

RAILWAY AND HARBOUR
REPORT

VANCOUVER B.C.


TO

VANCOUVER TOWN
PLANNING COMMISSION

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RAILROAD TRANSPORTATION REPORT
-FOR-
VANCOUVER, B. C.

INTRODUCTION

The future development of Vancouver is naturally a matter of paramount interest to its own people and to those of the communities immediately adjacent to it; yet in this study as well as others affecting the physical and social aspect of the City, it is necessary to take into consideration the relation of Vancouver to the Province of British Columbia and to the Dominion as a whole. Vancouver, by reason of its strategic and unrivalled location, is a national asset of great importance. It affords convenient egress and ingress for products made and consumed in Canada. It is at the cross roads of coastwise and transcontinental shipping. Its harbour is ideally sheltered, commodious and forever open and free from ice. It is the

principal western terminus of Canadian railways. Added to these advantages are its equable climate and almost limitless natural resources within economic reach, such as water power, forests, minerals, fisheries and agriculture.

By means of its ship and railroad lines focusing here Vancouver is enabled to function, with increasing effectiveness, as a primary unit in the economic structure not only of the Province of British Columbia, but of the Dominion. The United States is not without interest in the proper development of this City.

It is evident that the transportation interests are vitally concerned in the manner and direction of growth of the City, especially as their trackage and terminals may be affected. In a similar manner the community itself is concerned as to future extent of railroad growth.

PURPOSE OF RAILROAD
TRANSPORTATION REPORT

It is generally most difficult for railroad officials to visualize municipal growth in the light of Town Planning standards or to comprehend the necessity of controlled expansion, although it is certainly greatly to their advantage to be fully informed on this comparatively recently developed science. Many instances may be cited in other cities where railroad terminal operations have become sadly handicapped through the lack of accurate foresight.

It is the purpose of this report to describe briefly the material elements of the local railroad situation and to make certain recommendations that have for their purpose the elimination of the more serious points of interference that may now, or in the future, jeopardize that harmony of mutual understanding so requisite to satisfactory progress.

The public as a rule possess little knowledge of the railroad's requirements or of their operating difficulties. It is, therefore, thought necessary to go somewhat into detail in describing the operating methods of the several railroads, in order that some of the suggestions offered may be understood.

CO-OPERATION OF THE RAILROADS ESSENTIAL

While many of the recommendations submitted will cost considerable sums to carry out, it is believed that in every case improved operating conditions will result with their adoption. It is highly essential, however, that the railroads co-operate in the study in order to bring out additional facts that may influence the conclusions and which may also have a bearing upon other phases of the City Plan, particularly the Zoning and Major Street Plan.

COMMENTS ON THE PRESENT
RAILROAD SITUATION

Generally speaking the railroads in Vancouver have built sufficiently in advance of their needs so that no serious interruptions to the smooth flow of traffic are likely to occur in the near future. Such facilities as the passenger stations, freight houses, team yards and, with few exceptions, the classification yards are decidedly adequate, and are functioning efficiently. The criticisms made and suggestions offered have principally to do with the improvement of the Port operations, the encouragement of industries and the relief of certain streets and areas from the inconvenience of railroad operations. Briefly, the specific items to which attention is directed as subject to improvement are as follows:-

1. Railroad activities along the North Shore of False Creek, between Pender and Granville Streets, are detrimental to civic development. Much work performed here should be transferred to other localities.
2. The Carrall Street line of the Canadian Pacific Railway is a positive handicap to the City and an inconvenient operating facility of the railroad.
3. There is a need for a freight yard of large capacity in the east section of the city to be used by the Harbour Commission Terminal Railway primarily for Port service in connection with the grain movement.
4. Front yard of the Canadian Pacific Railway requires enlargement.

5. Railroad yard space on the North Shore should be reserved.
6. The British Columbia Electric Railway is much too restricted in its scope of operations. Its terminal facilities and service tracks to industries are inadequate.
7. The passenger and freight facilities of the Great Northern and Canadian National Railways are over expanded and may well be consolidated.
8. Industries are at a disadvantage by reason of unsystematic switching arrangements and excessive intra-terminal switching charges.
9. Competitive railroad business is in an unhealthy state. Within a terminal no industry should be at a disadvantage by reason of its location.

10. Better methods of interchanging freight cars among the several roads are desirable.
11. Industrial development has not proceeded in an orderly and systematic manner.
12. A number of railroad grade crossings should receive early attention.
13. The False Creek industrial district has been permitted to become an eyesore and a menace to health. Its regeneration is essential to normal civic development.

CONCLUSIONS AND RECOMMENDATIONS

In attempting to arrive at a satisfactory solution of the railroad transportation problems of Vancouver, one is immediately confronted with practical difficulties standing in the way of an ideal solution. The greatest of these is cost to the railroads without commensurate return. Therefore, in the following recommendations it is the endeavour, while pointing out what might be called the ideal solution, to indicate also the lines along which railroad development may be expected to take place, bearing in mind that Greater Vancouver will possibly have quadrupled its present population within the next thirty-five years.

During this same period of time it is a conservative estimate that the railroads will increase their business to double the present amount. On account of exceedingly good prospects

of the Port of Vancouver, it is possible that it may increase to three times the present business. The increase may and probably will not be uniformly divided and it is fair to assume the greatest increase will come to the Canadian Pacific Railway. As has been noted in the description of the terminal facilities of the railroads, many of them, particularly the freight and passenger stations, are much more than ample in capacity so far as present business is concerned. The principle limitations will be felt in the freight yards for handling local business, trackage for service to the harbour, the increasing inconveniences of certain grade crossings and in the service to industries. It is convenient to discuss these several features in the following order:-

FREIGHT YARDS
CANADIAN PACIFIC RAILWAY

The Centre Yard of the Canadian Pacific Railway which lies along the north shore of False Creek and reaches from Pender Street to the Granville Street Bridge, occupies an undesirable position as far as future Vancouver is concerned. Much of the railroad operations conducted in this area has no place in the heart of the city. While it is conceded that a certain amount of railroad business must always be carried on here, it should be limited to that necessary in serving the industries and warehouses in that district, together with the yard work in classifying and assembling. This should be performed by electric locomotives in order to eliminate all smoke and most of the noise incident to switching operations.

The net result of this step would be the release of much valuable property for commercial development through the removal of all freight houses, excessive yard trackage, locomotive houses and repair

shops. The complete elimination of the Carrall Street grade crossings would be effected. Under a modified plan the Carrall Street tracks could remain in place but subjected only to two or three switching movements daily and these at convenient hours.

Neglecting for the moment the objections that will be raised to this plan, it is of interest if only from an altruistic standpoint to indicate how it may be accomplished.

It will be necessary to construct a yard to replace Centre Yard, at some other locality and so placed that it can be used for passenger equipment as well as for assembling cars for local industries and the freight station. Hence the rather logical choice of that district along Glen Drive adjacent to the Great Northern's Harbour track for a general yard to serve this purpose. This naturally points to a consolidation of freight stations with either the Great Northern or Canadian Pacific or the installation of an independent station in the same vicinity as that of the Canadian Pacific.

For passenger coach equipment, the suggestion for yard location is somewhat distant, about one and one half miles, which fact supports the proposition to move the passenger station of the Canadian Pacific to the general location of the other passenger stations on Main Street, thus forming in effect a single Union Passenger Terminal. This last proposal carries with it the very material advantage of relieving the now congested water front area of a great amount of extraneous switching that interfere with Port operations. A useful, but not necessary part of the program, is the establishment at Coquitlam of repair shops to take care of all freight equipment.

A modification of this plan is to leave the freight station, including team yard, in its present location, from Pender Street westward, and have it operated by the British Columbia Electric Railway, making the delivery either via Carrall Street or by a new route along the east of end of False Creek Channel across Main Street. This latter is an awkward movement and involves the use of alien trackage.

From the Canadian Pacific Railway's standpoint the entire plan is objectionable, as it involves a large capital expenditure, removes their freight station from a highly desirable location in this competitive territory and either forces them into an almost impracticable passenger train operation or necessitates the abandonment of an expensive and exceedingly well located passenger station. There are compensations of course in reduced terminal operating costs, in the better conditions that would result along the water front, and in the release and sale of property along the north shore of False Creek.

As a practical solution, the railroad proposes the tunnel about under Pender Street, extending from the extreme westerly end of their water front track to Centre Yard, as indicated by dotted line on the General Railroad Map. It is almost inconceivable that such a tunnel will ever be built, both by reason of its excessive cost, probably about \$6,000,000 for two tracks and the unsatisfactory operating conditions that would result.

PASSENGER TERMINAL YARDS
COAL HARBOUR.

Though it cannot be authoritatively stated, it may be concluded with reasonable certainty that the Canadian Pacific Railway has in mind, as a part of the tunnel plan, the construction of certain passenger terminal facilities along the frontage of Coal Harbour, probably near the foot of Cardero Street. The efficiency of their passenger station would be almost doubled if coach tracks, an engine house and turntable, together with other accessories could be located here. The present passenger terminal would then be in effect a through station, capable of handling many more trains than it does at present. Under these conditions, the tunnel would be used only for service to the freight stations and team tracks west of Pender Street, and the industrial area and trackage on the north shore of False Creek. This business should be sufficient in volume to keep the one electric locomotive busy that is provided for in the estimates of tunnel cost to date.

From a City Planning standpoint it is not believed to the best interests of the community or to the Port of Vancouver to permit of additional purely railroad development along any portion of the harbour, except that which will further the aid of navigation and port business and if the tunnel plan for eliminating the Carrall Street grade crossings is approved by the City, it would be done with that stipulation. It was for this reason that the alternative plan was suggested of depressing the railroad track in Carrall Street on about its present alignment. If the cost of this latter plan is within reason, its consideration is worth while as a trading point in negotiation with the railroad.

It is conclusive that whatever is done by the Canadian Pacific Railway in accommodating itself to the growth of Vancouver, a large expenditure is involved, and it is obvious that present conditions will continue indefinitely, as, considering the investment cost present operating

methods are cheaper and the advantage of location greater than would immediately result from any change in the near future.

Therefore, from a City Planning standpoint, it is necessary to recognize the fact that Centre Yard and the freight houses and even the railroad's shops and other facilities will remain in their present location and to adjust the street and zoning plans accordingly.

PROPOSED FREIGHT YARD
ALONG GLEN DRIVE

This yard concerns more the Harbour Commission Terminal Railroad than the others and is intended primarily for service to the Port of Vancouver. An opportunity is open here for the construction of a yard of at least 1500 to 2000 cars capacity at a convenient place near the approximate centre of water front activities. There is a natural ravine, for the most part lower than the

surrounding land, which will lend itself readily to the purpose and permit of important streets being carried over the Yard by viaducts. Regardless of whether or not this project finds favour at the present time with any of the railroads, it is recommended that in the zoning and major street plan, due allowances be made that will permit of the project being eventually carried out.

FRONT YARD
CANADIAN PACIFIC RAILWAY

This yard which extends along the wharf from the foot of Carrall Street to Broughton Avenue produced, will always be necessary and will require further development from time to time in order to secure its maximum efficiency. There is room for its expansion now. Its operation is handicapped by the crossing at grade of certain streets, particularly Columbia Street. All such grade crossings must be eventually eliminated, as the successful use of these tracks is of extreme importance to the Port.

NORTH SHORE YARDS
HARBOUR TERMINAL RAILWAY AND
PACIFIC GREAT EASTERN RAILWAY.

In planning harbour and industrial development for the North Shore, sufficient space should be reserved for yards having a total capacity of approximately 2000 cars. These may be divided, one at the east end, one at the west end. The yards should be connected by tracks independent of the main line. The location and construction of north shore yards should be worked out in conjunction with the Pacific Great Eastern Railway, whose future business may justify terminals on the North Shore, the Harbour Terminal Railway to handle this business from these to Vancouver.

BRITISH COLUMBIA
ELECTRIC RAILWAY

The usefulness of this electrically operated railroad to the industrial life of Vancouver is being daily demonstrated. It originates an impressive amount of freight business on its own lines and it is the agency through which each of the other

railroads maintains contact with certain districts which they otherwise could not reach. As a matter of fact, the British Columbia Railway is in effect a terminal switching company and as such its duties are certain to grow more heavy and exacting. At present it is deficient in yard space and even main line trackage, especially needed in serving the industries on Granville Island and the south shore of False Creek. It is largely for this reason that it was suggested that it utilize the old Great Northern right of way across the east end of False Creek Channel, thence looping westward and forming a connection to its other terminal east of Granville Street. This will give it double access to the yard on the north shore of False Creek, a circulatory movement and opportunity to develop ample yards in the False Creek District. It is recommended that the street plan be adjusted to permit of the accomplishment of this project.

Additional concentration yard for freight cars is also recommended in the vicinity of the Kitsilano Reserve Lands.

GREAT NORTHERN AND
CANADIAN NATIONAL RAILWAYS

Both of these roads are well provided with freight yards and although they are not arranged in the best manner for highly intensive operations, there is sufficient land available to increase the capacity and better the design to any desirable degree. In the event of the consolidation of the Northern Pacific and the Great Northern Railways new demands will be made upon the latter's facilities in Vancouver, but any additional business that may result from the consolidation can be well cared for by the present facilities.

INDUSTRIAL DEVELOPMENT
HARBOUR COMMISSION TERMINAL RAILWAY
AND BRITISH COLUMBIA ELECTRIC RAILWAY

The ideal conditions under which industries can survive and flourish are those under which they are assured of efficient railroad service on equal terms at reasonable cost, regardless of their location within the district. In the Harbour

Commission Terminal Railway and the British Columbia Electric Railway, Vancouver possesses the means by which this may be accomplished. From many points of view, but especially in regard to industrial service, it would be perhaps good policy to combine these two companies into one Terminal Association. In order to secure increased revenue, it will doubtless be the policy of the Harbour Commission Terminal Railway to develop as fast as possible every potential industrial site within its reach. This has been the successful programme of other terminal switching lines, notably the Public Belt Railroad of New Orleans, a considerable portion of which road's revenue is derived from industries.

The British Columbia Electric Railway is exceedingly well qualified for handling industrial switching on account of the lack of fire risk, important in this locality and to its flexibility and cheapness of operation.

The combination of these two roads, together with a uniform terminal switching charge, will do much toward securing new industries for Vancouver. Above all, access to the harbour front should be on equal terms and with the maximum facility. A large part of Vancouver's future industry must look to the foreign markets for an outlet, until the local demand attains satisfactory proportions.

UNIFORM SWITCHING RATES
POSSIBLE WITH TERMINAL COMPANY

One of the handicaps to industry and commerce in this district is the inequitable switching rates applied to intra terminal freight car movements. Some of the typically exorbitant charges made by the railroads are due to the multiple handling required on account of the lack of a single terminal Switching Company and others apparently to the mere lack of competition. A comprehensive outline of the rate situation is contained in the appendix.

Examples showing a charge of as much as \$30.00 per car minimum applied to an intra-terminal movement are cited.

This unfortunate state of affairs is exactly similar to that which existed in New Orleans, Louisiana, prior to the organization there of the Terminal Belt Railway. In New Orleans it was not uncommon for a car to be handled by three or more individual railroads before it reached its destination. This inefficient arrangement not only consumed an extraordinary amount of time but the cost of it to the shipper or consignee became at times enormous as each road added its own rate. When the Public Belt Railway was formed, a uniform switching charge of \$6.50 per car was established, regardless of the weight or destination of the car within the terminal. It is remarkable how well satisfied all parties concerned are with this simple arrangement.

If put into effect in Vancouver District, a uniform switching service at an established low rate will produce a most beneficial result upon industry and commerce here.

JOINT USE OF RAILROAD FACILITIES

A feature of contemporary railroad practice in the States is the more liberal attitude with which the railroads regard the joint use of certain facilities and the pooling of terminal switching. Operating privileges over main line tracks are more freely granted and in the case of two individually owned main line parallel tracks, it is the custom to operate them jointly on a double track line. In New York the pooling of lighterage is practiced. In Washington, D.C., one great railroad yard is a clearing place and interchange joint for six different trunk lines. The competitive character of the business does not seem to be affected by this closer union of interests, but tremendous economies result from the more intensive use of their track and structures.

