
Division of State and Regional Planning

TABLE IV–3
POPULATION BY MUNICIPALITIES

Municipality	Year Round			Seasonal + Temporary			Ratio Of Seasonal + Temporary To Total Population	
	1965	1985	% Increase	1965	1985	% Increase	1965	1985
Absecon	5,281	8,447	59.95	817	1,511	84.94	.1339	.1517
Pleasantville	15,805	22,237	40.70	609	1,620	166.01	.0371	.0679
Northfield	7,649	9,965	30.28	20	28	40.00	.0026	.0028
Linwood	5,139	7,003	36.27	42	48	14.29	.0081	.0068
Somers Point	6,109	7,881	29.01	1,169	1,712	46.45	.1606	.1784
Egg Harbor*	1,227	2,795	127.79	1,684	2,717	61.34	.5784	.4929
Brigantine	6,094	7,649	25.52	6,596	8,756	32.75	.5198	.5337
Atlantic City	59,587	61,898	03.88	60,568	71,686	18.36	.5042	.5366
Ventnor	10,821	14,853	37.26	6,261	8,147	30.12	.3664	.3542
Margate	10,400	13,522	30.02	8,308	9,859	18.67	.4442	.4217
Longport	1,584	1,763	11.30	1,967	2,453	24.71	.5539	.5818
Ocean City	11,193	13,879	24.00	42,943	61,332	42.80	.7933	.8155
S.M.S.A.	140,889	171,892	22.01	130,984	169,869	29.69	.4818	.4970

*Part of Egg Harbor Township

YEAR ROUND – Permanent resident of municipality
SEASONAL – Resident of more than 30 days but not a permanent resident
TEMPORARY – Resident of less than 30 days.

have the highest ratios of non-permanent dwellings to total dwelling units—57% and 78% respectively. There will be a 19% increase in permanent dwelling units and a 25.1% increase in non-permanent dwelling units.

Table IV-4 shows a decrease in the non-permanent occupancy in nine of the twelve municipalities. This indicates that proportionally more dwellings will be available in 1985 for residents in that category.

The Urban Renewal Program will have decreased the year round housing supply in Atlantic City from 28.9 dwellings per residential acre in 1965 to 27.7 dwellings per acre in 1985. This program was undertaken because of the old and deteriorated housing supply and the scarcity of new developable land.

Vehicle Ownership

The 1965 origin and destination survey indicated that 83,013 passenger vehicles were in the cordon area. This represents 0.305 vehicles per person for the total population. Extrapolating this figure to 1985 shows an increase to 138,325 vehicles, or a 67% increase from 1965. Table IV-5 gives the municipal amounts and percentage increases.

One of the significant conclusions drawn is that as income in low income areas increases, vehicle ownership increases disproportionately. Table IV-6 shows that Atlantic City, which houses the bulk of the low income population will have a 46% increase of automobile ownership per dwelling unit in 1985. This is by far the largest increment in the cordon area. However, in 1985 Atlantic City will still have a lower number of automobiles per dwelling unit than the other municipalities. Thus, despite its large increase in vehicles per dwelling unit, Atlantic City residents will continue to rely on public transportation for much of their travel needs.

Conversely, the outlying areas, because of their very existence, represent the mobility which the privately owned vehicle affords. These sparsely populated and widely dispersed areas are not conducive to being served by public transportation.

Land Use

The ACUATS land use survey was done on a zonal basis and aggregated by municipality as indicated in the previous chapter. The accompanying land use Tables IV-7 to IV-12 indicate that the total land area has been broken down into commercial, residential, transportation and vacant land. In 1965, the area had 15% residential, 9% commercial, 15% transportation, and 61% vacant land. In 1985, it is projected to be 22% residential, 11% commercial, 17% transportation and 50% vacant land.

Residential

Residential land includes all dwelling units ranging from a single family house to multi-unit dwellings.

The most intensive residential areas are on the island portion of the cordon area—Ocean City, Longport, Margate, Ventnor and Brigantine. On the mainland, Pleasantville has the highest residential density.

Commercial

The Central Business Districts of the area possess the attributes of being densely impacted and having a low residential density. The main commercial areas are located in Ocean City, Atlantic City and Pleasantville. The densest commercial areas with two exceptions are located in the C.B.D's of those municipalities. The exceptions take the form of regional shopping centers located on major arterials. For instance, in Atlantic City, a shopping center is located along U.S. 40 between Atlantic City and Pleasantville. West of Pleasantville and outside of the cordon area, the activity is centered at the Atlantic City Race Track and the National Aviation Facilities Experimental Center.

Vacant Land

In Table IV-7, 23,603 acres were available for development in 1965, 3,188 of which are to be developed residentially and commercially by 1985. After existing land is utilized some of the alternative ways of developing land is to reclaim the swamp and marsh land (26 square miles or 44% of the total study area), expand westward onto the mainland, and demolish and rebuild as either a public or private project. As indicated in Table IV-10, there are 2,682 acres of zoned residential land to be developed between 1965 and 1985. The listing in Table 11 indicates that Longport will develop approximately 20 residential areas. Ocean City, on the other end of the scale, will develop 493 residential acres.

In applying the same comparison to com-

TABLE IV–4
PEOPLE PER DWELLING UNIT
YEAR ROUND AND SEASONAL AND TEMPORARY

Municipality	Year-Round			Seasonal + Temporary		
	1965	1985	Percent Change	1965	1985	Percent Change
Absecon	3.29	3.33	01.21	1.64	1.72	04.88
Atlantic City	2.63	2.64	00.38	2.31	2.30	–00.43
Brigantine	3.26	3.31	01.53	3.76	3.67	–02.39
Egg Harbor*	2.67	2.85	06.74	2.78	2.71	–02.52
Linwood	3.50	3.53	00.86	4.20	3.20	–28.00
Longport	2.49	2.59	04.02	3.67	3.56	–3.00
Margate	3.38	3.48	02.96	4.07	3.95	–2.95
Northfield	3.43	3.45	00.58	2.00	1.27	–36.50
Ocean City	2.92	2.97	01.71	3.68	3.77	02.45
Pleasantville	3.27	3.25	–00.61	2.77	3.73	34.65
Somers Point	3.17	3.24	02.21	2.93	2.73	–06.83
Ventnor	2.96	3.07	03.72	3.81	3.67	–3.67
S.M.S.A.	2.92	2.99	2.40	2.88	2.92	1.39

*See footnote on Table 4
*Only part of Egg Harbor Township is in this study area.

TABLE IV–5
AUTOMOBILES (TOTAL)

Municipality	1965 (1)	1985	% Increase 1965 to 1985
Absecon	2,847	5,896	107.09
Atlantic City	25,510	40,830	60.05
Brigantine	4,530	7,276	60.62
Egg Harbor Twp. (2)	1,181	3,033	156.82
Linwood	2,123	3,283	54.64
Longport	1,402	2,275	62.27
Margate	7,191	10,862	51.05
Northfield	3,156	4,901	55.29
Ocean City	19,819	34,169	72.41
Pleasantville	5,811	10,226	75.97
Somers Point	3,148	5,185	64.71
Ventnor	6,295	10,389	65.03
S.M.S.A.	83,013	138,325	66.63

(1) Total autos based in the area in the summer as per O. & D. data.
(2) Part of Egg Harbor Township.

TABLE IV–6
AUTO OWNERSHIP
PER DWELLING UNIT

Municipality	1965	1985	% Increase
Absecon	1.35	1.72	27.41
Atlantic City	.52	.76	46.15
Brigantine	1.25	1.55	24.00
Egg Harbor Twp.*	1.11	1.53	37.84
Linwood	1.44	1.64	13.89
Longport	1.20	1.66	38.33
Margate	1.41	1.66	17.73
Northfield	1.41	1.69	19.86
Ocean City	1.28	1.63	27.34
Pleasantville	1.15	1.40	21.74
Somers Point	1.36	1.69	24.26
Ventnor	1.19	1.47	23.53
S.M.S.A.	.88	1.20	36.36

*Part of Egg Harbor Township

TABLE IV–7

Municipality	1965 Residential Acreage	1965 Commercial Acreage	1965 Available Residential And Commercial Acreage	1965 Transportation Acreage	1985 Residential Acreage	1985 Commercial Acreage	1985 Available Residential And Commercial Acreage	1985 Transportation Acreage	Total Acreage
Absecon	557.37	213.57	2,453.79	521.16	897.31	241.57	2,040.42	566.59	3,745.89
Atlantic City	783.90	639.20	4,430.78	1,150.63	844.66	816.48	4,156.38	1,186.99	7,004.51
Brigantine	387.15	269.01	3,258.53	388.43	579.11	279.08	3,056.50	388.43	4,303.12
Egg Harbor Twp.*	202.36	352.41	4,766.21	293.87	561.53	363.59	4,321.33	368.40	5,614.85
Linwood	575.80	303.02	1,318.99	294.72	748.85	324.99	1,069.44	349.25	2,492.53
Longport	103.12	14.12	26.64	87.53	123.22	15.50	5.16	87.53	231.41
Margate	379.46	112.06	135.78	312.33	488.39	121.45	17.46	312.33	939.63
Northfield	601.64	740.25	741.52	293.91	799.09	786.87	421.11	370.24	2,377.32
Ocean City	865.72	219.57	2,580.90	868.92	1,359.27	265.75	1,873.93	1,036.16	4,535.11
Pleasantville	726.09	315.62	1,927.63	725.26	1,095.66	468.57	1,375.67	790.70	3,694.60
Somers Point	439.60	296.59	1,368.50	481.43	568.48	331.98	817.00	868.66	2,586.12
Ventnor	292.19	76.94	593.83	326.32	530.49	79.29	353.18	326.32	1,289.28
S.M.S.A.	5,914.40	3,588.36	23,603.10	5,744.51	8,596.06	4,095.12	19,507.58	6,651.60	38,814.37

*Part of Egg Harbor Township

TABLE IV–8

Municipality	1965 Percent Residential	1965 Percent Commercial	1965 Percent Available Residential & Commercial	1965 Percent Transportation	1985 Percent Residential	1985 Percent Commercial	1985 Percent Available Residential & Commercial	1985 Percent Transportation
Absecon	14.88	5.70	65.51	13.91	23.96	6.45	54.57	15.13
Atlantic City	11.19	9.13	63.26	16.42	12.06	11.66	59.34	16.95
Brigantine	9.00	6.25	75.73	9.02	13.46	6.49	71.03	9.02
Egg Harbor Twp.*	3.60	6.28	84.89	5.23	10.00	6.48	76.96	6.56
Linwood	23.10	12.16	52.92	11.82	30.04	13.04	42.91	14.01
Longport	44.56	6.10	11.51	37.83	53.25	6.70	2.23	37.82
Margate	40.38	11.93	14.45	33.24	51.98	12.93	1.86	33.23
Northfield	25.31	31.14	31.19	12.36	33.61	33.10	17.71	15.57
Ocean City	19.09	4.84	56.91	19.16	29.97	5.86	41.32	22.85
Pleasantville	19.65	8.54	52.17	19.63	29.66	12.68	37.24	21.40
Somers Point	17.00	11.47	52.92	18.61	21.98	12.84	31.59	33.59
Ventnor	22.66	5.97	46.06	25.31	41.15	6.15	27.39	25.31
S.M.S.A.	15.24	9.25	60.81	14.80	22.15	10.55	50.26	17.14

*Part of Egg Harbor Township

TABLE IV–9

Municipality	1965 Percent Cordon Residential	1965 Percent Cordon Commercial	1965 Percent Cordon Available	1965 Percent Cordon Transportation	1985 Percent Cordon Residential	1985 Percent Cordon Commercial	1985 Percent Cordon Available Residential & Commercial	1985 Percent Cordon Transportation	Percent Cordon Total Acreage
Absecon	9.42	5.95	10.40	9.08	10.44	5.90	10.46	8.52	9.65
Atlantic City	13.25	17.81	18.77	20.11	9.83	19.94	21.31	17.84	18.05
Brigantine	6.55	7.50	13.81	6.81	6.74	6.81	15.67	5.84	11.09
Egg Harbor Twp.*	3.42	9.82	20.19	5.18	6.53	8.88	22.15	5.53	14.47
Linwood	9.74	8.44	5.59	5.20	8.71	7.94	5.48	5.25	6.42
Longport	1.74	.39	.11	1.53	1.43	.38	.03	1.32	.60
Margate	6.42	3.12	.58	5.46	5.68	2.97	.09	4.70	7.42
Northfield	10.17	20.63	3.14	5.09	9.30	19.21	2.16	5.57	6.12
Ocean City	14.64	6.11	10.93	15.06	15.81	6.49	9.60	15.57	11.68
Pleasantville	12.28	9.80	8.17	12.39	12.75	11.44	7.05	11.89	9.52
Somers Point	7.43	8.27	5.80	8.39	6.61	8.11	4.19	13.06	6.66
Ventnor	4.94	2.14	2.52	5.70	6.17	1.94	1.81	4.91	3.32

*Part of Egg Harbor Township

TABLE IV–10

Municipality	Acres Of Residential Development 1965-1985	Acres Of Commercial Development 1965-1985	Municipal Percent Residential Development 1965-1985	Cordon Percent Residential Development 1965-1985	Municipal Percent Commercial Development 1965-1985	Cordon Percent Commercial Development 1965-1985
Absecon	339.94	28.00	9.08	12.68	.75	5.52
Atlantic City	60.76	177.28	.87	2.27	2.53	34.98
Brigantine	191.96	10.07	4.46	7.16	.23	1.99
Egg Harbor Twp.*	359.17	11.18	6.40	13.39	.20	2.21
Linwood	173.05	21.97	6.94	6.45	.88	4.35
Longport	20.10	1.38	8.69	.75	.60	.27
Margate	108.93	9.39	11.59	4.06	1.00	1.85
Northfield	197.45	46.62	8.31	7.36	1.96	9.20
Ocean City	493.55	46.18	10.88	18.40	1.02	9.11
Pleasantville	369.57	116.95	10.00	13.78	3.17	23.08
Somers Point	128.88	35.39	4.98	4.81	1.37	6.98
Ventnor	238.30	2.35	18.48	8.89	.18	.46
S.M.S.A.	2681.66	506.76		100.00		100.00

*Part of Egg Harbor Township

TABLE IV–11
RESIDENTIAL DEVELOPMENT
FROM 1965 TO 1985

Municipalities	Deviation From Mean (Acre)	Acres of Residential Development
Longport	−203.37	20.10
Atlantic City	−162.71	60.76
Margate	−114.54	108.93
Somers Point	−94.59	128.88
Linwood	−50.42	173.05
Brigantine	−31.51	191.96
Northfield	−26.02	197.45
Municipal Average	223.47	
Ventnor	+14.83	238.30
Absecon	+116.47	339.94
Egg Harbor	+135.70	359.17
Pleasantville	+146.10	369.57
Ocean City	+270.08	493.55

TABLE IV–12
COMMERCIAL DEVELOPMENT
FROM 1965 TO 1985

Municipalities	Deviation From Mean (Acre)	Acres of Residential Development
Longport	−40.85	1.38
Ventnor	−39.88	2.35
Margate	−32.84	9.39
Brigantine	−32.16	10.07
Egg Harbor*	−31.05	11.18
Linwood	−20.26	21.97
Absecon	−14.23	28.00
Somers Point	−6.84	35.39
Municipal Average	42.23	
Ocean City	+3.95	46.18
Northfield	+4.39	46.62
Pleasantville	+74.72	116.95
Atlantic City	135.05	177.28

*Part of Egg Harbor Township

mercial development, Longport will develop 1.38 acres, Atlantic City will develop 177 acres of the 506 total commercial acres in ACUATS by 1985.

