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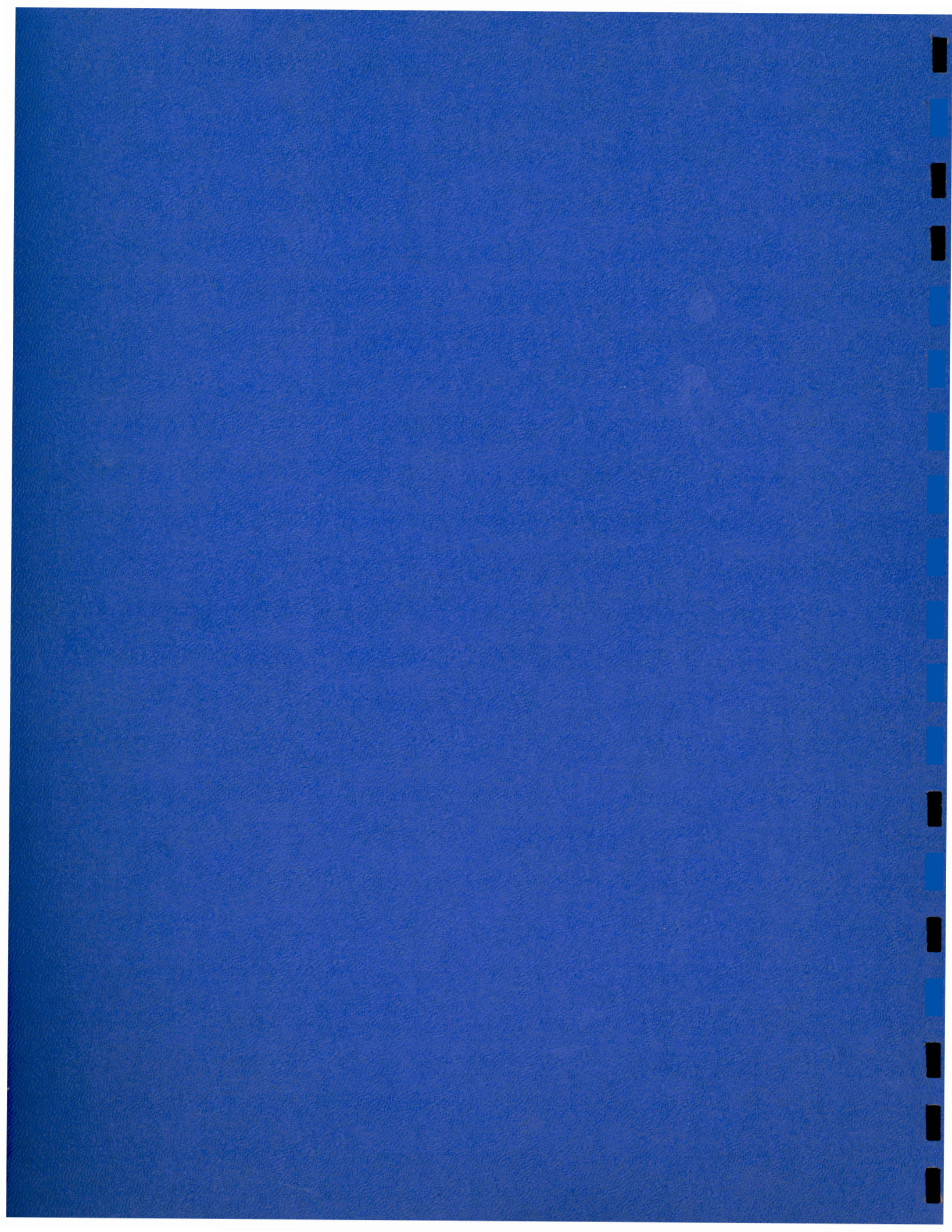
Traffic Needs Study
for
Eastern Hudson County
between
Jersey City and Weehawken

Wilbur Smith and Associates

265 CHURCH STREET
NEW HAVEN, CONNECTICUT

April 1955

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TRAFFIC NEEDS STUDY
for
EASTERN HUDSON COUNTY
between
JERSEY CITY and WEEHAWKEN

Wilbur Smith and Associates
265 Church Street
New Haven, Connecticut

April 1955

New Jersey State Library

22

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 200 million to 400 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

the 1990s, the number of people in the United States who are 65 years of age or older is projected to increase from 20 million to 30 million, and the number of people 75 years of age or older is projected to increase from 10 million to 15 million (U.S. Census Bureau, 1997). The number of people 85 years of age or older is projected to increase from 2 million to 4 million (U.S. Census Bureau, 1997). The number of people 90 years of age or older is projected to increase from 500,000 to 1 million (U.S. Census Bureau, 1997). The number of people 95 years of age or older is projected to increase from 100,000 to 200,000 (U.S. Census Bureau, 1997). The number of people 100 years of age or older is projected to increase from 10,000 to 20,000 (U.S. Census Bureau, 1997).

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New Haven, Conn.

April 23, 1955

Hon. Dwight R. G. Palmer
State Highway Commissioner
1035 Parkway Avenue
Trenton 8, New Jersey

Dear Commissioner Palmer:

We are pleased to transmit herewith a report on traffic studies in Hudson County, New Jersey, between the approaches to the Holland Tunnel and the Lincoln Tunnel. The studies and report were undertaken in accord with our contract dated August 4, 1954, and revised February 4, 1955. By agreement, the New Jersey State Highway Department, the New Jersey Turnpike Authority, and the Port of New York Authority jointly sponsored the study.

It is apparent from our findings that an improved north-south route between the approaches to the Holland Tunnel Plaza and the Lincoln Tunnel Plaza will accommodate a substantial volume of traffic and will provide a much needed traffic service to Hoboken and adjacent communities. While a limited access roadway is not essential, the traffic volumes potential to a new alignment are sufficiently great to warrant the construction of a high type facility. While no attempt has been made in this report to fix the location of a new north-south route through Hoboken, it is obvious from the traffic analyses and from the other factors considered, that maximum overall benefits will be derived from an alignment near or to the west of Willow Avenue. Ultimately the southern end of the facility should connect with U.S. Route 1-Business and the Newark Bay-Hudson County Extension of the New Jersey Turnpike so that it will serve the dual purpose of eliminating objectionable turning movements on the approaches to the Holland Tunnel and accommodating substantial north-south movements into and through Hoboken. If


April 23, 1955

such a connection is not provided immediately, interim improvements should be provided to accommodate the turning movements from the Newark Bay-Hudson County Extension and U.S. Route 1-Business on the 12th Street Viaduct at Jersey Avenue.

We should like to take this opportunity to express to you, to the New Jersey Turnpike Authority, and to the Port of New York Authority our sincere thanks and appreciation for the valuable assistance rendered throughout the field studies and analyses. We should like to also acknowledge the excellent help which was given us by the city officials of Hoboken, particularly the police. Many other organizations and groups gave us valuable information and assistance. We are grateful for this and all other cooperation.

We hope that the information contained in this report will be valuable to you and to the other agencies concerned in reaching sound conclusions for the development of a north-south traffic artery through Hoboken.

Respectfully submitted,


Wilbur S. Smith

WSS/mew

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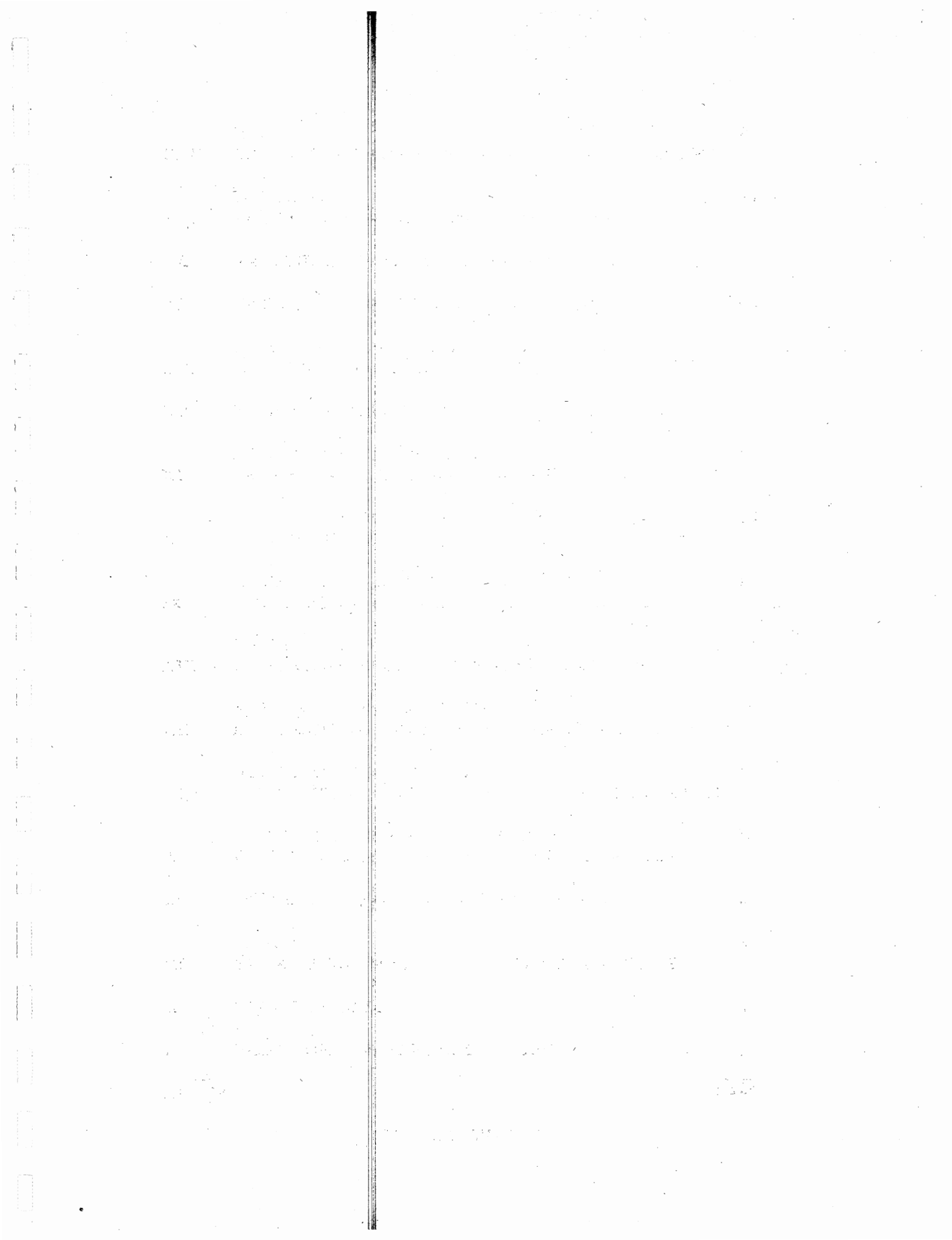
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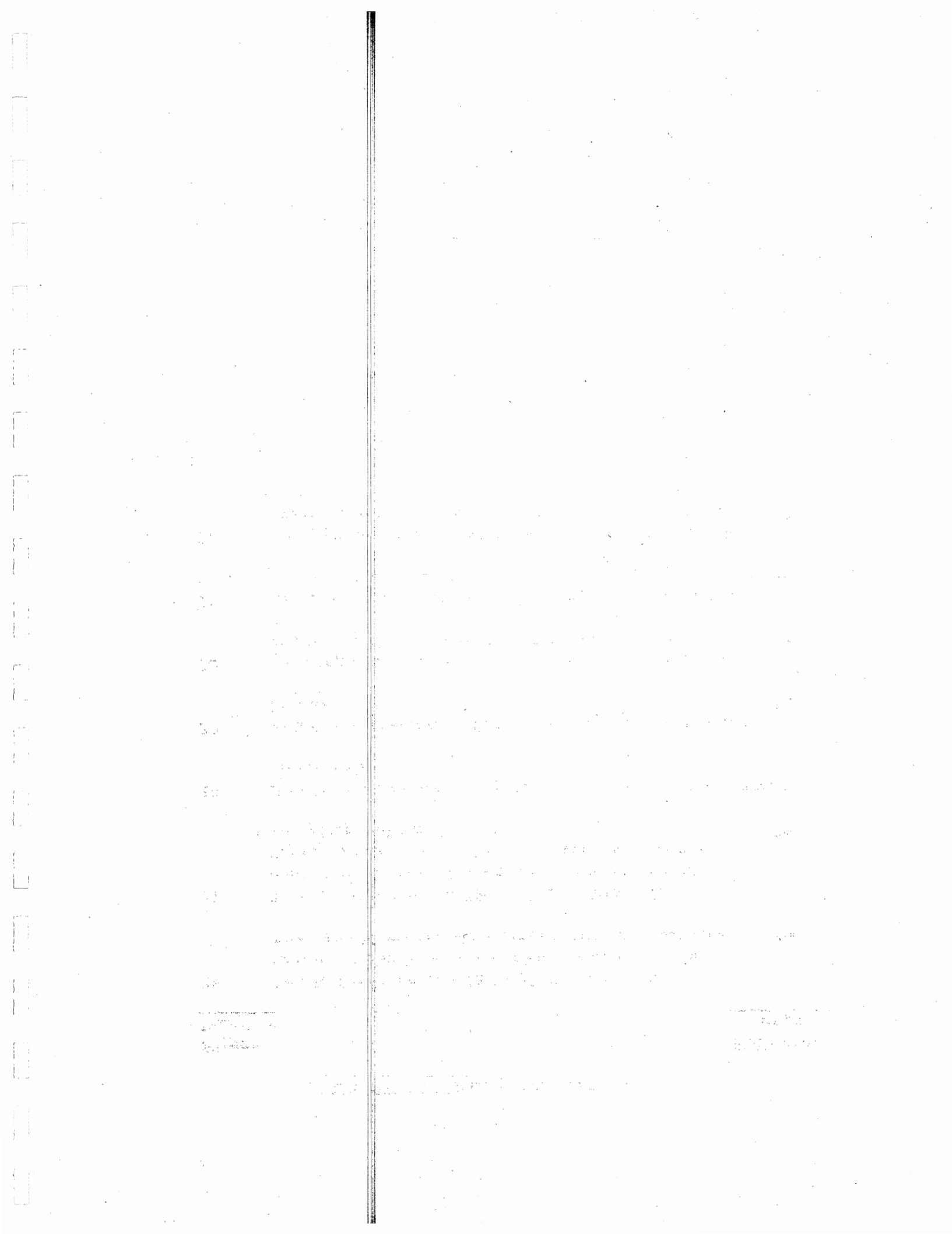
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SUMMARY

This report and the surveys on which it is based are largely concerned with north-south traffic movements through the City of Hoboken, New Jersey.

While the population of Hoboken has practically stabilized, the city is still an important transportation center and is situated in an area of some of the world's heaviest traffic movements.

Basic information for the report and for future reference was procured by extensive origin and destination surveys and traffic counts in August, 1954. Survey limits circumscribe the City of Hoboken.

Regional and state traffic data were procured and trends in movement on the New Jersey Turnpike and the Lincoln and Holland Tunnels were analyzed.

The average volume of traffic through the survey screen line exceeds 82,000 vehicles daily.

More than 67,000 daily trips passed through the survey stations. Approximately 22 percent are through trips without origin or destination in Hoboken. The importance of Hoboken as a traffic generator is shown by the fact that almost 80 percent of the trips have a terminus in the city.

Commercial vehicles are relatively more predominant in the through trip category than are passenger vehicles.

Heavy trip desires extend through the survey area along a north-south axis. The importance of local traffic generators in the close proximity of Hoboken is apparent from the traffic desire line studies.

While the patterns of traffic on typical weekdays as compared with those on Mondays and Fridays show some differences, no important changes were found.

Trans-river trips are of negligible consequence insofar as passenger vehicle movements are concerned. While volumes are small, a substantial number of trucks crossing the Hudson River pass

through Hoboken en route.

While local trips generate the bulk of the traffic movements into and through Hoboken, external trips also are substantial and prominently affect the traffic problem.

Despite the trends in population and vehicle usage within the City of Hoboken, it is reasonable to expect that the growth in traffic in the area will follow the general pattern for the state and the New York Metropolitan Region. Planned highway improvements in the immediate area do much to insure a continued growth in traffic.

Traffic entering Hoboken from points south and west of the city will create increasing problems along 12th Street at the Holland Tunnel Plaza as highway improvements now programmed are completed.

Traffic volumes generated by Jersey City and Hoboken waterfront areas are substantial and should be served by a new highway facility into Hoboken. This means that the facility should be located, designed, and integrated with other facilities so as to serve the dual purpose of alleviating merging and turning conflicts on the approaches to the Holland Tunnel Plaza and accommodating the local north-south movements.

Because of the local street pattern, railroads, and interchanges at termini, a six-lane facility of the semi-expressway type is suggested. Stage development appears feasible.

Travel assignments have been made to a roadway which will develop optimum traffic services, with assumed interchanges. Projections have been carried to 1976 with full account given to the completion of major new roadway facilities affecting the travel pattern of the area. It is estimated that by 1976 average annual daily traffic volumes will range from 58,000 to 62,000 on the route.

Only slight relief can be expected for the northern section of the existing New Jersey Turnpike and U.S. Routes 1 and 9 and other major arteries which are generally parallel to the proposed route. The diversion of traffic to the new roadway will provide marked traffic relief to several key north-south streets in Hoboken.

PART I

INTRODUCTION

The New York and Northern New Jersey Metropolitan Area has long been beset by many complex traffic problems. Much has been done to meet the needs of automotive transportation. Some of the world's most expensive and elaborate roadway facilities have been constructed; existing facilities have been improved; objective studies have been made; regulations and devices have been effectively used. However, the rapid growths in motor vehicle use have made it difficult, if not impossible, to keep pace with the demands for highway capacity. This study is another indication of the desires of public officials to coordinate their plans, efforts, and resources, to meet the traffic needs of the area.

Hoboken was laid out in the early 1800's by Dutch settlers. Development of the city was slow prior to 1860, but following that date large gains were recorded in population and area expansion was concurrent. Maximum population was reached about 1910, when more than 70,000 people were recorded within the corporate limits. Since 1910, decreases have reduced the official population of the city to about 50,000. Between 1940 and 1950 a slight gain was indicated. Table I shows the population changes which have taken place in Hoboken during the period between 1860 and 1950.

Table I

HOBOKEN POPULATION TRENDS

<u>Year</u>	<u>Population</u>	<u>Per Cent Change</u>
1860	9,622	--
1870	20,297	- 110.1
1880	30,999	- 52.7
1890	43,648	- 40.8
1900	59,364	- 36.0
1910	70,324	- 18.5
1920	68,166	- 3.1
1930	59,261	- 13.1
1940	50,115	- 15.4
1950	50,676	- 1.1

Hoboken is located directly across the Hudson River from lower Manhattan. It became the focal point of many transportation facilities which developed adjacent to New York City. It presently serves as the terminus for both rail and water transportation.

Increases in motor vehicle registration and use in recent years have made the city more important as a transportation center. However, highway facilities in and through Hoboken have not kept pace. There is no attractive north-south facility through the city. Traffic is required to wind its way through the city on narrow one-way streets. No suitable parallel facility is available in the adjacent municipalities.

Purpose and Scope of Study

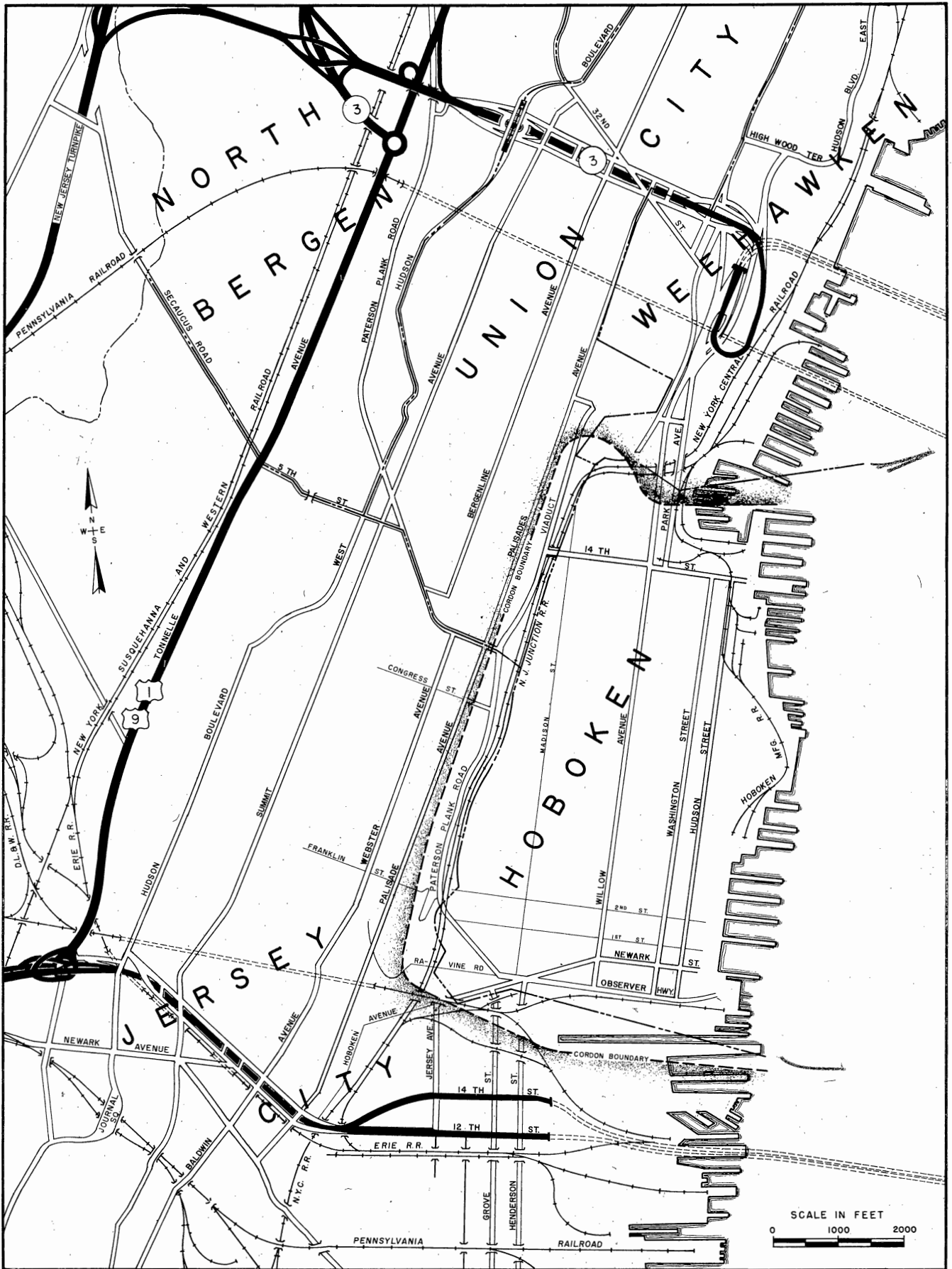
This survey was undertaken by joint agreement between the New Jersey State Highway Department, the New Jersey Turnpike Authority, and the Port of New York Authority. It was the purpose to determine the patterns of present travel into and through the area bounded by the Erie Railroad viaduct, south of the Holland Tunnel Plaza and State Highway Route U.S. 1-Business on the south, Palisade Avenue on the west, the Lincoln Tunnel Plaza on the north, and the Hudson River on the east. The survey area is shown in Figure 1. Based upon the survey data, projections of highway needs and general roadway alignments were desired.

The work to be undertaken was divided into two general areas. The first called for an origin-destination survey, including determination of volume and type of vehicular traffic in the survey area described above.

In addition, data were to be developed as necessary to determine whether vehicular needs warrant, or will warrant, construction of a highway through Hoboken. The general locations which should be considered for the alignment of such a highway were to be reviewed. Recommendations concerning the provision for traffic movements at the northerly terminus of the Newark Bay-Hudson County Extension of the New Jersey Turnpike, if a connection with an existing or proposed highway extending farther north were indicated, also were desired.

Description of Survey

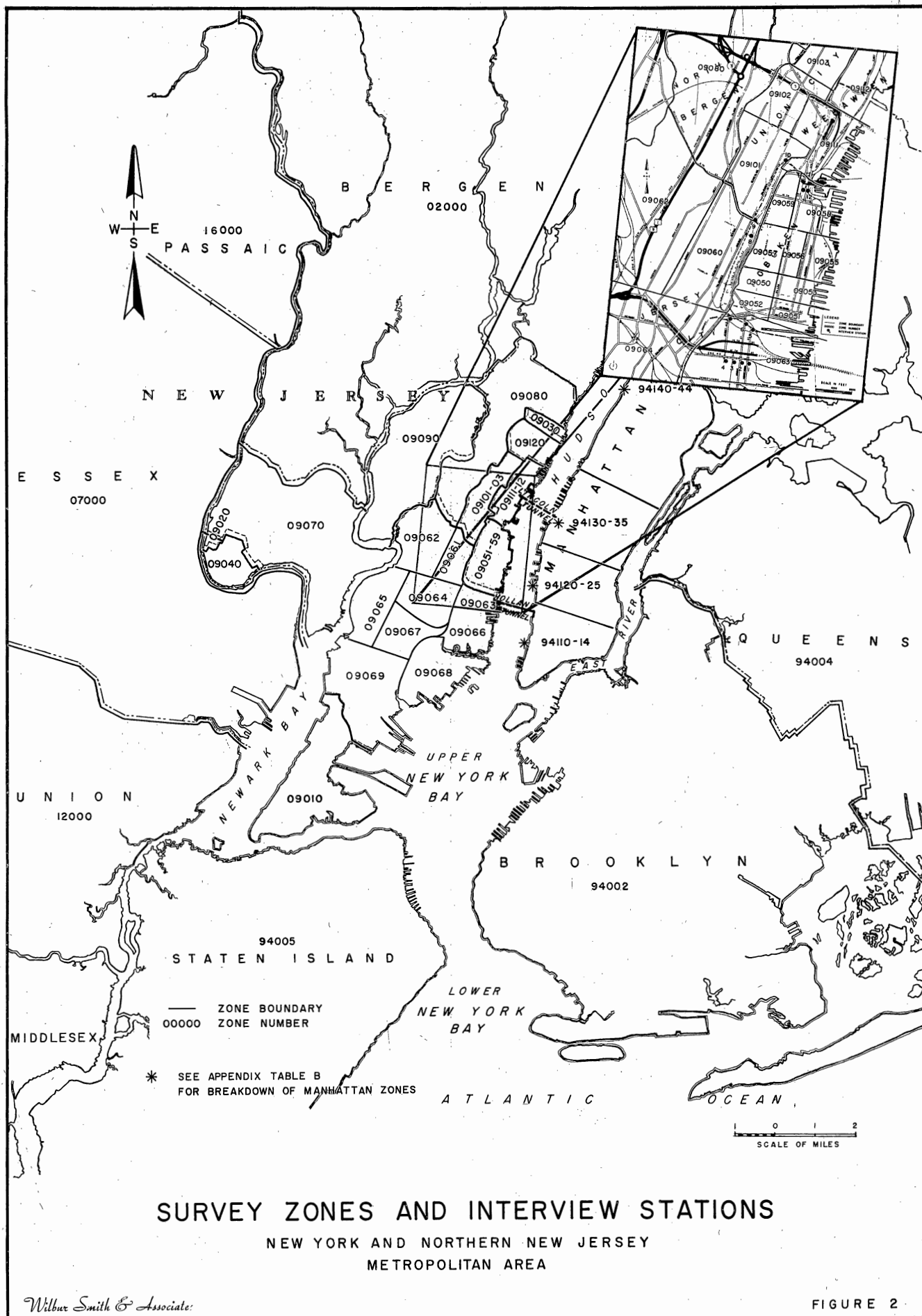
The origin and destination survey was conducted between Wednesday, August 18 and Monday, August 30, 1954. Roadside interviews were conducted at twelve survey stations in the Hoboken area. These stations are shown in Figure 2, along with



SURVEY AREA
HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

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FIGURE 1



the zones which were established for analyzing and processing the survey data. It should be noted that survey stations were established on all the key streets providing access to Hoboken. Most of the stations were situated in adjacent towns, with nine located in Jersey City.

At each of the survey stations, interviews were conducted between 6:00 A.M. and 10:00 P.M. on typical weekdays. Continuous manual classification counts were made for a complete 24-hour period on each of the survey days.

In addition to the weekdays, interviewing was also conducted at six stations on a Friday and a Monday during the survey period. Classified traffic counts were recorded at these same stations during a Saturday and a Sunday.

Survey coverage of origins and destinations is indicated in Table II. It is to be noted that an overall sample of 40.2 per cent was obtained in the interviews.

Table II
SURVEY COVERAGE

<u>Date</u>	<u>Stations Operated</u>	<u>16 Hour Volume*</u>	<u>Number Interviewed</u>	<u>Per Cent Interviewed</u>
August 18	4	24,618	11,728	47.6
August 19	3	25,915	11,403	44.0
August 20	3	27,620	10,808	39.1
August 23	3	25,775	9,921	38.5
August 24	2	14,128	6,431	45.5
August 26	3	28,757	11,928	41.5
August 27	3	37,666	13,580	36.1
August 30	<u>3</u>	<u>35,053</u>	<u>12,508</u>	<u>38.5</u>
	24	219,532	88,307	40.2

* Passenger cars and trucks only (buses excluded).

Additional traffic counts were conducted on other roadways leading into Hoboken to determine the magnitude of traffic using these streets.

Traffic volume data were obtained from the New Jersey State

Highway Department and from the Port of New York Authority for key locations in the Hudson County area and for the Holland and Lincoln Tunnels.

Base maps, photographs, area roadway plans, and significant trends affecting travel patterns were procured from the sponsoring agencies and from local officials in Hoboken.

In processing the origin and destination data for analysis, all interviews were coded. Tabulating cards were prepared by the Bureau of Planning and Traffic of the New Jersey State Highway Department, and exhaustive tabulations were obtained for analysis.

PART II

PRESENT TRAFFIC

A first objective of this survey was to measure existing traffic conditions, and to obtain an accurate understanding of traffic characteristics in the survey area. Vehicle volumes, composition, basic travel patterns, and quality of movement were determined. A full understanding of the existing roadway patterns, and the traffic services provided is essential to a proper analysis of traffic facts.

Basic Conditions Affecting Traffic

Highway System - The Holland and Lincoln Tunnels make Hoboken readily accessible to New York City. The tunnels are approached on the New Jersey side of the river by multi-lane expressway type facilities which connect with major north-south traffic arteries west of the Palisades. These include U.S. Routes 1 and 9 and the New Jersey Turnpike. At present these north-south routes accommodate the bulk of the through traffic.

In addition, the tunnel approach roadways provide direct access to east-west routes across Northern New Jersey. These include U.S. Route 22 which is reached via U.S. Routes 1 and 9 at the Newark Airport. New Jersey Route 3 provides a direct route between the Lincoln Tunnel and U.S. Route 46 in Clifton. The locations of principal routes, and their relationship to Hoboken and the New York and Northern New Jersey Metropolitan area are shown in Figure 3.

The Influence of Railroads in Survey Area - Railroads have always been a major factor in planning developments for this area. The metropolitan terminal of the Lackawanna Railroad is situated along the southerly side of Hoboken and provides a distinct barrier between Hoboken and Jersey City. Another major terminal, that of the Erie Railroad, is located just south of the approach to the Holland Tunnel in Jersey City. While each of these lines are elevated over the Jersey City and Hoboken streets, there are only three streets having underpasses by which north-south traffic can traverse the area.

The New Jersey Junction Railroad runs along the foot of the Palisades on the west side of Hoboken and forms the western and

northern boundary of the city as it turns with the Palisades toward the Hudson River at the north end of the city. In following this alignment the railroad passes under Willow Avenue and Park Avenue, the two major north-south arteries entering Hoboken from the north.

Railroad grade crossings are found on Paterson Plank Road where the New Jersey Junction Railroad crosses it at the foot of the Palisades, and at points along Jersey Avenue and Hoboken Avenue just south of the Lackawanna Railroad viaduct where the Lackawanna freight tracks cross these streets.

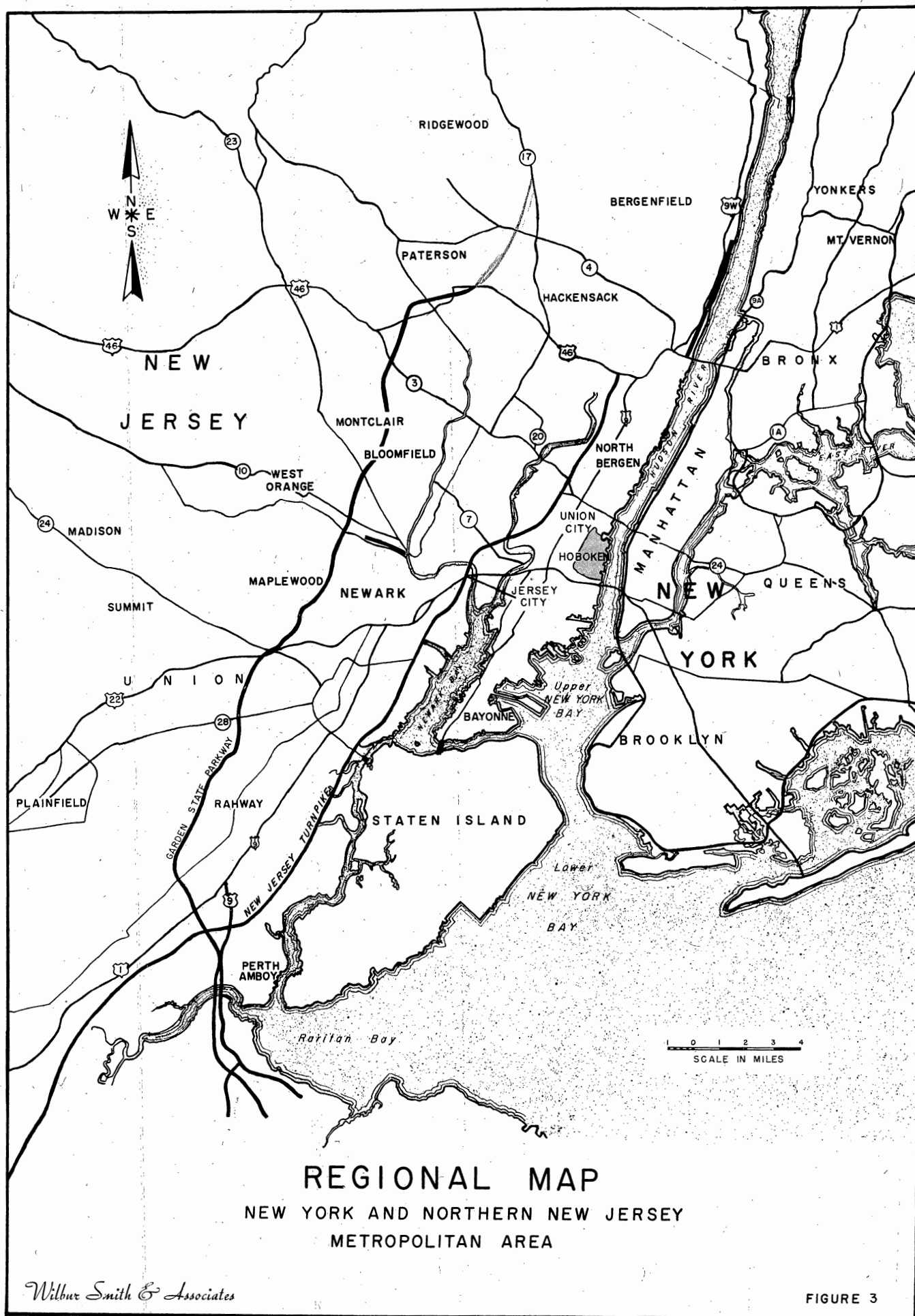
Bridges and Viaducts - Due to both the railroads and to the topographic limitations imposed by the Palisades, viaducts play an important role. Bridges over the railroad on Willow Avenue and Park Avenue, located at the northerly end of Hoboken, create a more serious bottleneck than might normally be expected since the Park Avenue bridge is limited to light vehicles. This forces truck traffic to use the Willow Avenue bridge when entering or leaving Hoboken from the north.

