

CITY OF NEW YORK

Board *of* Estimate
and Apportionment

PROGRESS REPORT OF A SPECIAL
COMMITTEE CONSISTING OF THE
CHIEF ENGINEER OF THE BOARD
OF ESTIMATE AND APPORTION-
MENT, THE COMMISSIONER
OF DOCKS, THE COMMISSIONER
OF PLANT AND STRUCTURES,
AND THE ENGINEER OF THE
BOROUGH OF RICHMOND

Concerning

THE NEGOTIATIONS WITH THE TRUNK LINE
RAILROAD COMPANIES WITH RESPECT TO
THE BROOKLYN-RICHMOND FREIGHT AND
PASSENGER TUNNEL PROJECT

AND THE

ELEMENTS OF DIFFERENCE
BETWEEN THE
NARROWS TUNNEL AND PORT AUTHORITY PLANS

JANUARY TWENTY-THREE, NINETEEN TWENTY-TWO

CITY OF NEW YORK (City) Committee on
Brooklyn-Richmond freight and passenger tunnel

Board of Estimate and Apportionment

PROGRESS REPORT OF A SPECIAL
COMMITTEE CONSISTING OF THE
CHIEF ENGINEER OF THE BOARD
OF ESTIMATE AND APPORTION-
MENT, THE COMMISSIONER
OF DOCKS, THE COMMISSIONER
OF PLANT AND STRUCTURES,
AND THE ENGINEER OF THE
BOROUGH OF RICHMOND

Concerning

THE NEGOTIATIONS WITH THE TRUNK LINE
RAILROAD COMPANIES WITH RESPECT TO
THE BROOKLYN-RICHMOND FREIGHT AND
PASSENGER TUNNEL PROJECT

AND THE

ELEMENTS OF DIFFERENCE
BETWEEN THE
NARROWS TUNNEL AND PORT AUTHORITY PLANS

JANUARY TWENTY-THREE, NINETEEN TWENTY-TWO

TF 847
NSA 5
1922

LIBRARY OF CONGRESS
RECEIVED
FEB 2-1922
DOCUMENTS DIVISION

22-11242

1922

CONTENTS.

	PAGE
Report of Special Committee.....	5
Report of Consulting Engineer, William J. Wilgus	7
Frontispiece (map)	facing 7
Introduction	7
I. Necessity for Relief.....	8
II. Authority for Comprehensive Plans of Relief.....	13
III. The Narrows Tunnel Preferable to the Port Authority Plan.....	15
Narrows Tunnel Plan.....	16
Port Authority Plan.....	20
Preferable Plan	24
IV. Estimated Savings	25
Volume of Traffic.....	25
Costs and Savings per Car.....	27
Estimated Annual Savings.....	28
Net Savings as of 1926.....	30
V. Justifiability of the Project.....	31
Preliminary Costs of Construction.....	31
Surplus over Fixed Charges on new investment.....	32
Additional Advantages	32
VI. Conclusions	33
Tables	35
A—Tonmages and Cars—1921.....	35
B—Costs per Car—Present Methods.....	37
C—Operating Costs per Car—Proposed Methods.....	38
D—Savings per Car Applicable to Fixed Charges.....	39
E—Annual Savings	41
Senate Bill No. 108—Proposed amendment to Narrows Tunnel Act.....	43
Senate Bill No. 41—Proposed amendment to Port Authority Act.....	50
Map showing Contrasting Features of the Two Projects.....	63
Map of Project reported to Board of Estimate and Apportionment.....	64

CITY OF NEW YORK.

BOARD OF ESTIMATE AND APPORTIONMENT.

January 23, 1922.

Hon. JOHN F. HYLAN,
Mayor.

Sir:

In compliance with the directions given by the Board of Estimate and Apportionment at its meeting of January 20, 1922, your Committee on Negotiations with representatives of the trunk line railroad companies in the matter of the development of a plan for the joint use by all of the railroads of the facilities which should be made available by the proposed tunnel under the Narrows, the construction of which was directed by the Legislature through its enactment of Chapter 700 of the Laws of 1921, submits the following progress report:

With our report of October 15, 1921, which was presented at the Board meeting of October 21, 1921, there was submitted a report from the Chief Engineer of the Board, accompanied by reports from the Consulting Engineers and the Tunnel Engineer, addressed to the Engineering Committee representing the trunk line railroads entering the Metropolitan District and consisting of the Chief Engineers of these railroads, reviewing the investigations which had been made up to that time and presenting, for the consideration of that Committee, a plan designed to accomplish the desired purpose, which plan was supported by an economic study of the project to establish its financial feasibility as a self-supporting enterprise.

The report of the engineers of the Board was made the subject of a conference with the railroad engineers on October 21, 1921, at which time it was agreed that it would be given independent consideration by the railroad engineers, and that a further joint engineering conference would be held as soon as they had completed their investigation of the project as submitted.

We are informed by the Chief Engineer of the Board of Estimate and Apportionment that between that date and January 19, 1922, the railroad engineers have held several meetings to consider the matter and that there had been presented to them a report prepared by a subcommittee made up from their membership, based on the omission of a connection with the northerly tier of railroads in New Jersey, and also excluding from consideration the proposed industrial railroad along the Brooklyn waterfront, with the effect of decreasing the tonnage and incidentally recasting the economic features of the project. Upon receipt of the data used in the preparation of this report and, on January 9th, of certain other information deemed necessary to a further study of the matter, Consulting Engineer Wilgus promptly undertook a more comprehensive analysis of the economic features of the project, basing the same upon the carrying out of the entire plan as originally proposed and also upon its curtailment as suggested by the subcommittee representing the railroad engineers. This report was considered in a conference between the railroad engineers and the engineering staff

of the Board of Estimate and Apportionment held on January 19, 1922, at which time it was agreed that as soon as copies could be placed in the hands of the railroad representatives it would be made the subject of further study and of joint conference after they had given it the consideration to which it was entitled.

At this meeting it was brought out that there was no basis whatever for the assertions which have been made from time to time in the press to the effect that either the railroad engineers or the railroad executives had acted adversely on the plan prepared on behalf of the Board of Estimate and Apportionment, and that the matter was still under advisement.

The report of Consulting Engineer Wilgus includes a review of the subject from every angle and is presented herewith as setting forth the status of the project at the present time.

In accordance with instructions, your Committee is also presenting with this report a copy of Senate Bill No. 108, prepared pursuant to the directions given by the Board and introduced by Senator Smith, making provision for amending Chapter 700 of the Laws of 1921 in such a way as to broaden the power of the City in the matter of carrying out the Narrows Tunnel project. This bill has also been introduced in the Assembly by Assemblyman Cosgrove as No. 131.

There is also presented a copy of Senate Bill No. 41, introduced by Senator Meyer, providing for the adoption of what is described as "The Comprehensive Plan for the Development of the Port of New York," as prepared by the Port Authority. This bill has been introduced in the Assembly by Assemblyman Mastick as No. 129. Particular attention is called to the provision made in this measure for giving the Port Authority the status of a "municipal corporate instrumentality of the two states for the purpose of developing the port," which is unquestionably designed to relieve the Port Authority from the payment of taxes on property which it may acquire.

We are also submitting a map showing the location proposed for the Belt Line Railroad and for the Narrows Tunnel, as well as the suggested industrial railroads along the New York City waterfront, and a map showing the more important elements of difference between the project recommended by the Port Authority and the one which has been reported to your Board by its engineering staff.

Respectfully submitted,

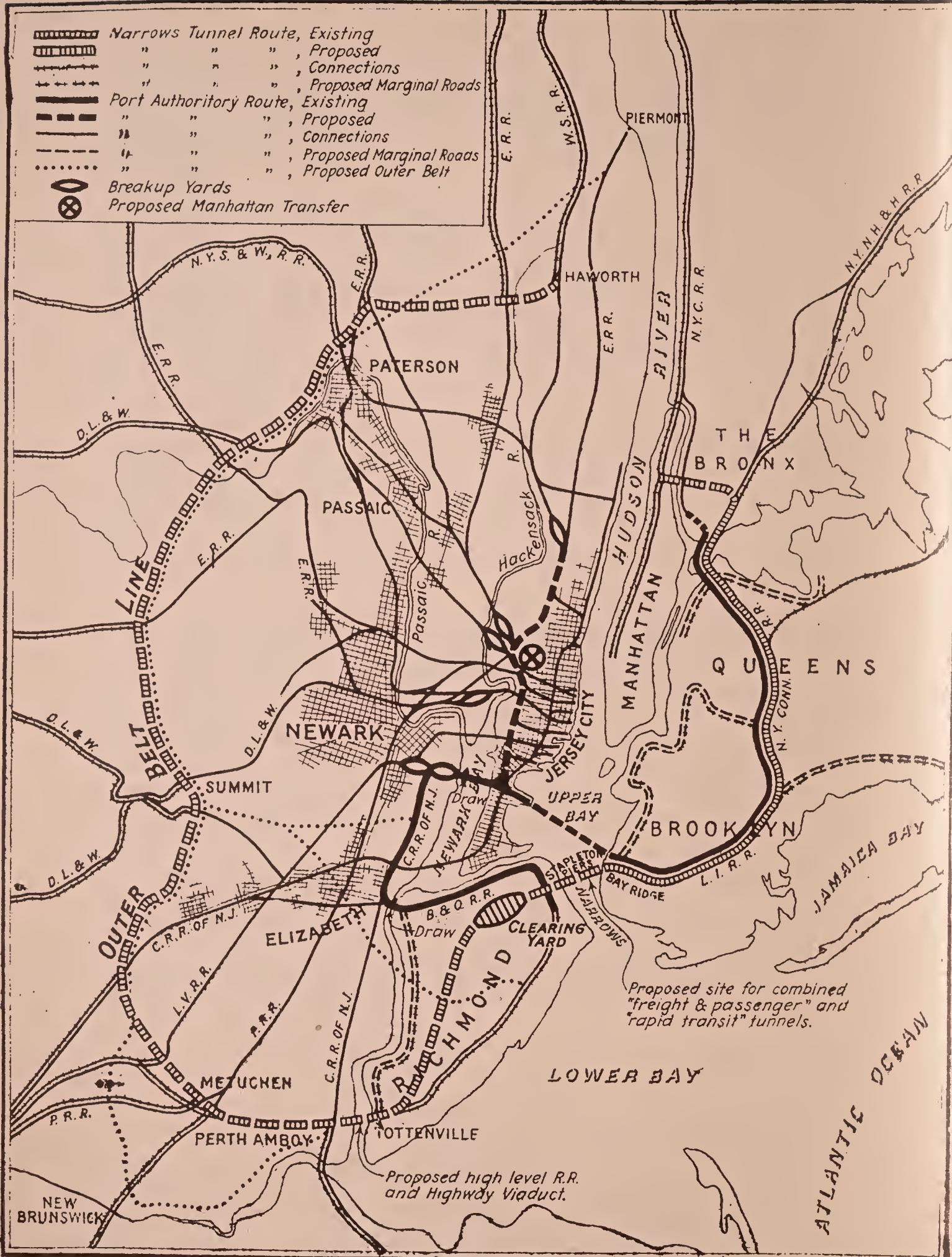
ARTHUR S. TUTTLE,
Chief Engineer,
Board of Estimate and Apportionment.

JOHN H. DELANEY,
Commissioner of Docks.

GROVER A. WHALEN,
Commissioner of Plant and Structures.

THEODOR S. OXHOLM,
Engineer, Borough of Richmond.

MAP SHOWING NARROWS TUNNEL
AND PORT AUTHORITY ROUTES.



MAP SHOWING NARROWS TUNNEL AND PORT AUTHORITY ROUTES.

January 18, 1922.

Mr. ARTHUR S. TUTTLE,
Chief Engineer, Board of Estimate and Apportionment,
Municipal Building, New York, N. Y.

DEAR SIR:

The subjoined rather voluminous analysis of the merits of the Narrows tunnel plan has been prepared in the belief that it will be helpful at our conferences with the railroads. In it the attempt is made to show why we are convinced that something must be done to relieve the existing cross-harbor transportation situation, why we feel that the Narrows tunnel provided for by law offers the best solution of the problem, why we believe that net savings through the use of the Narrows tunnel route and numerous other advantages to carriers, shippers and the general public, including better means of military protection in time of war, amply justify the required large expenditure and why we press upon the railroad representatives the desire of the City to negotiate with them to the end that an agreement may be reached whereby, on equitable terms, this great work may be constructed and jointly operated by them in their interest and that of the public.

The more I consider this project the more I believe in it. Perhaps this feeling is colored by the successful outcome of other momentous enterprises in which I have taken a part and it is possible that I have outlived my usefulness as a reader of the future. However, I have full confidence that the Narrows tunnel plan, if carried out as here proposed, will no more fail to live up to the expectations of its proponents than has been the case with the Grand Central and Pennsylvania improvements in this City, or the Detroit River tunnel or many other advances in the art of transportation that have been of such vast benefit to man.

The subject is treated under the following captions:

- I. Necessity for Relief.
- II. Authority for Comprehensive Plans of Relief.
- III. The Narrows Tunnel Preferable to the Port Authority Plan.
- IV. Estimated Savings.
- V. Justifiability of the Project.
- VI. Conclusion.

I

NECESSITY FOR RELIEF

In seeking the best manner in which to cure the transportation ills of the Port of New York, we are met at the outset by the claim that the existing cross-harbor water and rail facilities, with some improvement from time to time, are amply sufficient for the purpose; and that the Narrows tunnel, or for that matter any comprehensive plan for an all-rail connection between the trunk lines that now terminate in New Jersey and the several boroughs of New York City, is unnecessary.

This plea for the *status quo* may be best answered by quoting from the utterances of various organizations and individuals, taking first those having to do with the problem in its broader aspects:

The New York Chamber of Commerce says "it is essential to the welfare, not only of this city but of the Nation, that all handicaps to an efficient port be removed."

Our Merchants' Association, in commenting on what it rightly terms "antiquated" facilities states that it "has long viewed with great solicitude the inadequate traffic facilities of this Port, which impose a heavy and wasteful burden of charges upon our trade and commerce. The conditions are rapidly becoming acute and threaten this City with immeasurable damage by the enforced diversion of its business to other ports where terminal and port charges are much less than here. * * * Year after year the Port is neglected. It is the only great port in the world where no intelligent plan has been adopted for improvements to enable it to meet the demands upon it."

The Brooklyn Chamber of Commerce says "Immeasurable loss will be suffered by the City through diversion of its commerce to other ports, if terminal costs are not reduced by improvements in terminal facilities."

In the proceedings before the Interstate Commerce Commission in the matter of rate allowances at New York it was shown that the whole organization of the Port fundamentally is wrong and that under the unscientific and uneconomic methods practiced by the carriers, congestion and expense have become normal conditions, and some remedy soon must be found.

