

FOR REFERENCE

A--3 (

CIVIL SERVICE COMMISSION
NOT TO BE TAKEN FROM THIS ROOM

.90
T764
1926b

RAPID TRANSIT

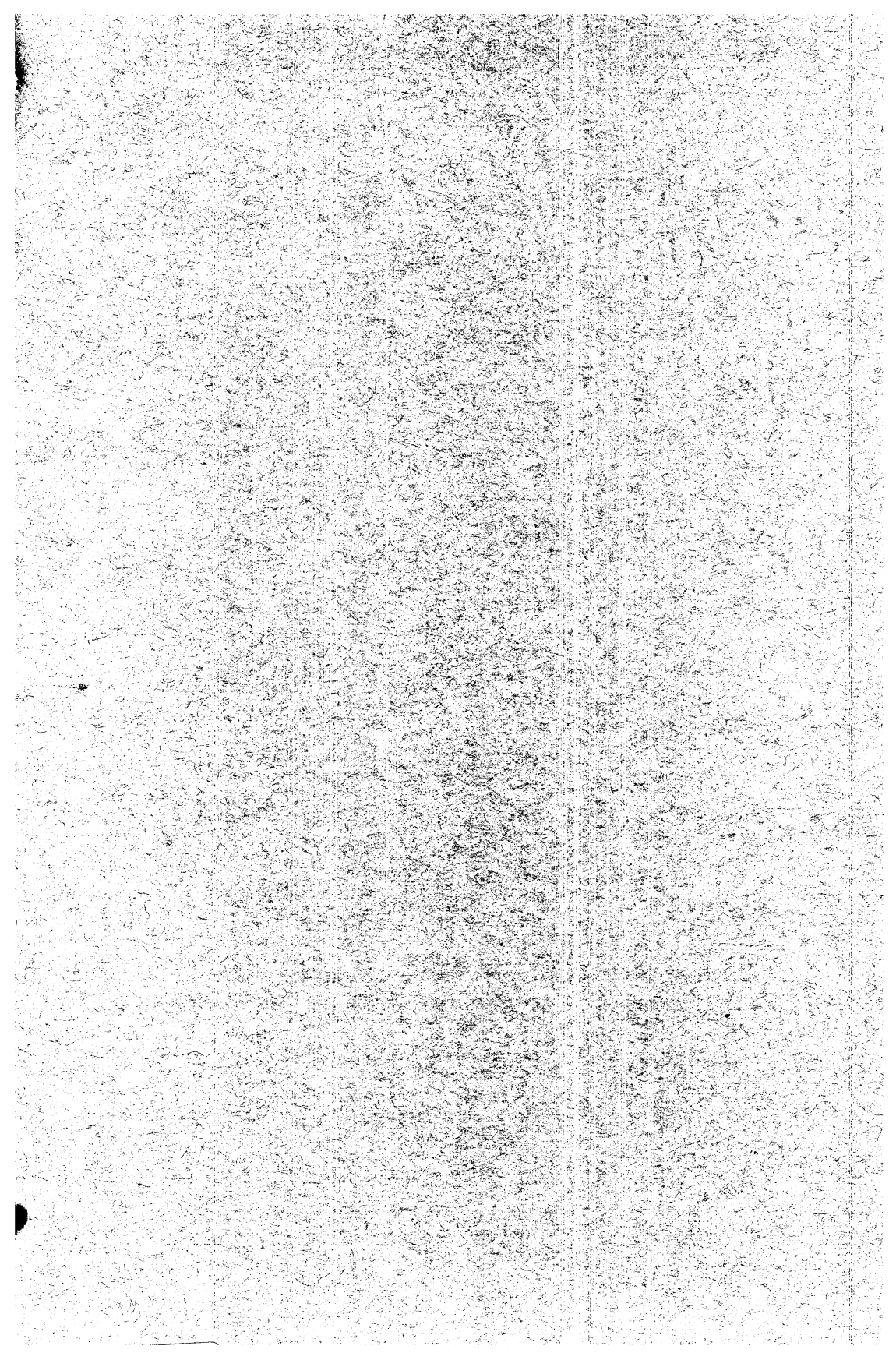
For
Northern New Jersey

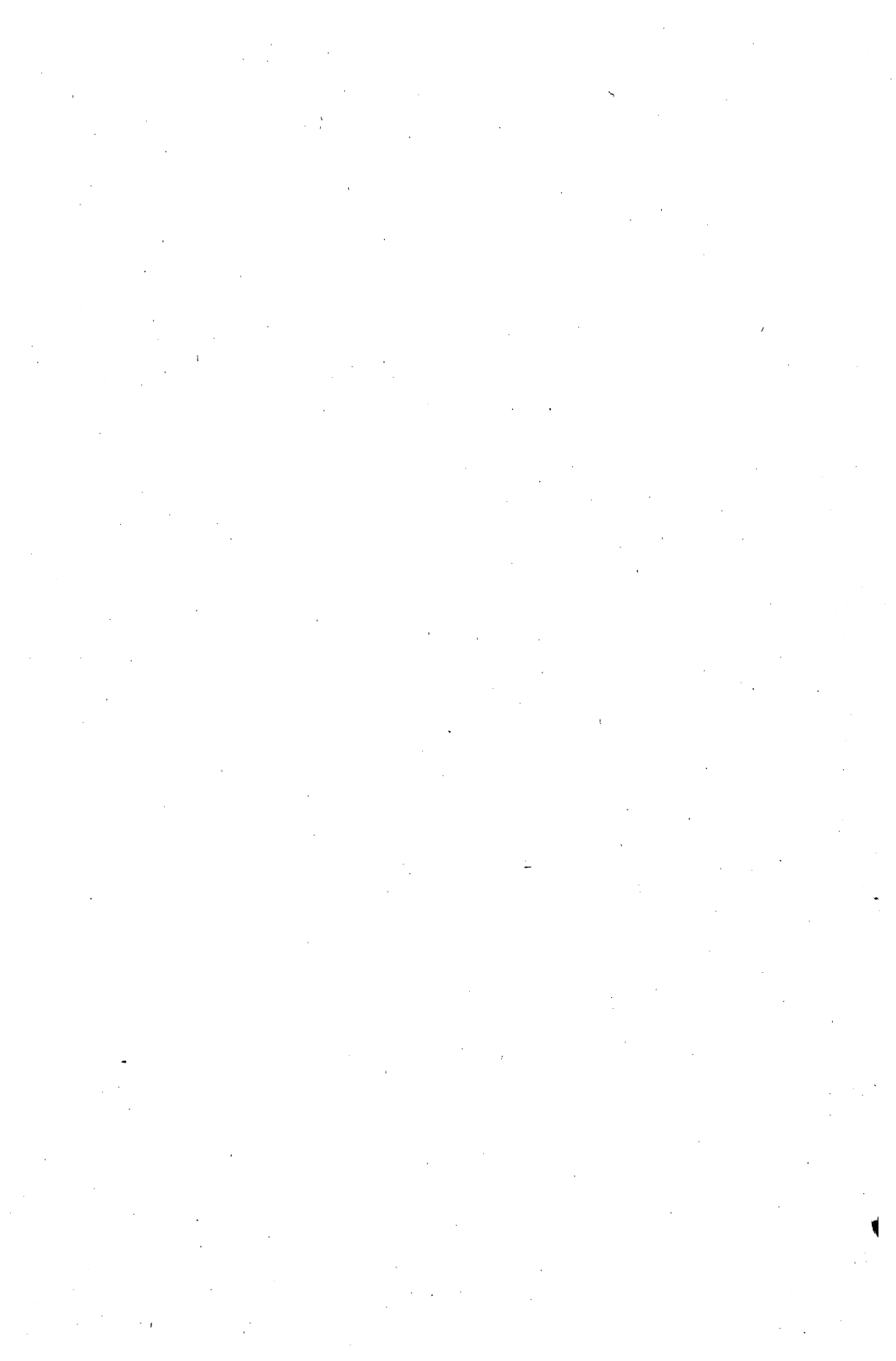
974.90
T764
1926b

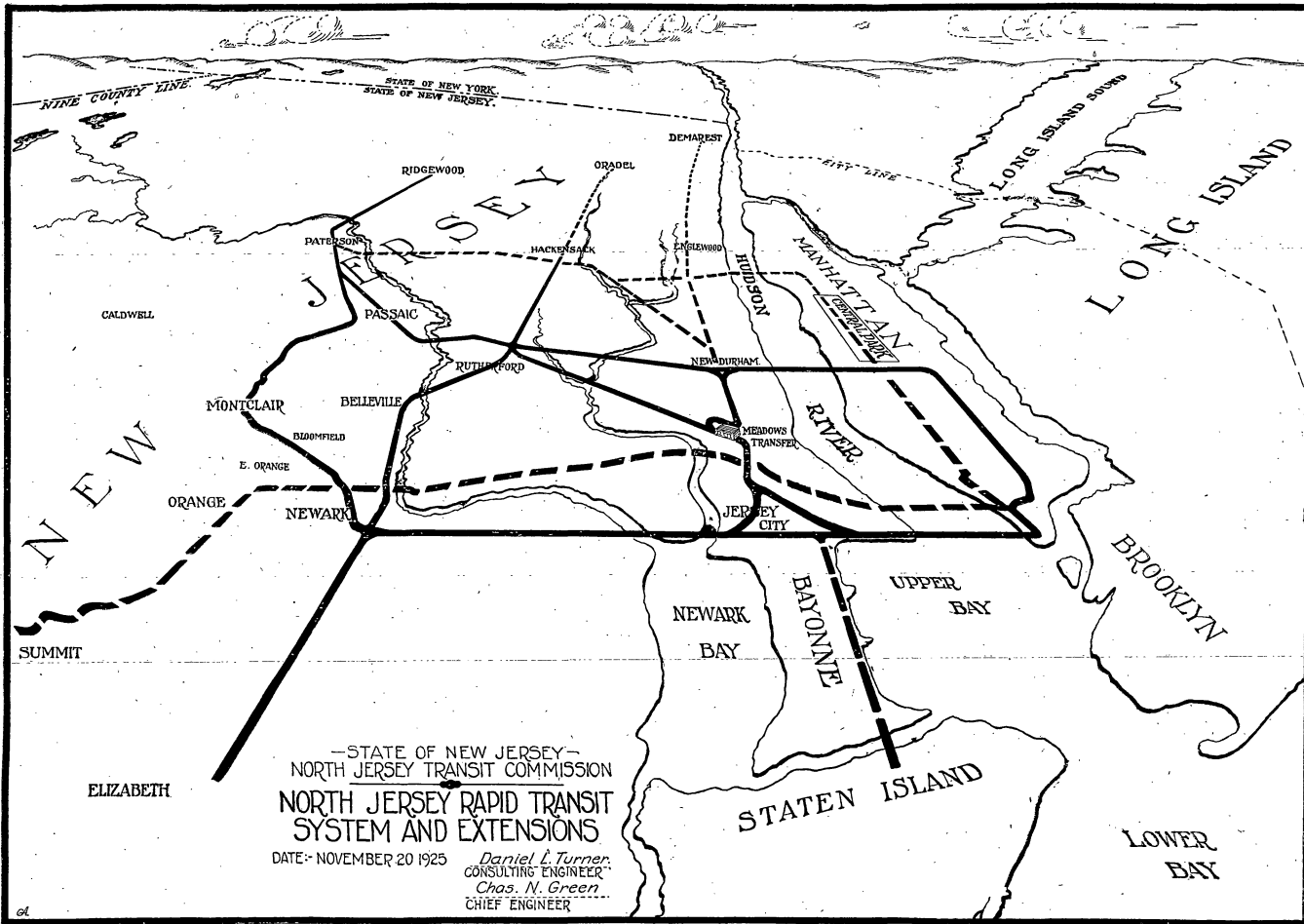
Summary of 1926 Report
OF
NORTH JERSEY TRANSIT COMMISSION