Employment

Table IV-13 shows employment for year round dwelling units. These statistics are based on the home based trips and roadside inbound work trips.

The most prevalent dormitory municipalities are Absecon, Ventnor and Longport while the most job generative communities are Atlantic City and Ocean City. They have a 14% net attraction of jobs compared with the number of year round dwelling units.

Because of the seasonal nature of business inside the cordon line, the mainland population must look outside the area to find employment. Table IV-13 indicates that 9 out of 10 jobs are located within the cordon area.

This trend does improve somewhat by 1985. Only 1 out of 20 jobs come from outside the area. This assumption is based on the one job per year round household premise.

Employment Increase

Table IV-14 indicates that the S.M.S.A. of Atlantic City will realize a 22% increase in permanent population and a 26% increase in employment by 1985. Within the cordon line employment is increasing at a faster rate than population. If the current trend continues, Atlantic City and Ocean City will generate most of the new jobs—an increase of 27% over 20 years to 38,059 jobs out of 54,122 jobs projected for the area (See Table IV-15).

The combine of Atlantic City and Ocean City had 30,000 jobs in 1965 or 69.81% of the jobs in the cordon area. In 1985, it accounts for 38,059 jobs or 70.32% of the jobs. This combine demonstrates economic generative strength.

In Table IV-14, the relationship between the population increase to the employment increase from 1965 to 1985 shows some significant developments. The City of Ventnor has the highest ratio (31.02), Atlantic City has the lowest (0.332). These statistics indicate that Ventnor is increasing its population thirty-one times faster than jobs and Atlantic City is creating three new jobs for every new inhabitant. In other words, Ventnor will continue to be a dormitory suburb and Atlantic City will continue to be a dynamic job generative force.

After 1985

In 1985 about 19,500 acres of land will be vacant in the ACUATS region Table IV-16, in deviations from the mean, lists the developable acreage available to each municipality.

Longport has the least amount of developable acreage—five acres, or 0.03% of all vacant land. At the other end of the spectrum, Egg Harbor Township has the greatest amount of developable land—4,321 acres, or 21% of all vacant land.

A clue to the kind of development which could take place on this vacant land is illustrated by the land available in Atlantic City and Egg Harbor Township. This land is served by U.S. Route 30, U.S. Route 40, the Garden State Parkway and the Atlantic City Expressway. The infrastructure of already existing utilities is ripe for industrial park expansion. There is certainly sufficient land for the construction of typical industrial parks with their one story buildings, parking lots and ample space for loading, landscaping and future expansion.

Table IV-17, illustrates that Longport and Margate will have used up most of their vacant land by 1985. Of course, it must be realized, that the ample space seemingly available for development in Brigantine and Egg Harbor Township is primarily marshland, not economically suitable for development.

TABLE IV—13
EMPLOYMENT

Municipality	Employment 1965	Year Round D.U. 1965	Employment Year Round D.U. 1965	Employment 1985	Year Round D.U. 1985	Employment Year Round D.U. 1985
Absecon	801	1,605	.499	989	2,536	.390
Atlantic City	25,880	22,681	1.141	32,849	23,393	1.404
Brigantine	933	1,872	.498	1,212	2,310	.525
Egg Harbor*	755	458	1.648	862	979	.880
Linwood	1,106	1,467	.754	1,391	1,982	.702
Longport	158	636	.248	199	681	.292
Margate	1,775	3,076	.577	2,232	3,876	.576
Northfield	1,470	2,230	.659	1,850	2,881	.642
Ocean City	4,130	3,839	1.076	5,210	4,680	1.113
Pleasantville	3,216	4,831	.666	4,093	6,842	.598
Somers Point	1,435	1,928	.744	1,812	2,436	.744
Ventnor	1,293	3,655	.354	1,423	4,836	.294
S.M.S.A.	*42,972	48,278	.890	54,122	57,432	.942

*The Employment Distribution consists of one-half of the home base work trips + roadside inbound work trips.
*Part of Egg Harbor Township

TABLE IV–14
TOTAL EMPLOYMENT

Municipality	1965	1985
Absecon	801	989
Atlantic City	25,880	32,849
Brigantine	933	1,212
Egg Harbor Township*	775	862
Linwood	1,106	1,391
Longport	158	199
Margate	1,775	2,232
Northfield	1,470	1,850
Ocean City	4,130	5,210
Pleasantville	3,216	4,093
Somers Point	1,435	1,812
Ventnor	1,293	1,423
S.M.S.A.	42,972	54,122

*Part of Egg Harbor Township

TABLE IV–15
1965 TO 1985 YEAR ROUND
POPULATION AND EMPLOYMENT PROJECTIONS

Municipality	Population Increase	Percent Increase	Employment Increase	Percent Increase	Population Increase Employment Increase
Absecon	3,166	59.95	188	23.47	16.840
Atlantic City	2,311	3.87	6,969	26.92	.332
Brigantine	1,555	25.51	279	29.90	5.573
Egg Harbor Twp.*	1,568	127.79	87	11.22	18.022
Linwood	1,864	36.27	285	25.76	6.540
Longport	179	11.30	41	25.94	4.365
Margate	3,122	30.01	457	25.74	6.831
Northfield	2,316	30.27	380	25.85	6.094
Ocean City	2,686	23.99	1,080	26.15	2.487
Pleasantville	6,432	40.69	877	27.27	7.334
Somers Point	1,772	29.00	377	26.27	4.700
Ventnor	4,032	37.26	130	10.05	31.015
S.M.S.A.	31,003	22.01	11,150	25.95	2.78

*Part of Egg Harbor Township

TABLE IV – 16
1985 DEVELOPABLE ACREAGE AVAILABLE

Municipality	Vacant Land Beyond 1985 (Acres)	Deviation From The Mean (Acres)
Longport	–1,620.47	5.16
Margate	–1,608.17	17.46
Ventnor	–1,272.45	353.18
Northfield	–1,204.52	421.11
Linwood	–556.19	1,069.44
Somers Point	–808.63	817.00
Pleasantville	–249.96	1,375.67
Municipal Average	1,625.63	
Ocean City	+248.30	1,873.93
Absecon	+414.79	2,040.42
Brigantine	+1,430.87	3,056.50
Atlantic City	+2,530.75	4,156.38
Egg Harbor*	+2,695.70	4,321.33

*Part of Egg Harbor Township

TABLE IV – 17
MUNICIPAL VACANT LAND
IN 1965 AND 1985

Municipalities	Available Acreage		Municipal Percent Available	
	1965	1985	1965	1985
Absecon	2,453.79	2,040.42	66%	55%
Atlantic City	4,430.78	4,156.38	63%	59%
Brigantine	3,258.53	3,056.50	76%	71%
Egg Harbor Twp.*	4,766.21	4,321.33	85%	77%
Linwood	1,318.99	1,069.44	53%	43%
Longport	26.64	5.16	12%	2%
Margate	135.78	17.46	15%	2%
Northfield	741.57	421.11	31%	18%
Ocean City	2,580.90	1,873.93	57%	41%
Pleasantville	1,927.63	1,375.67	52%	37%
Somers Point	1,368.50	817.00	53%	32%
Ventnor	593.83	353.18	46%	27%

*Part of Egg Harbor Township

CHAPTER V

THE TRANSPORTATION PLAN

The primary goal of an Urban Area Transportation Study is the development of an area wide transportation plan that will promote desired growth in the area and accommodate the transportation needs brought about by this growth. In developing the *"ultimate"* plan, the study must concern itself with considerable amounts of data for the area. In Chapter 3, 1965 traffic data for ACUATS were presented. While this information is useful in evaluating present conditions in the area, forecasts of these data were necessary to obtain information relating to future conditions. In Chapter 4, the forecasted socio-economic data for 1985 were discussed along with an analysis of the effects these changes would have on the region.

The information presented in Chapter 4 is the "raw data" used to develop information for future travel conditions within the area. Because the final information must relate to the socio-economic structure of the area, it is necessary to relate transportation needs to sociological and environmental characteristics. The development of area wide travel information is only one segment of the transportation analysis.

This chapter will develop the 1985 transportation data, analyze the area's transportation system in light of 1985 traffic, pinpoint areas of deficiency, develop proposals to ameliorate these deficiencies, and recommend a definite set of improvements to enable the transportation system to meet the needs of the area. The chapter will also discuss the development and evaluation of alternative approaches to transit plans in ACUATS.

1985 Area Wide Travel Demand

Of all the steps involved in the planning process, the relating of travel to the socio-economic characteristics of the region is the most difficult and at the same time, the most influential on future travel forecasts. The process by which this is accomplished is called trip generation and the methodology entails relating a series of real life activities by means of a mathematical model.

In this study, the final trip generation equations were developed for the various modes of travel. It was found that the following socio-economic variables had the greatest effect on trip generation:

1. **Automobiles per zone**
2. **Employment per zone**
3. **Total population per zone**
4. **Year round population per zone**
5. **Seasonal and temporary population per zone**
6. **Year round occupied dwelling units per zone**

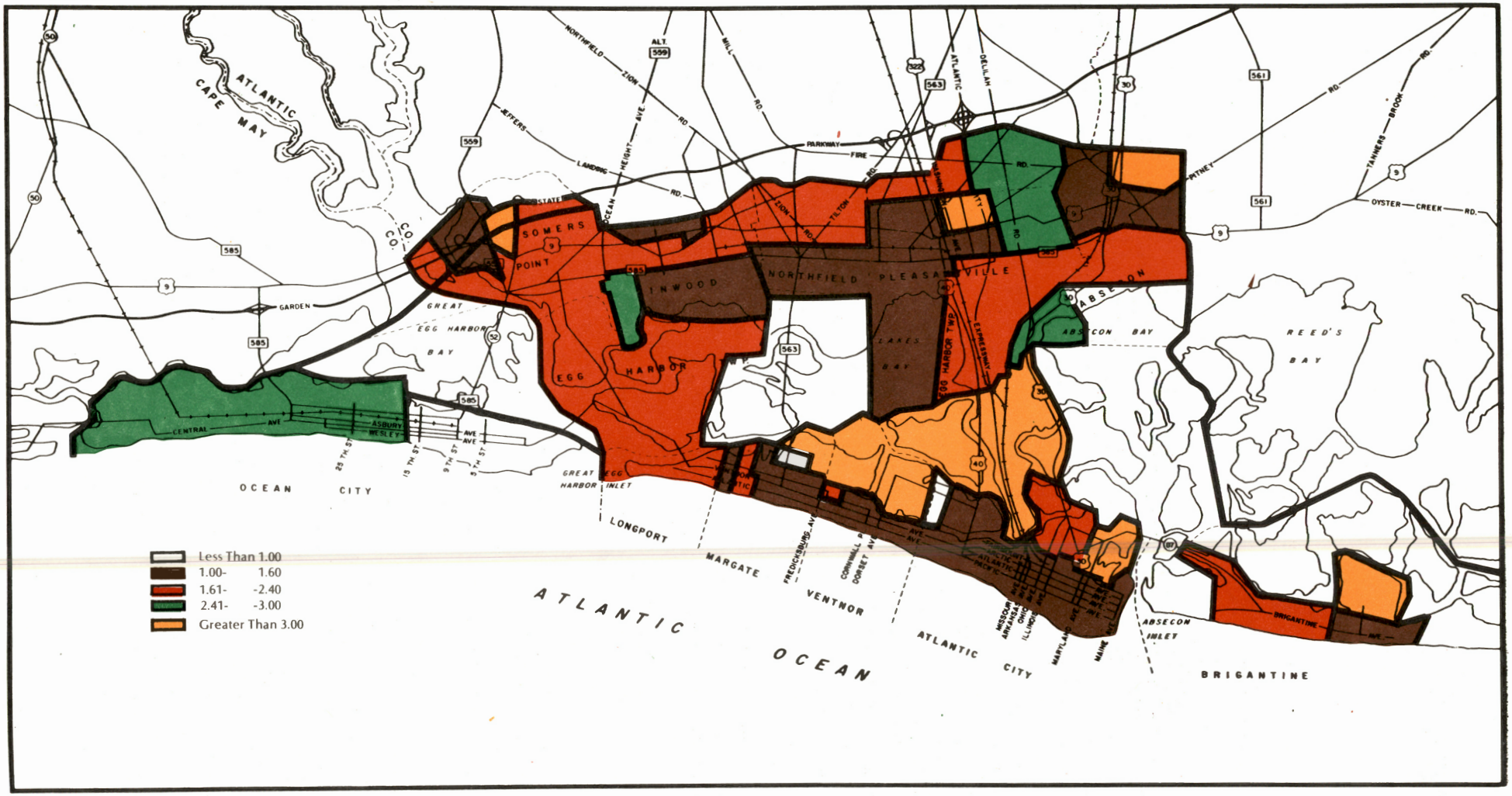
These variables were then used, either singularly or in combination to estimate trips in the data collection year.

Once the trip generation equations had been developed, the data presented in Chapter 4 were used to obtain zonal trip ends for 1985. In this manner, zonal travel demand for the forecast year was directly related to the sociological characteristics of the area. Although this information enabled the analysis of travel demand for any zone, the development of regional travel required the use of a trip distribution model.

The Fratar Model was utilized to distribute inter-zonal trips. Since the input to the Fratar Model is zonal growth factors, the forecasted travel demand for each zone had to be expressed in terms of relative zonal growth. If these growth factors are thought of as indicators in zonal activity over the next twenty years, they may be used to determine areas of vigorous growth, status quo, or decreasing activity. When using growth factors for analysis purposes, however, it must be remembered that they only show zonal change and do not relate the absolute values of one zone to another.

Map V-1 shows the expected change in travel

MAP V-1
ZONAL TRAFFIC GROWTH FACTORS



demand for each zone in the region. With the exception of a few mainland zones, the greatest increases will be in the southern sections of Ocean City and the bay side areas of Brigantine, Atlantic City, Margate, and Ventnor. As could be expected, those areas, where a large portion of available land has already been developed, will experience relatively little growth. These areas include the ocean side of Atlantic City, Margate, and Ventnor, all of Longport and the northern section of Ocean City. Because of the availability of vacant land on the islands, the growth in the mainland communities within the Cordon boundary is not as pronounced as in some sections of the island communities. This should not be construed to mean, however, that these mainland communities will remain stagnant over the next twenty years. In fact, it is expected that growth on the mainland will be of a balanced constant nature, with travel demand approximately doubling over the next twenty years.

Of particular importance in a region dependent on travel from outside the area for its economic health, due mainly to its many recreational activities, is the expected growth of trips with one end crossing the Cordon line.