Within the next decade it would appear that more progress will be made in Canada along these lines as operating expenses are higher here than in the States.

In Vancouver there are opportunities for a closer communion of interests, as has been pointed out. The passenger station situation is an instance where consolidation would promote economy. There are three separate stations, any one of which with a few modifications, could be made to accommodate the traffic of all roads entering Vancouver.

INTERCHANGE METHODS

At the present time the interchange of freight cars serving the several roads is comparatively light and the movement is fairly direct. The heavier work of this sort is done outside of the district, for example, at Fraser, Westminster, Sumas and Huntington, etc.

Looking forward for a period of several decades, it may be anticipated that this transfer of cars from one road to others within Vancouver proper will assume much greater proportions and the current methods of handling this business will no longer answer.

As the British Columbia Electric and the Harbour Commission's Terminal Railroad will probably share more than the others in this intra-terminal business special considerations must be given to providing the tracks and connections necessary to handle it. The proposed Glen Drive yard will be the focusing point for all railroads and is, therefore, especially well adapted for interchange purposes.

In order to further assist the British Columbia Electric to classify cars originating in the False Creek district for delivery to other roads, the connection across the east end of the Channel was proposed. Another connection is suggested in East Vancouver, where the British Columbia Electric's Westminster line passes over the Great Northern. From here the British Columbia Electric could either operate over the Great Northern Tracks across Main Street, or construct another independent parallel line. This will give the British Columbia Electric a complete loop track free from interferences with traffic of the central business district. Again, it is but a short distance from the Great Northern, British Columbia Electric crossing in East Vancouver to the junction of the Fraser Valley line of the British Columbia Electric (Commercial Junction) so that traffic from this very important branch could also be brought in via the proposed Main Street Route.

Interchange yards may be established either in the False Creek area, or a portion of the Great Northern or Canadian National property be set aside for this purpose. If, however, the suggested Glen Drive Yards are built, all British Columbia Electric cars for other lines could enter it directly and be distributed from there. By a suitable redistribution of the tracks in Centre Yard of the Canadian Pacific Railway, this yard could be used to great advantage by both roads in handling cars from that general district and assembling them for distribution for other lines.

The double tracking of the British Columbia Electric's leased line along the south shore of False Creek is an essential feature of improved interchange methods as well as for the more efficient service to the industries all along False Creek. There is extreme congestion here now and within the time considered in this plan, conditions will become intolerable.

GRADE CROSSING ELIMINATION

The grade crossing problems that now confront the city and the railroads for solution, are comparatively few in number, but very difficult and costly of solution. At the present time three of the principal projects will be considered:-
The Carrall Street crossings, the water front situation and the Main Street crossing of the Great Northern Railroad.

CARRALL STREET CROSSINGS

Under present operating conditions the Carrall Street track is an essential link of the Canadian Pacific Railway's terminal trackage. It connects the water front yards with Centre Yard and it is the sole practicable means of communication between the main line track and passenger station

and freight stations, team tracks, car and locomotive repair shops, engine house, storage yards and the numerous industries along the north shore of False Creek. By it the Canadian Pacific and the British Columbia Electric Railways maintain an interchange contact. The passenger station operation is absolutely dependent upon the Carrall Street track. The track on Carrall Street penetrates a highly developed commercial district practically for the entire length. It is but a single track and the right of way is narrow, not over 50 feet. Fortunately there are no essential industries and only one or two establishments now served from this track. The track crosses at grade several important streets, the principal one of which is Hastings Street, probably the most intensively used street in Vancouver. Other streets crossed are Alexander, Powell, Cordova and Pender Streets.

The most satisfactory method of eliminating this series of grade crossings is to remove the necessity for the track, which can only be through a quite elaborate revision of the Canadian Pacific Railroads terminal facilities and operating methods. If the use of the track could be reduced merely to that required for freight house operation, interchange and service to industries, it might even remain in place during the time covered by the City Plan.

In the event the railroad elects to retain the connection and eliminate the grade crossing features there are two schemes which appear feasible, one by the use of a tunnel approximately under Pender Street for its full length and the other involving the depression of the present track in Carrall Street with practically no change in alignment.

The first, or tunnel scheme, has been much discussed and even tentative plans and estimates made. In either scheme it is believed a double track might well be considered, rather than a single track so that operations can be carried on simultaneously in both directions. While no detailed estimates have been compiled as a part of this report, it is believed that the tunnel (double track) would cost about \$6,000,000. On the basis of cost alone, aside from the unsatisfactory operating conditions that would result, it is believed the tunnel plan is barred. In any event, it does not seem that the city should be expected to contribute much toward such a plan if another and cheaper one is possible.

As an alternative to the tunnel scheme, the depression of the Carrall Street track should be considered. It may be noted that no long trains of great tonnage use this track, but only empty passenger coaches, or short cuts of freight cars.

Under these conditions relatively steep grades may be used, as much as two or possibly three percent. Even with these grades it will be necessary to raise Alexander Street and possibly Pender Street a material amount to give the necessary clearance. It is assumed that 19 feet above top of rail will be all that the railway will require. This means that at the street crossings the difference in elevation between the railroad tracks and the street grade must be about 22 feet minimum.

The tracks would be in an open cut, built, however, tube like for its lower sector as it would have to resist water pressure. A detailed estimate of this scheme has not been prepared, but it is believed that its cost would not exceed about \$3,000,000.

An elevation plan has also been considered, and while feasible, it is believed too destructive of property values in this district to be practicable. The City has officially expressed its objection to elevation.

THE WATER FRONT GRADE CROSSINGS

The elimination of water front railroad crossings require boldness and a somewhat spectacular method. An example of the type of the construction that must necessarily prevail along the waterfront is had in the recently completed elevated roadway built by the Canadian Pacific Railway primarily to serve their new Pier B-C and adjacent piers "A" and "D". This elevated roadway provides a circulatory vehicular movement from Burrard Street to Granville Street and the ramps enable trucks and teams to reach ground level with no interference from or to railroad operations. This roadway is not intended for general public use but must be restricted to harbour business as the roadway is too narrow, four lines wide, and the turns quite sharp.

A treatment somewhat similar to that started by the Canadian Pacific Railroad is adaptable to that section of the south shore extending from Granville Street to Gove Avenue and from Gove Avenue to Princess Street. Radial connections may be made to this elevated structure from Granville Street, Cambie Street, Gove Avenue and Dunlevy, Princess and possibly Heatley Avenue.

From Heatley Avenue eastward, the type of piers and other waterfront facilities are not of such character as to require access for teams and trucks, and it is not believed necessary to extend an elevated water front roadway beyond Heatley Avenue. This will give a good entry to the Ballantyne Pier which is badly handicapped now by its inadequate street approaches.

The entire elevated roadway should be of such type that the space beneath it can be utilized either for railroad tracks or as a water level highway.

It is a circumstance favorable to the above proposed elevated roadway along the south shore that the warf structures are not of a permanent type of construction between Granville Street and Hearley Avenue, and it would be good policy if the elevated roadway could precede other permanent improvements or at least be correlated with such that are contemplated.

ELEVATED ROADWAY AND FERRY PIER

The elevated roadway along the south shore front is of immediate concern especially that portion along the section between granville Street and Gore Avenue. The poorest kind of approach is now provided to the North Vancouver Ferry which, it may be noted in passing, should have been located at the foot of Granville Street. The opportunity should be taken to build in connection with the elevated roadway a modern and

commodious pier for ferry and excursion boats. The plan accompanying this report indicates a new pier pushed farther out in the bay and with a fairly large space for vehicles and possibly even street cars on the upper level. The most satisfactory solution of the ferry and excursion steamer dock question would be for the Canadian Pacific Railway to reconstruct its Pier "D" at the foot of Granville Street for this purpose. Thus would be provided a public pier, easily accessible and in the prominent position where such a pier should be.

Unlimited possibilities present themselves here for the creation of a useful and ornamental port entrance to the City of Vancouver. The Canadian Pacific could not afford to enter into such a plan at this time, but in later years such an innovation might not appear unwarranted.

THE MAIN STREET
GREAT NORTHERN CROSSINGS

Even under the anticipated expansion of terminal operations of future years, this Main Street crossing will not be subjected to rapid main line train movements, but rather to the intermittent switching of cars being routed to and from the British Columbia Electric Railway interchange. While the transit study has not yet been carried sufficiently far to determine, it seems likely that interurban lines might be also diverted over this crossing, enabling them to reach the business district without threading their way through heavily travelled streets. Again this is looking forward for some years. In any event the kind of railroad movements across Main Street are such that are subject to control both as to time of occurrence and their duration and it is believed that for many years a separation of grade here would be an unwarranted expense. When the elimination of this crossing

does become necessary, it is recommended that the railroad tracks be raised from six (6) to ten (10) feet and the street depressed from twelve (12) to eight (8) feet, whichever alternative proves to be the most practical and economical.

In the event that immediate elimination of this crossing is contemplated, a viaduct over the track may prove much less expensive and easier to build. However, if the project is delayed until the abutting property is improved by buildings a viaduct will most likely prove to be impracticable.

PROMOTION OF
INDUSTRIAL DEVELOPMENT

Within Vancouver proper the amount of land suitable for industries of a variegated sort is limited, considering the population that must be cared for in future years. It is, therefore, necessary to conserve carefully all areas which are peculiarly suited for the various classes of manufactures. Such land as is available is more adaptable to the light rather than the heavy type of industry. Even now there are certain establishments ordinarily classed as heavy industry or the nuisance type, that occupy land so close into the city that they are detrimental to health and normal commercial development. Had the City been zoned for industry many years ago, it would present a quite different appearance to-day.

It is true that the North Shore of Burrard Inlet will provide sites for manufacturing establishments of every description, but its use for this purpose will develop slowly owing to its remoteness from the local market and lack of adequate railroad service. Improved means of communication between Vancouver and North Vancouver will materially accelerate the industrial growth of North Vancouver.

There is an area of quite large extent lying eastwardly from Main Street and between Atlantic and First Streets which is admirably situated for certain classes of industry, such as warehousing and light manufacturing. This section is gradually being occupied,

THE FALSE CREEK AREA

In the early stages of this study the scarcity of good industrial land was realized and for this reason the general statement was made that the utilitarian advantages of the False Creek section should be preserved, but not at the expense of health or even at the entire sacrifice of esthetic principles. In other words it was believed then and has since so proven that it is feasible from an engineering and city planning standpoint to restore the False Creek area to a condition resembling order and cleanliness and to control its future use to the end that it will become a much greater asset to the city than it now is. A plan for the regeneration of False Creek is in preparation but its details are so interwoven with street, transit and zoning requirements that work on it can only proceed simultaneously with these studies.

Its essential features are a twenty foot channel of maximum width, probably not exceeding 500 feet, turning basins, vertical concrete quay walls to prevent the exposure of tidal flats, interceptor sewers to eliminate the sewage inflow, the back filling, and eventually the closure of the easterly arm that projects to Georgia Avenue.

The Canadian Pacific Railway and the British Columbia Electric Railway, if sympathetic to this or any other plan for the improvement of the district, can immensely facilitate the work as their interests are largely predominant. This one project offers a most splendid opportunity for a co-operative and constructive effort that will, with absolute certainty, result in gratifying benefits to the entire community.

ENCOURAGING INDUSTRY

With the gradual building up of the district tributary to Vancouver, the opening of the Peace River territory and the increasing business of the Port, Vancouver will need practically every sort of industry capable of supplying the necessities and luxuries of life. No raw material of any sort should be permitted to pass eastward through the Port without a careful study being made as to whether it could not be profitably worked up into the finished product here. Again outgoing shipments of manufactured articles, food products, etc., should be classified, the market studied and the possibility of their manufacture here considered.

The advantageous location of Vancouver for distributing supplies of all sorts should be taken advantage of to the fullest,

Stock ownership by employees in industrial and commercial enterprises not only promotes efficiency but stabilizes labour supply and makes for good citizenship.

Probably the most important influence in attracting industry is the ability and willingness of the community to supply land and buildings at a not exorbitant cost. Many a prospective manufacturer has been discouraged from locating in some cities by the hold up methods of real estate owners and the unsympathetic attitude of the banks.

Attention has been called to the need of better terminal switching methods and rates. These points are of deep concern to the manufacturer.

A diversity of manufacturers should be sought rather than a single predominating type in order to insure a more stable labour supply and business balance.

Industrial and trade schools are to be encouraged as specialized labour is of high value and difficult to obtain.

No small enterprise, however insignificant should be ignored and neglected. Few people have the tenacity and genius of Mr. Ford, but their basic ideas may be as sound and, under proper tutelage, as susceptible to successful development.

ADVERTISING

Judicial and well directed advertising has produced good results in many communities. The encouragement of tourists is one form of advertising that not only pays as immediate profit but often produces lasting results. For the tourist usually has money looking for investment.

Accompanying this report is a map showing the Natural Resources of the territory tributary to Vancouver. If it could be reproduced in colour, as it is and distributed broadcast, it would tell an interesting story to the investing public.

Advertising matter should be dignified and not bombastic or else it defeats its own purpose. Facts only may be safely stated and the data should be conveniently classified so as to be readily absorbed by the busy executive.

DISPOSITION OF FALSE CREEK CHANNEL

DESCRIPTION

The False Creek Channel from its junction with English Bay or about on a line with Broughton Street, to its extreme easterly end, 300 feet west of Main Street, is two miles long. Exclusive of Granville Island it provides a frontage along the Head Line established by the Vancouver Harbour Commission, of 22,000 lineal feet, or roughly four miles. Granville Island affords an additional water frontage of 5,000 feet.

From Kitsilano Bridge eastward, particularly on the south shore and Granville Island, the water frontage is well developed with industries, numbering in all a hundred or more. The most important and numerous of these are the logging and milling concerns and subsidiary interests. There are

also many concerns handling coal and other fuels, oils and buildings materials.

For approximately 75% of the industries, conservatively estimated, the water frontage is essential to the conduct of their business. Proximity to the heart of the city, good railroad facilities, a sheltered location and access to coastal waters, all combine to make this a fertile field for industrial opportunity. Inquiry invariably developed that the present incumbents of the lands consider it so.

Naturally the development of an industrial district so close to commercial and residential areas of high value, cannot take place without some disadvantage to the latter. The False Creek district, at least that portion lined with industries, is fringed by residential buildings of low order, which are gradually being replaced by industries. It is probable that the "buffer" so to speak, between the False Creek industrial area and high class commercial districts will later consist of warehouses, light

manufacturers and wholesale dealers instead of the cheap residences as at present.

The danger that may arise, and in fact is said by some to have already occurred through the unrestricted use of False creek basin, is that the transition above mentioned may take place too rapidly for property to acquire normal values. That is to say, an actual depreciation may occur in adjacent property values by reason of offensiveness of False Creek and its industries. This was investigated, with the particular view of determining where in False Creek has or may become detrimental to the growth of the city as a whole by reason of its uncouth appearance, disagreeable odor, smoke, etc., and recommendations are appended indicating how the situation can be corrected.

GRANVILLE ISLAND

Granville Island was built about the year 1916, under the direction of the Harbour Commission. The material was placed by hydraulic dredges operating in English Bay. The total area of the Island is about thirty-four (34) acres and it is divided into some eighty (80) lots, generally fifty and sixty feet wide and some 200 to 300 feet deep.

The shape of the Island and layout of lots are such that each lot has direct railroad switching service and the outside tier of lots have wharfage as well.

There are at present forty tenants and no additional land is available for lease on the Island. There are, however, several lots that can be sub-leased from the original lessees. The annual rental is at the rate of \$1600.00 per acre, and the land can be leased for twenty-one years with the option of renewal for twenty-one years additional. The title of the land is with the Vancouver Dock Board.