JANUARY 15, 1926

New Jersey State Library







SUMMARY OF 1926 REPORT
OF THE
North Jersey Transit Commission
to the
Senate and General Assembly
of the State of New Jersey



Commission

BERTRAM H. SAUNDERS, *Chairman*

DANIEL A. GARBER,
Vice-Chairman

HERBERT S. SWAN,
Secretary

ARCHIBALD COX,
WALTER M. DEAR,

SPAULDING FRAZER,
H. HATCHER.



A. W. COFFIN, *Executive Secretary*

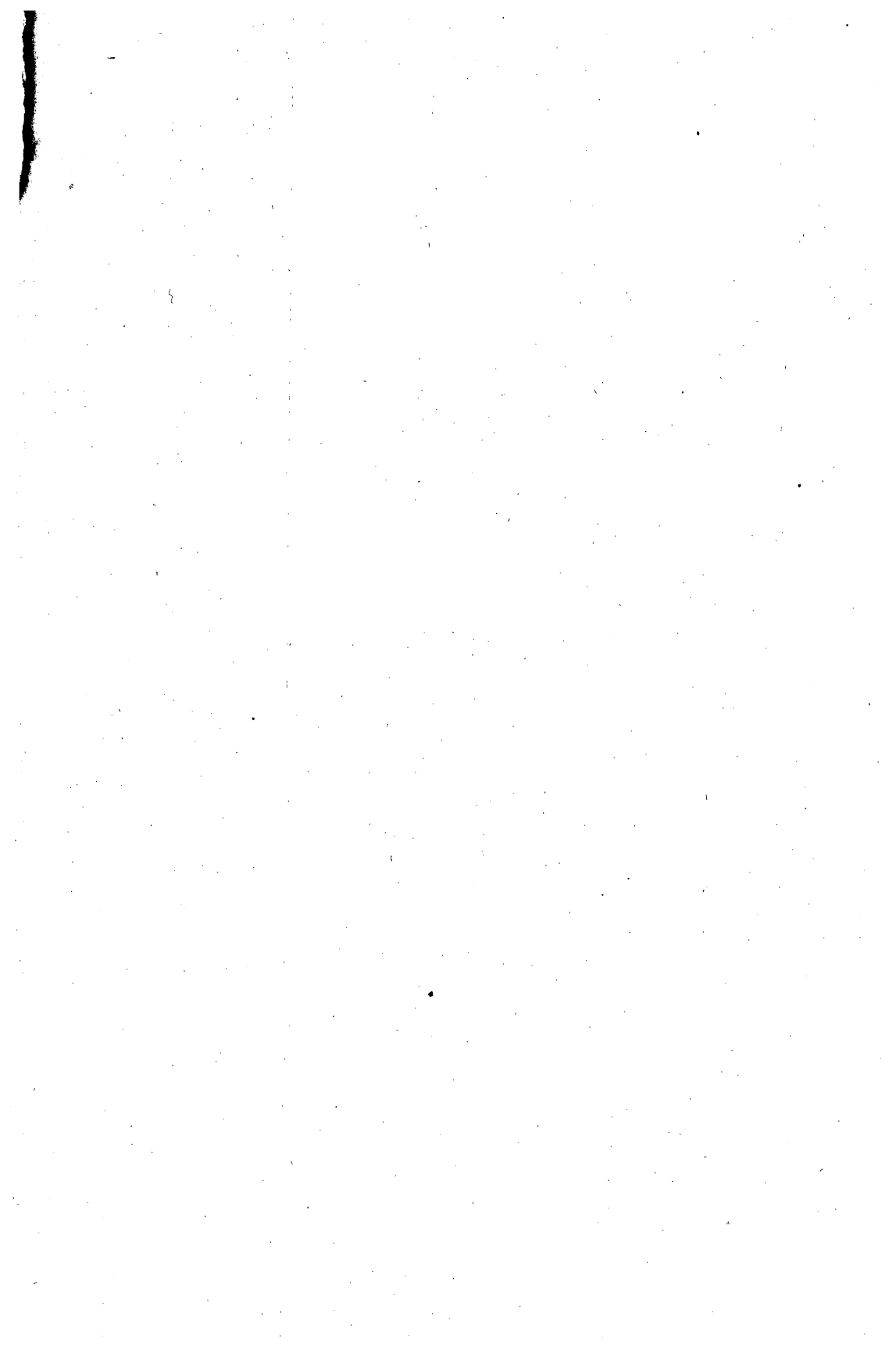
CHARLES NEWTON GREEN,
Chief Engineer

GLENN S. REEVES,
Asst. Chief Engineer.

DANIEL L. TURNER, *Consulting Engineer*

OFFICE: 1 NEWARK ST., HOBOKEN, N. J.

JANUARY 15, 1926



Letter of Transmittal

*To the Senate and General Assembly
of the State of New Jersey,*

*Through His Excellency,
Governor A. Harry Moore.*

HONORABLE SIRs:

Pursuant to the provisions of Chapter 104 of the Laws of 1922 and of Joint Resolution number 3 of the Legislative Session of 1925, the North Jersey Transit Commission transmits herewith its report* embodying the engineering features of a comprehensive plan for passenger transit between communities within the nine northern counties comprising the district within the jurisdiction of the North Jersey Transit Commission and also between the communities within this district and the City of New York.

The work of the Commission during the past year has dealt largely with the engineering features of a proposed transit plan. Necessarily this work has been of a technical character and the North Jersey Transit Commission believes that the report of Mr. Daniel L. Turner, the Commission's Consulting Engineer, and Mr. Charles N. Green, its Chief Engineer, to the Commission would more clearly set forth the scope of its work than any presentation by the Commission itself. The Engineers' plan has received the careful consideration of the North Jersey Transit Commission and is transmitted to the Legislature with its approval and as the report of the Commission, although, necessarily, as to the location of the proposed line in Manhattan, the recommendation is not intended to be final.

The Commission is gratified to be able to transmit with the report of its engineers, a criticism** of that report, generously made by Colonel William J. Wilgus, whose eminence in the field of rail transportation is well known. It is a source of no little satisfaction that Colonel Wilgus, while making certain constructive suggestions regarding subsequent extensions, has endorsed most cordially the Commission's plans.

While the report deals primarily with a comprehensive scheme of rapid transit, incidental reference is made to suggested plans of financing. To this very important phase of the work the Commission

* Report of North Jersey Transit Commission to the Senate and General Assembly of the State of New Jersey, Jan. 15, 1926. A summary of this report is presented herewith.

** This criticism is to be found in Complete Report of the Commission to the 1926 Legislature but is not given in the Summary presented herewith.

has given considerable thought. Due, however, to its limited powers and its inability authoritatively to deal with the railroads and to negotiate officially with the proper authorities of New York City and State, no definite scheme of financing could be determined. Informal discussions have been held with the Port of New York Authority, the New York Transit Commission, New York Board of Transportation, the Westchester County Transit Commission and their respective engineers, as well as with the New York State Suburban Transit Commission, established last year by the New York Legislature. Without exception, in all these conferences the North Jersey Transit Commission has been graciously received and a spirit of co-operation has been evidenced by all parties.

Similarly in regard to the position of the railroads, the Commission has continued to confer with the executives of the Hudson & Manhattan, the Interborough and Brooklyn-Manhattan Transit Systems, the Public Service Railway and the trunk lines entering the territory and by their co-operation has had the advantage of an advisory group of engineers representing the several railroad interests from whom most valuable criticisms of tentative plans have been received.

With the comprehensive plan herewith transmitted as the basis of a solution of the transit problem for Northern New Jersey, the continuation of the work should be carried on by a Commission with sufficient authority to negotiate and report for the approval of subsequent Legislatures a plan of interstate relationship, railroad co-operation and method of financing.

Respectfully submitted,

The North Jersey Transit Commission.

BERTRAM H. SAUNDERS,
Chairman.

D. A. GARBER,
Vice-Chairman.

HERBERT S. SWAN,
Secretary.

ARCHIBALD COX,
WALTER M. DEAR,
SPAULDING FRAZER,
H. HATCHER.

January 15, 1926.

FOREWORD.

For the convenience of those desiring to know quickly the conclusions reached and the resulting recommendations of the North Jersey Transit Commission after its studies of the transit problem of Northern New Jersey, this summary of the Engineers' report is printed. The purpose of that report is

- To develop and discuss the transit needs of the Northern New Jersey area now, and for the future;
- To recommend for immediate construction such facilities as the traffic conditions seem to require;
- To submit the probable operating results of the proposed Initial Transit Project with a suggested operator;
- To suggest the several methods of financing the project that might be adopted;
- To recommend how the Initial Transit Project should be expanded into a more complete system;
- To indicate what emergency facilities might be proceeded with in the event that the recommended plan cannot be started at once, and finally,
- To show how the transit facilities for the Northern New Jersey area can be developed into a comprehensive system for the future.

