Report
of the
NORTH JERSEY TRANSIT COMMISSION
to the
SENATE AND GENERAL ASSEMBLY
of the
STATE OF NEW JERSEY
1925

REPORT OF THE

NORTH JERSEY TRANSIT COMMISSION

TO THE

SENATE AND GENERAL ASSEMBLY OF THE STATE OF NEW JERSEY

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Office: 1 Newark Street, Hoboken, N. J.

JANUARY 15, 1925

To The Senate and General Assembly of the State of New Jersey, Through His Excellency, George S. Silzer, Governor of the State of New Jersey.

The North Jersey Transit Commission, appointed under the provisions of Chapter 104 of the Laws of 1922, and continued under the provisions of Joint Resolution No. 3 of the Laws of 1924, hereby reports as follows:

The work of this Commission proceeds on a recognition of the fact that New Jersey must give immediate and thoughtful consideration to its transit problem in order that its growth and prosperity shall be continued and in order that its natural development may not be retarded.

Transit facilities induce population

The usefulness and value of land depends upon the population that can be housed, served, or employed on the land. Population follows transportation and conversely transportation must be supplied to induce population. The better the transportation the greater the use of the land, and therefore the larger the population. This is the fundamental principle that makes necessary and justifies all transit development. It applies with particular force to Northern New Jersey, especially when the conditions there are compared with those existing in the neighboring areas across the Hudson River.

A 20-mile circle from City Hall, New York, completely circumscribing New York City, when extended west of the Hudson River, encircles a New Jersey population of 1,940,000 people, or nearly 83 per cent of the population of the nine northern counties of New Jersey, or over 61 per cent of the entire population of the State. The same circle within New York State, chiefly in New York City, includes a population of 5,879,000 people, or 75 per cent of all the population within the circle, as compared with the 25 per cent in the New Jersey area within the circle.

If New York City had been developed as a circular city extending over into New Jersey, instead of being confined solely within New York, and thereby had developed Northern New Jersey within the 20-mile circle to the same population density as the New York District, New Jersey's larger area would be accommodating a population of nearly 4,500,000 instead of the 1,940,000 people that it now accommodates.

These figures very clearly illustrate to what an extent improved transit facilities make the land more usable and valuable, because these two districts, the one west of the Hudson River in New Jersey and the other east of the Hudson River in New York, have practically the same proximity to Manhattan, and the most important and controlling difference between them is in the character of the transportation facilities serving them.

In the case of New York, the greater population of the district is supplied with the most modern type of rapid transit facilities, that furnish high-speed, frequent interval service for the whole population between their homes and their community activities without change of cars. As a general proposition the people can come and go quickly when and wherever they please within this district without having to study time tables, wait for trains or use several different kinds of facilities in a single journey. In New York City 90 per cent of the entire population is served by, and lives within, walking distance of rapid transit lines.

New Jersey transit disadvantages

New Jersey, on the other hand, is not nearly so well served. As far as circulation within the district is concerned, there are practically no facilities available. One must ride to Manhattan and take another train in order to reach his destination in some other part of New Jersey. In going to Manhattan, everyone travels by time-table. After the leaving time of his train has been discovered, he generally has to wait. Then he is deposited at a terminal. There he may have to wait for a ferry. Before he finally arrives at his destination, he may have to take one or two other transit facilities with consequent inconvenience and loss of time. Returning, the experience is repeated. The only exception to this condition in New Jersey is the service of the Hudson & Manhattan Railroad. What New Jersey needs is more of this kind of service.

Already the nine northern counties* of New Jersey are confronted with a serious situation and that situation is growing more serious each year.

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*The original legislation authorizing the Commission contemplated only seven counties, but very early in the studies it was found necessary to include Somerset and Monmouth Counties because of the large number of commuters interested in and affected by the conditions which led to the appointment of the Commission.

This area is made up of the following counties:

Bergen	Middlesex	Passaic
Essex	Monmouth	Somerset
Hudson	Morris	Union

and contains:

Total area: **one-third of the entire state.**
Tax ratables: **three-fourths of the entire state.**
Population: **three-fourths of the entire state.**

From this area 350,000 people travel daily into New York City. The transit facilities serving these people are dangerously near the saturation point. As the present system has been built up piecemeal by the various railroads, further extension after the saturation point is reached will be very difficult except through an entirely new plan.

Will take 5 to 10 years to make changes

When the solution of the problem is decided upon, from five to ten years must elapse before the new facilities can be put into operation.

The normal increase in passengers is so great that by the time adequate facilities can be provided present discomforts will have given way to actual danger.

If the solution of the transit problem is delayed longer, some of the railroads will, of necessity, be compelled to limit the number of passengers to be carried during rush hours or provide additional facilities at a cost which would make commutation fares prohibitive, and which would even then be only an increase in carrying capacity, without solving the problem. In either case the result would be disastrous to New Jersey.

Crux of problem at terminals

The railroads acting separately have endeavored for a number of years to keep pace with the increasing travel. The crux of the problem is at the terminals in Hudson County and in the distribution of passengers from the New Jersey side of the river to their destinations in New York City.

The average time interval during the rush hour between trains arriving at these terminals is less than two minutes; in fact at one terminal the time interval is only one minute and

forty seconds, which is eight seconds less than that between express trains on the New York subways.

Solution impossible at river front

Such land as is available for additions to the present terminals is wholly inadequate and too costly for commuter travel. Furthermore, it is needed in the development of commerce.

The initial facility provided for the transfer of commuters from New Jersey to New York across the Hudson River was the ferry. These ferries originally were located so as to serve downtown New York, where most persons at that time went to business. With the trend of business activities northward in New York, the ferries could not follow because of the prior occupancy of the river front.

Conditions became acute and the Hudson & Manhattan tubes were built to connect three of the New Jersey railroad terminals, those of the Delaware, Lackawanna & Western, Erie and Pennsylvania Railroads, as well as to serve portions of Essex and Hudson Counties with direct service into New York.

This improvement was a considerable step forward, for the Hudson Tubes penetrated into the new uptown business district of New York, at Herald Square, as well as into what might be called the heart of downtown New York, by carrying transit facilities almost to Broadway rather than to the river edge, as the ferries had done prior to that time.

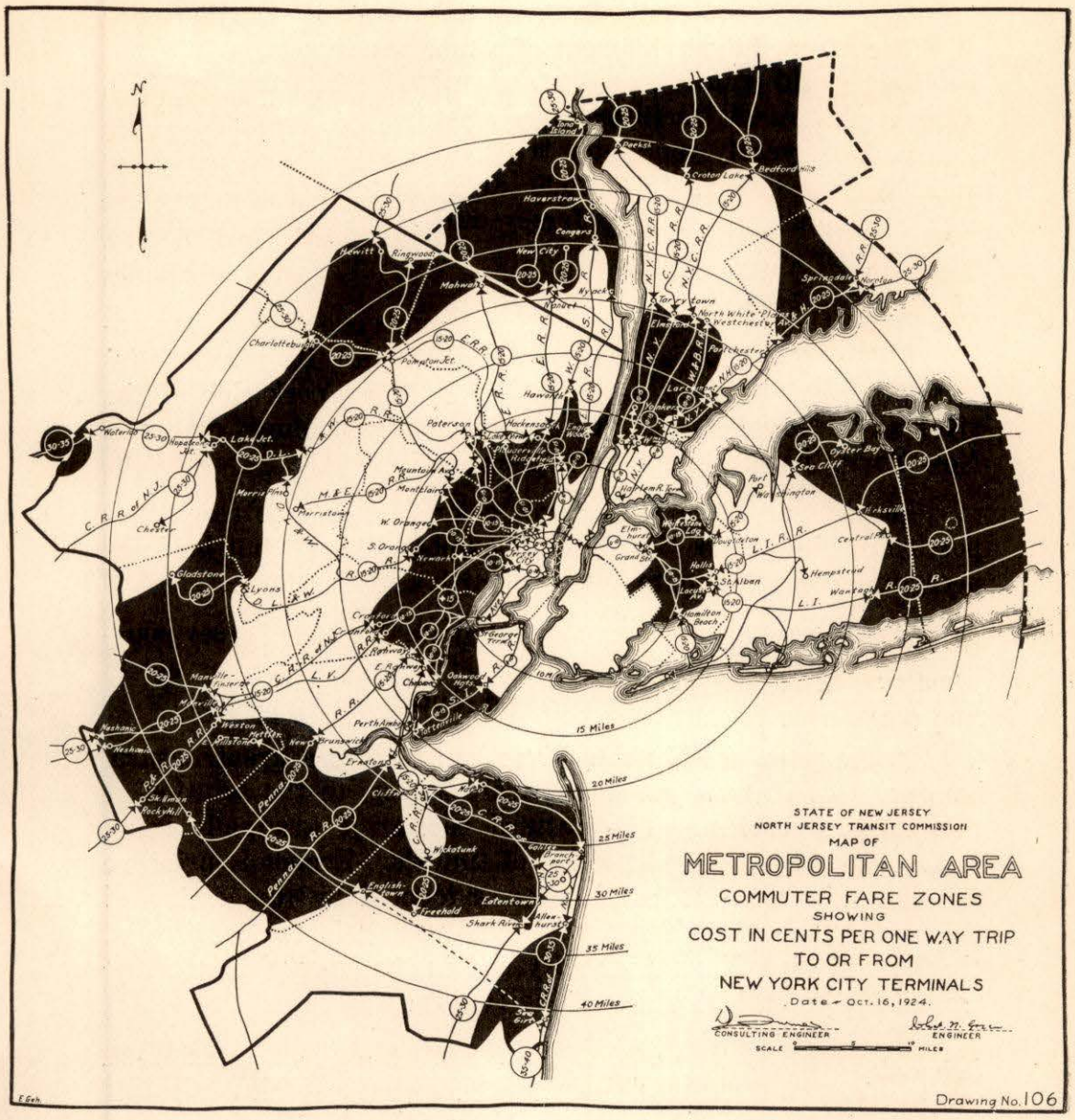
The opening of the Hudson Tubes in 1910 was only a partial solution. Two of the terminals, those of the Central Railroad Company of New Jersey, and West Shore Railroads, were still isolated and dependent upon ferries.

The tubes have become crowded to the point of discomfort; in fact, during rush hours the tube trains are as congested as the New York subways.

Fare and time disadvantages

Commuter fares into Long Island and Westchester County are somewhat less than those into Northern New Jersey. The drawing on page 5 shows this difference.

Westchester County and Long Island have a greater advantage over New Jersey in the time consumed in reaching points


STATE OF NEW JERSEY
NORTH JERSEY TRANSIT COMMISSION
MAP OF
METROPOLITAN AREA
COMMUTER FARE ZONES
SHOWING
COST IN CENTS PER ONE WAY TRIP
TO OR FROM
NEW YORK CITY TERMINALS
Date - Oct. 16, 1924.
CONSULTING ENGINEER
ENGINEER
SCALE
MILES
15 Miles
20 Miles
25 Miles
30 Miles
35 Miles
40 Miles
Drawing No. 106

equi-distant from lower Manhattan. It is possible to travel out of Manhattan north into Westchester County or east into Long Island the same distance in an hour that it takes to travel west into New Jersey in an hour and fifteen minutes. This time advantage is shown by the drawing on page 7.