Also of major importance is the 14th Street Viaduct in Hoboken which carries traffic from Willow Avenue up a long grade to the west to the Palisades. At the Palisades the viaduct splits and permits traffic to continue up the Palisades both south to Jersey City at Paterson Plank Road and north to Union City.

The 12th and 14th Street Viaducts in Jersey City are perhaps the most important highway structures in the entire area. These viaducts carry all of the U.S. Route 1-Business traffic to and from the Holland Tunnel and with the Upper and Depressed Roadways provide connectors between the Tunnel and the Pulaski Skyway and local areas on top of the Palisades. Added importance will be attached to these viaducts when they become the northern terminus of the Newark Bay-Hudson County Extension of the New Jersey Turnpike which is presently under construction.

Ferry Traffic and Waterfront Activity - The Hoboken Ferries operate between the Lackawanna Railroad Terminal at the foot of Hudson Place in Hoboken and Christopher and Barclay Streets in New York. Traffic on these ferries has decreased to such an extent that an application has been filed for the discontinuance of the Christopher Street Ferry. This ferry operation carried between 560 and 720 vehicles per day during the period of the traffic survey in August, 1954. It did not operate on Saturdays and Sundays.

During the same period, the Barclay Street Ferry carried



between 1350 and 1630 vehicles on weekdays and only approximately 900 vehicles per day on weekends.

It was determined that the period in which traffic data were collected was an abnormally low one for waterfront activity. July and August are below average months while May and June produce peak waterfront activities.

Some ships avoided Hoboken during August, 1954 due to the threats of labor trouble among longshoremen, adding further to the sub-normal conditions. It is apparent that traffic generated by waterfront activities will produce higher average values than those measured.

Of particular interest along the Hoboken waterfront is the development of new piers by the Port of New York Authority in the area below Pier 3. It is anticipated that these will be a boon to activity along the waterfront and will make the area one of the busiest spots in Hoboken when construction is completed. The piers will also serve to relieve traffic congestion on streets adjacent to the waterfront by providing space off the streets where trucks can be loaded or unloaded.

Traffic Volumes

Extensive traffic volume data were collected in the Hoboken area. Information was also obtained concerning traffic on highway facilities adjacent to the area for the purpose of comparing traffic flow characteristics. Figure 4 shows the 24-hour traffic volumes measured at the survey cordon line. The importance of the north-south traffic movement as compared to east-west movement is indicated. It will be noted that the major facility at the north end of Hoboken is Willow Avenue which is currently carrying approximately 17,350 vehicles on a mid-week day and that Jersey Avenue at the south end of Hoboken carried 14,700 vehicles on a similar day. Minor traffic flows may also be noted on Franklin Street, on New York Avenue or Ravine Road, and on Hoboken Avenue. A summary of traffic volumes at each of the interview stations may be found in the Appendix, Table B.

Traffic Volume Variations - Hourly variations in traffic crossing the screen line at both the north and south end of Hoboken are shown in Figure 5. Variations on the Hoboken streets appear to be comparable to those found in most urban metropolitan areas in the course of a normal weekday. The peak flows into Hoboken occur between 4:00 and 6:00 P.M. at the south screen line and between 7:00 and 9:00 A.M. at the north screen line. Since, at the

same times, heavy outbound movements are reported at the opposite ends of the city, a peak hour movement through Hoboken is observed.

Peak hour traffic flow characteristics, at selected survey stations, are listed in Table III. This indicates the relative magnitudes of traffic volumes which passed through the cordon line at peak traffic periods during the course of the field survey. It is interesting to note that in general there are no significant changes in peak hour volumes on the various days of the week. Willow Avenue has an increase in the northbound traffic flow during the evening peak period on Monday and Friday, as compared with the weekday. The southbound peak hour on Willow Avenue is lower on Monday and Friday than on other weekdays.

From the traffic counts conducted over the weekends during which the survey was made, it is possible to picture clearly the weekend traffic flow pattern in the Hoboken area. Table IV shows the 24-hour traffic volumes for the various survey stations on the

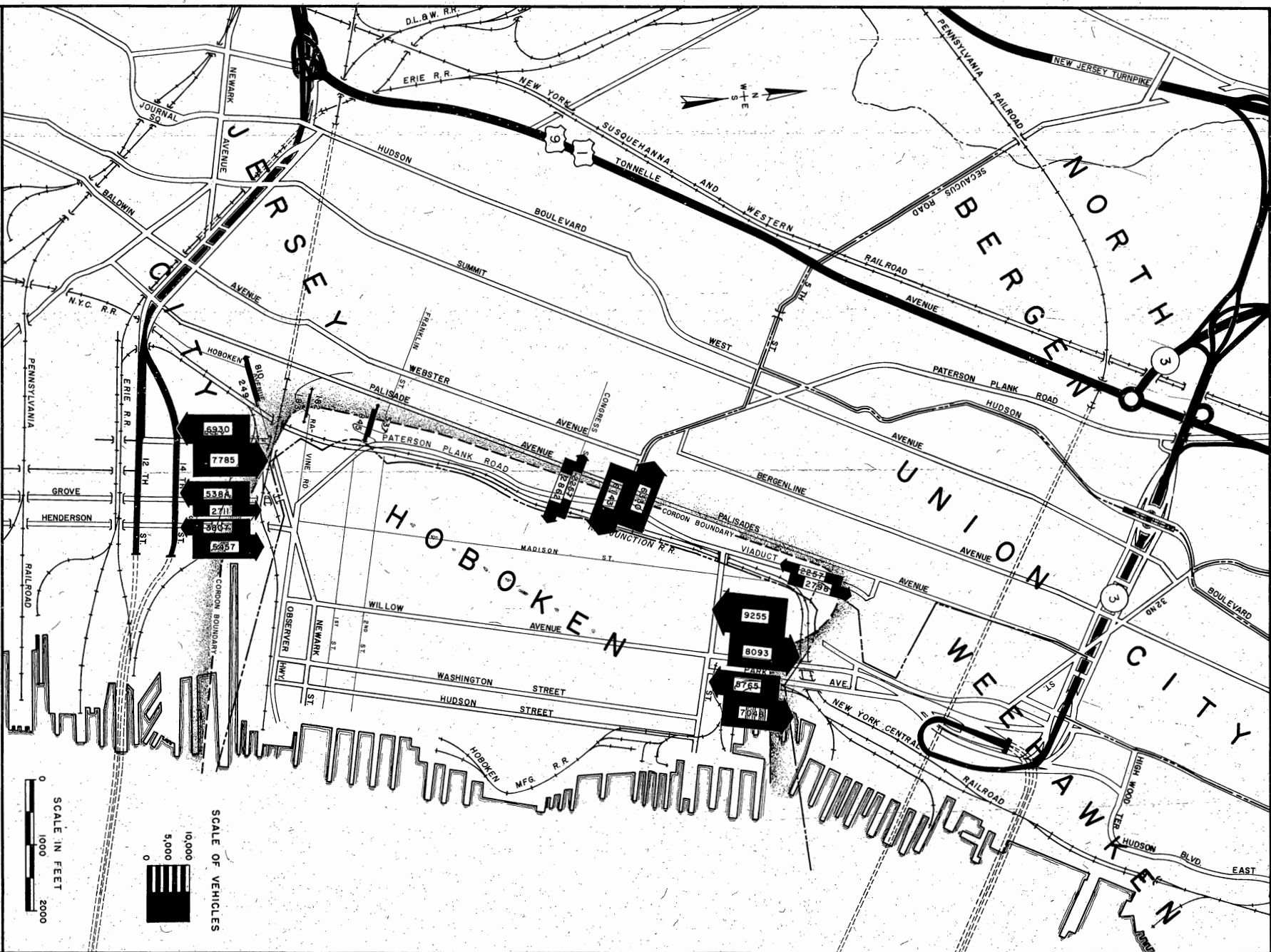
Table III

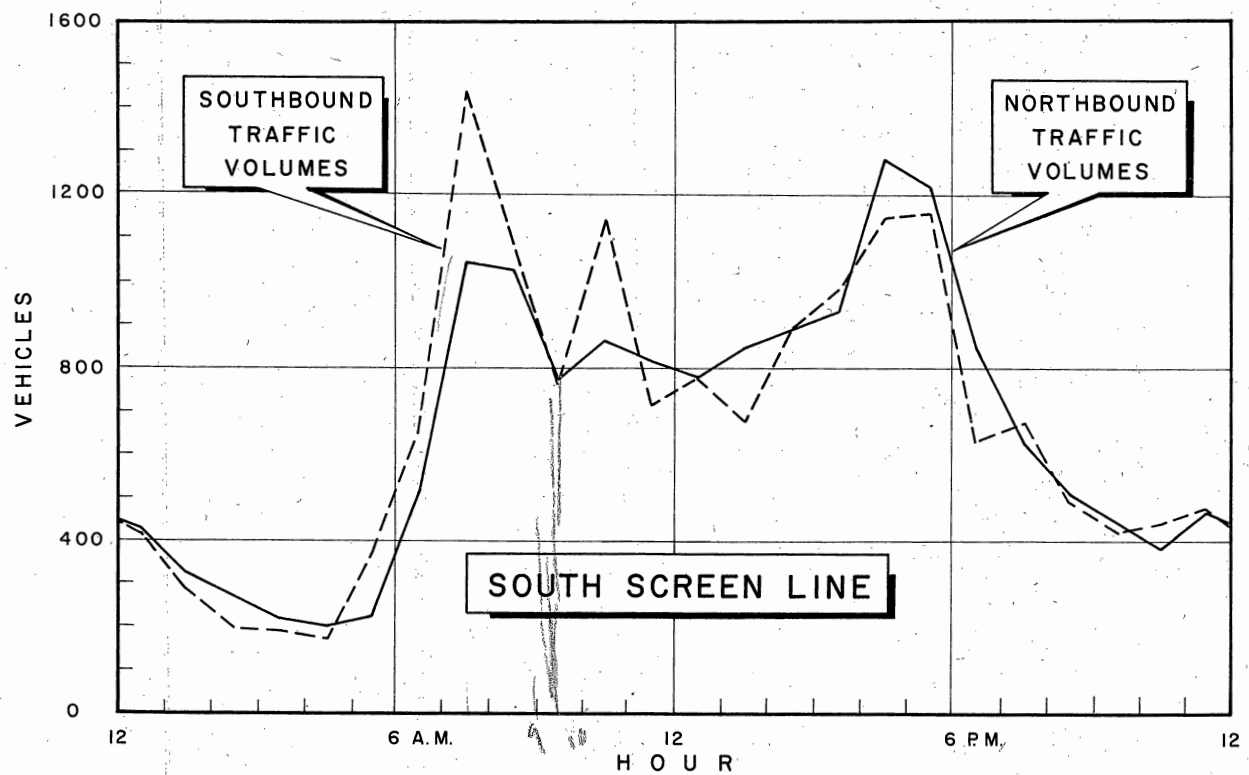
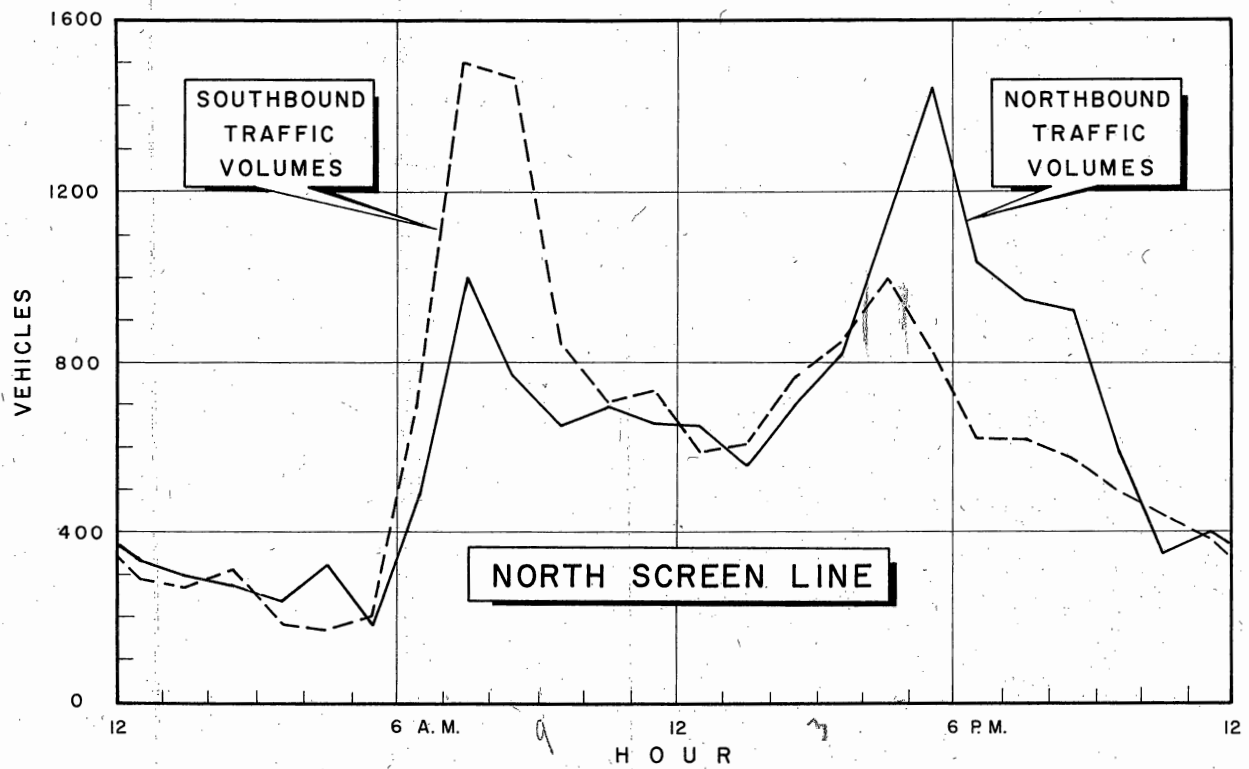
PEAK HOUR TRAFFIC VOLUME CHARACTERISTICS

<u>Location</u>	<u>Weekday</u>		<u>Monday</u>		<u>Friday</u>	
	North	South	North	South	North	South
Henderson St. between 16th and 18th Streets	411 4-5 PM	342 7-8 AM	372 3-4 PM	296 7-8 AM	383 5-6 PM	359 7-8 AM
Jersey Avenue between 17th and 18th Streets	623 5-6 PM	633 10-11 AM	594 5-6 PM	582 8-9 AM	632 8-9 AM	709 8-9 AM
Willow Avenue between 15th and 16th Streets	716 5-6 PM	875 8-9 AM	857 5-6 PM	732 8-9 AM	835 5-6 PM	735 8-9 AM
Park Avenue between 15th and 16th Streets	716 5-6 PM	705 7-8 AM	720 5-6 PM	705 7-8 AM	915 5-6 PM	809 7-8 AM
	East	West	East	West	East	West
Paterson Plank Road between Palisade Ave. and the Viaduct	655 8-9 AM	512 5-6 PM	709 8-9 AM	559 5-6 PM	734 7-8 AM	575 4-5 PM

24 HOUR TRAFFIC VOLUMES AT CORDON LINE HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

FIGURE 4





HOURLY TRAFFIC VARIATIONS

days of operation. It is apparent that the weekend is the low traffic volume period during the week. Thursday and Friday normally develop comparable volumes. Monday volumes are very similar to those found Tuesdays through Fridays, except at a few stations where modest increases were noted on Monday.

Traffic control counts maintained by the New Jersey State Highway Department have been reviewed and analyzed. Counts for typical locations in this area have been summarized and the variations are shown in Figure 6. It should be noted from these counts that August is a low month in the year in terms of traffic movement in the area, about 10 percent below the annual average daily traffic. Comparing the curves in this figure with the data collected in the survey, it appears that the curve most typical of the Hoboken traffic pattern is developed from data procured on Newark Avenue, Jersey City. This curve has been used in expanding the traffic data collected in Hoboken.

Table IV

DAILY TRAFFIC VOLUME VARIATIONS

Survey Station*	<u>Day of Week</u>						
	<u>M</u>	<u>T</u>	<u>W</u>	<u>TH</u>	<u>F</u>	<u>S</u>	<u>S</u>
	<u>24 Hour Volume, Both Directions</u>						
1	-	-	11,844	-	-	-	-
2	-	-	4,528	-	-	-	-
3	-	-	5,846	-	-	-	-
4	-	-	6,342	-	-	-	-
5	8,772	-	-	9,264	9,392	6,357	5,285
6	7,842	-	-	8,095	8,712	5,164	4,249
7	14,807	-	-	14,715	14,551	9,518	7,011
8	-	5,119	-	-	-	-	-
9	12,215	12,473	-	-	13,716	8,737	8,431
10	-	-	-	5,055	-	-	-
11	17,932	-	-	17,348	18,391	12,927	11,009
12	12,017	-	-	12,813	13,499	8,814	8,656

* See Appendix Table B.

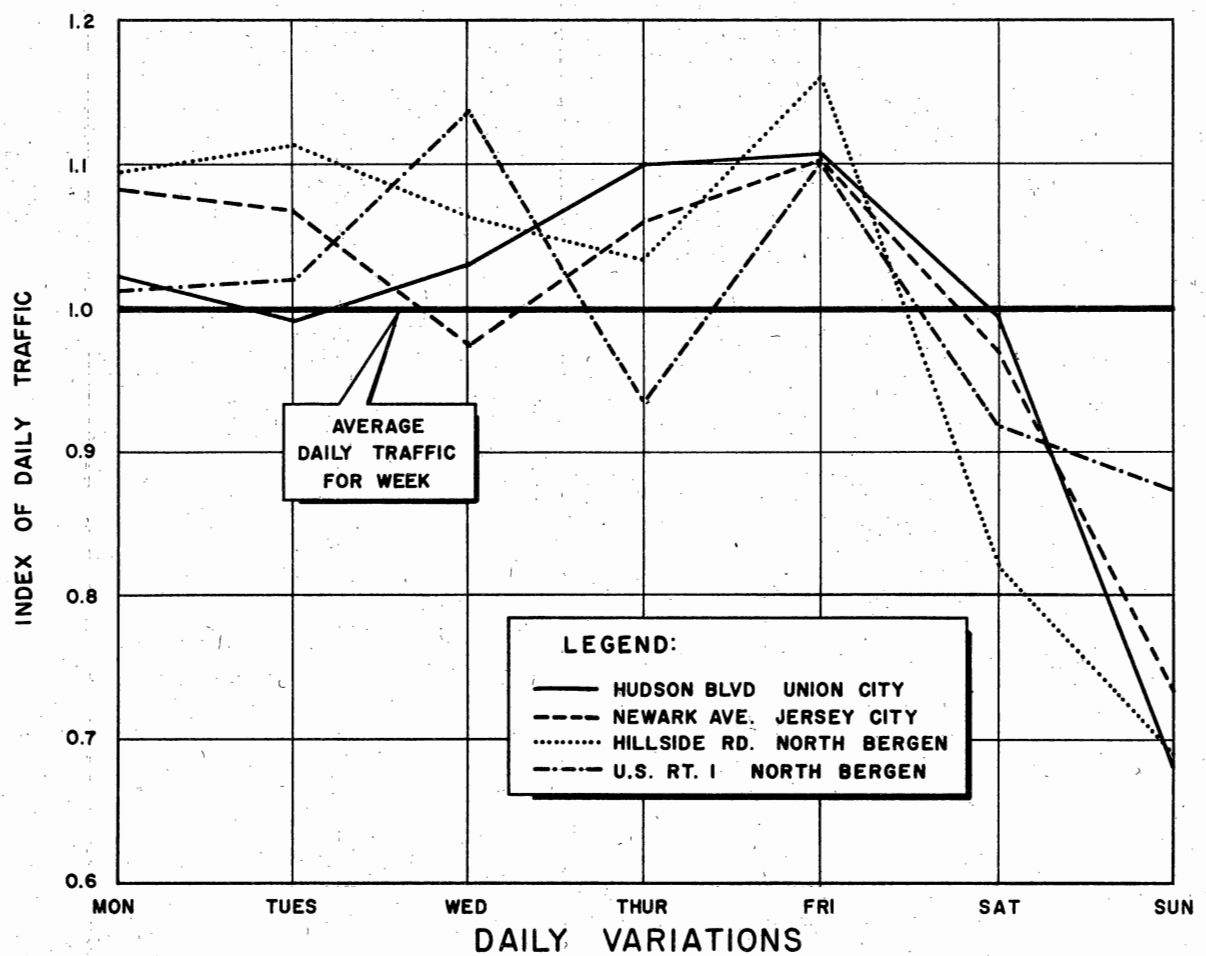
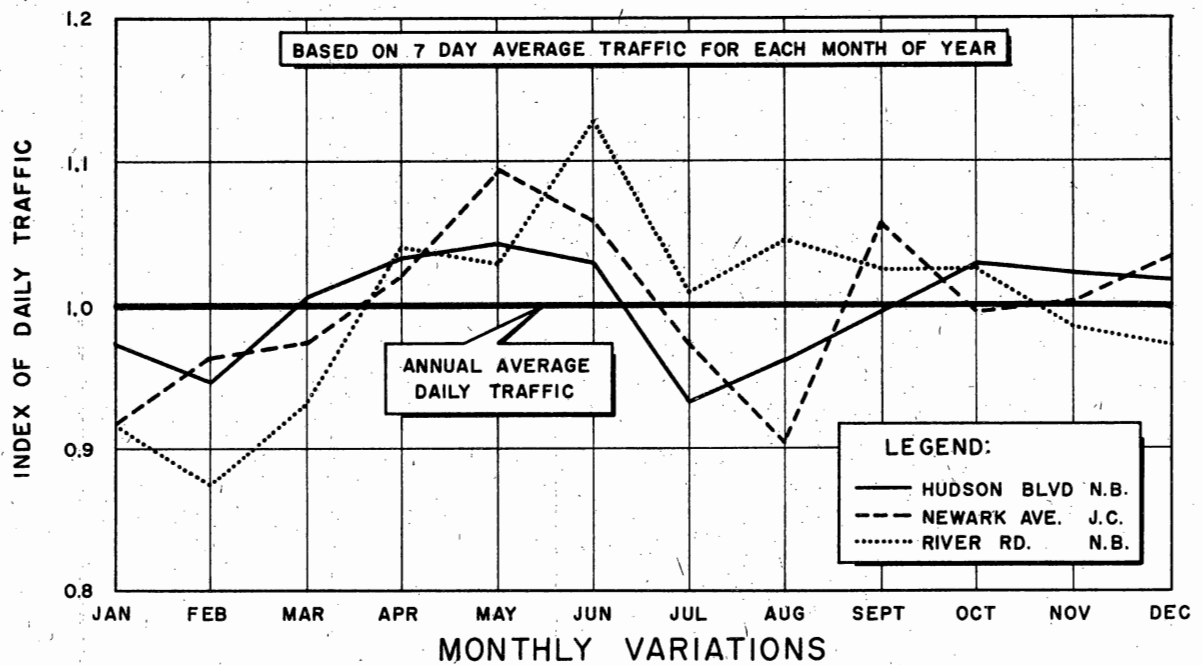
Local Streets - Traffic counts on some Hoboken streets were obtained from the Police Department. They have been adjusted to 1954 values and are shown in Table V. At most locations, the peak hour does not exceed the average daytime hour

Table V
ESTIMATED 1954 TRAFFIC VOLUMES
AT SELECTED LOCATIONS IN HOBOKEN

<u>Location</u>	<u>Average Hour *</u>	<u>Peak Hour *</u>
Washington St. at 1st St. (both approaches)	616	740
1st St. at Washington St. (eastbound)	111	115
Washington St. at 8th St. (both approaches)	738	837
11th St. at Washington St. (eastbound)	169	177
Washington St. at 14th St. (northbound)	480	730
14th St. at Washington St. (both approaches)	1,456	2,115
Willow Avenue at 14th St. (both approaches)	1,651	1,720
14th St. at Willow Avenue (both approaches)	1,567	1,670

* Between 7-11 A.M. and 2-6 P.M.

Note: One-way traffic on all numbered streets between 1st and 13th.



TRAFFIC VARIATIONS

HUDSON COUNTY

by more than 10 percent.

Tunnel Traffic - Daily traffic fluctuations at the Holland and Lincoln Tunnels for the period of the survey are shown in Figure 7. The principal variations in these values and those found in Hoboken are on weekends. The peak tendencies from Friday through Monday at the tunnels are not apparent at most survey stations representative of north-south movements through Hoboken.

Hourly variations in tunnel traffic are given for a weekday in August in Figure 8. It is obvious that the peak periods for the tunnels are more sustained than those at most survey stations.

Holland Tunnel Approach Roads - Traffic counts conducted on the Holland Tunnel approach roads by the Port of New York Authority in June, 1952 indicate that approximately 32,000 vehicles used the 12th Street viaduct daily. Westbound traffic on the 14th Street Viaduct amounts to approximately 31,500 vehicles per day. During peak periods, over half of the eastbound traffic and 40 percent of the westbound traffic leaves or enters the tunnel approach roads between the Viaducts and the Tunnel.

Travel Patterns

Extensive analyses were made of traffic origin and destination data. Basic zone to zone movements for passenger cars and for commercial vehicles are shown respectively in Tables C and D of the Appendix. These data have been developed from weekday interviews at the various survey stations. Adjustments were made for all through trips which were duplicated at the survey screen lines in the interviews and counts.

A review of the tables indicates that some zones are much heavier traffic generators than others. Among these are the central business district of Hoboken, the area west of the central business district at the south end of the city, the waterfront area around 14th and Washington Streets, the Jersey City area immediately adjacent to the Holland Tunnel approach and the Journal Square area of Jersey City. Other zones also attract large numbers of trips, but are not as uniformly heavy generators as these zones.

Outside the immediate Hoboken area, Bergen County represents the greatest generator of traffic using streets in and around Hoboken. Individual municipalities in Bergen County have been grouped to reduce the number of zones and to simplify the processing of data.

In most of these zones the ratio of truck trips to total traffic movements is generally constant, although truck trips are more predominant in zones in the waterfront area and in areas where truck terminals are located. Such areas are North Bergen, Secaucus, West New York, the Tonnelles Avenue section of Jersey City, and Brooklyn.

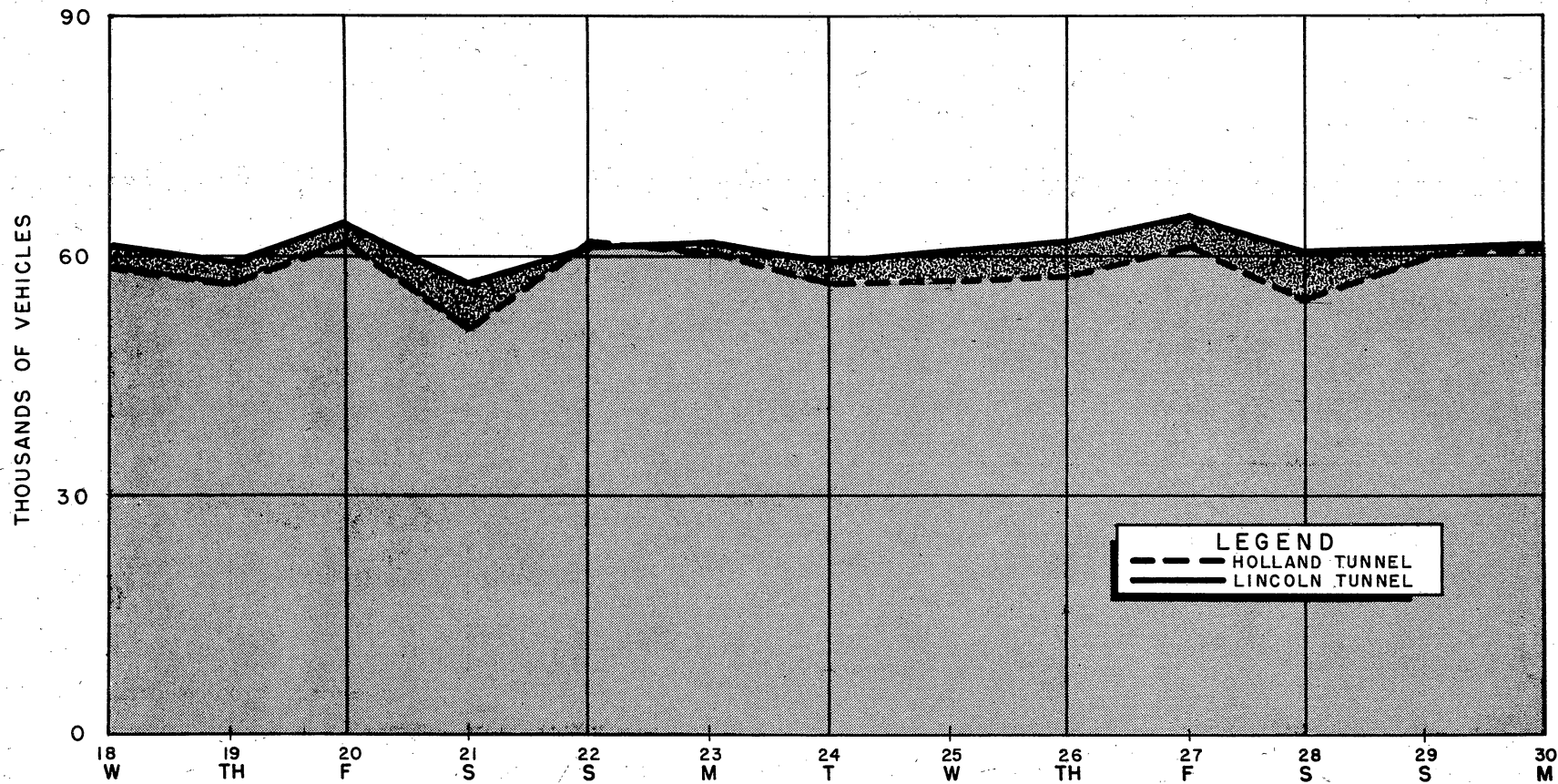
Peak zone to zone movements occur chiefly between the various zones or areas listed above and in lesser numbers between these zones and other zones in Hoboken, the adjacent Jersey City area, nearby Union City, and Weehawken. The overall trip desire pattern is depicted in Figure 9 for passenger cars and in Figure 10 for trucks. The predominance of north-south movements is readily noted. The importance of Bergen County as a generator of traffic in the Hoboken area is obvious.

Directional Analysis - Since interviews were conducted in both directions at each of the survey stations, it was possible to develop the origin and destination patterns by directions and to thereby determine unbalanced zone to zone movements. In general, it appears that most movements are well balanced with flows in each direction approximately equal.

The zones generating larger trip movements have been summarized and the directional breakdown of zone to zone movements is shown in Table VI. It is to be noted that these movements are very nearly balanced. The notable exceptions evident in Table VI are the trip interchanges between Bergen County and downtown Hoboken, and between Essex County and downtown Hoboken. The latter interchange, for example, shows many more Hoboken to Newark trips than Newark to Hoboken trips.

Among the minor movements, small imbalance in directional flows are not uncommon. This is true for both passenger cars and trucks but it is likely the result of sampling procedures rather than indicative of any unusual travel conditions.