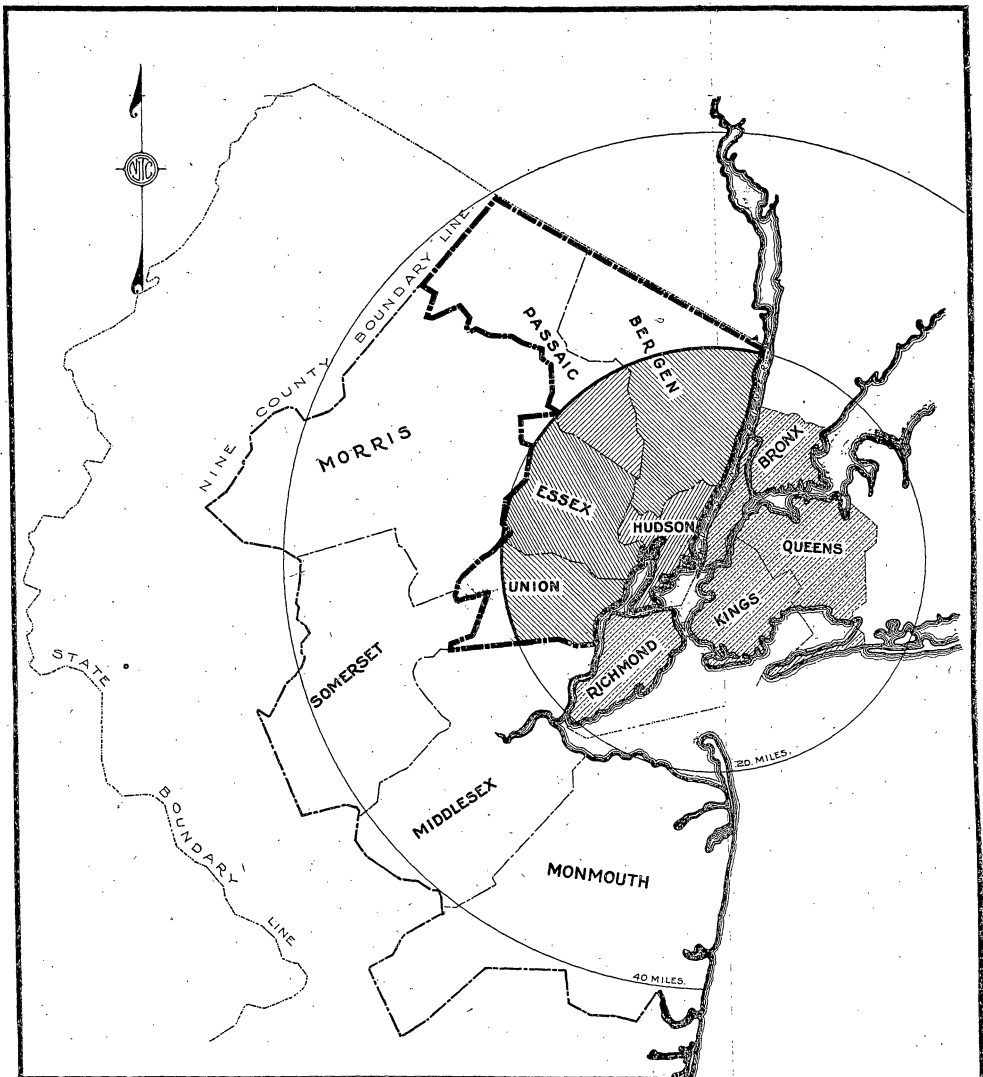
The report to the State Legislature deals exclusively with the Northern New Jersey problem. But the recommendations and suggestions for transit development for Northern New Jersey have always been considered in connection with the Suburban Transit Problem of the Metropolitan District as a whole. The Northern New Jersey-Manhattan facilities will co-ordinate with those that will ultimately be required for Westchester and for Long Island, on the assumption that the people from all of these outlying metropolitan areas will wish to be served in Manhattan as nearly alike as practicable. This means by facilities that will circulate and distribute the majority of the traffic from all directions most conveniently to its destination in Manhattan without transfer.

Some of the recommendations included in the report are modifications or amplifications of ideas that have been expressed by others.

To reach the conclusions and recommendations submitted it has been necessary to accumulate and study a large amount of statistical material; to conduct a traffic survey in co-operation with all the railroads traversing the area; to make a great many studies, estimates and diagrams; and to confer with many railroad officials and others interested.

Daniel L. Turner,
Consulting Engineer.

Chas. Newton Green,
Chief Engineer.



LEGEND

- State Boundary Line
- Nine County Boundary Line
- Five County Boundary Line
- North Jersey Rapid Transit Area.
- ▨ New York City.

Outer Ring Counties

Morris
Somerset
Middlesex
Monmouth

Inner Ring Counties

Bergen
Passaic
Essex
Hudson
Union

— STATE OF NEW JERSEY —
NORTH JERSEY TRANSIT COMMISSION.

**MAP OF NORTHERN NEW JERSEY
SHOWING THE AREA OF
NINE COUNTIES UNDER STUDY.**

DATE: NOVEMBER 20-1925.

Daniel L. Turner.
CONSULTING ENGINEER.

PLAN NO. T-125
FILE. D-3

Chas. N. Green
"CHIEF" ENGINEER.

Summary of Report on Rapid Transit

Submitted to

Senate and General Assembly of the
State of New Jersey

Justification for Transit Development.

Population follows transportation and conversely transportation must be supplied to induce population. The better the transportation the larger the population and the greater the use of the land, and consequently the more valuable the land becomes. 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.

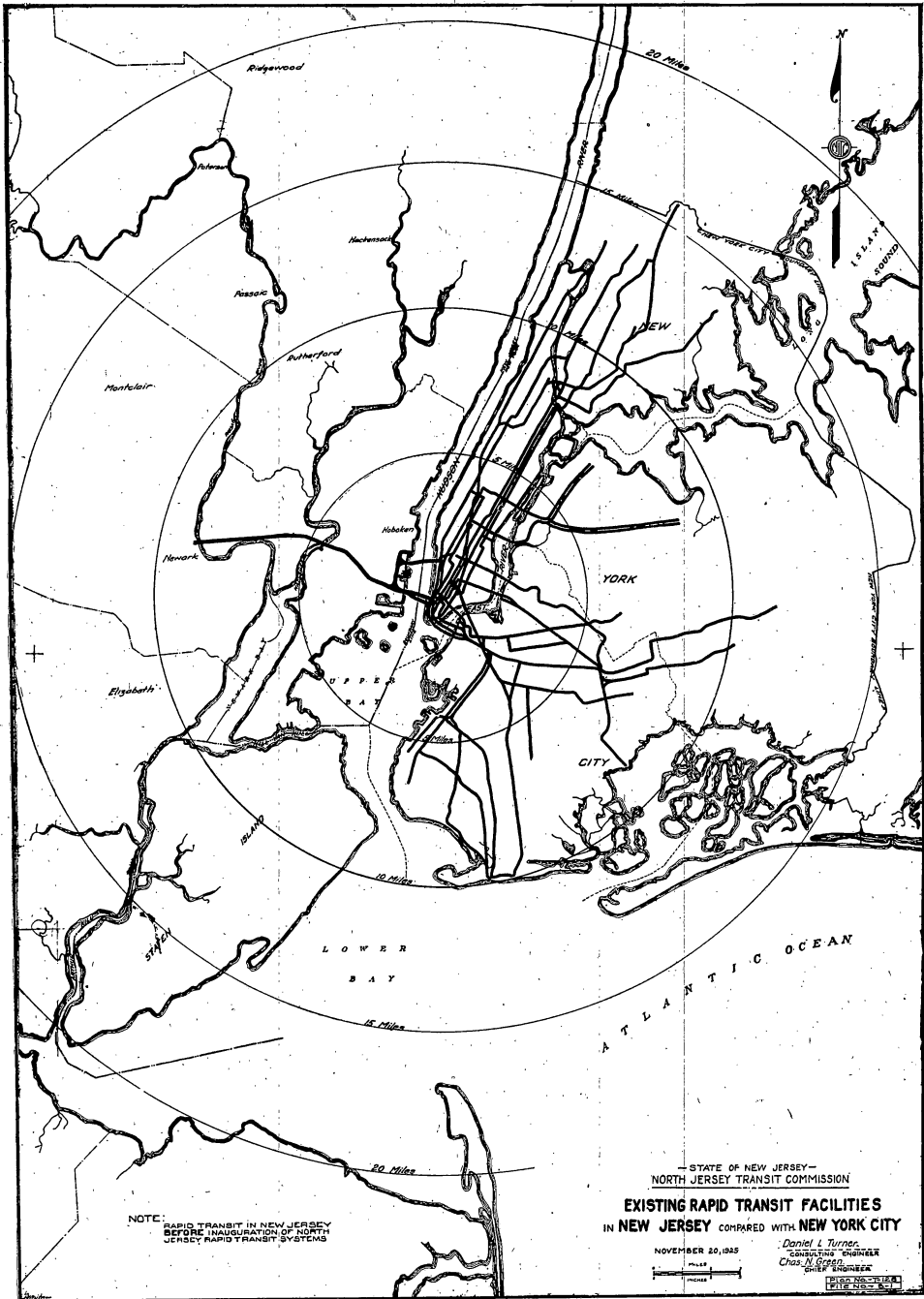
After a full study of the problem the following findings and conclusions have been reached with respect to the Northern New Jersey Transit Problem:

Characteristics of Northern New Jersey Area.

Improved transit for Northern New Jersey at first means rapid transit facilities that will traverse parts of the **Inner Ring** of five counties immediately opposite and nearest New York City, namely:

Hudson,
Essex,
Bergen,
Passaic,
Union.

The entire Northern New Jersey area that has been included in the transit studies consists of the nine counties



within the 40-mile circle from the City Hall, Manhattan. The **Inner Ring** that should be directly served first, has

Area	706 square miles
	31 per cent of 9 counties,
	9 per cent of the State.
Population	1,951,000
	83 per cent of 9 counties,
	62 per cent of the State.
Tax Ratables.....	\$3,122,000,000
	87 per cent of 9 counties,
	66 per cent of the State.