The effect of these differences in time and fare brought about by direct rapid transit travel is shown by the fact that in 1911, when rapid transit facilities were afforded by the Long Island Railroad, its yearly commuter traffic was about 10,263,000 and in 1923 it was about 45,734,500, an increase of about 350 per cent. The increase in New Jersey during the same period was about 74 per cent.

New Jersey's problem in New York

This transit problem is one of great magnitude and many complexities. Its solution lies almost as much on the New York side of the river as in New Jersey. The shifting of the business center in New York City has increased it enormously.

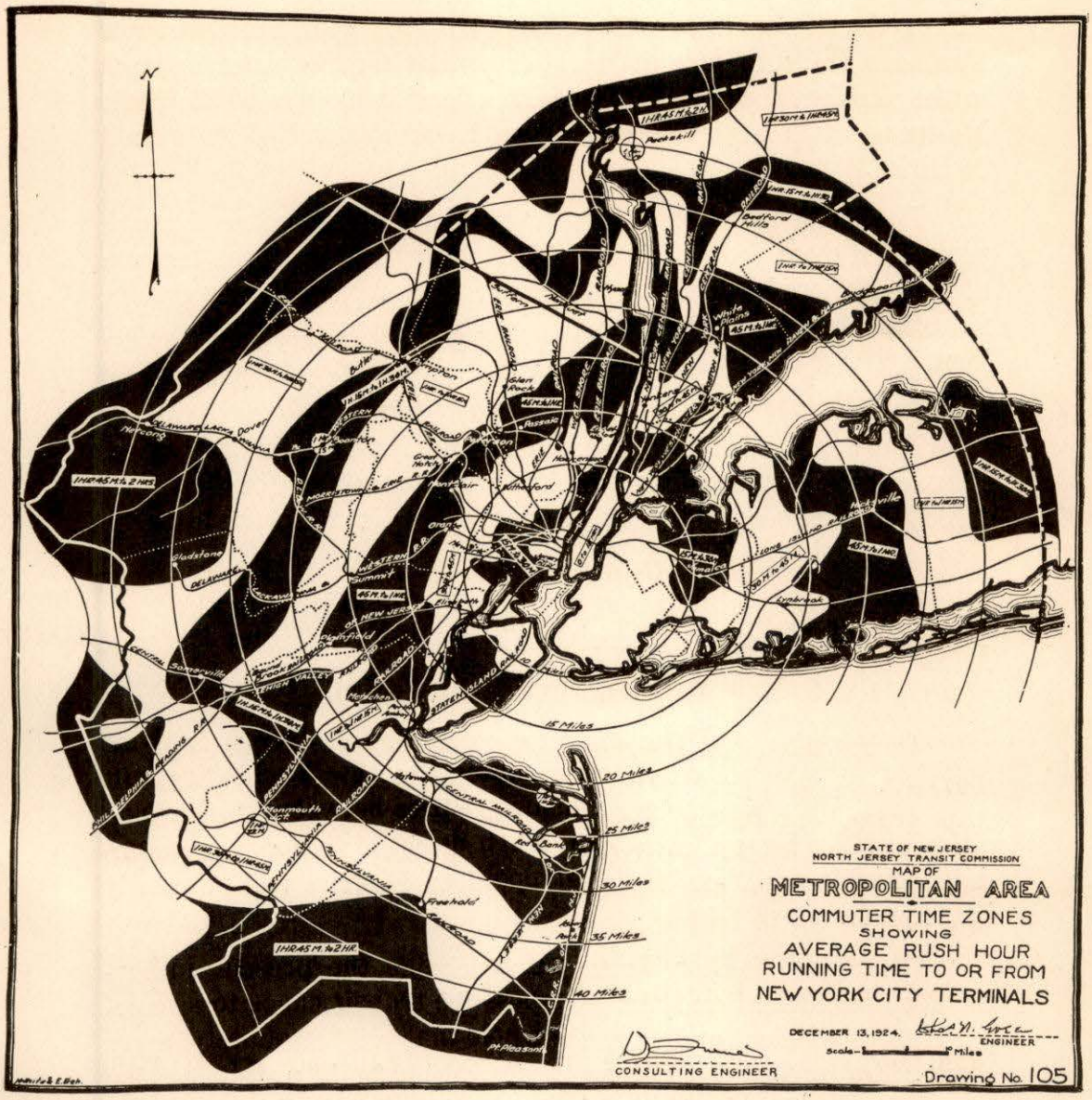
People from New Jersey now desire not only to reach that portion of New York City below Chambers Street, but business necessities compel them to go as far north as 59th Street.

It is, moreover, necessary to distribute this New Jersey population from the Battery to 59th Street in such a way as not to interfere with New York's north and south bound travel.

In the past, the Hudson River has formed a great natural barrier, as well as a great political barrier, to the solution of this transit problem. The natural barrier is gradually being broken down by the construction of tunnels. Economic pressure has overcome the political barrier, evidenced by the joining of the two states in building a vehicular tunnel; in the creation of the Port of New York Authority and in the co-operation of the transit bodies on both sides of the Hudson.

Railroads cannot solve the problem

There are six great railroads transporting commuters from New Jersey to New York City. These railroad systems have grown up under separate development, each independent of and competing with the others, handling not only commuter traffic, but also through passengers and freight.


STATE OF NEW JERSEY
NORTH JERSEY TRANSIT COMMISSION
MAP OF
METROPOLITAN AREA
COMMUTER TIME ZONES
SHOWING
AVERAGE RUSH HOUR
RUNNING TIME TO OR FROM
NEW YORK CITY TERMINALS
DECEMBER 13, 1924.
ENGINEER
CONSULTING ENGINEER
Drawing No. 105
15 Miles
20 Miles
25 Miles
30 Miles
35 Miles
40 Miles
Gladstone
Freehold
Pt. Pleasant
Hackensack
Rockaway
Lakehurst

The railroads unaided cannot solve the entire problem, nor should they, since the proper solution requires a comprehensive transit system that will unite all present railroad systems so that passengers on any of the railroads can use a common facility that will enable them to be carried to their destination without transfer, if possible, or at least with the convenience of easy transfer rather than with the cumbersome changing that now prevails. Furthermore, the State of New Jersey has a far greater interest in the problem than the railroads, because the future of the State is dependent in large measure upon the developmnt of its transit facilities.

The problem has been growing greater and greater through years that have been literally lost. During this time, because of lack of thought on the part of the State of New Jersey for the future of its transit lines, an expense for improvements has been incurred by the individual railroads which would have been unnecessary if there had been a comprehensive plan.

There are over 250 separate municipalities in this area. These bodies cannot undertake the solution because of their different interests and limitations of power; in fact, the number alone precludes unified action.

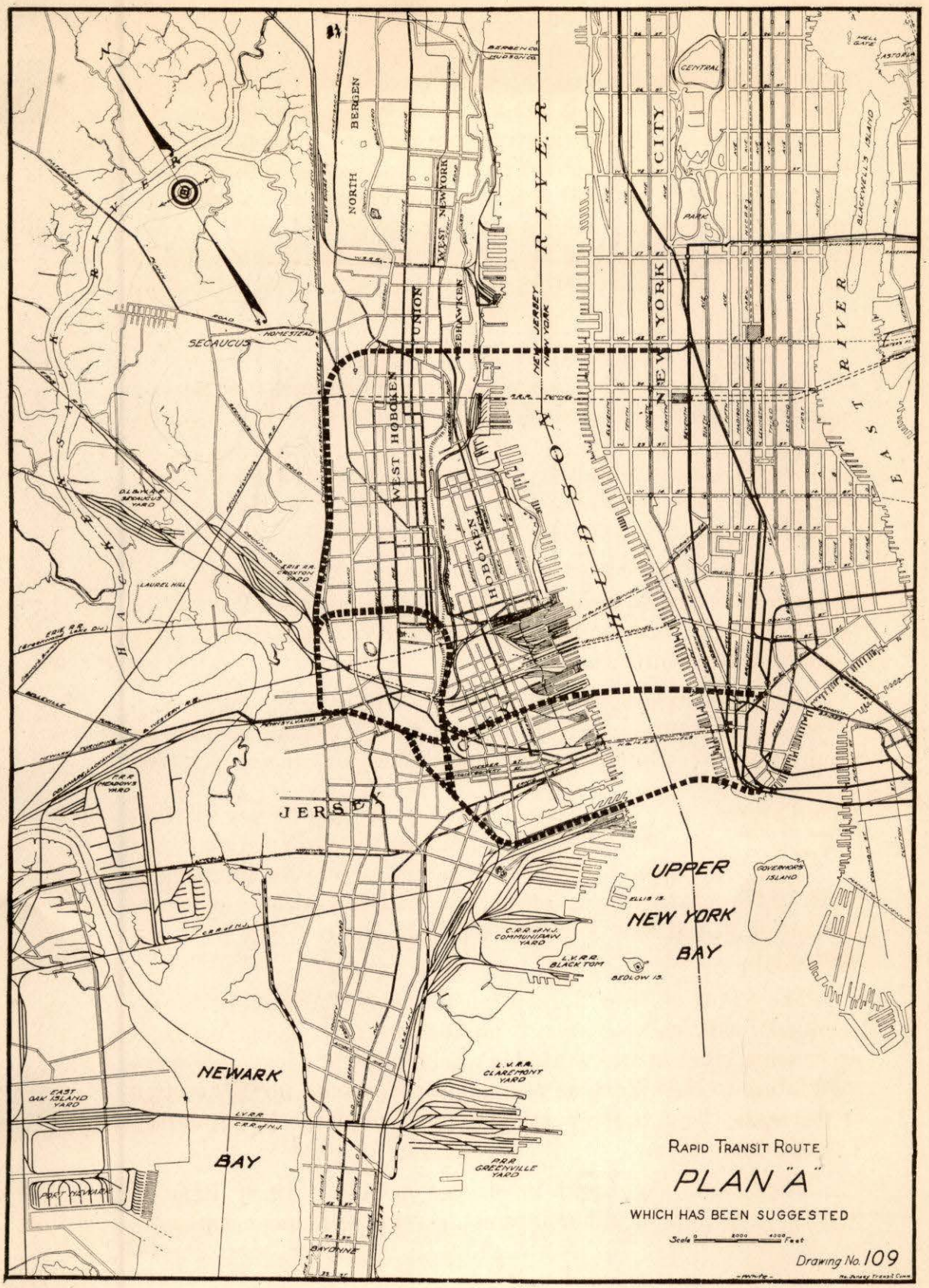
This is in striking contrast to conditions existing on the New York side of the river where Greater New York unites its vast population in a municipal entity that makes for concerted action.