While growth factors show the relative change expected for a particular zone, the change in actual trip ends is more meaningful in determining those areas where large increases in travel will occur. Table V-1 gives the total trip ends by municipality for 1965. Table V-2 gives the same information for 1985, with Table V-3 giving the total increase in trip ends by municipality. Table V-4 gives the ratio of 1985 trip ends to 1965 ends.

An examination of the information presented in these tables shows that Atlantic City will experience the largest increase in total internal trip ends and the largest increase in external trip ends. As expected, the municipality with the smallest increase in both external and internal trip ends is Longport. This is due to the fact that Longport has a much smaller population than any of the other municipalities. As mentioned before, from an economic standpoint, trips to the area from outside the region are extremely important. It is expected that external trip ends in Atlantic City will increase from 35,062 in 1965 to 66,127 in 1985, an increase of 89%. Ocean City's external trip ends will increase 73% from 22,059 to 38,219. It is noteworthy that Ocean City's 1985 external trip ends are greater than those of Atlantic City today. This would indicate that Ocean City will become increasingly important as a resort area. The growth in external trip ends for the remaining municipalities, while not as dramatic in terms of absolute numbers, exceeds Atlantic City and Ocean City on a percent increase basis with the exception of Somers Point. All of this indicates a continued interest in the area as a summer resort.

While the information presented so far is useful in evaluating the change in socio-economic conditions and potential travel demand, one of the requirements for these potential changes to occur is an adequate transportation system. In order to evaluate the existing system and possible improvements, zonal trip interchanges must be developed for the future.

Once the Fratar Model determined trip interchanges for the 1985 forecast year, the information was used to obtain actual travel on the region's transportation network. To accomplish this, the region's highway and street systems had to be simulated by a computer. In order to determine what route any trip will take, the computer goes through a decision making process based on the least time path to determine the "best" possible routing.

A diversion process was used when trips were "loaded" onto the network along the least time path. The reasoning behind utilization of the diversion process is the fact that trips, although shorter in mileage on land access routes, will still be made on a longer freeway facility because of a shorter overall travel time. Using the computer analysis procedure described above, a series of assignments were made to simulate regional travel for the forecast year.

Analysis of 1985 Travel Conditions

The first transportation system that was loaded with 1985 trips was a duplicate of the system discussed in Chapter 3. Because the network used reflected conditions found in the field in the data collection period and because travel speeds on this system were the same as those used to simulate 1965 travel, this assignment resulted in travel conditions that would occur if no improvements were made to the system. This way 1985 travel demand was serviced at the 1965 level.

While the travel patterns resulting from this assignment reflect the potential demand on the

TABLE V-1
ACUATS
TOTAL VEHICULAR TRIP ENDS
1965

	Internal	External	Internal & External
Absecon	16,170	4,849	21,019
Pleasantville	28,748	9,560	38,308
Northfield	19,319	6,800	26,119
Linwood	14,373	3,435	17,808
Somers Point	24,050	4,612	28,662
Egg Harbor Twp.	6,252	1,471	7,723
Brigantine	29,071	2,494	31,565
Atlantic City	145,924	35,062	180,986
Ventnor	27,058	2,517	29,575
Margate	36,072	4,007	40,079
Longport	7,169	887	8,056
Ocean City	96,992	22,059	119,051
TOTALS	451,198	97,753	548,951

TOTAL THRU TRIPS 3124

TABLE V-2
ACUATS
TOTAL VEHICULAR TRIP ENDS
1985

	Internal	External	Internal & External
Absecon	34,641	11,159	45,800
Pleasantville	48,292	20,227	68,519
Northfield	28,266	14,677	42,943
Linwood	23,100	7,067	30,167
Somers Point	43,387	7,162	50,549
Egg Harbor Twp	11,522	4,009	15,531
Brigantine	45,628	5,080	50,708
Atlantic City	198,839	66,127	264,966
Ventnor	41,319	5,594	46,913
Margate	47,673	8,973	56,646
Longport	10,207	1,878	12,085
Ocean City	147,856	38,219	186,075
TOTALS	680,730	190,172	870,902

TOTAL THRU TRIPS 5042

TABLE V-3
ACUATS
CHANGE IN TOTAL VEHICULAR TRIP ENDS FORM
1965-1985

	Internal	External	Internal & External
Absecon	18,471	6,310	24,781
Pleasantville	19,544	10,667	30,211
Northfield	8,947	7,877	16,824
Linwood	8,727	3,632	12,359
Somers Point	19,337	2,550	21,887
Egg Harbor Twp	5,270	2,538	7,808
Brigantine	16,557	2,586	19,143
Atlantic City	52,915	31,065	83,980
Ventnor	14,261	3,077	17,338
Margate	11,601	4,966	16,567
Longport	3,038	991	4,029
Ocean City	50,864	16,160	67,024
TOTALS	229,532	92,419	321,951

TOTAL THRU TRIPS 1918

TABLE V-4
RATIO OF TOTAL VEHICULAR TRIP ENDS
1985/1965

	Internal	External	Internal & External
Absecon	2.14	2.30	2.18
Pleasantville	1.68	2.12	1.79
Northfield	1.46	2.16	1.64
Linwood	1.61	2.06	1.69
Somers Point	1.80	1.55	1.76
Egg Harbor Twp.	1.84	2.73	2.01
Brigantine	1.57	2.04	1.61
Atlantic City	1.36	1.89	1.46
Ventnor	1.53	2.22	1.57
Margate	1.32	2.24	1.41
Longport	1.42	2.12	1.50
Ocean City	1.55	1.73	1.56
TOTALS	1.51	1.95	1.59

TOTAL THRU TRIPS 1.61

various segments of the system, they are not realistic because restrictions due to capacity limitations were not considered. Because of this, the assignment is referred to as the 1985 *"Demand Network"*.

In order to bring about realistic travel patterns, a series of assignments were made on the existing transportation system, each time changing the speeds so that they were in agreement with volume capacity characteristics indicated by the previous assignment. This process is known as capacity restraint. The end result is a loaded network with speeds representative of volumes on the network and travel patterns that are logical. The resulting assignment will be referred to as the 1985 *"Do Nothing Network."*

The purpose of the "do nothing" network is to provide a base for comparing various network improvements. Before any comparison can be made, however, it is necessary to have a basic understanding of some of the terms that will be used.

Two of the more frequently used indicators resulting from the assignment process are Vehicle Miles and Vehicle Hours. Since one of the desired results of any improvement to a system is a reduction in operating costs to the public it is desirable to reduce Vehicle Miles and/or Vehicle Hours.

Additionally, operating costs can be reduced by considering the type of roadway that is used for the various segments of each trip. This is due to lower operating costs per Vehicle Mile of travel on a freeway or arterial type facility than on a city street.

As mentioned before, the 1985 *"Demand Network"* represents travel patterns before capacity conditions were considered. The 1985 *"Do Nothing Network"* represents realistic travel patterns, taking into account volume-capacity characteristics. By the very nature of the process, this results in lower operating speeds, increased Vehicle Hours and in the rerouting of traffic, causing a change in Vehicle Miles of travel. Table V-5 shows pertinent information on the 1985 *"Demand Network"* and the 1985 *"Do Nothing Network."*

As can be seen from Table V-5, the total Vehicle Miles decreased. This was due to the rerouting of traffic from routes which were less direct (but which had faster overall travel times) to routes which are more direct, but not necessarily faster due to the consideration of capacity restraints. The total Vehicle Hours increased as expected, and the change in average speed is an excellent indicator of the speed changes required in the capacity restraint process.

Once the 1985 *"Do Nothing Network"* had been determined, it was possible to examine the existing system to locate areas of deficiency.

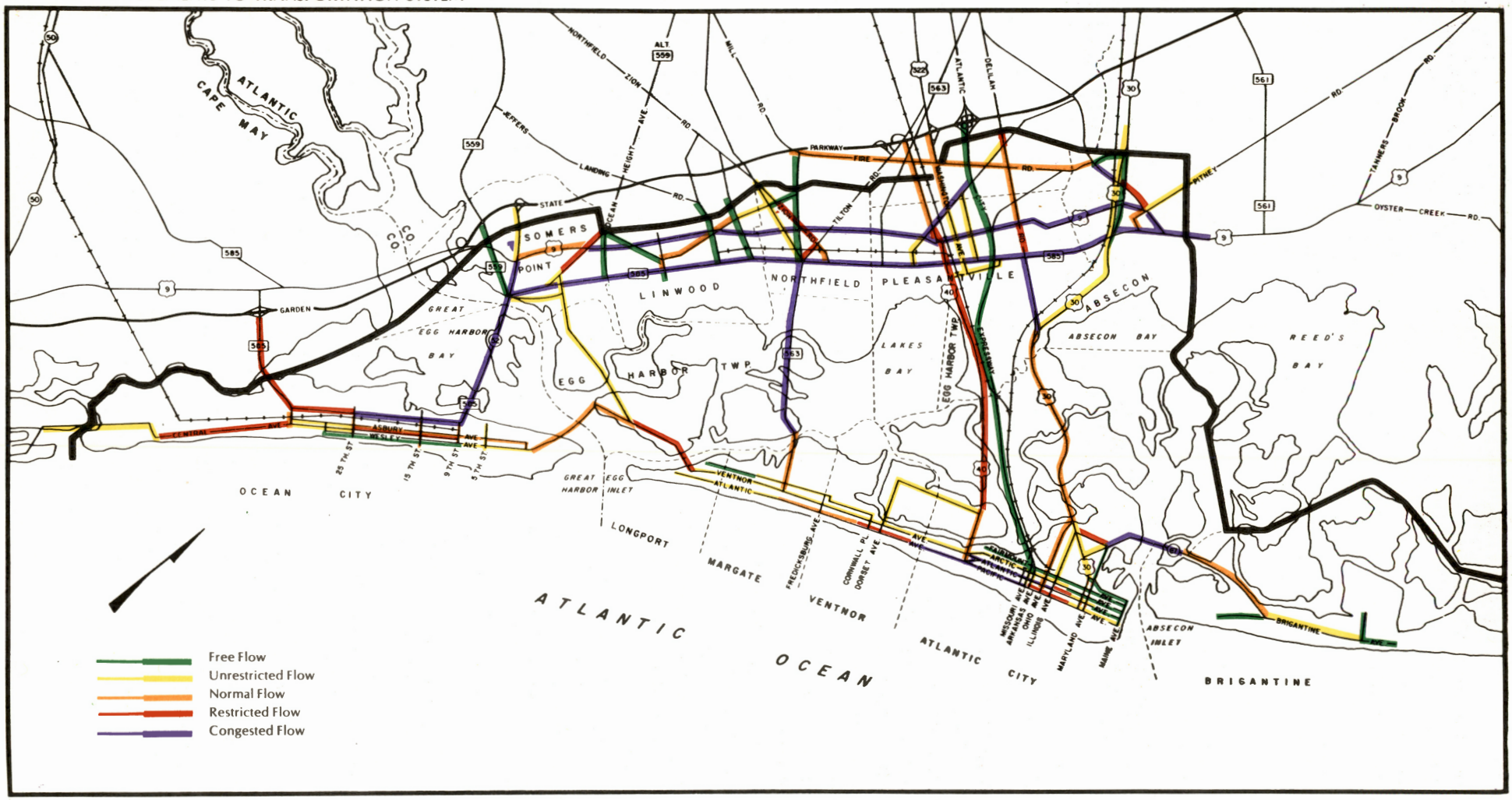
Map V-2 shows travel conditions for the various segments of the analysis network. This map is a graphic presentation of expected volume capacity ratio. The ratio is the expected volume divided by the capacity for that segment. If this ratio is low, travel conditions will be characterized by freedom of movement and operating speeds near the allowable limit for each type of facility. If the ratio is high, the volume approaches, or exceeds the capacity and serious congestion will occur along with correspondingly lower speeds. Map V-2 indicates those areas where free flow (unrestricted vehicle movement), unrestricted flow (speeds slightly affected), normal flow (movement restricted, but no serious restraint on the operator), restricted flow (movement severely restricted, but stable flow exists), and congested flow (unstable conditions exist—stop and go traffic and low operating speeds) exist.

The segments shown in purple indicate those areas where serious congestion will occur. These areas can generally be described as: 1) The Route 9, Shore Road corridor; 2) The Bay Crossing in the southern and central sections of the study area; 3) The Bridge Crossing to Brigantine.

TABLE V-5

	1985 "Demand Network"	1985 "Do Nothing Network"
Route Mileage	165.30	165.30
Vehicle Miles	1,897,747	1,891,830
Vehicle Hours	68,177	72,981
Average Speed	27.5	25.9

MAP V-2
OPERATIONAL CHARACTERISTICS – 1985 TRAFFIC
NO IMPROVEMENTS TO TRANSPORTATION SYSTEM



Proposals for Transportation Improvements in the ACUATS Area

Once the 1985 *"Do Nothing Network"* had been finalized and the analysis of the network had resulted in the determination of various areas of deficiency in the transportation system, a series of alternate improvements were developed with the intent to ease the problem areas. Before this could be done, however, it was necessary to determine what the desired results should be. It is not enough to base an improvement only on the desire to relieve adverse traffic conditions. Many social and environmental conditions can be significantly affected by an improvement to the transportation system.

In developing this evaluation framework, a series of goals and objectives were used. As defined in this study, a goal is an abstract, region wide, condition that is considered to be desirable and an objective is a specific characteristic of the regional condition. Table V-6 gives these goals and objectives along with the criteria used to evaluate these objectives. It is possible that no quantitative values exist for evaluating some of the objectives listed.

This listing of goals and objectives should not be construed to be all inclusive. It is noteworthy that no priority has been assigned to any goal or objective. Instead, the various objectives serve as a guideline in order to develop improvements that will be acceptable to the local areas and at the same time serve the entire region.

Once these guidelines were established, the various areas of deficiency in the transportation system were analyzed to determine what additions or changes could be made to provide for the expected travel demand. These improvements were considered as committed and proposed.

The improvements considered to be committed, those improvements under construction or ready for implementation, include a new high level bridge from Atlantic City to Brigantine, and a one way system for the Atlantic City CBD.

The Brigantine Bridge improvement, Map V-3, opened for traffic on October 14, 1972 consists of a high level, four lane bridge from Atlantic City over Absecon Inlet to Brigantine, with improved traffic circulation at the two approaches. The original bridge was a low level drawbridge, two lanes wide, connecting the existing street system in Atlantic City to Brigantine Boulevard. There were no ramp structures for the facility, and the intersections had poor operational characteristics on the Atlantic City end. Frequent raisings of the bridge interrupted traffic flow to and from the island community, and the bridge was in disrepair, resulting in a severe weight restriction.

The remaining committed improvement calls for the implementing of a oneway pattern in the downtown area of Atlantic City that would encompass a majority of the streets. The effects of the Atlantic City CBD oneway system were evaluated as part of the total regional network. Within this framework, specific benefits of the fine grained CBD route system are difficult to pinpoint. However, the results did warrant a more detailed traffic operational study for this limited area.