Our daily press is constantly recording cases of prolonged delays or interruptions to our cross-harbor traffic caused by fogs, storms, ice, high tides and marine strikes, all of which would be obviated by an all-rail service.

That we cannot remain fatuously contented with existing conditions, if we are to prepare for the future, is pointed out by so weighty an authority as General W. W. Atterbury, Vice President of the P. R. R., who says:

“ We ought to be preparing ourselves to take care of the prosperity which is sure to come. When it comes it will come fast. Railroad facilities cannot be built overnight. They must be planned long in advance; it takes years to build yards, terminals and other necessities. When this big volume of business comes, as it is sure to come, and you again begin to offer to the railroads goods to be carried in large quantities, and your prosperity depends upon getting the goods to market promptly, you will find, unless conditions quickly change, the railroads will be unable to carry your goods.

“ You will be forced then to say that if private owners do not or cannot supply the transportation you need; if they cannot solve this problem, you yourselves will have to take over the railroads and operate them as a Government proposition, even against your desires and your own good judgment. Under the Government it will be far more expensive and less responsive to your needs, but time will not wait then for a calm decision.”

Mr. Samuel Rea, President of the P. R. R., states that the use of the New York tunnels and passenger station of this company by other railroads “ is barred by the fact that the capacity of those facilities has been reached, so that it is only a question of time before the Baltimore & Ohio and Lehigh Valley railroads can no longer be accommodated.”

The last but not the least of the compelling reasons for an all-rail connection between the trunk lines in New Jersey and the islands and mainland to the east, is the crying need for this means of quick, unbroken transportation of troops and military supplies in time of war. Many of us who were in France during the World War witnessed the important part that was played by the outer belt line at Paris at crucial moments when the saving of a few hours in the dispatch of allied troops to the front made all the difference between victory and defeat. Moreover, many of us there participated in frenzied efforts under the most trying conditions, hurriedly to create means of by-passing our war traffic around centers of congestion, as for instance at St. Nazaire, Nevers and elsewhere. As patriotic Americans we cannot refuse to profit by these experiences. An unbroken line of transportation, such as we are discussing, some day may play a large part in the preservation of our national existence.

It is clear that a policy of *laissez faire* is not admissible if the Port as a whole is to hold its own.

Comments of this nature, however, are not confined to the situation in its broader phases, as will be seen from the following examples of many expressions of large shippers along the Brooklyn waterfront, when interviewed as to their attitude toward an all-rail connection with the trunk lines in New Jersey.

One says that the rail connection would be "of supreme benefit during the winter time. It would overcome delay due to lighterage from New Jersey terminals. In a normal year it takes about ten days, on an average, to get a car of freight from Jersey over here."

Another states: "In the last ten years the Port has lost 50 per cent. of possible trade. It has lost its coffee trade to Baltimore and New Orleans. Sugar going through Philadelphia and Baltimore can there be brought in for 35 per cent. of the cost in New York. Nitrates can be imported at Norfolk and Brunswick for 50 per cent. of New York costs. Wood pulp costs 40 cents a ton in Norfolk f. o. b., including labor and 15 days' storage, while here it would cost at least \$1.00, to be conservative, probably \$1.50. Poor terminals drive business out of this port."

Several engaged in the coal trade comment on the great saving that would be effected in rehandlings and consequently in degradation or breakage of coal, and on the possibility of stabilizing the market through storage.

A varnish manufacturer says, "substitute turpentine can be bought for 5 cents less per gallon in tank cars than in tank wagons or drums. Present situation threatens to force removal of concerns elsewhere."

A lumber merchant states, "I believe the waterfront railway is the only thing that will ever develop this section. Material now comes by rail one-third and by water two-thirds—but if the railroad was put through the proportion would be reversed."

A manufacturer of drop-forgings says, "we have been trying to get a car from New Jersey for a week—usually takes a week."

Another manufacturer, in forcefully expressing his desire for direct rail service, stated, "the history of this part of Brooklyn has been that when a plant becomes large it moves to Jersey," at the same time giving concrete examples of such action.

Another said, "paint and chemical industries ultimately will get out of town unless something is done."

Several spoke in favor of an elevated railroad, on account of the aid of gravity in discharging inbound raw materials, which are largely in excess of outbound shipments.

Another merchant, shipping 120,000 tons annually, said, "the present system is rotten."

The Brooklyn Chamber of Commerce says, "Brooklyn is suffering from the handicaps of poor transportation facilities, our industrial plants have direct rail connection with only two of the twelve or more trunk lines entering the port of New York. There is no community with over two million inhabitants in any city in the world that has as poor freight and passenger transportation with other parts of its

country by rail as has Brooklyn. * * * in the four boroughs there are more than 3,500,000 people and more than 15,000 factories, employing approximately 300,000 people. These factories are turning out manufactured products for the world's markets of an estimated value of \$1,000,000,000 to \$1,500,000,000 annually. * * * All of the raw material transformed in these factories into finished products is shipped in and then shipped out by the present inadequate freight terminal and railroad facilities. Yet, with all this vast flow of raw material and outgo of manufacturing products, Brooklyn and Queens and the Bronx have no direct rail connections with the main trunk line railroads to the west and south. * * * As a result this large industrial district, with its enormous consumption of raw material and output of manufactured products, is almost wholly dependent upon carfloats and lighters on the water and motor and horse drawn trucks on land for freight transportation. The team track capacity of the four terminals located along Brooklyn's waterfront, where cars are brought in by carfloats, is approximately 4,500 cars, a capacity which is seriously inadequate in times of heavy traffic, as witnessed by the enormous and long continued freight embargoes placed upon the yards during the past four years."

In general the feeling along the Brooklyn waterfront is to the effect that the all-rail route is a decided necessity, if the district is to be saved and migration stopped, especially to New Jersey, to which removal is now contemplated by several firms.

Not only does Brooklyn thus voice its demand for an all-rail connection with the trunk lines in New Jersey, but similar appeals are being made in behalf of New York's Cinderella borough—Richmond.

The Merchants' Association of New York says: "Staten Island, or the Borough of Richmond, is one of New York City's greatest undeveloped industrial assets," possessing "a combination of advantages which can hardly be duplicated anywhere else on the Atlantic seaboard," and now lying practically dormant, "due primarily to the lack of railroad facilities" and to the borough's "comparative isolation," defects which may be removed by building "the freight and passenger tunnel under the Narrows, which has already been authorized."

The Tunnel Committee of the Staten Island Civic League states:

"That the City of New York is actively proceeding to build a tunnel for freight and passengers between the Borough of Richmond and the Borough of Brooklyn.

"That the interests of Staten Island, as well as of the Boroughs of Brooklyn and Queens, are bound up in the City plan.

"That all Staten Island with one voice supports the City plan and proposes to do everything possible to hasten and assure the building of the City tunnel.

“ That the building of both tunnels would be an economic impossibility, and therefore it is more necessary for Staten Island to insist upon the building of the Staten Island tunnel now.

“ That the plans just disclosed by the Port Authority are not comprehensive, in that they make no provision for Staten Island, and should therefore be rejected.

“ That the proposal of the Port Authority to convert the Baltimore and Ohio lines on Staten Island into a belt line would not be an adequate or practical provision for the anticipated enormous freight traffic to emanate from the new City piers and from the industries on Staten Island.

“ That the hope of Richmond, Kings and Queens lies in the rejection of the Port Authority plan and in the carrying through of the City plan.

“ That the Legislature should be urged to equip the City with all necessary authority to carry through its plans to build separate freight and passenger tunnels, to build a belt line and other railroad connections as may be desirable, to acquire railroads, if necessary, and to operate them if this should prove advisable, in order to afford opportunity to all railroad systems to participate in and to afford adequate freight transportation into and out of the Port of New York.

“ That the Tunnel Committee is prepared in behalf of the Staten Island Civic League to wage an active campaign for the speedy building of the proposed City tunnel under the Narrows and to obtain such legislation as may be necessary to enable the City to carry through its plans.”

One of the large shipping interests on Staten Island says of that region's freight traffic: “ The estimated import, export, domestic and local industry freight traffic may be safely put at a yearly total of seven million tons. * * * Although a small percentage of the above seven million tons of freight is handled for rail movement by the Staten Island Rapid Transit Ry. and B. & O., there is no reason why the major portion, or at least 60% could not be handled all-rail, if all class and commodity freight rates were made to correspond with the New York rate basis, or if all points on Staten Island were made to operate under the New York rate structure, and if the Staten Island roads were either to perform or to absorb the terminal services and expense in lieu of the free lighterage now performed by the trunk lines having no direct connection with Staten Island, except through the Staten Island Rapid Transit Railway. A Union Belt Line Railroad operated for the benefit of all trunk lines is therefore the only solution with a division of the through rate sufficient to absorb all terminal service on Staten Island, thus making

the lightering of railroad freight unnecessary. * * * The enormous volume of Staten Island's freight movement, with the anticipated fourteen million tons to be handled over the new City piers, totalling 21,000,000 tons, is apparently not realized by the New York Port Authority, but is given merited recognition and greatest economic importance by the special Tunnel Committee of the Board of Estimate and Apportionment of the City of New York."

Staten Island unquestionably is entitled to the relief so eloquently demanded in these excerpts from responsible sources. This is due not only to a borough having such potentialities, but also to the City which must look to it for industrial expansion, and to the Port which cannot afford to have a large portion of its waterfront permanently doomed to inferior stub-end railroad service.

With these statements before us is it not evident beyond peradventure that inaction is not to be thought of, and that the thing to be done is quickly to determine the way in which to provide for improved cross-water freight and passenger transportation, not alone for the present, but broadly for the future to the extent that light may be given us to look ahead.

II

AUTHORITY FOR COMPREHENSIVE PLANS OF RELIEF

In recognition of the demonstrated need of comprehensive plans for relieving the present intolerable situation, the Legislature of the State of New York passed two laws in 1921. One (Chapter 700), expressly directs the Board of Estimate and Apportionment of the City of New York "to construct a tunnel for freight and passenger purposes under New York Bay, between the boroughs of Richmond and Brooklyn, by improving and increasing the terminal facilities of the City of New York to maintain the supremacy of the Port of New York"; such construction to begin within two years. The other (Chapters 154 and 203), in harmony with similar legislation passed in New Jersey, provides for a bi-state New York Port Authority, empowered to plan facilities for similarly maintaining the supremacy of the port. In the former law, usually referred to as the Narrows tunnel act, a specific remedy is prescribed; in the latter the recommendation of a suitable remedy is left to the discretion of the bi-state organization.

The Narrows tunnel act provides that in leasing the tunnel the City shall receive "an amount at least sufficient to pay the interest on bonds issued pursuant to this act and to amortize the principal thereof as such interest and principal become due"; in a word the project shall be self-supporting.

Hence the City, regardless of what may be done by the Port Authority, is required by legislative mandate forthwith to build a passenger and freight tunnel in a particular place, namely between Staten Island and Long Island, and to lease it only on a self-supporting basis. Not only must the City create a tunnel in this manner, with the object of maintaining the supremacy of the Port of New York; but it perforce must seek customers in order that the flow of traffic through the tunnel shall be sufficient to bear the burden of interest charges and amortization and thereby relieve the taxpayers from the necessity of so doing.

It is evident that the City officials, in obedience to this mandate, must in good faith look beyond the confines of the City for such customers, which naturally are the trunk lines now terminating in New Jersey. In beckoning to them to come into the city through this new gateway a way must be shown to them by which they may most effectively join in reaching it. Not only is this course required in order that the provisions of the law may be obeyed, but such a course is required by ordinary common sense which dictates that the very best results should be striven for in the true interest of the City and the Port, even if this does call for negotiations with the only possible users, the railroads. After all, the railroads are national carriers and not the exclusive servants of the state in which their terminals happen to lie. The City is not permitted to go beyond its boundaries to reach them, but it may with propriety invite them to come to the City. In fact under the provisions of the law it must do so if the interests of the public are conserved. Certainly it would be most blameworthy for the City supinely to do nothing to carry out the intent of the act as regards the maintenance of the supremacy of the port and the protection of the taxpayers, among whom are included the railroads themselves, from the burden of an unremunerative investment.

It will be seen that from the one source of supreme authority in the State, the Governor and Legislature, a mandate for the improvement of the terminal facilities of the port has simultaneously come forth to two instrumentalities, the Port Authority and the City of New York, and that the latter is in duty bound to make its plan sufficiently comprehensive to bring within its scope the railroads that now terminate on the New Jersey shore of the port.

It is decidedly unpleasant to be called upon to criticise the plans of the other of these two agencies, but there is no escaping this duty on the part of the representatives of the City, who bear the responsibility of making the Narrows tunnel project a success. There is not a need for both projects; one or the other must be selected.

III

THE NARROWS TUNNEL PREFERABLE TO THE PORT AUTHORITY PLAN

The need for radical improvements in our methods of cross-harbor transportation thus having been shown, and authority from the same source having been granted for putting them into effect through separate agencies, it remains to be determined which of them offers the better plan.

In doing this it is self-evident that underlying principles must be adopted as guides to a wise decision for the public good. Among them the ones that are believed to have special force are:

1. Fixed charges should be the minimum consistent with the accomplishment of the desired purpose: (a) through avoidance of costly duplicate routes, (b) through utilization of the City's credit for borrowing funds at a low rate of interest, and (c) through the establishment of the route in such manner as to make possible important savings in cost of construction through joint action with other public enterprises.

2. Tonnage to and from Staten Island, Long Island and New England should be routed around rather than through areas in New Jersey that are now or may in the future become congested by reason of their own local freight and passenger development, as for instance between the Orange Mountain range and the waterfront.

3. Crossings of rail and water traffic should be separated through the use of tunnels or high level bridges, so that one will not interfere with the other.

4. Use of temporary mainline structures should be avoided on account of fire hazard and cost of maintenance.

5. Gradients on steam operated new lines should be at least as light as on the railroads with which they are to connect.

6. The classification of freight cars and their suitable consolidation in trains should be provided for in a modern economically planned clearing yard into which all lines will feed, such yard to be so located as to minimize the territory that necessarily must be electrically operated at the start.

7. The portion of the route to be placed in tunnels should be minimized not only because of their cost but also by reason of the unremunerative non-traffic producing character of the territory so traversed.

8. The route should be so placed as to induce the flow of life giving traffic where it will do the most good and the least injury to the communities affected.

Having these principles in mind we may next examine in detail the qualities of the rival plans, that of the City known as the Narrows tunnel plan, and that proposed by the Port Authority.