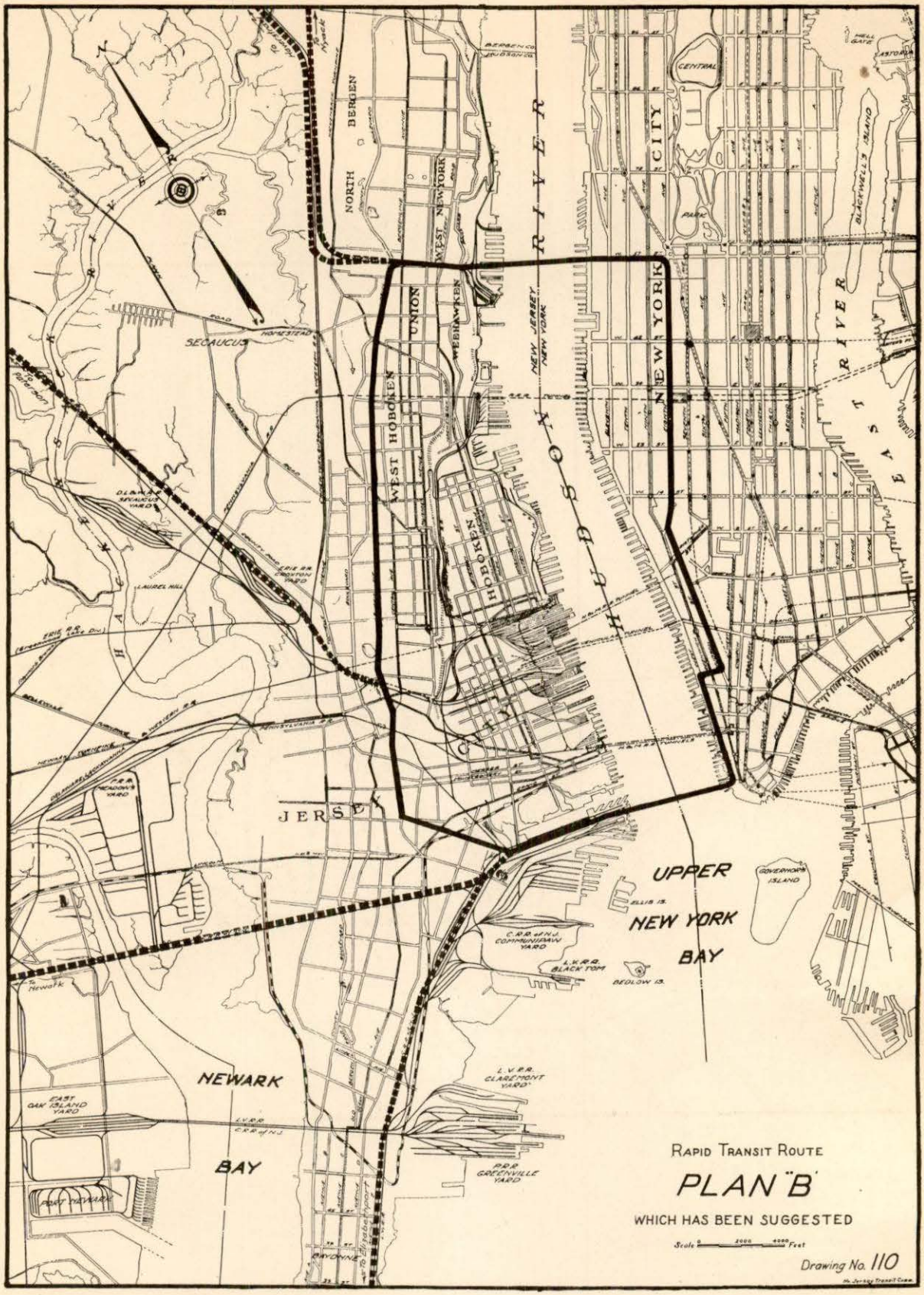
Transit needed between cities in New Jersey

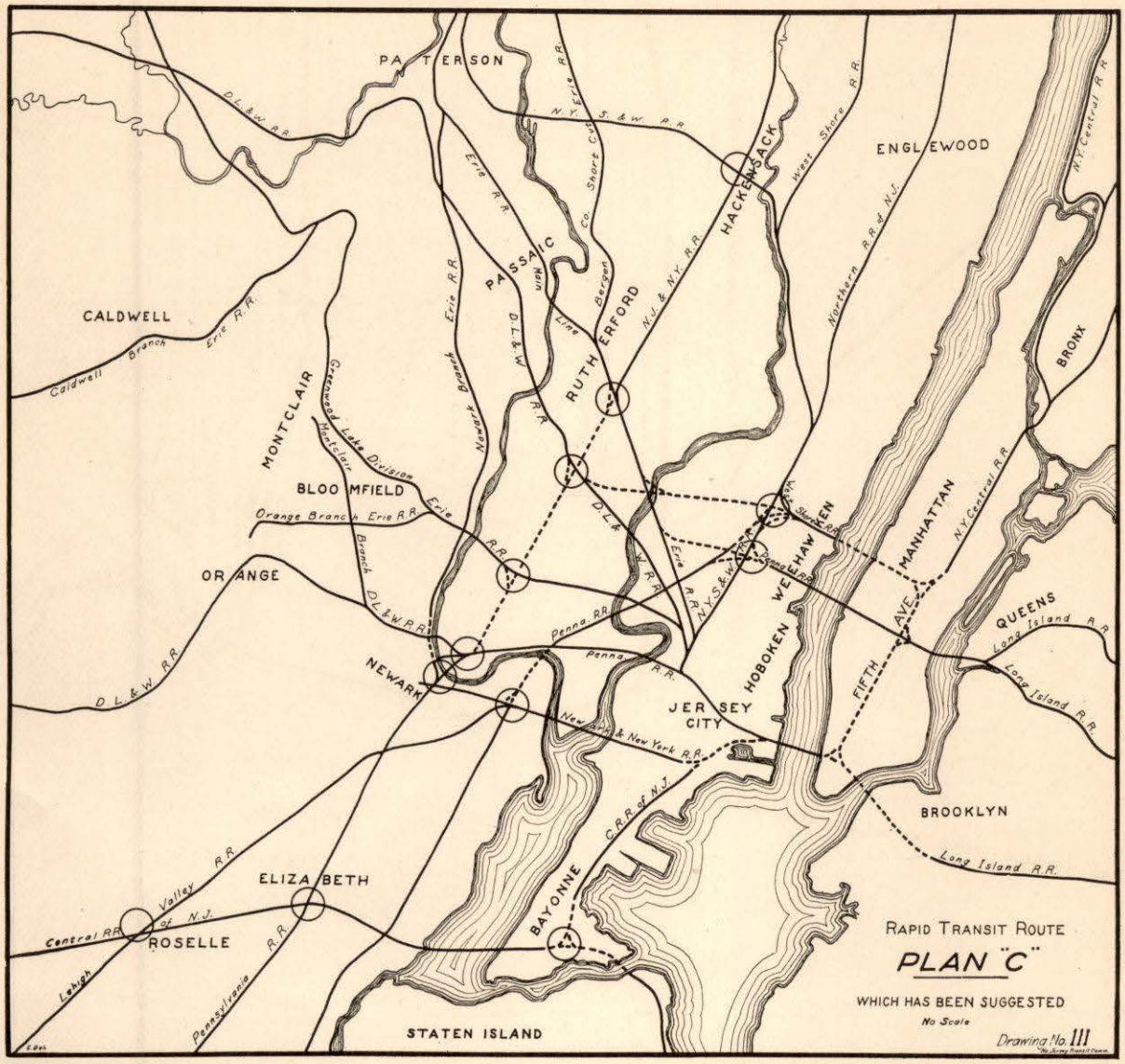
The transit problem in New Jersey involves not only the commuters to New York City, but also better transit facilities between the various cities in New Jersey. Any plan which does not encourage decentralization in the New York Metropolitan District will be wholly inadequate.

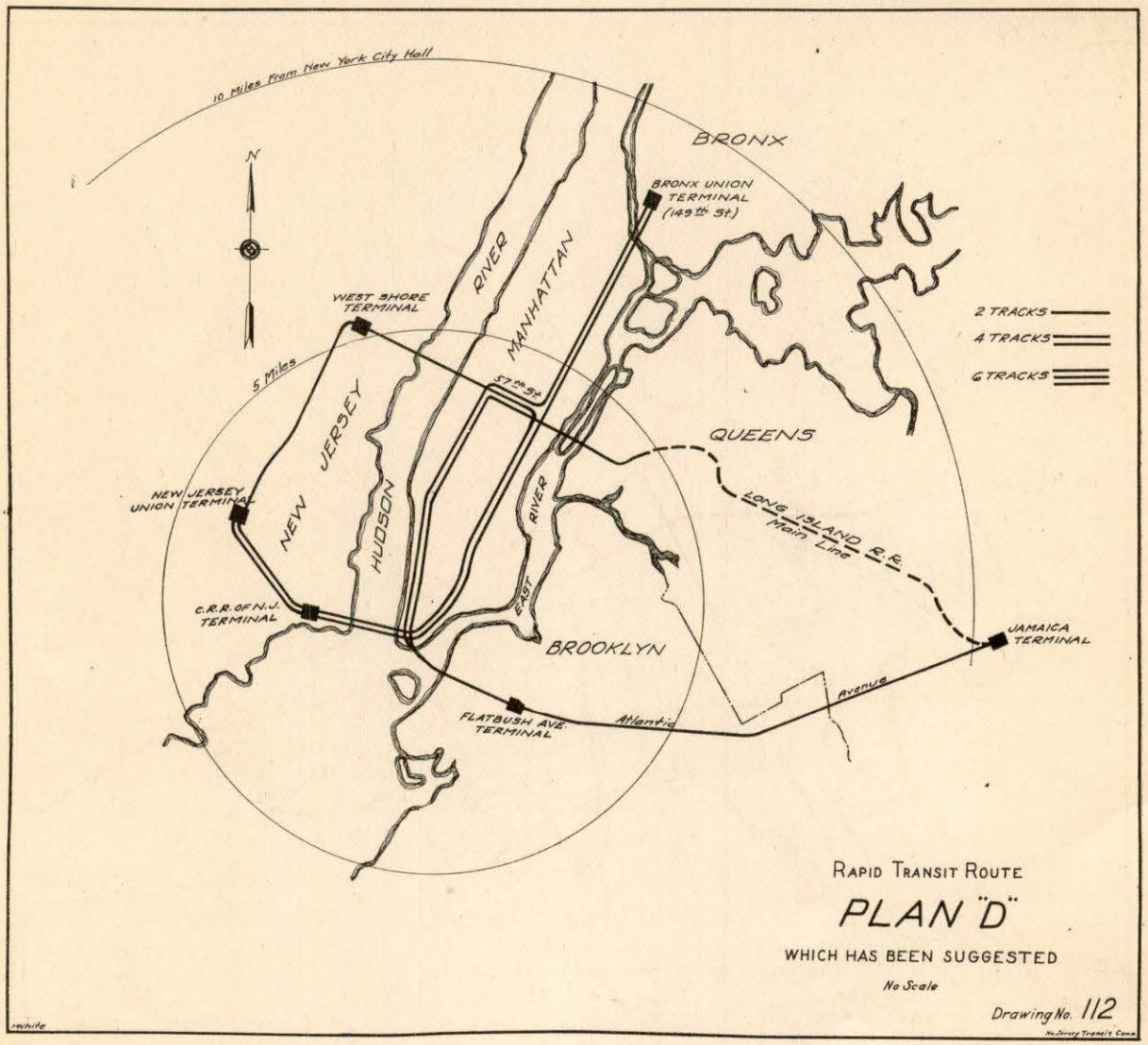
The State of New Jersey must change the present inharmonious, inefficient and almost impossible transit chaos to a comprehensive, efficient and workable whole that will adequately serve commuters to New York as well as properly build up this section of the State. This is the particular problem of the North Jersey Transit Commission.