The *1968 Federal Highway Act* made provisions for exactly these types of studies by creating the TOPICS (Traffic Operation Program to Increase Capacity and Safety) program. Its main objective is to provide safer improved traffic operations on a short range basis for locations where major capital highway projects are highly impractical. In the fall of 1970 such a Study was carried out for Atlantic City and resulted in numerous specific local traffic improvement recommendations. A TOPICS Study is also being conducted for Atlantic County, and it involves the remaining municipalities in the ACUATS area with the exception of Ocean City. MAP V-4 indicates the TOPICS oneway system for Atlantic City and the improvement of an intersection in the area of Albany Avenue and the Captain O'Donnell Parkway. Implementation of the project will begin in the very near future.

Proposed Improvements

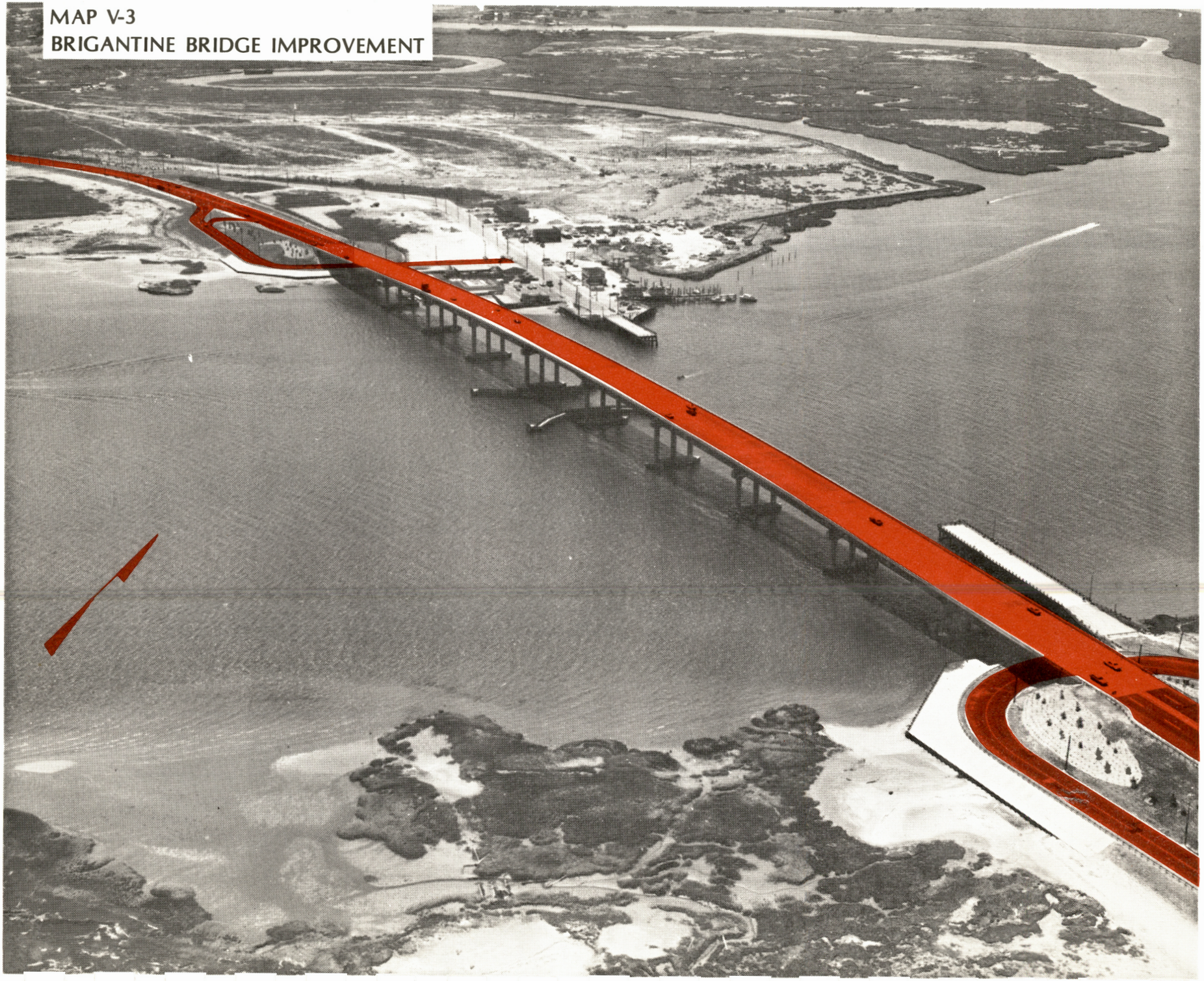
Traffic demands on the U.S. Route 9 and County Route 585 corridor are causing such congestion, that major improvements will be required for these facilities. However, the level of improvements needed to offer significant relief cannot be realized because of dense development along major portions of the highways. For this reason, a Route 9 Freeway proposal was developed.

Three basic alignments for the Route 9 Freeway were investigated (See MAP V-5). The first alignment, corridor A, lies between the Garden State Parkway and U.S. Route 9, the

TABLE V-6
GOALS AND OBJECTIVES FOR THE ACUATS REGION

Goal	Objective	Rating Criteria
To Provide an Efficient, Economic Transportation System	1. To minimize the indirection of travel	Vehicle Miles of Travel
	2. To minimize travel time	Vehicle Hours of Travel
	3. To minimize congestion	Vehicle Miles of Travel with practical capacity greater than 1.20
	4. To minimize Central Business traffic	Vehicle Miles in the Central Business District
	5. To minimize user costs	Road user costs
To Provide a Safe Transportation System	1. To minimize Accidents	Computed Accidents
	2. To minimize Fatalities	Computed Fatalities
To Provide for the Socio-Logical and Environmental Structure of the Region	1. To minimize Property Dislocations	None
	2. To promote Cohesive Growth on the Local Level	None
	3. To promote Land Use Compatibility	None
	4. To promote Desired Land Use Development	None
To Provide for Desirable Regional Growth	1. To promote Employment	None
	2. To promote Development of the Central Business District	None
	3. To Service Recreational Facilities	None

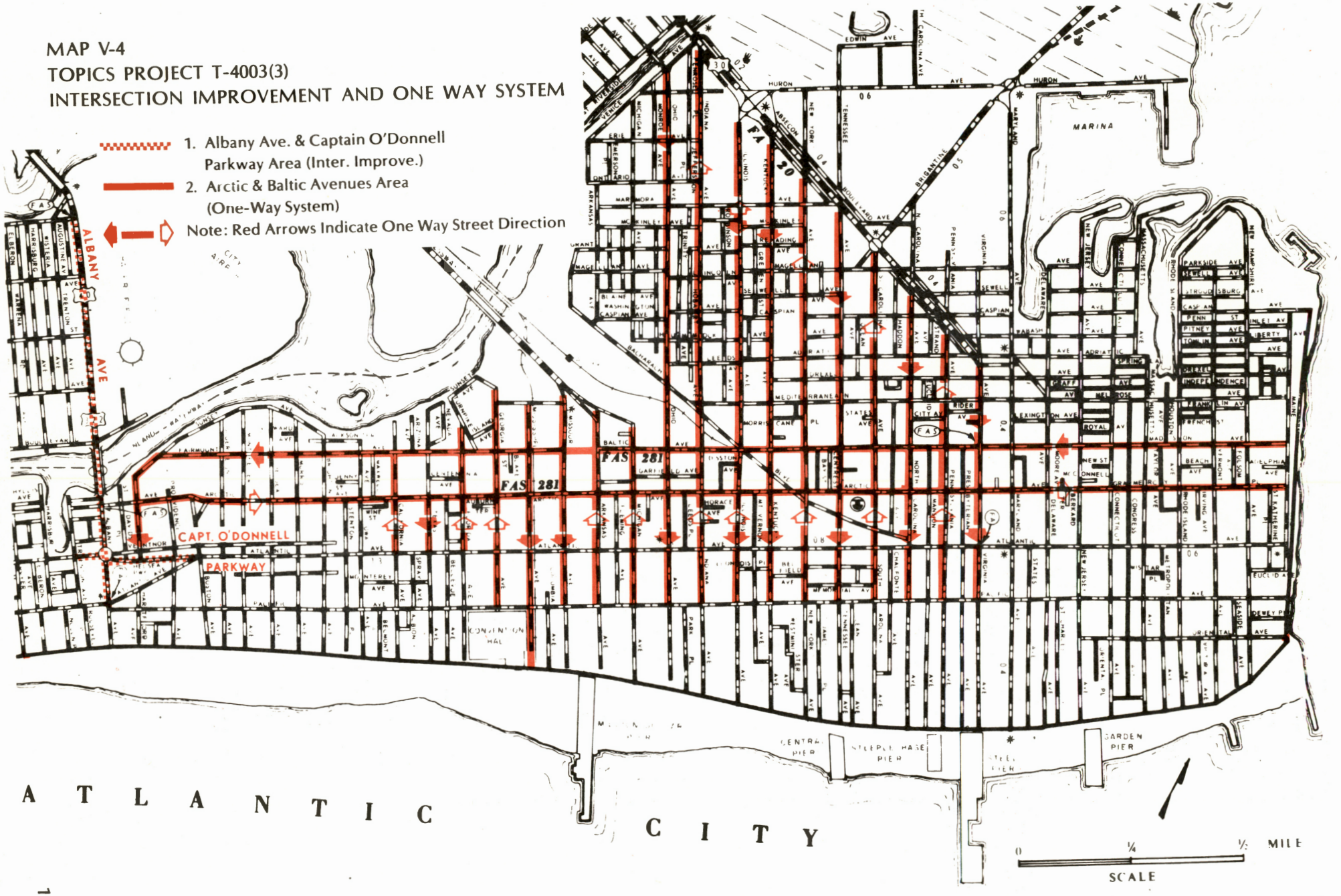
MAP V-3
BRIGANTINE BRIDGE IMPROVEMENT



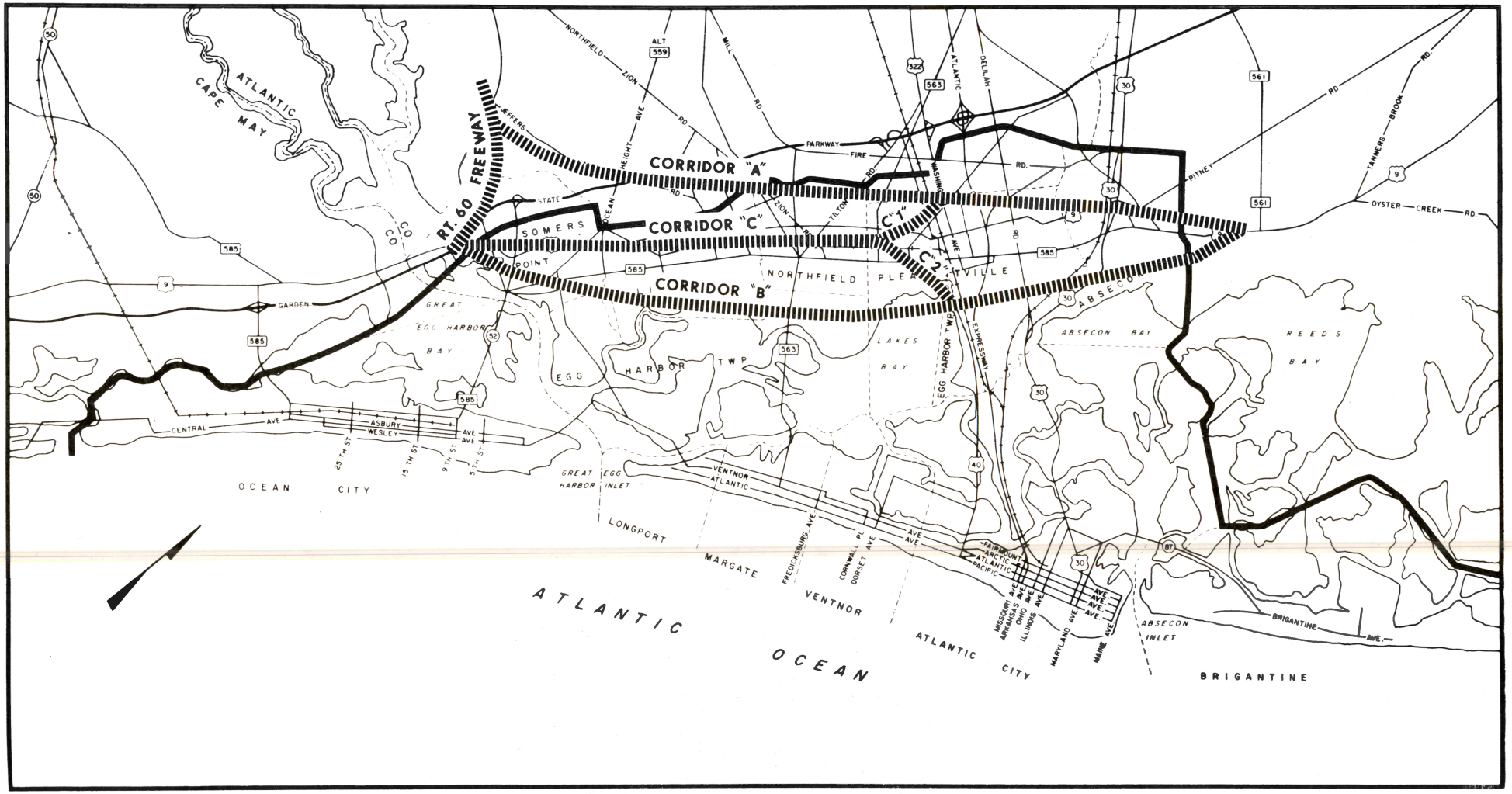
MAP V-4
TOPICS PROJECT T-4003(3)
INTERSECTION IMPROVEMENT AND ONE WAY SYSTEM

1. Albany Ave. & Captain O'Donnell Parkway Area (Inter. Improve.)
2. Arctic & Baltic Avenues Area (One-Way System)

Note: Red Arrows Indicate One Way Street Direction



MAP V-5
ALTERNATE CORRIDOR ALIGNMENTS
ROUTE 9 FREEWAY



second, corridor C, Utilizes railway right-of-way between U.S. Route 9 and Shore Road, and the third, corridor B, follows along the bay front of the mainland communities.

Of these three, corridor C, which follows the Penn-Reading Seashore Line right-of-way for a major portion of its route, was dropped early in the analysis stage. This was primarily due to the fact that the railroad right-of-way would not be wide enough to accommodate the type facility under consideration. Either additional right-of-way would have to be acquired, or an elevated structure, would be necessary. Neither of these alternatives appeared to be particularly attractive to the local community.

The two remaining corridors meet, for the most part, the non-engineering requirements stated in the beginning of this section. While trips from the northern island communities to Ocean City and points south would be better served by the easterly alignment (corridor B), the western corridor provides better connection for north and south extensions should they be required in the future. But more importantly, this corridor provides a more logical connection with the proposed Route 60 Freeway, serving Ocean City on the east and reaching the Delaware Memorial Bridge in the west via Cumberland and Salem Counties.

Compatible future land development, industrial and residential, could be better achieved by the western alignment. Also, the potential of conflict with the New Jersey Wetlands Act is far less with the western alignment than with the eastern alignment which runs along the bay front. For the same reason, most of the future growth of the region must be in a westward direction rather than on reclaimed land along the bays. It should be noted, however, while land is more stable in the western corridor, it too, would require some reclamation before all of the land could be developed.