The policy of creating such an Island in the first place may seem questionable, as it would appear that a more efficient channel would have been possible if the filling had been along both shore lines, instead of creating one main channel of rather small width and a back channel of decidedly inadequate width. However, as the shore property is practically all privately owned, it is probable that the title to the filled land would have had to remain with the private owners, whereas by creating the Island, riparian ownership was not disturbed and the Harbour Board retained control of the newly created land.

The industries now occupying the Island are all of a very useful character, well adapted to conditions and are typical of those requiring close in locations with wharfage. The great majority of the lessees either make direct use of their water frontage or are preparing to do so.

The advantage of the island for industrial purposes arises from its isolated position, free from extraneous traffic, yet it is conveniently close to the business district from which most of their business is derived. The industries on the Island give employment to from 400 to 500 men and nets the Harbour Board a considerable income. The British Columbia Electric Railway switches into and out of Granville Island an average of about thirty loaded cars a week. In addition to land rental the Harbour Board retails water supply. The lessee keeps his buildings and premises in repair and the Harbour Board maintains all trackage and street paving. The buildings are of fire proof construction, principally galvanized iron, and there is little danger of fire, although the streets are very narrow. The concerns are of a very excellent variety and employ many of the highly skilled mechanics such as are very essential to a successful industrial city.

The Island is evidently playing an important role in the industrial life of Vancouver and it is therefore recommended that its use be further encouraged and that its maintenance be kept at a high standard. It is suggested, if the proper arrangements can be made, that the back or south channel be filled in and joined to the mainland, east of Granville Bridge, in order that better access may be obtained by extending one or more streets to it, and additional acreage created.

A deeper channel which would permit of large vessels entering False Creek would enhance the value of the property. A canvas of the owners revealed that they are uniformly satisfied with the location and facilities provided. The men find working conditions there sufficiently agreeable.

NORTH SHORE OF FALSE CREEK

As will be noted by the map the North Shore of False Creek is not developed industrially nearly to the extent of the South Shore. This is principally due to the fact that it is under the control and ownership of and is largely occupied by the Canadian Pacific Railway and the British Columbia Electric Railway. And, in addition the north shore has very poor accessibility. It is along this section between Granville Street Bridge and the Georgia Street viaduct that, under proper planning many industries in the future can be located, by filling in out as far as allowable toward the Head Line. This filling in is now progressing especially in front of the British Columbia Electric Railway property.

CONCLUSIONS AND
RECOMMENDATIONS

The investigation so far conducted establishes the fact that the False Creek Channel is too valuable an asset to the city to consider its complete filling and obliteration. Rather it should be encouraged as an industrial entity of extreme usefulness to Vancouver. Theoretically and practically it contributes to an ideal situation in that it provides a harbour for industrial activities allied to shipping interests, yet permits of a desirable segregation from the purely commercial water borne traffic of Burrard Inlet. In other words, Vancouver is fortunate in having both a commercial and industrial harbour. While the North Shore of Burrard Inlet will almost certainly outstrip the False Creek basin in number of industries in the future, at present it has only a few and in addition it is not yet an integral part of Vancouver.

Emphasis is made of the importance of not only retaining the present industries along the channel, but of encouraging others to locate there. It should not be overlooked that should all of the mills be moved to the Fraser River as has been suggested, the effect would be far reaching and fairly detrimental to Vancouver. For it would not only remove capital itself, but the buying power of several thousand families. Not only the mills would be affected but many subsidiary enterprises whose business depends upon the proximity of the mills. There are no substitute industries in the offing to take their place. Lumber products would have to be freighted into Vancouver, thereby increasing their price in this market.

The desirability of fresh water for mill operation is no doubt an inducement for the mills to leave False Creek on account of the destructive effect the Terebo has on saw logs waiting manufacture. However, it seems that logs

can lie in the salt water of this channel about one year without damage from this cause. They rarely are stored this long and more usually the period does not exceed a few months.

At present the workers on and along False Creek do not find it objectionable, either by reason of sanitary conditions or environment, and it is believed that under intelligent and active supervision, the False Creek district will develop into a fairly ideal industrial section.

Looking forward into the more distant future, it is justly conceivable that the mills and some other industries of False Creek will be forced to move by reason of increasing land values. This is a normal process and usually insures the replacement of the migrating concerns by others of higher class.

In light of the foregoing conclusions the obvious next step is to so direct the use of False Creek channel that it may reach its maximum efficiency with the least inconvenience to other elements of community growth.

SANITATION

Of primary importance is the maintaining of this Channel in a sanitary condition. A fairly careful inspection of existing industries lining the channel indicates that there are no industries, the waste products of which are subject bacterial action or offensive putrefaction. As maximum concentration is approached and the working population becomes densely settled, adequate sanitary sewers must be provided.

Under no circumstances should any sanitary sewer be permitted to empty raw sewage into False Creek. It has no current and its only method of cleansing itself is by the rise and fall of the tide. Long, narrow arms, projecting from the main channel such as that from the turning basin along Main Street to just north of Georgia Street, should be given special attention and subjected to greater restrictions.

More careful supervision of the manner of filling and the kind of filling material used is essential. In several instances decaying vegetable matter was observed in new fill and in others such things as old bath tubs, auto bodies, parts boxes, etc., all of which should be rigidly excluded from harbour fill.

The principal source of odours that now are apparent along False Creek shores are the stagnant water beneath the covered timber wharf platforms and old freight sheds. This feature is especially pronounced along the North Shore. Such places are breeding homes for rats and other vermin, usually accused of carrying and transmitting disease. Many of these wharves are rotten and should be condemned and filled with good clean dirt.

Only one sanitary sewer was found that seemed to be offensive and this was located near Georgia Street. The outlet is said to be exposed at low tide. Some odours attributed to the Channel it seems, are really from the fertilizer works and tannery on the south shore. However, these industries do not contribute waste products to the channel that in themselves cause putrefaction.

A subsequent investigation of the records indicates the existence of a total of 16 sewers emptying into False Creek, 13 of which discharge sewage regularly and three only when storm water running. (See Major Mackenzie's Report on False Creek in appendix.)

It is recommended that the channel be dredged much deeper and that concrete quay walls be eventually constructed. A more systematic location of industries and especially of streets and railroad tracks will not only produce a more sightly appearance, but materially affect its efficiency and assist in maintaining healthful conditions.

Care should be taken to so control the use of this area that no industrial nuisance will be permitted to locate within it. This is extremely important on account of the close proximity of the commercial and residential sections of the city. Adequate zoning restrictions will insure a satisfactory solution of this difficulty.

SMOKE PREVENTION

An intelligent study should be made toward smoke abatement. It is this feature that has proven most fatal in other cities. Improved firing methods, more suitable furnaces and the wider use of electricity may be effective in eliminating this truly serious evil.

PARTIAL FILLING OF FALSE
CREEK CHANNEL RECOMMENDED

It is recommended that the easterly end of the channel be filled so as to make solid land from Main Street to a line about 400 feet west of the Great Northern Railway's abandoned trestle. It is also recommended that the trestle remain in approximately its present location as a solid track and that it be extended northward along the Georgia Street viaduct to a connection and interchange yard with the Canadian Pacific Railway. This new track as described in the Railroad section, should be under the control of the Harbour Commission's Terminal Railway and electrically operated.

The advantage of the above proposal is twofold. It provides about twenty-five acres of first class industrial property and affords a greater flexibility in switching cars into and out of the district. It will facilitate interchange between the five railways.

Incidentally it will make the Kitsilano Bridge unnecessary for freight car movements and by putting the street cars either over Granville Street Bridge or the deck of the proposed Burrard Street Bridge, only one single deck bridge will be required at Burrard Street.

In connection with the railroad study, other recommendations are set out, affecting in some measure the future of False Creek Channel.

DESCRIPTION OF RAILROAD
OPERATING METHODS AND FACILITIES

RAILROADS SERVING VANCOUVER

Vancouver is served by following trunk line
railroads:

Canadian Pacific Railway
Canadian National Railway
Great Northern Railway
British Columbia Electric Railway
Pacific Great Eastern Railway
Chicago Milwaukee & St. Raul Railway (Indirectly
Harbour Commission Terminal Railway (Switching
line)
Northern Pacific Railway (Indirectly)

The following is a brief outline of the
operating methods of the several railroads within this
district.

FREIGHT TRAFFIC
CANADIAN PACIFIC RAILWAY

The Canadian Pacific Railway brings its freight trains into Coquitlam Yard, which is about seventeen(17) miles east of Vancouver. Here the road engines are removed and the train is broken up and classified. The cars for Vancouver are brought into the Harbour yard or Front yard, where they are again classified and delivered by switching engines to the various industries on the Harbour front, the docks and elevators. Cars to be interchanged or delivered to the Great Northern Railway or the Canadian National Railway are brought to the transfer track in the vicinity of the Ballantyne Pier from where they are handled over the Great Northern Railway spur track either by the Great Northern Railway or the Vancouver Terminal Railway.

Cars for the Canadian National Railway are handled by the Terminal Railway and those of the Great Northern Railway are handled by the Great Northern Railway engines over the same track which is really operated jointly by the Harbour Commission's Terminal Railway and the Great Northern, the Terminal Railway paying for the use of this track on a wheelage basis.

Interchange cars from the Canadian Pacific Railway for the British Columbia Electric are taken to a transfer track in Centre Yard just east of the Granville Street Bridge. These are then distributed to the industries on Granville Island and vicinity, a few also being handled southward through Point Grey.

Ordinarily all cars destined to and from New Westminster are handled over the tracks of the Canadian Pacific Railway from Coquitlam yards to New Westminster where an interchange is also made with the British Columbia Electric Railway.

The interchange between the Great Northern Railway and the British Columbia Electric Railway takes place at a junction of these two railroads near Coughlan Shipyards on the south shore of False Creek.

Any interchange between the British Columbia Electric Railway and the Canadian National Railway is also handled at this point by the Great Northern Railway engines operating over the tracks of this company which lie south of Industrial Street.

Traffic originating in and destined to the United States between the Canadian Pacific Railway and the Northern Pacific is transferred at Sumas, so that none of this traffic enters into the Vancouver district.

The interchange of cars among the various railroads is described more in detail under the section entitled "interchange methods".

COQUITLAM FREIGHT
CLASSIFICATION YARD

The Coquitlam yard is the principal freight classification yard of the Canadian Pacific Railroad for this district. It is located just east of Port Coquitlam, between that town and Pitt River and is seventeen miles from Vancouver. If it were closer to Vancouver it would serve its purpose to better advantage, but there is no open space between Port Coquitlam and Vancouver sufficiently large to accomodate a yard of this size.

Coquitlam yard is about two miles long, has a capacity of about 1000 cars and is of good design. When business is heavy or during grain movements, classification may be made over the central hump by the gravity system. At other times ordinary flat switching is used. The plan of the yard indicates that considerable expansion is contemplated in the future and the topography of the adjoining land is eminently fitted for an unlimited amount of yard and shop construction.

Ordinarily there are seven freight trains entering the yard from the east and three leaving east bound, each twenty-four hours. The inbound trains are received, classified and forwarded to Vancouver, being handled by crews and engines from Vancouver. The road crews and engines of freight trains entering Coquitlam yard from the east are relieved here. In other words, Coquitlam is the terminating point for runs eastward.

Between Coquitlam and Vancouver two trains each way in twenty-four hours are sufficient to handle Vancouver business. These trains haul much greater tonnage as the grades are easier than those east of Coquitlam.

The volume of movement between Vancouver and Coquitlam ranges from 300 to 500 cars daily total in both directions.

The branch line from Port Coquitlam to New Westminster brings cars into Coquitlam yard for consolidation with main line trains. By means of this line and the British Columbia Electric Railway the north shore of the Fraser River between New Westminster and Point Grey is served. Some of the traffic also consists of interchange business with the Great Northern Railway and the Canadian National Railway which is handled at their junction with the Canadian Pacific just north east of New Westminster. The New Westminster branch contributes some forty to fifty cars daily to the business of Coquitlam Yard.

RECOMMENDATIONS

Coquitlam Yard is well situated and will prove of increasing benefit to this district. There is unlimited room to expand here and it is suggested that eventually the main terminal repair shops be located here.

Seventeen miles is quite a distance for shuttle service such as is maintained between Vancouver and Coquitlam Yard, and in order to reduce this movement and secure quicker operation during the grain season, a grain car yard would be useful closer to Vancouver. There are sidings of sixty cars capacity at Barnet, which are helpful in this respect.

CITY CLASSIFICATION YARDS

FRONT YARD

This yard consists of some eighteen tracks varying in length from 500 to 1900 feet and having a total car storage capacity of about 300 cars. The yard lies along the water front of Burrard Inlet and extends from Carrall Street to Burrard Street.

Front yard is a terminal yard for Vancouver proper. Into it are brought all freight trains from Coquitlam Yard and from there all mainline freight trains depart for the East. After entering the front yard the locomotives and cabooses are detached and the trains broken up and classified, the cars being sorted for delivery for the freight stations to the various industries and warehouses having sidings or interchange with the other railroads; for delivery to the lower of "H" yard where they are again sorted for delivery to the Pacific Great Eastern and to the piers for barge movement to Victoria, Ladysmith, Nanaimo and other points.

LOWER OR "H" YARD

This yard consists of some ten tracks having average length of 1000 feet, capable of storing some 200 cars. The yard is located along the water front between Broughton Street extended and Thurlow Street. The particular use of this yard is for marshalling or classifying cars for delivery to the car barns of the C. P. R. and the Pacific Great Eastern. Some of the tracks are used merely for car storage.

RECOMMENDATIONS

The two yards above described really function as one yard under the direction of the same yard master. The location of classification yards in this district is an unfortunate one as they occupy property of extremely high value and could be put to much better use in connection with the development of the Harbour proper. As a general principle it is true that in order to preserve the water front for its best use no other business should be transacted there than that which apply to navigation. As the traffic into and out of Burrard Inlet increases the necessity for greater track space for serving the various piers along the south shore of Burrard Inlet will be felt more and more and it is believed that the combined capacity of front yards and the lower or "H" yard will not be in excess of that needed for exclusive handling of port business.

At this time these classification yards are inconveniently small and it is important to materially increase their capacity. There is

however, an area of ground lying between the two yards extending from about the foot of Bute Street to Howe Street which by re-arranging the leads of the two yards can be efficiently built up with tracks thereby increasing the total yard capacity approximately 15%.

An inconvenient feature of the classification yard is the awkward train movement involved in serving the freight stations of the railroad and that industrial and warehouse district on the north shore of False Creek. In order to make this switching movement, the trains or cuts of cars are backed eastward out of Front yard and then moved forward crossing all streets from Alexander Street to Pender Street at grade. In addition the locomotives and cabooses of the freight trains after being relieved from the incoming trains are forwarded over the same tracks to the terminals in Centre Yard.

CENTRE YARD
CANADIAN PACIFIC RAILROAD

Centre Yard is that group of tracks located between Cambie Street Bridge and Pacific Avenue, extended, and along the north side of False Creek. Within it are tracks to accommodate the passenger coaches, various storage tracks for cars awaiting repairs and quite an extensive terminal consisting of engine house, shops, water and coaling equipment, etc. The lower or west end of the yard is electrified and used exclusively by the British Columbia Electric Railway as its freight terminal. It is here that the British Columbia Electric Railway and the Canadian Pacific Railway interchange their carload freight. A portion of Centre Yard is used in connection with freight house and team yard switching and in handling the cars for direct movement to and from the numerous warehouses and industries that have independent track service in this vicinity.

RECOMMENDATIONS

It is suggested that all shop facilities for freight car and locomotive repairs be moved to Coquitlam Yard where the freight car concentration is great and a more adequate layout is practicable. This will permit of a better disposition of trackage along False Creek and the release of land which can be used for industrial purposes. The removal of the shops will also reduce traffic across the intersecting streets between this district and the Burrard Inlet water front. It will also give some opportunity for a very badly needed expansion of the British Columbia Electric Railway's terminal facilities.