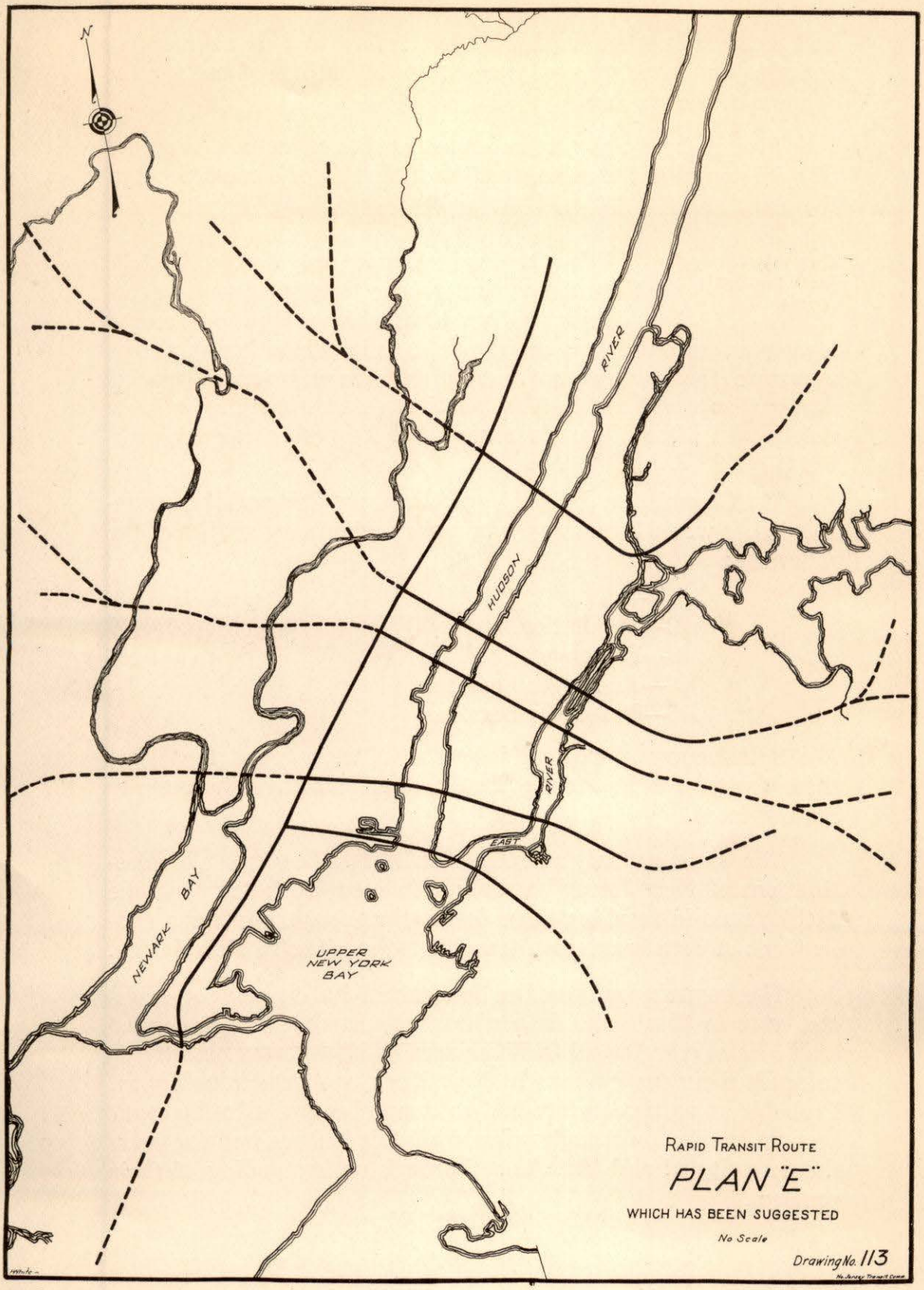
The Commission began its studies on July 1, 1924. Prior to that time, because of public interest, several prominent engineers


NORTH BERGEN
WEST NEW YORK
UNION
WEST HOBOKEN
HOBOKEN
HUDSON RIVER
NEW JERSEY
NEW YORK
NEW YORK CITY
EAST RIVER
CENTRAL PARK
HELL GATE
ASTORIA
BLACKWELL'S ISLAND
SECAUCUS
HOMESTEAD
D.L.&W.R.R. SECAUCUS YARD
ERIE R.R. KEARNY YARD
LAUREL HILL
HACKENSACK RIVER
JERSEY CITY
C.R.R. MEADOWS YARD
UPPER NEW YORK BAY
ELLIS IS.
GOVERNOR'S ISLAND
C.R.R. of N.J. COMMERCE AVE. YARD
L.V.R.R. BLACK TOM
BEDLOW IS.
NEWARK BAY
EAST OAK ISLAND YARD
L.V.R.R.
C.R.R. of N.J.
PORT NEWARK
L.V.R.R. CLAREMONT YARD
P.R.R. GREENVILLE YARD
BAYONNE
RAPID TRANSIT ROUTE
PLAN "A"
WHICH HAS BEEN SUGGESTED
Scale 0 2000 4000 Feet
Drawing No. 109


NORTH BERGEN
WEST NEW YORK
UNION
WEST HOBOKEN
HOBOKEN
NEW JERSEY
NEW YORK
HUDSON RIVER
NEW YORK CITY
CENTRAL PARK
EAST RIVER
BLACKWELL'S ISLAND
HELL GATE
ASTORIA
SECAUCUS
HOMESTEAD
D.L.&W.R.R. SECAUCUS YARDS
ERIE R.R. CROXTON YARDS
LAUREL HILL
ERIE R.R.
PENNSYLVANIA R.R.
P.R.R. MEADOW YARD
JERSEY
UPPER NEW YORK BAY
GOVERNOR'S ISLAND
ELLIS IS.
BEDLOW IS.
C.R.R. of N.J. COMMUNIPAW YARD
L.V.R.R. BLACK TOM
To Newark
NEWARK BAY
EAST OAK ISLAND YARD
L.V.R.R. C.R.R. of N.J.
L.V.R.R. CLAREMONT YARD
P.R.R. GREENVILLE YARD
To Elizabethport
BAYONNE
RAPID TRANSIT ROUTE
PLAN "B"
WHICH HAS BEEN SUGGESTED
Scale 0 2000 4000 Feet
Drawing No. 110
The Jersey Transit Com.


PATERSON
D.L.&W. R.R.
N.Y.Erie R.R.
N.Y.S.&W. R.R.
HACKENSACK
West Shore R.R.
ENGLEWOOD
N.Y.Central R.R.
Erie R.R.
Co. Shore Line
Bergen
PASSAIC
Main
N.J.&N.Y. R.R.
Northern R.R. of N.J.
CALDWELL
Caldwell Branch
Erie R.R.
Erie R.R.
Newark Branch
D.L.&W. R.R.
RUTHERFORD
BRONX
MONTCLAIR
Greenwood Lake Division
Hackensack Branch
BLOOMFIELD
Orange Branch Erie R.R.
Erie R.R.
D.L.&W. R.R.
Erie R.R.
N.Y.S.&W. R.R.
Penna. R.R.
WEEHAWKEN
MANHATTAN
N.Y.Central R.R.
ORANGE
D.L.&W.P.R.R.
Penna. R.R.
Penna. R.R.
HOBOKEN
FIFTH AVE.
QUEENS
Long Island R.R.
Long Island R.R.
NEWARK
JERSEY CITY
New Jersey & New York R.R.
D.L.&W. R.R.
BROOKLYN
Long Island R.R.
C.R.R. of N.J.
BAYONNE
ELIZABETH
Valley R.R. of N.J.
Central R.R.
ROSELLE
Lehigh
Pennsylvania R.R.
STATEN ISLAND
RAPID TRANSIT ROUTE
PLAN "C"
WHICH HAS BEEN SUGGESTED
No Scale
Drawing No. 111


10 Miles from New York City Hall
N
BRONX
BRONX UNION TERMINAL (149th St.)
WEST SHORE TERMINAL
RIVER
MANHATTAN
5 Miles
57th St.
QUEENS
NEW JERSEY UNION TERMINAL
NEW JERSEY
HUDSON
RIVER
LONG ISLAND R.R. Main Line
C.R.R. OF N.J. TERMINAL
EAST
BROOKLYN
JAMAICA TERMINAL
FLATBUSH AVE. TERMINAL
Atlantic
Avenue
2 TRACKS
4 TRACKS
6 TRACKS
RAPID TRANSIT ROUTE
PLAN "D"
WHICH HAS BEEN SUGGESTED
No Scale
Drawing No. 112
White
New Jersey Transit Comm.


N
HUDSON
RIVER
EAST
RIVER
NEWARK BAY
UPPER
NEW YORK
BAY
RAPID TRANSIT ROUTE
PLAN "E"
WHICH HAS BEEN SUGGESTED
No Scale
Drawing No. 113

had presented papers on this subject before various engineering societies and civic groups, suggesting, in outline, plans for the solution of the problem.

Five of these plans are here presented to show the divergence of opinion and at the same time the similarity of some aspects of the plans.

Commission seeks facts for basis of plan.

In the beginning it was decided by the Commission that rather than start with generally accepted premises which might be false and lead to an unsound solution, it would be better, although slower and more laborious, to analyze completely the problem and provide a plan that would meet actual requirements as based upon facts determined after diligent research and comprehensive engineering study.

The Commission decided that before any plan could be recommended, it would be necessary to make preliminary studies of the following:

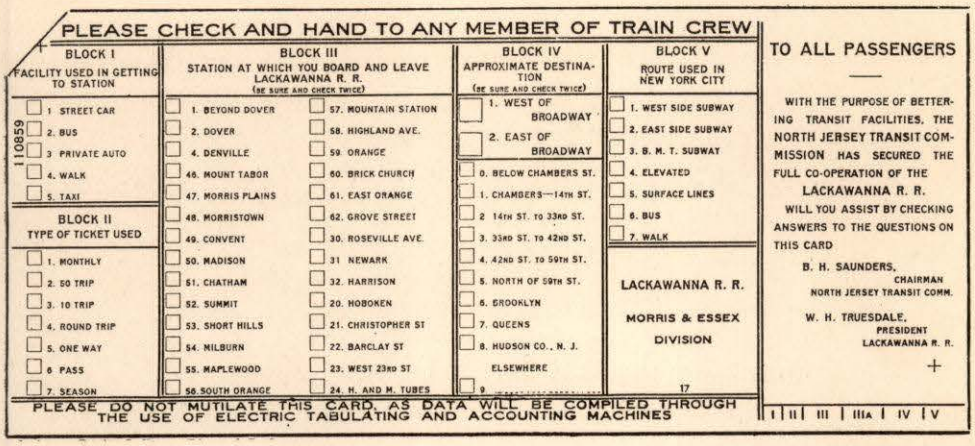
1—Area.
2—Population.
3—Passenger Traffic.
4—Passenger Facilities.
5—Passenger Service.