In comparison, the western alignment far exceeds the eastern alignment in promoting employment growth for the region.

One additional item of comparison is the construction cost estimate. The adjusted 1972 costs are approximately 50 million versus 53 million for the western and eastern alignments respectively. This resulted in a somewhat better benefit cost ratio for the western facility.

Concurrently with the Route 9, Shore Road Corridor, a new high level bridge to Ocean City was investigated to relieve expected congestion on the existing bridges in the southern end of the study region. The termini of this facility were tentatively located in Somers Point and in the mid-section of Ocean City. It was immediately clear that the bridge connection in Somers Point was influenced by the alignment of the Route 9 Freeway. Additionally, maximum usage of the bridge would depend on its accessibility from the proposed Route 60 Freeway. It must be stressed at this point that the exact location and alignment determination of the new bay crossing will require a more detailed engineering feasibility study. Both exact alignment and cost calculations are dependent on the finalization of the Route 60 Freeway.

MAP V-6 presents the various alternatives for a proposed improvement in the immediate area surrounding West End and Dorset Avenues. The following alternatives were investigated:

1. **A connector road running from U.S. Route 40, across Great Island to Dorset Avenue.**
2. **A connector road from U.S. Route 40, across Great Island to Ventnor in the vicinity of Buffalo and Fredericksburg Avenues.**
3. **The improvement and extension of West End Avenue from U.S. Route 40 (in Atlantic City) to Buffalo and Frederickburg Avenues (in Ventnor).**

From the investigation of these alternatives, it appears that the Extension of West End Avenue is the most favorable.

The West End Avenue Extension would aid the future development of Ventnor and would provide a continuous north-south arterial between U.S. Route 40 and Fredricksburg Avenue. This would create a more flexible traffic distribution system than that of the other alternatives, especially if ultimately continued as far south as Jerome Avenue (County Route 563).

Also to be considered is the fact that traffic conditions at the intersection of Dorset and Ventnor Avenues would be drastically improved by the West End Avenue Extension when compared to the Dorset Avenue connector scheme.

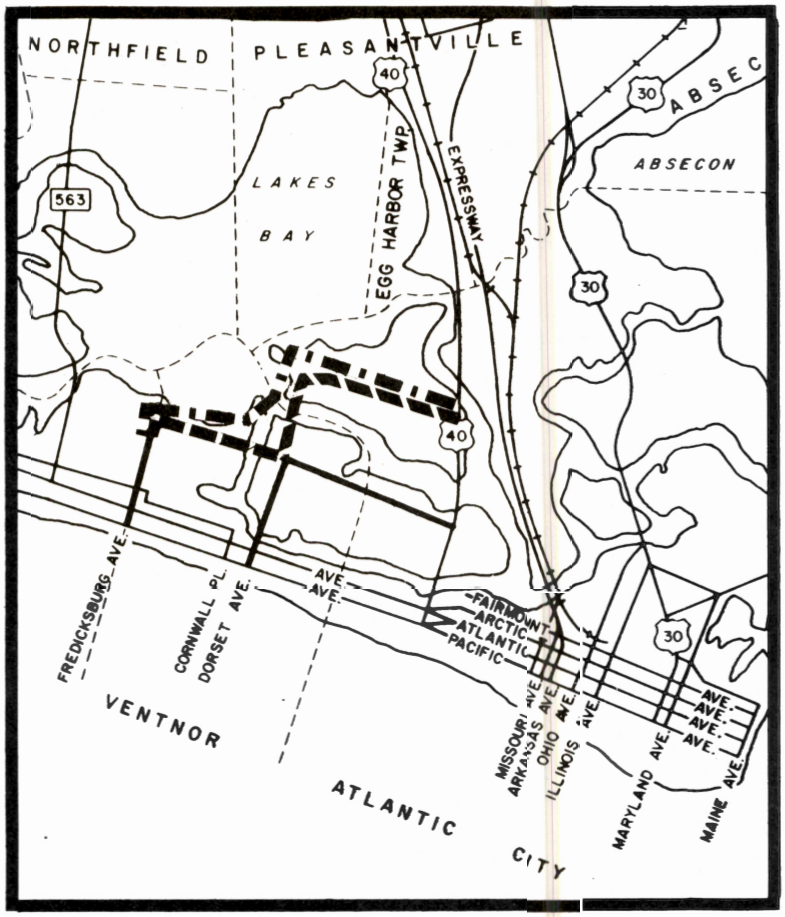
The possibility of a potential traffic problem may exist however, at the junction of West End Avenue and U.S. Route 40. Preliminary evaluation of signal phases indicate a probability of traffic delay during peak periods.

The connector road running from U.S. Route 40 to the Buffalo and Fredricksburg Avenue vicinity would indeed circumvent this problem, but it would do so at an additional cost of 7.5 million.

There are two reasons for this sizable con-

MAP V-6
PROPOSED IMPROVEMENTS IN THE
IMMEDIATE AREA SURROUNDING
WEST END AND DORSET AVENUES

West End Ave. Extension
Buffalo & Fredricksburg Ave. Connector
Dorset Ave. Connector



struction cost increase. First, the overall route mileage to be constructed or improved is greater than that of the West End Avenue Extension (approximately 2.8 miles compared to 1.2 miles). Second, the West End Avenue Extension considered a low level, vertical lift bridge at a cost of 3.1 million, to cross the West Canal. On the other hand, the Fredricksburg-Buffalo Avenue Connector Alternative considered a high level, fixed bridge at a cost of 8 million to cross Beach Thorofare.

It must also be pointed out that implementation of the alternatives tested will, to some extent, be dependent on compatibility with the Wetlands Act, which is concerned with the protection of coastal wetlands and which regulates any dredging, filling, removing, or other altering or polluting of these areas.

The next proposed improvement is the extension of Franklin Avenue from Bayview Avenue (just south of U.S. Route 40) to the Northfield-Pleasantville boundary, with a tie-in to County Route 585. The Franklin Avenue Extension will help relieve congestion on County Route 585 and U.S. Route 9, especially in the area between County Route 563 and Delilah Road. (See MAP V-7). A decrease in traffic is also noted on the section of U.S. Route 40 in Pleasantville between U.S. Route 9 and Franklin Avenue. This section's secondary function of trip distribution between the two north-south arterials was formerly much more pronounced.

The final proposed improvement deals with the removal of tolls on the Atlantic City Expressway for local traffic between Pleasantville and Atlantic City. This proposal would cause a diversion of a large number of trips between the mainland and island communities from U.S. Routes 30 and 40, to the Expressway, achieving a major improvement in traffic flow conditions on the two arterials.

However, while realizing improvements on parallel facilities to the Expressway, U.S. Route 9 and Franklin Avenue in Pleasantville, acting as feeder roads to the Expressway ramps, would be congested beyond an acceptable level of operation. The construction of the Route 9 Freeway, provided an interchange with the Atlantic City Expressway is constructed, would offer easement of this situation by diverting the intermediate and long distance north-south trips in this corridor.

It is not surprising in this proposal, that a heavy traffic demand is put on Arkansas and Missouri Avenues, the two terminal roads of the Expressway in Atlantic City. Overall, removal of tolls on the Expressway between Pleasantville and Atlantic City would be beneficial to local users, both from a user cost and traffic service viewpoint.

Implementation, however, most likely would be strongly opposed by the Atlantic City Expressway Authority, due to yearly revenue loss. Further difficulties are those dealing with the legal aspects of changing a toll road to a free facility for a portion of its users.

MAP V-8 presents all various committed and proposed improvements including their alternatives, for the ACUATS area.

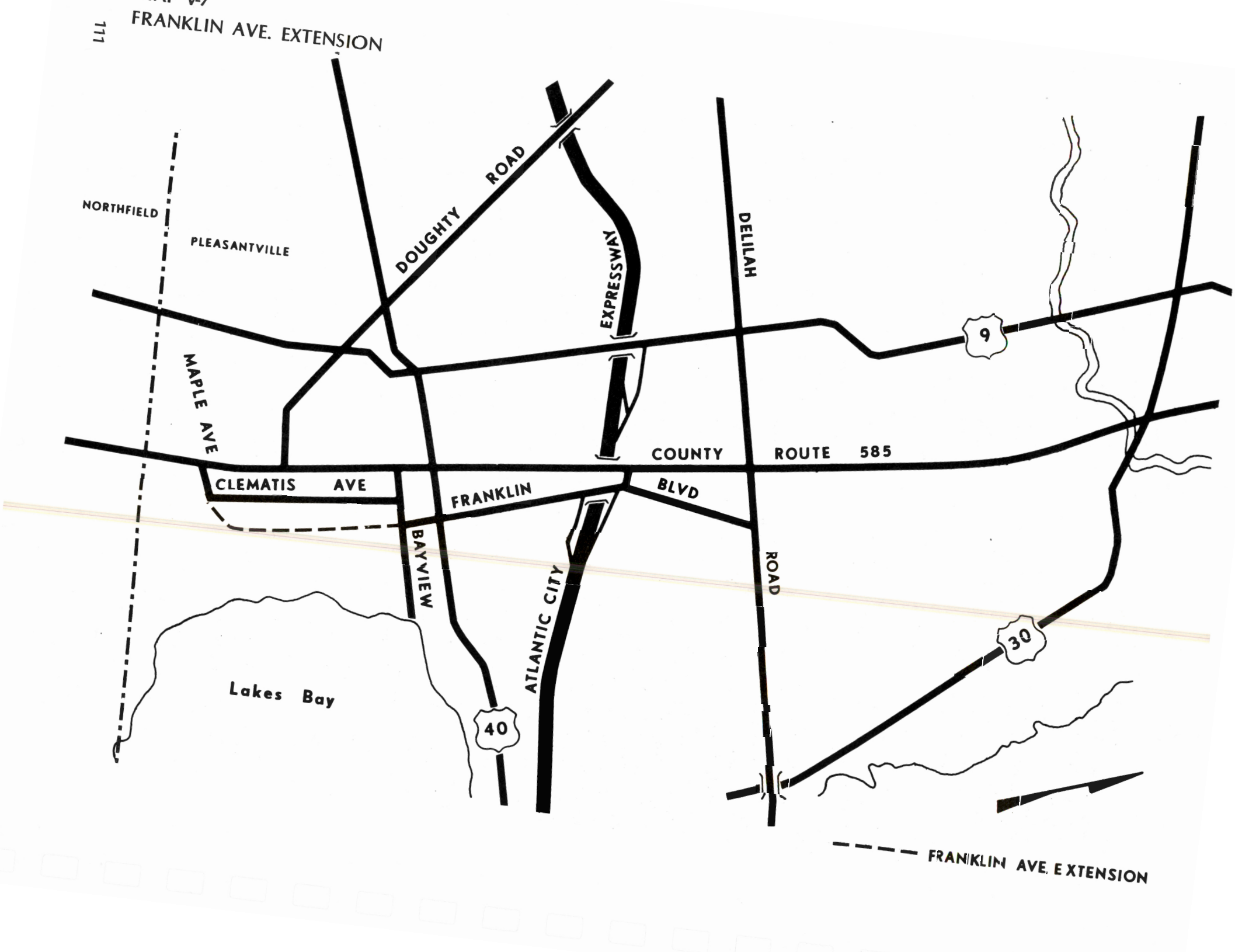
Evaluation Procedure

In evaluating future transportation systems, two general areas must be considered. The first of these, the qualitative effect on the region, covers those areas where it is difficult, if not impossible, to put a numerical value on the results of the improvement. The second area, covers those items where it is possible to quantify the results. Generally, those areas can be classified as non-highway and highway, although this classification can be misleading. The highway section deals only with those factors directly related to highway economics-operating costs, maintenance costs, the cost of travel time, the cost of accidents, and construction cost. The remainder of items analyzed fall into the non-highway category.

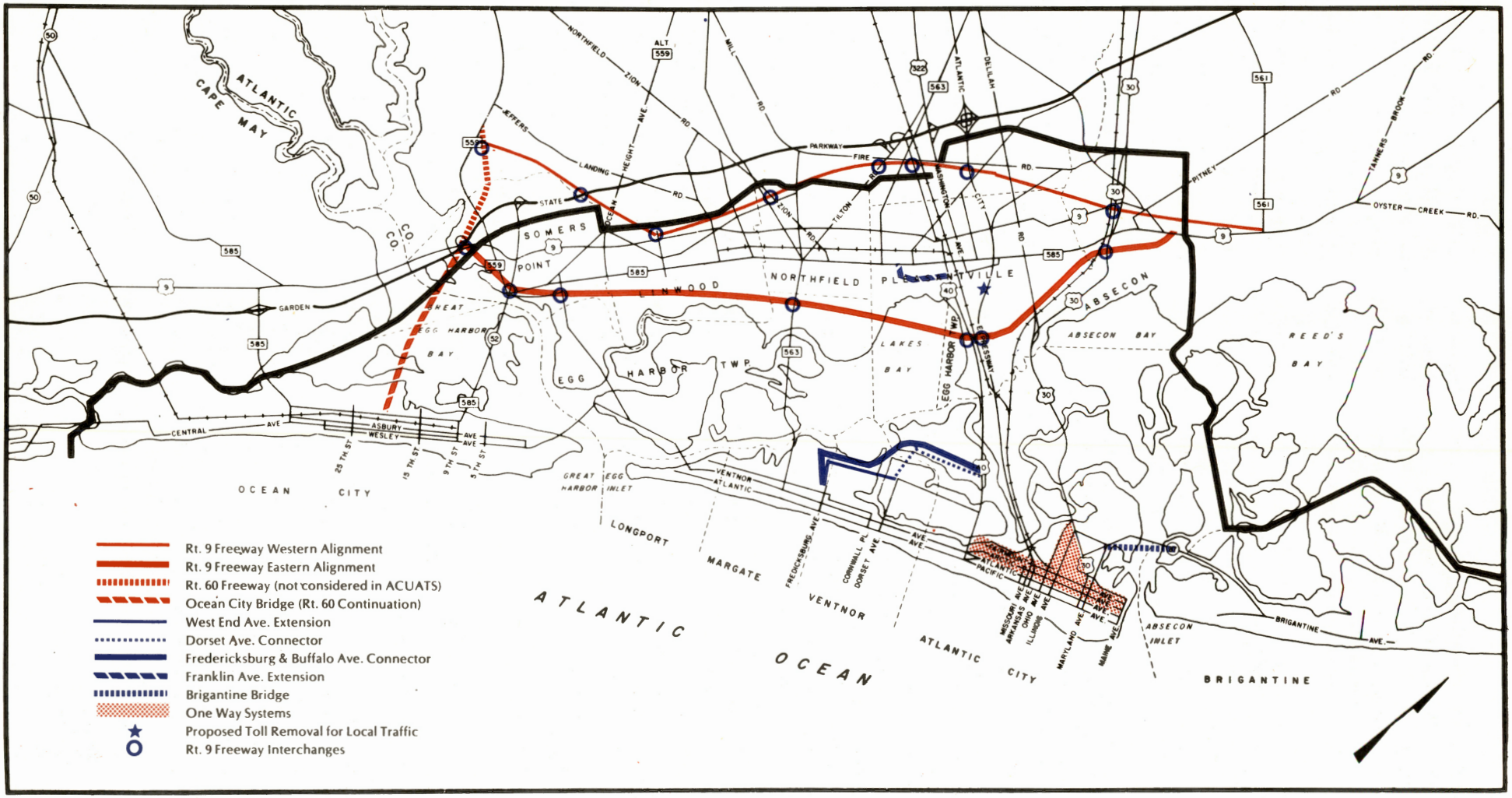
Although a number of methods are available to the analyst, all will yield similar results if properly applied. A Benefit-Cost analysis was used to determine if a proposed change in the transportation system would have a positive effect on the study area.