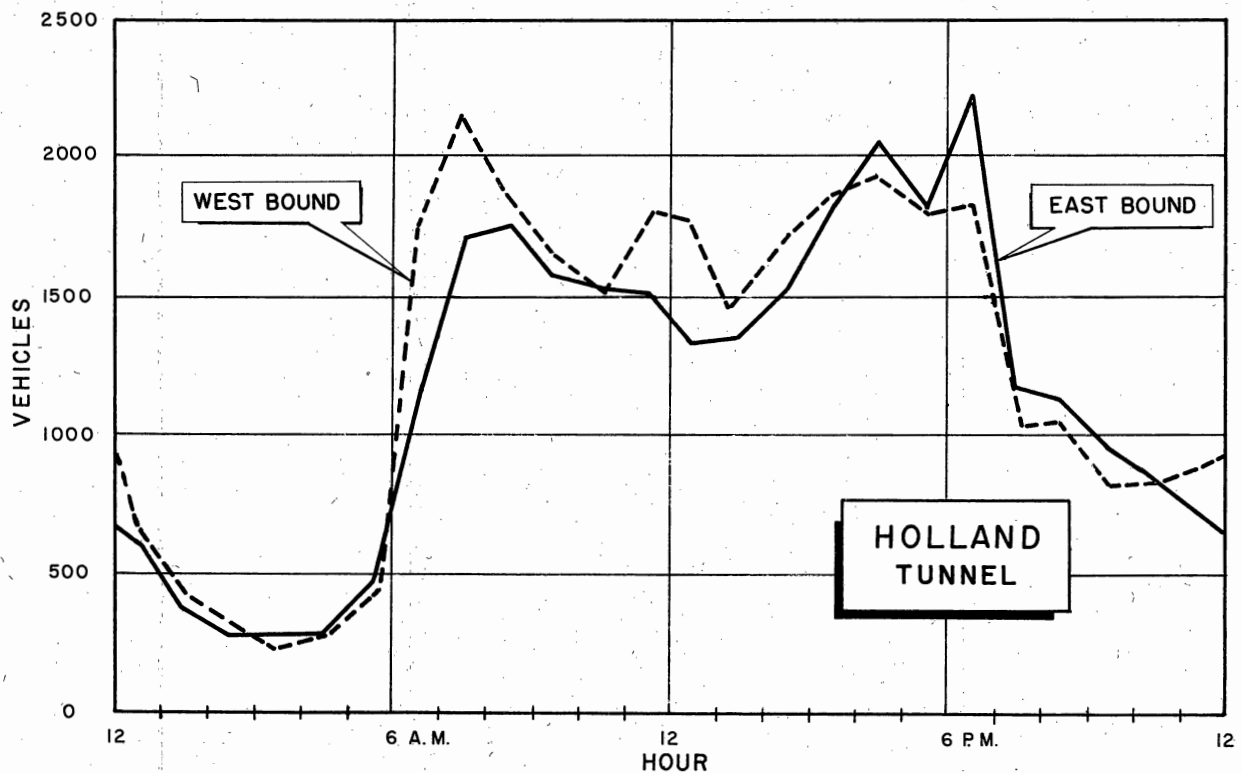
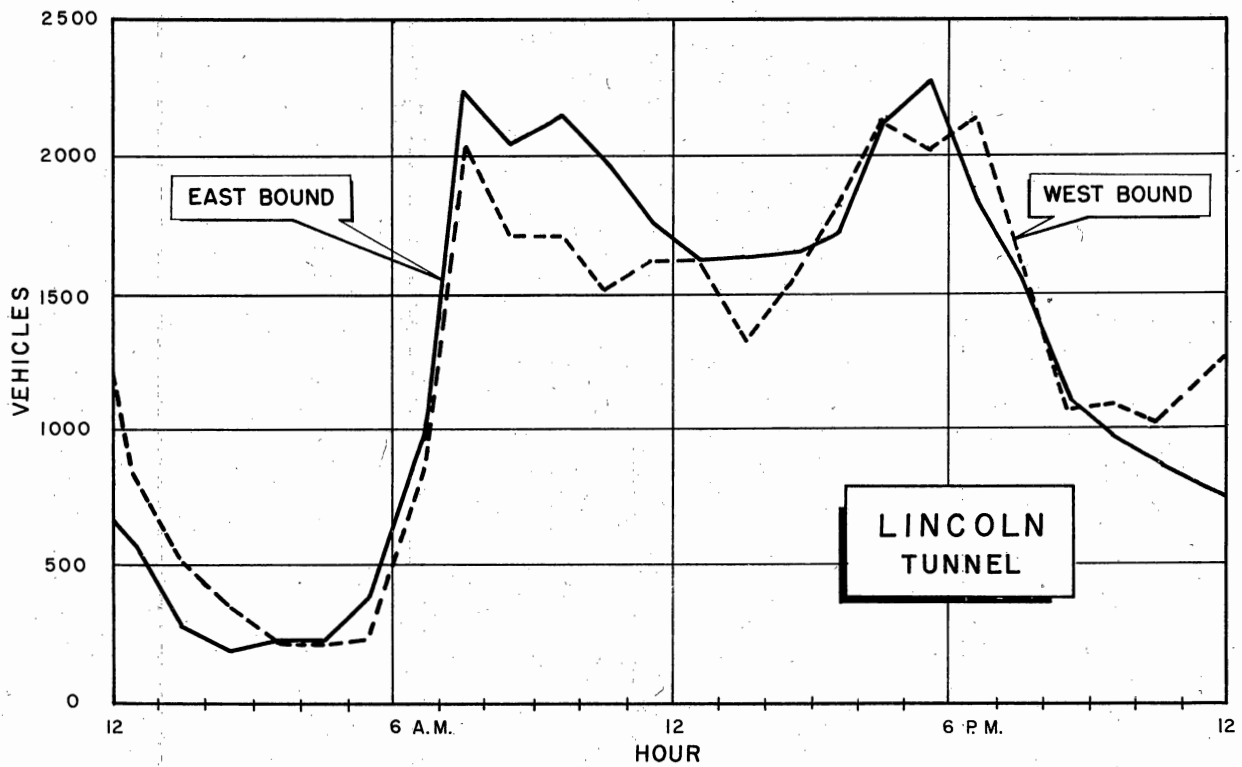
It would appear that much of the imbalance found in various zone to zone movements might be attributed to internal travel within Hoboken. For example, many trips entering the city destined for the waterfront area adjacent to 14th and Washington Streets continue to the central business district. It appears that many of these trips stop in the central business district to conduct some business before leaving the city from that area, thereby creating a circulatory movement. These areas have unbalanced movement patterns in trip directions, although data for the entire survey area show



DAILY TRAFFIC VOLUMES

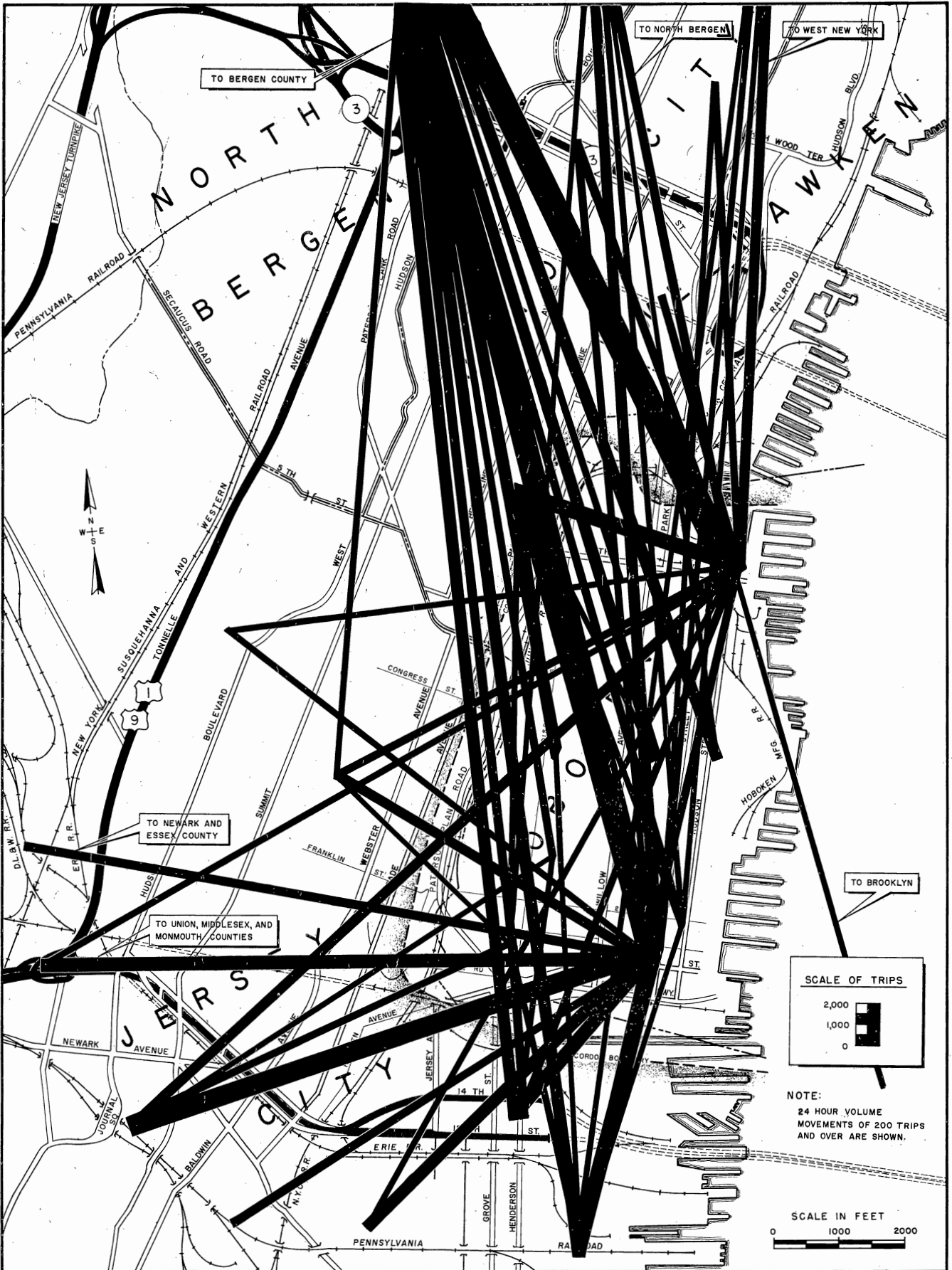
HOLLAND AND LINCOLN TUNNELS

AUGUST 1954



HOURLY TUNNEL TRAFFIC VOLUMES

AUGUST 18, 1954



TOTAL TRIP DESIRES - PASSENGER CARS HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

Wilbur Smith & Associates

FIGURE 9

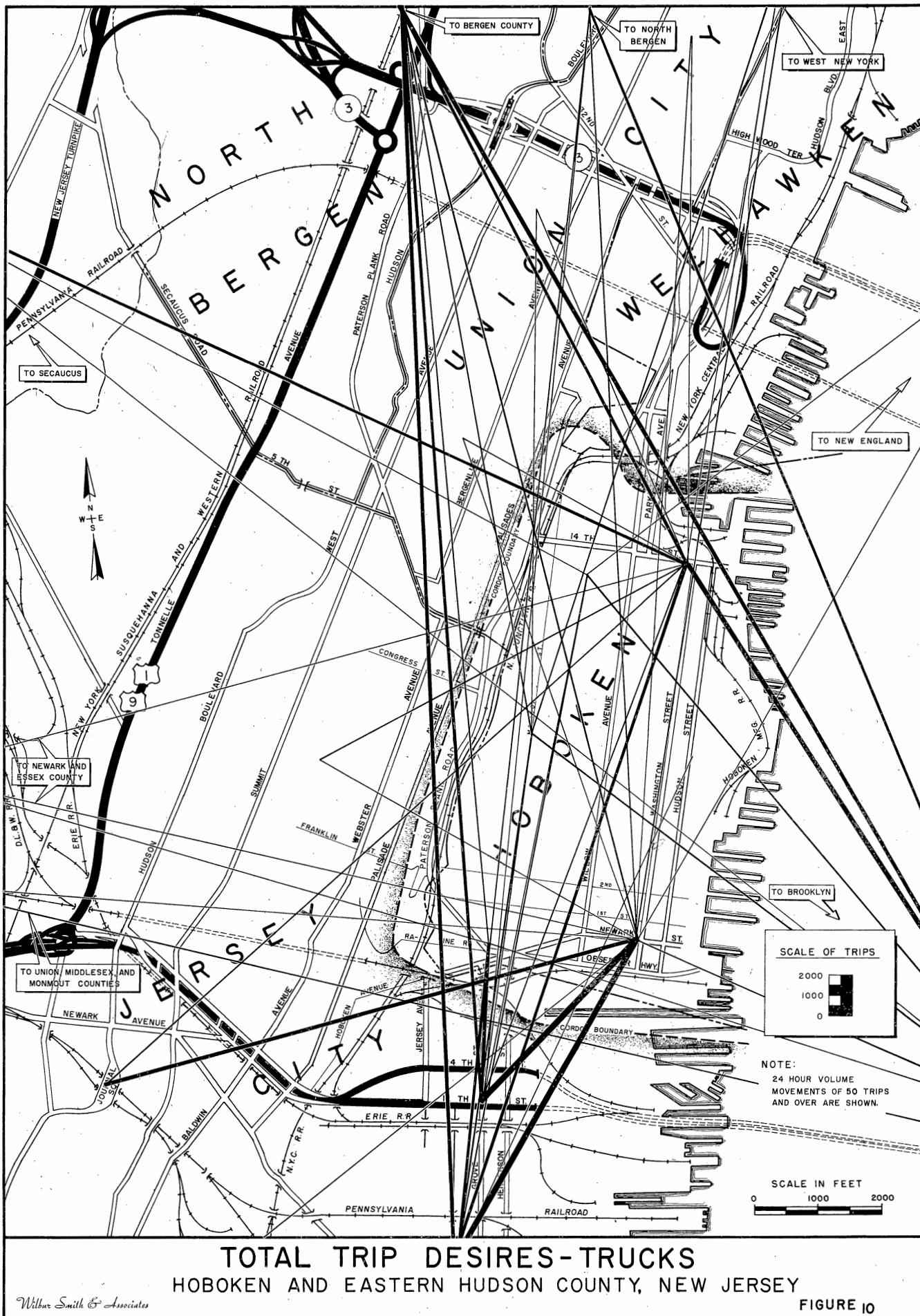


Table VI

DIRECTIONAL ANALYSIS OF TRAVEL PATTERNS
BETWEEN SELECTED ZONES

24 Hour Volumes

<u>Zone of Origin</u>	<u>Zone of Destination</u>	<u>Passenger</u>	
		<u>Cars</u>	<u>Trucks</u>
Downtown Hoboken	Bergen County	593	46
Bergen County	Downtown Hoboken	496	45
Hoboken (Madison & 1st)	Bergen County	212	65
Bergen County	Hoboken (Madison & 1st)	211	23
Hoboken (14th & Washington)	Bergen County	598	58
Bergen County	Hoboken (14th & Washington)	616	60
Downtown Hoboken	Jersey City - Journal Sq.	419	72
Jersey City - Journal Sq.	Downtown Hoboken	371	62
Hoboken (14th & Washington)	Union City - South	320	19
Union City - South	Hoboken (14th & Washington)	360	31
Downtown Jersey City	Downtown Hoboken	277	108
Downtown Hoboken	Downtown Jersey City	318	119
Downtown Hoboken	Brooklyn	86	28
Brooklyn	Downtown Hoboken	88	30
Downtown Hoboken	Essex County	382	59
Essex County	Downtown Hoboken	287	92

that trips originating in or destined to Hoboken are approximately balanced.

Table VII gives the distribution of origins and destinations within the cordon area and shows the balance in overall movements by directions.

Movements Across Cordon Line - To better picture the north-south traffic movements through Hoboken, trip desire data

Table VII

DISTRIBUTION OF TRIP ORIGINS AND DESTINATIONS
WITHIN HOBOKEN

Zone Number	Trip Origins		Trip Destinations		Total Trips	
	Passenger		Passenger		Passenger	
	Cars	Trucks	Cars	Trucks	Cars	Trucks
09051	5038	1108	4824	1085	9862	2193
09052	2239	668	1963	629	4202	1297
09053	1753	310	1684	257	3437	567
09054	1383	332	1305	315	2688	647
09055	1243	285	1653	245	2896	430
09056	1622	251	1516	240	3138	491
09057	1961	503	1752	509	3713	1012
09058	3935	899	4760	1176	8695	2075
09059	1303	610	1308	483	2611	1093
09050	<u>490</u>	<u>137</u>	<u>600</u>	<u>207</u>	<u>1090</u>	<u>344</u>
	20967	5103	21365	5164	42332	10267

have been analyzed to determine movements across the cordon lines, approximate distribution of these trips outside the cordon area, and the internal distribution of trip origins and destinations within Hoboken. From the origin and destination survey, it has been determined that, of a total of 82,067 movements across the cordon line on a typical week-day in August, 1954, 14,733 are through trips which have neither origin nor destination in Hoboken. The remaining 52,599 trips have one end in Hoboken and the other end at some point outside of the cordon area. This may be broken down to show passenger car and truck characteristics relative to through or local origin or destination. Table VIII gives summary data relative to trip origins and destinations.

Table VIII

COMPARISON OF THROUGH AND DESTINED TRIPS

	<u>Passenger Cars</u>	<u>Trucks</u>	<u>Total</u>
Total Screen Line Volumes	63,960	18,107	82,067
Origins or Destination in Hoboken	42,332	10,267	52,599
Through Trips	10,814	3,920	14,733
O & D Survey Volume	53,146	14,187	67,333

Figures 11 and 12 show, for passenger cars and trucks respectively, the distribution of through trip volumes at each of the screen lines. Among the features of interest in the breakdown of trips by direction at the cordon lines are the relative volumes of traffic using the Holland and Lincoln Tunnels. The percentage of the passenger car cordon line movement at the north end of Hoboken on Willow Avenue and Park Avenue which is bound to or coming from the Lincoln Tunnel amounts to 15 percent, and for trucks it is 34 percent. At the south cordon line approximately 17 percent of the passenger cars and 33 percent of the trucks are travelling to or from the Holland Tunnel.

Other interesting aspects of the patterns developed by these data include the movement of approximately 44 percent of the truck

volume through the westerly cordon line along the Palisades to areas northwest of Hoboken, and the movement of approximately 40 percent of passenger cars at the south cordon line to zones in the area directly south of Hoboken, along the Jersey City waterfront, and in the vicinity of the City Hall in Jersey City.

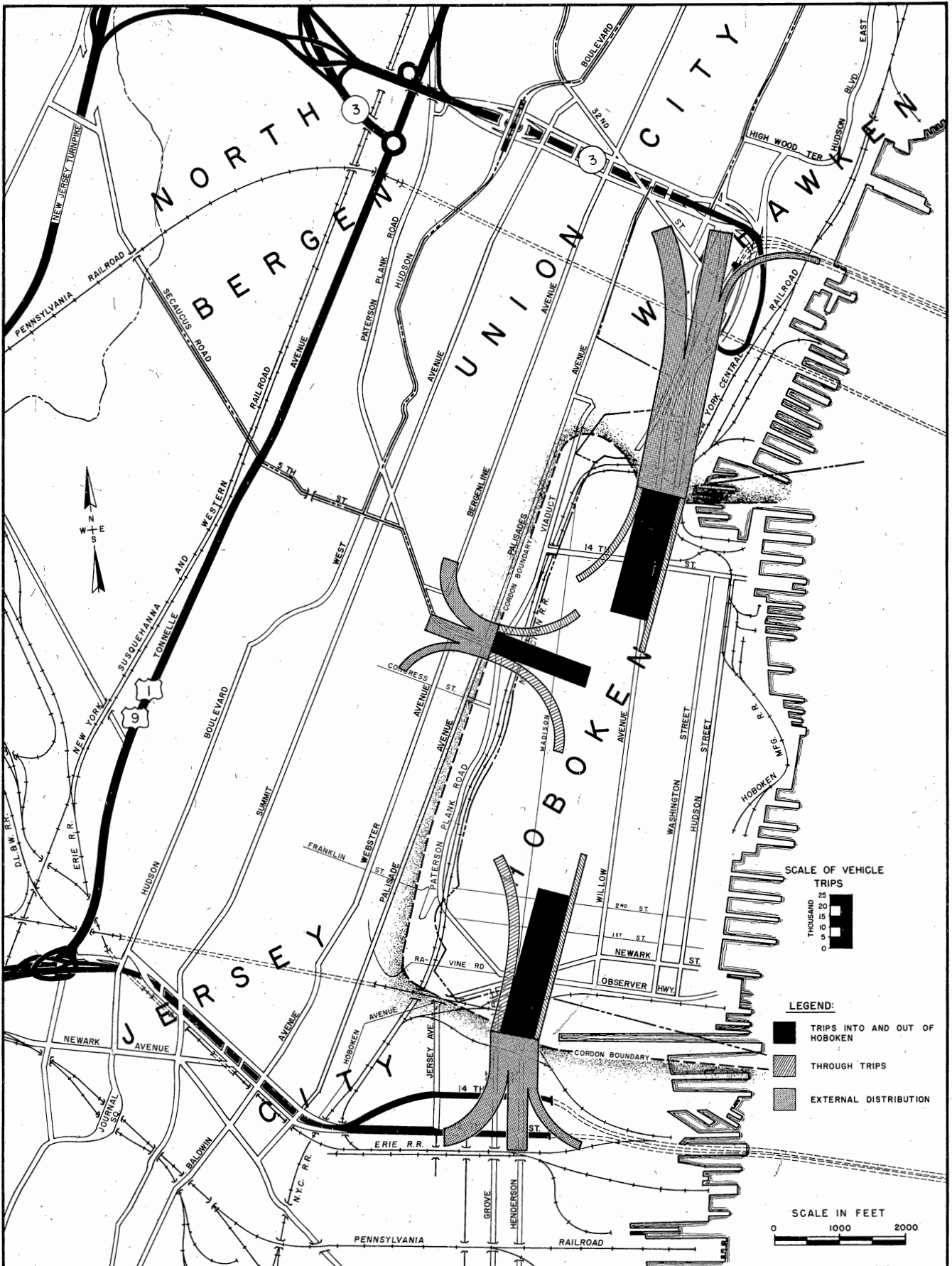
The attraction of commercial vehicles to the extreme western sections of Hoboken was heavy in consideration of the density of land development. It indicates the heavy activity of business and industries, some of which are comparatively new in that part of the city.

Variations in Travel Patterns - In an area such as Hoboken, variations in travel patterns may be noticed from day to day. The main generators in the area, the waterfront piers and the industrial plants located nearby create unusual traffic patterns.

As noted previously, the traffic volume data reflect the light commercial activity in Hoboken on the weekends. The weekend peak traffic which is general on major highways during summer months is not found in Hoboken. Instead, as shown by traffic volume data, Monday and Friday are the peak traffic days in the Hoboken week. Travel patterns on Mondays and Fridays normally vary in proportion to changes in traffic volumes recorded on these days. This appears to hold true in the Hudson County area, although there are reasons to expect variations of considerable magnitude due to the type activities which are found in the area.

Figures 13 and 14 show comparative trip desires for passenger cars and trucks respectively on a weekday, Friday, and Monday. Various zone to zone movements are apparent. As suggested above, no consistent variation is indicated, although a few movements show increases on Monday and Friday. For example, the movement between the central business district in Hoboken and Bergen County totalled over 1,000 passenger cars on the weekday during which the survey was conducted, while it reached over 1,600 on the Friday of the survey. There is no fixed pattern in this respect, however, and for some movements the weekday total is greater than either the Monday or Friday volume. Evidence of this is found in the movement between the 14th and Washington Street area of Hoboken and the southern section of Union City. This appears to be the exception, rather than the rule. Where any change is noted, it most often occurs as an increase in movements on Friday, and occasionally on Monday, as compared to weekdays.

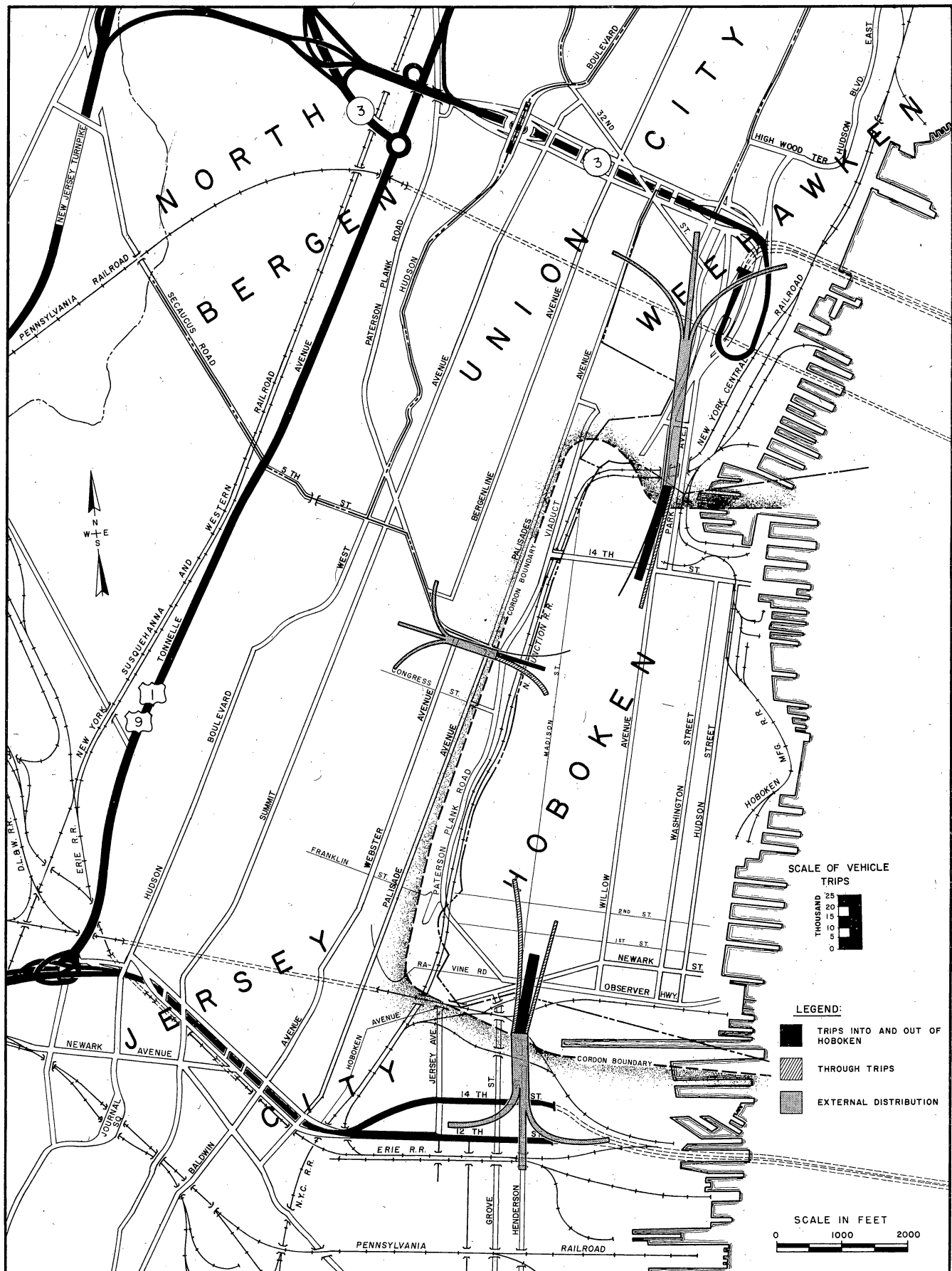
Peak Hour Travel Patterns - An analysis of travel pattern



TRAFFIC DISTRIBUTION-PASSENGER CARS
 HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

Wilbur Smith & Associates

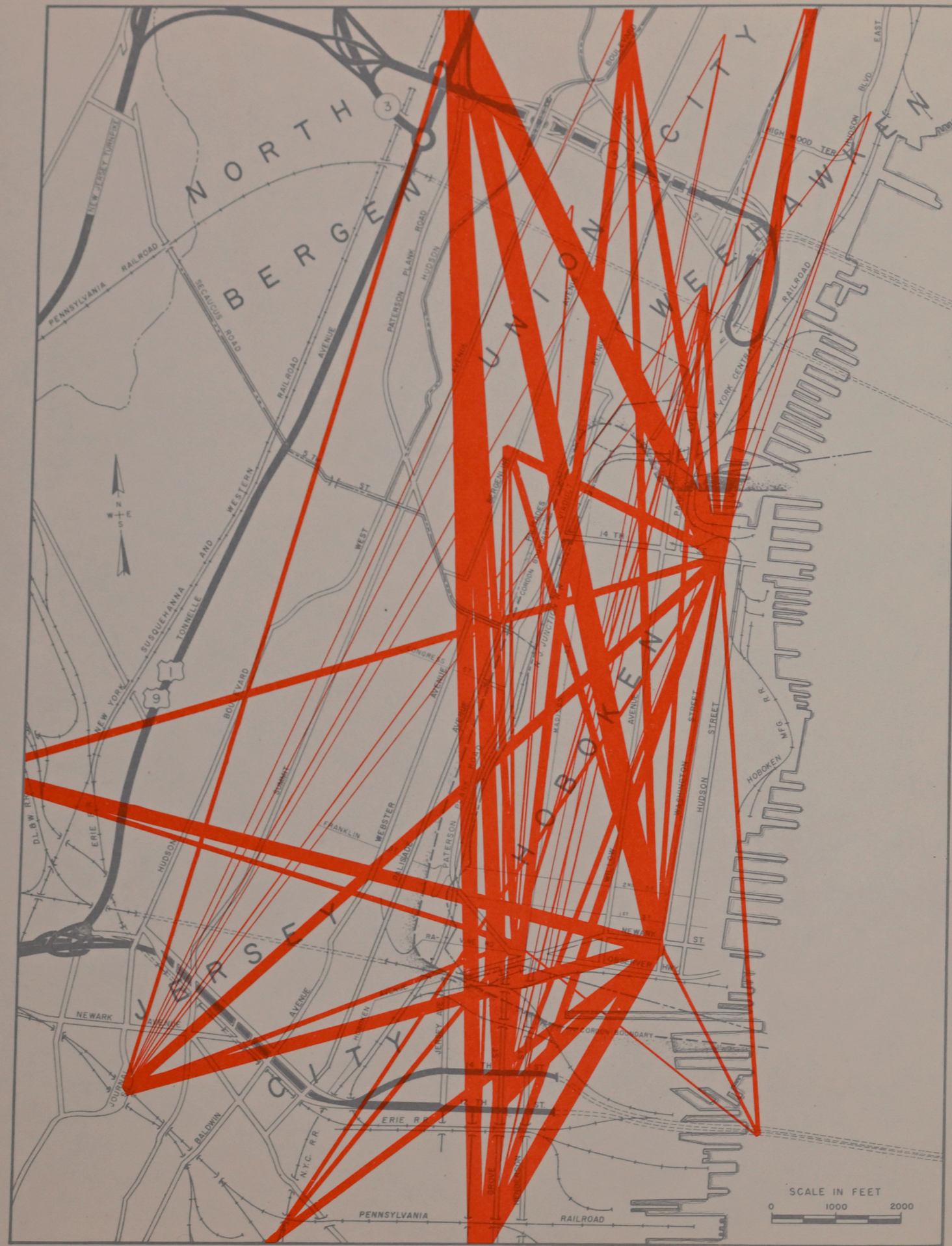
FIGURE II



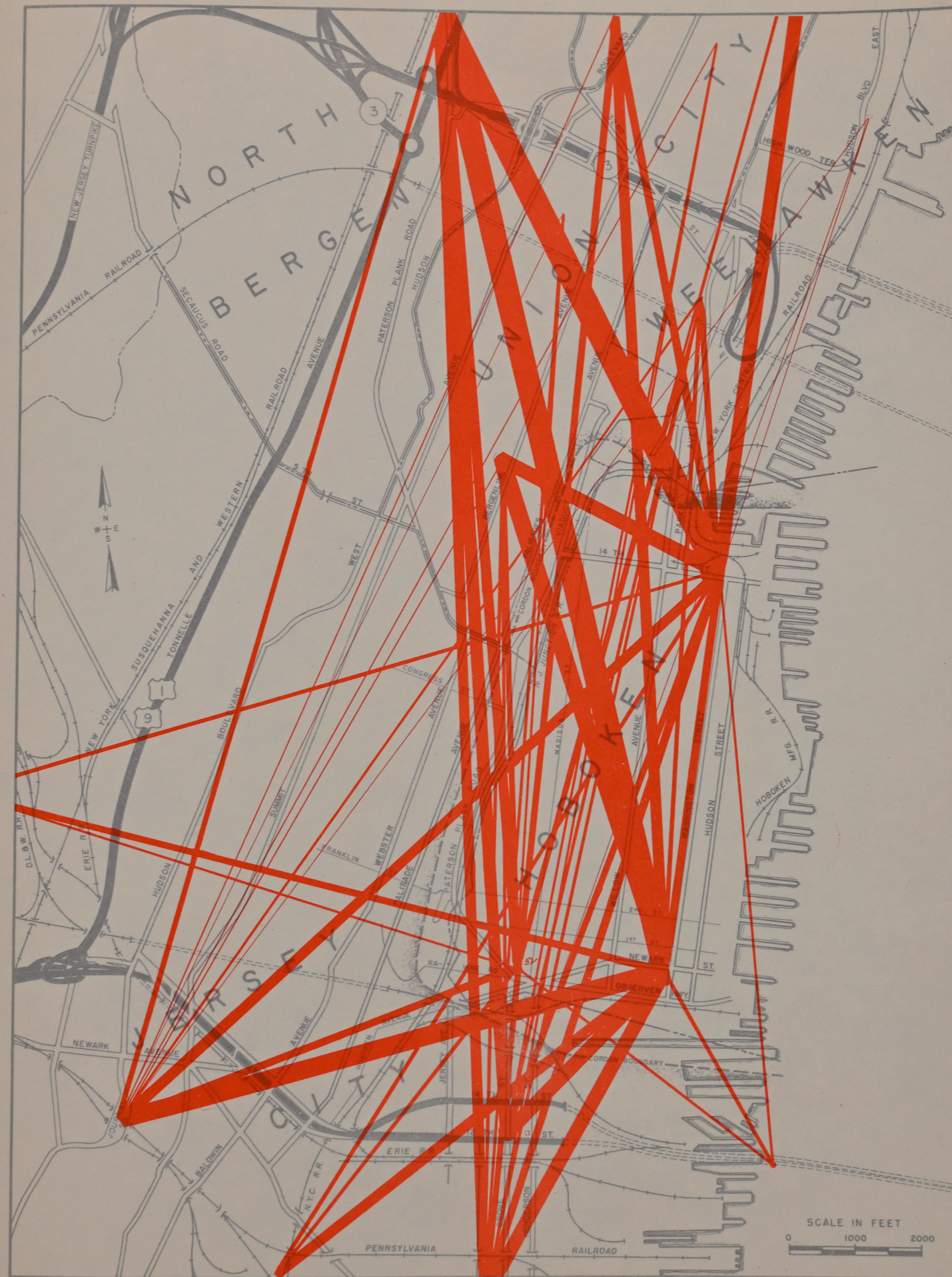
TRAFFIC DISTRIBUTION-TRUCKS
HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