The Narrows Tunnel Plan

The Narrows tunnel route, as laid out by the writer some ten years ago and placed by him at the disposal of the City, has its source in the north at its connection with the West Shore R. R. at Haworth, N. J., and passes thence in a westerly direction to the high land in the rear of Paterson; thence southerly along the rural valley of the Passaic River to a piercing of the Orange Mountains near Summit; thence continuing southerly and easterly through Scotch Plains, South Plainfield and Metuchen to a high level crossing of Arthur Kill between the bluffs that border that waterway in the vicinity of Perth Amboy, N. J., and Tottenville, Staten Island; thence on an easy incline through the midst of the Borough of Richmond to a modern "hump" clearing yard at which cars from many origins may be classified and consolidated into full-sized trains for varying destinations; and thence beneath the Narrows to a connection with the Long Island Railroad and proposed Brooklyn marginal railway in Bay Ridge, Brooklyn, beyond which access to existing and proposed marginal railways, port developments and other local facilities in the boroughs of Brooklyn, Queens, The Bronx and Manhattan, as well as direct connections to New England, is proposed via the New York Connecting Railroad and sundry connections.

The character of construction is proposed to be modern in every respect. On the steam operated section, which is the portion lying west of the proposed yard in Richmond, the maximum gradients are eight feet per mile against eastbound and sixteen feet per mile against westbound traffic in New Jersey, while within the limits of the city they descend with the eastbound movement and have a rise of twenty-one feet per mile against westbound traffic.

East of the yard, where the intended electric operation makes steep rates of grade unobjectionable, the ruling gradient is 2 per cent. in both directions, this being the rate in successful use at other important electric installations in tunnels and elsewhere. Lighter gradients would involve greatly increased expenditures with incommensurate returns in the way of lessened operating costs.

A double track main line is contemplated, free from grade crossings of every kind, with suitable provision for later expansion to four main tracks when warranted by increase of traffic.

Special attention is paid to the needs of Staten Island. An industrial line is planned along the easterly bank of Arthur Kill, on the opposite side of which, in New Jersey, there is an object lesson in the beneficial effects of adequate railroad facilities. Above all, a direct connection is made with the north shore of the island, on which already exist great ocean piers and warehouses, notably those of the American Dock Co., the Pouch Terminal and the \$25,000,000 development of the City itself.

Just where the division line should lie between the portion of this system that should be constructed by the railroads or other outside interests and

the portion that should be constructed by the City is a matter for negotiation to determine.

It is hoped that the railroads, through joint action, will organize a Metropolitan Terminal Railroad Association, somewhat similar to the one that has proven to be so successful at St. Louis, under the auspices of which the belt railway may be constructed in New Jersey and at other places to be agreed upon, and the City's part of the route and certain existing railroad lines may be leased, all with a view to unified operation at actual cost, in the interest of both the railroads and the public.

By planning in this manner all the principles above set forth are duly recognized. The proposed route involves no duplicate crossings of the bay, it avails itself of the City's credit and it lies where adjoining public facilities may be created with mutual savings of several million dollars, as for instance, through the placing of rapid transit tubes in the same trench across the Narrows and through the placing of a vehicular roadway on the Arthur Kills viaduct, as a means of shortening the journey of automobiles many miles between New York and the New Jersey seacoast resorts. It avoids the congested regions of New Jersey, an item of the greatest importance to the future growth of both states and to the nation, from the standpoint of protection in time of war. It crosses waterways above their heads of navigation in New Jersey, and with its anticipated burden of upwards of 20,000,000 tons annually it passes high over or beneath harbor channels, thereby obviating grade crossings of water and rail traffic, as would be the case if drawbridges were required. Its gradients on the steam operated part of the route, where this question is of moment, are very moderate. Its yard on Staten Island, being of ample length for tandem hump operation, serves all the purposes of economical classification and consolidation and makes unnecessary an extension of electric operation into the existing yards of the trunk lines. Its entire length is available for the industrial development of adjoining territory, except the comparatively short distance in tunnel beneath the heights of northern Staten Island, over the Arthur Kill and under the Narrows. It offers means of trunk line passenger entry to the populous portions of the Metropolis, which so far have been neglected in that respect, and in that way promises relief from the embarrassment referred to by Mr. Rea. It does no injury to the New Jersey communities in diverting from their midst New York's cross-water traffic, but on the contrary benefits them by removing a cause for growing congestion. Finally, in turning the arterial flow of New York's commerce through Staten Island, it will change that potentially rich borough from a vermiform appendix to a healthy and prosperous section of Greater New York, a fact which is of vital moment to every citizen of the City and to the railroads. In fact, this bringing of vast virgin areas in both states within reach of the unified service of all the trunk lines of the port spells new life for the metropolitan area in its competition for world trade.

It will be asked if all these points are well taken why should there be any hesitation in proceeding at once with the building of the tunnel as directed by the Legislature. Statements have appeared in the press that the project is "impracticable"; that the intent of the law is that the tunnel shall be treated as "an interborough or local improvement" and shall not invade the field reserved to the bi-state port organization; that it will not stand the test of an economic analysis; that either new costly "break-up" yards will be required at the points of intersection of the proposed belt line with the connecting roads, or expensive "back-haul" of traffic will be required from the existing break-up yards to such points of intersection; and that the outer belt line is a round-about route in contrast with one that would cross the entire width of Upper Bay to the north of the Narrows.

Regarding the charge of impracticability, the impression has been given in the press that this lies in the inability of the tunnel to handle both freight and *rapid transit* passenger traffic. This has never been claimed by the City's engineers. What they do claim is that the project is entirely practicable for doing just what the law says it shall do, namely, carry both freight and passengers. The Detroit River tunnel of the Michigan Central Railroad has been doing this successfully for some ten years, and it has been done for some thirty years through the Sarnia tunnel of the Grand Trunk Railway. There is no good reason why it should not be done here, until the time may come in the future when growth of traffic may warrant the laying of additional self-supporting tubes. As to rapid transit passenger service, it has been expected that tubes therefor would be laid alongside those intended to be created under the present law, and the published plans of the City have so indicated.

The charge that the Narrows tunnel project is intended to be a local improvement only is refuted in the act itself, as has already been explained in the chapter on "Authority for Comprehensive Plan of Relief."

As to the charge, attributed in the press to the bi-state port organization, that the Narrows tunnel project is uneconomic, no figures have been produced to substantiate it. If it is true of this admittedly necessary and authorized connection between Brooklyn and Staten Island, then it is true in a much greater degree if applied to the dual crossing of the Upper Bay by the tunnel of the Port Authority and the one ordered by the Legislature to be built by the City. Fortunately for the future of the Port and for the City—it is not true, as will be shown later. In this connection it has been repeatedly said in the press that the Port Authority plan "calls for no expenditure of tax money, as it will be carried out altogether with private funds; whereas the City's project can be executed only by taxing the people." Can any statement be more misleading? The money for either plan must come from "private funds" and the interest thereon paid by the ultimate consumer, who is the real taxpayer. The real difference is that in the case of the Port Authority plan the interest to be paid by the taxpayer on

funds borrowed from the public through bankers will be at the comparatively high rate usual with new enterprises, while with the City's plan the taxpayers get the benefit of the City's power to borrow money from the same public at a low rate. The difference will mean several million dollars to the community, including the railroads, and should be saved for their benefit and for the well-being of the Port in its competition with existing and prospective rivals.

As to the break-up yard statement, a few examples of yardless junctions will best illustrate its incorrectness. On the New York Central a yard of this nature was not found to be necessary at Depew, where trains made up many miles to the east, at DeWitt and East Rochester, split in two directions, one for Buffalo, via the main line, and the other for the West, via the Terminal Railway of Buffalo; nor was one found necessary at Hoffmans, on the Mohawk Division, where trains made up at distant DeWitt and destined for New England and the West Shore are diverted from the main line.

Similarly, on the Lehigh Valley Railroad, westbound trains on the Buffalo Division are made up at Manchester, and on arrival at Depew Junction and Lehigh and Lake Erie Junction are diverted to Suspension Bridge or Tift Farm or Buffalo, as the case may be, without the necessity for further classification at the junction points. This is also true on the same road at South Plainfield, where trains made up at Packerton are diverted to Perth Amboy or Oak Island, as the case may be, without the need for a break-up yard at the junction.

What is the reason then that trains for points east of New York Harbor cannot be made up at divisional yards to the west and diverted over the proposed belt railway to the new clearing yard on Staten Island, where classification and consolidation would enable the traffic to continue in suitably composed trains for various destinations on Staten Island, Long Island, The Bronx, Manhattan and New England. It is done elsewhere and it can be done here. Of course there will be fragmentary train lots that will be set off on sidings at the connections and moved thence in "pick-ups" in the usual way, and there will be a comparatively small volume of back-haul freight moving between the Jersey inner zone and eastern points, but these in no manner affect the main question, namely, the feasibility of operating the Narrows tunnel route, coupled with the outer belt railway, without the need for creating extensive new break-up yards at intersections with the connecting lines.

Now as to the alleged round-about nature of the Narrows tunnel route as compared with the Port Authority plan, it is true that the most northerly of the trunk lines, the West Shore R. R., has an excess haul of some 41 miles and that the northerly group of roads as a whole has an added haul of 31.3 miles. However, *per contra*, the one of the southerly group which carries approximately one-half of the entire tonnage of both groups, the

Pennsylvania R. R., has a four mile shorter haul than the Port Authority plan, and the entire southerly group, carrying 80% of the tonnage of both groups, has a lesser haul to the extent of 2.7 miles. Taking the traffic of both groups as a whole the average haul by the Port Authority plan is approximately 28 miles and by the Narrows tunnel plan about 33 miles, a difference in favor of the former of 5 miles, or say 18%. At first glance this added haul may seem objectionable, but on reflection it will be realized that a circuitous route is not necessarily less desirable than a direct one if over-balancing advantages are thereby gained. The New York Central between New York and Buffalo is 50% longer than an air line between those points and 11% longer than the D. L. & W. R. R., and yet in avoiding steep gradients and in seeking traffic producing regions it can hardly be termed an inferior route. The Lehigh and Lake Erie line of the Lehigh Valley R. R. into its Tifft Farm terminal is 150% longer than its former route via the Buffalo Creek R. R., and yet that company cannot be accused of improvidence in thus having built a round-about line to escape congestion on the old route. Many other illustrations could be given of the creation of round-about lines on which the added cost incident to longer train haul is far more than offset by outstanding advantages similar to those to be gained in this case, namely (a) escape from losses of time and money in passing through yards and congested regions on the existing routes and escape from other violations of the aforesaid fundamental principles of design, including congestion at the proposed bottle-neck at Greenville, and (b) reaping of vast future benefits through access to new traffic producing regions. It is to be expected in this case that the interests of all the roads will be pooled through a terminal association for joint operation, so that no one road will be penalized for its disabilities. The greatest good for the greatest number is the underlying thought of the City's proposition.

If the points as here outlined are well taken, as is believed to be the case, it is apparent that the Narrows tunnel plan accords with the principles that have been laid down as essential to a proper solution of the problem, and that it is free from the defects that have been charged against it from anonymous sources in the press.

The Port Authority Plan

The time has now come to inquire into the merits and demerits of the latest Port Authority plan, of which a short description will aid to an understanding. In many, if not most respects, this plan is quite similar to the Narrows tunnel plan, except as to the manner of linking together the two sides of the harbor and the promptness with which the construction of the outer belt line shall be undertaken.

The outer belt line of the Port Authority follows the Narrows tunnel route very closely between North Paterson and Summit, but differs therefrom very materially at the northerly and southerly ends. At the former

point it diverges in a northeasterly direction to a terminus at Piermont on the Hudson River. At the south, near Summit, it splits in three directions, one branch passing south to New Brunswick and Perth Amboy where neglected Staten Island is left in all its loneliness across Arthur Kill, another branch passing as a spur beneath Arthur Kill to Staten Island, and the third or main branch joining the so-called middle belt line, over which connection is had with the Lehigh Valley—Pennsylvania Railroad low-level drawbridge and trestle across Newark Bay, and thence by a tunnel beneath what is practically the widest portion of Upper Bay from Greenville to junctions in Bay Ridge, Brooklyn similar to those proposed in the Narrows tunnel plan. According to the press the building of the outer belt line part of the Port Authority's comprehensive plan is a matter to be determined in the dim and uncertain future.

For immediate construction it is proposed to link the trunk line roads together by means of a so-called inner belt line along the Hackensack Meadows and easterly shore of Newark Bay, which, together with the above mentioned middle belt line and Newark Bay trestle, will bring the traffic of all of the roads from their existing break-up yards to the proposed Greenville-Brooklyn tunnel. Staten Island, pending the construction of the outer belt line at some uncertain date, is to be served by the existing heavily burdened Baltimore & Ohio Railroad stub line on which there is a single track drawbridge kept normally open for the unfettered passage of the Arthur Kill water traffic estimated at 30,000,000 tons annually.

A study of these routes quickly shows that they are not planned in accordance with the aforesaid principles.

First, fixed charges necessarily will be high (a) because the expensive tunnel crossing of Upper Bay will duplicate the cross-bay tunnel at the Narrows which the State has directed the City of New York to build and which someone claiming to speak in behalf of the Port Authority is quoted in the press as stating "should be built regardless of whether it can be guaranteed of New Jersey traffic on a self-supporting basis," thereby placing an unnecessary heavy burden of fixed charges on the commerce of the port, (b) because annual interest charges for this public enterprise, of course paid in the first instance by the shipper and eventually by the ultimate consumer, will be higher by reason of the need for borrowing money directly through bankers at high rates with the usual commissions and discounts rather than through the City with its splendid credit, and (c) because the leaving of Staten Island on one side of the main route robs the project of the savings that would result (1) from the building of the proposed Staten Island-Brooklyn rapid transit tubes in the same trench used for the cross-harbor tunnel, and (2) from the utilization of the crossing of Arthur Kill for both railroad and vehicular traffic.

Second, the anticipated tonnage, far exceeding 20,000,000 tons per annum, will pass through regions in New Jersey now congested with some

75,000,000 tons of rail traffic annually as well as the passenger service of nine trunk lines, and promising to become increasingly so as time goes on, not only through the natural growth of long haul traffic but also through intensive local passenger and freight growth, neighboring great port developments, and the proposed transshipment of Manhattan freight in the very region in which this inner belt line is proposed to run. On this point it is fitting to quote the bi-state organization's recognition of the existence of this congestion, as set forth at page 23 of the report of 1920: "Its (the outer belt line) chief immediate purpose is to serve as a by-pass around the congestion nearer the waterfront." Again in its report of 1921, at page 31, it refers to this line as "extending around the westerly limits of the Port District beyond the congested section." The Narrows tunnel route accomplishes this desirable purpose at the start, instead of waiting indefinitely and building in the meantime an expensive route through the midst of this congestion to the mutual injury of the best interests of the communities on both sides of the harbor.