The Benefit-Cost analysis consists of nothing more than the difference in Road User Costs between two networks divided by the additional annual cost of the improvement. If an alternative provides a positive benefit to the user, the Benefit-Cost Ratio will be greater than unity. If benefits are gained, but outweighed by the cost, the result will be less than one, but greater than zero.

There are three inputs used in a Benefit-Cost analysis. Road User Cost, Maintenance Costs, and Annual Cost of the improvement. The first of these, Road User Cost, was determined on a link by link basis for the study. Road


FRANKLIN AVE. EXTENSION
NORTHFIELD
PLEASANTVILLE
DOUGHTY ROAD
EXPRESSWAY
DELILAH
9
MAPLE AVE
COUNTY ROUTE 585
CLEMATIS AVE
FRANKLIN BLVD
BAYVIEW
ATLANTIC CITY
ROAD
30
Lakes Bay
40
FRANKLIN AVE. EXTENSION

MAP V-8
COMMITTED AND PROPOSED IMPROVEMENTS



User Cost consists of total operating costs and accident costs. In determining operating costs for a network, the analysis can range from a microscopic analysis for each route to an analysis based upon gross values of vehicle miles and vehicle hours for the network. The method used in this study was based on link characteristics and summarized to give final values for each network. Characteristics considered in the analysis include roadway type, functional classification, volume to capacity ratio, and operating speed. Roadways were grouped by their functional classification and then both operating and delay costs were determined for each group depending on the various physical characteristics for each group. The accident costs and the cost of fatalities were directly related to the vehicle miles of travel.

The second cost, the cost of maintenance, is based on an average cost per land mile for each functional classification of roadway.

The third cost is probably the most difficult to predict accurately. It is impossible to arrive at an accurate cost estimate for construction until detailed construction plans have been finalized. In determining the total construction cost, road costs were based on 1970 costs used in the New Jersey Department of Transportation Needs Study. These costs are averages for the "shore area" (includes Tri-State South and Atlantic City) in a "suburban or outlying region" in a "new location". $1,635,000.00 per mile was used for a typical four lane facility with two ten foot shoulders. A 10% per year inflation factor was used to bring 69 and 70 costs to 72 costs.

One serious problem encountered in the ACUATS study resulted from the decision to base the study on the Average Summer Weekday. In order to determine annual costs to the vehicle operator, it was necessary to relate the Average Summer Weekday to Annual Average Daily Traffic. This was accomplished through the use of a series of step-down factors.

In the section on proposed improvements to the transportation system, a series of guide lines were presented to be used in designing and evaluating network improvements. These guide lines, or desired goals, and related objectives are shown in Table V-7, as they apply to the *"Do Nothing Network."*

Once the proposed improvements were determined and networks coded to enable computer simulation, a series of assignments were made to simulate 1985 travel. The results of each assignment provided the information necessary for evaluating the proposal and a basis for deciding whether the proposal should be recommended.

The 1985 Adopted Transportation Plan

The results of the evaluation of the various alternative improvements of the ACUATS transportation system indicated that the following proposals would provide for improved transportation in the area and at the same time meet the sociological and environmental needs of the region. The recommended improvements are:

1. **West End Avenue Extension**
2. **Franklin Avenue Extension**
3. **Route 9 Freeway – Western Alignment**
4. **Ocean City Connection – (Route 60 Continuation)**

The costs of construction for the recommended improvements are presented in Table V-8. Also shown are the annual construction and maintenance costs. The annual construction costs were arrived at by using an interest rate of five percent. All of the recommended improvements were presented to the combined ACUATS committees and were adopted by the Executive Committee on February 6, 1973, as part of the 1985 Total Transportation Plan.

Table V-9 shows the various indicators of network transportation for the 1985 *"Do Nothing Network"* and the 1985 *"Adopted Total Transportation Plan"*. As can be seen, by sacrificing a small amount of vehicle mileage, significant improvements are realized in other areas. Map V-9 shows the volume to capacity ratio on the highway network for the Adopted 1985 Total Transportation Plan. When this map is compared with the volume to capacity ratios of Map V-2, definite improvements appear in the 1985 Adopted Network.

The most significant improvements in traffic flow occur at the bridge crossings from Ocean City to Somers Point and Longport, and also the bridge crossing to Brigantine. Congestion is relieved to some extent in the Route 9 corridor, and on Ventnor and Atlantic Avenues which are the main arterials for the Island Communities.

Evalution and comparison of the travel needs with the capital costs required for implementation (that is, where and when will an expenditure provide the best service for the area) were major considerations in the follow-

TABLE V-7
IMPROVEMENT EVALUATION FORM

Goals and Objectives	Criteria Used in Evaluation	1985 Do Nothing Network	Test Alternate	Test Alternate
Goal: To Provide for Efficient Economical Transportation				
Minimize Indirection of Travel	Total Vehicle Miles Of Travel	1,891,830		
Minimize Travel Time	Total Vehicle Hours of Travel	72,981		
Minimize Congestion	Vehicle Miles of Travel with V/C > 1.20	565,627		
Minimize CBD Travel	Vehicle Miles of Travel in CBD	181,704		
Minimize User Cost	Total User Costs	$113,364,292		
Goal: To Serve The Sociological and Environmental Structure				
Minimize Dislocations	None			
Promote Cohesive Neighborhoods	None			
Compatability with Land Served	None			
Promote Desirable Land Development	None			
Goal: To Provide for a Safe Transportation System				
Minimize Accidents	Do Nothing Network	5,475		
Minimize Fatalities	Do Nothing Network	71		
Goal: To Provide for Desirable Regional Growth				
Promote Desirable Employment	None			
Service Central Business District	None			
Serve Recreational Facilities	None			

TABLE V-8

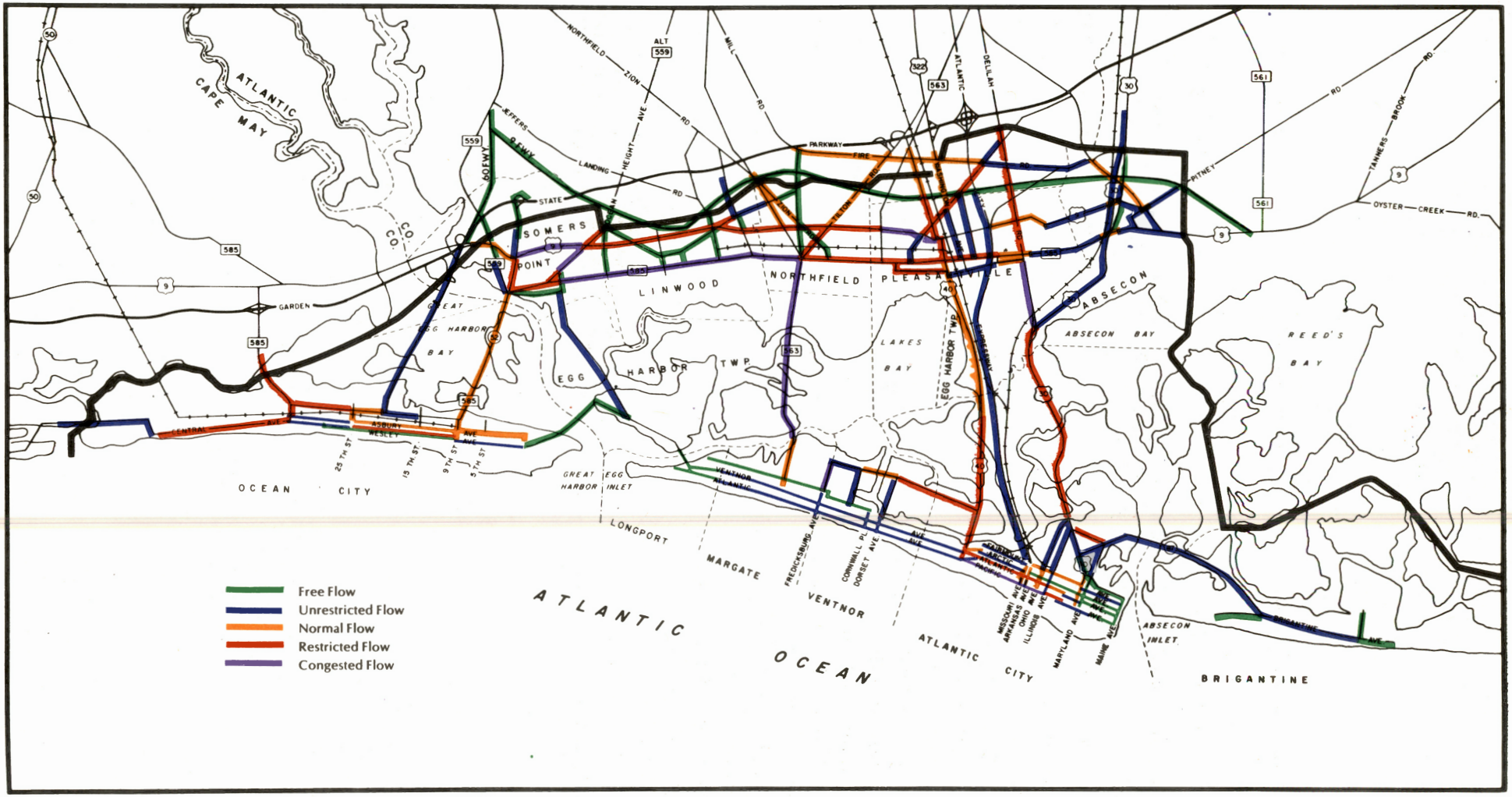
IMPROVEMENTS	CONSTRUCTION COSTS*	ANNUAL CONSTRUCTION COST	ANNUAL MAINTENANCE COST
COMMITTED IMPROVEMENTS			
TOPICS – One Way System for Atlantic City	673,000.00	54,000.00	–
Brigantine Bridge	10,800,000.00	703,000.00	4,800.00
RECOMMENDED IMPROVEMENTS			
Route 9, Freeway, Western Alignment	50,100,000.00	3,201,000.00	111,600.00
West End Avenue Extension	5,400,000.00	348,000.00	6,900.00
Franklin Avenue Extension	1,500,000.00	96,000.00	10,200.00
Ocean City Connection (Route 60, Continuation)	62,300,000.00	4,043,000.00	35,900.00
TOTALS	130,773,000.00	8,265,000.00	169,400.00

*1970 Base Year Costs Factored Up to 1972 Costs

TABLE V-9
COMPARISON OF "DO NOTHING NETWORK" AND THE 1985 ADOPTED NETWORK

	"Do Nothing"	Adopted Network
Total Vehicle Miles	1,891,830	1,980,368
Total Vehicle Hours	72,981	68,128
Vehicle Miles With V/C > 1.20	565,627	318,426
Miles of Roads with V/C > 1.20	29.6	19.6
Vehicle Miles in CBD's	181,704	152,343
Total Annual Accidents	5,475	4,940
Total Annual Fatalities	71	64
Total Construction Cost of Committed and Recommended Improvements	—	130,773,000
Total Maintenance Cost of Committed and Recommended Improvements	—	169,400
Annual Construction Cost of Committed and Recommended Improvements	—	8,265,000
Annual Road User Cost	113,364,292	106,239,328
Average Speed	25.9	29.1
Network Route Mileage	165.3	195.8

MAP V-9
OPERATIONAL CHARACTERISTICS
1985 TRAFFIC
TOTAL-ADOPTED PLAN



ing approximate implementation program of the adopted improvements:

1980-1985 West End Avenue (County Route)
Franklin Avenue (Municipal Street)
1985-1990 Route 9 Freeway (State Route)
1990-2000 Ocean City Connection (State Route)

These adopted recommendations are based on projections through 1985, but, as is true with all long range plans, the possibility always exists that the projected needs may change due to unforeseen developments. It is the purpose of the Continuing Phase of this study to keep abreast of these developments. For example, the already discernable westward expansion of the urbanized area might call for an analysis of Garden State Parkway improvements, as an alternative to the Route 9 Freeway proposal.

Transit Plans for ACUATS

The purpose of this section is to discuss the development and evaluation of alternative transit plans for the Atlantic City Urban Area Transportation Study. This discussion is presented in four parts: Operational Background, Development of Alternative Transportation Plans, Discussion of the Three Alternatives, and System Testing.

Operational Background

Presented here will be a brief description of the present operations of transit service in the Urban Area. A more detailed discussion is contained in a report by the consulting firm of Simpson and Curtin and entitled, *Transit in Atlantic County.*

For the Atlantic City Urban Area, the present status of public transportation is a juxtaposed picture of good and bad. On one hand, there is the jitney service providing a unique system of privately-owned, ten-passenger vehicles. The service is rapid with very short headways and the route is simple, running only on Pacific Avenue with extensions along New Hampshire Avenue to the north and along Ventnor Avenue to the south. The jitney service may be referred to as a demand responsive system, with the Jitneymen's Association controlling the number of jitneys allowed to service their route at a particular time. On the other hand, there is the Atlantic City Transportation Company providing off shore service to Atlantic City, Margate City, Ventnor, Longport, and Ocean City, as well as providing service to all of the mainland communities in the Study Area. Decreasing patronage and increasing costs have contributed to larger and larger deficits. In order to maintain service for the population dependent on transit transportation, State and County subsidies, as in so many urban areas across the country, have to be provided.

In addition, service between Atlantic City and Brigantine is now provided by the Atlantic City Transportation Company on an interim basis since the Atlantic-Brigantine Coach Company discontinued their operation. All three of the above operations provide a totally uncoordinated network of transit service that varies from very good to very poor.

Development of Alternative Transportation Plans

The alternatives for public transportation were developed in light of both the present Atlantic City Urban Area transit situation and the possibilities of potential situations. No consideration was given to rail-rapid service, at this time, because forecasted travel was not sufficiently large enough to warrant the initial high capital expenditures for that mode.

To aid in this development and to provide standards from which the alternative plans could be evaluated, specific objectives for the planning of future transit systems were established.

1. **Compatibility with Land Use—**

The long-range transit plan should serve existing and future land development and provide convenient service between residential and non-residential areas. In particular, the service should link low-income residential areas with major locations of employment.

2. **Highest Level of Service Consistent with System Costs—**

This objective is largely dependent upon the matching of supply and demand, but recognizing that a very high level of demand in one service route may offset a very low level of demand in another.

After considering the above objectives, three alternative approaches to area transit service were developed. The first alternative was a continuance of the present system into the forecast year of 1985. The second alternative called for a reduction of service provided by the Atlantic City Transportation Company and the extension of service by the jitney system. The third alternative provided for a revamped transit system with changes in operation, routing, and policy of both the bus and jitney services.