Satisfactory sources of information were found for all of these except for Passenger Traffic, the most important study contemplated.

There was not only an entire lack of data bearing on the destinations of New Jersey passengers in New York City and the facility used in reaching those destinations, but there was a similar lack of data bearing on travel between cities in New Jersey.

The Commission therefore determined that the first essential step was to obtain the data which was lacking. A passenger traffic count covering all facilities used by New Jersey passengers to reach their destinations in New York was determined upon. Probably at no time before had so comprehensive a traffic count been undertaken, although railroad officials had realized for years the necessity of such data to a thorough understanding of their problem.

Forty different card forms, similar to the one which is shown below, were devised, covering the different branches of the railroad, the ferries and the Hudson & Manhattan. Almost a half million of these cards had to be printed.



PLEASE CHECK AND HAND TO ANY MEMBER OF TRAIN CREW

BLOCK I
FACILITY USED IN GETTING TO STATION

- 1 STREET CAR
- 2. BUS
- 3 PRIVATE AUTO
- 4. WALK
- 5. TAXI

BLOCK II
TYPE OF TICKET USED

- 1. MONTHLY
- 2. 50 TRIP
- 3. 10 TRIP
- 4. ROUND TRIP
- 5. ONE WAY
- 6 PASS
- 7. SEASON

BLOCK III
STATION AT WHICH YOU BOARD AND LEAVE LACKAWANNA R. R.
(BE SURE AND CHECK TWICE)

- 1. BEYOND DOVER
- 2. DOVER
- 4. DENVILLE
- 46. MOUNT TABOR
- 47. MORRIS PLAINS
- 48. MORRISTOWN
- 49. CONVENT
- 50. MADISON
- 51. CHATHAM
- 52. SUMMIT
- 53. SHORT HILLS
- 54. MILBURN
- 55. MAPLEWOOD
- 56. SOUTH ORANGE
- 57. MOUNTAIN STATION
- 58. HIGHLAND AVE.
- 59. ORANGE
- 60. BRICK CHURCH
- 61. EAST ORANGE
- 62. GROVE STREET
- 30. ROSEVILLE AVE.
- 31 NEWARK
- 32. HARRISON
- 20. HOBOKEN
- 21. CHRISTOPHER ST
- 22. BARCLAY ST
- 23. WEST 23RD ST
- 24. H. AND M. TUBES

BLOCK IV
APPROXIMATE DESTINATION
(BE SURE AND CHECK TWICE)

- 1. WEST OF BROADWAY
- 2. EAST OF BROADWAY
- 0. BELOW CHAMBERS ST.
- 1. CHAMBERS—14TH ST.
- 2 14TH ST. TO 33RD ST.
- 3. 33RD ST. TO 42ND ST.
- 4. 42ND ST. TO 59TH ST.
- 5. NORTH OF 59TH ST.
- 6. BROOKLYN
- 7. QUEENS
- 8. HUDSON CO., N. J.
- ELSEWHERE
- 9

BLOCK V
ROUTE USED IN NEW YORK CITY

- 1. WEST SIDE SUBWAY
- 2. EAST SIDE SUBWAY
- 3. B. M. T. SUBWAY
- 4. ELEVATED
- 5. SURFACE LINES
- 6. BUS
- 7. WALK

LACKAWANNA R. R.

MORRIS & ESSEX DIVISION

17

TO ALL PASSENGERS

WITH THE PURPOSE OF BETTERING TRANSIT FACILITIES, THE NORTH JERSEY TRANSIT COMMISSION HAS SECURED THE FULL CO-OPERATION OF THE LACKAWANNA R. R.
WILL YOU ASSIST BY CHECKING ANSWERS TO THE QUESTIONS ON THIS CARD

B. H. SAUNDERS, CHAIRMAN NORTH JERSEY TRANSIT COMM.

W. H. TRUESDALE, PRESIDENT LACKAWANNA R. R.

PLEASE DO NOT MUTILATE THIS CARD, AS DATA WILL BE COMPILED THROUGH THE USE OF ELECTRIC TABULATING AND ACCOUNTING MACHINES

I | II | III | IIIA | IV | V

Cost found prohibitive; railroads aid

The cost of printing, distributing, collecting, punching, sorting and tabulating these cards was found to be so great that the funds of the Commission would not permit this work to be done at the expense of the Commission. In fact, this expense would have taken most of the funds provided by the Legislature. The railroad executives, because of their interest in the undertaking, agreed to bear the expense of distributing, collecting, punching, sorting and tabulating the cards.

Because of certain conditions on the Hudson & Manhattan and the Public Service Ferry at Edgewater, it was necessary to have one hundred additional men to aid in the collection of these cards at the New York terminals. The Board of Transportation of New York City and the New York State Transit Commission most generously provided these men from their own staff.

Wednesday, September 24th, 1924, was selected as a day of average travel. The traffic count covered the entire twenty-four hour period and included not only all steam railroad passengers, but also all Hudson & Manhattan and ferry passengers.

Public gives co-operation

By prior newspaper and radio publicity the Commission had prepared the commuting public for the count. Each passenger was requested to check his card as directed thereon. The response showed the keen interest of the traveling public.

It had been expected that the tabulation would be completed by the first of November, but because of the tremendous amount of work involved, it was not completed by all the railroads until the seventh of January, at which time the staff of the Commission began the consolidation and analysis of this vast amount of data.

A superficial examination clearly indicates that the time and effort spent in this particular study have been justified, although it has delayed progress in the formulation of a definite plan, for the facts relative to the distribution of passengers and use of New York transit facilities are quite different from the assumptions of practically every one who had given consideration to this question.

Mass of data collected

In pursuance of these preliminary studies much information has been assembled. It is impracticable to publish full tabulations of all of the analyses and observations. The following summaries are sufficient for present purposes:

Area

The area available in the Metropolitan District for commuting purposes is limited to that which can be reached within an hour to an hour and fifteen minutes from lower Manhattan.

The commuting area is practically confined within a radius of 40 miles of the City Hall in Manhattan and contains 3,432 square miles.

At present the traffic from the entire commuting area, 3,432 square miles, has for its destination an area of about 8.5 square miles in lower Manhattan south of 59th Street.

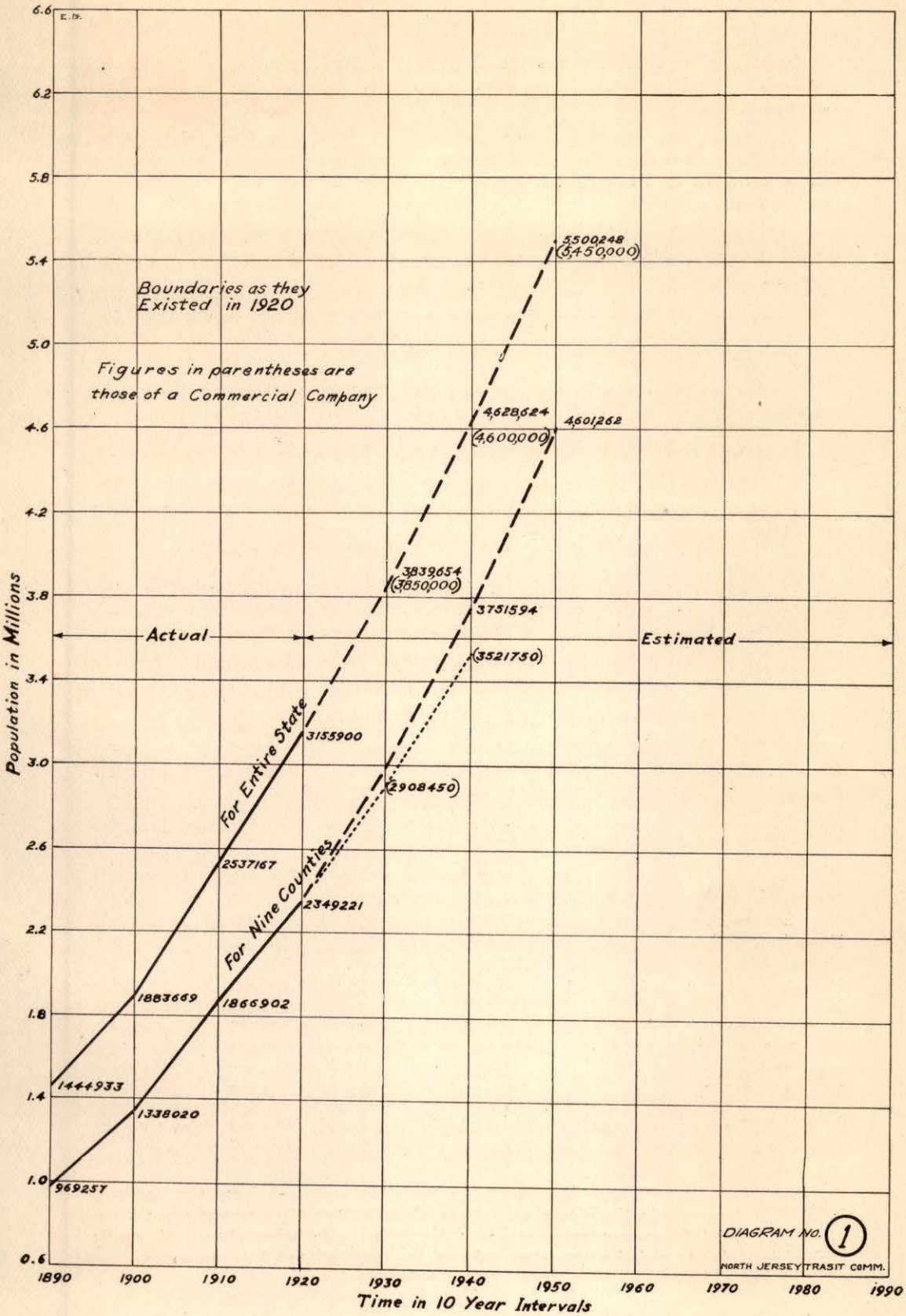
The portion of the Metropolitan District available for commuting purposes within New Jersey is practically co-extensive with the area within the boundaries of these nine counties and contains 2,277 square miles or 66 per cent of the entire Metropolitan District.

The area of these nine counties represents one-third of the total area of the State of New Jersey.

This area in New Jersey has great natural possibilities for residential, commercial and industrial development.

Population

The present population of these nine counties represents 75 per cent of the entire population of New Jersey. Diagram No. 1 on page 17 shows the combined population of the nine counties and the population of the entire State from 1890 to 1920 with forecasts for 1950.