Third, both the main route via Greenville and the B. & O. spur to Staten Island pass over navigable waterways by means of drawbridges, which will embarrass and therefore cause delay and increased cost of operation to both rail and water traffic. Newark Bay waterborne tonnage is large, now reported to cause some 13,000 yearly openings of the drawbridge, with the surety of great increases as the plans of the Port Authority for the deepening of the Newark Bay, Passaic and Hackensack river channels to Newark, Passaic, Paterson and other places are carried out. It is well to quote from page 345 of the 1920 report of the bi-state organization, in its reference to the L. V.-P. R. R. crossing, "Here also tunnels should be built rather than bridges. The Commission assumes that any crossing of the bay as a part of the exterior belt line system will be by tunnel." Also at page 30 of the same report the bi-state organization states "The Commission would further urge * * * that the Federal Government cooperate with the local authorities in providing 30 ft. entrance channels to Jamaica Bay and Newark Bay, and deep water channels within those bays. * * * The bridges over Newark Bay should be replaced, if feasible, by tunnels * * * ."

That the character of intersecting water traffic to be anticipated in the future will not be merely of the tug and barge variety but rather in large degree of the high-masted type, is shown by the following extracts from the bi-state organization's report of 1920:

"A project (Newark Bay) is now under way for deepening the channel to 30 ft. and widening it to 400 feet for the entire length of the Bay. * * * The city of Jersey City is planning developments along similar lines along the east side of the Bay and the lower Hackensack River * * * . (page 345).

"Dredging authorized by the Government will provide a channel 20 ft. deep and 300 ft. wide up the Passaic River to the Nairn Lino-

leum Works, thence 16 ft. deep and 200 ft. wide to the bridge of the Greenwood Lake Branch of the Erie, thence 7-12 ft. deep and 150 ft. wide through Belleville Bar, then 6 ft. and from 50 to 100 ft. wide to Passaic. * * *. The river should be dredged as soon as possible to provide a continuous channel of 12 foot depth as far as Passaic, and ultimately this should be extended to Patterson. (page 346).

“The Arthur Kill is at present being deepened to 30 ft. by Government dredging. The Kill carries a tonnage estimated at more than 30,000,000 tons per year and should be dredged to 30 feet in order to accommodate large freight ships serving the numerous industries located or likely to be located along its shores.” (page 346).

Thirty-foot channels are not alone intended for light draft craft. On top of all this, further embarrassment is to be expected from the concentration of all of the cross-harbor rail traffic at the very point where greatly increased rail movement is to be expected in connection with the Lehigh Valley Railroad new Claremont terminal, the new Port of Newark, the new Droyer's Point water terminal in Jersey City, and other projects which cluster about the place where the proposed “inner belt line” is to join the L. V.-P. R. R. trestle and the tunnel to Brooklyn.

Certainly the former plan of the bi-state organization in this regard was preferable to the later one, which now contemplates drawbridge crossings of these two waterways already having a volume of traffic several times that of the Panama Canal.

Fourth, the intended use of the Newark Bay trestle, unless it is to be replaced with a costly permanent structure, invites the same disaster that in the past has cut traffic in two for a long period due to a fire.

Fifth, the westbound ruling gradient on the outer belt line is understood to be 32 feet per mile, in contrast with much lower rates on the Narrows tunnel route.

Sixth, no provision appears to have been made for a clearing yard, unless it is intended to build one at Greenville or utilize that of the P. R. R. If none is intended, then there is no provision for consolidating partial train loads going from various origins to various destinations, with resultant costly operation in running light trains or else gross delays and congestion due to holding cars for full train loads, either of which is inadmissible. Moreover, in this case electric operation through the tunnel will have to be extended for long distances to the existing break-up yards of the various railroads, and into such yards, many of which are unadapted to so doing without radical changes. If a yard is intended at Greenville, then the short distance available for yard purposes between the tunnel summit and the place where the lines branch to the north and west forbids a modern yard layout and high cost of operation and congestion are sure to ensue.

Seventh, the portions of the route that are carried on trestle or in tunnels, including the Upper Bay and Newark Bay crossings and the future

crossing under Arthur Kill to Staten Island, aggregate with approaches some 18 or 20 miles, which, of course, are unadapted to local industrial development.

Eighth, the route leaves on one side of the main current of traffic the great county and borough of Richmond, with its existing deep-water ocean piers, having an anticipated tonnage of 21,000,000 annually, and the potentially important waterfront along the east bank of Arthur Kill, thereby depriving that promising part of New York of the great benefits that result from an arterial flow of main line traffic through the midst of a community.

No detail maps, profiles or estimates of cost of construction or operation or revenue have been made public by the Port Authority, and, therefore, the student of their plan is in more or less of a fog. Based on what has been published and with what are believed to be reasonable assumptions of what has so far been withheld from the public, it would appear that the Port Authority plan, so far as connections are concerned between the railroads in New Jersey and the boroughs of New York City, is gravely at fault in not having been based on fundamentals which are vital to the effective solving of New York City's cross-bay transportation problem.

The Preferable Plan

It has been shown that the Narrows tunnel plan is grounded on the principles that must have full recognition, if New York City is to profit to the full from an enterprise of such moment; and that the Port Authority plan, in failing to give them recognition will perpetuate handicaps which both sides of the harbor are seeking to eliminate.

After all, the point at issue is not whether the Narrows tunnel *or* the Port Authority's plan shall be selected, because it is generally recognized that the former in any event should be built. It then becomes a question whether (1) the Narrows tunnel with its outer belt line in New Jersey, or (2) the Narrows tunnel exclusive of the outer belt line *plus* the Port Authority's cross-bay tunnel, inner belt line and Staten Island spur, shall be the adopted plan. In the former case a self contained system, in full accord with the principles heretofore mentioned, is obtained at a cost of say \$85,000,000. In the other case the outer belt line portion of the City's plan is rejected in favor of a duplicate tunnel and inner connections in New Jersey, and the total cost of the plan as a whole, with its many objectionable features, becomes say \$120,000,000, this figure embracing the unescapable Narrows tunnel terminating in Staten Island and the cross-bay tunnel, connections and improvement of existing facilities in New Jersey as to which it has been necessary to hazard a guess in the absence of any published estimates by the Port Authority. It will thus be seen that so far as can now be judged from available data the City's plan promises a saving of say \$35,000,000, coupled with observance of sound principles of design.

There can, apparently, be but one conclusion and that is in favor of the building of the Narrows tunnel as directed by the Legislature of the State of New York and in conjunction with it the railroad connections which are necessary for its self-support.

IV ESTIMATED SAVINGS

This question will be taken up with a view to determining the volume of traffic that may be expected annually to flow over the new route, the costs of movement of such traffic via both the present and the proposed routes, and the difference or saving applicable to the payment of additional fixed charges.

The demonstrations will be made on the theory that all the New Jersey roads will join in the enterprise, including rail access to the Brooklyn waterfront; and also on the basis set forth by the engineers of the carriers, which excludes the northern group of roads from participation in the project and excludes rail access to the Brooklyn waterfront.

Volume of Traffic

Based on data procured from the best available sources—the railroad companies and the Port Authority—it is fair to assume that the normal current tonnages exchanged between the New Jersey railroads and points on Long Island and beyond are as follows:

To and From.	Southerly Group. (P. R. R., C. R. R. of N. J., B. & O. & L. V. R. R.)	Northerly Group. (E. R. R., D. L. & W., W. S. R. R. & O. & W. R. R.)	Total.
Interchanges via Bay Ridge (N. Y., N. H. & H. R. R. & L. I. R. R.)	11,400,000	940,000	12,340,000
Brooklyn Waterfront:			
Car Floatage (non-coal)	2,370,000	1,630,000	4,000,000
Lighterage (non-coal)	440,000	560,000	1,000,000
Lighterage (anthracite coal)	3,015,000	985,000	4,000,000
Total	5,825,000	3,175,000	9,000,000
Grand Total	17,225,000	4,115,000	21,340,000

(For details and explanation see annexed Table "A.")

It should be noted that these include nothing for future increases due to natural growth of population; nor for the Staten Island piers of the City, of the American Dock Company and of the Pouch Terminal, which in the aggregate are expected to handle 21,000,000 tons of water and rail traffic; nor for contemplated developments along the Staten Island side of Arthur

Kill and at Jamaica and Flushing Bays and Hunts Point, and at the proposed new "free port" on the projected island in Upper Bay. Neither is anything included for interchanges between the railroads in New Jersey, which the carriers now feel will be nil; nor for industrial growth along the New Jersey belt line which will be peculiarly attractive for new plants by reason of the projected unified service of the nine trunk lines. The Brooklyn tonnages have been investigated on the ground by Mr. Tuttle's representatives, who have interviewed shippers along the proposed route of the marginal railway and have found that as of 1914 or thereabouts, some 8,000,000 tons were shippable by an all-rail route, to which the addition of a reasonable increment would make the normal current tonnage far in excess of the 9,000,000 figure that has been used. It had been hoped that the railroads would accept the invitation of the City to join in the investigation, but in this we have been disappointed. The evidence points conclusively to the almost unanimous wish of shippers in this region for direct rail facilities and to their intention to use them if furnished. It is to be assumed that before commitment of the City and railroads to this plan a suitable understanding will be reached with property owners and shippers along the route, to the end that claims for damages shall be waived and reasonable assurances given of shipments via the proposed rail route when completed.

On the basis set forth by the engineers of the carriers the tonnages of the southern group of roads are as follows:

To and From	Tons.
Interchanges	11,400,000
Brooklyn Waterfront (Bush Terminal)	670,000
Total	12,070,000

The number of cars handled, based on the current tonnages for all roads, are as follows:

To and From.	Number of Cars, Empty and Loaded.		
	Southerly Group.	Northerly Group.	Total.
Interchanges via Bay Ridge (N. Y., N. H. & H. R. R. & L. I. R. R.)	729,000	72,000	801,000
Brooklyn Waterfront:			
Car Floatage (non-coal)	273,000	187,000	460,000
Lighterage (non-coal)	51,000	64,000	115,000
Lighterage (anthracite coal)	120,000	39,000	159,000
Total	444,000	290,000	734,000
Grand Total	1,173,000	362,000	1,535,000

(For details and explanations see annexed Table "A.")

The figures of the carriers' engineers for the southern group of roads were:

Railroads.	Cars.
C. R. R. of N. J.....	184,100
L. V. R. R.....	192,300
B. & O. R. R.....	23,600
Total, (average tons per car 12.3).....	400,000
P. R. R. (average tons per car 17.8).....	400,000
Total (average tons per car 15.1).....	800,000

Costs and Savings per Car

Costs per car by the present routes are predicated on information obtained mainly from the railroads and the Port Authority, supplemented by individual calculations in the few instances where that has been found to be necessary. They are based on prices for the year 1918 and cover the territory lying between the same points to which costs by the new route have been figured. Summarized they are as follows:

To and From	Costs by Present Routes Per Car (Loaded and Empty).					
	Southerly Group.		Northerly Group.		Both Groups.	
	Total, Including Fixed Charges on		Total, Including Fixed Charges on		Total, Including Fixed Charges on	
	Operation Only.	Present Routes.	Operation Only.	Present Routes.	Operation Only.	Present Routes.
Bay Ridge	\$ 5.71	\$ 7.03	\$ 6.29	\$ 8.40	\$ 5.76	\$ 7.15
Brooklyn Waterfront—						
Car Floatage (non-coal).....	7.75	9.31	8.44	10.93	8.03	9.97
Lighterage (non-coal)	14.08	18.32	14.04	18.47	14.06	18.40
Lighterage (anthracite coal)	12.30	14.82	12.22	14.95	12.28	14.85
All destinations	7.23	8.85	9.41	12.19	7.74	9.64

Costs by the proposed route are calculated from data supplied by the railroad companies and from independent sources, the results being as follows:

To and From	Costs by Proposed Route Per Car (Loaded and Empty).		
	Southerly Group.	Northerly Group.	Both Groups.
Bay Ridge	\$3.11	\$5.60	\$3.33
Brooklyn Waterfront—			
Car Floatage (non-coal).....	4.75	7.07	5.69
Lighterage (non-coal)	6.36	8.34	7.46
Lighterage (anthracite coal).....	6.39	8.73	6.96
All destinations	\$3.97	\$7.18	\$4.73

The differences or savings then become:

To and From	Savings by Proposed Route Per Car (Loaded and Empty)					
	Southerly Group.		Northerly Group.		Both Groups.	
	Operation Only.	Total, Including Fixed Charges on Present Routes.	Operation Only.	Total, Including Fixed Charges on Present Routes.	Operation Only.	Total, Including Fixed Charges on Present Routes.
Bay Ridge	\$ 2.60	\$ 3.92	\$ 0.69	\$ 2.80	\$ 2.43	\$ 3.82
Brooklyn Waterfront—						
Car Floatage (non-coal)	3.00	4.56	1.37	3.86	2.34	4.28
Lighterage (non-coal)	7.72	11.96	5.70	10.13	6.60	10.94
Lighterage (anthracite coal)	5.91	8.43	3.49	6.22	5.32	7.89
All destinations	3.26	4.88	2.23	5.01	3.01	4.92

(For details and explanations of above three tables see annexed Table "D.")

Estimated Annual Savings

Applying the number of cars to the savings per car the results are:

To and From	Southerly Group.		Northerly Group.		Both Groups.	
	Operation Only.	Total, Including Fixed Charges on Present Routes.	Operation Only.	Total, Including Fixed Charges on Present Routes.	Operation Only.	Total, Including Fixed Charges on Present Routes.
	Bay Ridge	\$ 1,899,370	\$ 2,859,320	\$ 49,720	\$ 201,640	\$ 1,949,090	$ 3,060,960
Brooklyn Waterfront—						
Car Floatage (non-coal)	818,850	1,245,900	256,030	721,660	1,074,880	1,967,560
Lighterage (non-coal)	393,470	609,950	364,900	648,420	758,370	1,258,370
Lighterage (coal)	708,700	1,011,310	136,130	242,600	844,830	1,253,910
Total	1,921,020	2,867,160	757,060	1,612,680	2,678,080	4,479,840
Grand Total	3,820,390	5,726,480	806,780	1,814,320	4,627,170	7,540,800

(For details and explanations of the preceding tables see annexed Table "D.")

It will be seen that for all roads the estimated annual operating savings are \$4,627,170; and \$7,540,800, including operating costs, and also fixed charges on the present routes.

For the southerly group only, excluding the Brooklyn waterfront, the estimated annual savings are \$1,899,370 in operating expenses only, and \$2,859,320, including both operating costs and fixed charges in contrast

with \$1,668,400 and \$2,521,180 respectively as estimated by the carriers, the latter two sums, however, also including figures for a portion of the Bush Terminal tonnage.

This discrepancy is in part due to the use by me of Port Authority costs of break-up yard and waterfront yard switching instead of the P. R. R. figures for the L. V. R. R. traffic; also a lower cost per car for tunnel operation as is explained in annexed Table "C."

Next it is necessary to determine what sum, under all the conditions, shall be adopted as fairly representing net savings.