Northern New Jersey Not Half Developed.

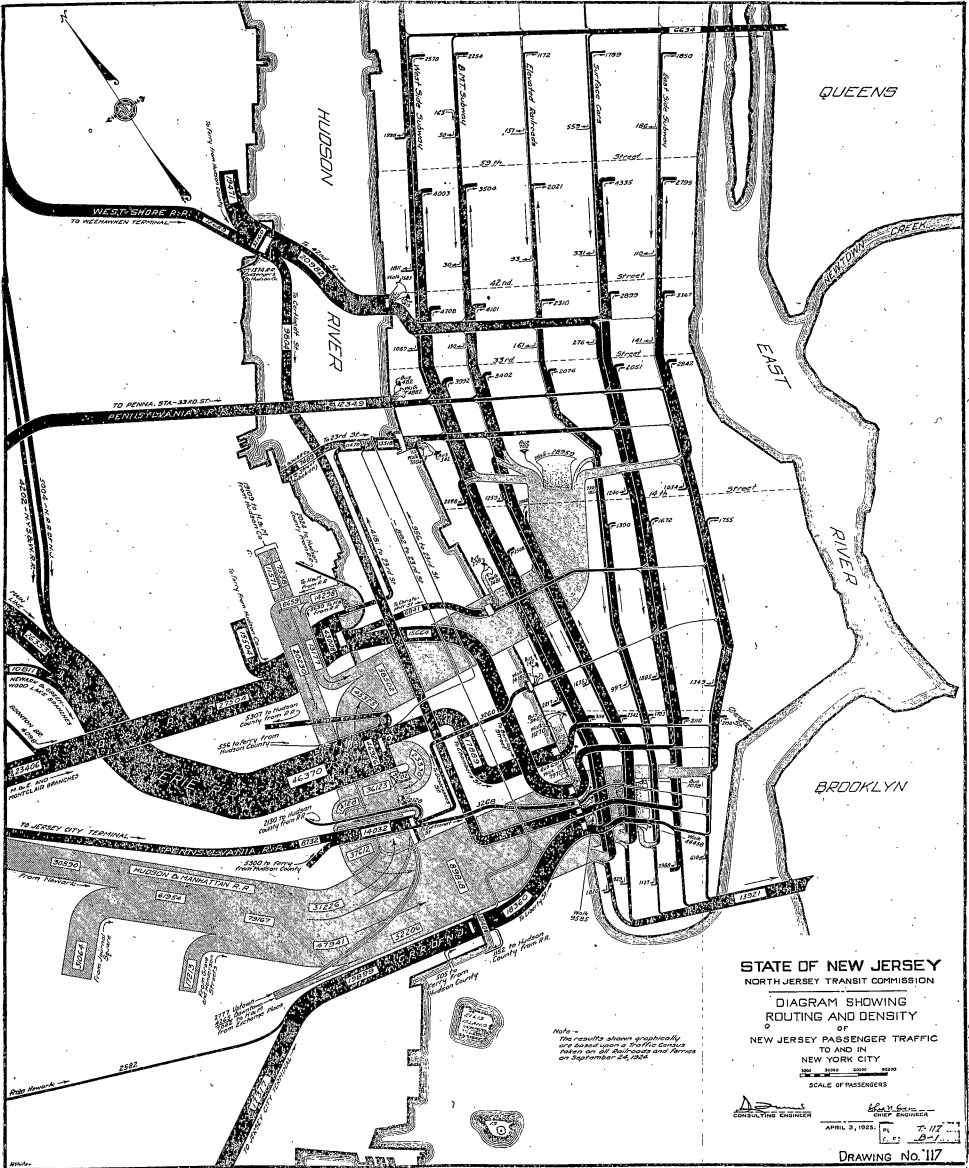
Most of the **Inner Ring** is within the 20-mile circle from the City Hall, Manhattan, that also circumscribes New York City. Despite this fact it is not half developed, chiefly because it lacks rapid transit facilities. New York is served with over 600 track miles of rapid transit lines, New Jersey with only 28. With equal service the New Jersey area now would probably have 4,500,000 population instead of about 2,000,000.

Suburban Railroad Facilities Saturated.

The commuter railroad facilities now serving the Northern New Jersey area are almost saturated during the rush hours. Trains are arriving at the principal railroad terminals at shorter intervals than they are being operated in the New York subways on a single track. The interval in the subways is 1 min. 48 sec. Trains arrive at the New Jersey terminals of the

Erie R. R.....	at 1 min. 18 sec. intervals
Central R. R. of N. J.....	at 1 min. 46 sec. intervals
Lackawanna R. R.....	at 1 min. 53 sec. intervals

During the past 10 years railroad traffic has increased at the average rate of about four per cent per year. This means an increase before any relief can be obtained of nearly one-



third above the existing traffic within the next seven years. **Therefore, the start of relief measures is urgently needed.**

Terminal vs. Through Service.

All central terminal services for commuters should be abandoned as soon as practicable and through services substituted for them, so that the Northern New Jersey population may be circulated and distributed in Manhattan just as effectively as city rapid transit facilities now circulate and distribute the city population.

A central terminal service in principle is the worst kind of service that can be furnished to commuters because it does not distribute them in the business center and completely isolates the surrounding metropolitan areas from each other. The Hudson & Manhattan system is the only transit facility serving Northern New Jersey that furnishes its riders with a through service into and through Manhattan. The New Jersey area needs more of this kind of service. The **NORTH JERSEY RAPID TRANSIT SYSTEM** is intended to furnish it.

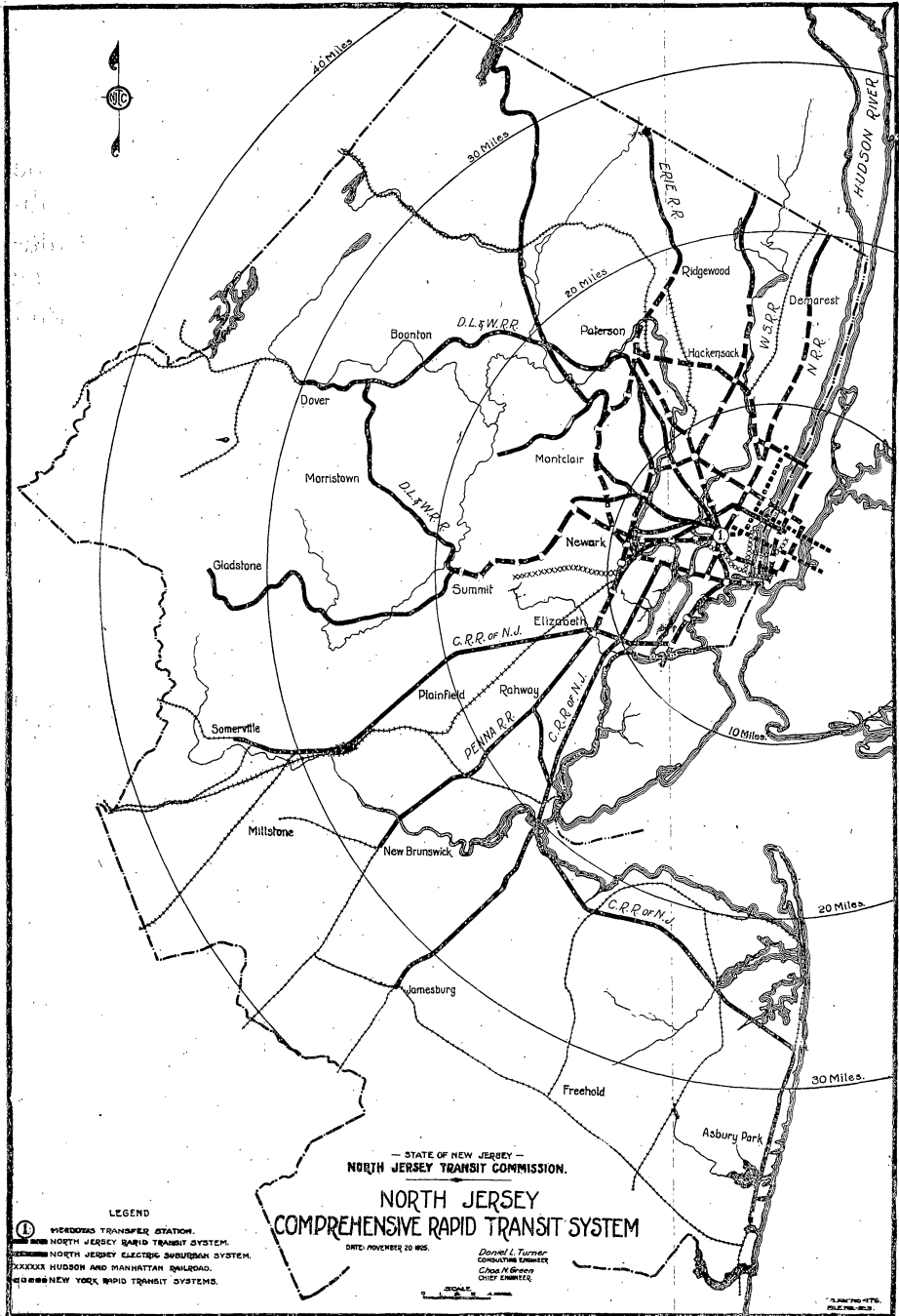
Routing of New Jersey Transit Lines in Manhattan.

The first additional transit facilities provided for Northern New Jersey should

1. Enter Manhattan at or as near the Battery as practicable.
2. Route the long way through Manhattan at least far enough to serve the district up to 59th Street.

By this routing the maximum number of passengers may be delivered to their destinations with a minimum walk and a minimum use of other facilities.

This conclusion was reached after a careful study of the traffic survey results, and also in view of the fact that the Manhattan business district is now four times longer than it is broad. It is probably destined in the future to be seven times longer than it is broad.



Comprehensive Transit System Must Be Visualized First.

A comprehensive system must be visualized before an initial system can be started, in order that each succeeding extension of the initial system may not be a misfit with what went before.