Discussion of the Three Alternatives

Each of the three alternatives has its merits and demerits in terms of operation and the fulfillment of transit planning objectives. Each alternative will now be defined and examined in detail to aid the decision makers in the selection of the proper alternative for the Urban Area.

The first alternative for future transit is essentially the present system and it is shown graphically in Map V-10. If the prevailing standard of the transit industry, that service should be available within 1,500 feet in urban areas, is applied, good coverage is provided in the Atlantic City Area. Service is provided to the captive riders in the Bungalow Park area and to job centers in Atlantic City and the mainland areas. Yet the operation is not providing sufficient revenue to cover operating expenses. A lack of area-wide transit coordination does exist, and the bus route is complicated, with off-route excursion commonplace. However, this is not directly the fault of the Atlantic City Transportation Company. When the Shore Fast Line interurban operated the route between Atlantic City and Ocean City, most stations were located quite a distance from U.S. Route 9, and were actually closer to residential districts. When buses were put on this route the towns requested the Public Utilities Commission to order the Company to serve these former station areas. Some of the more circuitous routes in the area are caused by the lack of through streets due to the numerous bays and inlets. Since many of the people in the Ventnor-Longport-Margate area are elderly, these branches are necessary to avoid excessive walking distances.

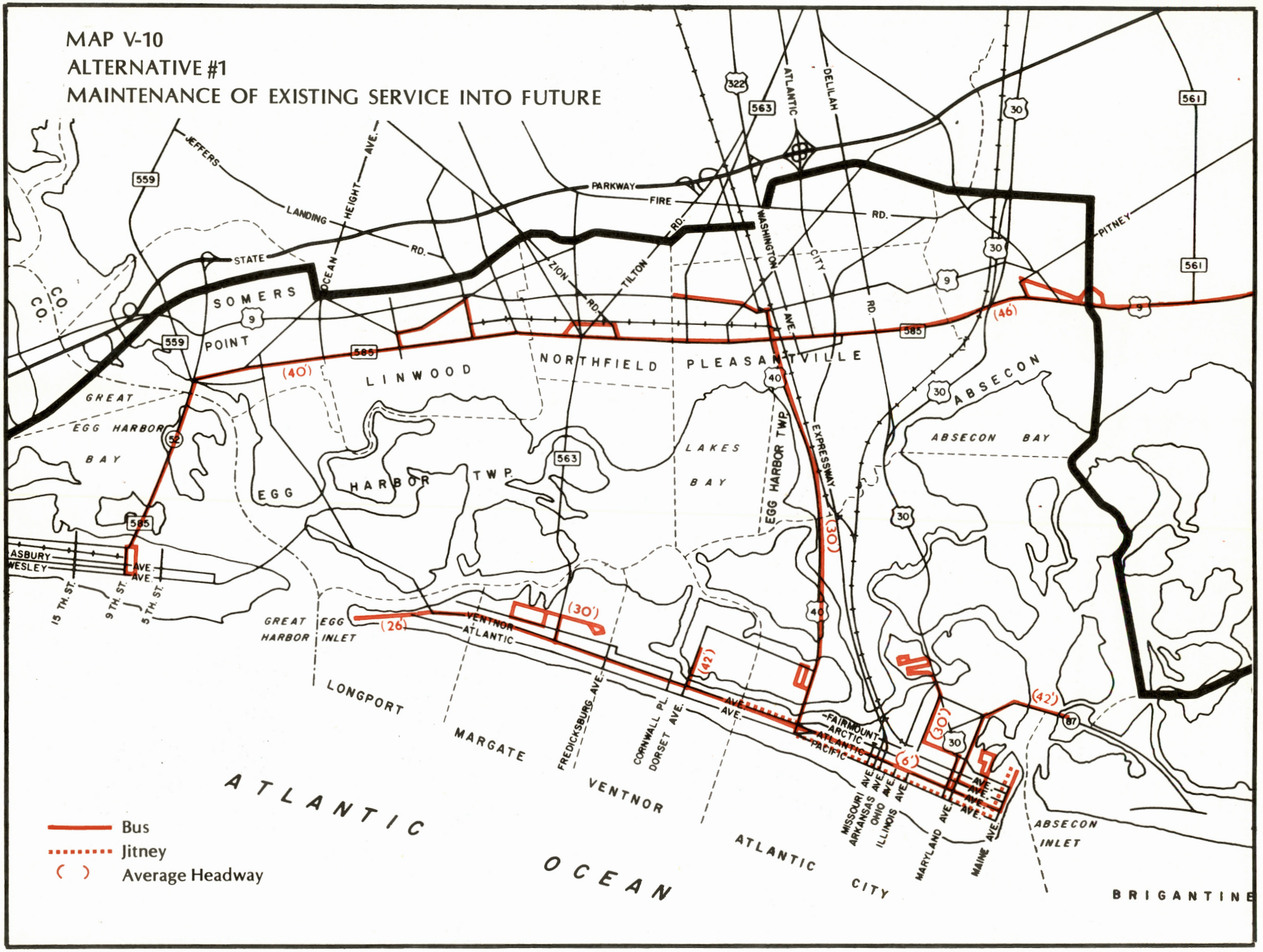
The second alternative calls for a considerable reduction in overall service as shown on Map V-11. All service on the Ocean City and Absecon Routes would be eliminated with the possibility of retaining hourly service between the Steel Pier and the Pleasantville CBD. This alternative also calls for reduction of service on the Atlantic-Ventnor Avenue route to 15 minute headways between Atlantic City's City Hall and Franklin Avenue. Hourly extensions to Longport and Venice Park would also be provided. The Atlantic-Brigantine route and the jitney route would be expected to serve the Inlet area. In addition, the jitneys would be expected to serve the Chelsea Heights area via Albany Avenue. This reduced level of service plan was developed from alternatives considered by the consulting firm of Simpson & Curtin in their transit study of Atlantic County. Their original plan called for the extension of the jitney route into Ventnor, Margate, and Longport. The plan also had Transport of New Jersey, which presently provides inter-city connection between Atlantic City and North Jersey, to make local stops in Absecon and Northfield. These original ideas were not specified in the second alternative because they were considered unlikely. This is particularly true in view of Transport of New Jersey's highly improbable consent to provide local service through Absecon, especially without provision of any subsidies. This carrier is having enough financial difficulties with its existing routes without adding any more. If a subsidy were provided, it might as well be provided to the local transit companies. Moreover, Transpot of New Jersey's express (New York-Atlantic City) routes would adversely be affected by requiring them to make local stops.

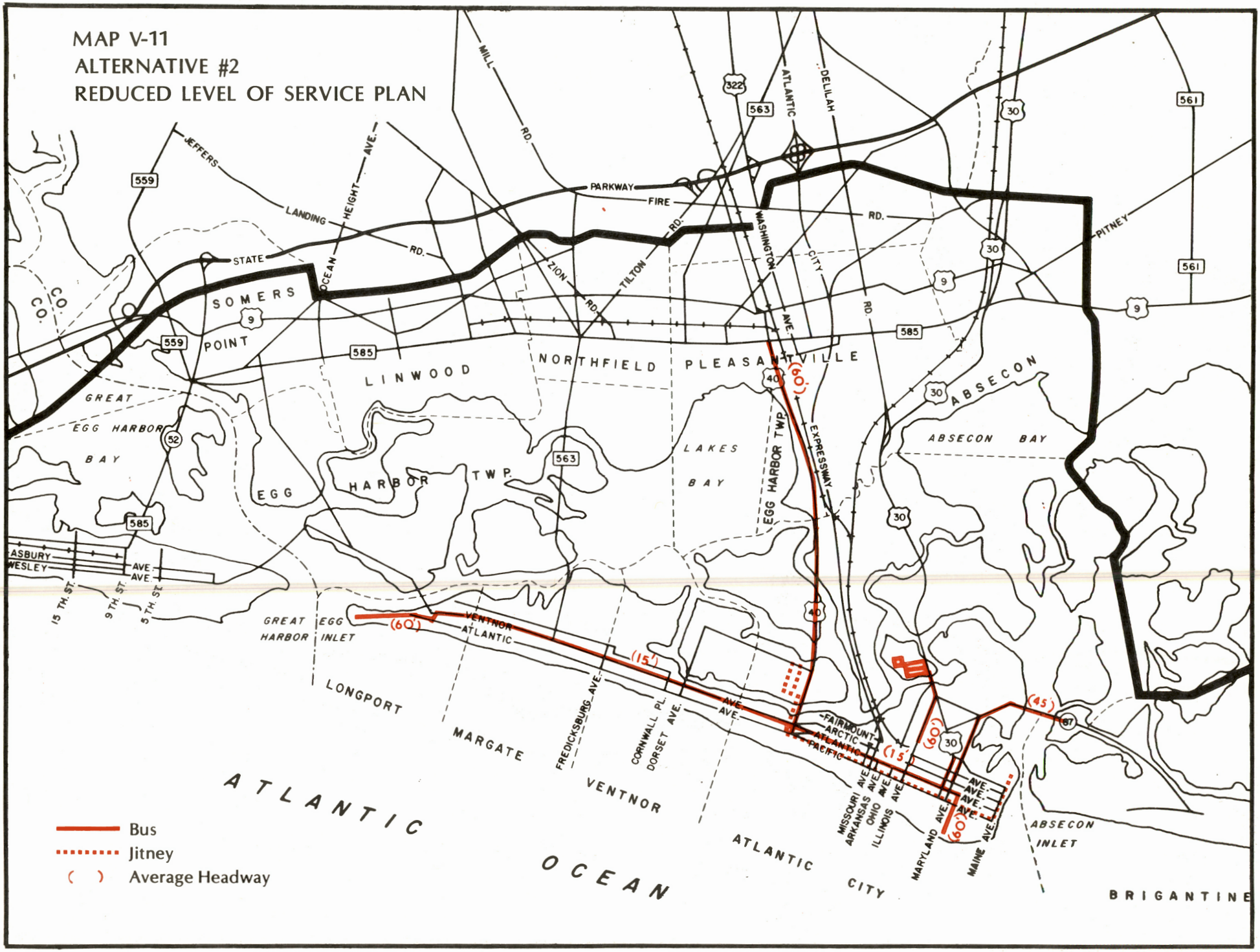
An extension of the jitney line into Longport would be difficult because of the nature of the jitney vehicle and the service it provides. It is a small, quick vehicle, providing rapid service for short trips. The objective of the jitney driver is to maximize his profits by having the greatest turnover of passengers in his vehicle possible. Requiring the driver to service the downshore areas would reduce his turnover and profits because of the increase in long trips. Furthermore, it is doubtful that the capacity of a 10-passenger jitney would be sufficient for longer runs.

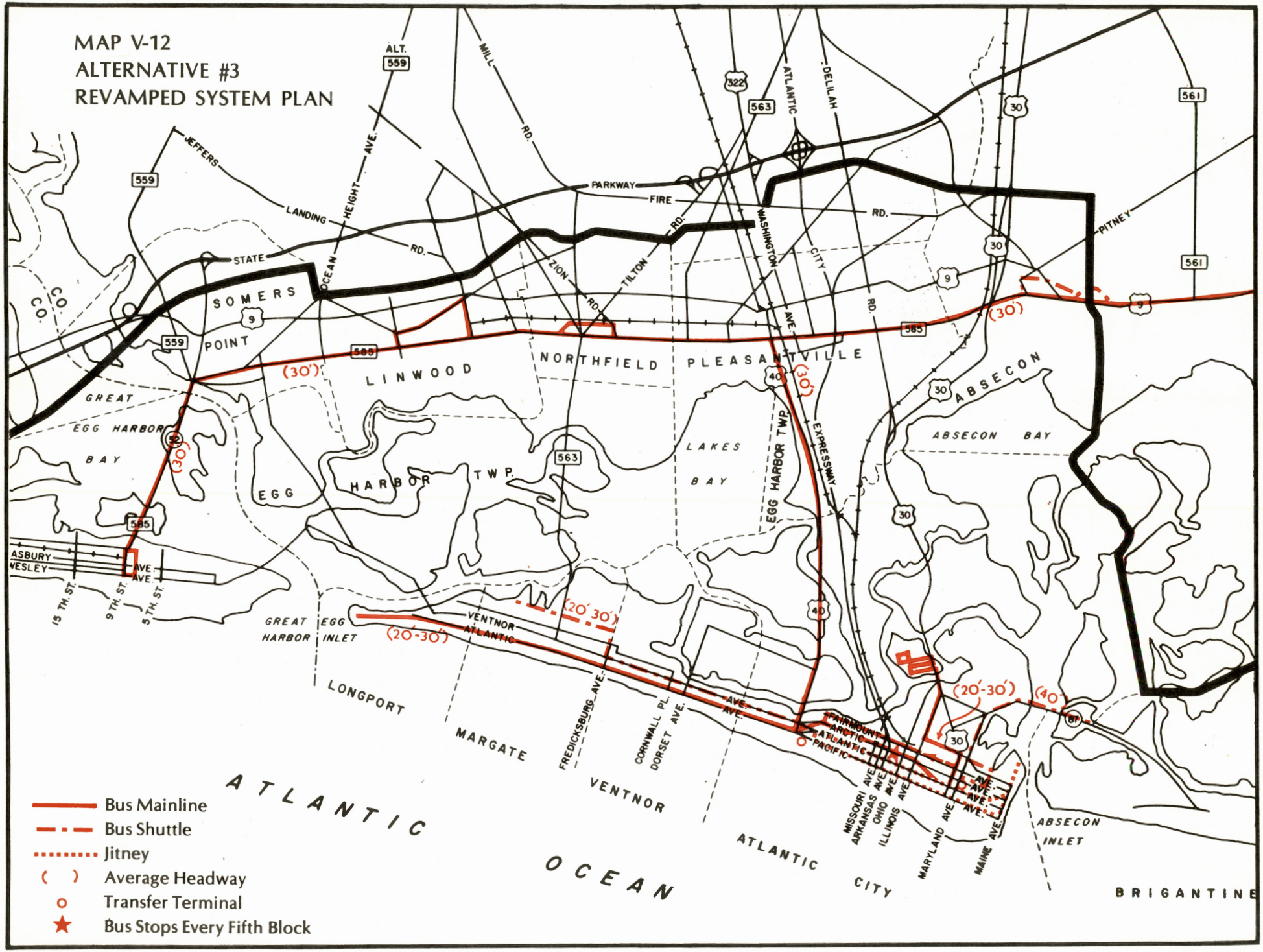
Overall, the second alternative does not provide sufficient access to jobs in the mainland areas for low income people who live offshore. The elimination of service to Ocean City causes considerable reduction in transit riders, but more importantly, deprives Ocean City of its only local bus service. While reducing the level of service would reduce operating expenses, it also would further reduce the attractiveness (which is already limited) of the bus service.

The third alternative, the revamped system, attempts to exploit the advantages that any of the present public transportation modes have in a coordinated system, that would link home and job activity centers. Map V-12 illustrates the plan.