It will be argued that in case of diversion of traffic to the new line the present route savings in fixed charges will not be realizable in full. Taking the total railroad tonnage at 76,000,000 the portion that will be left to be handled in the New Jersey terminals after the 21,000,000 east-harbor tonnage has been diverted, will be say 55,000,000 tons, the difference equalling say 40% of the latter figure. How long will it take for the natural accretion of traffic to replace the gap made by this diversion? If the average rate of growth is taken at 5% annually, eight years will be required to make up the 40%. As five years may be assumed as the period required to make the new project effective, the portion of the present route fixed charges assignable to the diverted traffic that may be counted upon as saved at the date of opening is say five-eighths of the full amount. The net annual savings, exclusive of car per diem, then become:

	Southerly Group.	Both Groups.
Operating savings, as above.....	\$1,899,370	\$4,627,170
$\frac{5}{8}$ of present route fixed charges assignable to the diverted traffic	599,970	1,821,020
	<u>\$2,499,340</u>	<u>\$6,448,190</u>

To these sums should be added an allowance for car per diem by reason of the elimination of delays incident to the passage of cars through the existing waterfront yards on the two sides of the harbor, the cross-water light-erage, and archaic break-up yards where they now exist in New Jersey. A perusal of many letters of complaint of gross detentions of cars in Brooklyn and equally gross detentions to car floats at bridges on the New Jersey shore, indicates that the average detention that would be obviated by an all-rail route may be conservatively estimated at two days per car for the Brooklyn waterfront and one-half day per car for the Bay Ridge traffic. At \$1 per car per day this will amount to \$400,000 for the southerly group and \$1,868,000 for both groups.

Net Savings as of 1926

All of the sums so far given are based on normal current tonnages, which the carriers report have increased 25% or 3.6% per annum since 1914. Allowing five years as the required period of construction 18% should be added to the foregoing amounts, thus:

	Southerly Group.	Both Groups.
Saving as above, based on normal current tonnages.....	\$2,499,340	\$6,448,190
Savings in car per diem.....	400,000	1,868,000
Increment 1921-1926	521,881	1,496,914
Net savings as of 1926.....	\$3,421,221	\$9,813,104

It will be said (1) that car per diem is not now a matter of concern, as there is such a surplus of idle equipment, (2) that there is the possibility that N. Y. N. H. & H. interchange tonnages will be diverted to other routes so as not to pass through the New York district, (3) that some 500,000 tons of C. R. R. of N. J. traffic near the New Jersey waterfront to and from eastern points will require a backhaul, and (4) that the entire traffic of the latter company should be eliminated from consideration here because of the loss of profit that that company would experience on its haul between the proposed connection near Bound Brook and Jersey City.

To the first point the reply is that while there is now a surplus of cars, that condition will be reversed when the revival of the country's business arrives as prognosticated by General Atterbury. In fact cars will then be worth to the carriers much more than the per diem charge.

As to the second point there is of course the contingency that the New Haven traffic in part will be diverted, but should that come about there is the compensating growth that is to be expected whenever there is a temporary lightening of the load in a territory that naturally lends itself to development, as for instance in the Jamaica Bay region, the proposed free port on the projected island in Upper Bay, the Arthur Kill waterfrontage and finally the ocean piers on Staten Island at which future water and rail traffic has been estimated at 21,000,000 tons annually.

The third point is not a serious one as it involves an added annual cost of say \$50,000 for added road haul, an amount that is inconsiderable in this case.

As to the fourth point, it does not seem possible that any one of the carriers can afford to ignore any new method of handling business if it is more efficient than old methods. This is particularly true where the public is expected to reap great advantages.

On the last point it will be well to pause a moment. The speeding of freight movement, entirely apart from the savings to the carriers, will mean much to shippers in competition with other ports; the all-rail connections in

Brooklyn will mean pronounced savings to the large concerns that will be accessible to side-track connections, and coal merchants will save much in degradation and handling of coal. From all this the ultimate consumer cannot fail to profit and of course the commerce of the port also. In a word, the savings are not confined to the carriers.

It is realized that these figures are merely approximate, but they at least are based on the best obtainable information. It is hoped that those who may criticise them will offer substitute figures which can be shown to be predicated on more reliable data than are here used.

V

JUSTIFIABILITY OF THE PROJECT

In passing upon this crux of the question it is necessary to consider cost of construction, the extent to which savings over present methods will make the project self-supporting at the start, and the promise of future returns and benefits in the interest of all concerned, carriers, shippers, the local community and the nation at large.

Preliminary estimates of cost of construction are as follows:

In New Jersey—

Haworth to vicinity of Metuchen.....	\$25,000,000
Vicinity of Metuchen to Perth Amboy.....	3,500,000
Arthur Kill Viaduct.....	3,500,000
Total	<u>\$32,000,000</u>

In New York—

Arthur Kill Viaduct.....	\$2,000,000
Arthur Kill to East End Richmond Yard.....	8,000,000
East End Richmond Yard to Bay Ridge.....	43,000,000
Total	<u>\$53,000,000</u>

Brooklyn marginal railway (Maj. Sullivan's estimate).....	<u>\$25,000,000</u>
---	---------------------

Grand Total	<u>\$110,000,000</u>
-------------------	----------------------

Note—Cost of connection to Stapleton Piers is excluded as no tonnage therefor have been included in this demonstration.

For connections with the southerly group of roads only, and excluding the Brooklyn marginal railway, the preliminary estimates of cost are:

In New Jersey.....	\$7,000,000
In New York.....	52,000,000
	<u>\$59,000,000</u>

Surplus Over Fixed Charges On New Investment

Using 6% in New York and 7% in New Jersey as conservative rates for fixed charges, embracing interest, taxes and amortization, the annual requirements are:

	Southerly Group.	Both Groups.
Fixed charges	\$3,610,000	\$6,920,000
In contrast with these requirements the aforesaid net annual savings are	3,421,221	9,813,104
Surplus	—\$188,779	\$2,893,104

Briefly stated, the project applied only to the southerly group and excluding the Brooklyn waterfront, falls little short of being self-supporting, while taken as a whole it is clearly better than self-supporting.

Additional Advantages

Even if returns from freight traffic should not be sufficient to meet this requirement there is the opportunity, which should not be lost sight of, to utilize the new route as a means of passenger entrance by the New Jersey roads into the heart of the population of some 3,500,000 inhabitants in the boroughs of Richmond, Brooklyn, Queens and The Bronx. The two great passenger terminals in Manhattan are becoming overtaxed. Why should not similar public conveniences be created in these other boroughs? Rapid transit routes, present and proposed, lend themselves to such a solution of the trunk line passenger problem of this gigantic city. Diffusion rather than concentration in this regard is highly desirable, and the project in question would lend itself admirably to such treatment.

Very few new projects of magnitude thus lend themselves to an analysis of this kind. As a rule they rest solely on the vision and sound judgment of those to whom they owe their conception.

For example, if I may be pardoned the personal allusion, the Grand Central Terminal owes its existence to a forecasting in 1902 of the brilliant possibilities that laid in the use of the overhead air rights then lying dormant in the face of prophecies that railroad hotels never had been nor would be successful, that office space, then figured as worth \$1 per square foot, never would be rentable, and that the trend of street travel never could be diverted from Fifth Avenue to Madison Avenue. The actual results have far exceeded the favorable forecasts of that time.

The same has been publicly said of the Pennsylvania Terminal, where "mists of doubt and rocks of inertia" failed to check the vision of the projectors of that great work.

Then such examples as the original trans-continental lines further

prove that power to pierce the future is even more weighty in accomplishment than analyses based on existing conditions.

Happily in this case the analysis has the merit of reinforcing judgment as to whether or not the expenditure of so much new capital is justifiable. With the prospects so bright for the project becoming self-supporting from the start there would seem to be no question whatever as to the advisability of proceeding at once with its creation in the interest of this community's future. Carriers, shippers, ultimate consumers, the city and the nation are equally concerned in the furnishing of this new avenue of commerce which will mean so much for all of them in reducing waste and delay, fostering industrial expansion and affording improved means of military protection.

The City and State of New York want it, shippers want it, the ultimate consumer wants it. Then certainly the carriers should be willing at least to negotiate as to the terms on which they are willing to join in its construction and operation.

VI CONCLUSIONS

In light of the situation as thus outlined it seems fair to conclude that:

First, there is a crying need for relief from the present method of freight transportation between the trunk lines and the eastern shore of the Harbor of New York;

Second, there are in existence two New York State laws which provide that this relief shall be given, one through the agency of the New York Port Authority which is directed to prepare and submit to the Legislature a comprehensive plan for such relief, and the other through the instrumentality of the Board of Estimate and Apportionment of The City of New York, which is required to build a freight and passenger tunnel beneath the Narrows, between the Boroughs of Brooklyn and Richmond, and, in effect, to go forth in search of users from whom a rental may be obtained of sufficient size to make the project self supporting;

Third, the preferable solution of the problem of affording relief under these two laws is that reached under the provisions of the Narrows Tunnel Act, because thereby (a) fixed charges will be minimized by reason of a low interest rate, savings at places where joint construction of neighboring public facilities is feasible and the first cost being some ^{\$35,000,000} ~~\$50,000,000~~ less than that involved under the Port Authority plan, (b) centers of congestion in New Jersey will be avoided, (c) grade crossings of water and rail traffic at draw-bridges will be obviated, (d) operation of trains over perishable trestles will be unnecessary, (e) gradients on the steam operated section are very moderate, (f) a clearing yard is provided at which cars from a variety of origins may be classified and consolidated for a multitude of destinations, (g) inter-

ferences with the traffic development of adjoining territory are minimized, and (h) the life giving flow of main line traffic is led through the midst of the Borough of Richmond, where the best of service may be afforded the great ocean piers on its northern shore and along the eastern shore of Arthur Kill;

Fourth, the estimated net savings on the proposed Narrows tunnel route, in conjunction with collateral advantages and prospective benefits in the future are believed amply to justify its immediate construction in the joint interests of carriers, shippers and the general public; and

Fifth, the carriers jointly should acquiesce in the desire of The City of New York to negotiate with them as to the terms under which the Narrows tunnel plan may be made effective, bearing in mind that the figures used in this analysis are not looked upon as conclusive but merely as showing that the project is worthy of serious study in detail, under conditions to be agreed upon.

Very truly yours,

(Signed) WILLIAM J. WILGUS,
Consulting Engineer.

"A"
TONNAGES AND CARS—1921

*Bay
Ridge 18
13

Brooklyn
†Non Coal 8.7
‡Coal 25
25

Note:—Car Contents (Tons)
P. R. R.....
Other roads.....

* Carriers' figures.
† Port Authority.
‡ W. J. W.

Railroads.	To and From Brooklyn Waterfront						Total	Grand Total
	To and From (1) Bay Ridge		(2a) Car Floats		(2b) Lighters (Non-Coal)	(2c) Lighters (Coal)		
<i>South Group—</i>								
P. R. R.....	Tons	6,900,000*	1,200,000	190,000	1,675,000	3,065,000	9,965,000	
	Cars	383,000	138,000	22,000	67,000	227,000	610,000	
C. R. R. of N. J.....	Tons	2,100,000*	495,000	110,000	900,000	1,505,000	3,605,000	
	Cars	161,000	57,000	13,000	36,000	106,000	267,000	
B. & O. R. R.....	Tons	150,000*	415,000	90,000	410,000	915,000	1,065,000	
	Cars	12,000	48,000	10,000	16,000	74,000	86,000	
L. V. R. R.....	Tons	2,250,000*	260,000	50,000	30,000	340,000	2,590,000	
	Cars	173,000	30,000	6,000	1,000	37,000	210,000	
Total	Tons	11,400,000*	2,370,000	440,000	3,015,000	5,825,000	17,225,000	
	Cars	729,000	273,000	51,000	120,000	444,000	1,173,000	
<i>North Group—</i>								
E. R. R.....	Tons	450,000†	387,000	200,000	410,000	997,000	1,447,000	
	Cars	35,000	44,000	23,000	16,000	83,000	118,000	
D. L. & W.....	Tons	160,000†	594,000	300,000	230,000	1,124,000	1,284,000	
	Cars	12,000	68,000	34,000	9,000	111,000	123,000	
W. S. R. R.....	Tons	210,000†	562,000	60,000	.....	622,000	832,000
	Cars	16,000	65,000	7,000	.....	72,000	88,000
O. & W. R. R.....	Tons	120,000†	87,000	.....	345,000	432,000	552,000
	Cars	9,000	10,000	.....	14,000	24,000	33,000
Total	Tons	940,000†	1,630,000	560,000	985,000	3,175,000	4,115,000	
	Cars	72,000	187,000	64,000	39,000	290,000	362,000	
Grand Total	Tons	12,340,000	4,000,000	1,000,000	4,000,000	9,000,000	21,340,000	
	Cars	801,000	460,000	115,000	159,000	734,000	1,535,000	

Brooklyn figures are from attached sheet.

* Carriers' figures.

† P. A. figures plus 25% for increase from 1914 to 1921 (Same percent. as reported by carriers).

BROOKLYN WATERFRONT TONNAGES.

Railroad	Car Floatage			Lighterage			Total			
	Coal	Non-Coal		Coal	Non-Coal		Coal	Non-Coal		Total
		Total	Coal		Non-Coal	Total		Coal	Non-Coal	
W. S. R. R.....	0	449,672	449,672	0	39,692	39,692	0	489,364	489,364	
O. & W. R. R.....	0	562,000	562,000	0	60,000	60,000	0	622,000	622,000	
E. R. R.....	0	69,605	69,605	685,936	.....	685,936	685,936	69,605	755,541
D. L. & W. R. R.....	0	87,000	87,000	345,000	.....	345,000	345,000	87,000	432,000
	0	310,004	310,004	807,933	129,491	937,424	807,933	439,495	1,247,428	
	0	387,000	387,000	410,000	200,000	610,000	410,000	587,000	997,000	
	75,000	475,431	550,431	455,846	203,899	659,745	530,846	679,330	1,210,176	
	0	594,000	594,000	230,000	300,000	530,000	230,000	894,000	1,124,000	
Total North Group.....	75,000	1,304,712	1,379,712	1,949,715	373,082	2,322,797	2,024,715	1,677,794	3,702,509	
	0	1,630,000	1,630,000	985,000	560,000	1,545,000	985,000	2,190,000	3,175,000	
C. R. R. of N. J.....	0	397,632	397,632	1,786,433	80,084	1,866,517	1,786,433	477,716	2,264,149	
B. & O. R. R.....	0	495,000	495,000	900,000	110,000	1,010,000	900,000	605,000	1,505,000	
	0	332,745	332,745	805,116	62,802	867,918	805,116	395,547	1,200,663	
L. V. R. R.....	0	415,000	415,000	410,000	90,000	500,000	410,000	505,000	915,000	
	0	211,647	211,647	61,840	36,989	98,829	61,840	248,636	310,476	
P. R. R.....	0	260,000	260,000	30,000	50,000	80,000	30,000	310,000	340,000	
	0	962,382	962,382	3,207,481	128,123	3,335,604	3,207,481	1,090,505	4,297,986	
	0	1,200,000	1,200,000	1,675,000	190,000	1,865,000	1,675,000	1,390,000	3,065,000	
Total South Group.....	0	1,904,406	1,904,406	5,860,870	307,998	6,168,868	5,860,870	2,212,404	8,073,274	
	0	2,370,000	2,370,000	3,015,000	440,000	3,455,000	3,015,000	2,810,000	5,825,000	
Grand Total	75,000	3,209,118	3,284,118	7,810,585	681,080	8,491,665	7,885,585	3,890,198	11,775,783	
	0	4,000,000	4,000,000	4,000,000	1,000,000	5,000,000	4,000,000	5,000,000	9,000,000	

Light faced figures are those given by Port Authority for 1914. Bold faced figures are the estimated figures for 1921, based on (a) car floatage increased 25% over P. A. figures for 1914, (b) coal increased 25% over the 1914 tonnages which dealers on the ground state would have been shippable by rail, and (c) non-coal lighterage increased about 40% over P. A. figures for 1914. These tonnages are considerably less than the figures that have been ascertained from recent detail inquiry on the ground. The total of 4,000,000 tons of coal is believed to be correct, but its allocation among the carriers is subject to more or less radical change.