FREIGHT STATION
CANADIAN PACIFIC RAILWAY

The freight house or sheds of the Canadian Pacific Railway are located between Pender Street and the Georgia Street Viaduct. The location is an exceedingly convenient one from the shipper's standpoint as it is but a short haul from the principal warehousing, wholesale, commercial and retail districts from which less-than-carload freight chiefly originates.

The freight station is U shaped, the out bound shed forming the west leg and the in bound shed the east leg of the U. and the Head house, used for offices joining the two at the north end.

The out bound section is 30 feet wide and 770 feet long. It is served by a driveway for the full length of the shed, and 30 feet in width.

The in bound shed, from which in coming freight is delivered to teams and trucks is 60 feet wide and 1250 feet long. The driveway is 35 feet wide for the full length of the shed. A section of the south end of this shed is leased to and used by the Pacific Great Eastern Railroad for its less-than-carload freight business, the switching of which is done by the Canadian Pacific Railroad.

The entire structure is of timber construction, but substantially built. A remarkable feature is the Australian hard wood floor which is still in very good condition after about thirty years service. Although the house should preferably be of brick or other fire proof construction, it is questionable whether, at this time, its entire re-modelling is advisable for the reason that future requirements may demand a much larger station with greater capacity both of floor area and house tracks. The in bound house is well divided by heavy brick .

fire walls. The team driveways of both sheds are of durable vitrified brick construction.

There are at present six house tracks in service located between the two sheds. They are in two groups, separated by a wooden platform at car floor level, which is used for transfer freight, of which there is considerable volume. By means of the transfer platform and movable wooden floors supported by trestles which connect the transfer platform to the sheds, freight may be trucked to any desired point.

The station although built some thirty years ago conforms to modern principles of design and aside from its being of wooden construction there is little to criticize about it. The house is switched generally only once a day, and by switching it oftener its capacity may be increased. Therefore it seems that without substantial alterations this facility of the Canadian Pacific Railway should serve its purpose satisfactorily for at least ten years more.

TEAM TRACKS

The team track yard of the Canadian Pacific Railway is located just east of the freight sheds. It contains some 9000 feet of trackage sufficient to accommodate 200 cars standing. The driveways between pairs of tracks are well paved, through a bit narrow. The design and capacity of this yard also exhibit advanced ideas and confidence in the future of Vancouver. Ample capacity is provided for a good many years. A feature of the layout is a depressed track for facilitating the unloading of automobiles. A twenty ton gantry crane spanning two tracks is part of the equipment.

RECOMMENDATIONS

The freight station layout above described could scarcely be better located to serve Vancouver. It is easily accessible, yet out of the way of street traffic. There is room for expansion and sufficient track space south of the sheds to provide for increased flexibility of operation. At present the station is switched from the yard on Front Street, or the main classification yard. All cars to and from the station therefore move over the switch track connecting this district with the water front and thus contribute to the traffic delays on Hastings Street and other intersecting streets.

THE CANADIAN NATIONAL RAILWAY

The Canadian National Railway enters Vancouver over the Great Northern Railway tracks of which road the Canadian National Railway is a tenant line from about New Westminster. The Canadian National Railway has no direct access to the Harbour of Vancouver and is, therefore, at some disadvantage in handling trans-pacific freight, and it is possible, on this account, that they may be compelled later to develop facilities, at least for transshipping grain at Port Mann. At the present time the Canadian National Railway operates car ferries between Port Man and Victoria. The Fraser River is not in the best condition for such services and it is maintained under difficulties.

CLASSIFICATION YARD
CANADIAN NATIONAL RAILWAY

The classification yard of the Canadian National Railway consists of ten tracks, averaging 1300 feet in length with a car capacity of approximately 300 cars. The yard is located south of the freight station.

For present business the yard is of sufficient size and there is ample room for expansion in the vicinity. Further improvements will consist of increased car storage space and the addition of longer tracks for receiving and forwarding the made up trains. Later, car and locomotive repair shops may be needed. At present this work is done by the Great Northern Railway. Heavy repairs are made at Port Mann by the Canadian National Railway.

FREIGHT STATION
CANADIAN NATIONAL RAILWAY

The freight house of the Canadian National Railway is located on the south side of Terminal Avenue, just east of Main Street. The shed proper is 800 feet long and 40 feet wide. In-bound and out bound freight is handled in the one shed. The building is of corrugated iron and is divided into four sections by brick fire proof walls.

The freight shed is served by three house tracks having a capacity of sixty cars.

Team tracks are located just south east of the station. They are two in number, having a capacity of twenty-two cars. The driveways are 33 feet wide and made of planks. An automobile unloading platform is provided, also a twelve ton wooden gantry crane.

There is little comment to make concerning this freight station layout. It is of sufficient capacity to handle a much larger business than now comes to it and is so arranged and constructed that it can be easily expanded to meet future requirements. It has the disadvantage, as does the Great Northern freight station, of being somewhat distant from the business district. However, the future is likely to bring a considerable increase in warehouses and light industries in the district. Also retail stores are and will continue to spread south and east, especially along Main Street, which will add to the business of this freight station district.

TEAM TRACKS
CANADIAN NATIONAL RAILWAY

The team tracks of the Canadian National Railway are located south of the freight shed and in the immediate vicinity. There are two tracks about 500 feet long served by a planked roadway 33 feet wide between tracks.

There is also a planked roadway at car floor level along and north of the freight sheds. This is 800 feet long and served by a single track. An automobile unloading platform 100 feet long is a part of the layout. The facilities are ample and well arranged.

THE GREAT NORTHERN RAILWAY
CLASSIFICATION YARD

The principal classification yard consists of eight tracks located north of First and Fifth Avenues and between the north ends of Scotia and Scott Streets. The tracks range in length from 600 to 2000 feet, with a total of about $1\frac{1}{2}$ miles of trackage. The capacity is approximately sufficient for 200 cars. In addition to the above, there are three tracks south of Industrial Street having a length of 2300 feet, 1900 feet and 900 feet respectively, which will take care of about 125 cars.

There are four stub ended tracks averaging 950 feet in length, between the Great Northern Railway and the Northern Pacific's abandoned freight shed, and two tracks 200 feet long extending from the ends of each of the two freight sheds, all of which can be used for storage and general yard works.

The Classification yards, while perhaps not as systematically arranged as they might be, are of suitable capacity for the business handled and there is space available for any desired expansion.

FREIGHT STATION
GREAT NORTHERN RAILWAY

The Great Northern Railway's freight station is east of main street and just south and parrallel to Prior Street. The head house is two stories high, of brick construction and contains the freight office. The shed is 50 feet wide and 525 feet long, served by two tracks with a total capacity of twenty-six cars. This house is of substantial brick construction with one firewall. Inbound and out bound business is passed through the same house. The capacity is ample.

BRITISH COLUMBIA ELECTRIC RAILWAY
PASSENGER STATIONS

The Carrall Street Station occupies part of the ground floor of the Company's office building on the north west corner of Hastings and Carrall Streets. The building itself is a five story structure.

Passenger trains are handled on two tracks. The Davie Street Station is located at the southeast corner of Davie and Seymour Streets. The building is an old wooden two story structure 80 by 60 feet in size and is provided with a waiting room, ticket office and trainmen's accommodations.

EXPRESS BUSINESS

Quite an important feature of the British Columbia Electric Railway's operations is the transportation of express matter especially of small packages and fruits. Light or package express is handled at the Carrall Station and fruits (chiefly from the Fraser River Valley) are received at the railroad's freight station at Georgia Street. The fruit business is of course seasonal, occurring chiefly during the months of June to September. A maximum daily movement of ten tons has been noted.

The shipment of milk is also an important function of the B. C. E. Some 400 to 500 ten gallon cans are received daily through the auxiliary freight sheds near the freight station.

FREIGHT STATION
BRITISH COLUMBIA ELECTRIC RAILWAY

The railroad has two freight sheds, both located just south of the Georgia Street Viaduct and west of Carrall Street produced. The two sheds are about 100 feet apart. Both are one storey wooden structures. The main shed is 60 feet wide and 160 feet long with corrugated iron sides and roof and wooden floor. A large quantity of less than carload Fraser Valley produce is handled here.

The auxiliary shed is 30 feet wide and 200 feet long with corrugated iron sides. Its principal use is for the milk traffic.

- The freight station facilities of the British Columbia Electric Railway, while approximately adequate so far as floor space is concerned, are inconveniently arranged and difficult of access. In appearance and appointments much improvement is desirable, and it is believed sufficient area is at hand in the general locality of the existing freight station for a better layout.

VOLUME OF BUSINESS HANDLED BY
BRITISH COLUMBIA ELECTRIC RAILWAY

Some idea of the importance of this line as a transportation agency to Vancouver and the district generally, may be had from the following description of its 1926 business:

14,266 through freight cars. 90 percent in or out of Vancouver and New Westminster.

4,974 Local Freight Cars. 80 percent in or out of Vancouver and New Westminster. In addition to the above, about 1000 cars of l. c. l. freight were handled or approximately 30,000 tons.

500,000 Tons Total Tonnage Carload Freight, 70 percent of which was lumber, remainder miscellaneous, but a large proportion live stock. Some 230 cars of oranges are included.

472 cars of live stock were moved from the prairies and 320 cars of feed and grain.

A great deal of this traffic is to and from the rich Fraser Valley, thus bringing into close contact Vancouver and vicinity with the source of a very important food supply.

TEAM TRACKS

In addition to the team tracks also used as an interchange track in First Avenue, the Company has three tracks close by the freight houses which accommodate about twenty cars.

SERVICE TO INDUSTRIES

A function of the British Columbia Electric Railway of very great importance to Vancouver is that of service to industries. Within the False Creek District alone more than 30 industries are directly switched by this railway. Many of these are lumber mills, there being nine of these on the south shore of the Creek. The British Columbia Electric Railway is well qualified to perform this work on account of its flexibility, cheapness of operation and freedom from fire risk. While it is handicapped by lack of trackage at certain places, notably along the South Shore, it does remarkably well. Future industrial growth of this district will become more dependent upon this method of switching and

provision should be made to provide now better facilities for classification and interchange, assembling cars for delivery and storage. Much of this track, practically all that serves the industrial district, is owned by the Canadian Pacific Railway and operated under lease by the British Columbia Electric Railway. This arrangement, while in effect for only about nine years more, is subject to renewal and doubtless may be considered a permanent operating feature, particularly as the tracks and structures of this section are not suitable for steam railroad operation.

SHOPS AND REPAIR YARDS

A very complete plant for making repairs to electric locomotives and cars is located in what is known as the Indian Reserve Lands, just west of the company's bridge over False Creek (Kitsilano Bridge).

Car barns are also operated at the corner of Main Street and 13th Avenue, and at Main and Prior Streets only passenger cars are stored, repaired and equipped at these places.

NEW WESTMINSTER FACILITIES

The British Columbia Electric Railway has extensive facilities for handling both passenger and freight business at New Westminster. These consist of a two storey passenger station at Eighth and Columbia Streets; a freight station just south of the passenger station, some team trackage and a classification yard for freight cars. The classification yard is between 14th and 16th Streets, about a mile west of the passenger station. It has three miles of track and occupies an area of about nine acres.

Other terminal structures include inspection and repair car barns.

As in Vancouver many important industries are served directly by the British Columbia Electric Railway.

1926 Freight Movement
Through New Westminster.

Carloads	20,196	Minimum	January	1,121
		Maximum	July	2,244
L. C. L.	1,272	Minimum	January	105
		Maximum	July	106
Weight, Tons, C.L.	459,964	Minimum	January	26977
		Maximum	July	50666
Weight, Tons, L.C.L.	16,140	Minimum	January	1,332
		Maximum	July	1,359
Empty Cars	14,280	Minimum	January	971
		Maximum	July	1,408

THE PACIFIC GREAT EASTERN RAILWAY

The Pacific Great Eastern Railway's constructed line extends from Squamish Dock to Quesnel a distance of 348 miles. The original plan was to extend the line to Fort George. There is a gap in the line also between Whytecliff and Squamish Dock, so that direct steam operation from North Vancouver is not yet practicable. The road is operated jointly with the Union Steamship Company and stages from Quesnel to Prince George and Barkersville.

In Vancouver, freight traffic originating on and destined to points on this line is handled by the Canadian Pacific Railway. That section of track in North Vancouver has been taken over by the Harbour Commission Terminal Railway, in connection with a service to the north shore of Burrard Inlet.

In its present condition the Pacific Great Eastern Railway is not a material factor in the industrial and commercial system of Vancouver and, in fact the railway possesses small intrinsic value unless it is extended so as to tap the Peace River District. The wisdom of expending further sums in developing this route has been seriously questioned, but it hardly seems possible that those responsible for investing as much as \$50,000,000 on the project did not have a substantial guarantee that the railway would eventually pay its way.

CHICAGO, MILWAUKEE AND
ST. PAUL RAILROAD

The Chicago, Milwaukee and St. Paul Railroad does not serve Vancouver directly on account of its inability to make proper arrangements for operating over the British Columbia Electric Company's line. However, it does serve the district of New Westminster and points east. In the agreement between the Canadian Pacific Railway and the British Columbia Electric Railway for the use of the former's Lulu Island line, it was stipulated that the British Columbia Electric Company's service in connection with the St. Paul Railway would be permitted in that territory.

The St. Paul Railway operates by car barge from Seattle to Bellingham and from there to Sumas over the Bellingham and Northern, its subsidiary line. There the interchange is effected. At the Minnesota transfer interchange is also made with the Canadian Pacific Railway

and the Great Northern Railway, so that the St. Paul Railway is not entirely eliminated from this portion of Canada. At the present time the Chicago, Milwaukee and St. Paul Railway also loads directly out of Seattle by way of the Border Line Transportation Company, whose boats land at Vancouver. However, the volume of freight handled on this line is small.

HARBOUR COMMISSION TERMINAL RAILWAY

The Harbour Commission Terminal Railway is a switching line operated by the Harbour Board. It has rights over about seven miles of track within the Vancouver District.

CLASSIFICATION YARD

The classification yard of the Harbour Terminal Railway consists of nine tracks located on the north side of the Canadian Pacific Railway's right of way, opposite the north ends of Heatley and Hawks Avenues and immediately south of the entrance to Ballantyne Pier. The tracks range in length from 650 to 1200 feet, with a total length of about 8800 feet or capacity for 200 cars.

The capacity of this yard is inadequate and there is little room in the vicinity for additional trackage, except at great cost for acquisition of property.

OPERATING EQUIPMENT

The Harbour Terminal Railroad rents two switching locomotives from the Canadian Pacific Railway. Aside from these the Company does not own or lease any other rolling stock.

MILEAGE OPERATED

False Creek to South Shore of Burrard Inlet

Running Rights over Great Northern
Railway Mile 1.60

Commissioners' Railway on South Shore
of Burrard Inlet

Between Ballantyne and Lapoint Pier 1.25

Commissioners' Railway from South end of
2nd Narrows Bridge to Lynn Creek on north
shore of Burrard Inlet.

Constructed but not yet in operation 1.51

Commissioners' Railway from Lynn Creek
to Lonsdale Avenue on North Shore of
Burrard Inlet

Railway under construction 2.27

Total Miles 6.63

EXTENSION OF HARBOUR COMMISSION
TERMINAL RAILWAY RECOMMENDED

In order to increase the usefulness of this road, particularly as an agency for interchange, it is recommended that it be permitted to operate freely over all belt tracks and to serve directly all facilities on the harbour. Preferably it should actually own its rails so as to circumscribe the entire harbour. This has been accomplished in other cities and may not be impossible here. It may in the end prove an equitable arrangement for the Harbour district, including the North Shore, leaving to the British Columbia Electric the False Creek District. The proposed Glen Drive yard should be under the control of the Harbour Commission's Railroad however.