Wilbur Smith & Associates

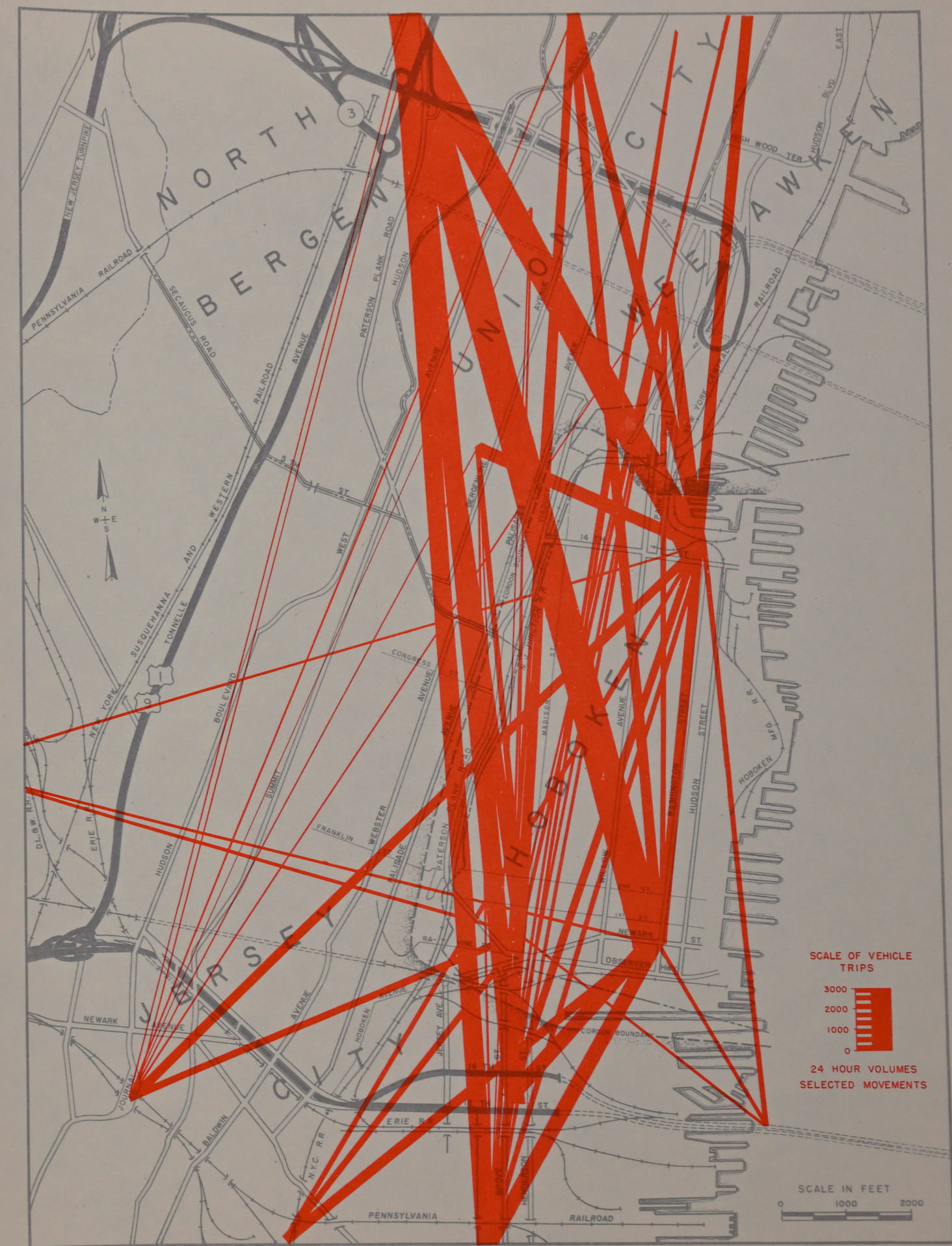
FIGURE 12



MONDAY

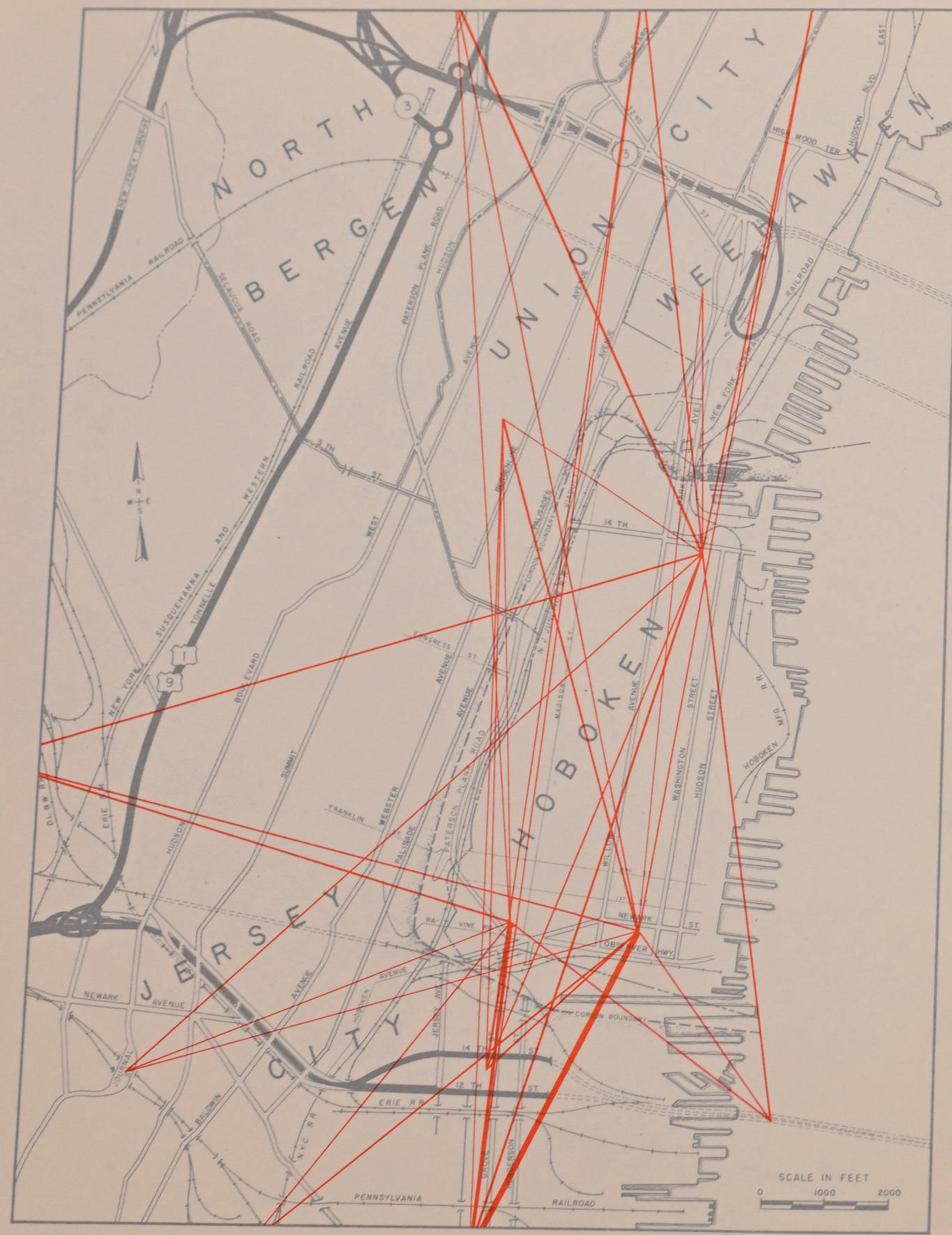


WEEKDAY

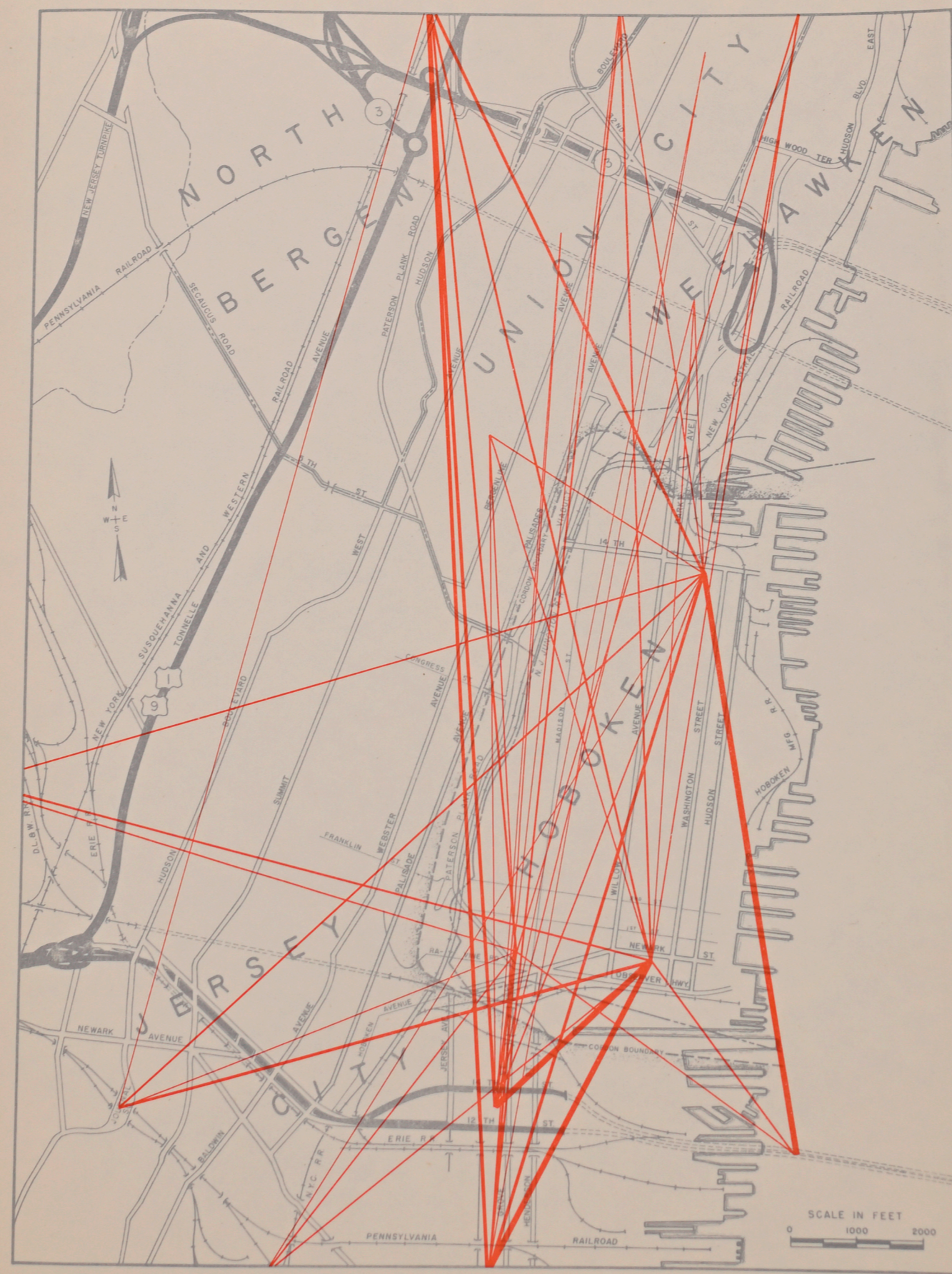


FRIDAY

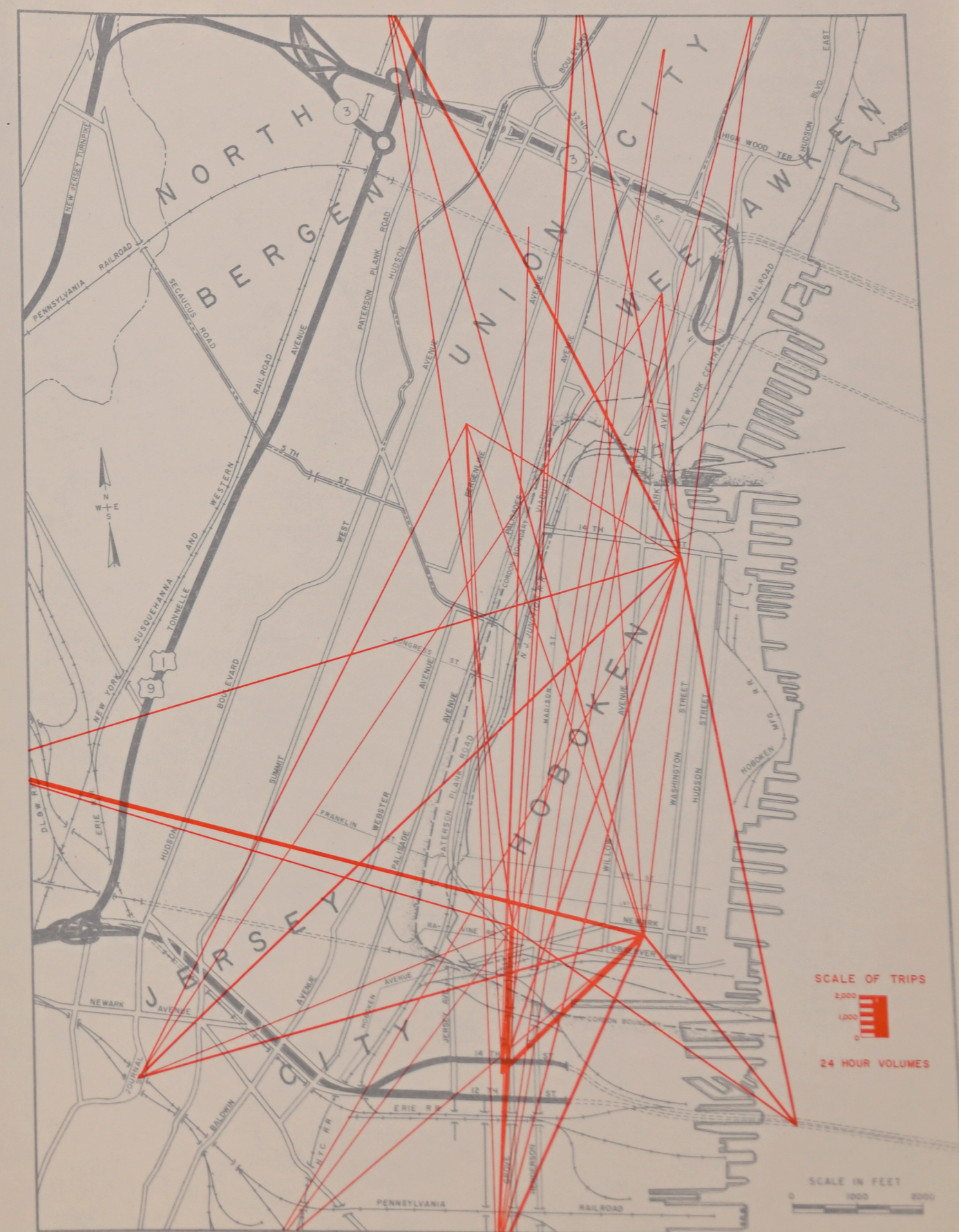
DAILY TRIP PATTERN VARIATIONS - PASSENGER CARS



MONDAY



WEEKDAY



FRIDAY

DAILY TRIP PATTERN VARIATIONS - TRUCKS

SCALE OF TRIPS
2000
1000
0
24 HOUR VOLUMES

SCALE IN FEET
0 1000 2000

variations during peak hour periods at the south screen line (Survey Stations 5, 6, 7) is shown in Table IX. The movements originating from and destined to selected survey zones during the morning and evening hours are given.

For this analysis 7:00 to 8:00 A.M. southbound traffic and 4:00 to 5:00 P.M. northbound traffic at the south screen line was

Table IX
COMPARISON OF SELECTED HOURLY
TRIP GENERATION PATTERNS
STATIONS 5, 6, 7

7-8 A.M. Southbound

<u>Zone of Origin*</u>	<u>Passenger Cars</u>			<u>Trucks</u>		
	<u>Thurs.</u>	<u>Fri.</u>	<u>Mon.</u>	<u>Thurs.</u>	<u>Fri.</u>	<u>Mon.</u>
02000	150	135	128	43	24	20
09051	94	104	61	12	36	7
09055	28	25	34	3	3	3
09058	72	49	57	8	12	8
09080	47	60	66	26	27	24
09090	8	2	11	5	6	6
09101	62	45	32	0	6	0
09120	49	50	41	0	0	3
94001	33	26	28	0	3	8
04140-44	27	11	31	0	0	0

<u>Zone of Destination*</u>						
07000	68	51	39	20	21	28
12000	15	22	26	5	15	11
09010	20	24	31	17	15	8
09063	390	286	280	45	12	26
09064	36	25	41	14	3	11
09066	337	302	361	76	51	40
94002	28	26	32	85	57	48

(cont.)

Table IX (cont.)

4-5 P.M. Northbound

<u>Zone of Origin*</u>	<u>Passenger Cars</u>			<u>Trucks</u>		
	<u>Thurs.</u>	<u>Fri.</u>	<u>Mon.</u>	<u>Thurs.</u>	<u>Fri.</u>	<u>Mon.</u>
07000	78	65	45	18	18	15
12000	15	22	26	5	15	11
09063	94	192	237	41	72	46
09064	53	106	91	4	31	7
09066	77	208	204	54	17	60
94002	54	38	33	9	32	59
<u>Zone of Destination*</u>						
0902000	28	82	58	12	10	0
09051	159	157	170	51	45	42
09055	39	51	36	6	6	5
09058	76	59	47	10	19	11
09080	10	33	30	0	17	24
09101	11	35	40	2	4	3
09120	10	32	39	2	4	2
94001	3	5	12	10	0	0
94140-44	0	15	15	4	0	0

*See zone location listing, Appendix, Table A.

line was studied to analyze variations in origins and destinations which occurred during the three days on which interviews were conducted. Table IX indicates variations which may be anticipated in the number of trips generated by selected survey zones on different days of the week.

Among the variations indicated it appears that the central business district of Hoboken generates a greater traffic movement through the south cordon line on Friday between 7:00 and 8:00 A.M. than on Thursday. Attention is also called to the comparative number of trips destined for the adjacent zones in Jersey City just south of the cordon line. These are zones 09063 and 09066. Passenger car trips to zone 09063 are 33 percent greater on Thurs-

day than on either Monday or Friday while zone 09066 finds most passenger cars destined to it on Monday between 7:00 and 8:00 A.M. Truck trips to these two zones are heaviest during the morning peak hour on Thursday rather than on Monday or Friday, peak days for passenger car trips.

Similar comparisons may be made for other peak hour trip patterns from Table IX.

Importance of Local Traffic in the Overall Problem - While the problems created by the lack of high-type roadway facilities for north-south traffic through Hoboken cannot be localized and must be considered as regional, it is true that the bulk of the traffic volumes using Hoboken streets at present are of local origin and destination. Most through traffic can be considered as local since many trips which make use of the Hoboken streets without having origin or destination within the city do not go beyond adjacent towns or cities.

The term "local trips" as applied in this discussion and in Figures 15-18 is defined as trips having both termini within the area composed of the survey cordon (Hoboken) and adjacent zones in Jersey City, Union City and Weehawken. Zones defined as local are zones 09050-09064 and 09066, zones 09100-09103, 09110 and 09112. In addition to Hoboken, these zones include the Northern area of Jersey City, all of Union City and all of Weehawken. All survey zones not in this group have been classified as external zones.

Of the total of 53,146 passenger car trips into, out of, or through the survey area on a mid-week day in August, 28,927, 52.5 per cent, can be classified as local trips. In the same category are 7,098 of 14,187 truck trips, approximately 50 per cent.

Of the external trips, only 2,243, or 4.2 per cent of the total number of passenger car trips, and 1,539, or 10.8 per cent of the total truck trips had neither origin or destination in a local zone.

In an effort to indicate the magnitude of the local traffic problem as it affects Hoboken, Figures 15-18 have been prepared. They show the travel patterns of traffic generated in Hoboken and in survey zones immediately adjacent. Figure 15 shows the trip desires of passenger car trips generated in this area. It is interesting to note that the predominant direction of flow is north-south, but important numbers of east-west trips appear in the pattern.

Individual generators of greatest import appear to be the

central business district of Hoboken, the 14th and Washington Street area, the central business district of Jersey City, and the area south of Hoboken along the Jersey City waterfront.

Truck trips generated by the same area are shown in Figure 16. In this case the north-south travel pattern is even more distinct and the primary generating areas are the central business district of Hoboken and the area immediately south in Jersey City.

The volume of local trips through Hoboken is, of course, considerably less than the volume of traffic with origin or destination in Hoboken. Due to the physical limitations in the area, north-south trips are the bulk of the through traffic as seen in Figure 17. Primary generators are noted adjacent to the Holland Tunnel approaches, and in the northern part of Jersey City west of Hoboken and atop the Palisades.

Figure 18 shows truck volumes of traffic through Hoboken. Again, the north-south through trips are predominant although the volumes shown are not heavy.

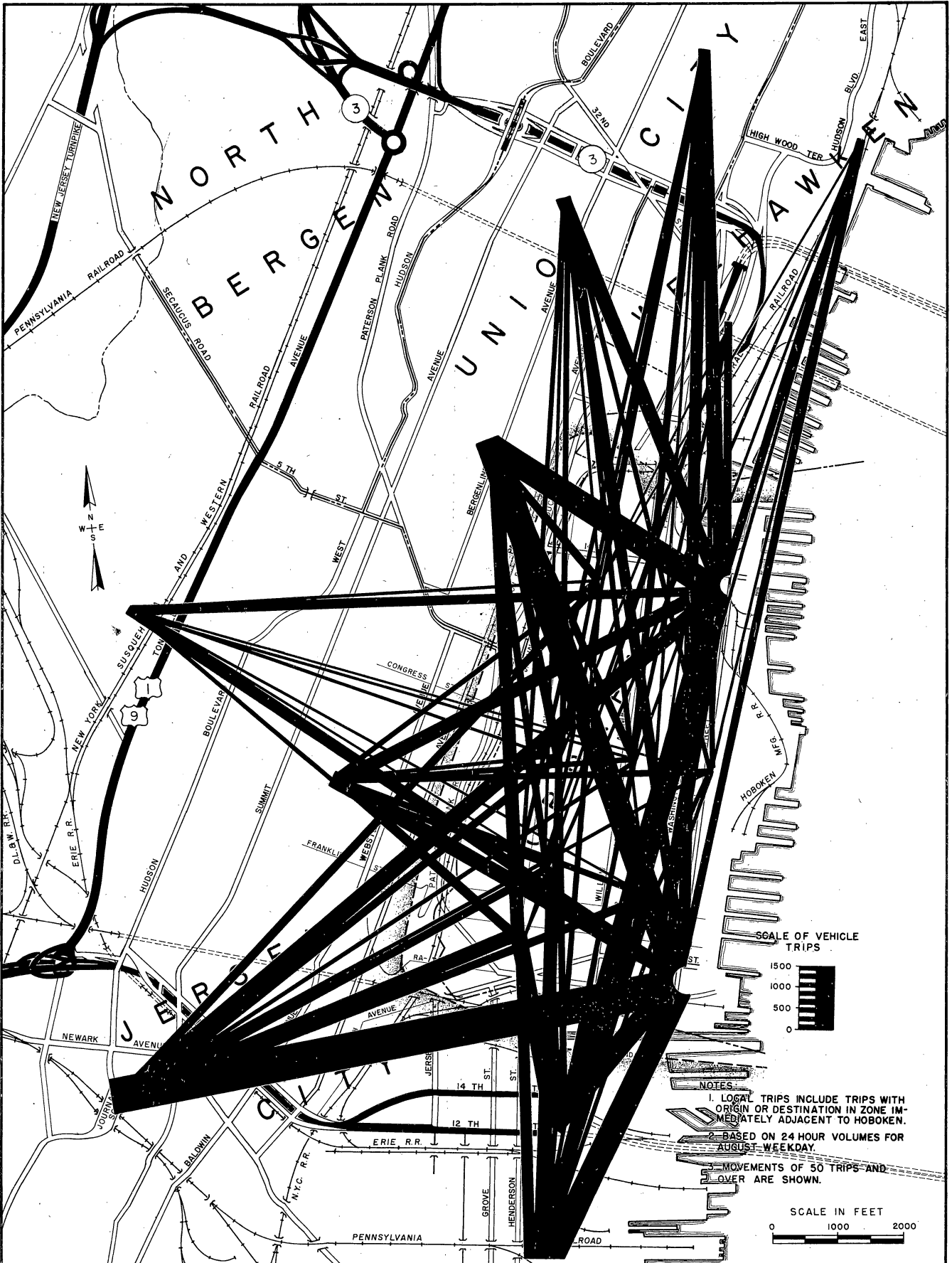
External trips, as defined above, have also been analyzed to determine basic travel patterns. These are shown in Figures 19-22.

For the purpose of simplification, Hoboken has been divided into three areas rather than the nine which were originally established. These three areas are combinations of the original zones and divide the city lengthwise so that South (including downtown), Central and North are the basic areas considered in this discussion.

Figure 19 shows passenger car trips between Hoboken and the external zones. It should be noted that predominant external generators are Bergen County, the North Hudson County communities, and Essex County. Union, Middlesex, and Monmouth County as a unit also generate approximately as many passenger car trips as Essex County.

The generation of trips by various zones in New York City shows that, considering each of the five boroughs as individual zones, Manhattan generates approximately twice as many trips as does the next heaviest generator, Brooklyn. The breakdown of Manhattan into numerous smaller zones, however, leaves Brooklyn, zoned alone, with the heaviest band of trip desires to and from Hoboken.

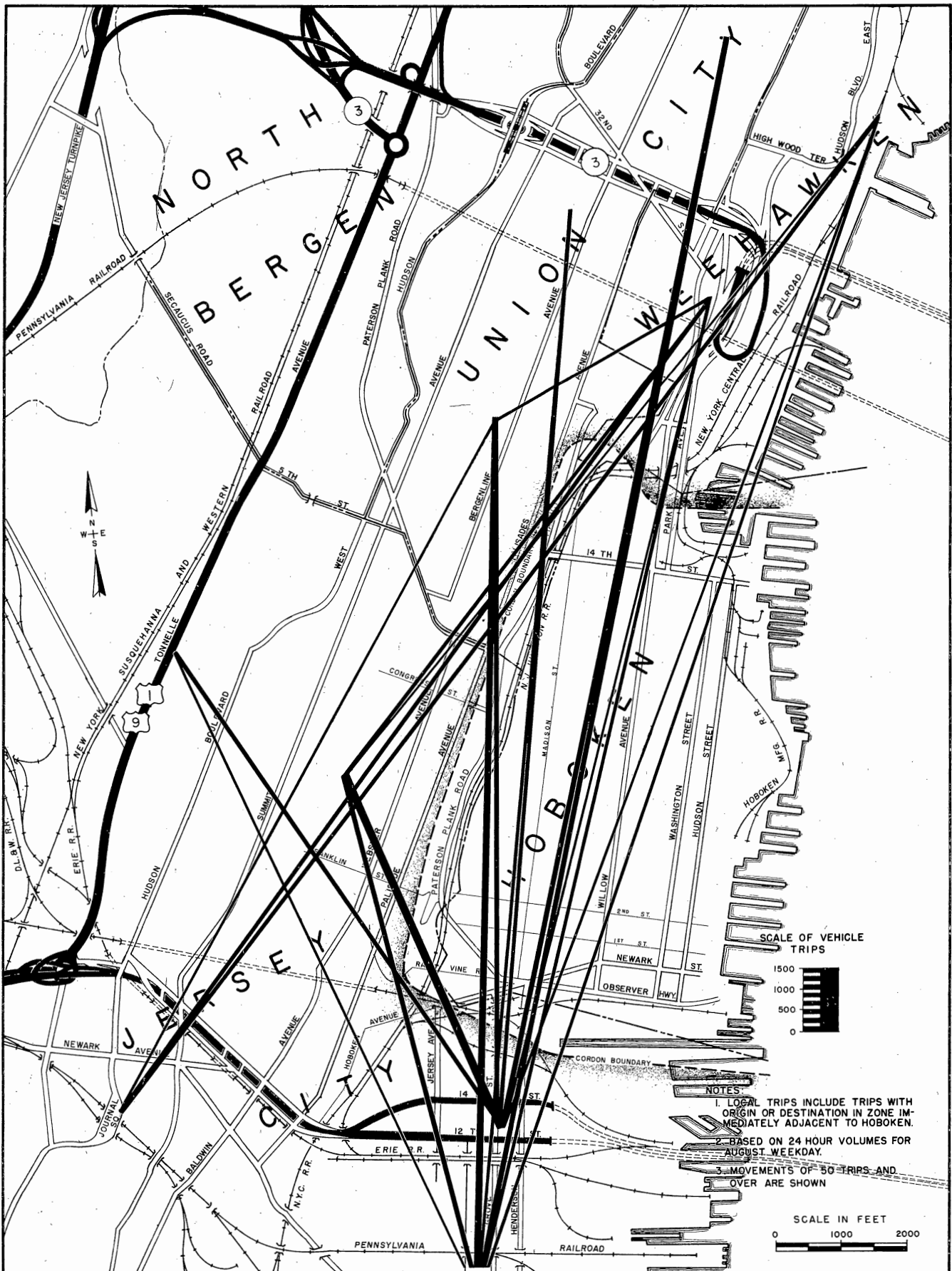
Figure 20 shows external passenger car trips through Hoboken. These trips have neither terminal in Hoboken or the adjacent area. It is interesting to observe the very low number of



LOCAL PASSENGER CAR TRIPS TO OR FROM HOBOKEN HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

Wilbur Smith & Associates

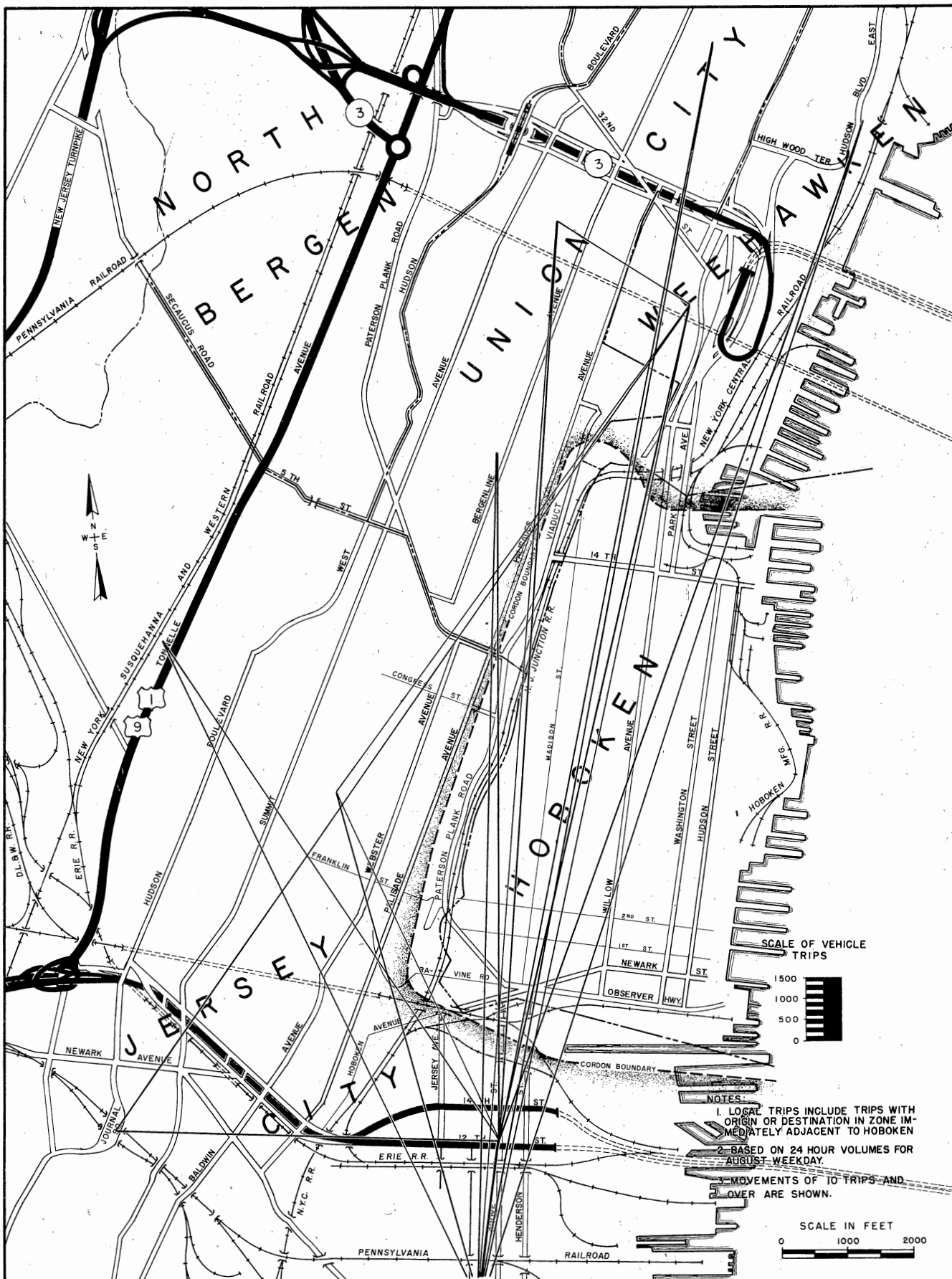
FIGURE 15



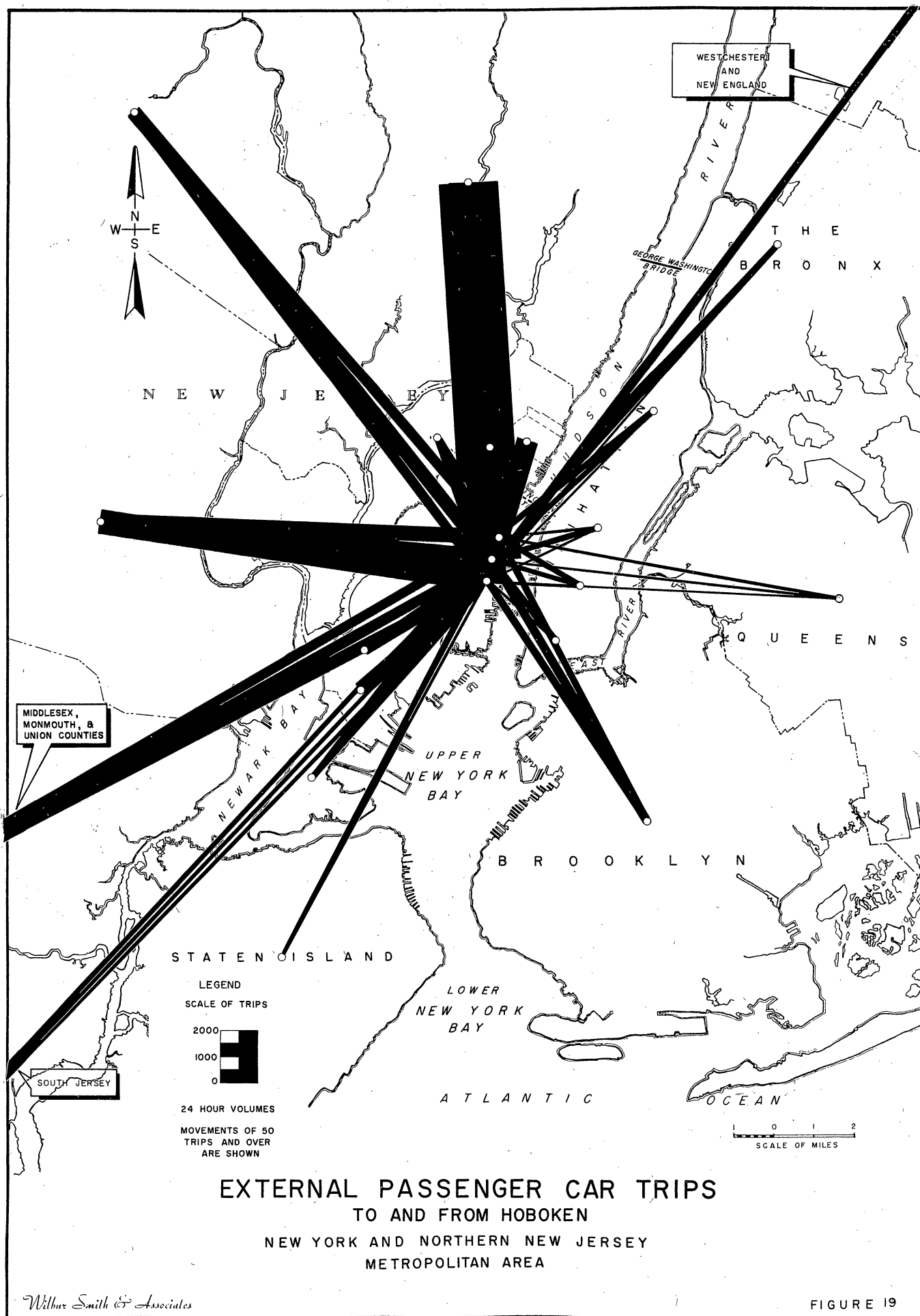
LOCAL PASSENGER CAR TRIPS THROUGH HOBOKEN HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY

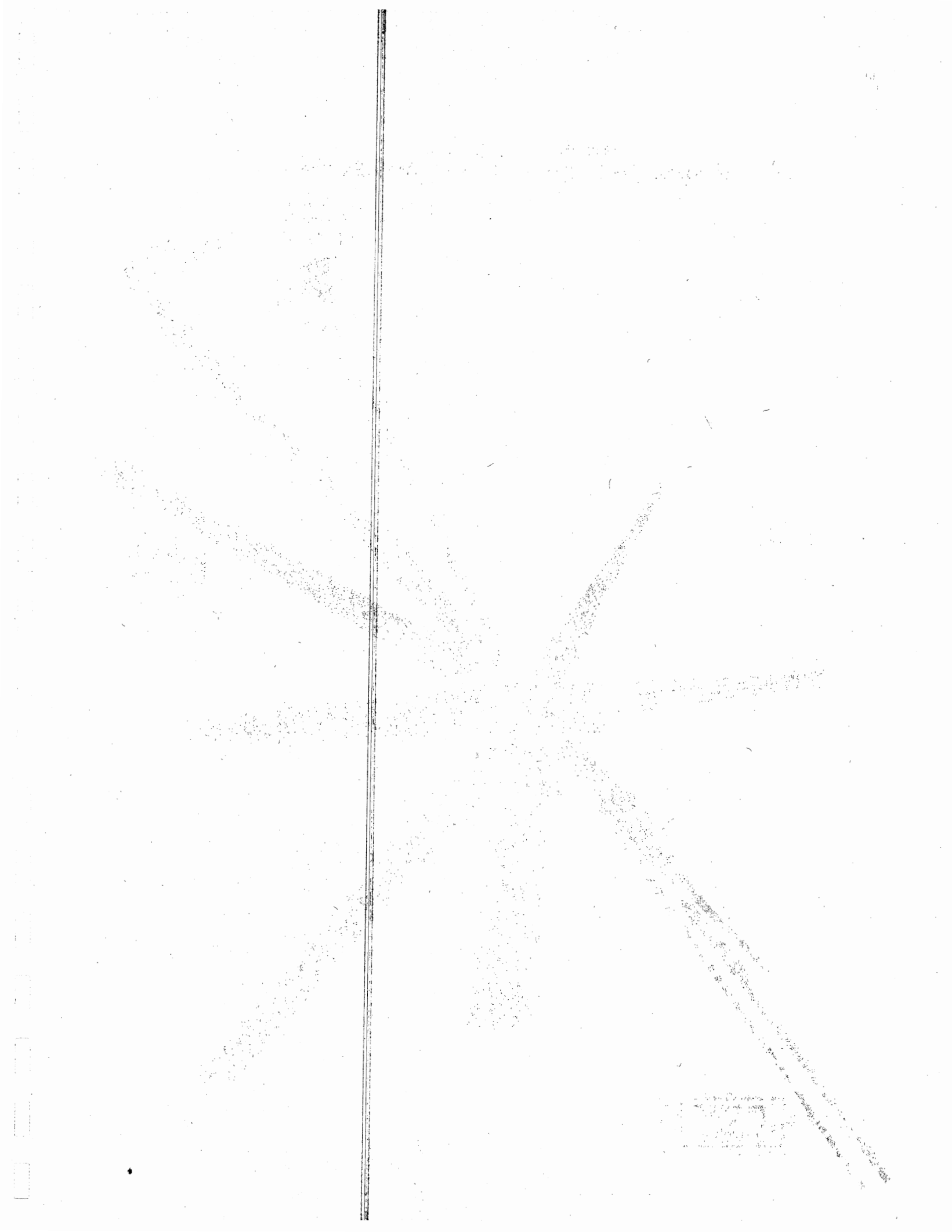
Wilbur Smith & Associates

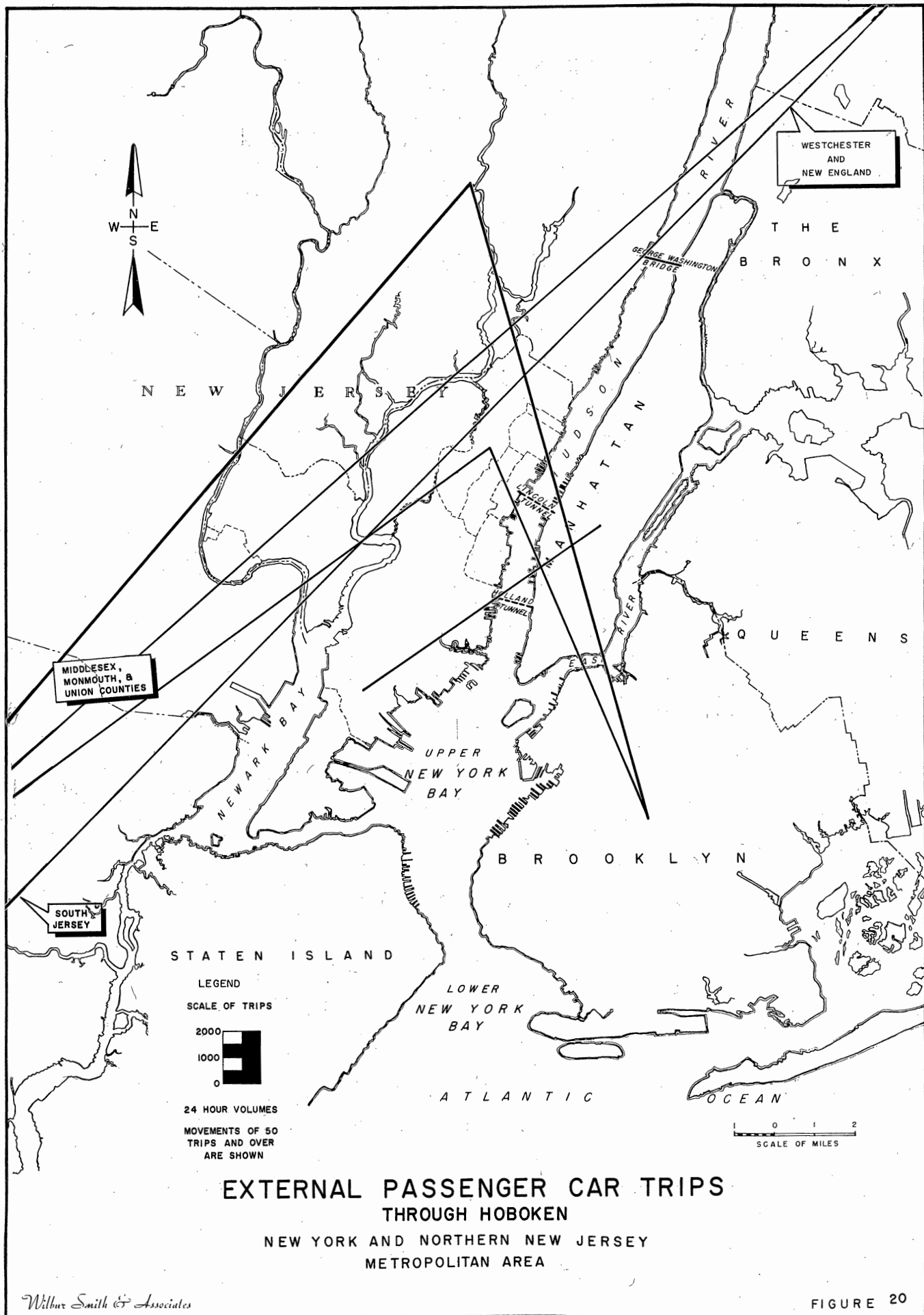
FIGURE 17

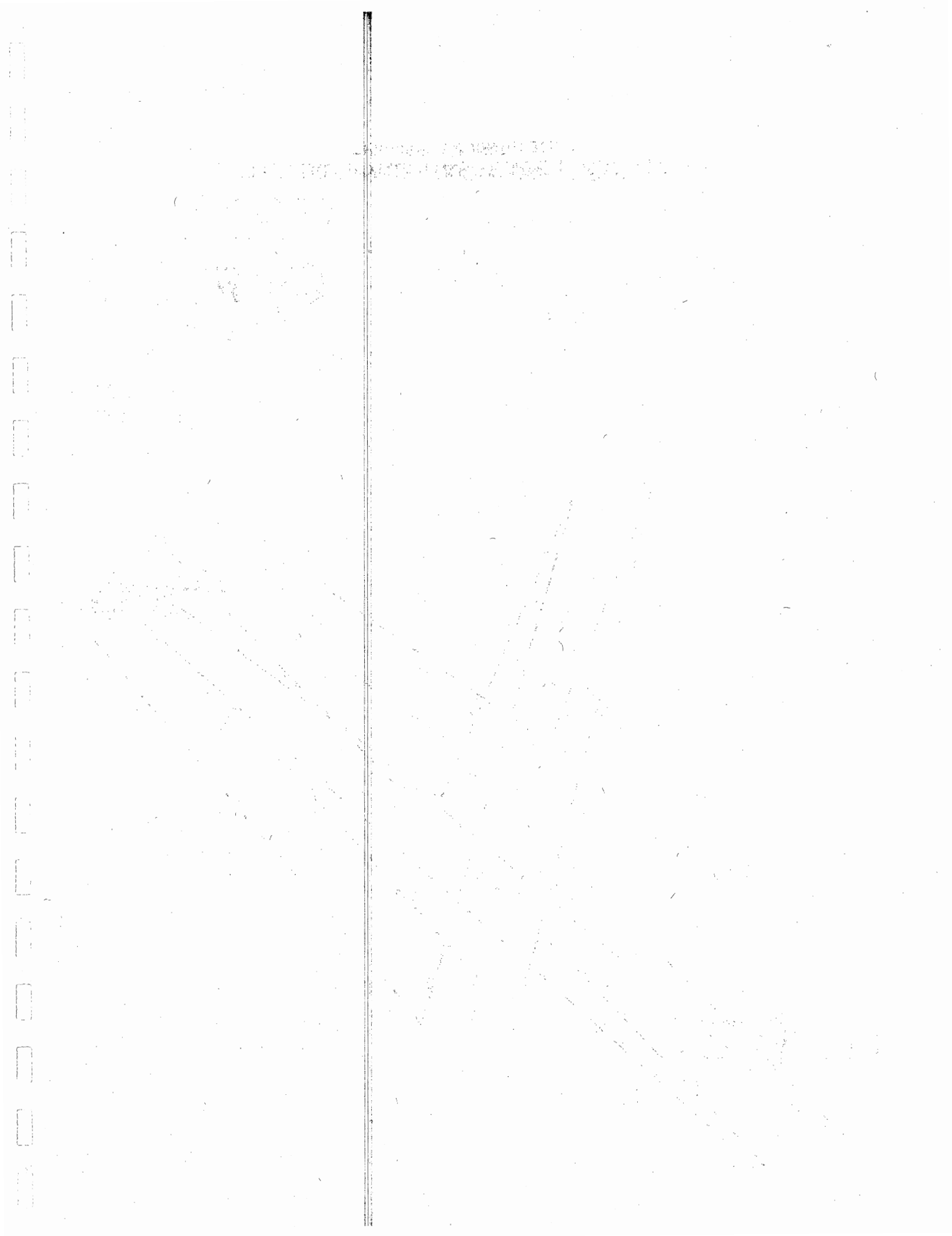


LOCAL TRUCK TRIPS THROUGH HOBOKEN
HOBOKEN AND EASTERN HUDSON COUNTY, NEW JERSEY









trips by passenger car through Hoboken. This substantiates the point that all major highway facilities by-pass Hoboken. Since most of the through or longer distance traffic would be using these routes, the low volume of external through trips on Hoboken streets is understandable.

External truck trips to and from Hoboken are shown in Figure 21. The major generators of truck trips are Brooklyn, Bergen County, Essex County, and the Passaic County area. The midtown and downtown areas of Manhattan are also proportionally heavier generators of truck trips than they are of passenger car trips.

Truck trips with external origins and destinations through Hoboken are shown in Figure 22. The proportion of through trips by trucks as compared to passenger cars indicates that the truck drivers are more prone to travel the local streets and indirect routes as an attempt to avoid delays in traveling about the metropolitan area. This figure also indicates rather well the primary truck generating zones outside of Hoboken.

An interesting aspect of the trip patterns shown in Figure 22 is the number of through trips which would not normally be expected to use the Hoboken streets in traveling between their origin and destination. The fact that these trips traversed the study area would appear to indicate that a business stop may have been made in Hoboken enroute. This would be true for such origin-destination combinations as Manhattan-New England, Brooklyn-Middlesex, Monmouth-Union Counties, and Essex County-Bergen County.

Trans-Hudson River Trips to and through Hoboken. Traffic generated by metropolitan New York which has origin and destination in Hoboken amounts to approximately 15 percent of the passenger car traffic moving through the north cordon line and 17 percent of the traffic moving through the south cordon line. In addition, approximately 35 percent of the truck movements through each cordon line have a terminus on the New York side of the Hudson River.

Three areas generate the bulk of the traffic through Hoboken that crosses the river. These are the central business district, the area between the central business district and the Palisades in the southwest part of Hoboken, and the area in the vicinity of 14th and Washington Streets. Primary zones of passenger car origin or destination on the New York side of the Hudson River are Brooklyn (an exaggerated generator because it was not sub-zoned) and the portions of Manhattan west of Broadway between 14th and 23rd Street, west of Fifth Avenue between 34th and 42nd Street and west

of Fifth Avenue between 59th and 110th Street. The maximum movement recorded is 42 daily trips between the 14th and Washington Street section in Hoboken and the area south of Worth Street and west of Broadway in Manhattan.

Truck trips crossing the Hudson River are heaviest between the same zones. The peak zone to zone movement is between the 14th and Washington Street area in Hoboken and the area between 34th and 42nd Streets and west of Fifth Avenue in Manhattan.

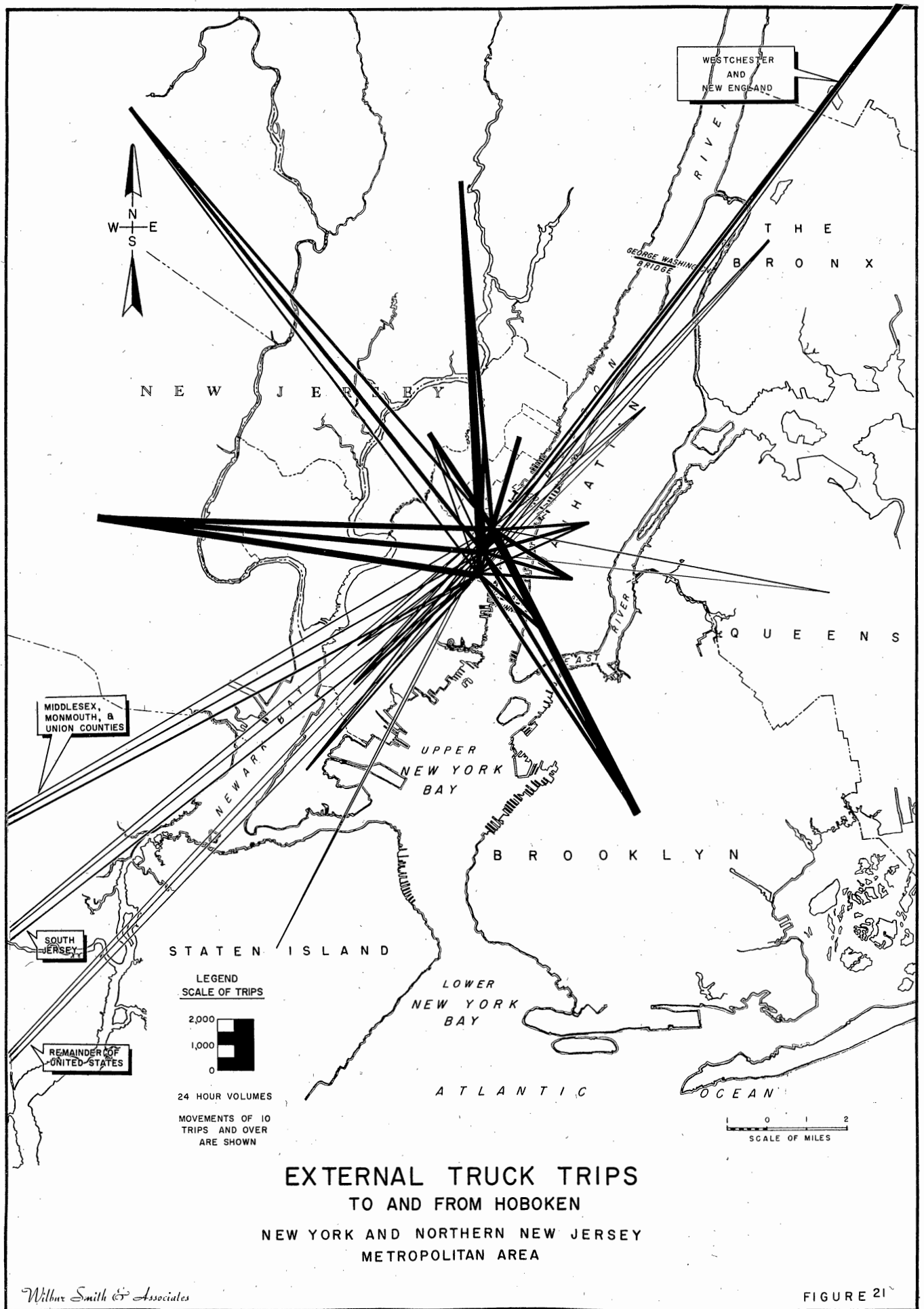
Traffic Entering Hoboken from the South and West - An analysis has been conducted of traffic entering Hoboken from points south and west of the city. For this purpose, traffic passing through Stations 5, 6, and 7, located at the south city limits of Hoboken, has been reviewed to determine the number of vehicles entering Hoboken from these points. Tables X and XI summarize these movements.

The origin and destination zones selected have been chosen to indicate the number of trips entering Hoboken from the south which approach this area from the west. The bulk of these trips can be assumed to approach the Lower Jersey City area adjacent to the Holland Tunnel by way of U.S. Route 1-Business. Thus trips originating in the southwestern part of Jersey City, Bayonne, Kearny, Harrison, Newark and Essex County, Middlesex, Monmouth and Union Counties and the remainder of South Jersey and points south and west throughout the country are included in Tables X and XI. Only the trips from these origin zones which are destined for Hoboken, Union City, Weehawken, North Bergen and West New York have been summarized.

Of the 4,594 passenger car trips which are generated by these two zone groups through Station 5, 6, and 7, 1,010 or almost 25 percent originate in zone 09064, the Journal Square area of Jersey City. Newark and Essex County is the second greatest zone of trip origins with 915 passenger cars making this movement in a typical day.

Trips are greatest in the lower part of Hoboken, the business district and area west of it. Numbers of destinations drop in proportion to the distance from the interview stations as indicated by the total of destinations in each of the zone groups.

Truck movements, as shown in Table XI, between these same zones and zone groups, total 946 in a 24-hour period. Newark and Essex County originate nearly one-third while almost one-half are destined for the south part of Hoboken.



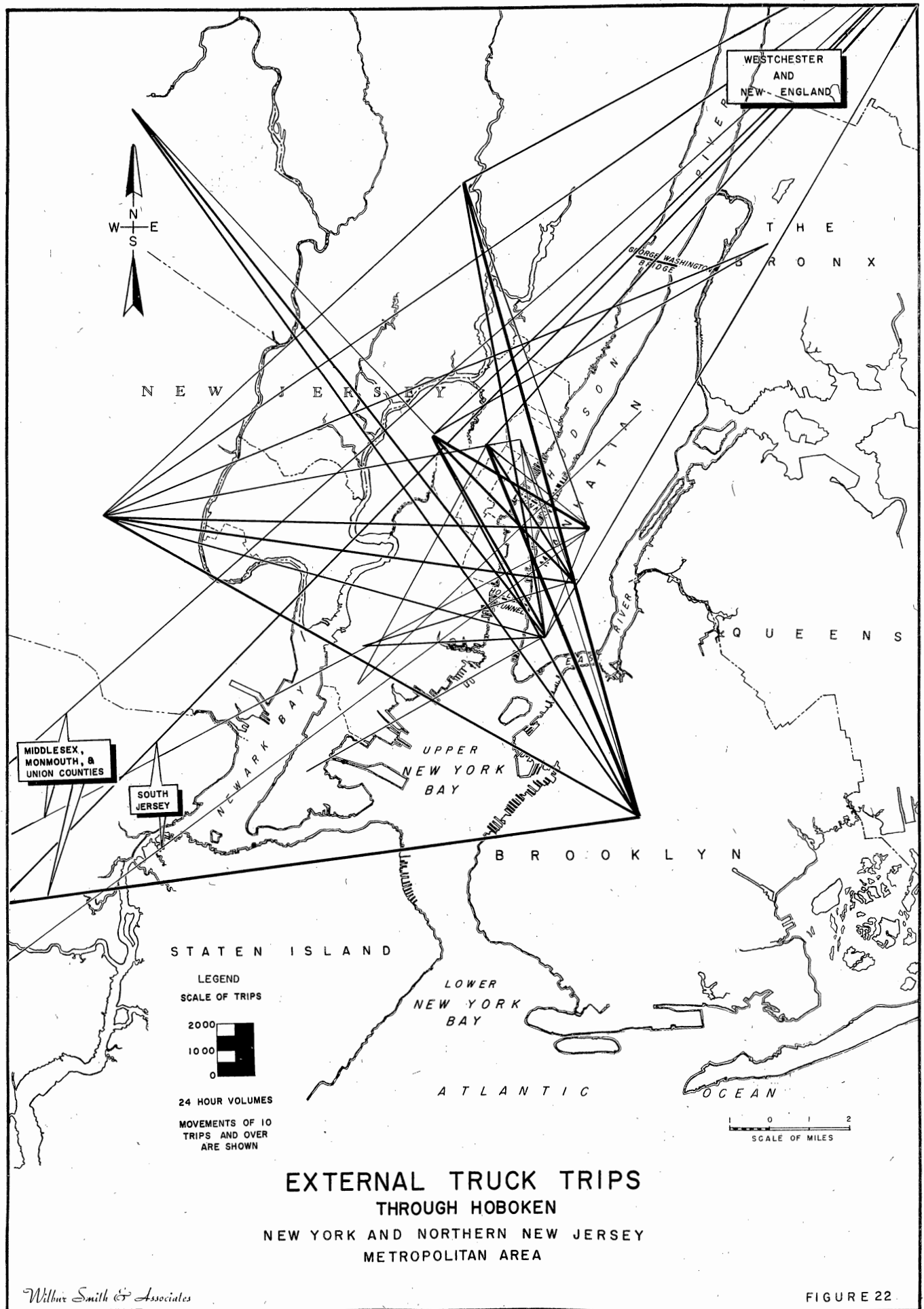


FIGURE 22



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TABLE X
PASSENGER CAR TRIPS ENTERING HOBOKEN
FROM POINTS SOUTH AND WEST

(Selected Zone to Zone Movements)

24 Hour Volume

Zones of Origin	<u>Zones of Destination</u>								
	09051	09053	09058		09100	09111			
	09052	-4-5 -6-7	09059	09050	-03	09112	09120	09030	09080
01000	98	67	31	10	11	6	-	-	- 223
07000	334	309	210	35	22	-	3	-	2 915
12000	231	160	145	19	-	4	7	-	9 575
14000	39	37	14	-	-	-	-	-	- 90
09010	106	90	49	12	4	9	-	-	6 276
09040	8	9	-	-	-	-	-	-	- 17
09061	21	28	14	4	-	2	2	10	- 81
09062	46	31	14	3	-	-	-	-	2 96
09064	447	249	160	30	36	11	36	23	18 1010
09065	61	58	32	16	1	-	6	-	- 174
09067	142	106	50	10	9	8	10	-	6 341
09069	263	174	83	29	19	18	8	-	2 596
09070	47	54	25	13	12	-	4	-	- 155
95000	<u>14</u>	<u>18</u>	<u>13</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>- 45</u>
	1857	1390	840	181	114	58	76	33	45 4594

TABLE XI
TRUCK TRIPS ENTERING HOBOKEN
FROM POINTS SOUTH AND WEST
(Selected Zone to Zone Movements)

Zones of Origin	24 Hour Volume									
	Zones of Destination									
	09051 09052	09053 -4-5 -6-7	09058 09059	09050	09100 -03	09111 09112	09120	09030	09080	
01000	12	6	1	-	-	-	-	-	-	19
07000	139	79	58	15	-	1	9	-	-	301
12000	36	21	23	5	-	-	-	-	2	87
14000	7	18	11	-	-	-	-	-	3	39
09010	37	13	23	4	-	-	-	2	2	81
09040	5	6	-	-	-	-	-	-	-	11
09061	2	3	2	-	-	-	-	-	-	7
09062	24	-	1	9	-	-	-	-	-	34
09064	44	36	11	5	3	6	3	2	2	112
09065	32	5	12	2	7	-	-	-	-	58
09067	23	23	7	-	3	5	-	-	-	61
09069	65	13	7	1	-	-	1	-	9	96
09070	3	6	5	1	-	-	-	-	-	15
95000	11	8	3	3	-	-	-	-	-	25
	440	237	164	45	13	12	13	4	18	946

Trips Generated by Lower Jersey City - To determine the volume of traffic generated by Lower Jersey City and the principal effect of this area on the traffic pattern of the Hoboken area, additional origin and destination data were collected south of the Holland Tunnel Plaza in Jersey City. Traffic on north-south streets adjacent to the Tunnel Plaza was interviewed. The traffic data which have previously been presented in the report were procured at the cordon survey stations shown in Figure 2.

Certain segments of the traffic volume generated by this area are potential users of the Newark Bay-Hudson County Extension of the New Jersey Turnpike and the proposed facility through Hoboken. Among these are the trips generated by lower Jersey City to or from points south and west of the immediate area, and to or from New York City zones north of 34th Street as well as Westchester County and New England.

Figure 23 shows the interchange of trips during a 24 hour period between three Lower Jersey City area zones (09063, 09066, 09068) and three basic areas north of the survey screen line between 10th and 12th Streets. Significant features are the relative magnitude of north-south trips to and through Hoboken, approximately 67 percent of total volume through screen line, the fact that 14 percent of the trips originate in or are destined for zones to the south and west, and that 45 percent of the approximately 4,000 vehicles destined for the Holland Tunnel are trucks.

These facts serve to point out the lack of access into Lower Jersey City and the heavy reliance which is placed upon U.S. Route 1-Business and the north-south feeder streets between the Holland Tunnel Plaza and the points of origin or destination in the waterfront zones. They also reflect the very high percentage of truck traffic which is common in this area and indicate that the problem is one created by short trips in and around the waterfront area.

In addition, the breakdown of trips with origins and destinations in these zones indicates that most of the trips had origin or destination a short distance south of the cordon. The designation of trips to the south and west covers all trips to or from other Jersey City zones as well as trips currently using U.S. Route 1-Business in entering or leaving the waterfront area. Holland Tunnel trips include all those destined for points in New York City from the lower Jersey City zones.

Further analysis of travel patterns of trips originating in or destined to the three waterfront zones in Jersey City indicate the volumes of such trips which would be potential to the Newark Bay-

Hudson County Extension of the New Jersey Turnpike. It was assumed that all trips between the south part of Jersey City, Bayonne, Staten Island, Newark and Essex County, all points south and west in New Jersey and the rest of the country, and the three selected zones would be potential to the route under construction.

The total number of potential passenger car trips involved above is approximately 2,589 per day. Of these, 440 trips are destined to or from Bayonne, Staten Island and the south part of Jersey City while the remainder are trips from Newark or more distant points.

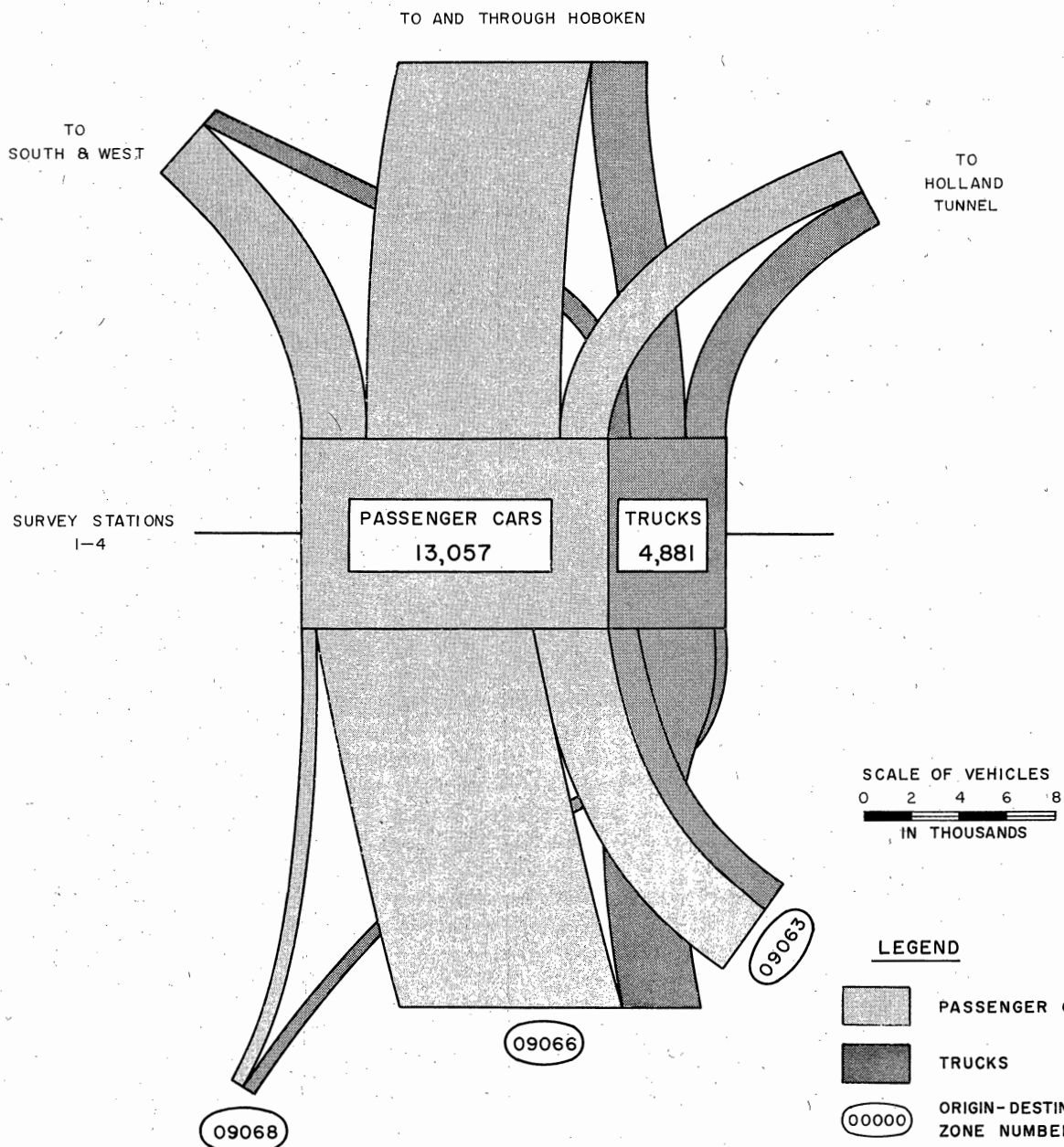
Truck trips totalled 618 which are potential to the Newark Bay-Hudson County Extension of which 120 are to or from Bayonne, Staten Island, or South Jersey City. The total number potential to the route under construction is 3,207 trips per day having either origin or destination in the waterfront area.

Directional analysis of these trips indicates that trips from the waterfront area are more numerous than are trips to the waterfront area. Approximately 55 percent of the trips are leaving the waterfront zones and 45 percent are destined to these zones.

An analysis of trip desires generated by the zones at the south end of Hudson County, including Bayonne and the south part of Jersey City, indicates the traffic generating characteristics of this area as compared to the area adjacent to the Jersey City Waterfront and between South Jersey City and the Holland Tunnel approach. Figures 24 through 27 show various breakdowns of trip patterns between the southern part of Hudson County and Hoboken or points north.

Figure 24 shows passenger car trips between zones in Jersey City north of the proposed Caven Point Road interchange on the Newark Bay-Hudson County Extension of the New Jersey Turnpike and Hoboken and zones to the north. Figure 25 shows passenger car trips between Bayonne and the most southerly zones of Jersey City and Hoboken or zones to the north thereof. The magnitude of trips which are made between the area north of the proposed Caven Point Road interchange on the Newark Bay-Hudson County Extension of the New Jersey Turnpike and Hoboken is readily noted to be a major traffic movement in this area. Trips into the Hoboken area from the Bayonne area are far fewer in number than the trips generated by the area north of the proposed Caven Point Road interchange.

Figures 26 and 27 indicate the truck traffic patterns which are created by trip desires between Bayonne and South Jersey City and Hoboken. Again the trips generated by the waterfront area of



BASED ON 24 HOUR
TRAFFIC VOLUMES, 1954

DISTRIBUTION OF TRIPS TO AND FROM SELECTED SURVEY ZONES

JERSEY CITY

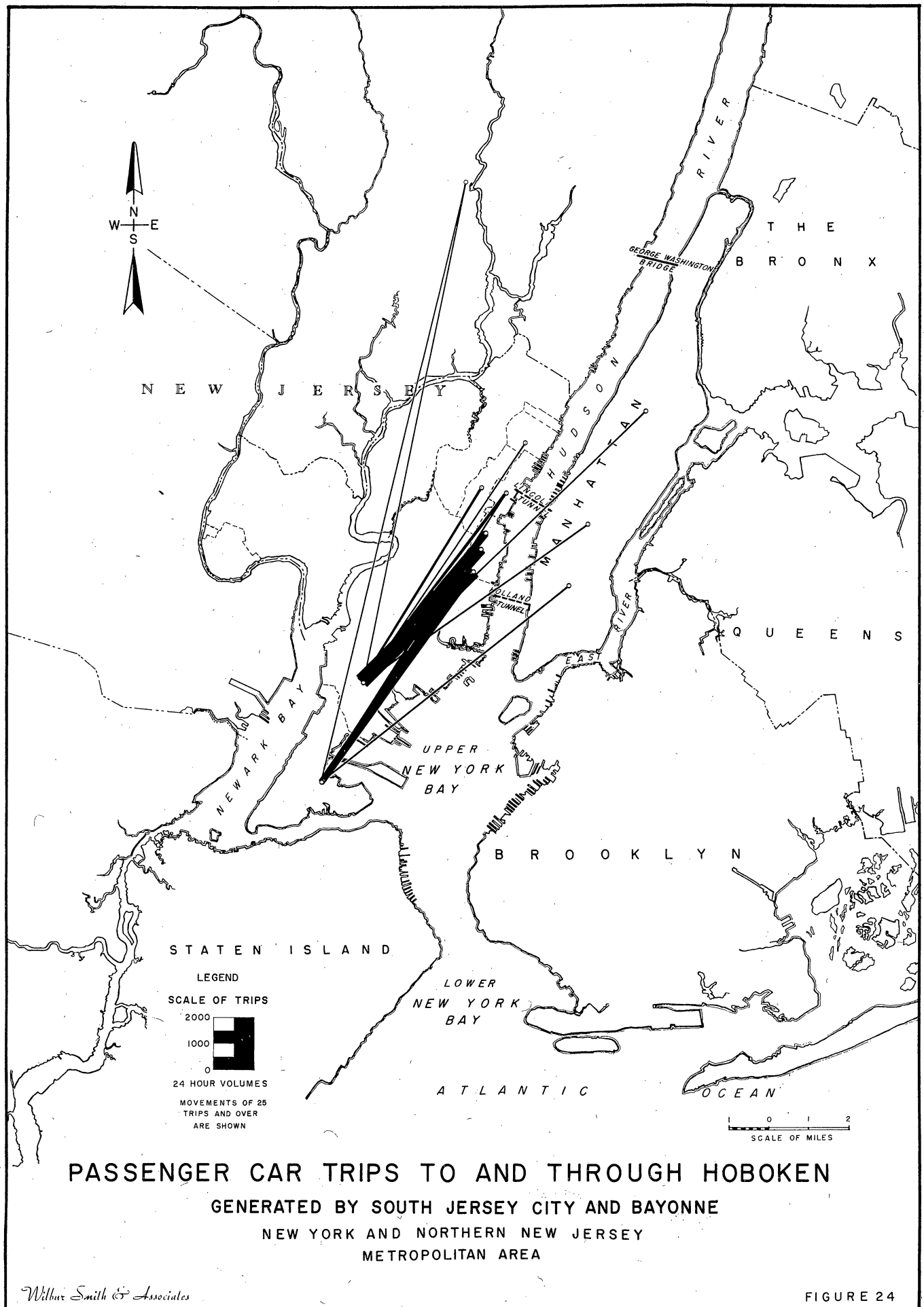
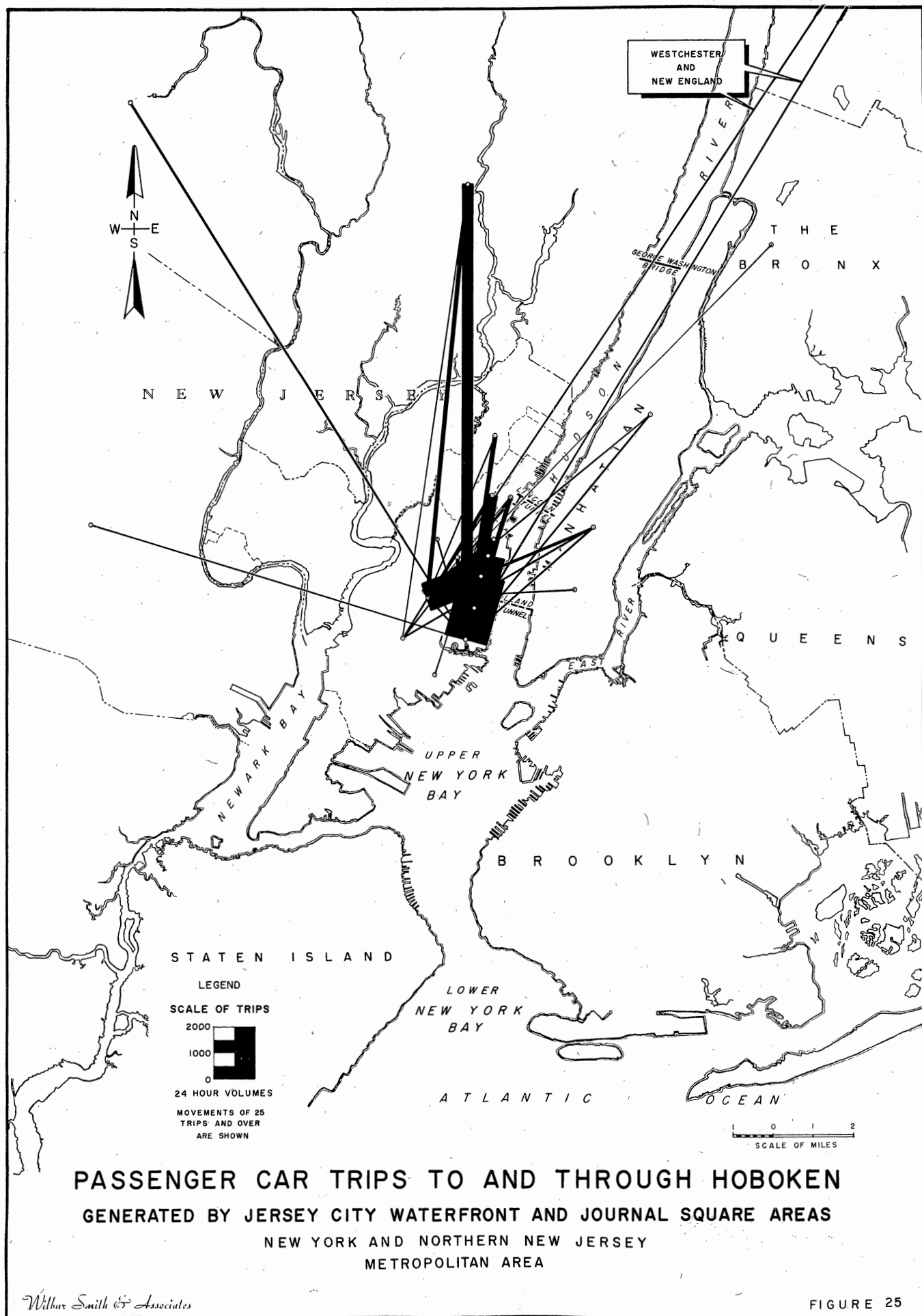
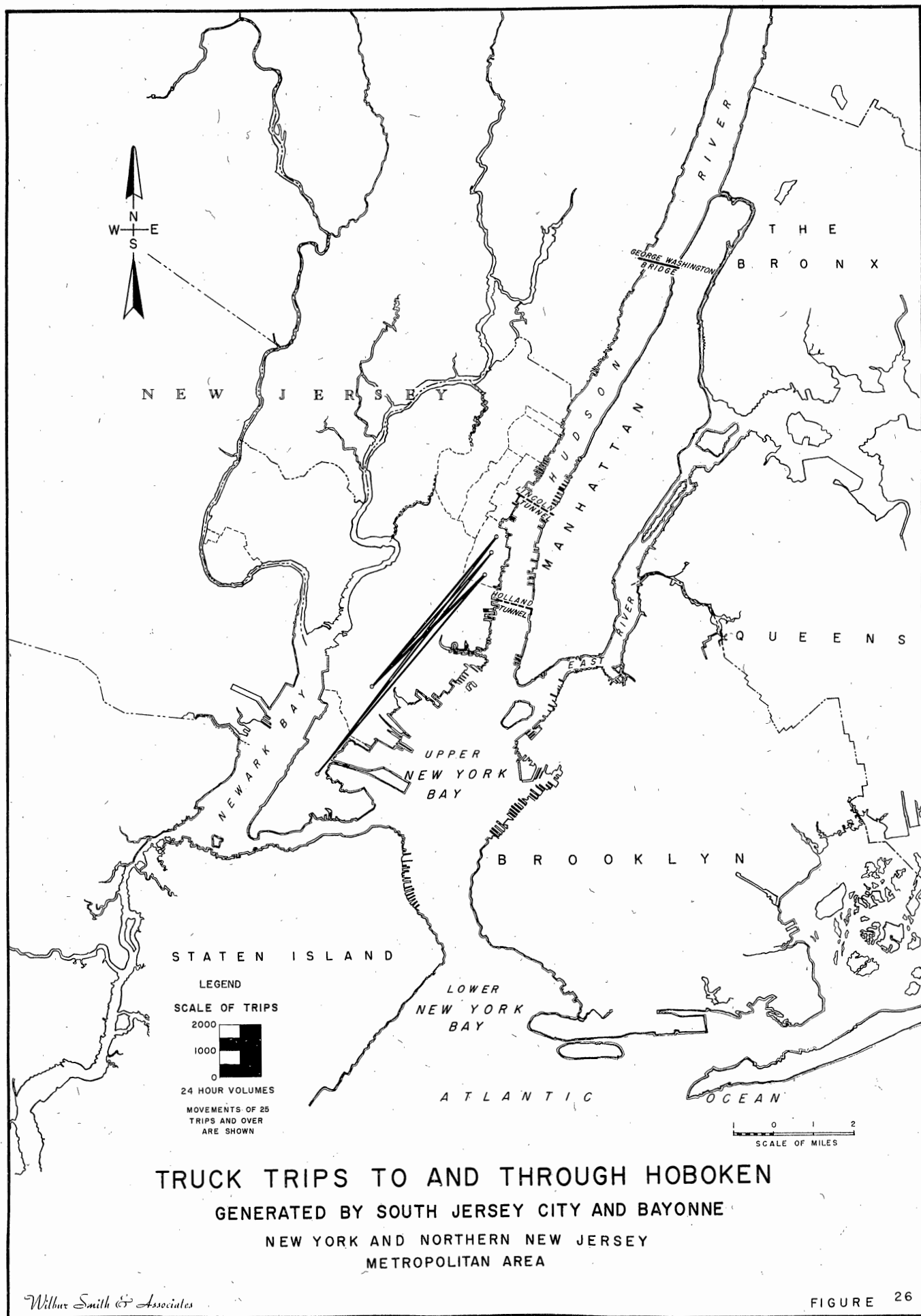