"B"

COSTS PER CAR—PRESENT METHODS

(Exclusive of all N. Y. shore costs, except bridging)

Railroads	Belt Line to Cl. Yard		Cl. Yard to W. F.	N. J. Waterfront			Marine Movement			N. Y. W. F. Yard 1, 2a	Total Cost				
	Distance Miles	Cost \$*		1, 2a	2b	2c	1	2a	2c		1	2a	2b	2c	
<i>South Group—</i>															
P. R. R.....	20	0.81	1.42†	0.75	4.13	1.35	1.60	3.74	7.70	8.70	0.92	5.50	7.64	14.06	12.28
Total.....	20	0.81	1.74‡	0.90	6.89	2.25	1.78	4.30	8.84	10.00	1.34	6.57	9.09	18.28	14.80
C. R. R. of N. J.....	21	0.85	1.42†	0.75	4.13	1.35	1.60	3.74	7.70	8.70	0.92	5.54	7.68	14.10	12.32
B. & O.....	21	0.85	1.74‡	0.90	6.89	2.25	1.78	4.30	8.84	10.00	1.34	6.61	9.13	18.32	14.84
L. V. R. R.....	17	0.69	0.89	1.60	4.13	1.35	1.60	3.74	7.70	8.70	0.92	6.36	8.50	14.07	12.29
Total.....	17	0.69	1.11	2.58	6.89	2.25	1.78	4.30	8.84	10.00	1.34	8.47	10.99	18.50	15.02
<i>North Group—</i>															
E. R. R.....	16	0.64	0.89	1.60	4.13	1.35	1.60	3.74	7.70	8.70	0.92	6.31	8.45	14.02	12.24
Total.....	16	0.64	1.11	2.58	6.89	2.25	1.78	4.30	8.84	10.00	1.34	8.42	10.94	18.45	14.97
D. L. & W.....	17	0.69	0.89	1.60	4.13	1.35	1.60	3.74	7.70	8.70	0.92	6.36	8.50	14.07	12.29
Total.....	17	0.69	1.11	2.58	6.89	2.25	1.78	4.30	8.84	10.00	1.34	8.47	10.99	18.50	15.02
W. S. R. R.....	14	0.56	0.89	1.60	4.13	1.35	1.60	3.74	7.70	8.70	0.92	6.23	8.37	13.94	12.16
O. & W.....	14	0.56	1.11	2.58	6.89	2.25	1.78	4.30	8.84	10.00	1.34	8.34	10.86	18.37	14.89
1 To and from Bay Ridge—P. R. R.															
2a To and from Brooklyn via floats.															
2b To and from Lighters (mdse.).															
2c To and from Lighters (anth. coal).															
* Miles x (\$1.708 cost per train mile = 4.03c. per C. M. for conducting transp'n.—Carriers' figures for N. J.)															
42.4 cars per train															

† Based on data from President of prominent coal company (40c.-45c. per ton).

‡ Based on data from carriers.

§ Based on data from W. J. W.

All other costs given by Port Authority.

"C"

OPERATING COSTS PER CAR—PROPOSED METHODS

Railroads	Belt Line to Richmond Yard		Rich- mond Yard	Richmond Yard to Bay Ridge		Bay Ridge to Brooklyn W. F.		Totals	
	Distance Miles	Cost		Bay Ridge	2a	2a	2b & 2c	Bay Ridge 1	2a 2b & 2c
		\$ *	\$ †	\$ ‡	\$ §	\$ §	\$	\$	\$
<i>South Group—</i>									
P. R. R.....	14	1.12	1.42†	0.58	1.57	3.17	3.12	4.69	6.29
C. R. R. of N. J. & B. & O.....	17	1.36	1.42†	0.58	1.57	3.17	3.36	4.93	6.53
L. V. R. R.....	17	1.36	0.89	0.58	1.57	3.17	2.83	4.40	6.00
<i>North Group—</i>									
E. R. R.....	50	4.00	0.89	0.58	1.57	3.17	5.47	7.04	8.64
D. L. & W.....	41	3.28	0.89	0.58	1.57	3.17	4.75	6.32	7.92
W. S. R. R., O. & W.....	59	4.72	0.89	0.58	1.57	3.17	6.19	7.76	9.36

* M. of W., Mscl. & G. E. \$1,550,000 (W. J. W. report 10/13/21)

34,539,000 + 6.7% = say 37,000,000 C. M. (W. J. W. rept. 10/13/21 increased to correspond to increase in tonnage from 20,000,000 to 21,340,000 tons)

† Based on data from carriers.

‡ Based on data from W. J. W. Same as at page 24 of the report of the Special Committee of the Board of Estimate, dated October 15, 1921, *modified* by reason of (a) halving the cost of maintenance of way, (b) increasing loco. and train wages to agree with figures of the engineers' committee of the carriers, and (c) diminishing the amount of electricity from 25,000,000 to 21,000,000 k. w. h. All other figures are from Port Authority.

§ \$1.57 is for moving cars between Bay Ridge and interchange tracks corresponding to existing methods of deliveries at terminal yards in Brooklyn. (See p. 25 above mentioned Special Committee report). For the other tonnages (2b & 2c) \$1.60 per car is added for local switchings.

= 4.19c + C. T. 4.03c (see footnote under "B") = 8.22c,
say 8c per C. M. x distance in miles = Cost.

"D"

SAVINGS PER CAR APPLICABLE TO FIXED CHARGES ON NEW INVESTMENT

Railroads	Based on Direct Charges (Opr. Expenses Only)				Based on Total Charges on Present Routes					
	1	2a	2b	2c	Total	1	2a	2b	2c	Total
	\$	\$	\$	\$	\$ *	\$	\$	\$	\$	\$ *
<i>South Group—</i>										
P. R. R.....	5.50	7.64	14.06	12.28	7.04	6.57	9.09	18.28	14.80	8.46
Proposed	3.12	4.69	6.29	6.29	3.94	3.12	4.69	6.29	6.29	3.93
Saving	2.38	2.95	7.77	5.99	3.10	3.45	4.40	11.99	8.51	4.53
C. R. R. of N. J. (includes P. & R.).....	5.54	7.68	14.10	12.32	7.33	6.61	9.13	18.32	14.84	8.83
Proposed	3.36	4.93	6.53	6.53	4.28	3.36	4.93	6.53	6.53	4.28
Saving	2.18	2.75	7.57	5.79	3.05	3.25	4.20	11.79	8.31	4.55
B. & O. R. R.....	5.54	7.68	14.10	12.32	8.99	6.61	9.13	18.32	14.84	10.91
Proposed	3.36	4.93	6.53	6.53	5.19	3.36	4.93	6.53	6.53	5.19
Saving	2.18	2.75	7.57	5.79	3.80	3.25	4.20	11.79	8.31	5.72
L. V. R. R.....	6.36	8.50	14.07	12.29	6.91	8.47	10.99	18.50	15.02	9.15
Proposed	2.83	4.40	6.00	6.00	3.16	2.83	4.40	6.00	6.00	3.16
Saving	3.53	4.10	8.07	6.29	3.75	5.64	6.59	12.50	9.02	5.99
Total*	5.71	7.75	14.08	12.30	7.23	7.03	9.31	18.32	14.82	8.85
Proposed	3.11	4.75	6.36	6.39	3.97	3.11	4.75	6.36	6.39	3.97
Saving	2.60	3.00	7.72	5.91	3.26	3.92	4.56	11.96	8.43	4.88

TABLE "D"—Continued

Railroads	Based on Direct Charges (Opr. Expenses Only)				Based on Total Charges on Present Routes				
	1		Total		1		Total		
	2a	2b	2c	Total	2a	2b	2c	Total	
<i>North Group—</i>									
E. R. R.....	6.31	8.45	14.02	12.24	8.42	10.94	18.45	14.97	12.20
Proposed	5.47	7.04	8.64	8.64	5.47	7.04	8.64	8.64	7.10
Saving	0.84	1.41	5.38	3.60	2.95	3.90	9.81	6.33	5.10
D. L. & W.....	6.36	8.50	14.07	12.29	8.47	10.99	18.50	15.02	13.11
Proposed	4.75	6.32	7.92	7.92	4.75	6.32	7.92	7.92	6.73
Saving	1.61	2.18	6.15	4.37	3.72	4.67	10.58	7.10	6.38
W. S. R. R.....	6.23	8.37	13.94	12.16	8.34	10.86	18.37	14.89	11.00
Proposed	6.19	7.76	9.36	9.36	6.19	7.76	9.36	9.36	7.60
Saving	0.04	0.61	4.58	2.80	2.15	3.10	9.01	5.53	3.40
O. & W.....	6.23	8.37	13.94	12.16	8.34	10.86	18.37	14.89	11.89
Proposed	6.19	7.76	9.36	9.36	6.19	7.76	9.36	9.36	8.01
Saving	0.04	0.61	4.58	2.80	2.15	3.10	9.01	5.53	3.88
Total *	6.29	8.44	14.04	12.22	8.40	10.93	18.47	14.95	12.19
Proposed	5.60	7.07	8.34	8.73	5.60	7.07	8.34	8.73	7.18
Saving	0.69	1.37	5.70	3.49	2.80	3.86	10.13	6.22	5.01
Grand Total *	5.76	8.03	14.06	12.28	7.15	9.97	18.40	14.85	9.64
Proposed	3.33	5.69	7.46	6.96	3.33	5.69	7.46	6.96	4.72
Saving	2.43	2.34	6.60	5.32	3.82	4.28	10.94	7.89	4.92

Based on data appearing in Tables "B" and "C," except totals which are derived from data in Table "E."
* Plus or minus.

ANNUAL SAVINGS

Railroads	Based on Direct Charges (Opr. Expenses Only)			Based on Total Charges on Present Routes						
	1	2a	2b	2c	Total	1	2a	2b	2c	Total
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
<i>South Group</i>										
P. R. R.....	2,106,500	1,054,320	309,320	822,760	4,292,900	2,516,310	1,254,420	402,160	991,600	5,164,490
	1,194,960	647,220	138,380	421,430	2,401,990	1,194,960	647,220	138,380	421,430	2,401,990
	911,540	407,100	170,940	401,330	1,890,910	1,321,350	607,200	263,780	570,170	2,762,500
C. R. R. of N. J.....	891,940	437,760	183,300	443,520	1,956,520	1,064,210	520,410	238,160	534,240	2,357,020
(includes P. & R.).....	540,960	281,010	84,890	235,080	1,141,940	540,960	281,010	84,890	235,080	1,141,940
	350,980	156,750	98,410	208,440	814,580	523,250	239,400	153,270	299,160	1,215,080
B. & O. R.....	66,480	368,640	141,000	197,120	773,240	79,320	438,240	183,200	237,440	938,200
	40,320	236,640	65,300	104,480	446,740	40,320	236,640	65,300	104,480	446,740
	26,160	132,000	75,700	92,640	326,500	39,000	201,600	117,900	132,960	491,460
L. V. R. R.....	1,100,280	255,000	84,420	12,290	1,451,990	1,465,310	329,700	111,000	15,020	1,921,030
	489,590	132,000	36,000	6,000	663,590	489,590	132,000	36,000	6,000	663,590
	610,690	123,000	48,420	6,290	788,400	975,720	197,700	75,000	9,020	1,257,440
Total.....	4,165,200	2,115,720	718,040	1,475,690	8,474,650	5,125,150	2,542,770	934,520	1,778,300	10,380,740
	2,265,830	1,296,870	324,570	766,990	4,654,260	2,265,830	1,296,870	324,570	766,990	4,654,260
	1,899,370	818,850	393,470	708,700	3,820,390	2,859,320	1,245,900	609,950	1,011,310	5,726,480

TABLE "E"—Continued

Railroads	Based on Direct Charges (Opr. Expenses Only)				Based on Total Charges on Present Routes			
	1			Total	1			Total
	2a	2b	2c		2a	2b	2c	
<i>North Group</i>								
E. R. R.....	220,850	322,460	195,840	1,110,950	294,700	424,350	239,520	1,439,930
	191,450	198,720	138,240	838,170	191,450	198,720	138,240	838,170
	29,400	123,740	57,600	272,780	103,250	225,630	101,280	601,760
D. L. & W. R. R.....	76,320	478,380	110,610	1,243,310	101,640	629,000	135,180	1,613,140
	57,000	269,280	71,280	827,320	57,000	269,280	71,280	827,320
	19,320	209,100	39,330	415,990	44,640	359,720	63,900	785,820
W. S. R. R.....	99,680	97,580	.....	741,310	133,440	128,590	.....	967,930
	99,040	65,520	.....	668,960	99,040	65,520	.....	668,960
	640	32,060	.....	72,350	34,400	63,070	.....	298,970
O. & W. R. R.....	56,070	.....	170,240	310,010	75,060	.....	208,460	392,120
	55,710	.....	131,040	264,350	55,710	.....	131,040	264,350
	360	6,100	39,200	45,660	19,350	.....	77,420	127,770
Total.....	452,920	898,420	476,690	3,405,580	604,840	1,181,940	583,160	4,413,120
	403,200	533,520	340,560	2,598,800	403,200	533,520	340,560	2,598,800
	49,720	364,900	136,130	806,780	201,640	648,420	242,600	1,814,320
Grand Total	4,618,120	1,616,460	1,952,380	11,880,230	5,729,990	2,116,460	2,361,460	14,793,860
	2,669,030	858,090	1,107,550	7,253,060	2,669,030	858,090	1,107,550	7,253,060
	1,949,090	1,074,880	844,830	4,627,170	3,060,960	1,258,370	1,253,910	7,540,800

Based on number of cars shown in Table "A" multiplied by present and proposed costs per car and savings per car shown in Table "D"

State of New York.