It is not the intention under the above suggested arrangement in any way to prevent or hinder the trunk line railways from serving industries on their own lines. But the important thing is that by a consolidated terminal switching system, all industries, even though they are reached by spurs of only one railroad, can be assured of a uniform switching charge and expeditious service. By reducing the number of handling and distance travelled, much greater flexibility of movement can be secured at a lower cost.

FREIGHT INTERCHANGE METHODS

CANADIAN PACIFIC RAILWAY
CANADIAN NATIONAL RAILWAY

Interchange between these two roads is performed through the agency of the Harbour Terminal Railway. The Harbour Terminal Railway receives the cars at the interchange yard of the Canadian National Railway and delivers them to the Canadian Pacific Railway's interchange track which is the first track south of the Harbour Commission's car unloading shed at the Ballantyne Pier. This track is 750 feet long, having a capacity of about 18 cars, and belongs to the Canadian Pacific Railway. In the reverse process the Harbour Terminal Railway receives the cars from the Ballantyne interchange track and delivers them to the Canadian National at their interchange near Depot Yard.

CANADIAN PACIFIC RAILWAY
GREAT NORTHERN RAILWAY

The interchange of cars of these roads is handled by engines of the Great Northern operating from the latter's yard to the Ballantyne interchange track of the Canadian Pacific Railway. The great Northern receives and delivers on the second track south of the Harbour Commission's car unloading shed in the Ballantyne Pier Yard. This track is 1000 feet long and has a capacity of about 25 cars.

CANADIAN PACIFIC RAILWAY
BRITISH COLUMBIA ELECTRIC RAILWAY

These are two points where car interchange is effected between the Canadian Pacific Railway and the British Columbia Electric. The Granville Street Interchange consists of four tracks aggregating about a mile in length, located on the north shore of False Creek and on the north side of the Canadian Pacific Railway's main line track in this district.

The Carrall Street interchange is located west of the Marshall-Wells Building, between Carrall and Abbott Streets, and the Georgia Street Viaduct and Pender Street. It consists of a double track, each 800 feet in length, one of which is for cars from the British Columbia Electric to the Canadian Pacific Railway and the other for the reverse movement. In both yards, each railroad receives and delivers. Interchange is also effected between these roads at Abbotsford.

CANADIAN NATIONAL RAILWAY
GREAT NORTHERN RAILWAY

The Great Northern delivers to the Canadian National on a siding 800 feet long parallel to and east of the Canadian National Railway's main line track east of Depot Yard. This siding is the property of the Canadian National Railway.

The Great Northern delivers to the Canadian National on a siding between Scotia and Burns Streets and which is along the Great Northern's main line. This siding is 2200 feet long and is owned by the Great Northern Railway. As the interchange between these two roads is made close at hand to their terminals, the arrangement is a satisfactory one and little time is lost in the transaction.

CANADIAN NATIONAL RAILWAY
BRITISH COLUMBIA ELECTRIC RAILWAY

As there is no physical connection between these two roads, the interchange of freight is accomplished by an intermediary line, the Great Norther, which handles this movement with their own to the British Columbia Electric Railway.

At Chilliwack there is a direct interchange between the Canadian National and the British Columbia Electric Railway.

GREAT NORTHERN RAILWAY AND
BRITISH COLUMBIA ELECTRIC RAILWAY

Interchange between these two roads takes place where their respective main line tracks connect on First Avenue, at a point 50 feet west of the West side of Alberta Street produced, in the vicinity of the Coughlan Ship Buildings Company's switch.

The British Columbia Electric Railway places cars for the Great Northern on the latter's main line east of the junction point of the railroads. If this track is already occupied, the cars are placed on the British Columbia Electric's main line west of their junction point.

There is a side track 900 feet long on the south side of the British Columbia Electric main line, just west of the junction of the two roads which may be and at times is used for handling interchange business. This is the normal way of operating, but as this siding is used as a team delivery track of the British Columbia Electric Railway, its use for interchange purposes is restricted.

The foregoing method of performing interchange between the Great Northern and British Columbia Electric is not particularly efficient as it involves the use of a main switching head for this purpose. It is recommended that the British Columbia Electric Railway operations be extended to that district east of Main Street and that it receive and deliver directly from the Great Northern yard, or from a new yard built for this purpose.

At Cloverdale there is also a direct interchange between the Great Northern Railway and the British Columbia Electric Railway.

GREAT NORTHERN AND
HARBOUR COMMISSION'S TERMINAL RAILWAY

The Great Northern Railway delivers to the Harbour Commission's Terminal Railway in the latter's classification yard at the Ballantyne Pier, using any of the sidings that may be available at the time.

The Harbour Commission's Terminal Railway delivers to the Great Northern Railway on any of four tracks parallel to and immediately south of the Great Northern's main line between the north ends of St. Catherine Street and Glen Drive. These tracks have a capacity of about 65 cars.

The physical arrangements for making this interchange are satisfactory but it would be more economical for one road to do the work, both for these two roads and the Canadian National. It is one of the function of a terminal railway to handle such movements.

NORTHERN PACIFIC RAILROAD
BRITISH COLUMBIA ELECTRIC RAILWAY

The Northern Pacific Railway does not enter Vancouver directly at this time, but connects with the British Columbia Electric Railway at Huntingdon where freight is interchanged, the British Columbia Electric Railway handling all Northern Pacific business in this district. A connection is also made here with the Canadian Pacific Railway and shipments may be made via this road to Vancouver from Huntingdon. However, the preferred route is the British Columbia Electric.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY
BRITISH COLUMBIA ELECTRIC RAILWAY

The entrance of this Chicago, Milwaukee and St. Paul Railroad to Vancouver is from Seattle by boat to Bellingham and from Bellingham to Sumas by rail. Here interchange is made to the British Columbia Electric which road handles the shipments to destination.

The Chicago, Milwaukee & St. Paul Railway also makes deliveries to Vancouver directly by boat but the above is the preferred handling.

HARBOUR COMMISSION TERMINAL
RAILWAY INTERCHANGE

This road performs a purely switching business and its interchange operations are therefore quite important. The various points where the work is done are described as follows:

H.T.R and C.P.R.	Ballantyne Pier Yard.
H.T.R and C.N.R.	C.N.R. Depot Yard.
H.T.R and G.N.R.	Receives from G.N.R. in H. T. R. yard at Ballantyne Pier and delivers to G. N. R. at 5th Avenue and Glen Drive.
H.T.R. and B.C.E.R.	Handled through the C.P.R. and the G.N.R.

The Harbour Commission's Terminal Railroad is largely instrumental in transporting grain to the elevators as will appear in the description of the grain movement which follows:

GRAIN MOVEMENT TO BURRAKD INLET ELEVATORS.

CANADIAN NATIONAL RAILWAY

Incoming trains are broken up and classified or marshalled in the Depot Yard of the Canadian National Railway. From there they are moved in cuts of twenty cars by the Harbour Terminal Railway to the latter's yard near Ballantyne Pier. Here the cars are sorted and grouped for the several elevators to which they are taken by the Harbour Terminal locomotives.

CANADIAN PACIFIC RAILWAY

Coquitlam Yard is the initial terminus for all incoming freight trains as well as the grain cars. The trains are broken up here and sorted for delivery to Front Yard of the Canadian Pacific Railway which lies west from Carrall Street. In this yard the grain cars (as well as others) are re-grouped for their final movement to the elevators. The Canadian Pacific Railway has entry to each of the four elevators on the waterfront where they use certain assigned tracks.

At the following elevators both the Harbour Terminal Railway and the Canadian Pacific Railway have tracks assigned to their individual use.

Burrard Elevator Company's Elevator.
No. 1. Elevator (Government Dock)
Spillers Elevator
No. 2. Elevator (Ballantyne Pier)

GREAT NORTHERN RAILWAY

This road now hauls little if any grain for export.

SERVICE TO HARBOUR COMMISSION'S PIERS
CANADIAN PACIFIC RAILWAY

At the elevator piers the operating rights of the Canadian Pacific Railway apply only to grain movement inward and empty car movement outward.

Lumber and all general cargo for export originating on this C. P. R. is handled exclusively by the Harbour Terminal Railway from its interchange with the Canadian Pacific Railway to the freight sheds or docks.

CANADIAN NATIONAL RAILWAY

The Harbour Terminal Railway likewise switches the freight of the Canadian National Railway from its interchange point to pier destination.

GREAT NORTHERN RAILWAY

From the Interchange Yard the Harbour Commission Terminal Railway moves Great Northern through export freight to any of the piers. Also the Harbour Terminal Railway delivers to the Great Northern Railway at the interchange, all through import freight.

INTERCHANGE SWITCHING RATES

The appendix contains a statement covering the rates for performing the foregoing interchange switching movements.

PASSENGER TRAFFIC

Vancouver is well supplied with railway passenger stations, all efficiently arranged and operated and of much architectural merit.

PASSENGER STATION CANADIAN PACIFIC RAILWAY

The passenger station of the Canadian Pacific Railway is located on the north side of Cordova Street between Granville Street and Richards Street. It is in close proximity to the principal business district of Vancouver and also to the company's ocean pier.

The station is a four storey concrete and brick structure about 400 feet long and 60 feet wide. The upper floors are used as district offices.

The station tracks are six in number four being through tracks and two stub end tracks.

The waiting room of the station is commodious and well arranged. A convenient ing space for automobiles is provided at the east end of the station at street level.

RECOMMENDATIONS

For the present traffice the passenger station is adequate. However, there is little room for expansion and the station and its trackage occupy ground space that will later be needed for harbour development. It is difficult to take care of some of the longer trains now, and the reverse movements involved in making up passenger trains from Centre Yard impose bad operating conditions and contribute their share to the grade crossing nuisance.

The Canadian Pacific Railway station is, however, undeniably well located to serve the public. It brings them immediately to the heart of things. It is, to the railroad, an advantageous location for competitive passenger traffic and its closeness to the steamer piers permits of a quick transfer from one to the other.

The implied desirability of seeking another location for this passenger station may seem to be and is a somewhat radical innovation. The railroad cannot be expected to relinquish such a favourable location. Yet in the scheme of things, looking forward to the time when the Burrard water front is approaching its maximum degree of concentrated activity, it is conceivable that the railroad itself may see the desirability of relocation in order to avoid the inconvenience and delays caused by freight switching movements and the awkward operation of getting to its terminals on False Creek.

Much should and must be sacrificed toward preserving the water front for purely shipping business and this suggestion of the removal of the Canadian Pacific Railway Passenger Station is in line with that thought.

SUGGESTED SITE FOR
CANADIAN PACIFIC RAILWAY PASSENGER STATION

The proposal very naturally suggests itself of grouping the Canadian Pacific Railway passenger facilities with those of the Great Northern and the Canadian National Railway on Main Street. This will give Vancouver a Union Station which, under the circumstances, would be a decided advantage. This being a terminating point in every sense of the word, and a city of not too great population, a Union Station for all roads possesses all of the good and none of the bad features usually associated with the arrangement.

The Great Northern and Canadian National Railway stations are only four minutes by taxi from the heart of the business district, less than a mile. Much room is available for expansion and the extensive plaza already provided guarantees for all time pleasing surroundings.

The Canadian Pacific Railway could enter the Main Street location by direct movement from their main line, over tracks in the valley between Campbell Street and Glen Drive. Thus the heavily congested trackage along the water front from Hastings Mills westward could be avoided and traffic over grade crossings within the city further reduced.

PASSENGER STATION
CANADIAN NATIONAL RAILWAY

The passenger station of the Canadian National Railway is located 400 feet east of the east line of Main Street and just north of Terminal Avenue. The building is three stories high, 104 feet wide and 325 feet long, with the long side parallel to Main Street. It is of concrete, faced with sand stone. The two upper floors are used for the company offices and the ground floor, which is at street level, is devoted exclusively to waiting rooms and other passenger accommodations.

There are at present only two station tracks, stub end, each with platform and wooden umbrella sheds. The station was constructed in 1917.

The station is built considerably in advance of present demands and there is much room available for expansion of both track and station facilities. With its broad well grassed plaza between the building and Main Street, this passenger station, as well as that of the Great Northern Railway almost immediately adjacent to it, have an agreeable setting seldom duplicated. By appropriate planting and landscaping, it can be made one of the most interesting show places of Vancouver.

PASSENGER STATION
GREAT NORTHERN RAILWAY

The passenger station of the Great Northern Railway is located 400 feet east of the east side of Main Street and 108 feet north of the north end of the Canadian National Railway's passenger station. The building has a frontage of 240 feet parallel to Main Street and a depth of 55 feet. It is two stories high, the upper story being used for offices and the lower exclusively for passenger accommodations. It is constructed of brick with stone facing and is of pleasing appearance.

The station tracks are four in number provided with two umbrella sheds and wooden platforms about 755 feet long.

This passenger station will serve the requirements of the Great Northern for many years and its location and arrangements are such that it can be easily increased in capacity as traffic warrants.

APPENDIX 1.

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RAILROAD STATISTICS

From an address by Lawrence Chalmers Toombs, M. A.

January 31st, 1927.

CANADIAN PACIFIC RAILWAY

19,000 miles

15 Hotels

115,000 miles telegraphs

100 ships

100,000 persons employed

Built 1880-1886

Entered Vancouver 1886

CANADIAN NATIONAL RAILWAYS

22,191 miles

13 Hotels

112,000 miles telegraph

75 ships

100,000 employees or more

Co-ordinated 1917-1919.

Entered Vancouver 1915, using Great Northern Depot.

New Station 1916.

RAILROAD MILEAGE BY PROVINCES

Ontario	10,908
Saskatchewan	7,056
Alberta	4,965
Quebec	4,797
Manitoba	4,540
British Columbia	4,117

BRITISH COLUMBIA ELECTRIC RAILWAY

303 miles track

Construction began 1897 and has grown steadily ever since.

1911: 77,598 Tons

1912: 256,083 Tons

1925: 396,474 Tons

Owns 11 electric locomotives
357 passenger cars
476 freights cars, etc.

GREAT NORTHERN RAILWAY

Entered Vancouver 1904

Main Street Terminal 1917.

APPENDIX 2.

RAILWAY INTERSWITCHING AND
LOCAL SWITCHING CHARGES IN
VANCOUVER TERMINALS

I N D E X
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APPENDIX 2.

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INTERSWITCHING CHARGES
ON CARLOAD TRAFFIC

(For distance not exceeding four miles from point of interchange-full local rate charges for excess over that distance)

Interswitching charges are the rates charged by a railway on traffic loaded or unloaded on its sidings which is delivered to or received from a connecting line, and on which such connecting carrier receives a "long-haul".

Interswitching Rates on Carload Traffic

Private Sidings

On all traffic unloaded from or to be loaded on private sidings on a railway, or directly from or into an industry, elevator or public stockyard abutting upon its tracks:- a rate of 1 cent per 100 pounds; Subject to the minimum weight of the long haul carrier's tariff, but in no case less than:-

\$3.00 per car on 7th, 8th and 10th class traffic
as per Canadian Freight Classification
\$5.00 per car on all other traffic.

Team Tracks

When traffic is loaded on and unloaded upon public team tracks:- A rate of 2¢ per 100 lbs. subject to the minimum weight of the long-haul carriers' tariff, but in no case less than \$6.00 per car.

(Exception:- These Team Track rates will not apply at the point of origin on traffic loaded on public team tracks consigned to a destination at which the required delivery can be effected by the Railway, or through its connections, or by interswitching at equal rates with a competing line, and such traffic will be subject to the local tariff rate to the point of interchange, which rate will be an additional charge against the shipment.)

Intermediate Service

When the Railway acts as an intermediate carrier between the line-haul carrier and the terminal carrier:

Not exceeding 3 miles	\$5.00 per car
Over 3 and not exceeding 4 miles	\$3.50 per car

The foregoing Interswitching rates do not apply:

- (a) To tracks used by the railway for the transfer of freight between cars and its freight warehouse, or for the purpose of transshipment from car to car, nor to tracks otherwise set apart for its own working purposes, except team tracks.
- (b) To joint movements which both begin and end in the same terminal on group of terminals or adjoining switching districts.