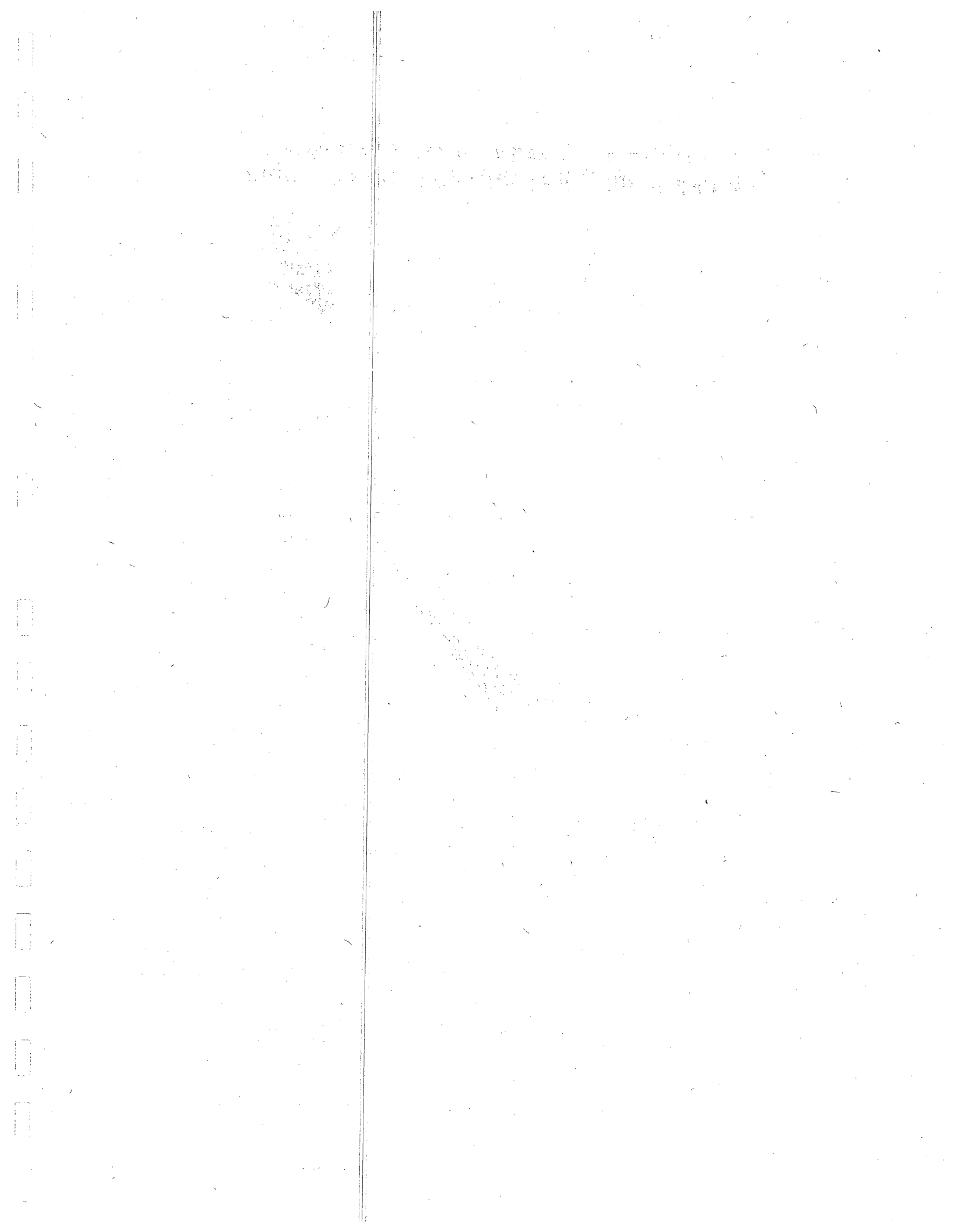
FIGURE 24

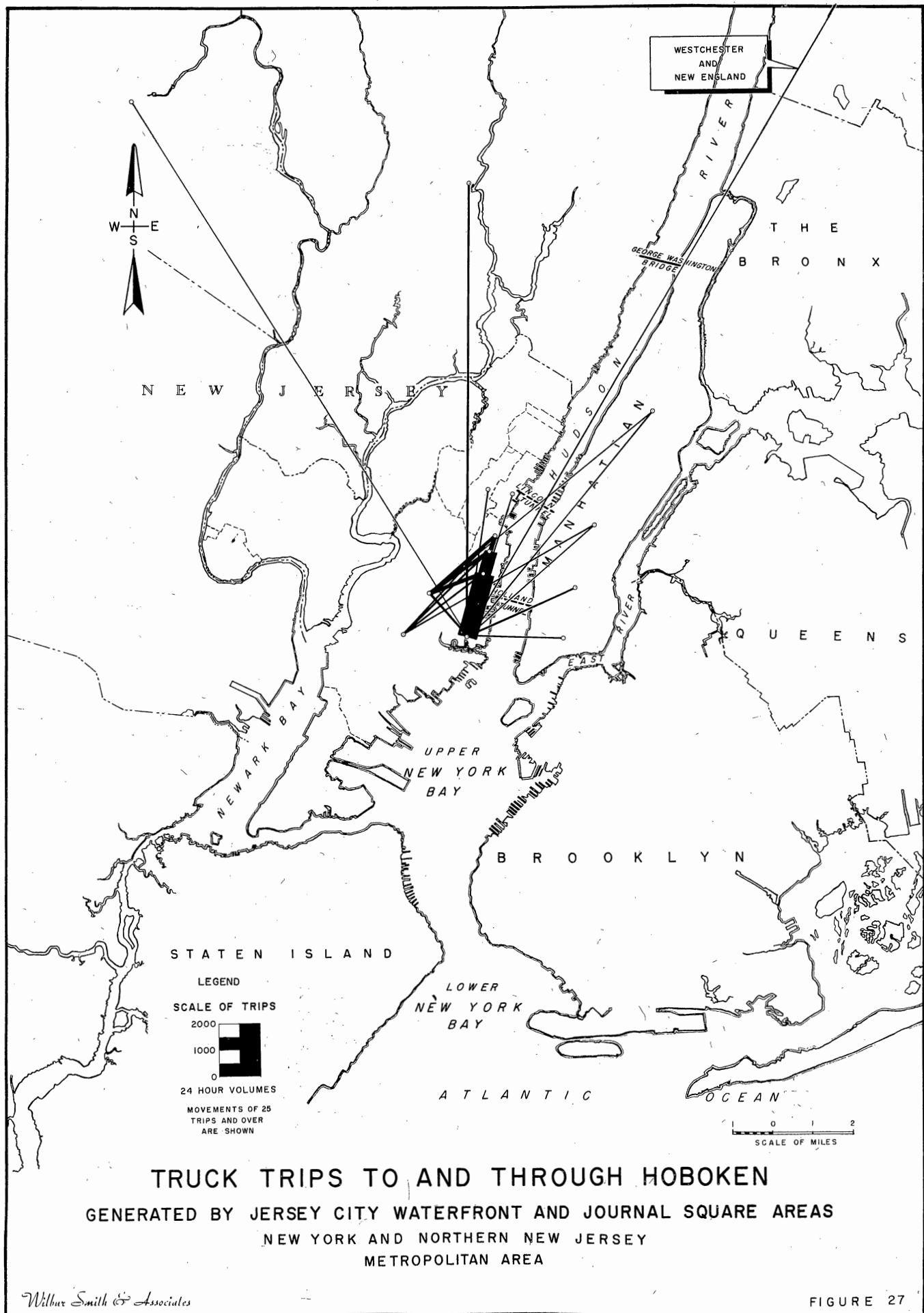


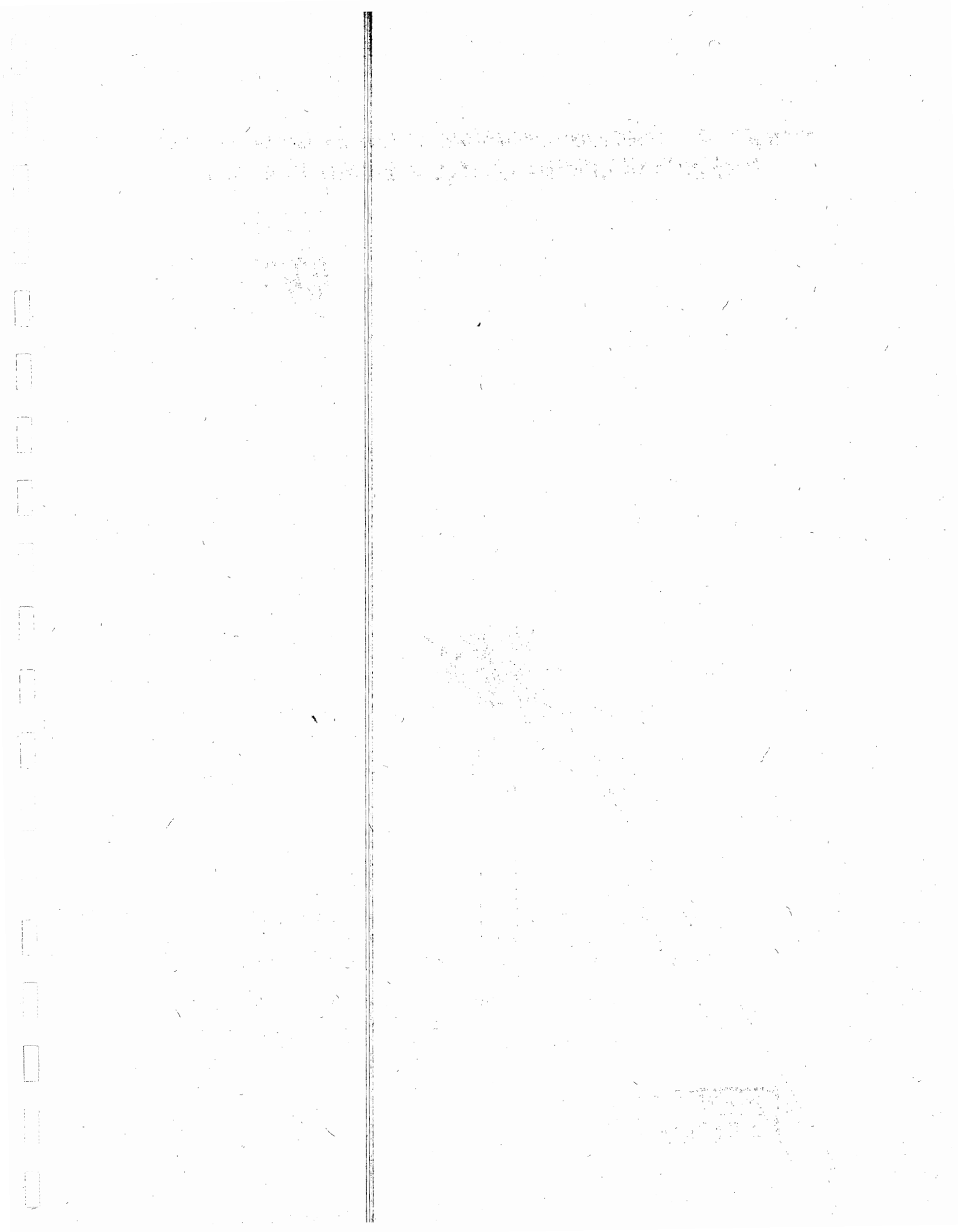
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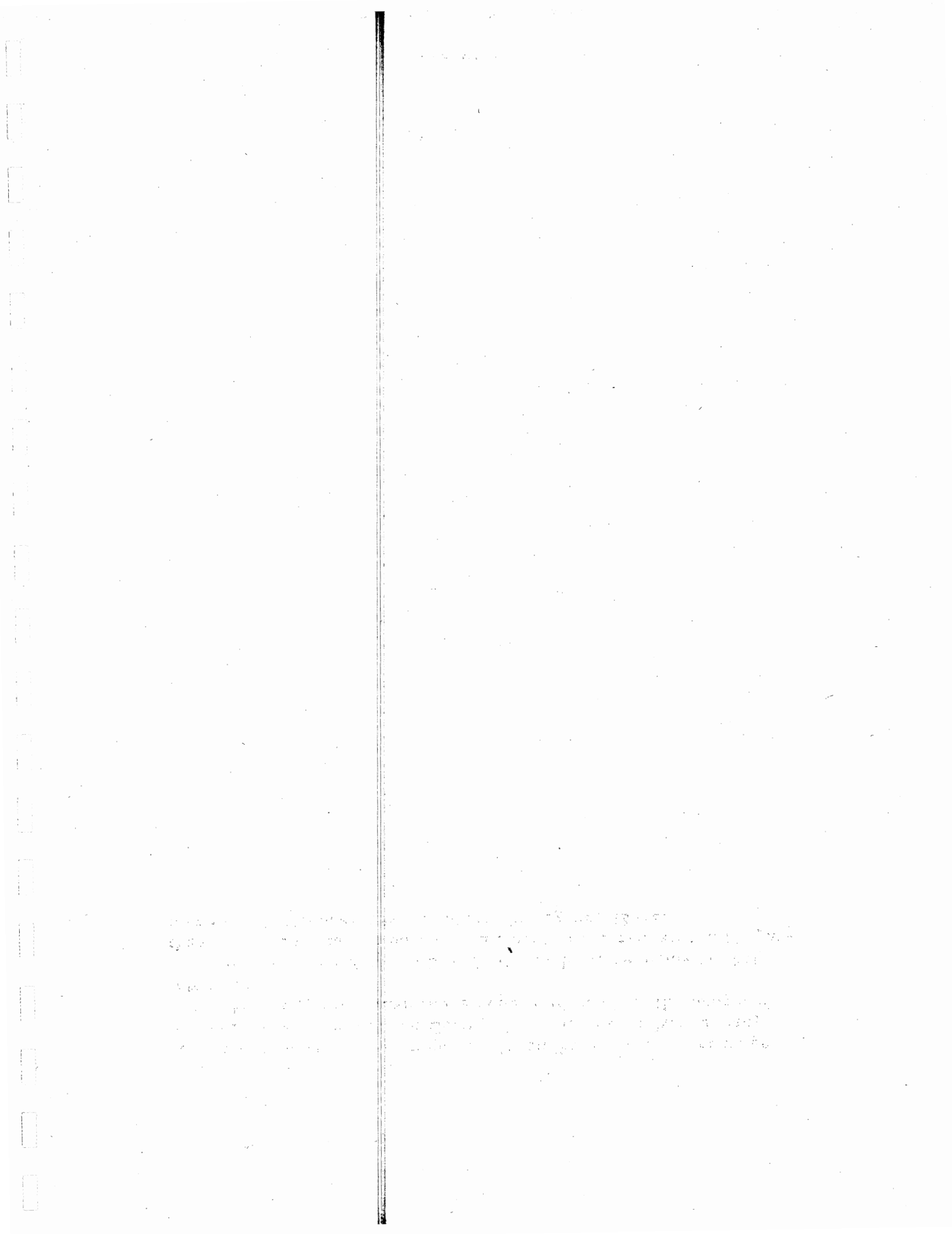






Jersey City north of the proposed Caven Point Road interchange on the Newark Bay-Hudson County Extension of the New Jersey Turnpike are greater than those generated south of the proposed interchange.

In reviewing Figures 24-27, it should be recognized that these trip patterns are only a small part of the overall traffic patterns of the Hoboken area as shown in Figures 12-22.



PART III

FUTURE TRAFFIC

New highway facilities must be designed for future traffic requirements. Roadway capacities should be adequate to accommodate traffic increases likely to occur within a reasonable period of time, or provision should be made in planning the grading and structures for stage development by the addition of lanes as the needs develop.

Basic Trends Affecting Future Traffic

Traffic growth is a function of several significant and related variables including population trends, changes in vehicle ownership ratios and variations in annual usage. Careful study has been given to these factors as they relate to future traffic on a proposed north-south facility. Obviously, the growth in traffic through and into Hoboken will be affected not only by changes in the city itself but also by those in the surrounding areas.

While the population of the New York Metropolitan Region has increased 52 percent since 1920 the population of Hudson County has decreased 4.1 percent. During the same period, as shown in Figure 28, population of Hoboken has declined from 68,166 to 50,676, a decrease of approximately 25 percent. In spite of this decrease in population, Hoboken remains one of the most densely populated cities in the nation with 42,230 persons per square mile in 1950.

Although population has declined, vehicle registration has increased steadily in Hudson County and Hoboken since 1944. As shown in Figure 29, the vehicle registration in Hudson County increased from 97,730 in 1944 to 169,389 in 1953 and in Hoboken from 7,310 to 11,494 during the same period.

Vehicle ownership in Hudson County, Hoboken, and New Jersey has steadily increased since 1944. In 1953 there was approximately one vehicle for every 2.74 persons in New Jersey, one for every 3.56 persons in Hudson County and one for every 4.41 persons in Hoboken. Assuming constant population in Hoboken and Hudson County over the next 20 years, vehicle ownership ratios will be reduced to approximately 3.47 for Hoboken and approximately 3.12 for Hudson County.

On the basis of projections of vehicle ownership ratios, vehicle registrations will approach 200,000 in Hudson County and

15,000 in Hoboken in 1970, increases of about 18 and 31 percent respectively over current registration.

Increases in vehicle registration will bring about related increases in travel. Past changes in traffic volumes on major highways in the area are presented in Table XII. Average annual increases on U.S. Routes 1 and 9 in North Bergen and on River Road in North Bergen have approximated 4 and 6 percent respectively in recent years while other streets in the vicinity have had slight reductions in traffic volume.

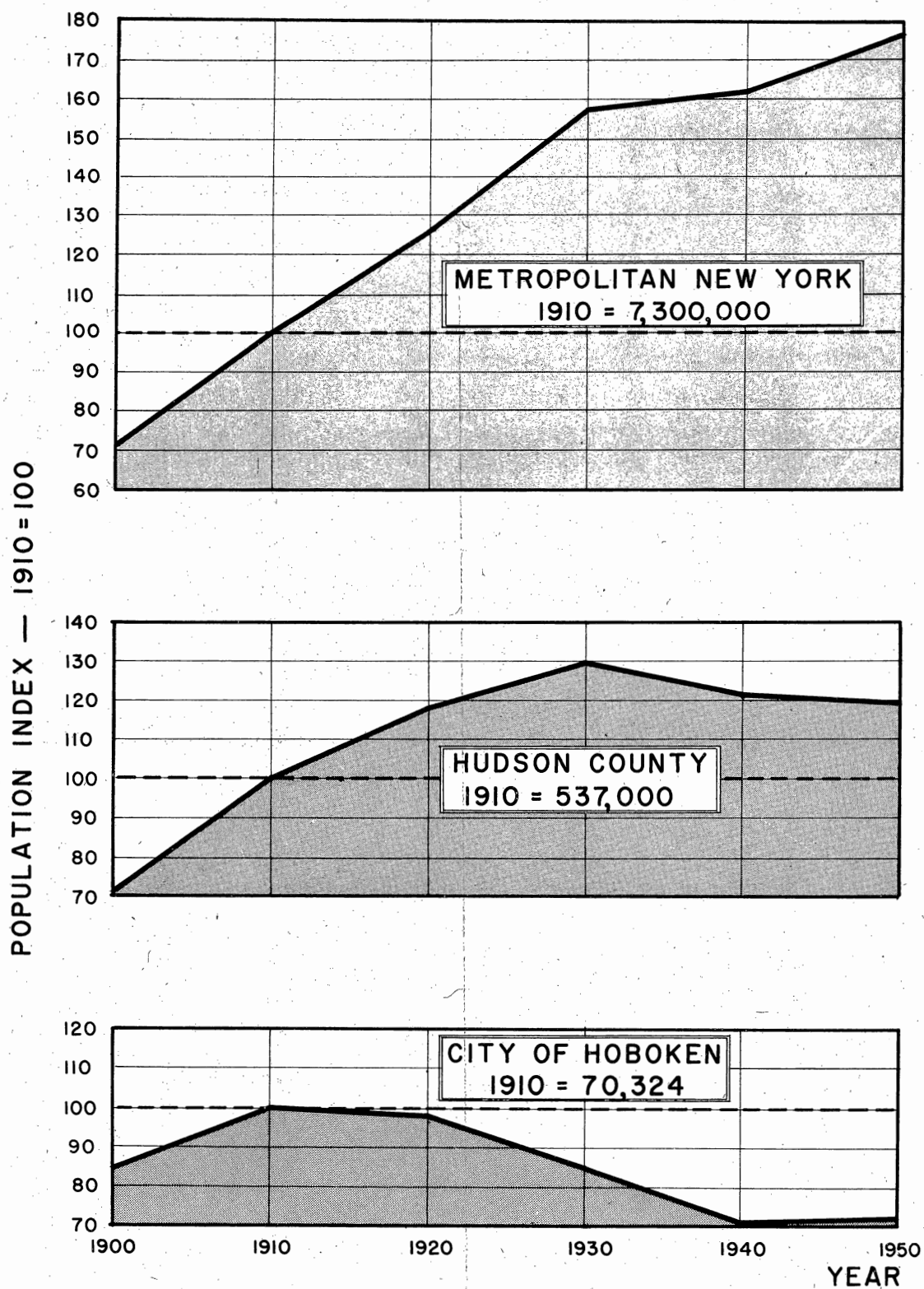
While present trends in population and in traffic volumes are not indicative of anticipated increases in motor vehicle use in the immediate area, vehicle registration trends, the overall picture of traffic expansion in the metropolitan area, and the present overloaded conditions on all major and many minor streets suggests that greater use may be expected.

Table XII

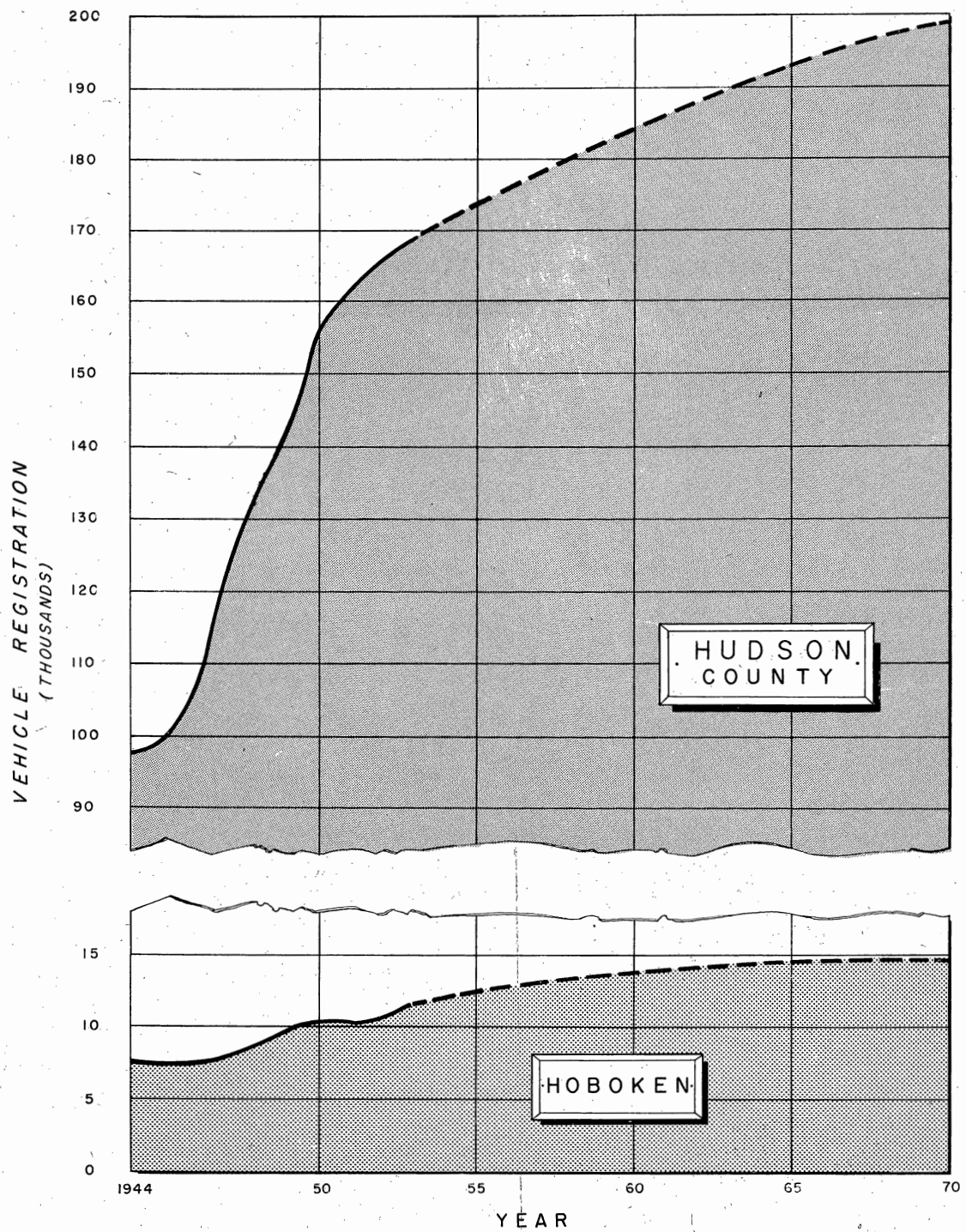
ANNUAL AVERAGE DAILY TRAFFIC 1949 - 1953

A.A.D.T.

<u>Location</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>
Hudson Blvd. (Nbd)	10,397	10,702	10,174	9,980	9,625
Union City					
U.S. Rts. 1 & 9 (Nbd)	--	--	--	18,412	19,870
North Bergen					
Newark Ave. (E & W)	8,500	8,646	8,628	8,373	8,259
Jersey City					
River Road (N & S)	--	10,053	10,305	11,001	11,743
North Bergen					



POPULATION TRENDS
CITY OF HOBOKEN, HUDSON COUNTY, METROPOLITAN NEW YORK



VEHICLE REGISTRATION TRENDS
HOBOKEN AND HUDSON COUNTY

Highway Developments Affecting Future Traffic

The highway improvements planned, proposed and in progress for the Regional Highway System of Metropolitan New York-New Jersey will increase the traffic potential to the proposed north-south route through Hoboken. Developments which will directly affect traffic flow on this route include the: (1) Newark Bay-Hudson County Extension of the New Jersey Turnpike; (2) Additional Lincoln Tunnel tube; (3) Route 58 Extension; (4) Middlesex Freeway; (5) West Shore Expressway; and (6) The Clove Lakes Expressway. These routes are shown in Figure 30.

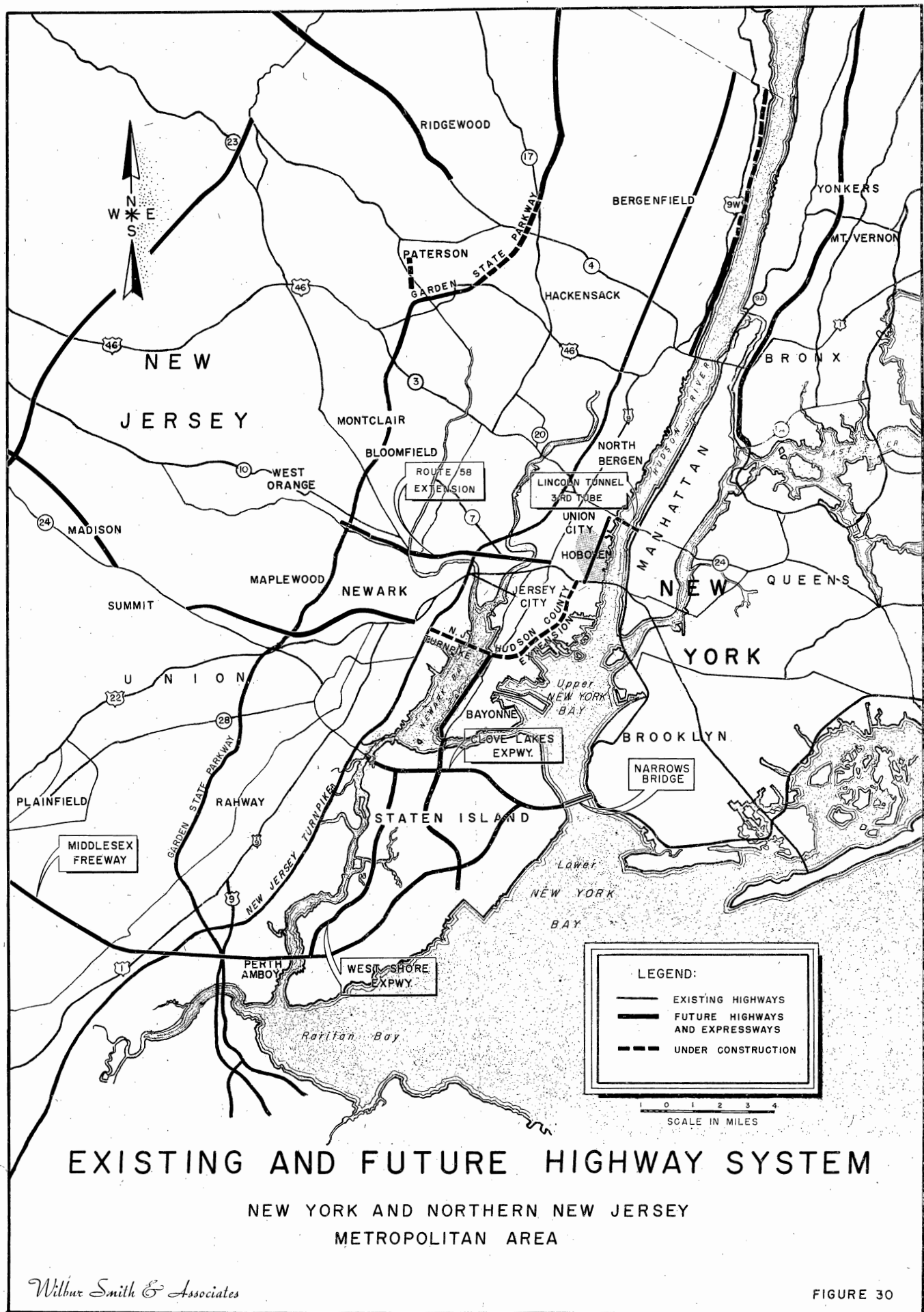
All of these developments extend and increase the traffic potential of a route between the Holland and Lincoln Tunnel Plazas. For example, with the Newark Bay-Hudson County Extension of the New Jersey Turnpike, the proposed roadway provides a link in a continuous route between the Lincoln Tunnel and the Goethals Bridge and Outerbridge Crossing. It also provides an additional route to Newark and the Newark Airport from the Lincoln Tunnel via the Newark Bay-Hudson County Extension of the New Jersey Turnpike. With the completion of the Route 58 Extension, an expressway route from the Holland Tunnel to the north area of Newark and to East Orange will be provided.

Access to the Newark Bay-Hudson County Extension of the New Jersey Turnpike will be provided by interchanges at Avenue E in Bayonne, Caven Point Road and Brunswick Street in Jersey City and near the Holland Tunnel Plaza in addition to the one adjacent to Newark Airport where the extension leaves the Main Line of the turnpike. Two way interchange is provided at all locations except at Brunswick Street where only exit for northbound traffic and entrance for southbound traffic is afforded. No entrance ramp is planned for northbound traffic between the Caven Point Road interchange and the Holland Tunnel.

All present Hudson River crossings are taxed beyond their capacity at peak periods. This results in a negative attitude toward motor vehicle use in the immediate Metropolitan Area.

Completion of the third tube of the Lincoln Tunnel along with the anticipated construction of a second deck on the George Washington Bridge and of the proposed Narrows Bridge between Brooklyn and Staten Island should provide needed relief for the present Hudson River crossings. The additional capacity provided by these proposed facilities should further stimulate motor vehicle use in the Metropolitan Area. Based upon experiences in recent years with new traffic facilities in this area, relief which would be pro-

vided on the existing Hudson River crossings by the new facilities at the time of their opening would soon be more than compensated for by the induced traffic which would make use of the additional roadway capacity.