In developing a comprehensive transit system for the Northern New Jersey area there are really three transit problems to be considered, as follows:

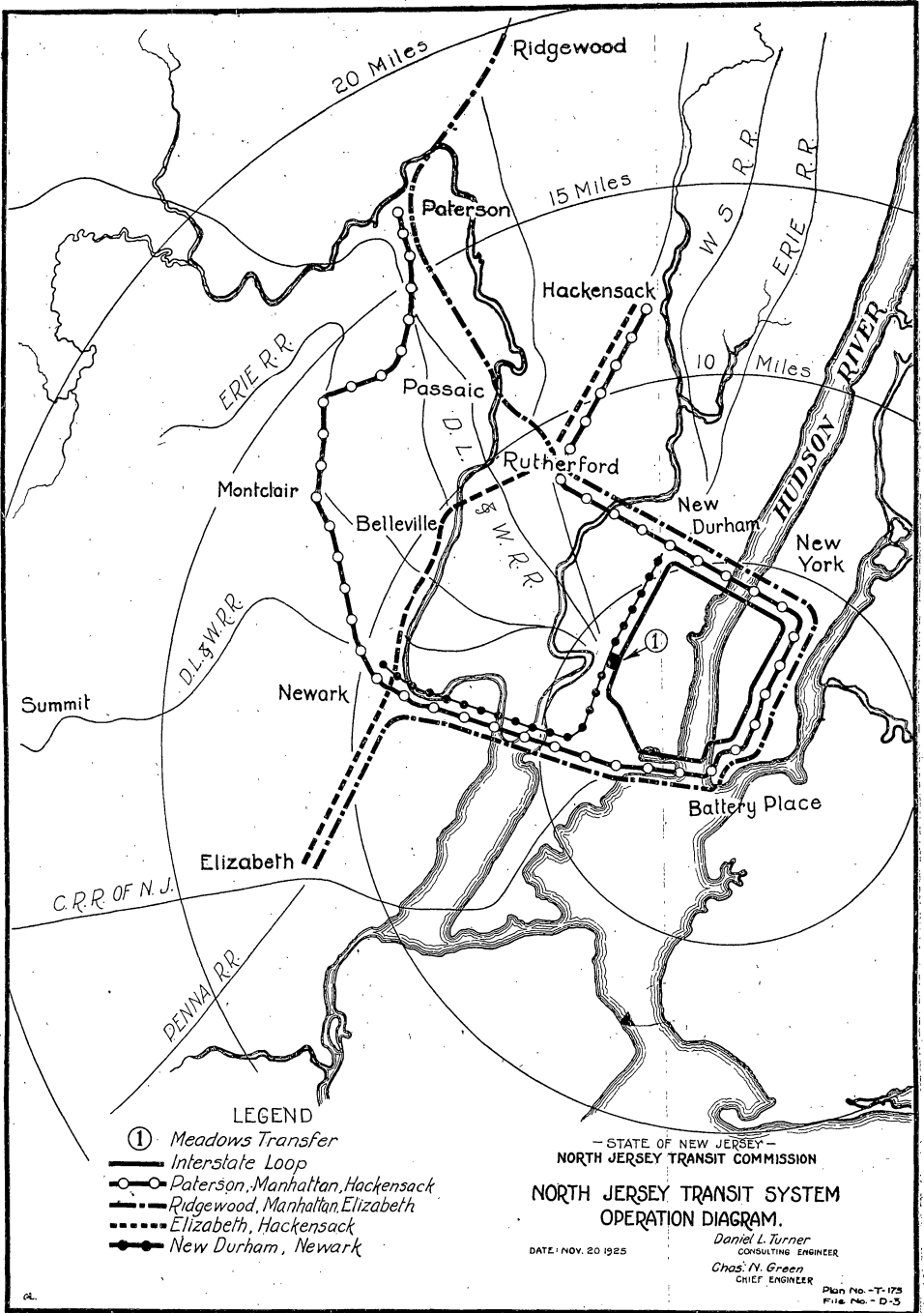
1. To furnish Intra-Northern New Jersey rapid transit facilities for the **Inner Ring** Area immediately contiguous to Manhattan, and at the same time, to connect this area with Manhattan by rapid transit facilities comparable as to service with that now being supplied into Manhattan from the Boroughs of Brooklyn, Bronx and Queens of New York City.
2. To provide eventually for a commuter or suburban transit service for the **Outer Ring** that will deliver its passengers directly into and through Manhattan in the same convenient way as will be done by the rapid transit facilities proposed for the **Inner Ring**.
3. To utilize the existing rapid transit facilities—the Hudson & Manhattan, the Interborough and the Brooklyn-Manhattan Systems—for the benefit of the New Jersey area either more effectively where already used, or as advantageously as practicable where not now used.

The Proposed Comprehensive Transit System.

As a result of the study of the three Northern New Jersey transit problems, a comprehensive system composed of the following six principal parts has been produced as a necessary guide for the present and future transit development:

1. **NORTH JERSEY RAPID TRANSIT SYSTEM**—supplying an Intra-Northern New Jersey and Manhattan-bound rapid transit service for the **Inner Ring** of Counties.

INTER-STATE LOOP—being the initial construction of the **North Jersey Rapid Transit System** and the first step towards a rapid transit service and improved commuter service for Northern New Jersey.



2. **HUDSON & MANHATTAN RAILROAD EXTENSIONS** in New Jersey.
3. **INTERBOROUGH EXTENSIONS** of their Manhattan lines to New Jersey.
4. **BROOKLYN-MANHATTAN TRANSIT SYSTEM EXTENSION** from Manhattan to New Jersey.
5. **EXTENDED NORTH JERSEY RAPID TRANSIT SYSTEM**—extending the advantages of rapid transit service to a larger New Jersey area.
6. **ELECTRIC SUBURBAN SYSTEM** for commuters from the **Outer Ring** of counties—furnishing a through service into and up and down Manhattan, obtained by electrifying the existing railroad facilities.

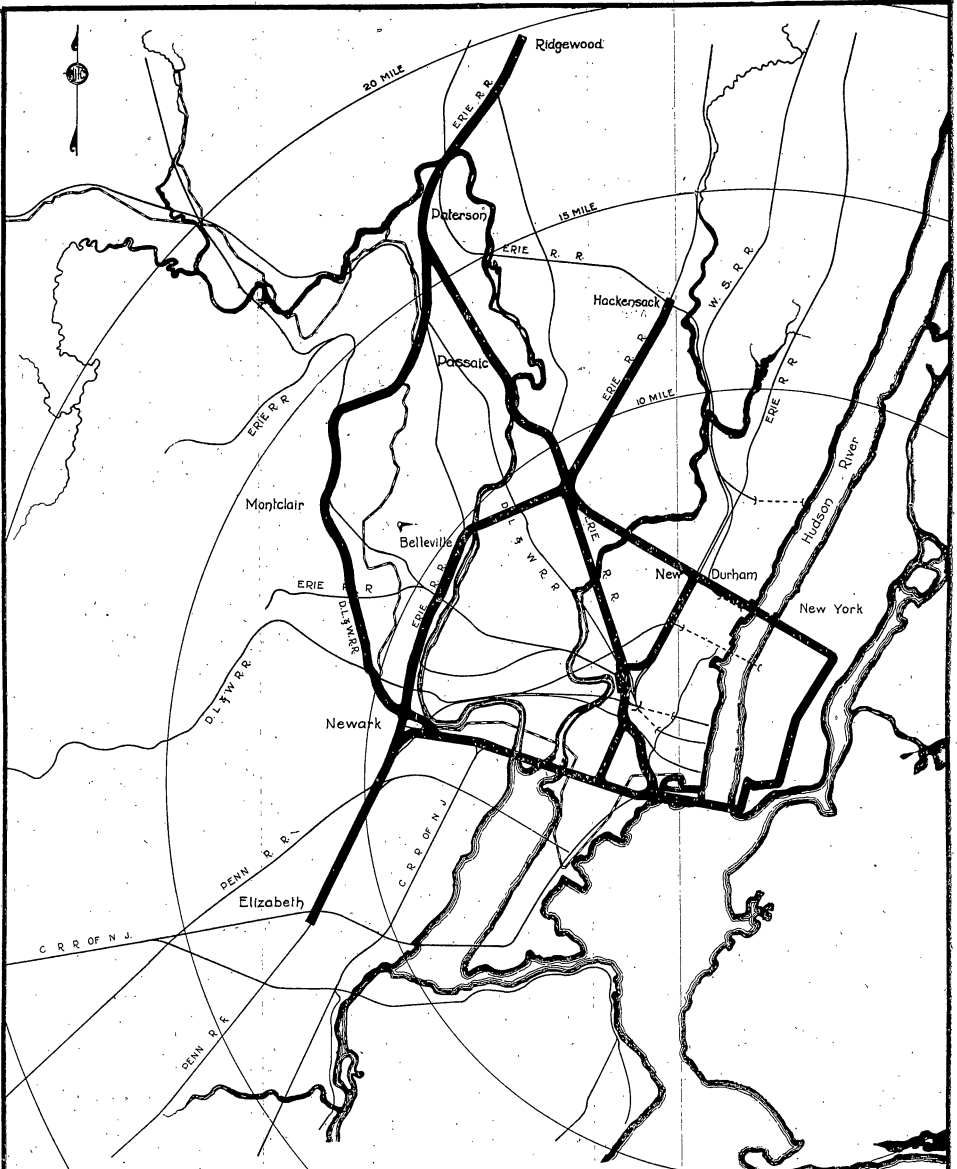
THE NORTH JERSEY RAPID TRANSIT SYSTEM

(Part 1 of Comprehensive System.)

The **North Jersey Rapid Transit System** is designed to furnish Intra-Northern New Jersey and Manhattan-bound rapid transit facilities for the **Inner Ring** of counties. It consists of the following five lines:

	Route Miles
I. INTER-STATE LOOP LINE —from Meadows Transfer, to the Central R. R. of N. J. Station, the Battery, up through Manhattan, 57th Street, New Durham, back to Meadows Transfer and in the reverse direction.....	17.3
II. PATERSON, MANHATTAN, HACKENSACK LINE —from Paterson, through Montclair, Newark, Central R. R. of N. J. Station, the Battery, up through Manhattan, 57th Street, New Durham, Rutherford, to Hackensack and return	41.9
III. RIDGEWOOD, MANHATTAN, ELIZABETH LINE —from Ridgewood, through Paterson, Passaic, Rutherford, New Durham, 57th Street, down through Manhattan, the Battery, Central R. R. of N. J. Station, Newark, Elizabeth and return	39.8

Note:—From Rutherford Manhattan-bound, this line may take a short cut route directly to Meadows Transfer and thence to Manhattan over the Inter-State loop.