Population, Actual and Forecast, for the State and the Nine Counties

From 1910 to 1920, the increase in population for the entire State was 24.4 per cent. Of this increase, 78 per cent occurred in the nine counties of northern New Jersey.

The nearer the counties are to the center of the New York Metropolitan District the greater their population and the faster their population is increasing; this is indicated by Drawing No. 103 on page 19 which shows the population by annular zones.

Although nearly twice as large as the other sections of the Metropolitan District commuting area combined, the nine counties of New Jersey have only about one and one-third times the combined population.

These nine counties are far from being as densely populated as the remainder of the commuting area and are therefore more capable of extension, expansion and development.

The Urban population in the nine counties is about 85 per cent of their total population.

In this area there are eighteen of the twenty-one cities in the State having a population of 25,000 or over.

Three of these eighteen cities are the largest in the State—Newark, Jersey City and Paterson—having an aggregate population of about one-third of the entire population of this area.

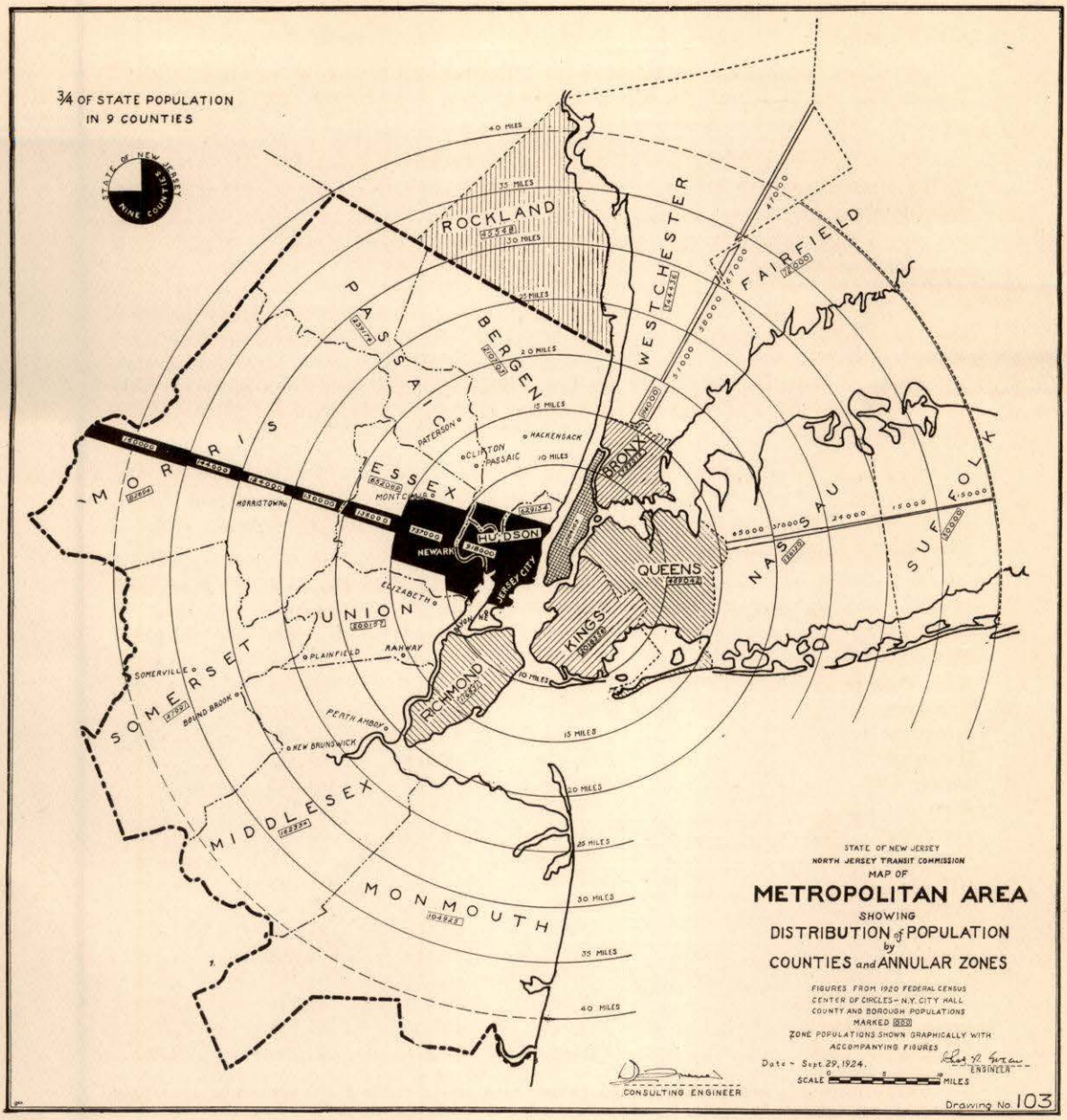
Estimates show that the population of the nine counties will be doubled by 1950. Diagram No. 2 on page 21 shows the present and estimated population of each county in this area. The table below gives the same information for the eighteen cities of over 25,000 population within the area.

By Cities	*Actual* 1920	*Forecast* 1930	*Forecast* 1940	*Forecast* 1950
Bayonne	76,754	95,395	114,889	134,235
Clifton	26,470	37,405	51,784	69,557
East Orange	50,710	71,717	99,244	133,312
Elizabeth	94,783	135,552	187,595	251,985
Hoboken	68,166	84,641	101,938	119,104
Irvington	25,480	36,088	49,942	67,086
Jersey City	298,103	369,427	444,922	519,840
Kearny	26,724	33,120	39,888	46,600
Montclair	28,810	40,761	56,469	75,768
New Brunswick	32,779	39,857	48,051	57,078
Newark	414,524	514,126	619,193	723,458
Orange	33,268	47,078	65,149	87,512
Passaic	63,841	90,324	124,998	167,901
Paterson	135,875	192,179	265,955	357,242
Perth Amboy	41,707	50,724	61,152	72,639
Plainfield	27,700	39,273	54,351	73,005
West Hoboken	40,074	49,605	59,712	69,703
West New York	29,926	37,215	44,798	52,367

These forecasts are practically identical with those made for commercial purposes by the engineering staff of a company working independently of the Commission.

Passenger traffic

In 1923, the total passenger traffic by rail and ferry through and from within the nine counties was about 222,897,000 passengers or about 348,400 one-way passengers per day. The table below shows this traffic divided into classes and the percentage of certain combinations of these classes.


3/4 OF STATE POPULATION
IN 9 COUNTIES
STATE OF NEW JERSEY
NINE COUNTIES
ROCKLAND
WESTCHESTER
FAIRFIELD
PASSAIC
BERGEN
MORRIS
ESSEX
HUDSON
BRONX
QUEENS
KINGS
NASSAU
SUFFOLK
UNION
SOMERSET
MIDDLESEX
MONMOUTH
RICHMOND
PATERSON
CLIFTON
PASSAIC
HACKENSACK
MONTCLAIR
MORRISTOWN
NEWARK
JERSEY CITY
ELIZABETH
RAHWAY
PLAINFIELD
SOMERVILLE
BOUND BROOK
PERTH AMBOY
NEW BRUNSWICK
40 MILES
35 MILES
30 MILES
25 MILES
20 MILES
15 MILES
10 MILES
STATE OF NEW JERSEY
NORTH JERSEY TRANSIT COMMISSION
MAP OF
METROPOLITAN AREA
SHOWING
DISTRIBUTION of POPULATION
by
COUNTIES and ANNULAR ZONES
FIGURES FROM 1920 FEDERAL CENSUS
CENTER OF CIRCLES - N.Y. CITY HALL
COUNTY AND BOROUGH POPULATIONS
MARKED
ZONE POPULATIONS SHOWN GRAPHICALLY WITH
ACCOMPANYING FIGURES
Date - Sept. 29, 1924.
ENGINEER
SCALE
MILES
CONSULTING ENGINEER
Drawing No 103

	1923 Passengers Per Year	Av. One Way Passengers Per Day	Present Steam R. R. Passengers	Percent Total Traffic	Percent Rail Passengers
*Commuters	87,094,000	136,100	66.6	39.1	48.7
**Regular	43,529,000	68,000	33.4	19.5	24.6
Total	130,623,000	204,100	100.0		
†Hudson & Manhattan	47,528,000	74,300		21.3	26.7
Total	178,151,000	278,400			100.0
‡Ferry	44,746,000	70,000		20.1	
Total	222,897,000	348,400		100.0	

The traffic for 1923 represents an increase of nearly 70 per cent in steam railroad commuters and an increase of about 65 per cent in all rail passengers since 1911. This means that the average increase has been in excess of 9,000 all-rail passengers per year, of which increase the steam railroad commuters have furnished more than one-half.

At this same rate of increase in 1934 the all-rail traffic for which provision must be made will be about 370,000 and the commuter traffic about 176,000 one-way passengers per day; also in 1950 or only 25 years hence the all-rail passengers will aggregate a total of 516,000 and the commuter traffic about 250,000 one-way passengers per day.

Passenger facilities Serving this traffic in New Jersey are six railroads whose passenger business in this area during the rush hour is almost entirely made up of commuters. These railroads are shown on Drawing No. 107 on page 23.

The number of route miles per 10,000 population is a relative measure of the extent of the railroad facilities with respect to the existing population; on the other hand the number of route miles per 100 square miles of area measures the degree of development that has been attained in terms of railroad facilities. This latter measure emphasizes the fact that the problem is not so much to furnish new facilities in the area as it is to provide better outlets for travel into New York. The table below shows these measures for various areas.