PART IV

TRAFFIC POTENTIAL TO A NORTH-SOUTH ROUTE

The traffic patterns which have been discussed, showing heavy north-south traffic movement into and through Hoboken, may be used to determine the best traffic alignment for a north-south highway facility.

A review of the basic origin and destination tables (Appendix Tables C and D), as well as the total trip desire patterns, indicate zone to zone movements most affected by the proposed route. Among the movements which can be expected to benefit most from the new facility are those generated by Hoboken zones, Bergen County zones, the zones along the Jersey City waterfront immediately south of Hoboken, the other Jersey City zones south of U.S. Route 1-Business, and the nearby areas immediately north of Hoboken, such as the north portion of Union City, Weehawken, West New York and North Bergen.

Advantages would also accrue, through the construction of a north-south facility, to trips currently traveling through the Hoboken area to or from points in New York at either end of Manhattan Island. There would be little advantage based on possible route alignment plans for traffic originating in the Jersey City area at the top of the Palisades, north of U.S. Route 1-Business or in the south part of Union City, due to the physical barrier provided by the Palisades.

The Traffic Corridor

Previous discussion has pointed up the magnitude of traffic movements along a north-south axis into and through Hoboken. It was shown that of the nearly 70,000 trips into and out of the area, almost one-fourth are through trips. These through trips although local in terms of origin and destination form the basis for a heavy north-south trip desire pattern through Hoboken. Many of them are obviously potential to a new roadway alignment which might be developed to provide improved traffic services in relation to the services rendered by existing streets.

Most of the trips with origins or destinations within the city would benefit by using portions of a new north-south roadway. These basic movements were discussed in Part II and are demonstrated in Figures 9, 10, and 13-22. It is apparent from these

diagrams that many trips are potential to a north-south facility. The emphasized north-south corridor effect was also demonstrated by the passenger car and truck trip distributions shown in Figure 11 and 12.

Centroidal Determination of Route Alignment

Although the general direction of a possible alignment and the location of termini are limited by physical considerations, there remains considerable east-west flexibility in the choice of a route through Hoboken.

Nearly all of Hoboken lies east of a line connecting the Lincoln Tunnel Plaza and the Holland Tunnel Plaza at Jersey Avenue and since access to the route from the west will be physically limited by the Palisades, trips in Hoboken will be best served by a location east of the direct line. The relationship of local to through trips and the major points of origin and destination indicate the line which will provide optimum service to all traffic.

Trips from outside the cordon area which are potential to the proposed facility have been assumed to enter the area at one of three points: the Lincoln Tunnel Plaza, the Holland Tunnel Plaza at Henderson Street, and the Holland Tunnel Plaza at Jersey Avenue. Trips assigned to these points of choice include trips entering the area from local streets north and south of the survey area as well as trips approaching the area by way of the Tunnels from New York and major highways from the west. Topography limits nearly all north-south trips to or through the survey area to these points of entry and exit. Trip terminals within the cordon are assumed to be concentrated at area centroids of the nine survey zones into which Hoboken is divided. Figure 31 shows the distribution of passenger car and truck trip termini among these entry and exit points and zone centroids.

In the analysis a north-south base line was constructed. Centroids of trip termini were divided into five groups and projected to this base line at right angles. Thus a point or centroid was established for each group of termini. These points are shown in Figure 31. It can be seen that a line connecting these points would generally follow the alignment of Willow Avenue through Hoboken, swinging to the west to cross the Holland Tunnel Plaza area between Grove and Erie Streets. Such a line could be termed the route of optimum traffic value through the study area.

Anticipated Developments Affecting Route Location

The theoretical determination of route alignment just pre-

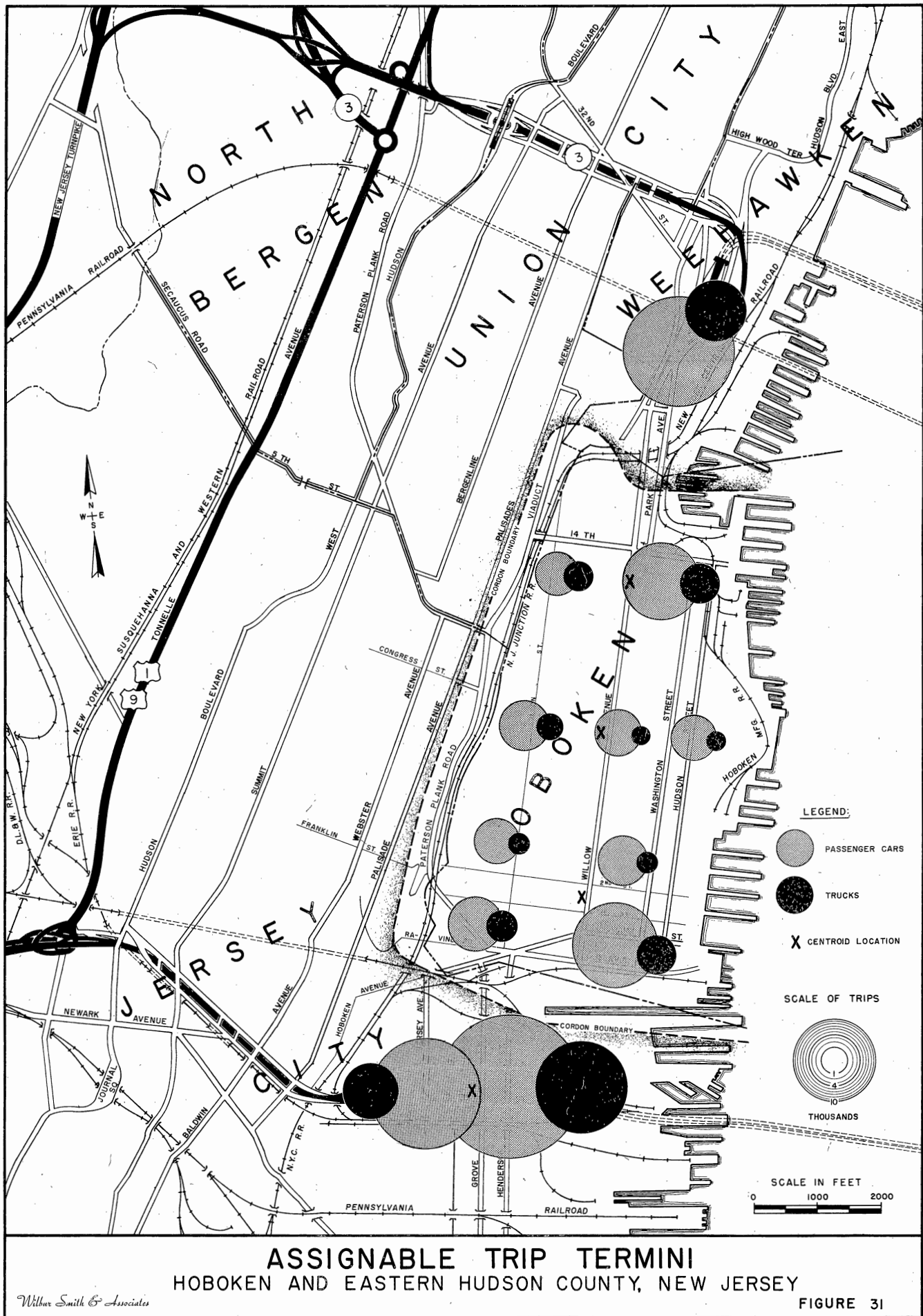


FIGURE 31

sented is based upon present traffic origin and destination patterns. The completion of highways presently under construction in the immediate area, such as the Newark Bay-Hudson County Extension of the New Jersey Turnpike can be expected to alter these travel patterns. A review of changes which may be anticipated will serve to indicate additional considerations relative to possible route location.

Newark Bay-Hudson County Extension - The completion of this route will have the effect of increasing the number of trip termini which may be assigned to the Holland Tunnel Plaza at Jersey Avenue. This increase will be brought about chiefly by the addition of the number of trips generated by the Newark Bay-Hudson County Extension. The net result of this addition would be a shift of the theoretical route line to the west at its southern end.

Other changes which might occur would be the increase in trip termini within Hoboken. This would also be attributed to generated traffic and would tend to hold the theoretical line in its present location in the Hoboken area.

Adjustment of Interchange Locations - Another development which should be considered as a possible factor in future traffic patterns in the study area is the provision of an entrance ramp to the Newark Bay-Hudson County Extension at or near the proposed exit ramps at the Grand-Montgomery Street interchange. It is apparent that such a ramp would be valuable in providing for waterfront traffic between Jersey City and Hoboken.

The construction of such a ramp would also serve to increase the number of trip termini assigned to the Holland Tunnel Plaza at Jersey Avenue and decrease the number of termini assigned to the Holland Tunnel Plaza at Henderson Street.

On the basis of traffic values and anticipated developments in highway construction and planning the indicated location of a route through Hoboken is in the central part of the city approximately along Willow Avenue with a terminus at the Lincoln Tunnel Plaza on the north end and near Jersey Avenue at U. S. Route 1-Business on the south end.

Basic Land Use Changes

The stability of land use in the immediate Hoboken area has been suggested in discussion of population trends and business and industrial development of the city. The trips to be served by the

proposed north-south route through Hoboken are largely local in character. Few extend beyond adjacent towns and counties. Therefore, the principal effects of land use on desirable route location are in Hoboken and its immediate environs. It is not apparent that changes likely to occur in the reasonable future will be of sufficient magnitude to have any marked effect on the traffic potentials to the north-south route. It must be expected, of course, that the construction of the route will encourage more heavy commercial and industrial development which is already characteristic of the area, but such development will be of necessity uniformly distributed with regard to the area of influence of the proposed roadway.

The consideration of traffic potentials to the route do not, therefore, take into account any major changes in local land uses and population distributions.

PART V

ROADWAY LOCATION CONSIDERATIONS

One of the purposes of this traffic study is the review of possible highway alignments which could accommodate north-south traffic in and through the area bounded on the south by the Erie Railroad viaduct south of the Holland Tunnel Plaza and State Highway Route U.S. 1-Business, on the west by Palisade Avenue, on the north by the Lincoln Tunnel Plaza, and on the east by the Hudson River.

In the development of this report plans were considered based on a minimum acceptable roadway within the survey area. In the early planning it was anticipated that an arterial highway facility at grade with some signalized intersections, and with direct or expressway connections at its terminal points might be satisfactory.

It soon became evident, however, that with the potential traffic volumes and with the physical limitations which have been previously explained, there would be few opportunities to construct a facility at grade which would provide adequate service.

Traffic Considerations

Study has been devoted to pertinent characteristics of traffic in the survey area, including volumes; hourly, daily and seasonal variations in flow; composition, facility of movement; and trip patterns. Growth trends and the effect of highway improvements on future traffic have been discussed. It has been shown that, based on present and anticipated traffic patterns, the best "traffic location" for the facility under consideration is a line running approximately along Willow Avenue and slightly east of a line connecting the Lincoln Tunnel Plaza with a point on U.S. Route 1-Business (Holland Tunnel Plaza) near Jersey Avenue. Most trip termini that lie to the east of this line are localized at either the downtown area of Hoboken, or the Holland Tunnel Plaza. Thus it will be possible for a line different from the one indicated by theoretical analysis, to give good traffic service for major trip desires, if it is connected with major generating zones by roads or local streets providing reasonable freedom of flow.

Additional factors which govern the traffic location of a north-south route through this area include traffic congestion currently experienced on the approaches to the Tunnels at extremities

of the proposed route. This is especially important adjacent to the Holland Tunnel.

Traffic congestion caused by the Holland Tunnel's operation at capacity during peak hours and at times by the tunnel's inability to disburse traffic on the New York side of the Hudson River, frequently results in back-ups on the New Jersey approach to the Tunnel (12th Street and the 12th Street Viaduct) which create general traffic congestion in the vicinity of U.S. Route 1-Business through Jersey City. It is therefore important to recognize this situation in establishing the location of a north-south route, particularly its southern extremity in order to minimize the effects of congestion on the Tunnel approaches.

Physical Considerations

The development of a north-south route through Hoboken is certain to encounter high land acquisition and construction costs. As a solution to the two problems suggested above, consideration should be given to the construction of a single north-south facility which would have one end in the vicinity of the proposed northern terminus of the Newark Bay-Hudson County Extension of the New Jersey Turnpike and which would follow generally the line which renders maximum traffic service.

Varying this line to the west will result in its movement away from the heavy traffic generators in Hoboken but will result in lower land acquisition cost. The construction of a facility along the slope of the Palisades, the most westerly line which can be considered, will encounter a relatively low land acquisition cost but more expensive construction.

A line east of the theoretical line of best traffic service also encounters heavy land acquisition costs and provides less effective traffic service because its extremities are farther removed from peak concentrations of traffic desires. Another physical consideration is the relative position of the Hoboken waterfront and adjacent streets as compared with the street system and waterfront in nearby Jersey City. The most easterly north-south street in Hoboken is Hudson Street. This is approximately one-half mile east of Henderson Street, the most easterly north-south street through Jersey City. The Henderson Street alignment also lies west of the alignment of Willow Avenue in Hoboken.

Land use within Hoboken follows a pattern in which the bulk of the industrial development is along the west side. The central area is primarily residential, with apartment houses predominating,

and small business interspersed. The east side has the central business district at the south end, residential development in the midtown area and commercial and industrial at the north end. In addition, docks line the entire Hoboken waterfront.

One of the most important considerations bearing on the development of a north-south route through the Hoboken area is the contemplated completion of the Newark Bay-Hudson County Extension of the New Jersey Turnpike in 1956. The northerly terminus of this route is planned for U. S. Route 1-Business on the 12th and 14th Street Viaducts west of Jersey Avenue. As pointed out previously this development will serve to change the traffic pattern by increasing the importance of the area around 12th and 14th Streets.

The physical implications of this facility are also important. In the design of this expressway the New Jersey Turnpike Authority has recognized the possibility of a future extension to the north and provision has been made for interconnection of roadways for straight through movements.

While principal consideration has been given to traffic needs, it is apparent from field investigations that physical factors, land development plans and proposed major improvements related above must play an important part in the final selection of a north-south route through Hoboken. It appears that, in general, any transfer in location would logically fall to the west, rather than to the east, of the line which the origin-destination studies have shown would best serve existing travel. In this way, the traffic entering the area on major facilities would be benefitted more than if the proposed route were shifted eastward.



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PART VI

TRAFFIC MOVEMENT IN THE VICINITY OF THE HOLLAND TUNNEL PLAZA

Traffic movements in the vicinity of the Holland Tunnel Plaza are complicated and have been given special attention in analyses. These movements have been considered in accord with volumes anticipated upon completion of the Newark Bay-Hudson County Extension of the New Jersey Turnpike to its terminus on the 12th and 14th Street Viaducts.

Left Turns at Jersey Avenue

A difficult movement will involve left turns by northbound traffic from the Newark Bay-Hudson County Extension on U.S. Route 1-Business at Jersey Avenue. It is understood from information made available by the New Jersey Turnpike Authority that plans are now being made to provide for this left turn movement by means of a right turn loop ramp at grade from 12th Street to Jersey Avenue. Without these provisions, it would be necessary for traffic to weave across three lanes of vehicles approaching the Holland Tunnel on U.S. Route 1-Business. Again, without improvement, this weaving maneuver would not be possible at most times, due to the heavy volumes of eastbound traffic and the back-up of vehicles normally created by the Holland Tunnel.

The construction of the planned right turn ramp should not be considered as a permanent solution to this problem, however. As an interim solution it will serve well. As traffic volumes increase, the volume of left turns will become great enough to create congestion during peak periods.

Future consideration of this problem should be focused upon two possible means by which the intersections of 12th and 14th Streets and Jersey Avenue can be by-passed by traffic which will be forced to use them under present plans.

These solutions are as follows:

1. Construction of a spur ramp, which would continue north of the terminus of the Newark Bay-Hudson County Extension as an extension of the alignment

of its northbound roadway and would place the left turning traffic, the bulk of which is destined for Hoboken and points north, at grade on Hoboken Avenue (along the slope of the Palisades), or

2. Construction of an expressway facility for two-way traffic to the north beyond 14th Street into Hoboken.

The first solution would provide for left turning movements if further consideration is not to be given to the construction of a north-south facility through Hoboken in this immediate area. The second solution is the most desirable ultimate treatment; it combines the elimination of left turning movements with a new north-south highway facility through Hoboken.

Right Turns at Jersey Avenue

Another problem involves the right turns from U.S. Route 1-Business eastbound to the south on Jersey Avenue. It appears that it will be difficult, if not impossible, to continue to permit these right turns across the volumes of traffic anticipated from the Newark Bay-Hudson County Extension to the Holland Tunnel. Among possible solutions are the following:

1. weaving of the desired movement through the tunnel-destined traffic from the Newark Bay-Hudson County Extension so that the right turn may be made at Grove Street or at Henderson Street;
2. separation of conflicting traffic movements by signalization and channelization, such as the movement of the right turn from U.S. Route 1-Business on a green arrow indication with the Jersey Avenue traffic;
3. requiring all vehicles destined to Lower Jersey City points to keep left on the 12th Street Viaduct and leave U.S. Route 1-Business by means of a left turn only at either Jersey Avenue, or Erie Street, followed by right turns to go south on either Grove or Henderson Streets.

Of these, the first and second appear to be least desirable. The first because of the weaving problems which would be encountered during periods of heavy traffic, and the second because of the back-ups which are now common on the Tunnel approach and which frequently require manual direction of traffic. There are

a number of variations in routing, all using existing streets, which may be applied in connection with the third solution and which would move traffic from the north side of the Tunnel Plaza to the south after it has left the tunnel-bound streets.

Traffic Considerations

A better understanding of these turning movement problems can be gained by a review of traffic origin and destination patterns. Data set forth in Tables X and XI show that 1954 volumes of traffic making a left turn off U.S. Route 1-Business in the area adjacent to the Holland Tunnel Plaza to enter Hoboken amount to about 5,540 vehicles per day. It is estimated that 1,680 passenger cars and 490 trucks, a total of 2,170 will make use of the Newark Bay-Hudson County Extension toward Hoboken during an average day following its completion in 1956. This volume of traffic would be required to travel over existing streets after leaving the Newark Bay-Hudson County Extension on 12th Street Viaduct.

Present traffic on the 12th Street Viaduct approaching the Holland Tunnel averages 32,000 vehicles per day. While some of this traffic will be diverted to the Newark Bay-Hudson County Extension of the New Jersey Turnpike, the volume on U.S. Route 1-Business will remain heavy so that problems of congestion and hazard will be created in the merging area.

The volume of traffic now using Jersey Avenue south of 12th Street is about 6,650 vehicles per day of which 3,110 are north-bound. The volumes of traffic using Erie, Grove and Henderson Streets crossing 12th Street are approximately 6,300 vehicles, 4,800 vehicles and 12,000 vehicles per day, respectively.

A projection of the volume of traffic which will desire to turn left from the Newark Bay-Hudson County Extension of the New Jersey Turnpike at Jersey Avenue shows that there will be approximately 2,670 vehicles per day by 1960. While it is acknowledged that all of this traffic flow may not use Jersey Avenue, plans are being advanced to encourage the use of Jersey Avenue and this has been anticipated in subsequent volume and capacity determinations. Growth of northbound Jersey Avenue traffic to about 6,000 vehicles per day can be expected to 1960, with the right turn loop in operation. This volume will require more time to cross 12th Street than the present volume and adjustments in signal timing may be necessary.

Conditions at intersections along 12th Street, including Jersey Avenue, are such that point control of traffic by the Port of

New York Authority Police is required at peak periods so that traffic movement in a north-south direction may be maintained in spite of severe congestion and back-ups caused by the inability of the Holland Tunnel to handle traffic approaching New York. Routing additional traffic volumes through 12th Street and Jersey Avenue is not desirable, just as it is not desirable at other intersections along 12th Street.

The volume of vehicles presently turning right off U.S. Route 1-Business at the foot of the 12th Street Viaduct in Jersey City approximates 2,440 vehicles per day at the 1954 traffic level. In addition, right turns at Grove Street and Henderson Street amount to 3,180 vehicles per day. While a small number of these, approximately 250 per day, may be anticipated to use the Newark Bay-Hudson County Extension following its opening in 1956, a total of 2,870 vehicles will desire to turn right from U.S. Route 1-Business, across traffic from the Newark Bay-Hudson County Extension destined for the Holland Tunnel, Hoboken and points north.

Since on the Newark Bay-Hudson County Extension of the New Jersey Turnpike in 1956, 7,600 vehicles per day are anticipated to approach Jersey Avenue, the right turning volume from U.S. Route 1-Business to Jersey Avenue will be hazardous and it is likely to create serious congestion if permitted.

Capacity Considerations

An analysis has been made of intersection capacities in the vicinity of the U.S. Route 1-Business and Jersey Avenue to determine the impact of traffic from the Newark Bay-Hudson County Extension of the New Jersey Turnpike. Anticipated peak hour traffic has been related to available lanes and operational characteristics to determine sufficiency of key intersections.

Plans for the completion of the Newark Bay-Hudson County Extension indicate that the primary increase in total traffic using the intersections will be brought about by the generation of new traffic. Table XIII indicates sufficiency of intersection approaches in the vicinity of 12th and 14th Streets and Jersey Avenue as affected by anticipated volume increases. These values have been developed upon assumed vehicle headways of three seconds for passenger cars and 4.5 seconds for trucks. Signal timing splits also greatly affect the capacity of these intersections. It may be seen that the Jersey Avenue approach to 14th Street will be overloaded and will undoubtedly become very congested as early as 1956 as a result of the additional volumes of traffic desiring to use the intersection. Also significant is the capacity of 14th Street as related

to the anticipated peak traffic volumes. More capacity is available than required. This suggests modification in signal timing at this intersection to make better use of the existing roadway facilities. An adjustment which would split the available time 50-50

TABLE XIII

INTERSECTION SUFFICIENCY

Anticipated Daily Peak-Hour Volumes

<u>Location</u>		<u>1956</u>	<u>1960¹</u>	<u>1960²</u>	<u>Practical Capacity³</u>	<u>Sufficient</u>
Jersey Avenue at 12th Street	Northbound	545	600	570	1275	Yes
Jersey Avenue at 14th Street	Northbound					
	Thru	920	1015	985	920	No
	Left Turn	280	305	305	345	Yes
	Total	1200	1320	1290	1265	No
14th Street at Jersey Avenue		1950	2160		2460	Yes

Note: Capacity Calculations based on headways of 3 seconds for passenger cars and 4.5 seconds for trucks.

1. Based on all left turning traffic from Newark Bay-Hudson County Extension using Jersey Avenue.
2. Based on small volume of traffic using Erie and Henderson Streets
3. Based on 60-40 time split favoring 12th and 14th Streets.

between the two streets, or which would slightly favor Jersey Avenue should be considered.

It appears that the best alternate route for the right turns from U.S. Route 1-Business would be via Erie Street, 13th Street and Grove Street, as suggested previously. Capacities along this route are variable, depending upon traffic controls on 12th Street; however, these streets will be able to handle the portion of the turning traffic which is expected to use them. During off-peak periods, and possibly during some peak hours, vehicles could weave across 12th Street to make the right turn at Grove Street without serious difficulty. The alternate route suggested would probably not be used by many drivers during peak hours unless there is strict supervision. If congestion is caused by continuation of the right turn at Grove Street after a weaving movement, consideration should be given to the prohibition of the weaving movement by means of a physical barrier or by regulation and strict enforcement.

Summary of Traffic Improvements Along 12th Street

The construction of a right turn ramp at grade for traffic from the Newark Bay-Hudson County Extension to Hoboken and points north should be considered as an immediate measure only. A design should be developed which will divert this traffic, as well as all additional traffic on U.S. Route 1-Business destined to Hoboken, away from this intersection. When such design and construction are undertaken, it is recommended that the possibility of combining a north-south highway through Hoboken with this project be examined. A facility which would provide adequate traffic service for the north-south traffic movement and would permanently eliminate the left turning problem at 12th Street and Jersey Avenue would be much more beneficial than two separate facilities.

Traffic service provided Hoboken and the surrounding generators would be good since the north-south traffic corridor is so narrow. A westerly line for a new roadway, such as would be required if relief of the left turn problem is to be combined with the north-south facility, would have the advantage of passing through the less densely developed portions of Hoboken.

Right turns from U.S. Route 1-Business to Jersey Avenue should be prohibited. Alternates provide for the use of Grove Street by either direct right turning traffic, or by traffic which would be routed to it via Erie Street and 13th Street.

PART VII

TRAFFIC ASSIGNMENT

Estimates of traffic usage of a free highway facility between the Holland and Lincoln Tunnel approaches have been made. Traffic assignments take into account the anticipated usage of the facility upon its completion and the traffic changes which may be expected in future years. To determine the immediate usage, estimates must be made of the traffic diverted from existing roads and the traffic generated by the removal of previously suppressed travel desires. Traffic projections, which are necessary for economic justification and planning, require estimates of traffic growth due to normal increases in vehicle ownership and usage.

Diverted and Induced Traffic

Diverted traffic is that component which would shift from existing alternate routes to the new facility. The origins and destinations of vehicular trips using existing roads (see Appendix Tables C and D) as well as the considerations of time and distance savings, are basic to the estimation of probable diversion. It is generally accepted that on free roads, savings in time give a better measure of traffic potential than savings in distance. Based on the above factors, diversions have been determined. The diversions were calculated for each zone to zone movement, from the origin and destination figures. Time requirements for each trip were obtained from travel time studies made over the existing network of roadways. Based upon previous experience and traffic engineering judgment taking into account time and distance factors, diversion percentages were derived for all movements pertinent to a north-south roadway. From the diversion factors, traffic volumes have been assigned to each section of the route.

In addition to the normal growth trends and traffic diverted to a facility, an allowance has been made for induced traffic--traffic which presently does not exist, but will be created by the provision of a new facility. In an area such as Hoboken where some traffic movements are physically curtailed, the percentage of induced trips should be relatively high. The present congestion on existing streets argues further for substantial inducement. It is estimated that a north-south facility will induce traffic equal to 25 percent of the diverted trips. This induced traffic volume

does not include traffic which will be diverted to the proposed facility by the Newark Bay-Hudson County Extension of the New Jersey Turnpike. The induction factor of 25 percent is considered a very reasonable value for a free facility. Equivalent or higher values have been used in the planning of new toll facilities in the area.

While inducements will be somewhat higher for through trips than for some local trips destined to Hoboken, a single value has been used because the generation qualities of the survey zones differ substantially in basic characteristics. Again, however, the value used is very modest.

For the purpose of projecting traffic it is assumed that a construction period of one and one-half years would be required and that the first year of operation would be 1956. An average annual increase of 4 percent per year is assumed in projecting traffic to 1956. A change in the completion date would not seriously affect the assigned values, unless it exceeded two years. The greater the normal growth of traffic in the area before construction of a new roadway, the greater will be the assigned traffic values in subsequent years.

In the assignments of traffic, roadway improvements discussed in Part III, and shown in Figure 30 were assumed. Assignments also assume that expressway standards for the most part will be used in construction. No decline in industrial activity, or in the national economy from average levels of recent years is expected.

In addition to normal growths and the volume of traffic diverted from existing streets, it is estimated that 3,000 through vehicles per day will be diverted to the new facility from the Newark Bay-Hudson County Extension of the New Jersey Turnpike which is planned for completion in April, 1956.

In projecting traffic from 1956 to 1960 an average annual increase of 5 percent per year is assumed. This makes slight allowance for the extension of the inducement effect beyond the first year. In 1957 it is estimated that an additional volume of traffic amounting to about 975 vehicles per day will be diverted to the new facility when the third tube of the Lincoln Tunnel is completed.

After 1960 it is estimated that traffic on the facility will increase at the rate of 4 percent per year for the seven years between 1961 and 1967, thence at 3 percent per year for five years, 2 percent per year for three years and 1 percent for the year 1976.

TABLE XIV
GROWTH IN TRAFFIC ASSIGNMENTS

Annual Average Daily Traffic

<u>Year</u>	<u>Notes</u>	Section A - South		<u>Total</u>
		<u>Passenger Cars</u>	<u>Trucks</u>	
1954	General Diversion including diversion from U.S. Rt. 1 & 9	12, 948	4, 625	17, 573
1956	Assumes completion of Newark Bay-Hudson County Extension of New Jersey Turnpike. ¹ Includes induced traffic on new roadway. ²	19, 261	7, 267	26, 528
1957	Assumes opening of Third Tube of Lincoln Tunnel. ³	20, 849	8, 053	28, 902
1960		24, 134	9, 590	33, 724
1965		29, 360	12, 237	41, 597
1970		34, 698	15, 173	49, 871
1976		39, 451	18, 647	58, 098

1. Traffic diverted by Newark Bay-Hudson County Extension of New Jersey Turnpike. All sections: 1781 passenger cars, 1219 trucks, 3000 total vehicles.

2. Traffic induced by opening of new roadway: 3496 Passenger Cars, 1008 Trucks, 4504 Total.

3. Traffic generated by opening of Third Tube, Lincoln Tunnel. All sections: 625 passenger cars, 350 trucks, 975 total vehicles.

CONTINUED ON NEXT PAGE

TABLE XIV (Continued from Page 49)

GROWTH IN TRAFFIC ASSIGNMENTS

Annual Average Daily Traffic

<u>Year</u>	<u>Notes</u>	Section B - Central		<u>Total</u>
		<u>Passenger Cars</u>	<u>Trucks</u>	
1954	General Diversion including diversion from U. S. Rt. 1 & 9	14,433	4,585	19,018
1956	Assumes completion of Newark Bay-Hudson County Extension of New Jersey Turnpike. ¹ Includes induced traffic on new roadway. ²	21,266	7,217	28,483
1957	Assumes opening of Third Tube of Lincoln Tunnel. ³	22,954	8,000	30,954
1960		26,572	9,528	36,100
1965		32,330	12,159	44,489
1970		38,211	15,079	53,290
1976		43,450	18,534	61,984

1. Traffic diverted by Newark Bay-Hudson County Extension of New Jersey Turnpike. All sections: 1781 passenger cars, 1219 trucks, 3000 total vehicles.

2. Traffic induced by opening of new roadway: 3897 Passenger Cars, 998 Trucks, 4895 Total.

3. Traffic generated by opening of Third Tube, Lincoln Tunnel. All sections: 625 passenger cars, 350 trucks, 975 total vehicles.

CONTINUED ON NEXT PAGE

TABLE XIV (Continued from Page 50)

GROWTH IN TRAFFIC ASSIGNMENTS

Annual Average Daily Traffic

<u>Year</u>	<u>Notes</u>	Section C - North		
		<u>Passenger Cars</u>	<u>Trucks</u>	<u>Total</u>
1954	General Diversion including diversion from U.S. Rt. 1 & 9	13,931	4,089	18,020
1956	Assumes completion of Newark Bay-Hudson County Extension of New Jersey Turnpike. ¹ Includes induced traffic on new roadway. ²	20,589	6,567	27,156
1957	Assumes opening of Third Tube of Lincoln Tunnel. ³	22,243	7,311	29,554
1960		25,749	8,708	34,457
1965		31,328	11,113	42,441
1970		37,026	13,782	50,808
1976		42,102	16,939	59,041

1. Traffic diverted by Newark Bay-Hudson County Extension of New Jersey Turnpike. All sections: 1781 passenger cars, 1219 trucks, 3000 total vehicles.

2. Traffic induced by opening of new roadway: 3761 Passenger Cars, 890 Trucks, 4,651 Total.

3. Traffic generated by opening of Third Tube, Lincoln Tunnel. All sections: 625 passenger cars, 350 trucks, 975 total vehicles.

Traffic Volumes by Roadway Section

In Table XIV the projected volumes of passenger cars and trucks are shown by years to 1976. These volumes are shown by roadway section, designated A, B, C. It is not expected that the values for any given year will exactly represent growths anticipated. They are an estimate of the manner in which an average volume would be built-up, and are intended to indicate a trend over a period of years rather than the volumes in any particular year. There will, of course, be years in which volumes may be higher or lower than indicated, depending on economic conditions and overall travel patterns at the time.

Applying the above factors, it was determined that the facility should be expected to accommodate approximately 62,000 vehicles over the heaviest section in 1976. The expected volumes anticipated for the facility are given in Table XV. These values were used in estimating the influence of the roadway on traffic and other facilities.

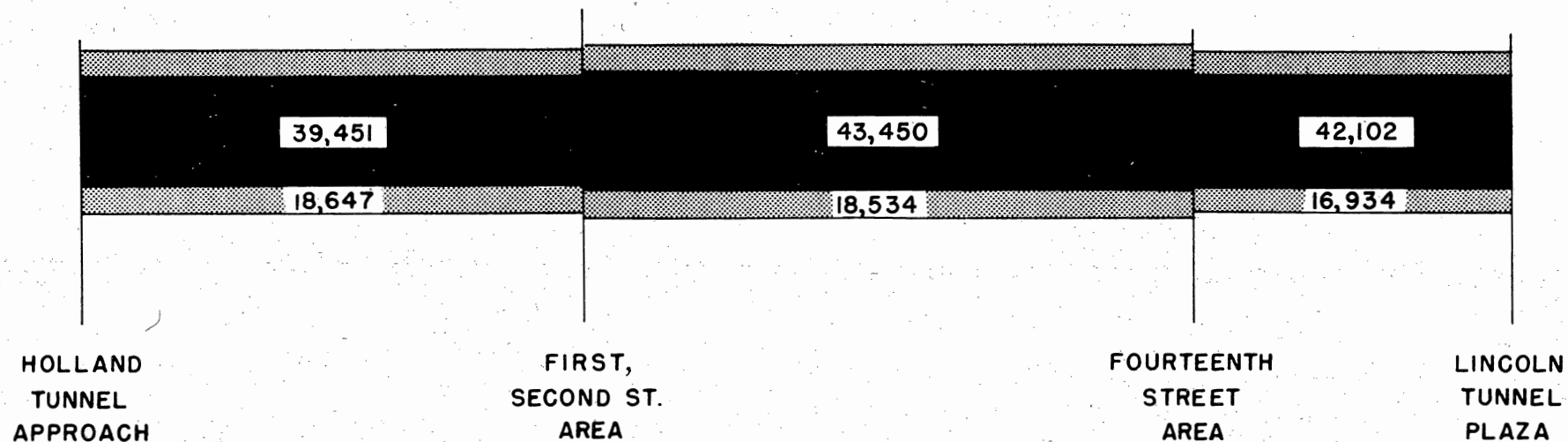
TABLE XV
ANTICIPATED TRAFFIC VOLUMES

1976

Annual Average Daily Traffic

<u>Section</u>	<u>Passenger Cars</u>	<u>Trucks</u>	<u>Total</u>
A (South)	39,451	18,647	58,098
B (Central)	43,450	18,534	61,984
C (North)	42,102	16,934	59,041

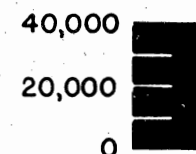
The volumes of traffic assignable to the road by 1976 are shown graphically in Figure 32. The center section (b) will carry almost 62,000 vehicles on an average day. Volumes on this section are greater than at the extremities, because of the overlapping movements between various points in North Hoboken and the south and between South Hoboken and the north.



LEGEND



SCALE OF VEHICLES



ANTICIPATED TRAFFIC VOLUMES 1976

NORTH-SOUTH TRAFFIC FACILITY

HUDSON COUNTY, NEW JERSEY

The consistency of volume throughout the entire route for both passenger cars and trucks is interesting to note in Figure 32. While it is due in part to a significant percentage of local through trips, over 50%, the principal cause is the close balance between trips approaching the Hoboken area from the north and from the south.

From the assignment data, the traffic volumes which might be expected between interchanges were determined. This has been done on the assumption that interchanges would be situated near Second Street and Fourteenth Street. Volumes assigned to route sections are shown in Table XVI. It is apparent from analysis of the traffic volumes suggested herein that a facility of the highest type should be provided for north-south traffic in this area. Immediate need for six lanes is suggested and plans should be made for future expansion through the provision of a shoulder of sufficient width to carry traffic when the demand develops. In view of these anticipated volumes, it does not appear that further consideration can be devoted to the possibility of an arterial street with grade intersections to accommodate this traffic.