— STATE OF NEW JERSEY —
NORTH JERSEY TRANSIT COMMISSION.
NORTH JERSEY
RAPID TRANSIT SYSTEM.

DATE: NOVEMBER 20 1925.

Daniel L. Turner
 CONSULTING ENGINEER.
Chas. N. Green
 CHIEF ENGINEER.

PLAN NO. T-1157
 FILE NO. 10-5

IV. ELIZABETH, HACKENSACK LINE —from Elizabeth, through Newark and Rutherford to Hackensack and return.....	18.8
V. NEW DURHAM, NEWARK LINE —from New Durham, through Meadows Transfer to Newark and return.....	13.0
	<hr/>
Total	130.8
Some of these routes operate over the same tracks with others. The total duplicated mileage amounts to	48.2
Leaving a net total route mileage of.....	82.6

Advantages of the North Jersey Rapid Transit System.

The North Jersey Rapid Transit System will have the following advantages:

1. TRANSIT SERVICE WITH DISTRIBUTION IN MANHATTAN WITHOUT TRANSFER.

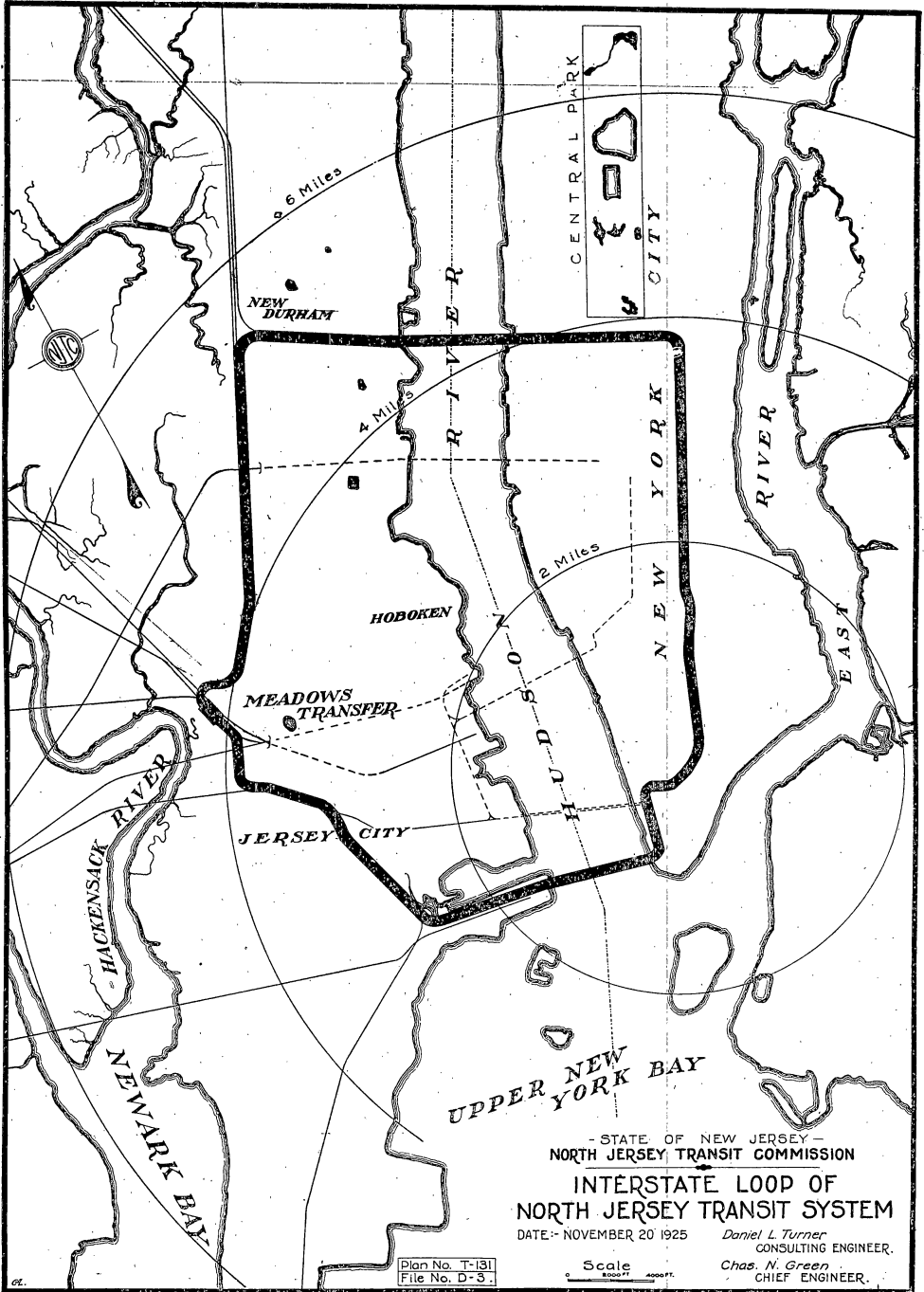
Three of the lines—**Lines I., II. and III.**—will operate as through lines and, therefore, will furnish a through service from one outer terminal, through Manhattan from the Battery to 57th Street—or vice versa—to the other outer terminal and return, just as the Interborough's lines now operate from the Bronx through Manhattan to Brooklyn and return.

2. INTER-STATE LINE AS FIRST STEP OFFERS DISTRIBUTION IN MANHATTAN WITH A SINGLE TRANSFER.

Line I. alone, if the other lines of the system are not immediately constructed, will furnish the commuters from both the **Inner and Outer Rings**, or from the entire Northern New Jersey area, with a through Manhattan service from the Battery to 57th Street, from the Meadows Transfer Station by interchange of passengers from the steam railroad trains.

3. INTER-STATE LINE OF COMPLETED SYSTEM OFFERS DISTRIBUTION IN MANHATTAN TO OUTER RING.

Line I. as a part of the completed system will perform its principal function of furnishing the commuters from the **Outer Ring** of counties not furnished directly by the system with a through Manhattan service from the Meadows Transfer Station as before.



- STATE OF NEW JERSEY -
 NORTH JERSEY TRANSIT COMMISSION
**INTERSTATE LOOP OF
 NORTH JERSEY TRANSIT SYSTEM**
 DATE: - NOVEMBER 20 1925

Daniel L. Turner
 CONSULTING ENGINEER.
Chas. N. Green
 CHIEF ENGINEER.

Plan No. T-131
 File No. D-3

Scale
 1" = 1 MILE

4. INTRA-CITY COMMUNICATION THROUGH NEWARK.

Line IV. will provide a cross country service connecting Lines II. and III. at about their center points in the Northern New Jersey area, and pass through Newark, the population center of the area, thereby greatly aiding the System to encourage and develop an Intra-Northern New Jersey traffic.

5. INTRA-CITY COMMUNICATION THROUGH NEWARK AND THE PALISADES SECTION.

Line V. will afford Jersey City and the Bergen County Palisades section, by means of transferring at the New Durham station, with convenient access to Newark and again help to induce Intra-Northern New Jersey traffic.

6. INTRA-CITY COMMUNICATION IN ANY PART OF THE AREA WITH ONE TRANSFER.

From any station on any line of the System one can reach all other stations on any other line by means of transferring once from one line to another at one of the eight transfer stations.

7. RAPID TRANSIT SERVICE FOR 83% OF POPULATION IN NINE COUNTIES.

Consequently this system will furnish a completely articulated Intra-Northern New Jersey and also Manhattan-bound rapid transit service for the Inner Ring area, or, either directly or indirectly for a Northern New Jersey population of about 2,000,000, or 83 per cent of the population of the nine counties, or 62 per cent of the population of the State, or a population nearly as large as that of Manhattan.

Inter-State Loop First Construction Step.

The cost of the North Jersey Rapid Transit System is too great to permit it all to be proceeded with as a single project. It must be completed progressively. Line I. constitutes the Manhattan circulating and distributing unit for the whole system. It is the line that will render more service to the INNER RING commuters than any other single line. It is also the line that will best serve the OUTER RING commuters. For these reasons, therefore, Line I. or the Inter-State Loop, is logically the first construction step.

Inter-State Loop Route.

The Inter-State Loop Line will start and end at the Meadows Transfer Station. Its route will be as follows:

From Meadows Transfer south along the Susquehanna right-of-way, Pennsylvania right-of-way, National Dock Railway to tunnel portals near Johnston and Jersey Avenues, Jersey City, under the Hudson River to the Battery in Manhattan, under private property, Washington Street, private property Barclay Street, Park Row, private and city property, Mulberry Street, Lafayette Street, Irving Place, Lexington Avenue, 57th Street, under Hudson River, under the Palisades to New Durham and along the Susquehanna right-of-way to Meadows Transfer.

The Loop will be a two-track line except for the short distance from the Meadows Transfer to the Pennsylvania right-of-way where it will be four-tracked to permit the Hudson & Manhattan Company to operate trains to and from the Meadows Transfer Station. It will be 17.3 miles long, 6.5 miles of which is in Manhattan.

Inter-State Loop Distributes Traffic North and South in Manhattan.

The Loop route will be a through service route in Manhattan, and will run up and down Manhattan the long way through the business district, not the short way across town. This is the most important thing from the standpoint of distributing the traffic effectively.

Inter-State Loop Stations.

As an added convenience to its passengers, the **Inter-State Loop** will be located in deep tunnel under the Interborough East Side Subway. This subway has 18 stations from the Battery to 59th Street. The **Inter-State Loop** will have about seven stations located as follows:

Morris Street
Brooklyn Bridge
Spring Street
14th Street
28th Street
42nd Street
54th Street

These are the principal objective points for traffic on the lines from the Battery to 57th Street. **The Inter-State Loop trains will run express.**

The location of the **Inter-State Loop** under the subway makes an easy transfer for the passengers desiring to reach intermediate points by using the Interborough local trains. Also by such transfer the **Inter-State Loop** passengers can conveniently reach all points in the greater city touched by the Interborough lines.