District	Route Miles Per 100 Sq. Miles	***Population Per Route Mile	Route Miles Per 10,000 ***Population
1. Commuter Area	38.8	4,589	2.18
2. Nine Counties (New Jersey)	34.5	2,987	3.31
3. State (New Jersey)	30.8	1,364	7.33
4. Long Island	32.0	3,512	2.85
5. Westchester	33.2	5,771	1.73
6. New York City	53.5	35,125	.28
7. Metropolitan District	34.5	6,616	1.51

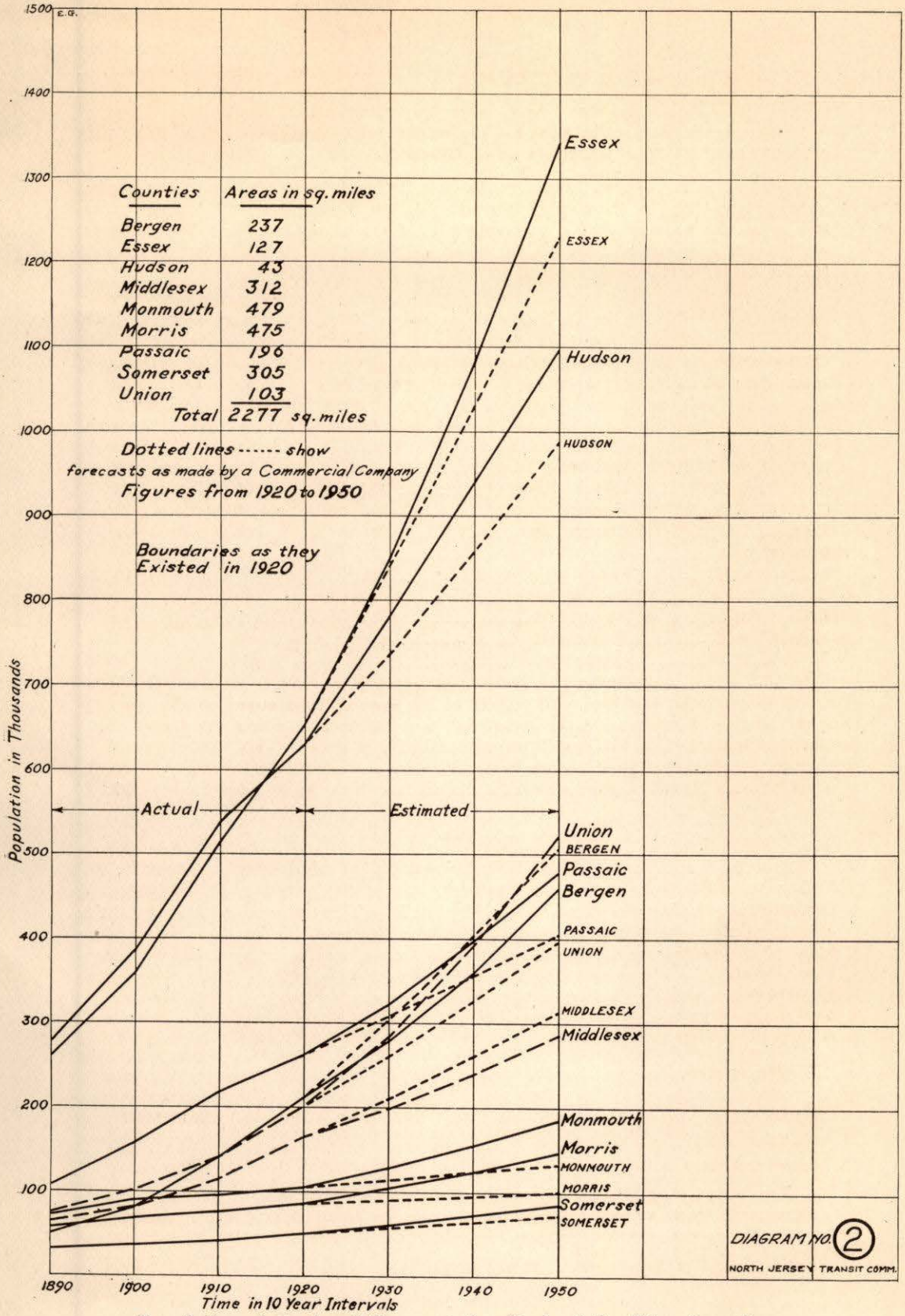
***1920 Census.

*COMMUTERS—All steam railroad passengers who travel at less than regular fare. This term also includes Hudson & Manhattan passengers from beyond Summit Avenue (Journal Square), Jersey City, as such passengers travel at less than regular fare and are really passengers of the Pennsylvania Railroad delivered to the Hudson & Manhattan at Summit Avenue (Journal Square).

**REGULAR—All steam railroad passengers other than commuters.

†HUDSON & MANHATTAN—All passengers from Summit Avenue (Journal Square), Grove Street and local passengers from Hoboken, Erie and Exchange Place; does not include steam railroad passengers.

‡FERRY—All local passengers; does not include the passengers from steam railroads.



Population, Actual and Forecast, for Each of the Nine Counties

Of the 515 stations in the entire area of the nine counties about one-half are in the sector from 10 to 25 miles measured from City Hall, Manhattan.

The average distance between stations on the various railroads is 1.32 miles with a maximum of 4.8 miles and minimum of 0.33 miles.

Bergen County, served largely by the Erie Railroad, leads not only in the number of stations but also in the number of route miles per county and with but one exception it has the least population per route mile of any of the counties. This indicates that it is the character of service furnished by the various facilities that is the controlling factor in the development of an area.

Passenger service During the past summer (schedule 1924) there were a total of 736 trains each day with passengers for New York City originating in New Jersey or beyond and arriving at terminals in the New Jersey area. The division of trains for each railroad is as follows:

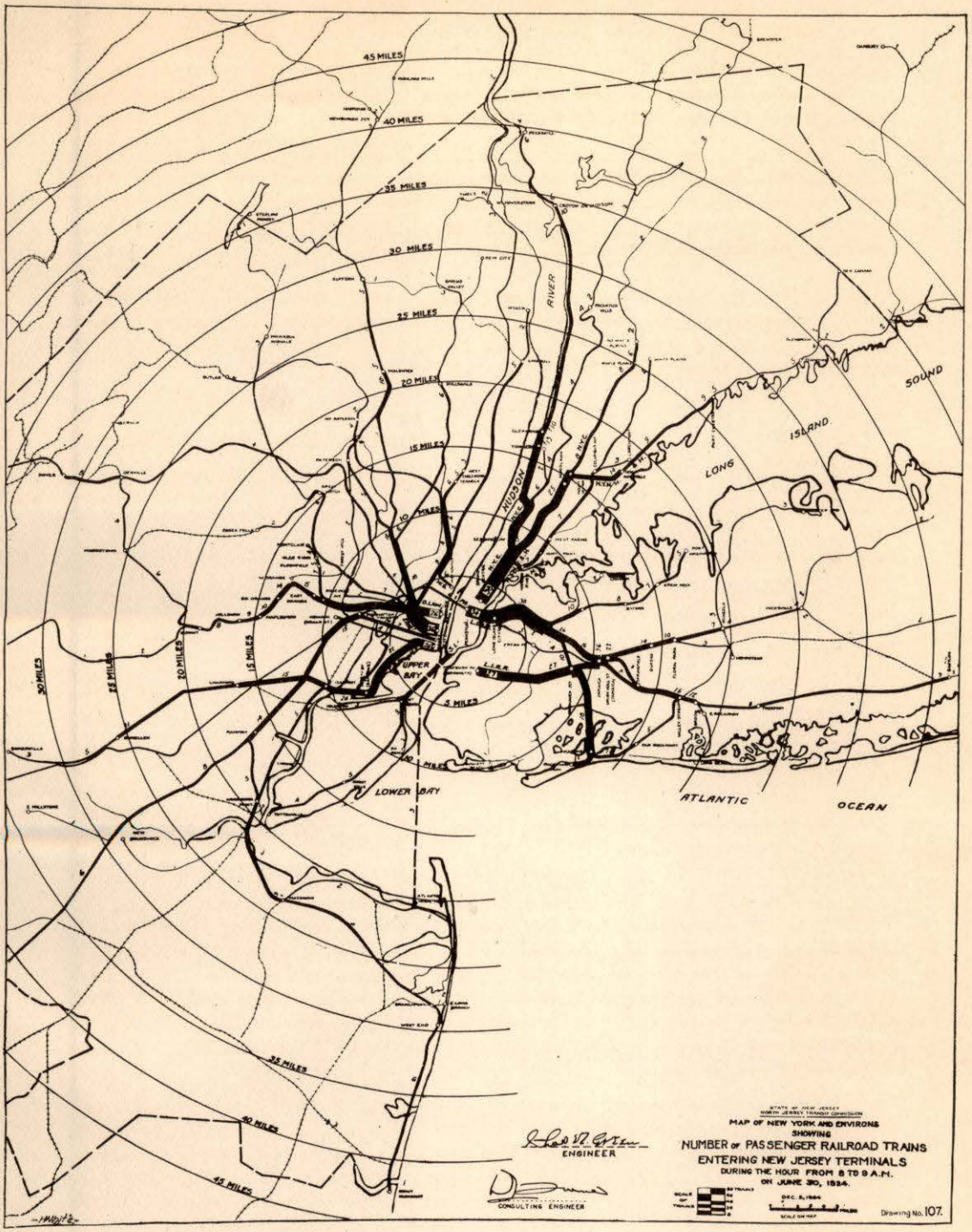
Railroad	Terminal	Total Trains	Trains in 24 hours: Within 25 Mile Zone*	Trains in 24 hours: Through Trains*
D., L. & W. R. R.	Hoboken	109	66	10
C. R. R. of N. J.	Jersey City**	154	117	23
C. R. R. of N. J.	Newark	27	24	
Erie	Jersey City	145	103	9
Pennsylvania	Jersey City	38	16	
Pennsylvania	Penna. Station, N. Y.	76		65
Lehigh Valley	Penna. Station, N. Y.	6		6
Lehigh Valley	Jersey City	3	1	
West Shore	Weehawken	29	8	6
N. Y. O. & W.	Weehawken	8		8
B. & O.	Penna. Station, N. Y.	7		7
		602	335	134
Pa. Rapid Transit	Hudson Terminal	134	134	
Total		736	469	134

*Included in Total Trains.
**Includes 14 Boat Trains arriving in New York from Atlantic Highlands.

From 8:00 A. M. until 9:00 A. M. is the peak load of inbound trains. Drawing No. 107 on page 23 shows graphically this rush hour service, omitting all the Hudson & Manhattan trains because they are considered as Rapid Transit service. A study of this drawing indicates that heaviest suburban traffic originates within the 25-mile zone. Of a total of 736 trains arriving in 24 hours, 469 trains (not including Hudson & Manhattan trains) or 64 per cent originate within this 25-mile radius. The corresponding rush period service originating within the 25-mile radius is 75 trains or 29 per cent out of a total of 126 trains.

Of all the inbound service, including suburban and through trains reaching the New Jersey steam railroad terminals during the 24 hours, only 18 per cent originates beyond the 40-mile circle from New York City. The railroads of New Jersey carried in 1923, from, into and through this New Jersey area, more than 130,000,000 passengers or about one-eighth of the total passengers carried by all the railroads in the United States.

The intensity of this service can be more easily appreciated if we consider that at the steam road terminals combined there is a train arriving every thirty-three seconds during the rush hour, exclusive of Hudson & Manhattan trains. Consider some of these terminals separately; during the rush hour the Lackawanna has on the average a train arriving every two minutes and eighteen seconds (twenty-six in one hour), the



Trains shown on this drawing are first class passenger trains arriving at or traveling toward New York Terminals during the hour from 8 to 9 A.M. on an average week-day according to the time tables of June 30, 1924.

Trains marked "Sunday Only," "Monday Only," "Saturday Only," and "Holiday Only" are omitted. Mail, Ry. express and special trains are omitted.

Figures at terminals give total number of trains arriving at each terminal.

Figures on lines give number of trains thru or at stations and points marked. Most of these trains go without change to the New York terminals, but on some branches there are local trains terminating at a junction where connection is made with a direct train to New York.

Circles represent distances from New York City Hall.

Central Railroad of New Jersey every two minutes and eighteen seconds (twenty-six in one hour), the Erie Railroad every one minute and forty seconds (thirty-six in one hour), and the Pennsylvania Railroad at Jersey City, every six minutes and forty seconds, (nine in one hour). In comparison with the above figures, the minimum interval between trains that has been reached by the express service of the New York subways is one minute and forty-eight seconds.