- (c) To cars which having been once properly interswitched for unloading, are reconsigned for unloading elsewhere within the same terminal or group of terminals.
- (d) To cars which have once been placed by long-haul carrier and subsequently ordered for delivery on the railway's tracks.

Rates include the movement of empty cars to or from the point at which they are received by the interswitching carrier.

Switching (In transitu) Grain to and from Mills
Elevators and Warehouses.

(Does not apply to Harbour Terminal Railway).

On grain carried at established rates, with the privilege of stopping in transit for the purpose of manufacture, storage or treatment the toll collected by the railway for switching the grain or its product between points of interchange and mills, elevators and warehouses, located on the tracks of the railway at the transit point shall be 1¢ for 100 lbs., minimum \$3.00 per car, maximum \$5.00 per car, in each direction.

ABSORPTION BY LONG-HAUL CARRIER OF
INTERSWITCHING CHARGES ON CARLOAD TRAFFIC

Non-Competitive Traffic

Definition:

- (a) Traffic having either its origin or destination at a station on the railway not served by another railway; or traffic which cannot be handled by a competitive route at equal rates.
- (b) Traffic having either its origin or destination at a station on the railway, which is also served by another railway, but where equal rates are not in effect via a competitive route between points of origin and destination.
- (c) Where switching is performed by a railway either at point of origin or destination and such railway is not a participating carrier in the rate from point of origin to destination; the traffic will be considered as non-competitive only so far as concerns the absorption of such railway's switching.

Absorption

On such traffic when, at either point of origin or destination, interswitching is performed by a connecting railway, the following proportion of tolls of the intermediate or terminal carrier, or both, will be absorbed by the long-haul carrier;

On all traffic, except team track EXCEPTION on Page 2, one-half of the tolls of the Terminal carrier but not exceeding one-half cent per 100 lbs., minimum \$1.50 per car, on 7th, 8th and 10th class traffic as per Canadian

Freight Classification, and \$2.50 per car on all other traffic, for a distance not exceeding four miles from the point of interchange. When distance exceeds four miles from the point of interchange, no portion of the terminal carrier's switching will be absorbed.

Also one-half of the tolls of the intermediate carrier, if any, but not to exceed the following amounts:-

- \$1.50 per car when intermediate carrier's haul does not exceed three miles
- \$1.75 per car when intermediate carrier's haul is over three miles and does not exceed four miles.

The long-haul carrier's revenue between shipping point and destination shall not be reduced below \$12.00 per car, unless the current tariff rate makes a lower charge.

COMPETITIVE TRAFFIC

Definition:

Traffic having both its origin and destination at stations on the railway and its connections and which is also served at equal rates by another railway direct or through its connections where the line performing the initial or final switchings is a party to such rates; or in other words:- When the railway performing the switching service can handle the shipment in long-haul movement from the origin station at equal rate, or could have handled the shipment in long-haul movement into the destination station at equal rate.

Absorption

The long-haul carrier will absorb the entire amount of the authorized tariff switching charges of the railway performing the interswitching service, including the switching charges of an intermediate carrier, if any, provided that in no case shall the long-haul revenue between shipping point and destination be reduced below \$12.00 per car, unless the current tariff rate makes a lower charge.

Exceptions

- (a) No part of connecting line's switching charge will be absorbed at a milling or transit point on traffic moving under transit arrangements.
- (b) On import and export traffic, except bulk grain interchanged with the Harbour Terminal Railway the long-haul carrier will absorb the Harbour Terminal Tailway switching charge of \$3.50 per car.

NOTES RE INTERSWITCHING

GRANVILLE ISLAND

Under interswitching order of the Railway Board the B.C. Electric Railway's charge for switching of long-haul general freight between all interchanges and Granville Island is one cent per 100 lbs. which the long-haul lines absorb whether competitive or non-competitive.

B. C. E. Sidings on
South Shore of False Creek

The B. C. E. switch charge between C.P.R. Interchange and sidings on the south shore of False Creek is one-half cent per 100 lbs., which, as these sidings were formerly part of the C.P.R.'s Vancouver yard, is absorbed by the C.P.R. in terms of the Lulu Island agreement under which the B. C. E. leases. G.N.R. and C.N.R. switches to these sidings come under the general interswitching order.

Harbour Terminal Railway through
Freight Switches (Except Grain in Transit)

1. Between Vancouver Harbour Commission and Elevator Docks (except Columbia) and the following interchanges - C.P.R., B.C.E., via C.P.R. and G.N.R. at Ballantyne Pier, \$3.50 per car.
2. Between V.H.C. and Elevator Docks (except Columbia) and the G.N.R. interchange at Glen Drive and 5th Avenue, 1¢ per 100 lbs. Minimum \$5.00 per car.

Harbour Terminal Railway Switches of
C.P.R. and C.N.R. Long-haul Grain.

1. From C.P.R. Interchange to No.3 Burrard Elevator and Tracks 13 and 14 at No.2 Elevator, \$3.50 per car.
2. From C.N.R. Interchange to Elevators on South shore of Burrard Inlet, except Columbia, and docks on H.T.R. lines 1¢ per 100 lbs. Minimum \$6.00. Maximum \$6.50 per car.

The C.P.R. has equal loading and unloading rights with H.T.R. at V.H. C. Elevators No. 1 (LaPointe) No.3. (Burrard) and the Terminal Grain Company's (Spillers); and equal unloading rights only with H.T.R. at No.2. Elevator (Ballantyne)

LOCAL SWITCHING OF
CARLOAD TRAFFIC

Existing Authorized and Published
Rates for Specific Movements.

Local Switching Movements include,
mainly:-

1. Intra-terminal Switching. The supplying of a car to be loaded and moved to another siding for delivery in Vancouver Terminals.
2. Inter-Plant Switching. The movement of a car from one location to another within the limits of the same plant or industry for unloading a portion of the original load, or completion of load for road-haul.
3. Re-Switching. The additional movement of a car at consignee's or shipper's request to another point within yard limits after having once been placed for delivery or loading - rate 1¢ per 100 lbs. Minimum \$5.00 per car. This charge applies on carload freight originating at or destined to a point outside of the station yard limits where switching is performed, and upon which the Railway receives a long-haul. It does not apply on cars loaded within yard limits destined to another point located therein, nor on cars which have been once placed and partially loaded or unloaded. **EXCEPTION:-** On cars of bulk grain placed at sidings of public terminal or other elevators, and re-switched for re-inspection or survey, the charge will be \$2.50 per car for each additional switch.
4. Bulk Grain. On cars of bulk grain moved from Sidings of public terminal or other elevators and, after inspection, again placed on a siding of the same elevator, a switching charge of \$2.50 per car in each direction will be assessed.

Procedure in determination of local switching rates in Vancouver Terminals has been through consideration by the railway or railways concerned of each individual requirement as it arose followed after agreement, by authorization and publication.

Following is the complete published authorization at date, classified in terms of character of freight. The details will reflect the significance of local switching costs at the present time.

Grain (cleaned or sacked) and Grain Products for Export Overseas (Except to U.S.A.)

C.P.R. Movement

From: (a) Vancouver Milling & Grain Company
(b) Elevators on South Shore Burrard Inlet except No. 2.
(c) B.C.F. Interchange
(d) G.N.R. Interchange

To: (a) C.P.R. Docks
(b) H.T.R. Interchange for V.H.C. and Elevator Piers.
(c) G.N.R. Interchange for G.N.R. Docks

Rate: $1\frac{1}{2}\%$ per 100 lbs. Minimum \$7.50
Maximum \$10.00 per car.

GRAIN in bulk for Export

C.P.R. Movement

From: Vancouver Milling & Grain Company
To: Elevators on South Shore, Burrard Inlet
Rate: 1¢ per 100 lbs. Minimum on marked capacity
but not less than \$6.00 per car.

Grain Re-shipped.

Between: Columbia Grain Elevator Company
and Elevators on South Shore Burrard Inlet
Rate: 1¢ per 100 lbs. Minimum on marked capacity
but not less than \$6.00 per car.

C.P.R. Movement

From: H.T.R. Interchange
To: Columbia Grain Elevator Company
Rate: 1¢ per 100 lbs. (does not include cost of
H.T.R. switching in cases where the latter
handles traffic to the interchange) Minimum
on marked capacity, but not less than \$6.00
per car.

GRAIN and Grain Products ex connecting lines
and Grain Screenings, bulk or sacked (when
interswitching rates are not applicable.

Harbour Terminal Railway Movement.

Between: Elevators on south shore of Burrard Inlet
except Columbia
and V.H.C. or Elevator Docks
Between: Elevators on S. shore of Burrard Inlet except
Columbia and V.H.C. or Elevator Docks.
and Interchanges with connecting lines
Rate: 1¢ per 100 lbs. Minimum \$6.00 per car.

GRAIN Ex connecting Lines and
Grain Screenings.

H.T.R. and G.N.R. Movements.

From: Elevators on South Shore Burrard Inlet except
Columbia
To: Mills and Elevators on G.N.R. tracks, i.e.,
Vernon & Buckerfield, 321 - 1st Avenue East, and
T.H.Wallace Co., 620 Raymur Avenue, through
G.N.R. interchange at Glen and 5th Avenue.
Rate: 2¢ per 100 lbs. Minimum \$12.00 per car.

H.T.R., C.P.R., and B.C.E. Movements.

From: Elevators No. 1 (LaPointe) and No.2 (Ballantyne)
only
To: Mills on B.C.E. 1. e. Victory Flour, 806
Beach Avenue, McLennan & McGarter, 1605 - 6th Ave. W.
Rate: 3¢ per 100 lbs., Minimum \$18.00 per car.

GRAIN AND GRAIN SCREENINGS

C.P.R. Movement

From: Elevators on South Shore, Burrard Inlet except #2
To: Mills served by C.P.R. for milling and reship-
ment by C.P.R. i.e., Vancouver Milling and Grain
Company, 236 Smythe Street, and Ellison Milling
Company, 1206 Homer Street.
Rate: 1¢ per 100 lbs. Minimum \$6.00 per car.
Note: In the case of No. 2. Elevator the above charge
applies from H.T.R. Interchange.

GRAIN

C.N.R. Movement

From : Rennie Seed Company's Warehouse
To: G.N.R. Interchange
Rate: $1\frac{1}{2}\text{¢}$ per 100 lbs. Minimum \$9.00 per car.

STEAMER FREIGHT

When interswitching rates are not applicable.

C.P.R. Movement

Between: Docks on South Shore Burrard Inlet served
by C.P.R.
and: C.P.R. sidings, H.T.R., and G.N.R.
Interchange

B.C.E. Movement

Between: C.P.R. Interchange
and: B.C.E. Sidings.
Rates: 2¢ per 100 lbs. Minimum \$10.00 per car.

LOCAL FREIGHT, EXPORT and IMPORT, Destined to or
Originating at Points in Vancouver Terminals.

Between: Elevators on South Shore of Burrard Inlet
except Columbia
V.H.R. and Elevator Docks
H.T.R. Sidings
and: Interchanges with other lines
Rate: 2¢ per 100 lbs. Minimum \$10.00 per car.

GENERAL FREIGHT. Being Domestic, all land Traffic, other than Deep Sea and Coastwise Export and Import and Export Grain in Transit.

H.T.R. Movement

Between: Elevators on south shore Burrard Inlet, except Columbia; H.T.R. Sidings.
And: V.H.C. and Elevator Docks
Interchanges with other lines

C.P.R. Movement

Between: C.P.R. Ferry slips, Vancouver
and: Interchanges of all lines re P.G.E. Traffic
Rates: 1¢ per 100 lbs. Minimum \$5.00 per car.

FREIGHT

B.C.E. and C.P.R. Movements

Between: Vancouver Machinery Depot (On South Shore False Creek)
And: All C.P.R. Sidings
Rate: 5¢ per 100 lbs. Minimum \$15.00 per car.

LOCAL FREIGHT

B.C.E. Movement

From: Main Street
To: Bodwell Road, South Vancouver
Rate: \$8.00 per car.

LUMBER AND SHINGLES for sorting or completion of
car load and reshipment via C.P.R.

C.P.R. Movement

Between: Heaps & Company (Foot of Semlin Drive)
And: B.C.Mills Timber & Trading Company (foot
of Jackson Street) Vancouver-Iowa
Shingle Co. (1605 Georgia St. W.)
Robertson-Hackett Sawmills (North Shore
False Creek)
Rate: 2¢ per 100 lbs. Minimum \$10.00 per car.

C.P.R. and B.C.E. Movements

Between: Heaps & Company (Foot of Semlin Drive)
And: Sawmills on South Shore False Creek.
Rate: 3¢ per 100 lbs. Minimum \$15.00 per car.

C.P.R. and B.C.E. Movements

From: Sawmills on south shore False Creek
To: Vancouver-Iowa Shingle Co. (1605 Georgia W.)
Rate: 3¢ per 100 lbs. Minimum \$15.00 per car.

MACHINERY

B.C.E. Movement

Between: Vancouver Engineering Works (519-6th Ave.W.)
And: Vancouver Machinery Depot (1155-6th Ave.W.)
Rate: \$5.00 per car.

IRON AND STEEL

B.C.E. Movement

Between: Industries on south shore False Creek
Rate: 4¢ per 100 lbs. Minimum \$16.00 per car.

STEEL AND STEEL CASTINGS

B.C.E. Movements

Between: Coughlin's Steel Plant No. 1.
And: Coughlin's Steel Plant No. 2.
Rate: \$5.00 per car.

FUEL OIL In owner's Tank Cars.

C.P.R. Movement

From: Imperial Oil Co., (Foot of Main Street)
Union Oil Co., (Foot of Jarvis Street)
To: All C.P.R. Sidings
Rate: 4¢ per 100 lbs. Minimum \$20.00 per car.

C.P.R. and B.C.E. Movements

From: Imperial and Union Oil Companies
To: All B.C.E. Sidings
Rate: 4½¢ per 100 lbs. Minimum \$22.50 per car.

CANNED SALMON

H.T.R. and C.P.R. Movements

From: Ballantyne Pier
To: Terminal Dock and Warehouse Co. (Foot of Nanaimo
Street)
Rate: 3¢ per 100 lbs. Minimum \$15.00 per car.

FROZEN MEATS When Interswitching Rates are not applicable.

C.P.R. Movement

Between: Docks on South Shore Burrard Inlet served
by C.P.R.
And: C.P.R. Sidings, H.T.R. and G.N.R.
Interchanges
Rate: 3¢ per 100 lbs. Minimum \$15.00 per car.

MOLASSES In owner's tank cars

C.P.R. and B.C.E. Movements

From: B.C.Sugar Refinery (Foot of Glen Drive)
To: Consolidated Distilleries (Granville Island)
Rate: 5¢ per 100 lbs. Minimum \$30.00 per car.

C.P.R. and G.N.R. Movements

From: B.C.Sugar Refinery
To: Vernon and Buckerfields (320 - 1st Ave.E.)
Rate: 6¢ per 100 lbs. Minimum \$30.00 per car.

SYRUP In owner's tank cars

C.P.R. Movement

From: B.C. Sugar Refinery
To: Kelly Confectionery Co. 1106 Mainland Street.
Rate: 4¢ per 100 lbs. Minimum \$20.00 per car.

APPENDIX 3

-1-

REPORT ON FALSE CREEK

14th July, 1927.

by A. R. Mackenzie

UNSAVOURY CONDITION OF FALSE CREEK

During the last fifteen years the community development of the False Creek area has decidedly not kept pace with the generally satisfactory progress in surrounding parts of the City and on the water frontage of Burrard Inlet. Admittedly, the saw-mill industry, which occupies 45% of the False Creek waterfront, is still very active on the South Shore, but, apart from these mills and excepting Granville Island, there are less than half a dozen industrial concerns of any magnitude over the four miles of water frontage between the B. C. Electric Railway Company's Kitsilano Bridge and Main Street. What is not occupied by railway trackage of the filled-in area east of Main Street, has been now for years a desert waste while Main Street property and values in the vicinity of False Creek have, for some considerable time, been devlining in sympathy with the atmosphere, both economic and physical, east and west of that important Avenue's crossing of the area. The attractive Railway Terminal buildings in their immediate setting of park and pavements, the solitary beacons of encouragement for betterment of the district, at present only accentuate the depressing impression around.