No. 108.

Int. 108.

IN SENATE,

January 11, 1922.

Introduced by Mr. SMITH—read twice and ordered printed,
and when printed to be committed to the Committee on Affairs
of Cities.

AN ACT

To amend chapter seven hundred of the laws of nineteen hundred and twenty-one, entitled “An act to authorize the board of estimate and apportionment of the city of New York to construct a tunnel for freight and passenger purposes under New York bay, between the boroughs of Richmond and Brooklyn, by improving and increasing the terminal facilities of the city of New York to maintain the supremacy of the port of New York,” generally.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

- 1 Section 1. Chapter seven hundred of the laws of nineteen hun-
- 2 dred and twenty-one, entitled “An act to authorize the board of
- 3 estimate and apportionment of the city of New York to construct
- 4 a tunnel for freight and passenger purposes under New York bay,
- 5 between the boroughs of Richmond and Brooklyn, by improving
- 6 and increasing the terminal facilities of the city of New York to

EXPLANATION—Matter in *italics* is new; matter in brackets [] is old law to be omitted.

1 maintain the supremacy of the port of New York" is hereby
2 amended to read as follows:

3 Section 1. The board of estimate and apportionment of the
4 city of New York shall within two years after the taking effect
5 of this act begin the construction of a railroad tunnel under New
6 York bay between the boroughs of Richmond and Brooklyn. Such
7 tunnel connection shall be used for both freight and passenger
8 purposes. [Such construction shall be undertaken and completed
9 in the same manner, by the same procedures and with the same
10 regulations as are authorized by the charter of the city of New
11 York for local improvements except that the entire expense shall
12 be borne by the city of New York.] *And it is also authorized,*
13 *at such time as it shall deem proper and expedient, to construct*
14 *connections with existing railroads, piers, docks, ferries and float*
15 *bridges; to acquire and construct the necessary buildings and*
16 *other structures, and classification, switching, storage, and deliv-*
17 *ery yards and appurtenances; and to purchase and instal any*
18 *necessary equipment, including tracks, signals, interlocking*
19 *plants, electric conductors, pumps, drains, telephones, rolling*
20 *stock, and other railroad appliances. The said board may select*
21 *the sites necessary for such tunnel and the terminals thereof and*
22 *connections therewith and for connections with existing railroads,*
23 *and may decide upon the capacity, method of construction and all*
24 *other matters pertaining to the establishment of such tunnel and*
25 *other connections as may be proposed, and adopt detailed plans*
26 *and specifications for the construction and equipment thereof.*

1 *and execute all contracts incidental to the said construction and*
2 *equipment. All lands, rights or easements, and other property,*
3 *necessary therefor, when not acquired by agreement, shall be ac-*
4 *quired by the city of New York in the manner provided by the*
5 *charter of such city for the acquisition of lands for the [purpose*
6 *of public use] improvement of the water-front, except, that if the*
7 *right to cross, intersect or connect with any existing railroad*
8 *purposes. [Such construction shall be undertaken and completed*
9 *quired pursuant to section twenty-two of the railroad law.*

10 § [1, pt.] 2. *After the [such] construction of such tunnel*
11 *and connections from time to time, the city, acting by and through*
12 *the said board of estimate and apportionment, may lease the same*
13 *to such person, firm or corporation or to such persons, firms or*
14 *corporations as may be determined upon by the board of estimate*
15 *and apportionment upon such terms as may be agreed upon; or*
16 *the city may operate any such tunnel or connections through such*
17 *official agency as may be determined by the said board of estimate*
18 *and apportionment; or it may enter into a contract for the opera-*
19 *tion or the partial operation of all or a part of such tunnel and*
20 *connections [and thereafter the maintenance, operation and*
21 *repair together with the collection of tolls and charges for the use*
22 *of such tunnel shall be under the control and management of such*
23 *lessee within the limitations and conditions of such lease. Such*
24 *lease or any renewal thereof shall not be for a longer time than*
25 *twenty-five years. Such lease shall reserve as rent or compen-*
26 *sation to the city an amount at least sufficient to pay the interest*

1 on bonds issued pursuant to this act and to amortize the principal
2 thereof as such interest and principal become due. The board of
3 estimate and apportionment shall have power to fix all charges
4 and tolls for the use of such tunnel, but not less than sufficient
5 to pay the cost of the administration, maintenance and operation
6 of such tunnel.】

7 § 3. *Such lease or contract, if made for a period of more than*
8 *ten years, shall reserve as rent or compensation to the city an*
9 *amount at least sufficient to pay the interest on so much of the*
10 *bonds issued pursuant to this act as represents the cost of that*
11 *portion of the improvement included in such lease or contract,*
12 *and to amortize the principal thereof as such principal becomes*
13 *due. No lease or contract shall be made until after the matter has*
14 *been made the subject of a duly advertised public hearing nor*
15 *for a greater period than ten years if that part of the improve-*
16 *ment included in the lease or contract is not self sustaining.*

17 § 4. *The powers conferred by this act shall not be limited or*
18 *in any way controlled by the provisions of any other law, general,*
19 *special, or local, except as in this act especially provided.*

20 §【2.】 5. For the purposes of this act the commissioners of the
21 land office of the state of New York may, in their discretion, and
22 upon such terms and conditions as the commissioners may deem
23 proper, cede in fee simple by proper instruments in writing all
24 the right, title and interest of the people of the state of New
25 York in and to any lands under water necessary for the construc-
26 tion of such tunnels and the terminals thereof.

1 § [3.] 6. The board of estimate and apportionment may issue
2 bonds or corporate stock of the city of New York to meet the ex-
3 pense of the construction of such tunnel, *connections and all other*
4 *facilities and appurtenances herein described, as well as the cost of*
5 *acquiring any property to be taken for the improvements* or provide
6 funds therefor in any manner authorized by the charter of such
7 city, *but in addition to corporate stock or serial bonds now author-*
8 *ized by law to be issued by such city. Said bonds or corporate*
9 *stock shall be payable at maturity out of a sinking fund to be*
10 *established and maintained for that purpose out of the annual*
11 *rentals or revenues of said improvements or any part thereof,*
12 *and such sum as it may be necessary to raise annually by taxes*
13 *to supply any deficit in such rentals or revenues; but this pro-*
14 *vision shall not diminish or affect the obligation of the city as*
15 *debtor upon such bonds or any other right or remedy of any*
16 *holder or owner of such bonds to collect the principal or interest*
17 *thereof.*

18 §7. (1) *The said board of estimate and apportionment of the*
19 *city of New York shall be deemed to be the local authority in*
20 *control of the streets, roads, bridges, viaducts, highways, avenues,*
21 *boulevards, driveways, parks, parkways, docks, bulkheads, wharves,*
22 *piers and public lands and waters within the city for all the pur-*
23 *poses of this act; the consent of such board and the mayor shall be*
24 *the only consent of local authority required hereunder, and the*
25 *resolution of the said board of estimate and apportionment au-*

1 *thorizing the construction of any such connecting railroad shall be*
2 *deemed the consent of the local authorities of the city of New*
3 *York.*

4 (2) *The said board shall take the necessary steps to obtain,*
5 *if possible, the said consents of the property owners along the line*
6 *of the said route or routes. For the purposes of this act the*
7 *value of the property bounded on that portion of any street or*
8 *highways in, upon, over or under which it is proposed to construct*
9 *or operate such railroad or railroads, on any part thereof, shall*
10 *be ascertained and determined from the assessment roll of the*
11 *city, confirmed, or completed last before the local authorities shall*
12 *have given their consent, as above provided. If such consents of*
13 *property owners cannot be obtained, the corporation counsel shall,*
14 *upon the direction of said board, make application in the name*
15 *of the city to the appellate division of the supreme court in the*
16 *department in which such railroad is to be constructed for the*
17 *appointment of three commissioners to determine and report after*
18 *due hearing whether such railroad ought to be constructed and*
19 *operated. Three weeks' notice of such application shall be given*
20 *by publication thereof once in each week in two daily newspapers*
21 *published in the city. The newspapers in which said publication*
22 *shall be made shall be designated by the appellate division of the*
23 *supreme court to which such application is to be made on the*
24 *application of the city without notice.*

25 (3) *The said appellate division upon due proof of the pub-*
26 *lication aforesaid, shall appoint three disinterested persons who*

1 shall act as commissioners, and such commissioners within ten
2 days after their appointment shall cause public notice to be given
3 in the manner directed by the said appellate division of their
4 first sitting, and may adjourn from time to time until all their
5 business is completed. Vacancies in such commission may be
6 filled by said appellate division after such notice to persons in-
7 terested as the appellate division may deem proper, and the evi-
8 dence taken before as well as after such vacancy occurred shall
9 be deemed to be properly before such board. The said commis-
10 sioners shall determine after public hearing of all parties inter-
11 ested whether such railroad ought to be constructed and operated
12 and shall report the evidence taken to said appellate division,
13 together with a report of their determination whether such road
14 ought to be constructed and operated, which report, if in favor
15 of the construction and operation of such road, shall, when con-
16 firmed by said court, be taken in lieu of the consent of the prop-
17 erty owners above mentioned. Such report shall be made within
18 sixty days after the appointment of said commissioners, unless the
19 said court, or a judge thereof, shall extend such time.

20 §[4]8. This act shall take effect immediately.

State of New York.

No. 41.

Int. 41.

IN SENATE,

January 9, 1922.

Introduced by Mr. MEYER — read twice and ordered printed, and when printed to be committed to the Committee on Finance.

AN ACT

By which the state of New York agrees with the state of New Jersey upon the comprehensive plan for the development of the port of New York, pursuant to the compact authorized by the two states and signed April thirtieth, nineteen hundred and twenty-one, and consented to and approved by congress and the president of the United States, August twenty-third, nineteen hundred and twenty-one, and authorizing and empowering the port of New York authority to effectuate the same, and making an appropriation therefor.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

- 1 Whereas, The states of New York and New Jersey on the thir-
- 2 tieth of April, nineteen hundred and twenty-one, pursuant to
- 3 chapter one hundred and fifty-four of the laws of nineteen hun-
- 4 dred and twenty-one of New York and chapter one hundred and
- 5 fifty-one of the laws of nineteen hundred and twenty-one of New

EXPLANATION—Matter in *italics* is new; matter in brackets [] is old law to be omitted.

1 Jersey, did enter into a compact or agreement which pledged the
2 two states to faithful cooperation in the future planning and
3 development of the port of New York, and which, furthermore,
4 created the port of New York district, as therein described, and
5 the port of New York authority, a body politic and corporate, as
6 an instrumentality or agency of the two states to effectuate such
7 pledge of cooperation;

8 And whereas, The said compact or agreement provides in article
9 ten thereof that the " legislatures of the two states, prior to the
10 signing of this agreement, or thereafter as soon as may be prac-
11 ticable, will adopt a plan or plans for the comprehensive develop-
12 ment of the port of New York " ;

13 Now, therefore (the state of New Jersey by appropriate legisla-
14 tion concurring therein), the following be and it is hereby adopted
15 as the comprehensive plan for the development of the port of New
16 York under and pursuant to said compact or agreement :

17 Section 1. Principles to govern the development :

18 First. That terminal operations within the port district, so
19 far as economically practicable, should be unified ;

20 Second. That there should be consolidation of shipments at
21 proper classification points so as to eliminate duplication of
22 effort, inefficient loading of equipment and realize reduction in
23 expenses ;

24 Third. That there should be the most direct routing of all
25 commodities so as to avoid centers of congestion, conflicting cur-
26 rents and long truck-hauls ;

1 Fourth. That terminal stations established under the compre-
2 hensive plan should be union stations, so far as practicable ;

3 Fifth. That the process of coordinating facilities should so
4 far as practicable adapt existing facilities as integral parts of the
5 new system, so as to avoid needless destruction of existing capital
6 investment and reduce so far as may be possible the requirements
7 for new capital; and endeavor should be made to obtain the con-
8 sent of local municipalities within the port district for the coor-
9 dination of their present and contemplated port and terminal
10 facilities with the whole plan.

11 Sixth. That freight from all railroads must be brought to all
12 parts of the port wherever practicable without cars breaking bulk,
13 and this necessitates tunnel connection between New Jersey and
14 Long Island, and tunnel or bridge connections between other parts
15 of the port ;

16 Seventh. That there should be urged upon the federal authori-
17 ties improvement of channels so as to give access for that type
18 of waterborne commerce adapted to the various forms of develop-
19 ment which the respective shorefronts and adjacent lands of the
20 port would best lend themselves to ;

21 Eighth. That highways for motor truck traffic should be laid
22 out so as to permit the most efficient inter-relation between
23 terminals, piers and industrial establishments not equipped with
24 railroad sidings and for the distribution of building materials
25 and many other commodities which must be handled by trucks ;

1 these highways to connect with existing or projected bridges, tun-
2 nels and ferries.

3 Ninth. That definite methods for prompt relief should be
4 devised which can be applied for the better coordination and opera-
5 tion of existing facilities while larger and more comprehensive
6 plans for future development are being carried out.

7 § 2. The bridges, tunnels and belt lines forming the compre-
8 hensive plan are generally and in outline indicated on maps filed
9 by the port of New York authority in the offices of the secretaries
10 of the states of New York and New Jersey and are hereinafter
11 described in outline.

12 § 3. Tunnels and bridges to form part of the plan. (a) A
13 tunnel or tunnels connecting the New Jersey shore and the Brook-
14 lyn shore of New York to provide through line connection
15 between the transcontinental railroads now having their terminals
16 in New Jersey with the Long Island railroad and the New York
17 connecting railroad on Long Island and with the New York
18 Central and Hudson River railroad and the New York, New
19 Haven and Hartford railroad in the Bronx, and to provide con-
20 tinuous transportation of freight between the Queens, Brooklyn
21 and Bronx sections of the port to and from all parts of the west-
22 erly section of the port, for all of the transcontinental railroads.

23 (b) A bridge and/or tunnel across or under the Arthur Kill,
24 and/or the existing bridge enlarged, to provide direct freight
25 carriage between New Jersey and Staten Island.

1 (c) The location of all such tunnels or bridges to be at the
2 shortest, most accessible and most economical points practicable,
3 taking account of existing facilities now located within the port
4 district and providing for and taking account of all reasonably
5 foreseeable future growth in all parts of the district.

6 § 4. Manhattan service. The island of Manhattan to be con-
7 nected with New Jersey by bridge or tunnel, or both, and freight
8 destined to and from Manhattan to be carried underground, so
9 far as practicable, by such system, automatic electric as herein-
10 after described or otherwise, as will furnish the most expeditious.
11 economical and practical transportation of freight, especially
12 meat, produce, milk and other commodities comprising the daily
13 needs of the people. Suitable markets, union inland terminal sta-
14 tions and warehouses to be laid out at points most convenient to
15 the homes and industries upon the island, the said system to be
16 connected with all the trans-continental railroads terminating in
17 New Jersey and by appropriate connection with the New York
18 Central and Hudson River railroad, the New York, New Haven
19 and Hartford and the Long Island railroads.