Possible solution—double loop system

Because of the lack of time for complete analysis and the necessity of obtaining further data and conferring with all parties interested, the Commission does not at this time report a definite plan. But the interest that has been manifested makes desirable some statement.

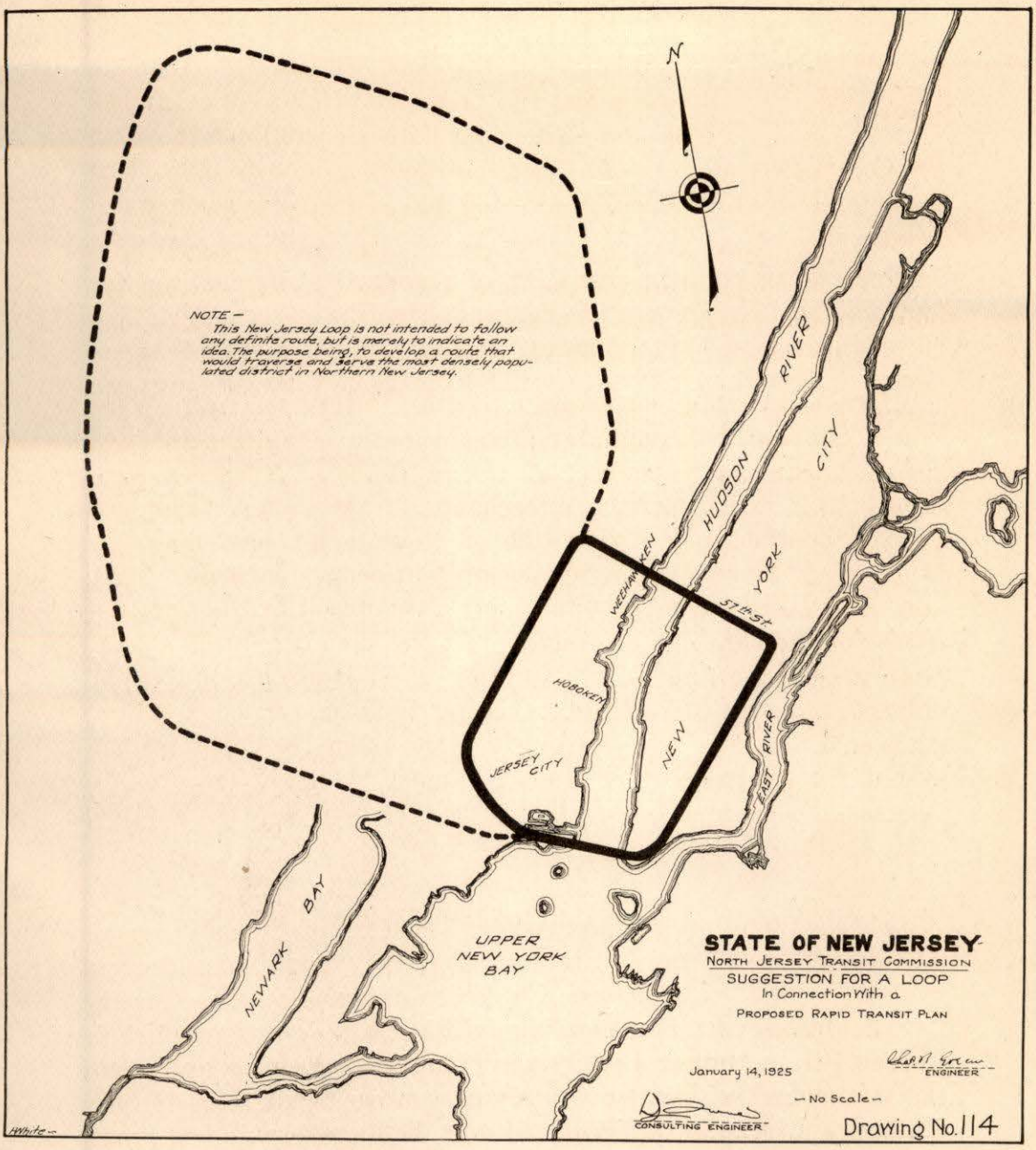
A superficial study of the data and facts so far established points to the desirability of what might be termed a double loop system, as shown in Drawing No. 114 on page 25.

The Inter-state loop shows a possible initial step in the solution of the so-called commuter problem by the establishment of a rapid transit loop to connect all the railroads of Northern New Jersey so as to permit the interchange of passengers from one road to another and distribution of New Jersey passengers in Manhattan, thereby relieving the present congested water front and permitting the proper and more valuable utilization of this space for the handling of freight. At the same time this should be of great advantage in the building up of Hudson County, not only by relieving the already existing facilities which are now congested, but also by affording a more extensive rapid transit system for a large part of Hudson County, which at the present time is not conveniently served by either the ferries or the Hudson & Manhattan.

Proposed loop could connect all railroads

The route which at this time seems to be most logical and desirable for this new rapid transit loop is as follows:

Beginning at the West Shore Railroad just back of the Bergen Hill in Hudson County and running south to connect with the Pennsylvania, Delaware, Lackawanna & Western, Erie and Hudson and Manhattan Railroad and thence across Jersey City to the present terminal of the Central Railroad of New Jersey, thence by means of a sub-aqueous tunnel to connect, possibly, with one of the present subway systems of New York City, thus


NOTE —
This New Jersey Loop is not intended to follow any definite route, but is merely to indicate an idea. The purpose being, to develop a route that would traverse and serve the most densely populated district in Northern New Jersey.
N
HUDSON RIVER
NEW YORK CITY
WEEHAWKEN
HOBOKEN
JERSEY CITY
57th St
EAST RIVER
NEWARK BAY
UPPER NEW YORK BAY
STATE OF NEW JERSEY
NORTH JERSEY TRANSIT COMMISSION
SUGGESTION FOR A LOOP
In Connection With a
PROPOSED RAPID TRANSIT PLAN
January 14, 1925
ENGINEER
— No Scale —
CONSULTING ENGINEER
Drawing No. 114

producing a counter movement of passengers which would be desirable from a revenue standpoint, or possibly with an entirely new system which should in all probability distribute the commuters from the Battery to 59th Street, running thence into New Jersey either by another sub-aqueous tunnel or possibly by the proposed Lindenthal Bridge and across North Hudson to the point of beginning at the West Shore Railroad.

Stations undoubtedly should be so established in New Jersey as to serve not only the railroad commuters, but also those from the populous sections of Hudson County.

All new construction for this rapid transit loop should be so built as to permit the operation of standard equipment so that ultimately, if and when the railroads shall have been electrified, it would be possible to run trains direct from the suburban sections of New Jersey by way of the loop through the business sections of New York City. When this time arrives, entirely new facilities will have to be provided for the loop in New York City, if the initial connection is with the existing subways, as they will not now accommodate standard equipment.

Subsequent expansion for three counties

Any system should be planned with a view to the possibilities of expansion with new direct routes into Bergen, Hudson and Essex Counties. It should be planned also with a view to the possibilities of ultimate expansion into Bayonne and perhaps into Elizabeth, Perth Amboy and the seashore resorts by way of Staten Island, which would afford a shorter route from Western Staten Island into Manhattan by way of Bayonne than the tunnel now being constructed under the Narrows.

Combination vehicular and transit tunnels

The suggested locations of the sub-aqueous tunnels are such that they might also conveniently serve for vehicular tunnels connecting the two States. For this reason it might be possible and practicable to have these tunnels serve as combination vehicular and rapid transit tunnels simliar to the tunnel proposed under the Mersey River at Liverpool, which is 44 feet in diameter and approximately 3,000 feet long. Such a combination tunnel, if found practicable, might be built at a great saving over the cost of separate facilities of equal capacity.

Inter-City traffic would be facilitated

The New Jersey loop shown on Drawing No. 114, on page 25, would contribute largely to the solution of the second phase of the problem —the improvement of the inter-communication between the cities of North New Jersey. Such a loop, by its connection with seashore lines, would afford possibilities of the operation of through trains to the shore and would thereby give the thousands of people of this area a more direct access to these resorts. Also by reason of its articulation with all the railroads traversing this area, it would afford better access to the other cities and sections of the State and even the United States.

It would permit direct travel to the seashore resorts and to Newark, Elizabeth, New Brunswick, Rahway, Perth Amboy, Plainfield, from such cities as Hackensack, Paterson, Passaic, Montclair, Bloomfield, the Oranges, and other cities. It would permit a more direct route from this area to Trenton, Camden, Philadelphia and places to the south and west.

In providing such a loop it is possible that existing railroad facilities might be co-ordinated and used to a large extent or that the Morris and Essex Canal bed might be used to advantage.

These statements are not intended as conclusions, but only as indications of possibilities.

Further consideration must be given to the engineering, legal, economic, financial and political aspects of the problem. These considerations undoubtedly will necessitate modification of the ideas suggested, but it is thought that the adoption of these ideas, or ones somewhat similar, may solve the problem.

It will be necessary to take into consideration that the transit problem of Newark already extends into the Oranges, Maplewood, Bloomfield, Irvington, Belleville and other sections of Essex County and also the West Hudson section of Hudson County.

Newark, which has proposed a transit plan for itself, has not the authority to go out into these sections. The proper planning of rapid transit facilities for the North Jersey Area will do much, undoubtedly, for the future prestige and development of Newark and its environs.

Hudson County also presents a peculiar problem in that it is composed of several contiguous cities. The problem is not only Jersey City's but also Bayonne's, Hoboken's and North Hudson's.

In time residential sections will be established along existing bus routes which now operate in almost rural sections. It will then be necessary to replace these bus routes with real rapid transit facilities.

If decentralization in the Metropolitan District is to be encouraged and New Jersey cities built up, these local transit problems must be considered in their entirety for the good of the State.

Not only should these local studies be made, but there is also need for the study of motor bus and street railway transportation in order that these classes of transportation may be correlated and co-ordinated with a rapid transit system.

Important studies yet to be made

In order to make specific recommendations it will be necessary to make very careful study of the following:

1—An analysis of the mass of figures and information contained in the traffic count.

2—A physical survey, including the determination of surface and sub-surface conditions, borings, etc.

3—A definite plan and a complete layout of routes showing type and design of tunnels, subways, stations and other constructions.

4—Type of electrical operation and equipment.

5—Estimate of cost of construction and equipment.

6—Methods of operation; public ownership and public operation; public ownership and private operation; private ownership and private operation.

7—Methods of financing—private capital; State bonds; assessment district for area benefitted; or some combination of two or more of these sources of finance; or by methods similar to those planned by the Port Authority.

It will be necessary to have further conferences with the heads of various railroads, with officials of the various municipalities affected, as well as with New York City, and with such companies as may be interested in the ownership and operation of such a system as suggested, or similar system, and with such agencies as may be affected.

The Commission believes that this work should be continued to completion.

Respectfully submitted,

Bertram H. Saunders
Chairman.

D. A. Gruber
Vice Chairman.

Herbert S. Swan
Secretary.

Hannibal Ross.

Walter McDear

Spaulding Frazer.

H. Hatcher