Besides the seven stations from the Battery to 57th Street there will be two stations, one at 7th and 8th Avenues and one at 11th Avenue on the line crossing through 57th Street, and five in New Jersey, making 14 loop stations altogether, nine of which will be in Manhattan. The five stations in New Jersey are

Bergenline Avenue
New Durham
Meadows Transfer
Journal Square
Central Railroad of New Jersey

The heavy traffic stations will be constructed on the reservoir principle to permit the maximum line capacity to be developed.

Meadows Transfer Station.

The Meadows Transfer Station will be the chief entrance point in the **Inter-State Loop**. A second will be at the Central Railroad of N. J., and a third at New Durham for some of the trains of the Northern, Susquehanna and West Shore Railroads. **The Meadows Transfer will in no sense be a terminal station.** It will serve for the transfer of passengers from the steam trains to the rapid transit trains to complete their journey to and through Manhattan. With the completion of the entire North Jersey Rapid Transit System it will be a transfer point for the suburban passengers from the **Outer Ring** area only. The **Inner Ring** passengers then will be transported directly into and through Manhattan without

transfer by means of the **North Jersey Rapid Transit System**. There will be 18 tracks for steam trains and nine tracks for electric trains at the Meadows Transfer. It will have a capacity of 140 steam trains per hour and will accommodate all of the suburban trains now operated over the Erie, Lackawanna, New York, Susquehanna & Western, and West Shore railroads if necessary. Adequate yard facilities will be supplied nearby.

Time Advantage by Using Inter-State Loop.

With the inauguration of service on the **Inter-State Loop** by which electric trains from Meadows Transfer will enter New York City via the proposed 57th Street tunnels and the proposed Battery tunnel, the entire central section of New York City from Avenue A on the east to 9th Avenue on the west and from the Battery to 72nd Street, may be reached in 40 to 45 minutes from the Meadows Transfer Station. **There is no combination of existing rapid transit facilities that will cover as much territory in the same time.**

Cost of Inter-State Loop—Construction.

The cost of constructing the **Inter-State Loop Line** will approximate \$154,000,000. The under-river and Manhattan portions of the Loop cover approximately 85 per cent or \$130,000,000. of this cost. The work in New Jersey, although about 37 per cent of the mileage, only represents about 15 per cent, or \$24,000,000. of the cost. These figures indicate the price that the New Jersey commuters must pay for delivery into and through Manhattan. If the Westchester Transit Commission can co-operate by building their subway in Lexington Avenue, thus constructing a four-track line at the start, the construction cost of the **Inter-State Loop** can be reduced by \$22,000,000. or from \$154,000,000. to \$132,000,000.

Cost of Inter-State Loop—Equipment.

The cost of equipping the **Inter-State Loop**, exclusive of power facilities, approximates \$40,000,000. This sum should be financed by the operator. This sum added to the construction cost makes the total cost of the proposed initial rapid transit project approximate \$194,000,000.

Capacity of Inter-State Loop.

The capacity of the **Inter-State Loop** is equivalent to two two-track lines or one four-track line from New Jersey to New York, although it only consists of a two-track line up and down through Manhattan. This is because it is a two-way line and utilizes its Manhattan trackage 100 per cent. Its daily one-way capacity is

Tracks	2
Trains per hour (35 trains per track).....	70
Cars per hour (11-car trains).....	770
Passengers per hour (100 passengers per car) . . .	77,000
Daily passengers	192,500
Yearly passengers	62,500,000

From the above the **Inter-State Loop** will accommodate about 125,000,000 passengers per year both ways. This is based on a rush hour load ratio of 40 per cent of the daily one-way traffic being carried in one hour. With a rush hour load ratio of 20 per cent, a little under the present Hudson & Manhattan ratio, the annual two-way capacity of the Loop would be 250,000,000 passengers. If the **Loop** could be operated right now it has been conservatively estimated that it could develop a two-way traffic of about 128,000,000 passengers per year. It will take six or seven years at least to get such a system in operation. By that time the **Inter-State Loop** quota of the traffic will have become 160,000,000 or 170,000,000 passengers per year, assuming that the traffic continues to increase at about the same annual rate as for the last 10 years.

Financing Transit Facilities.

There are three ways in which a transit project may be financed:

PRIVATE CAPITAL may be called upon either to assist in the financing or to provide all of the money necessary;

STATE, CITY OR COMMUNITY credit may be utilized by issuing bonds; or

A BENEFIT ASSESSMENT PLAN may be used to raise the money, under which each beneficiary—the rider, the taxpayer, the land owner and the steam railroad traversed—may pay a share of the cost of the line and the service on it proportional to the benefit that each receives.

These financial plans may be used separately or in combination with each other. Recommendations with respect to financing are reserved for a later report.

Fares Necessary on Inter-State Loop.

A 10-cent fare will be possible on the **Inter-State Loop** if the interest and sinking fund charges on the construction cost can be eliminated. However, if these interest and sinking fund charges must be included, or in other words, if all of the money must be borrowed and therefore the most costly method of financing must be adopted, then a 15-cent fare will be required. Both of these fares mean a quality of service that permits a comfortable rush hour travel, not excessive over-loading. With New York subway rush hour overloading, the service can probably be furnished for a 12-cent fare, even under the most costly method of financing.

When it is realized that many of the commuters who use the Hudson & Manhattan lines and another facility in Manhattan now pay from 11 to 15 cents in fares above their railroad fares before they reach their destination, a straight 15-cent fare (if such a fare has to be resorted to) which will deliver probably two-thirds of the commuters to their destinations is not unreasonable.

Operator for Inter-State Loop.

An operator cannot be agreed upon until satisfactory terms have been negotiated. The Hudson & Manhattan Company is already operating the only rapid transit facility that New Jersey enjoys; for this reason it is a logical operator for the **Inter-State Loop Line**, and thereafter for the **North Jersey Rapid Transit System**. The Public Service Railway Company is another logical operator, for the reason that it operates almost all of the feeder facilities that could be advantageously co-ordinated with such a rapid transit system.

Inter-State Loop Only First Step in Real Rapid Transit.

It must be emphasized that the **Inter-State Loop** is only the first step in real transit improvement for Northern New Jersey. **The North Jersey Rapid Transit System must be inaugurated in its entirety before Northern New Jersey can enjoy complete rapid transit facilities.**

Broad Street Station, Newark, to Be "Times Square" of New Jersey.

The Broad Street Station in Newark at the intersection of the Paterson-Manhattan-Hackensack and the Elizabeth-Hackensack Line is one of the most important stations on the **North Jersey Rapid Transit System**. It will be the focal point in Newark for all the Newark-bound Northern New Jersey rapid transit traffic. Likewise it will be the Newark point from which traffic can reach all stations on the **North Jersey Rapid Transit System**. It will be to Newark and to Northern New Jersey what the Times Square Station is to Manhattan.

Rapid Transit System Utilizes Existing Railroad Rights-of-Way.

The existing railroad trackage traversing Northern New Jersey is to be used to the greatest extent practicable in

the rapid transit system. This is an important feature. It avoids duplication of facilities and therefore prevents economic waste. Two new tracks will be constructed along the railroad rights-of-way for the exclusive use of the rapid transit trains. At some points the two existing tracks will also be used, thus securing a four-track line at such points for express operation. This is the way that the railroad rights-of-way will be utilized for rapid transit purposes. Approximately 51 miles out of a total of 83 miles in the **North Jersey Rapid Transit System**, or about 62 per cent, of the total mileage, will be constructed along existing railroad rights-of-way in this manner, with the result that the average cost of the system in Northern New Jersey will only be about \$1,920,000 per route mile as compared with \$11,900,000 per route mile to get to and traverse Manhattan.

Cost of North Jersey Rapid Transit System.

The approximate cost of the North Jersey Rapid Transit System inclusive of the five routes will be for

Construction	\$260,000,000
Equipment	122,000,000
Total	<u>\$382,000,000</u>

This is a large sum, but only about one-third of what New York has spent and is in prospect of spending for its rapid transit facilities. The Northern New Jersey area has 2,000,000 population, New York over 6,000,000.

Temporary Transit Relief.

It is recognized that as a temporary expedient and as an emergency measure it may be necessary to start with a project requiring even a smaller expenditure than the \$154,000,000 required to construct the **Inter-State Loop Line**. In such an event, the only recourse is to utilize some of the existing rapid transit facilities, because extensions to such facilities will afford the cheapest and easiest means of securing quick temporary relief.

Battery Line as First Transit Relief.

The construction of the proposed new Battery tunnels and the continuation of the lines in New Jersey to and including the Meadows Transfer Station, which may for short be called the **Battery Line**, and which constitutes the southern part of the proposed **Inter-State Loop**, with suitable connections in Manhattan will afford the easiest, cheapest and most effective means of securing transit relief for Northern New Jersey.

Battery Line Operator.

The Battery Line logically may be operated either by the Interborough Company or the Hudson & Manhattan Company. If the Interborough becomes the operator the local tracks of the East and West Side Subways will be connected with the line at the Battery as a temporary measure—the West Side Subway by a short connection from Morris and Greenwich Streets; the East Side Subway by continuing the construction of the **Inter-State Loop Line** (of which the Battery Line is a part) as far as Vesey Street and further connecting it with the subway at Spruce Street. If the Hudson & Manhattan becomes the Operator, the **Battery Line** will be continued as a part of the **Inter-State Loop** to the first station in Manhattan at Morris Street and there temporarily will stop.

Battery Line Cost.

The cost of the Battery Line, exclusive of power, is as follows:

	Under Interborough Operation	Under Hudson & Manhattan Operation
Construction	\$62,000,000	\$62,500,000
Equipment	11,500,000	11,000,000
	<hr/>	<hr/>
	\$73,500,000	\$73,500,000

Battery Line Capacity.

The capacity of the **Battery Line** will be about the same for Interborough and Hudson & Manhattan operation. Carrying passengers as they now carry them in the rush hour and assuming 40 per cent of the daily one-way passengers carried in the maximum hour, the annual traffic capacity will be about 80,000,000 passengers; for a 20 per cent rush hour ratio 160,000,000. Before the line can be constructed and operated the total annual commuter traffic from New Jersey to New York will have increased by about 80,000,000 if the rate of increase for the last 10 years continues, so there will be ample traffic for the new line when it is ready to operate. It is believed that under either the Interborough or Hudson & Manhattan as an operator the total cost of the service can be paid for by a 10-cent fare.