Undoubtedly the unwholesome sanitary condition throughout the False Creek area, especially between Granville and Main Streets, is the underlying and very serious obstacle to suitable industrial developments. During the summer months the atmosphere around Main Street and the Connaught Street Bridge is considerably tainted, the maximum of offence being at low water stage in the estuary. The odour is unmistakably of sewer origin and the different sewer outfalls can be easily located where intensification of the peculiarly local smell is apparent.

There are sixteen separate sewer outfalls into False Creek, detailed as follows:-

On North Shore

1. Foot of Jervis Street. Sewage only while storm water running.
2. Foot of Burrard Street.
3. Foot of Granville Street
4. Foot of Nelson Street, C. P. R. sewers.
5. Foot of Smythe Street.
6. At west side of Brackman-Kerr mill, opposite foot of Dunsmuir Street.
7. Foot of Columbia Street.

On West Side of Main Street

8. Opposite C. N. R. Terminal Station.
9. At foot of Northern Street.

On South Shore

10. Clark Drive Sewers overflow to 6th Avenue and Glen Drive
Sewage only when storm water running.
11. Foot of Columbia Street.
12. Half way between foot of Yukon and foot of Alberta Streets
13. Foot of Laurel Street.
14. Foot of Hemlock Street. Sewage only when storm water running.
15. Granville Island Sewage outfall. Under southend of Granville Street Bridge.
16. Foot of Granville Street.

The Greater Vancouver & Districts Joint Sewerage and Drainage Board controls outfalls No. 10, 11, and 14, and the City of Vancouver the remainder.

Outfall No. 12, serves a considerable area south, east and west of the south end of the Connaught bridge. The present intention of the Sewage Board is to construct an interceptor which will pick up that sewage along 7th Avenue, westwards from Cambie Street to Spruce Street, thence north to 6th Avenue, then westwards to Fir Street, thence northwards to 2nd Avenue, thence westwards to Arbutus Street, then northwards to 1st Avenue, thence westwards along 1st Avenue, later picking up the Balaclava Street Sewer and running out at Imperial Street. The grade of that interceptor will be too high to carry sewage from the lowest portion of the south shore slope between Cambie and Main Streets, Granville Island, Kitsilano Reserve Lands, that portion of the "fill" east of Main Street which cannot be served by the Clark Drive sewer, and any future reclaimed areas in the False Creek water area, but will receive it from appropriate pumping installations.

It is intended that the interceptor will be designed to handle only dry weather sewage and industrial waste from the territory draining into it, storm water to be overflowed into the False Creek waterway. It is assumed that as storm water conditions obtain only in the winter months when English Bay is not used by bathers, overflow sewage during that period will not offend.

English Bay bathing beach is distant only half a mile west of the westmost sewer outfall at the foot of Jervis Street.

Decision as to the likely character of the ultimate development of the False Creek area between Main and Granville Streets will reflect vitally on design of interception of the sewage at present discharging into the waterway. Intercepting sewers on either shore cannot be located with grade sufficiently depressed to collect sewage from the lowest portions of the area, and pumping arrangements of more or less magnitude will inevitably be required. Economical disposition of such pumping installations will naturally be encouraged if, in good time, a policy is determined on in respect of the character of the general future development of the entire False Creek area.

DILAPIDATED AND UNSIGHTLY TIMBER WORK

At various points along the shore of False Creek and occupying 10% of the total length of waterfront are decayed and abandoned timber structures unfit for further use. Their removal would appear to be desirable for sanitary reasons alone. Locations and particulars as follows:

1. Total waterfront length of 200 feet, with width of 40 feet, of decayed piled wharfage at the south end of the Mainland Transfer Company's wharf opposite the foot of Nelson Street.
2. Total waterfront length of 350 feet of very dilapidated piled wharfage, opposite the foot of Smithe Street on the property of the Pacific Box Company.

3. 200 feet of old trestle work, 20 feet in width at the west side of the Brackman-Kerr Mill, opposite the foot of Dunsmuir Street.
4. Waterfront length of 100 feet of piles and floor beams, width 100 feet, at the south west corner of the B. C. Electric Railway Company's fill opposite the foot of Carrall Street.
5. For a water front length of 525 feet northwards from the north end of the B. C. Electric car barn yard at the foot of Prior Street and for a further length of 250 feet south of a point 150 feet south of the south end of the same yard the piled retaining wharfage has long been abandoned and is falling to pieces, as also is a gravel bin structure in the latter location.
6. Waterfront length of 30 feet, width 180 feet, of dilapidated piles and superstructure opposite the Canadian National Terminal Station.
7. Six abandoned boat hulls opposite the foot of Quebec Street.
8. A total of fifteen inferior type house boats strung out along a four foot wide floating wharf opposite the foot of Manitoba Street, only 200 yards from one of the most offensive of the sewer outfalls. There are also located here a decayed gravel bin on piles and an abandoned 50 foot boat hull.
9. Waterfront length of 100 feet of old pile wharfage with a heap of steel and iron refuse behind it, at the north east corner of the City Yard on the east side of the south end of the Connaught Bridge.
10. Abandoned logs and wood debris over a waterfrontage of 300 feet, opposite the foot of Ash Street.
11. Abandoned logs and two disused floating shacks opposite the foot of Spruce Street.

OLD GREAT NORTHERN RAILWAY TRESTLES AND TERMINAL

The Great Northern Railway Trestle running parallel with and 250 yards west of Main Street across False Creek and the old Railway Terminal yard at its North end, between Carrall and Columbia Streets has been out of Commission for some years. The steel trackage and the swing bridge on it opposite the foot of Terminal Avenue have been removed. The structures, with exception of the west leg of the Y at the south end, at 1st Avenue, which is being used by the coal interests there, are, throughout, very unsightly and unfit for further use, as follows:

1. Two concrete swing-bridge abutments, each 20 feet in length and six feet in width, and wooden drawrest midway between them 200 feet in length 25 feet in width.
2. East leg of Y at 1st Avenue and continued trestles across False Creek-a total length of 3,000 feet on piled substructure 25 feet in width; also a total length of 2,500 feet of trestle on piled substructure 12 feet in width.
3. Freight shed, timber construction with corrugated iron walls and roof, 600 feet in length by 40 feet in width, on piled substructure, all in deteriorating condition; wood floor team track along side the shed on west side, 33 feet wide on piled substructure and very dilapidated.
4. Four parallel wood floor team tracks of 6 inch by 12 inch timbers between the freight shed and Carrall Street, one track 30 feet wide, 400 feet in length, three tracks 40 feet wide, total length 1,000 feet, all more or less decayed.

REFUSE DUMPS

There are eight refuse dumps at various points on the shores of False Creek and occupying 15% of the total length of waterfront. In view of the possibility of, eventually, considerable industrial development of the False Creek area and the construction of buildings of consequence on either side in the proximity of the ultimate restricted waterway, it would appear that much stricter supervision of the character of materials used in fill dumps, wherever permitted or encouraged is very desirable. Locations and particulars of refuse dumps, at present being operated, are as follows:

1. Opposite C. P. R. round-house, on north shore, mainly ash dumps, 300 feet in length.
2. A length of 400 feet of the waterfront opposite the foot of Davie Street is used by the C. P. R. for dumping of manure in the process of cleaning out cattle trucks on the spur alongside.
3. Closely east of the manure dump is another C. P. R. dump of iron and steel debris, 50 feet in length.
4. An unsightly dump of wood and steel rubbish, 200 feet in length, immediately along side and Mainland Transfer Company's wharf, opposite the foot of Nelson Street.
5. Dump of lumber wast and mixed refuse, 200 feet in length, in centre of Terminal Mills waterfrontage, opposite the foot of Robson Street.
6. The 700 feet of length of fill immediately west of the Brackman-Kerr Mill opposite the foot of Duns-muir Street is, with the exception of 100 feet at the west end, being built of unsatisfactory wood and steel debris.

7. The B. C. Electric Railway Company's fill opposite the foot of Carrall Street is, generally, formed by good material, with the exception of a length of 50 feet where wood boxes, steel pipes and motor car bodies and radiators are being dumped.
8. A length of 200 feet of water front is being filled with excellent earth material opposite the foot of Columbia Street.

The following is Clause 253 of Health By-law No. 949, Part 11, the City of Vancouver, governing refuse dumps:-

"No person within the City Limits shall suffer the accumulation upon or the escape from, or deposit, or permit the deposit upon any land, premises or place belonging to, or occupied by him, or under his control, of anything which may endanger the public health, or deposit or permit to be deposited upon, on or into any street, square, lane, highway, wharf, dock, slip, pond, bank, stream, sewer, or water or waters of Burrard Inlet, Coal Harbour, or False Creek, any dead animal, fish, ashes, dirt, rubbish, excrement, dung, manure, offal, or other refuse or vegetable or animal matter or other filth or offensive thing."

SMOKE NUISANCE

The False Creek smoke nuisance is confined to the activities of the eleven large sawmills operating on the waterfront between the B. C. Electric Railway Company's Kitsilano Bridge and Main Street, three of which are on the north shore and eight on the south shore. Those mills and their lumber yards occupy 45% of the total waterfrontage of 4 miles, half a mile on the north shore and one and a quarter miles on the south shore.

So far, two corrective methods have been tried by several of the mills in an effort to reduce the smoke volume:

1. Institution of "down-draft" burners, by four of the mills-result very satisfactory.
2. Water-spray process, produces ink black water, but not approved by the Marine Department which will not permit such contamination of the water in False Creek and English Bay.

It would appear that the main nuisance in the form of unburnt particles of carbon, comes from the smoke stacks of the differnet boiler plants, comparatively little from the burners. The boiler plants not being, generally, of sufficient capacity for supply of the power required, the fires have to be forced for the necessary steam by use of too much quickly combustible fuel and a great deal of the worst form of smoke producer-dry shavings. The ideal fuel for the boiler plants is said to be sawdust, being green there is little smooke. Shavings and similar waste should be entirely diverted to the burners and the several laundries in the City. The laundry boiler plants are of such completely efficient type that proper draft regulation, so essential in smoke elimination, is practicable.

It would appear that there are three possible methods by which the smoke nuisance in False Creek can be reduced materially or completely removed:

1. By such improved steam-producing capacity of the boiler plants of the sawmills as will obviate the necessity of forcing the fires by the use of smoke-producing fuel, and by proper draft-regulating facilities.
2. By provision of "down-draft" burners. This, in most cases, would entail the removal of existing burners and their substitution at a cost of between \$20,000 and \$30,000 in each case.
3. By installation of a central power plant to, by electrical transmission, operate all the sawmills in the area, with steam transmission for kilns. Such a centralized plant could be so completely and efficiently equipped and its fuel supply so satisfactorily selected that the solitary stack would give infinitesimal offence.

Allied with the smoke nuisance incidental to the operation of sawmills in False Creek is the menace to the Granville Street and Connaught bridges. Conditions on the west side of the north end of the Connaught bridge where, over a distance of two hundred yards immediately alongside, piles of lumber rest on a mattress of deteriorated pile sub-structure interlaced with heaps of dry discarded lumber and could be very easily set ablaze with disastrous consequences. The proximity of the Hanbury sawmill to the pile bents of the south end of the Granville Street bridge constitutes quite a serious menace to the City's main traffic avenue.

IMPROVEMENT OF EXISTING CONDITIONS

Correction of the distinctly unwholesome sanitary condition, removal of the abandoned and unsightly piled quayage, trestles and other wooden structures, selection of proper materials to be used in forming dumps and fills, and elimination of the smoke nuisance would undoubtedly combine to transform the False Creek area into one of the most promising industrial and warehousing sections of the City and considerably enhance its evident strategic advantage of central location.

In anticipation of whatever improved development there may take place in due course, effort should be made, meantime, to remove present evidence of neglect and dereliction and to intrigue the public with the idea that the False Creek area can be given an attractive and refreshing appearance.

A comparatively inexpensive programme of tree and shrub planting should, meantime, be undertaken in the following locations:-

- (a) Along each side of the route of Terminal Avenue and that of the proposed Gore Street-Grandview Highway connection.
- (b) Clumps in scattered spots all over the desolate portions of the filled in area east of Main Street.
- (c) Screening of the large unsightly City dump at the foot of Raymur Avenue to prevent its being the first impression of the City of Vancouver received by incoming passengers over the Great Northern Railway
- (d) On the vacant municipal property on the west side of Main Street opposite the Canadian National Terminal Station.
- (e) Removal of the old G. N. R. freight shed and team tracks and the space between Carrall, Pender and Columbia Streets and the Georgia Street Viaduct should be lawned and shrubbed.
- (f) Wherever practicable along the south edge of the stretch of C. P. R. yard property on the North shore of False Creek, as well as on the vacant land between the Rate Portage and Hanbury's Mills in the vicinity of the south end of the Granville Street Bridge.
- (g) Pending whatever disposal there may be of the Kitsilano Reserve Lands portions of the tract could, to scenic advantage, be at present planted with trees and shrubbery of quick growth.

Within three years of such suggested planting at a total cost that would not be very considerable, the whole outlook on the False Creek area would be so freshened that there would automatically be inculcated in the mind of the general public a desire to go ahead with the good work. The effect on the character of Main Street and on property values there would probably be most beneficial in encouraging commercial progress worthy of that important traffic avenue.

Later, as industrial occupation proceeds throughout the area, the cost of removal of these trees and shrubs, where necessary, will be negligible.

It is generally appreciated that until the sawmills move from False Creek it will be impracticable to carry out satisfactory development of the area. While they operate to the same extent as at present log booms will require all the existing waterway for passage and storage. With the sawmills away to more appropriate locations, there need only be a restricted waterway through from English Bay to Main Street, releasing most of the area now covered by water for reclamation of considerable economic and industrial attraction and value.

It is probable that no greater width of waterway than from 300 to 350 feet, with possibly a series of bays from the main channel along the south side of it, will be necessary for the most ambitious industrial and warehousing development. Establishments in need of intimate contact with water transport might line the waterway, occupancy grading off from that necessity in proximity to the bays to what could be satisfactorily served by railway transportation alone. Operation of such a waterway, which would presumably float scows and barges, would be by high-powered gasoline tugs, eliminating any need for swing spans in the different bridges crossing the area.

A sketch has been prepared, scale 300 feet to one inch, showing suggestion of development of the False Creek area on such lines. A total of existing water area of 430 acres between the B. C. Electric Kitsilano Bridge and Main Street is considered and apportioned as follows:-

<u>Waterway</u>	95 acres
<u>Filled-in-area</u>	
Industrial & warehouse sites	180 acres
Roads, 100' & 66' wide, 9 Miles	93 acres
Parks (exclusive of Kitsilano Reserve Lands)	<u>62 acres</u>
	<u>335 acres</u>
<u>Total present Water Area</u>	<u>430 acres</u>

A very conservative valuation of the suggested 180 acres of industrial and warehouse sites, say ten years from now, would be \$75,000 per acre - a total possible significance of \$13,500,000. Assuming a general average depth of 15 feet requiring to be filled, and the cost of such fill at 50 cents per cubic yard, construction cost might be roughly taken as follows:-

Cost of Fill	\$4,500,000
Cost of Quayage and Wharfage	2,500,000
Compensation to affected interests	<u>3,500,000</u>
TOTAL	<u>\$10,500,000</u>

which would leave a surplus of \$3,000,000 for development purposes and discounting of the carriage of "overhead" liability during probably leisurely growth of occupation.