Presently, the jitney system for Atlantic City is limited to the eastern half of the CBD, namely Pacific Avenue. The revamped system alterna-


MAP V-10
ALTERNATIVE #1
MAINTENANCE OF EXISTING SERVICE INTO FUTURE
JEFFERS
LANDING
OCEAN HEIGHT AVE.
RD.
STATE
PARKWAY
FIRE
RD.
ZION
RD.
TILTON
RD.
WASHINGTON
AVE.
CITY
RD.
ATLANTIC
DELILAH
PITNEY
559
322
563
30
561
9
585
SOMERS POINT
LINWOOD
NORTHFIELD
PLEASANTVILLE
ABSECON
(40')
(46')
GREAT EGG HARBOR BAY
EGG HARBOR TWP.
LAKES BAY
ABSECON BAY
EXPRESSWAY
(30')
52
40
ASBURY
WESLEY
AVE.
AVE.
15 TH. ST.
9 TH. ST.
5 TH. ST.
GREAT EGG HARBOR INLET
(26')
VENTNOR
ATLANTIC
(30')
(42')
LONGPORT
MARGATE
VENTNOR
ATLANTIC CITY
FREDERICKSBURG AVE.
CORNWALL PL.
DORSET AVE.
AVE.
FAIRMOUNT
ARCTIC
ATLANTIC
PACIFIC
(6')
MISSOURI AVE
ARKANSAS AVE
OHIO AVE
ILLINOIS AVE
MARYLAND AVE
MAINE AVE
87
ABSECON INLET
BRIGANTINE
ATLANTIC OCEAN
Bus
Jitney
( ) Average Headway


MAP V-11
ALTERNATIVE #2
REDUCED LEVEL OF SERVICE PLAN
Bus
Jitney
( ) Average Headway
ATLANTIC OCEAN
SOMERS POINT
LINWOOD
NORTHFIELD
PLEASANTVILLE
EGG HARBOR TWP.
LAKES BAY
ABSECON
ABSECON BAY
ABSECON INLET
GREAT EGG HARBOR BAY
GREAT EGG HARBOR INLET
LONGPORT
MARGATE
VENTNOR
ATLANTIC CITY
BRIGANTINE
EXPRESSWAY
PARKWAY
STATE
JEFFERS
LANDING
HEIGHT
OCEAN
MILL
FIRE
ZION
TILTON
WASHINGTON
ATLANTIC
DELILAH
PITNEY
CITY
VENTNOR
ATLANTIC
FREDERICKSBURG AVE.
CORNWALL PL.
DORSET AVE.
FAIRMOUNT
ARCTIC
ATLANTIC
PACIFIC
MISSOURI AVE.
ARKANSAS AVE.
OHIO AVE.
ILLINOIS AVE.
MARYLAND AVE.
MAINE AVE.
15 TH. ST.
9 TH. ST.
5 TH. ST.
(60')
(15')
(45')


MAP V-12
ALTERNATIVE #3
REVAMPED SYSTEM PLAN
Bus Mainline
Bus Shuttle
Jitney
( ) Average Headway
Transfer Terminal
Bus Stops Every Fifth Block
ATLANTIC OCEAN
SOMERS POINT
LINWOOD
NORTHFIELD
PLEASANTVILLE
ABSECON
EGG HARBOR TWP.
LAKES BAY
ABSECON BAY
GREAT EGG HARBOR BAY
GREAT EGG HARBOR INLET
LONGPORT
MARGATE
VENTNOR
ATLANTIC CITY
ABSECON INLET
BRIGANTINE
JEFFERS LANDING RD.
STATE
OCEAN HEIGHT AVE.
MILL RD.
ZION RD.
TILTON RD.
PARKWAY
FIRE RD.
WASHINGTON AVE.
ATLANTIC CITY EXPRESSWAY
DELILAH RD.
PITNEY
ASBURY AVE.
WESLEY AVE.
15 TH. ST.
9 TH. ST.
5 TH. ST.
VENTNOR AVE.
ATLANTIC AVE.
FREDICKSBURG AVE.
CORNWALL PL.
DORSET AVE.
FAIRMOUNT AVE.
ARCTIC AVE.
ATLANTIC AVE.
PACIFIC AVE.
MISSOURI AVE.
ARKANSAS AVE.
OHIO AVE.
ILLINOIS AVE.
MARYLAND AVE.
MAINE AVE.
(30')
(20'-30')
(20' 30')
(40')

tive proposes that the jitney service provide a two-directional circulation system for the CBD by running on Atlantic Avenue in addition to the Pacific Avenue route. It should be noted that the Atlantic City Transportation Company's buses do not fare well against the jitney in the Atlantic City CBD area anyhow. The bus seems to be more suited for longer trips and could complement the jitney service by serving as a feeder system. This concept would require two major transfer points; to the south, at the Monument, and to the north, in the vicinity of the Steel Pier. The Ocean City to Pleasantville to Atlantic City line would terminate at the Monument. Persons desiring to further penetrate the CBD could transfer to the jitney service. Another route would serve as a feeder from Longport, Margate, and Ventnor City with a stop at the Monument. It should be noted at this point that the path this route will follow is not definate, and that further investigation will be conducted to determine the most logical path for this area. However, the route would continue on Arctic Avenue to the north terminal before heading into the Bungalow and Venice Park areas. On the return trip, the bus route would run on Baltic and Fairmount Avenues, since Arctic, Baltic, and Fairmount are part of a oneway couplet proposed in the TOPICS project for Atlantic City. Intermediate stops on Arctic, Baltic, and Fairmount Avenues would be limited to every fourth or fifth block and would, in fact, operate on a semi-express basis for that portion of the line. Thus, the people in the upper portions of Atlantic City would have direct access to Ventnor, Margate, and Longport, intermediate access to the Atlantic City CBD, or full access to the CBD if they transfer to the jitney service at the north terminal. In addition, jobs at the inland areas would also be accessible by transferring to the Ocean City—Pleasantville line at the south terminal. Shuttle service between Absecon and the Pleasantville CBD would complement this route. Shuttle service would also be provided between Amherst Avenue in Ventnor and the south terminal, and between Brigantine and the north terminal. By instituting these transfer points and shuttle systems and eliminating certain stops, overall headways of the transit system could be improved without increasing the number of buses to run the system. Improvement of headways appears to be a very significant factor in increasing transit patronage as shown in the model split model developed for the area. Thus, this alternative proposes to reduce the present mainland headways of 60 minutes to 30 minutes. The 20-30 minute headways servicing Longport and the Venice Park areas could be maintained with fewer buses than the present system, because the new route would not require stops at every block as is the case on Atlantic Avenue through the Atlantic City CBD.

To summarize, the third alternative is flexible and simple while still maintaining relatively good access to the transit system with improved headways and travel times. The successful operation of the revamped system will heavily depend on complete coordination of scheduling and interline transfer arrangements. This is because people prefer through transit, regardless of fares or other inconveniences, over transit requiring transfers. Therefore, in order to enhance the attractiveness of the system under discussion, it is suggested that route guidance signs be posted at major stops and that these signs indicated the estimated arrival times for all buses. Finally, attractive facilities should be available at both of the major transfer terminals, and a program of public information should be initiated.

System Testing

In order to establish a quantitative basis for analyzing the three alternatives, a mathematical model was developed to estimate future transit patronage. The calibration of this model is presented in greater technical detail in another paper *(ACUATS Modal Split Report)*. Essentially, the model was a two-step process. First, it estimated the number of persons that would use transit instead of auto, based on the characteristics of the user and the system. Such factors as population density and the percentage of households having no automobile were significant user characteristics. Significant system characteristics included access to the transit system, and average headways between transit vehicles. The second step then estimated the proportional split of the transit users between bus and jitney riders. In this step, the degree of urbanization of the area under question and its relative proximity to the two modes were found to be the determining factors. Thus, not only did the mathematical model provide a procedure to forecast transit demand, but also a guide of contributing factors for influencing

MAP V-13
BUS ZONES

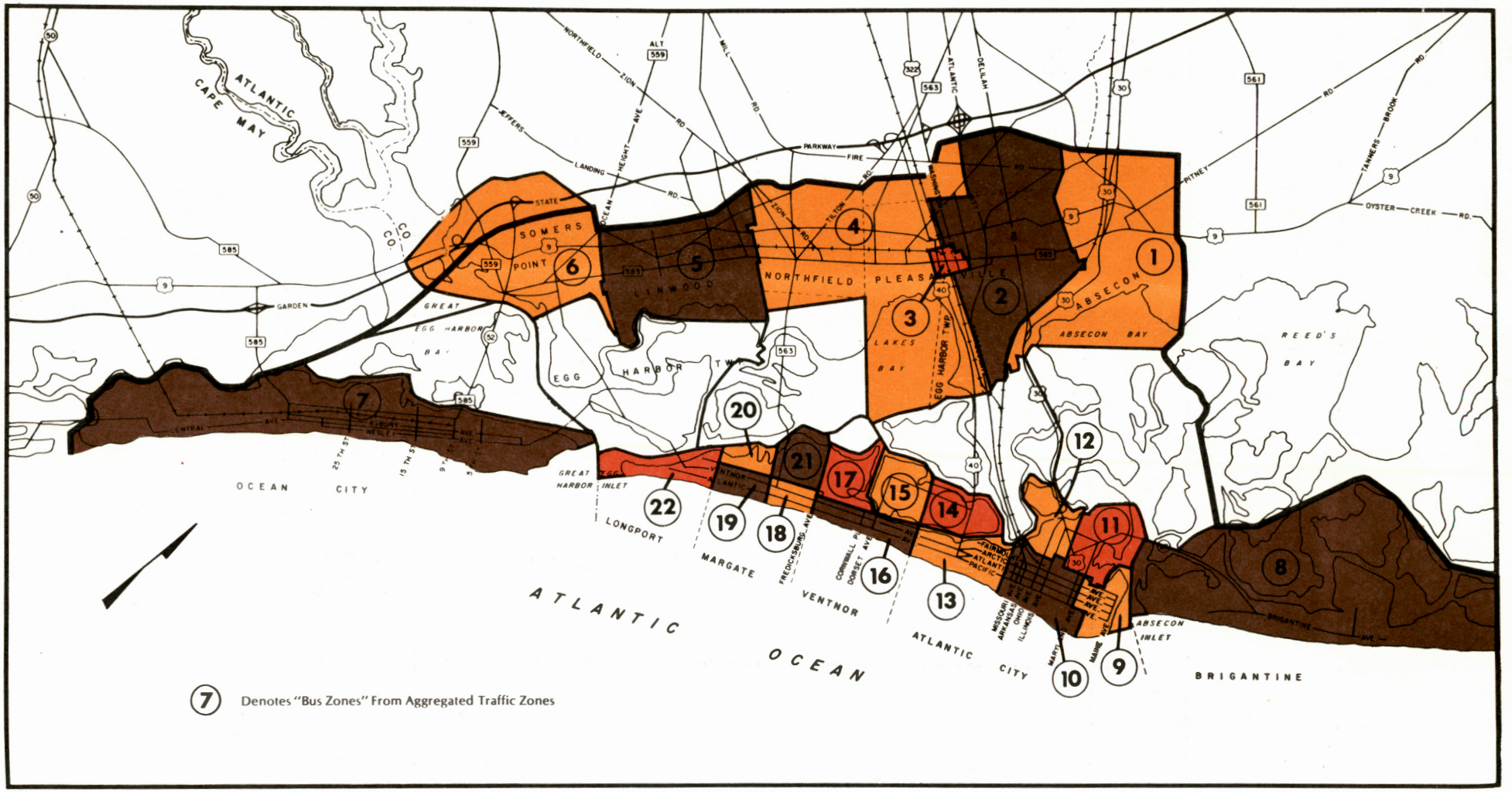


TABLE V-10
TRIP END SUMMARY
(ORIGIN & DESTINATION)

Bus Zone No.	1965 Actual	1965 Estimated	1985 Alt. 1	1985 Alt. 2	1985 Alt. 3
1	391	267	74	0	1,125
2	235	250*	345*	60*	405*
3	422	739	1,651	1,066	1,651
4	1,031	1,802	1,192	0	2,900
5	339	588	356	0	1,040
6	477	489	470	0	1,647
7	1,825	2,000*	1,500*	0	2,350*
8	850	1,281	760	760	760
9	5,799	5,657	6,354	0	4,456
10	14,204	14,096	15,223	14,517	14,032
11	878	757	1,223	1,223	1,223
12	968	1,539	1,957	1,290	1,957
13	4,498	3,987	4,324	5,207	4,481
14	464	437	484	0	484
15	100	174	233	0	0
16	3,001	3,594	2,452	2,452	3,062
17	325	479	528	528	470
18	1,642	1,214	976	635	2,255
19	968	1,068	1,922	1,071	1,922
20	782	1,094	1,087	451	886
21	905	650	661	82	1,229
22	292	300*	385*	238*	385*
TOTAL BUS	40,396	42,462	44,157	29,580	48,720
TOTAL JITNEY	50,400	48,900	63,650	66,000	65,000
TOTAL TRANSIT	90,800	91,362	107,807	95,580	113,720

*Adjusted from original forecast

transit demand and a basis to aid in the development of alternative plans.

The model was calibrated first on the 1965 transit system and socio-economic characteristics of the Urban Area. After the calibration, the model was used to forecast the 1985 transit demand on a zonal basis for each of the three alternatives. To compensate for modeling errors, the zones were aggregated on a geographic and homogeneous socio-economic basis for the bus mode. On the other hand, the jitney estimates were not aggregated. Map V-13 shows the geographic location of the zones and Table V-10 lists the actual, 1965, and the 1985 estimates. Also, indicated are the total jitney ridership figures.

It can be seen that continuing the present system or level of service will result in some net increase in bus trips for the mainland areas (Bus zones 1-6). For the Ocean City and Brigantine areas, the demand will probably be reduced by this alternative. Still, for the rest of the off shore area—Atlantic City to Longport—more bus and jitney riders are anticipated.

The second alternative, reduced level of service plan, suffers substantial loss in bus ridership in areas both on the mainland and island communities. No riders to and from Ocean City can be expected because of the elimination of bus service to that city. Similarly, the mainland will have a great reduction in ridership as only hourly service would be provided to the Pleasantville CBD. Reducing the level of service on the Atlantic City island causes drops in bus ridership while the jitney service acquires only part of the slack.

The third alternative, with its improved level of service, shows increases in demand everywhere except for Brigantine. The latter exception is probably a result of changes in the socio-economic nature of the area. Otherwise, the increases are substantial, particularly in the mainland areas where the level of service is to be improved the most. The jitney service would also receive ridership gains that would be greater than gains forecasted for Alternative I. Overall, the third alternative is expected to have the largest number of transit (jitney and bus) riders of all the alternatives.

It appears that the third alternative provides the best future transit system. However, it must be emphasized that Alternative III, Transit System Plan, is intended to provide only a basic framework. It is fully realized that, prior to implementation, detailed studies of scheduling, exact routing, location of transfer points, etc., must be carried out with full coordination and approval by the affected operating agencies.

During the Continuing Phase of the transportation planning process, significant factors will be monitored, analyzed and evaluated. The findings of this report will be periodically reviewed to reflect major deviations from projected future data. This process must be employed in order to plan intelligently for future needs.