TABLE XVI

TRAFFIC VOLUMES ASSIGNED TO ROUTE SECTIONS

Annual Average Daily Traffic

<u>Year</u>	<u>Sections</u>				
	A	AB	ABC	BC	C
1954	4,982	3,969	8,622	6,427	2,971
1956 ¹	6,684	5,308	14,536	8,639	3,981
1957 ²	7,031	5,589	16,282	9,079	4,189
1960	8,191	6,520	19,013	10,567	4,877
1976	13,921	11,242	32,935	17,807	8,299

Note: Volumes shown are volumes assigned to given section or sections only. Total volume in any section is sum of volumes indicating use of section.

¹ Assumes completion of Newark Bay-Hudson County Extension of New Jersey Turnpike and includes traffic induced to new facility.

² Assumes opening of Third Tube of Lincoln Tunnel.

PART VIII

EFFECT OF FACILITY ON EXISTING ROADS AND STREETS

The provision of a new north-south facility through Hoboken will affect traffic volumes on some of the existing streets and highways in the area. The diversion of traffic to such a route will bring about a redistribution of traffic flow on the existing facilities. The facilities primarily affected will be parts of the Hoboken street system. The New Jersey Turnpike, and U.S. Routes 1 and 9 (Tonnelles Avenue) in Jersey City will also be influenced. Some changes may be expected in the distribution of traffic flows across the Hudson River through the Holland and Lincoln Tunnels as a result of construction of this road.

Hoboken Streets

The existing street system in Hoboken is seriously deficient in capacity for north-south traffic. The only north-south street in the city which is sufficiently wide to carry more than one lane of traffic with parking practices which prevail, is Washington Street which carries two lanes in each direction and provides a lane for parking along each side. All other streets in the city which could carry the north-south traffic movements provide a total of 10 lanes, 5 in each direction. Each of the streets has a width of approximately 30 feet and parking is permitted along both sides of each street.

The impact of a six lane traffic facility built to high design standards on the Hoboken street system is readily recognized. Such a facility would have the effect of doubling the north-south traffic capacity through the Hoboken area because of the serious inefficiencies which are presently created by double parking for loading purposes and by other illegal parking practices.

The principal north-south streets which would be relieved by the construction of a new facility are Washington Street, Willow Avenue, and Park Avenue. Since these streets carry the bulk of the north-south traffic in the city, the relief afforded will be noticeable.

Relief which can be expected during the first year of operation of a north-south facility is demonstrated by considering some of the volume changes which may be anticipated on the local streets

in Hoboken. A total of approximately 6,700 vehicles will be diverted from the local streets during each day. When this volume is measured against volumes on the north-south streets through Hoboken relief is provided for the various streets in the area in accordance with Table XVII.

TABLE XVII

TRAFFIC RELIEF FOR TYPICAL LOCAL STREETS - 1957

	<u>Volume with Normal Growth</u>	<u>Volumes anticipated with New Roadway</u>	<u>Per cent Decrease</u>
Washington Street	11,000	8,500	22%
Willow Avenue	5,000	3,000	40
Park Avenue	4,000	3,000	25
Clinton Street	3,000	2,500	30
Grand Street	2,000	1,700	15
Jefferson Street	2,000	1,600	20

The east-west street system in Hoboken, consisting of alternate one-way streets, each approximately 30 feet in width and with parking on both sides, will be taxed to provide adequate access to and from the proposed facility. It is partially for this reason that interchange has been planned for the First Street area. The bulk of the local north-south traffic movements to or through Hoboken will be diverted to east-west streets although only for the distance between the origin and destination in Hoboken and the ramps to a new facility.

Based upon the traffic assignments made to this facility

it is anticipated that traffic volumes on the east-west streets will require the prohibition of parking along both sides of these streets for at least two blocks from the point of access to the facility and along one side for the remainder of the distance between the ramp connection and the central business district. Although estimated traffic volumes along the east-west streets are not heavy, as shown in Table V, the capacity of these streets is only about 400 to 500 cars per hour, and the volume of traffic from the proposed facility would congest the streets under present operating conditions. For example, First Street might carry traffic into the Hoboken business district from a new facility and the volume of traffic which would be diverted to that street in a design hour in 1976 would be approximately 700 vehicles. It is anticipated that the 700 vehicles which would leave a north-south facility and use First Street would not all continue to the east along First Street. Some of these trips would turn off at the first opportunity for a local destination. Only through parking prohibitions and street widening can the street handle the volumes which will be directed to it. Second and Third Streets which are similar in physical dimension and in volumes would have to be similarly treated.

New Jersey Turnpike

The volume of traffic along the New Jersey Turnpike north of Newark will be relieved by the construction of the Newark Bay-Hudson County Extension. It has been estimated in studies developed for the New Jersey Turnpike Authority, that volume on the section of the New Jersey Turnpike from Raymond Boulevard to the Newark Airport - Port Street interchange will be reduced about 2,000 vehicles per day when the Extension is completed. It is not likely that this diversion would be further increased by more than 500 vehicles per day by development of a route through Hoboken. Drivers destined for central New York City would be expected to continue on the Turnpike to Route 3 and into the Lincoln Tunnel, otherwise, diversion by the new route would be greater.

Another reason for diversion from the Turnpike is noted. The congestion generally found in the movement of traffic into and through Hoboken from the south makes it more attractive for some drivers to follow the existing line of the New Jersey Turnpike to the Lincoln Tunnel interchange and then travel on Route 3, the Lincoln Tunnel approach road, and enter Hoboken from the north.

The completion of the Newark Bay-Hudson County Extension of the New Jersey Turnpike and a north-south facility through Hoboken should eliminate this type of movement and may also attract some vehicles from the Turnpike so that they will have the choice of traveling through the Holland Tunnel if that is not congested, or through the Lincoln Tunnel. However, the number of trips which could be diverted for this reason is not believed significant, and is not anticipated to exceed 300 vehicles per day.

U. S. Routes 1 and 9

Traffic will be diverted off U. S. Routes 1 and 9 (Tonnele Avenue) by the construction of a facility between the Holland and Lincoln Tunnel approach roadways through Hoboken. The present volume of traffic diverted was less than 2,800 vehicles on an average day. This would be a noticeable drop in volume along U. S. Routes 1 and 9. Such a drop would probably soon be recovered up to present volumes. Limited relief is all that can be expected for this route due to the natural barriers provided by the Palisades and to the fact that the roadway drains different areas than those which would be primarily served by a north-south facility through Hoboken.

West Side Highway

The West Side Highway in Manhattan would be parallel to a north-south facility through Hoboken and is subject to traffic diversion. It is anticipated, however, that little relief will be provided for the West Side Highway. The amount of relief is estimated at about 550 vehicles per day in 1957. This is not sufficient to effectively reduce the volume of traffic on the West Side Highway and can be ignored.

Most of these trips would be regained on the West Side Highway by the completion of the Third Tube of the Lincoln Tunnel.

Other Roadways

In addition to the routes mentioned above, reductions in traffic can be expected on the north-south streets along the top of the Palisades in Jersey City. On some of these, Palisade Avenue, for example, noticeable relief would be provided since origins and destinations of traffic at either end of Palisade Avenue, as well as some intermediate trips would be divertable to a north-south route. Since these streets carry heavy north-south volumes, the relief anticipated would be important.

APPENDIX

APPENDIX TABLE A

CODING SYSTEM

ZONES OF ORIGIN AND DESTINATION

01000	South Jersey, (all of New Jersey south of and including Mercer and Ocean Counties plus Hunterdon County)
02000	Bergen County
07000	Essex County, including Newark
12000	Middlesex, Monmouth and Union Counties
14000	Morris, Passaic, Somerset, Sussex, Warren County
09010	Bayonne
09020	East Newark
09030	Guttenberg
09040	Harrison
09050	Hoboken
09051-9	(See Figure 2)
09060	Jersey City
09061-9	(See Figure 2)
09070	Kearny
09080	North Bergen
09090	Secaucus
09100	Union City

APPENDIX TABLE A (Contd)

09101-3	(See Figure 2)
09110	Weehawken
09110-1	(See Figure 2)
09120	West New York
91000	Westchester County, Upper New York State, New England, Canada
94000	New York City (General)
94001	Bronx
94002	Brooklyn
94004	Queens
94005	Staten Island
94100	Manhattan (general)
94110	Manhattan South of Worth St., West of Broadway
94111	Manhattan South of Worth St., East of Broadway
94112	Manhattan, between Worth and Houston Streets, west of Broadway
94113	Manhattan, between Worth and Houston Streets, east of Broadway
94120	Manhattan, between Houston and 14th St., west of Broadway
94121	Manhattan, between Houston and 14th St., east of Broadway
94122	Manhattan, between 14th St., and 23rd St., west of Broadway

APPENDIX TABLE A (Contd)

94123	Manhattan, between 14th St., and 23rd St., east of Broadway
94124	Manhattan, between 23rd St., and 34th St., west of 5th Avenue
94125	Manhattan, between 23rd St., and 34th St., east of 5th Avenue
94130	Manhattan, between 34th St., and 42nd St., west of 5th Avenue
94131	Manhattan, between 34th St., and 42nd St., east of 5th Avenue
94132	Manhattan, between 42nd St., and 50th St., west of 5th Avenue
94133	Manhattan, between 42nd St., and 50th St., east of 5th Avenue
94134	Manhattan, between 50th St., and 59th St., west of 5th Avenue
94135	Manhattan, between 50th St., and 59th St., east of 5th Avenue
94140	Manhattan, between 59th St., and 110th St., west of 5th Avenue
94141	Manhattan, between 59th St., and 110th St., east of 5th Avenue
94142	Manhattan, between 110th St., and 141st St., west of 5th Avenue
94143	Manhattan, between 110th St., and 141st St., east of 5th Avenue

APPENDIX TABLE A (Contd)

94144 Manhattan, between north of 141st St.

95000 Remainder of U. S. west of Delaware River, including all Southern States

(Unrec'd) TABLE B

STATION 1

Henderson Street, between 10th and 12th Streets, Jersey City
Wednesday, August 18, 1954

	<u>16 Hour Volume</u> <u>6 AM to 10 PM</u>	<u>Number of</u> <u>Interviews</u>	<u>Percent</u> <u>Interviews</u>	<u>24 Hour</u> <u>Volume</u>
Northbound				
Passenger Cars	2652	1175	44.3	3428
Trucks	1924	956	49.7	2258
Buses	17	--	--	24
Southbound				
Passenger Cars	3160	1517	48.0	3805
Trucks	1903	851	44.7	2212
Buses	<u>103</u>	<u>--</u>	<u>--</u>	<u>117</u>
Total	9759	4499		11844

STATION 2

Grove Street, between 10th and 12th Streets, Jersey City
Wednesday, August 18, 1954

Southbound				
Passenger Cars	2822	1421	50.1	3229
Trucks	1125	485	43.1	1158
Buses	<u>125</u>	<u>--</u>	<u>--</u>	<u>141</u>
Total	4072	1006		4528

TABLE B (Contd)

STATION 3

Erie Street, between 10th and 12th Streets, Jersey City
Wednesday, August 18, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	4100	1646	40.2	4322
Trucks	1360	488	35.9	1370
Buses	<u>140</u>	<u>--</u>	<u>--</u>	<u>154</u>
Total	5600	2134		5846

STATION 4

Jersey Street, between 10th and 12th Streets, Jersey City
Wednesday, August 18, 1954

Northbound				
Passenger Cars	2271	1223	53.9	2548
Trucks	346	183	52.9	358
Buses	84	--	--	99
Southbound				
Passenger Cars	2416	1574	65.3	2903
Trucks	416	209	50.3	429
Buses	<u>5</u>	<u>--</u>	<u>--</u>	<u>5</u>
Total	5538	3189		6342

TABLE B (Contd)

STATION 5

Henderson Street, between 17th and 18th Streets, Jersey City
Friday, August 20, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	3071	1476	48.1	3932
Trucks	1525	586	38.4	1570
Buses	--	--	--	56
Southbound				
Passenger Cars	2379	1479	62.1	3018
Trucks	730	286	39.2	767
Buses	--	--	--	49
Total	7705	3827		9392

STATION 5

Henderson Street, between 17th and 18th Streets, Jersey City
Monday, August 23, 1954

Northbound				
Passenger Cars	2817	1400	49.7	3680
Trucks	1393	533	38.3	1483
Buses	--	--	--	52
Southbound				
Passenger Cars	2108	1152	54.6	2783
Trucks	629	202	32.1	725
Buses	--	--	--	49
Total	6947	3287		8772

TABLE B (Contd)

Station 5

Henderson Street, between 17th and 18th Streets, Jersey City
Thursday, August 19, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	2830	1549	54.7	3706
Trucks	1545	774	50.1	1691
Buses	--	--	--	60
Southbound				
Passenger Cars	2350	1238	52.7	2938
Trucks	750	397	52.9	839
Buses	--	--	--	30
Total	7475	3958		9264

TABLE B (Contd)

STATION 6

Grove Street, between 17th and 18th Street, Jersey City
Thursday, August 19, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	1398	966	69.1	1788
Trucks	694	490	70.6	719
Buses	--	--	--	204
Southbound				
Passenger Cars	2628	1302	49.5	3364
Trucks	1672	707	42.3	1810
Buses	--	--	--	210
Total	6392	3465		8095

STATION 6

Grove Street, between 17th and 18th Street, Jersey City
Friday, August 20, 1954

Northbound				
Passenger Cars	1606	998	62.1	2094
Trucks	820	362	44.1	854
Buses	--	--	--	214
Southbound				
Passenger Cars	2884	1348	46.7	3566
Trucks	1692	652	38.5	1779
Buses	--	--	--	205
Total	7002	3360		8712

TABLE B (Contd)

STATION 6

Grove Street, between 17th and 18th Street, Jersey City
Monday, August 23, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	1633	885	54.2	1833
Trucks	748	322	43.0	774
Buses	--	--	--	221
Southbound				
Passenger Cars	2671	1391	52.1	3247
Trucks	1521	652	42.9	1564
Buses	--	--	--	203
Total	6573	3250		7842

STATION 7

Jersey Avenue at 18th Street, Jersey City
Thursday, August 19, 1954

Northbound				
Passenger Cars	4724	1493	31.6	6106
Trucks	1576	365	23.2	1668
Buses	--	--	--	11
Southbound				
Passenger Cars	4029	1712	42.5	5102
Trucks	1719	410	23.9	1821
Buses	--	--	--	7
Total	12048	3980		14715

TABLE B (Contd)

STATION 7

Jersey Avenue at 18th Street, Jersey City
Friday, August 20, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	4728	1463	30.9	5558
Trucks	1638	364	22.2	1676
Buses	--	--	--	26
Southbound				
Passenger Cars	4748	1465	30.9	5431
Trucks	1799	329	18.3	1846
Buses	--	--	--	--
Total	12913	3621		14551

STATION 7

Jersey Avenue at 18th Street, Jersey City
Monday, August 23, 1954

Northbound				
Passenger Cars	4689	1335	28.5	5541
Trucks	1573	290	18.4	1625
Buses	--	--	--	8
Southbound				
Passenger Cars	4292	1437	33.5	5439
Trucks	1701	322	18.9	1778
Buses	--	--	--	11
Total	12255	3384		14402

TABLE B (Contd)

STATION 8

Congress Street, between Paterson Plank Road and Palisade Avenue,
Jersey City

Tuesday, August 24, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Eastbound				
Passenger Cars	1751	997	56.9	2201
Trucks	286	165	57.7	315
Buses	--	--	--	346
Westbound				
Passenger Cars	1307	763	58.4	1727
Trucks	166	102	61.4	182
Buses	<u>--</u>	<u>--</u>	<u>--</u>	<u>348</u>
Total	3510	2027		5119

STATION 9

Paterson Plank Road, between Viaduct and Palisade Avenue, Jersey
City-Union City

Tuesday, August 24, 1954

Eastbound				
Passenger Cars	3747	1607	42.9	4500
Trucks	1525	510	33.4	1574
Buses	--	--	--	69
Westbound				
Passenger Cars	3913	1718	43.9	4765
Trucks	1433	569	39.7	1454
Buses	<u>--</u>	<u>--</u>	<u>--</u>	<u>111</u>
Total	10618	4404		12473

TABLE B (Contd)

STATION 9

Paterson Plank Road, between Viaduct and Palisade Avenue, Jersey
City-Union City
Friday, August 27, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Eastbound				
Passenger Cars	4101	1406	34.3	4918
Trucks	1697	452	26.6	1750
Buses	--	--	--	46
Westbound				
Passenger Cars	4237	1110	26.2	5454
Trucks	1375	238	17.3	1454
Buses	--	--	--	94
Total	11410	3206		13716

STATION 9

Paterson Plank Road, between Viaduct and Palisade Avenue, Jersey
City-Union City
Monday, August 30, 1954

Eastbound				
Passenger Cars	3721	1260	33.8	4508
Trucks	1657	523	31.6	1679
Buses	--	--	--	57
Westbound				
Passenger Cars	3608	991	27.5	4495
Trucks	1323	289	21.8	1366
Buses	--	--	--	110
Total	10319	3063		12215

TABLE B (Contd)

STATION 10

Viaduct on Hudson Avenue, South of 16th Street, Union City
Thursday, August 26, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	1930	1117	57.9	2376
Trucks	296	110	37.2	313
Buses	--	--	--	109
Southbound				
Passenger Cars	1553	987	63.6	1829
Trucks	289	107	35.9	313
Buses	--	--	--	115
Total	4077	2321		5055

STATION 11

Willow Avenue, between 15th and 16th Street, Hoboken
Thursday, August 26, 1954

Northbound				
Passenger Cars	4775	1903	39.9	5641
Trucks	1762	568	32.2	2001
Buses	--	--	--	451
Southbound				
Passenger Cars	5466	1854	33.9	6604
Trucks	1913	660	34.5	2169
Buses	--	--	--	482
Total	13916	4985		17348

TABLE B (Contd)

STATION 11

Willow Avenue, between 15th and 16th Street, Hoboken
Friday, August 27, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	5030	2283	45.4	6545
Trucks	1759	674	38.3	1916
Buses	--	--	--	420
Southbound				
Passenger Cars	5570	2087	37.5	7019
Trucks	1955	692	35.4	2024
Buses	<u>--</u>	<u>--</u>	<u>--</u>	<u>467</u>
Totals	14314	5736		18391

STATION 11

Willow Avenue, between 15th and 16th Street, Hoboken
Monday, August 30, 1954

Northbound				
Passenger Cars	4836	1894	39.2	6419
Trucks	1742	599	34.4	1990
Buses	--	--	--	461
Southbound				
Passenger Cars	5430	2017	37.1	6584
Trucks	1857	651	35.1	1998
Buses	<u>--</u>	<u>--</u>	<u>--</u>	<u>480</u>
Totals	13865	5161		17932

TABLE B (Contd)

STATION 12

Park Avenue, between 15th and 16th Street, Hoboken
Thursday, August 26, 1954

	<u>16 Hour Volume 6 AM to 10 PM</u>	<u>Number of Interviews</u>	<u>Percent Interviews</u>	<u>24 Hour Volume</u>
Northbound				
Passenger Cars	4972	2410	48.5	5836
Trucks	678	120	17.7	960
Buses	--	--	--	252
Southbound				
Passenger Cars	4849	2008	41.4	5486
Trucks	265	84	31.7	278
Buses	--	--	--	1
Total	10764	4622		12813

STATION 12

Park Avenue, between 15th and 16th Street, Hoboken
Friday, August 27, 1954

Northbound				
Passenger Cars	5923	2404	40.6	6818
Trucks	410	61	14.9	442
Buses	--	--	--	0
Southbound				
Passenger Cars	5354	2112	39.4	5972
Trucks	255	61	23.9	265
Buses	--	--	--	2
Total	11942	4638		13499

TABLE B (Contd)

STATION 12

Park Avenue, between 15th and 16th Street, Hoboken
Monday, August 30, 1954

	<u>16 Hour Volume</u> <u>6 AM to 10 PM</u>	<u>Number of</u> <u>Interviews</u>	<u>Percent</u> <u>Interviews</u>	<u>24 Hour</u> <u>Volume</u>
Northbound				
Passenger Cars	5318	2426	45.6	5843
Trucks	368	60	16.3	402
Buses	--	--	--	1
Southbound				
Passenger Cars	4963	1756	35.4	5490
Trucks	220	42	19.1	281
Buses	<u>--</u>	<u>--</u>	<u>--</u>	<u>0</u>
Total	10869	4284		12017

ZONE TO ZONE MOVEMENTS - PASSENGER CARS

24 HOUR VOLUMES-MIDWEEK DAY

	01000 ¹	02000	07000	12000 ²	14000 ³	09010	09020	09030	09040	09050	09051	09052	09053	09054	09055	09056	09057	09058	09059	09060	09061	09062	09063	09064	09065	09066	09067	09068	09069	09070	09080	09090	09100	09101	09102
01000 ¹	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
02000	3	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
07000	1	30	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12000 ²	1	30	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14000 ³	-	6	9	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09010	1	33	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09030	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09050	25	79	65	33	23	11	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09051	104	1089	669	309	307	176	-	20	19	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09052	29	423	238	153	93	76	-	12	11	7	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09053	30	392	119	50	109	38	-	25	-	-	5	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09054	20	316	87	75	23	57	2	7	6	-	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09055	21	521	134	50	108	17	-	7	2	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09056	29	497	127	73	127	46	-	25	7	3	14	4	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09057	35	542	224	100	127	62	-	15	11	16	23	-	4	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09058	104	1216	449	235	317	126	-	24	16	14	51	14	7	22	25	27	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09059	26	251	114	103	63	26	-	16	3	10	3	1	4	2	4	6	42	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09060	2	29	4	-	10	-	-	4	-	80	136	50	59	78	9	43	6	78	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09061	5	213	30	18	24	5	4	18	-	41	396	200	146	150	156	107	121	329	133	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09062	-	34	-	5	1	3	-	5	-	10	259	81	51	53	50	64	62	119	75	3	33	-	-	-	-	-	-	-	-	-	-	-	-	-	
09063	22	507	35	25	89	2	3	16	-	66	582	367	177	197	101	152	172	278	134	24	169	69	-	-	-	-	-	-	-	-	-	-	-	-	
09064	5	177	16	10	13	21	-	22	1	62	790	318	158	195	98	99	169	403	154	16	37	14	41	-	-	-	-	-	-	-	-	-	-	-	
09065	-	13	1	1	5	-	-	-	-	20	94	52	20	23	23	26	22	52	24	-	2	3	11	-	-	-	-	-	-	-	-	-	-	-	-
09066	31	437	32	23	84	-	3	17	3	96	595	265	182	150	129	97	167	314	118	22	120	49	46	42	4	-	-	-	-	-	-	-	-	-	
09067	-	37	1	4	2	-	-	1	-	13	256	99	57	68	33	39	74	113	47	5	14	8	13	8	-	8	-	-	-	-	-	-	-	-	
09068	7	30	2	5	-	-	-	2	-	15	62	38	9	27	15	14	22	53	12	1	12	4	8	4	-	9	-	-	-	-	-	-	-	-	
09069	-	46	7	3	2	6	-	4	-	35	473	125	85	66	58	52	96	194	79	4	9	3	23	13	8	15	8	3	-	-	-	-	-	-	
09070	-	4	-	-	-	-	-	-	-	15	75	31	13	37	15	13	41	50	6	-	6	-	7	3	-	2	-	-	-	-	-	-	-	-	
09080	4	7	14	10	5	13	-	2	4	35	467	242	266	193	197	169	183	394	161	13	57	7	181	59	-	161	13	17	20	2	-	-	-	-	
09090	1	-	3	2	-	4	-	-	-	10	162	72	82	52	39	82	64	170	79	5	5	-	36	8	-	14	-	-	-	-	-	-	-	-	
09100	-	5	-	-	1	3	-	-	-	29	36	25	11	6	16	18	10	43	14	4	5	3	21	4	1	16	2	1	4	-	3	-	-	-	
09101	4	32	6	6	6	10	-	2	-	53	618	254	246	162	157	207	203	680	166	12	49	12	150	56	8	170	8	14	29	5	25	2	4	-	
09102	-	3	5	2	2	1	-	-	-	26	261	122	161	82	89	132	150	376	94	7	17	6	77	24	5	70	6	3	8	3	3	-	2	9	
09103	5	-	19	1	1	-	-	3	1	24	253	109	131	79	119	170	98	310	83	23	35	13	109	44	1	126	10	10	15	3	7	-	4	8	
09110	-	6	15	1	-	4	-	-	-	9	42	4	25	20	16	20	10	29	12	5	2	6	13	12	-	15	12	3	5	-	2	-	10	1	
09111	9	3	19	16	-	17	-	-	2	18	79	60	98	66	66	106	83	279	61	11	72	38	63	70	12	65	19	8	33	-	6	3	6	64	
09112	2	8	21	8	3	8	-	-	-	7	170	70	99	25	74	65	65	191	60	17	62	19	62	75	4	77	19	6	43	-	9	2	1	15	
09120	9	6	9	11	3	9	-	-	-	23	364	164	247	102	141	178	159	451	97	9	68	24	126	122	12	200	19	23	35	5	-	-	2	3	
91000 ⁴	44	23	29	53	19	5	-	-	2	15	161	72	34	48	105	63	78	145	56	8	55	26	55	60	13	67	19	16	16	6	10	10	2	24	
94000	2	3	14	3	4	1	-	-	-	5	8	11	-	10	-	-	6	7	5	1	2	1	24	1	-	14	6	-	1	-	-	-	-	-	
94001	9	14	21	17	7	4	-	-	6	-	66	19	30	26	15	28	71	105	30	15	25	9	84	32	7	19	6	8	10	2	2	-	15	2	
94002	25	81	37	9	44	13	-	6	2	22	174	91	75	28	40	48	151	152	84	9	45	16	23	16	-	24	9	8	11	1	51	7	5	68	
94004	7	7	2	5	7	7	-	-	2	-	45	9	23	13	14	12	14	78	19	2	27	5	17	14	3	2	8	4	9	-	12	-	-	11	
94005	-	14	1	1	4	1	-	-	-	7	59	34	14	8	17	21	39	75	37	-	3	-	5	8	-	-	2	-	-	-	-	-	-	-	
94100	-	9	9	1	9	1	-	-	-	10	27	6	11	8	7	18	17	36	10	12	22	4	22	12	3	11	13	-	5	-	10	4	-	14	
94110 ⁵	2	18	24	8	1	-	-	-	-	15	17	12	9	14	2	15	43	4	5	15	1	2	6	6	6	7	2	-	1	-	14	6	2	6	
94111	1	9	1	4	8	-	-	-	1	3	16	6	5	3	6	-	4	10	7	-	3	1	-	3	-	5	1	-	4	-	7	-	8	5	
94112	3	58	3	-	19	2	-	-	1	4	7	10	7	-	13	4	6	23	5	-	9	2	2	8	-	4	5	1	-	-	18	4	3	12	
94113	3	5	4	3	3	-	-	1	-	7	19	7	3	2	8	-	7	7	-	2	7	3	-	5	-	1	-	2	2	-	14	4	-	10	
94120	-	11	9	5	7	2	-	-	-	4	12	5	3	6	11	-	2	27	6	3	9	5	2	3	-	2	3	-	6	-	11	2	4	17	
94121	-	7	4	3	2	-	-	-	-	-	10	2	-	2	-	-	-	2	6	-	6	1	2	-	-	2	-	-	1	4	4	-	1	1	
94122	-	7	2	3	2	-	-	-	-	-	26	13	3	-	21	-	9	34	7	5	8	6	5	6	-	7	3	-	2	-	1	-	-	6	
94123	3	-	1	2	-	-	-	-	-	-	7	-	2	-																					

ZONE TO ZONE MOVEMENTS - PASSENGER CARS 24 HOUR VOLUMES-MIDWEEK DAY (CONTINUED)

	09103	09110	09111	09112	09120	91000 ⁴	94000	94001	94002	94004	94005	94100	94110 ⁵	94111	94112	94113	94120	94121	94122	94123	94124	94125	94130	94131	94132	94133	94134	94135	94140	94141	94142	94143	94144	95000 ⁶
01000 ¹																																		
02000																																		
07000																																		
12000 ²																																		
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09010																																		
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09102																																		
09103																																		
09110																																		
09111	4																																	
09112	-																																	
09120	2	-	-	3																														
91000 ⁴	2	-	-	1	6																													
94000	-	-	-	-	-	3																												

ZONE TO ZONE MOVEMENTS - TRUCKS 24 HOUR VOLUMES - MIDWEEK DAY

	01000 ¹	02000	07000	12000 ²	14000 ³	09010	09020	09030	09040	09050	09051	09052	09053	09054	09055	09056	09057	09058	09059	09060	09061	09062	09063	09064	09065	09066	09067	09068	09069	09070	09080	09090	09100	09101	09102
01000 ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02000	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07000	5	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12000 ²	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14000 ³	-	2	8	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09010	-	8	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09030	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09050	-	4	30	10	10	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09051	28	91	151	57	43	39	-	-	19	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09052	6	88	105	28	30	36	-	-	52	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09053	-	49	32	12	53	6	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09054	20	67	32	6	25	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09055	5	35	31	9	25	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09056	-	34	32	8	26	23	-	-	-	-	9	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09057	6	76	39	29	22	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09058	16	118	99	30	80	34	-	-	3	3	30	25	8	5	7	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09059	9	45	88	19	38	13	-	-	1	-	1	7	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09060	-	16	8	-	8	3	-	-	2	20	39	38	4	5	-	8	25	12	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09061	2	17	7	1	8	10	-	3	-	9	58	34	4	12	5	8	12	76	17	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09062	-	6	-	-	-	3	-	-	-	-	13	33	17	3	12	2	3	7	21	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09063	8	98	20	14	14	4	-	-	5	-	29	247	141	33	42	19	32	65	74	71	8	10	11	-	-	-	-	-	-	-	-	-	-	-	-
09064	-	16	7	2	3	-	-	-	2	-	12	134	32	25	33	12	12	38	68	45	2	5	8	15	-	-	-	-	-	-	-	-	-	-	-
09065	-	3	5	-	1	-	-	-	-	2	26	14	5	5	4	-	-	13	18	3	1	-	-	1	3	-	-	-	-	-	-	-	-	-	-
09066	5	107	12	1	29	4	-	6	-	48	227	80	42	37	48	9	75	112	67	6	14	13	44	4	2	-	-	-	-	-	-	-	-	-	-
09067	-	5	-	2	1	2	-	-	-	4	31	13	10	7	-	13	21	18	19	1	-	2	1	3	-	1	-	-	-	-	-	-	-	-	-
09068	-	15	3	-	4	-	-	1	-	9	31	21	4	12	1	7	2	20	13	-	2	-	1	5	-	4	-	-	-	-	-	-	-	-	-
09069	5	8	3	-	-	-	-	-	-	3	65	38	8	21	6	5	13	27	30	9	4	4	11	-	3	5	-	-	-	-	-	-	-	-	-
09070	-	-	-	-	-	-	-	-	-	1	-	8	5	11	3	-	13	30	24	-	2	-	6	4	-	-	-	1	-	-	-	-	-	-	-
09080	-	-	9	5	3	7	-	1	3	8	76	34	16	23	14	12	34	37	44	-	2	-	32	11	-	23	-	2	10	-	-	-	-	-	-
09090	-	2	-	2	-	-	-	-	-	8	37	21	14	14	12	6	25	140	50	1	-	2	22	7	-	17	1	-	-	-	-	-	-	-	-
09100	-	-	2	-	-	-	-	-	-	4	4	2	-	8	-	-	2	9	4	2	2	-	2	-	-	2	-	-	-	-	-	-	-	-	-
09101	4	5	9	4	-	-	-	1	-	10	51	45	9	20	12	35	38	50	34	4	8	2	26	6	-	13	2	2	6	-	-	-	-	-	-
09102	-	-	-	-	1	2	-	-	-	6	37	10	24	6	22	4	56	64	12	3	3	4	19	4	1	23	-	6	3	-	-	-	-	-	-
09103	-	-	7	-	-	-	-	-	-	4	25	18	59	33	31	21	18	60	25	2	4	4	22	1	4	17	6	5	-	-	-	-	-	-	-
09110	-	-	-	-	-	2	-	-	-	3	4	-	7	-	16	17	2	5	-	-	8	2	15	-	-	7	2	-	-	-	-	-	-	-	-
09111	9	2	11	-	-	7	-	-	-	-	41	4	20	21	24	32	14	41	12	5	17	6	16	14	2	14	3	6	4	3	3	9	-	-	12
09112	-	6	10	-	2	-	-	-	-	3	33	12	8	-	31	6	6	47	8	3	-	-	17	10	-	8	6	3	15	1	-	-	-	-	-
09120	-	-	10	3	-	-	-	-	-	4	82	36	14	19	19	25	65	64	15	-	13	6	7	8	-	20	3	-	6	-	2	-	-	-	1
91000 ⁴	-	12	11	15	4	9	-	-	4	6	40	20	3	28	5	20	44	41	45	10	13	2	36	11	2	34	-	10	5	3	12	12	2	11	3
94000	-	4	8	2	-	-	-	-	-	9	9	2	-	2	2	-	2	2	9	2	-	-	9	5	-	7	-	-	-	-	-	-	-	-	-
94001	6	9	10	8	7	-	-	-	2	5	20	18	-	4	3	2	16	23	32	5	2	-	26	13	3	20	2	5	-	7	4	11	-	7	3
94002	5	96	40	33	54	6	-	2	-	16	80	55	10	29	15	7	95	241	91	10	5	5	16	11	-	13	3	2	7	3	109	32	-	13	-
94004	-	5	5	2	5	-	-	-	-	-	2	-	-	7	1	-	2	10	13	-	-	4	4	2	2	14	-	-	-	-	5	1	-	2	-
94005	-	4	-	-	1	-	-	-	-	-	5	-	10	4	3	-	7	12	3	-	1	-	4	-	-	4	2	-	-	-	-	-	-	-	-
94100	-	3	3	-	-	-	-	1	-	8	15	-	-	-	4	-	2	-	17	2	-	1	3	-	2	7	2	-	2	-	-	-	-	-	-
94110 ⁵	1	20	7	-	14	7	-	-	-	5	19	18	8	7	9	8	20	32	14	2	4	-	6	7	-	28	3	1	2	5	12	8	-	2	4
94111	2	12	8	-	1	-	-	-	-	9	14	17	-	2	8	3	2	36	7	-	-	5	6	2	2	6	-	-	-	-	12	1	2	11	3
94112	2	17	2	-	18	3	-	2	-	2	27	13	13	6	1	8	17	12	20	-	1	1	11	5	1	4	7	-	5	-	21	4	-	-	5
94113	2	6	1	2	6	1	-	-	-	-	10	9	2	3	2	2	2	-	-	-	5	-	-	3	-	-	2	-	-	-	9	9	-	-	2
94120	4	3	22	4	9	3	-	-	-	3	19	10	3	6	2	6	12	25	20	7	-	5	17	2	-	7	3	-	3	-	9	6	2	5	-
94121	-	3	2	-	-	-	-	-	-	-	3	4	2	2	4	-	2	-	-	-	3	-	1	3	-	2	1	-	-	2	4	5	-	3	-
94122	2	1	5	1	3	-	-	-	-	2	15	12	2	8	-	2	9	21	20	2	1	1	4	-	-	19	-	4	2	2	4	-	3	2	-
94123	-	-	1	-	-	-	-	-	-	2	5	6	3	4	2	-	2	2	4	-	-	-	2	4	-	1	-	-	-	-	-	2	-	-	-
94124	-	8	7	-	1	2	-	-	-	-	3	12	2	8	15	2	20	17	16	-	3	2	13	7	-	23	8	2	-						

ZONE TO ZONE MOVEMENTS - TRUCKS
24 HOUR VOLUMES - MIDWEEK DAY
(CONTINUED)

[illegible]