Battery Line—Hudson & Manhattan Operation.

Hudson & Manhattan operation of the **Battery Line** will consist of the same kind of service from the Meadows Transfer to the Morris Street Station in Manhattan that the Hudson & Manhattan now is furnishing to its terminal at Cortlandt and Fulton Streets, only the new tunnel line would permit it to increase its service. From the terminal station at Morris Street passengers desiring to go to midtown or uptown Manhattan would have to walk and transfer to the other rapid transit lines.

Battery Line—Interborough Operation.

Interborough operation of the **Battery Line**, on the other hand, will consist of extending both the East and West Side local service across the Hudson River to the Meadows Transfer Station, instead of stopping them as they do now at the City Hall Loop and Battery respectively. By means of these services New Jersey commuters would be afforded through routes into and up the East and West sides of Manhattan, thereby reaching almost any point in business Manhattan

without having to use another facility; would have direct access to any point throughout New York reached by the Interborough lines; and a large majority would only have to make the one change at the Meadows Transfer in their trip from home to work in Manhattan. For these reasons Interborough operation would be preferable.

HUDSON & MANHATTAN RAILROAD EXTENSIONS.

(Part 2 of Comprehensive Plan.)

Besides possibly using the **Battery Line**—a part of the Inter-State Loop—as a temporary transit measure, at some time in the future the Hudson & Manhattan system can be extended in New Jersey to advantage, as follows:

	Route Miles
1. In Hoboken from the Lackawanna Station along Washington Street to 14th Street.....	1.3
2. In Newark from the proposed Pennsylvania Railroad Market Street Station out Clinton and Springfield Avenues to Springfield.....	8.1
Total	9.4

This is a total of 9.4 route miles, at a cost roughly approximated at about \$75,000,000 for construction and equipment without power.

INTERBOROUGH EXTENSIONS.

(Part 3 of Comprehensive Plan.)

Similarly, the Interborough Company in time may have extensions constructed under the Hudson River to New Jersey for permanent operation, as follows:

	Route Miles
1. EAST SIDE SUBWAY —from Spruce Street via Vesey and Washington Streets to a Tunnel at the Battery.....	1.0

2. WEST SIDE SUBWAY —from Morris Street via Greenwich Street to the Battery, and thence, with the East Side Subway extensions, under the Hudson River to Jersey City, along the Central Railroad of New Jersey, under the Boulevard, Tonnelle Avenue, through Meadows Transfer, under Manhattan Avenue, Central Avenue, Bergenline Avenue to Anderson Avenue in Cliffside Park.....	15.0
3. QUEENSBORO SUBWAY —from 41st Street and 8th Avenue under 41st Street, the Hudson River, Franklin Street to connect with the Bergenline Avenue Line described in Extension 2	2.5
Total	18.5

These extensions are all for two tracks and are roughly estimated to cost \$150,000,000 for construction and equipment. At the Battery these extensions would require their own tunnels so the operation could be entirely independent of the **Inter-State Loop** or the **North Jersey Rapid Transit System**. If the Interborough should become the temporary operator of the **Battery Line** it would discontinue such operation as soon as the **Inter-State Loop** could be completed. These extensions are for the future.

BROOKLYN-MANHATTAN TRANSIT SYSTEM EXTENSION

(Part 4 of Comprehensive Plan.)

The Brooklyn-Manhattan Transit Company's 14th St. Line, now terminating at 6th Avenue in Manhattan, could be extended under the Hudson River through 7th Street, Hoboken, and South Jersey, Jersey City, to the Meadows Transfer Station, thus affording New Jersey commuters access to Manhattan at 14th Street and thence across Manhattan into Brooklyn with convenient transfer by means of the Brooklyn-Manhattan transit lines to almost any point in Brooklyn. The line could be constructed and equipped for \$33,000,000. It can be proceeded with at any time it can be

financed, but if Northern New Jersey is to construct it, it should not take precedence over the **Inter-State Loop Line**.

EXTENDED NORTH JERSEY RAPID TRANSIT SYSTEM.

(Part 5 of Comprehensive Plan.)

Later on additional lines may be added to the **North Jersey Rapid Transit System**, thus evolving the **Extended Rapid Transit System** and thereby extending the advantage of rapid transit to a larger part of the **Inner Ring** area.

ELECTRIC SUBURBAN SYSTEM.

(Part 6 of Comprehensive Plan.)

Ultimately an **Electric Suburban System** for the commuters from the **Outer Ring** area may be inaugurated by electrifying the existing railroad facilities traversing the area, and thus furnishing a through service into and through Manhattan eventually for all commuters in New Jersey.

Hudson River Crossings.

Eventually, the Hudson River will be crossed by seven additional two-track crossings, or 14 additional single track crossings, if all of the proposed transit projects for the Northern New Jersey area included in the **Comprehensive Transit System** are carried out.

There are already six single track tunnels connecting New Jersey and New York—four Hudson & Manhattan tunnels and two Pennsylvania ones—making a total of 20 single track crossings existing and proposed, as compared with the 36 existing and proposed—26 existing and 10 proposed—East River crossings connecting Manhattan with Brooklyn and Queens.

Possibly before all the Hudson River crossings reach the construction stage one or more Hudson River bridges may be available for use.

Super-Highways.

In the future express automobile transit must be provided for as well as express transit on rails. To this end in co-operation with the State Highway Commission, the Port Authority and other interested governmental agencies, a system of Super-Highways should be planned and the machinery inaugurated to permit their rights-of-way to be secured while the land is undeveloped and therefore relatively cheap.

RECOMMENDATIONS.

Finally, as a result of extensive studies and conclusions, it is recommended:

1. That the proposed **Inter-State Loop Line** be planned and constructed as the initial part of a **North Jersey Rapid Transit System**.
2. That the route of such **Inter-State Loop Line** be as follows:

From the Meadows Transfer Station south on the Susquehanna right-of-way to the Pennsylvania tracks at Marion, thence along the Pennsylvania tracks through Journal Square along the National Dock Railway to tunnel portals in the vicinity of Johnston and Jersey Avenues, Jersey City, under the Hudson River to the Battery in Manhattan, to continue northward under Washington Street, Barclay Street, Park Row, Mulberry Street, Lafayette Street, Irving Place, Lexington Avenue. At 57th Street and Lexington Avenue the line routes westward under 57th Street, under the Hudson River, under the Palisades to New Durham, thence southward along the Susquehanna right-of-way to Meadows Transfer Station—17.3 route miles.

3. That the **Inter-State Loop Line** be constructed as a two-track line except for a short distance from the Meadows Transfer to Journal Square where it should be four-tracked to permit the Hudson & Manhattan trains to operate to and from the Meadows Transfer Station.
4. That where the **Inter-State Loop Line** in Manhattan follows the route of the East Side Interborough Subway it be constructed in deep tunnel below such subway with transfer connections to the subway stations above, in order that passengers may conveniently use the subway local trains to reach intermediate points not directly served by Loop Line stations.
5. That the construction cost amounting approximately to \$154,000,000 be financed under a plan which will avoid long term borrowing to the greatest extent possible, and thus reduce the interest and carrying charges to the minimum.
6. That the equipment cost amounting to \$40,000,000 be financed by the operator.
7. That the operating company be selected with the idea that eventually it will operate the entire **North Jersey Rapid Transit System**, thereby largely freeing the railroads from the commuter burden from which they so much desire relief.
8. That, if the foregoing recommended project cannot be proceeded with at one time on account of its cost, then, but **only as a last resort and as a temporary emergency measure**, the **Battery Line** from Meadows Transfer to the Battery in Manhattan (a part of the **Inter-State Loop Line**) should be constructed; and either connected temporarily with the Interborough East and West Side subway local tracks for operation temporarily by the Interborough Company; or stopped at the first **Inter-State Loop** station at Morris Street, for operation temporarily by the Hudson & Manhattan Company, both as already described—such temporary operations to continue until the **Loop Line** can be completed and service over it inaugurated.
9. That thereafter, efforts be made to complete the constructions of the **North Jersey Rapid Transit System** as rapidly as possible to the end that the Northern New Jersey area nearest New York may be furnished with a rapid transit service.
10. If the foregoing recommendations can be effectuated, Northern New Jersey will have started to solve both its commuter and its rapid transit problems.

IN CONCLUSION.

The **Inter-State Loop Line**, after one change from the steam railroads at the Meadows Transfer

- a. Will furnish all its passengers with through service into and up and down Manhattan, thereby delivering two-thirds of its traffic directly to its destination without the use of any other facility in Manhattan.
- b. Will develop a two-way traffic over its Manhattan tracks, and therefore utilize them to 100 per cent capacity.
- c. Will circulate and distribute its passengers in business Manhattan from the Battery to 59th Street.
- d. Will afford its passengers easy access to the East Side subway and thus permit them conveniently to reach any intermediate points along its route not served by its own stations.
- e. Will provide its passengers with easy access to any part of New York City reached by the Interborough Lines.
- f. Will deliver its passengers just as conveniently in the 57th Street Section uptown as in the Battery Section downtown, without requiring them to ride through Manhattan.
- g. Will furnish the Central Railroad of New Jersey and West Shore Railroad riders with tunnel service to and through Manhattan, a transit convenience which they have not yet enjoyed.
- h. Will make all Northern New Jersey commuters independent of ferry transportation, thus eliminating the annoyances resulting from fog and other bad weather conditions.
- i. Will greatly relieve the waterfront congestion by removing most of the passenger traffic from the waterfront terminals.
- j. Will increase the tunnel facilities for commuters from Northern New Jersey by 100 per cent.
- k. Will furnish this service for a 10-cent fare if the construction cost can be financed so as to eliminate interest and carrying charges; on the other hand, if financed by long term borrowed money, the fare must be 15 cents to pay the entire cost of the service.

- I. Finally, the Inter-State Loop Line not only will greatly increase and improve service for all Northern New Jersey commuters, but also it will be the beginning of a real rapid transit system designed to serve the Northern New Jersey area within the 20-mile circle just as the New York area within the same circle is now being served, and thereby induce a development in New Jersey commensurate with its strategical location in the greatest metropolitan area of the country.