20 § 5. Belt lines. The numbers hereinafter used correspond
21 with the numbers which have been placed on the map of the com-
22 prehensive plan to identify the various belt lines and marginal
23 railroads.

24 Number 1. Middle belt line. Connects New Jersey and
25 Staten Island and the railroads on the westerly side of the port

1 with Brooklyn, Queens, the Bronx and the railroads on the
2 easterly side of the port. Connects with the New York Central
3 railroad in the Bronx; with the New York, New Haven and Hart-
4 ford railroad in the Bronx; with the Long Island railroad in
5 Queens and Brooklyn; with the Baltimore and Ohio railroad near
6 Elizabethport and in Staten Island; with the Central Railroad
7 Company of New Jersey at Elizabethport and at points in
8 Newark and Jersey City; with the Pennsylvania railroad in
9 Newark and Jersey City; with the Lehigh Valley railroad
10 in Newark and Jersey City; with the Delaware, Lackawanna and
11 Western railroad in Jersey City and the Secaucus meadows; with
12 the Erie railroad in Jersey City and the Secaucus meadows; with
13 the New York, Susquehanna and Western in West Hoboken;
14 with the New York, Ontario and Western and the West Shore
15 railroads on the westerly side of the Palisades above the Wee-
16 hawken tunnel.

17 The route of the middle belt line as shown on said map is in
18 general as follows: Commencing at the Hudson river at Spuy-
19 ten Duyvil running easterly and southerly generally along the
20 easterly side of the Harlem river, utilizing existing lines so far
21 as practicable and improving and adding where necessary, to a
22 connection with Hell Gate bridge and the New Haven railroad,
23 a distance of approximately seven miles; thence continuing in
24 a general southerly direction, utilizing existing lines and improv-
25 ing and adding where necessary, to a point near Bay Ridge, a
26 distance of approximately eighteen and one-half miles; thence

1 by a new tunnel under New York bay in a northwesterly direc-
2 tion to a portal in Jersey City or Bayonne, a distance of approxi-
3 mately five miles, to a connection with the tracks of the Pennsyl-
4 vania and Lehigh Valley railroads; thence in a generally
5 northerly direction along the easterly side of Newark bay and
6 the Hackensack river at the westerly foot of the Palisades, utiliz-
7 ing existing tracks and improving and adding where necessary,
8 making connections with the Jersey Central, Pennsylvania,
9 Lehigh Valley, Delaware, Lackawanna and Western, Erie, New
10 York, Susquehanna and Western, New York, Ontario and
11 Western, and West Shore railroads, a distance of approximately
12 ten miles. From the westerly portal of the Bay tunnel and from
13 the line along the easterly side of Newark bay by the bridges of
14 the Central railroad of New Jersey (crossing the Hackensack
15 and Passaic rivers) and of the Pennsylvania and Lehigh Valley
16 railroads (crossing Newark bay) to the line of the Central rail-
17 road of New Jersey running along the westerly side of Newark
18 bay and thence southerly along this line to a connection with the
19 Baltimore and Ohio railroad south of Elizabethport utilizing
20 existing lines so far as practicable and improving and adding.
21 where necessary, a distance of approximately twelve miles; thence
22 in an easterly direction crossing the Arthur kill, utilizing existing
23 lines so far as practicable and improving and adding where neces-
24 sary, along the northerly and easterly shores of Staten Island to
25 the new city piers and to a connection, if the city of New York
26 consent thereto, with the tunnel under the Narrows to Brooklyn

1 provided for under chapter seven hundred of the laws of the
2 state of New York for nineteen hundred and twenty-one.

3 Number 2. A marginal railroad to the Bronx extending along
4 the shore of the East river and Westchester creek connecting
5 with the middle belt line (number one), and with the New
6 York, New Haven and Hartford railroad in the vicinity of West-
7 chester.

8 Number 3. A marginal railroad in Queens and Brooklyn ex-
9 tending along Flushing creek, Flushing bay, the East river and
10 the upper New York bay. Connects with the middle belt line
11 (number one), by lines number four, number five, number six
12 and directly at the southerly end at Bay Ridge. Existing lines
13 to be utilized and improved and added to and new lines built
14 where lines do not now exist.

15 Number 4. An existing line to be improved and added to
16 where necessary. Connects the middle belt line (number one),
17 with the marginal railroad number three near its northeasterly
18 end.

19 Number 5. An existing line to be improved and added to
20 where necessary. Connects the middle belt line (number one),
21 with the marginal railroad number three in Long Island City.

22 Number 6. Connects the middle belt line (number one), with
23 the marginal railroad number three in the Greenpoint section of
24 Brooklyn. The existing portion to be improved and added to
25 where necessary.

1 Number 7. A marginal railroad surrounding the northerly
2 and westerly shores of Jamaica bay. A new line. Connects
3 with the middle belt line (number one).

4 Number 8. An existing line, to be improved and added to
5 where necessary. Extends along the southeasterly shore of Staten
6 Island. Connects with middle belt line (number one).

7 Number 9. A marginal railroad extending along the westerly
8 shore of Staten Island and a branch connection with number
9 eight. Connects with the middle belt line (number one), and
10 with a branch from the outer belt line (number fifteen).

11 Number 10. A line made up mainly of existing lines, to be
12 improved and added to where necessary. Connects with the mid-
13 dle belt line (number one) by way of marginal railroad number
14 eleven. Extends along the southerly shore of Raritan bay and
15 through the territory south of the Raritan river reaching New
16 Brunswick.

17 Number 11. A marginal railroad extending from a connec-
18 tion with the proposed outer belt line (number fifteen) near
19 New Brunswick along the northerly shore of the Raritan river
20 to Perth Amboy, thence northerly along the westerly side of the
21 Arthur Kill to a connection with the middle belt line (number
22 one) south of Elizabethport. The portion of this line which
23 exists to be improved and added to where necessary.

24 Number 12. A marginal railroad extending along the east-
25 erly shore of Newark bay and the Hackensack river and con-
26 nects with the middle belt line (number one). A new line.

27 Senate, No. 41.

1 Number 13. A marginal railroad extending along the
2 westerly side of the Hudson river and the Upper New York bay.
3 Made up mainly of existing lines—the Erie Terminals, Jersey
4 Junction, Hoboken Shore, and National Docks railroads. To be
5 improved and added to where necessary. To be connected with
6 middle belt line (number one).

7 Number 14. A marginal railroad connecting with the mid-
8 dle belt line (number one), and extending through the Hacken-
9 sack and Secaucus meadows.

10 Number 15. An outer belt line, extending around the
11 westerly limits of the port district beyond the congested section.
12 Northerly terminus on the Hudson river at Piermont. Connects
13 by marginal railroads at the southerly end with the harbor waters
14 below the congested section. By spurs connects with the mid-
15 dle belt line (number one) on the westerly shore of Newark bay
16 and with the marginal railroad on the westerly shore of Staten
17 Island (number nine).

18 Number 16. The automatic electric system for serving
19 Manhattan Island. Its yards to connect with the middle belt
20 line and with all the railroads of the port district. A standard
21 gauge underground railroad deep enough in Manhattan to per-
22 mit of two levels of rapid transit subways to pass over it. Stand-
23 ard railroad cars to be brought through to Manhattan terminals
24 for perishables and food products in refrigerator cars. Cars with
25 merchandise freight to be stopped at its yards. Freight from
26 standard cars to be transferred onto wheeled containers, thence

1 to special electrically propelled cars which will bear it to Man-
2 hattan. Freight to be kept on wheels between the door of the
3 standard freight car at the transfer point and the tail board of
4 the truck at the Manhattan terminal or the store door as may be
5 elected by the shipper or consignee, eliminating extra handling.

6 Union terminal stations to be located on Manhattan in zones
7 as far as practicable of equal trucking distance, as to pickups and
8 deliveries, to be served by this system. Terminals to contain
9 storage space and space for other facilities. The system to bring
10 all the railroads of the port to Manhattan.

11 § 6. The determination of the exact location, system and char-
12 acter of each of the said tunnels, bridges, belt lines, approaches,
13 classification yards, warehouses, terminals or other improvements
14 shall be made by the port authority after public hearings and
15 further study, but in general the location thereof shall be as in-
16 dicated upon said map, and as herein described.

17 § 7. The right to add to, modify or change any part of the
18 foregoing comprehensive plan is reserved by each state, with the
19 concurrence of the other.

20 § 8. The port of New York authority is hereby authorized
21 and directed to proceed with the development of the port of New
22 York in accordance with said comprehensive plan as rapidly as
23 may be economically practicable and is hereby vested with all
24 necessary and appropriate powers not inconsistent with the con-
25 stitution of the United States or of either state, to effectuate the
26 same, except the power to levy taxes or assessments. It shall

1 request the congress of the United States to make such appropri-
2 ations for deepening and widening channels and to make such
3 grants of power as will enable the said plan to be effectuated. It
4 shall have power to apply to all federal agencies, including the
5 interstate commerce commission, the war department, and the
6 United States shipping board, for suitable assistance in carrying
7 out said plan. It shall co-operate with the state highway com-
8 missioners of each state so that trunk line highways as and when
9 laid out by each state shall fit in with said comprehensive plan.
10 It shall render such advise, suggestion and assistance to all
11 municipal officials as will permit all local and municipal port and
12 harbor improvements, so far as practicable, to fit in with said
13 plan. All municipalities within the district are hereby author-
14 ized and empowered to co-operate in the effectuation of said plan,
15 and are hereby vested with such powers as may be appropriate
16 or necessary so to co-operate. The bonds or other securities
17 issued by the port authority shall at all times be free from taxa-
18 tion by either state. The port authority shall be regarded as the
19 municipal corporate instrumentality of the two states for the
20 purpose of developing the port and effectuating the pledge of the
21 states in the said compact, but it shall have no power to pledge
22 the credit of either state or to impose any obligation upon either
23 state, or upon any municipality, except as and when such power
24 is expressly granted by statute, or the consent by any such munici-
25 pality is given.

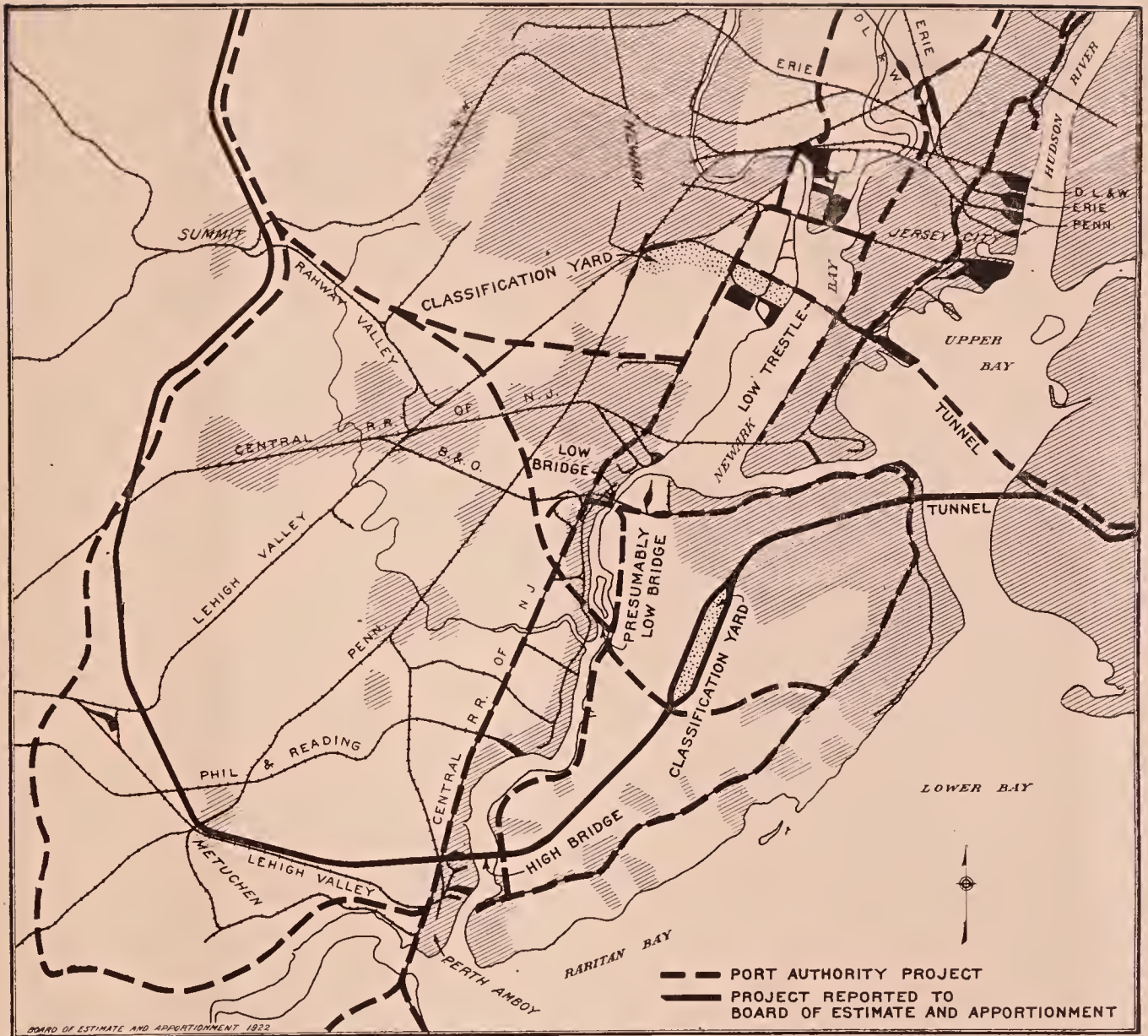
1 § 9. The sum of one hundred thousand dollars (\$100,000), or
2 so much thereof as may be necessary, is hereby appropriated out
3 of any moneys in the state treasury not otherwise appropriated,
4 for the expenses of the port authority. The moneys hereby appro-
5 priated shall be paid out by the state treasurer on the warrant
6 of the comptroller upon vouchers audited by the chairman of
7 the port authority.

8 § 10. All acts and parts of acts inconsistent herewith are hereby
9 repealed, and this act shall take effect immediately.

10 Senate, No. 41. 4



M. B. Brown Printing & Binding Co.,
New York.



MAP SHOWING THE ESSENTIAL FEATURES OF THE PROJECT RECOMMENDED BY THE PORT AUTHORITY IN CONTRAST WITH THOSE OF THE PROJECT REPORTED TO THE BOARD OF ESTIMATE AND APPORTIONMENT.



LIBRARY OF CONGRESS



0 033 266 427.A