There is little doubt that the primary cause of the decadence of Main Street during recent years has been the proximity of the Gas Works and prominent occupancy of a considerable portion of the west side of the Street by the B. C. Electric auxiliary power station and car barns. The considerable teaming from gravel and coal bins on the west side, south of Prior Street, while seriously disturbing the even flow of the considerable traffic along Main Street, have operating premises extending over nearly half a mile of street frontage that should be occupied by up-to-date commercial structures if present environment was not the handicap it unfortunately is.

The first stage in a well considered scheme of general development of the False Creek area would in, all likelihood, be confinement of the waterway in a filled-in area between Main Street and the Connaught Bridge. The aforementioned sketch shows suggested suitable new locations, well away from Main Street, for the Gas Works (necessitating only inconsiderable extension, westward, of existing outlet main), car barns, the gravel and coal and other distinctly undesirable present occupants of what should be the premier section of Main Street. There can be little doubt that successful treatment of that first step of the scheme would encourage progressive prosecution of the remainder of the complete programme of development.

But before the governing principles of such a project can be soundly determined a profound study of the following considerations will be required:

1. Ownership and leases throughout.
2. Economic and financial significance of existing industries and businesses along the shores of False Creek, and estimate of compensation and other costs in respect of their transference to new waterfront locations in lieu of their present holdings.
3. Feasibility of location elsewhere, say the mouth of the Fraser River, of the sawmills; and cost and compensation significance of transfer.
4. Study of existing industrial and warehousing conditions in the City of Vancouver and estimate of classes and dimensions likely to be attracted to a properly developed False Creek area.
5. Desirable minimum width and operating requirements of the new waterway, and the relation of these dimensions to the probable value and area of the remaining present water surface available for reclamation so that satisfactory economic balance can be determined.

6. Segregation, in the general design of the varying standards of accommodation for industries and warehouses of different dimensions and characters to co-ordinate with judicious provision of railway transportation, water supply and sewerage service.

Design can then be so thoroughly prepared that progressive procedure of the development, commencing at the Main Street end and then section by section westwards over a probable considerable period of years, will continuously take shape, by definite plan, towards satisfactory completion.

A sympathetic and co-operative attitude of the Government, which owns the bed of False Creek, would result in the project being eventually so sound financially that the suggested provision of between 60 and 70 acres of small parks throughout the area would be quite justifiable and along with the 70 acres of the Kitsilano Reserve Lands, very satisfactorily provide for the recreational needs of the considerable industrial community to be expected when the area is attractively and efficiently developed.

R E P O R T

-ON-

VANCOUVER HARBOUR

Harland Bartholomew
and Associates

Wm. D. Hudson
Associate Engineer

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REPORT ON VANCOUVER HARBOUR

INTRODUCTION

The importance of the Port of Vancouver in the national transportation scheme cannot be over estimated. It is one of the primary elements in the line of communication which enables the British Empire to Maintain contact with its eastern possessions and oriental markets. Through the port of Vancouver flows no small proportion of the life blood of the greatest united government that the world has ever known. It is urgent, therefore, that the resources of the Port be jealously guarded and that no fraction of its water front be wasted through inadequately financed improvements nor should it be exposed to the danger of self interested private or corporate exploitation.

The administration has been wisely delegated by the Dominion Government to a Harbour Commission made up of prominent men of affairs, fully alive to their responsibilities and ably supported by a competent technical staff. The only apparent handicap to efficient port development that is likely to arise is the lack of funds. It is believed that these should be more generously supplied by the Dominion Government and perhaps by the Province and that the Port should not be expected to be self supporting, at least for many years.

RELATION OF PORT DEVELOPMENT
TO THE CITY PLAN

It is not the purpose of this study to enter into the detail design of harbour facilities, but rather to forecast along what lines the harbour will develop, in order to make the necessary provisions in the City Plan to the end that co-ordination may be effected. For example, had the City Plan been prepared years ago it is certain that one of its provisions would have been a broad trucking highway at dock floor level extending the full length of the south shore. The need for such a waterfront street is now acute but impracticable to obtain as the building line of dock structures is firmly established and cannot be altered except at prohibitive cost. In order to obtain such a highway on the landward side, many expensive buildings and much private property would have to be destroyed. The only alternative is to construct an overhead street, such as the C. P. R. has lately built. To supplement this expedient the

Major Street Plan proposes the widening of Water from Cambie Street eastwardly and also Powell Street which is in effect an extension of Water Street.

Harbour development does not take place rapidly as it is principally a function of national growth, particularly if the immediate territory adjacent to the Port is thinly settled as in the case of Vancouver. There is, therefore, ample time in which to anticipate and provide the essential physical improvements by means of which municipal and harbour development may be properly related.

SCOPE OF THE INVESTIGATION AND REPORT

This investigation is intended to indicate the present extent to which the Burrard Inlet is utilized and its approximate useful area when fully developed for harbour purposes. Statistics and descriptive matter is available in the printed annual reports of the Harbour Commission which cover very fully the operations of the Port and set out in detail its various facilities.

Sufficient additional data has been prepared to show the growth of port business and the kind and quantity of the principal commodities handled. The railroad report includes recommendations affecting the harbour, and the two studies are really complementary to each other.

PROGRESSIVE DEVELOPMENT OF THE PORT

That the business of the Port is on a substantial basis and in a healthy condition is evident from the steady increase in its volume of trade during the past decade.

As indicated in the diagram Plate 6 the total exports have increased from about 1,000,000 tons in 1921 to about 3,500,000 tons in 1926, or over three times in five years. Most of this is due to deep sea trade.

The Imports, Plate 7, have risen from about 1,600,000 tons in 1921 to 4,700,000 tons in 1926. This great increase of about three fold is largely due to local coastwise traffic, the deep sea being of lesser influence.

It seems evident that from past performances that the recent construction, by the Canadian Pacific Railway, of its new and elaborate Pier is justified, although at present it is somewhat in excess of actual requirement.

EFFECT OF PANAMA CANAL

That the advent of the Panama Canal has had a stimulating effect upon the growth of the Port of Vancouver is evident from the statistics showing the proportion of export freight transported via that route. For the period from 1921 to 1926 inclusive, it appears that the following percentages were shipped through the Canal in proportion to the total amount by both Canal and Ocean.

Lumber	33%
Shingles	93%
Canned Salmon	72%
Fish, Frozen, Salted, Cured	3%
Flour	14%
Wheat	71%
Lead and Spelter	45%
Apples	69%

The detail statement from which the foregoing figures were derived, also indicate that the proportion shipped by the Panama Canal has been steadily increasing.

FOREIGN CONTACT WITH VANCOUVER

One of the distinct benefits of the Port of the Vancouver district is that it provides a direct contact with so many foreign countries. Since the year 1909, the number of vessels of foreign registry that enter the Port has increased from seventy-one to over a thousand, the actual figures being 1029 in 1926. A list of these follows for the year 1926.

British	419
U. S. A.	264
Japan	158
Norway	64
Denmark	24
France	23
Holland	21
Sweden	20
Germany	20
Italy	19
Belgium	5

In addition to the above, vessels from Russia, Mexico, Peru, Chilli, Spain, Nicaragua, Panama and Greece make occasional trips to Vancouver.

PASSENGER TRAFFIC THROUGH PORT

During 1924 there was 814,878 passengers landed and shipped by boat, in 1925 approximately 1,000,000 and during 1926, over 1,250,000. This traffic is important to Vancouver both for its direct revenue producing power and its advertising value. Every effort should be made to acquaint all travellers with the advantages of this district. Few cities have so great an opportunity of securing a personal contact with citizens from every corner of the world.

DIVERSITY OF CARGO

A stabilizing factor to port business and also a beneficial influence upon the commercial life of the city, is the diversity of cargo handled both in and out of this port.

Plate 8 shows the principal export items and their amounts, while the following table is illustrative of the more important incoming shipments. It is seen that Vancouver is not a one cargo port, although by its bulk and value grain may be considered the leading cargo.

PORT OF VANCOUVER

Table showing sundry imports
for the Year 1924

<u>WATER-BORNE</u>	<u>TONS</u>	<u>VALUE</u>
Chemicals	3,588	276,732
Dry Good, Carpets, etc.	7,723	4,302,636
Earthenware	2,108	256,434
Fruit, fresh and dried	16,323	1,687,138
Gunney sacks	9,599	1,462,359
Hemp	3,776	618,921
Meats, fresh and cured	4,300	181,576
Oils, Crude fuel, Distillate, Gasoline	585,505	6,032,200
Shoes	229	127,592
Silk	8,205	83,024,526
Soap	1,549	231,610
Steel, Iron & Machinery	36,446	2,840,312
Sugar	84,008	8,006,921
Tea	12,462	4,188,925
Wool	2,614	3,106,471

CONSTRUCTIVE PROGRESS

By reference to the diagram Plate 5, it will be apparent that warehouse area and dock frontage have been provided in corresponding relation to the increase in traffic. This diagram shows that since 1910 dock facilities have been about tripled. The beneficial influence of the Panama Canal opening in 1914 is indicated by the greater constructive activity and increased number of ships entering the port since that date.

PART OF THE RAILROADS IN HARBOUR DEVELOPMENT

The railroads have been here as elsewhere, foremost in inaugurating harbour improvements and their investment in Vancouver in piers and warehouses amounts to many millions of dollars. The most recently built pier of the Canadian Pacific Railway elsewhere described, cost in excess of \$5,000,000. The City must continue to look to the railroads for much of the capital necessary to fully develop the harbour.

However, railroad business is highly competitive and they, therefore, usually insist upon a monopoly of a privilege for which they pay. While this practice tends to produce the highest state of efficiency in individual operations, it is not, in the broad sense, a constructive policy nor is it likely to result in the maximum benefit to the greatest number of people. If unregulated, railroad control of the harbour is likely to stifle its growth. There are examples where the public is practically excluded from even a sight of their waterfront on account of the uncontrolled activities of the railroads. Fortunately through the timely organization of Harbour Commission, Vancouver is in no such danger. But there is still much to accomplish in the way of giving equal access to all carriers to every portion of the harbour front. Whether this is accomplished by a rate adjustment of switching or the joint use of all trackage on the water front is not very material, but it is believed that the most satisfactory method of

providing equal privileges to all, would be by extending the scope of the Harbour Commissions Terminal Railway and giving it a practical monopoly of the switching business within the limits of Vancouver. As suggested in the Railroad Report, it would be to advantage to combine the Terminal Railway with the B. C. Electric Railway as the latter is peculiarly fitted for serving certain sections of the City.

In the development of the North Shore now in progress by the Harbour Commission, the opportunity is given to prove the soundness of the policy above outlined, as the Terminal Railway alone is in a position to serve this territory.

SUGGESTED DEVELOPMENT
OF VANCOUVER HARBOUR.

The present extent of use of Vancouver Harbour and a plan for developing for harbour and industrial purposes the remaining unused areas are illustrated by Plates 3 and 4.

The following tables, "A" and "B" show in detail the frontage used by the various classes of owners. It is interesting to note that relatively small percentage of undeveloped water frontage on the south shore.

PRESENT USE OF BURRARD INLET-SOUTH SHORE-YEAR 1927

Between Coal Harbour Causeway and 2nd Narrows.

Length of Waterfrontage 30,500 feet - 5.8 miles

Canadian Pacific Railway Co.	6,600 feet	22%
Vancouver Harbour Commission	3,750 feet	12%

Remaining Shipping Interests

Union Steamship Co.	200 feet	
Evans, Coleman & Evans	400 "	
North Vancouver Ferry	200 "	
Canadian National Railway	300 "	
Great Northern Railway	500 "	
Terminal Dock Co.	2,400 "	
Columbia Elevator Co.	<u>400 "</u>	4,400 ft. 14%

Industries

Coal Harbour	1,650 Feet	
Canadian Fishing Co.	700 "	
Sugar Refinery	550 "	
P. Burns Co.	350 "	
Ross & Howard	250 "	
B. C. Marine Works	<u>300 "</u>	3,800 ft. 12%
Sawmills		3,250 ft. 11%
Undeveloped Water front		<u>8,700 ft.</u> 29%
TOTALS		30,500 ft. 100%

"B"

PRESENT USE OF BURRARD INLET
North Shore Year 1927

Between 1st and 2nd Narrows. Length of Waterfrontage
29,700 feet -- 5.6 miles.

Vancouver Harbour Commissioners

Public Booming Ground	1,100 feet		
Undeveloped Waterfront	4,500 feet	- 5,600 feet	19%

Sawmills		1,700 feet	6%
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Industries

Creosoting Plant	500 feet		
Northern Construction Co.	700 feet		
Burrard Dock Co.	800 feet		
Boatbuilders	400 feet	- 2,400 feet	8%

Undeveloped Waterfront		<u>20,000 feet</u>	67%
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TOTALS		29,700 feet	100%
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Comparison of Present and Potential Wharfage Vancouver Harbour.	<u>Present</u>	<u>Proposed</u>
Wharfage, North Shore	0.25 miles	7.13 miles
Wharfage, South Shore	<u>4.22 miles</u>	<u>3.98 miles</u>
Total	4.47 miles	11.11 miles

The figures serve to show the importance of conserving for strictly harbour purposes the entire water frontage of Burrard Inlet, for, although much of the shore line east of the Second Narrows Bridge will, some time, come in for harbour and industrial use, that portion between the first and second Narrows will always constitute the true harbour.

The South Shore will develop more rapidly, especially for commercial vessels. The North Shore is more adaptable for handling cargo of great bulk, such as grain and lumber requiring much storage space for cars. As indicated by the plates, the North Shore offers opportunity for the establishment of industries by reason of the large amount of flat areas immediately to the rear of the proposed harbour frontage.

In general then, it is recommended that the south shore be reserved for active marine commercial wharfage, including fish docks and general coastwise and high class deep sea trade, and the north shore for lower grade, less active bulk cargo, shipyards, grain elevators and the like, including industries that may or may not require wharfage.

COMPARISON OF ACREAGE - PRESENT AND FUTURE.

Substantiating the above recommended general uses of the harbour, a comparison of the tackage area, present and proposed is interesting.

SOUTH SHORE	Present area	155 acres
	Proposed area	<u>185</u> acres
	Total	340 acres
NORTH SHORE	Present area	24 acres
	Proposed area	<u>947</u> acres
	Total	971 acres

The significance of the comparison which indicates that almost three times the area available on the south shore can be obtained on the north side, becomes apparent when it is realized how much trackage is required to operate satisfactorily a huge grain elevator holding as much as 2000 cars of grain.

There should be close at hand a yard more than sufficient for a day's run or say of 200 cars capacity, and in convenient proximity a storage yard for from 1000 to 2000 cars. At the present time the lack of yard space is seriously felt along the south shore. In order to partially supply this need, the recommendation of a large yard along the Great Northern's harbour track, in the vicinity of Glen Drive, was recommended in the Railroad Section of this report.

PROGRAMME FOR HARBOUR DEVELOPMENT

It is not anticipated that the entire potential wharfage and trackage or industrial area will be required for possibly fifty years. The tonnage and other curves showing port business indicate that within that time approximately three times the volume of water borne commerce will be passing through this port of entry. Existing facilities can absorb much of this as they are not now used to their full capacity excepting possibly the elevators. However, it is urgently recommended that immediate steps be taken to insure the gradual carrying out of a programme that will have for its ultimate object the complete development for harbour purposes of the entire shore line of Burrard Inlet.

The essential first step is to secure absolute control of the water frontage through the Harbour Commission, and sufficient of the back ground to accommodate the railroad tracks and accessory facilities that are necessary. The land should, if possible, be purchased outright and then developed industrially with limited lease holds, until it is gradually needed for docks and piers. Possibly a form of option may be arranged whereby at a fixed price the land may be acquired later, meantime its use to be controlled by the Harbour Commission.

PUBLIC ACCESS TO WATER FRONT.

It should not be neglected in the development of either shore, to provide public access to the waterfront. This may be done by extending wide avenues or street ends entirely to the pier head line and holding them reserved for public use.

NO UNUSUAL CONSTRUCTION
PROBLEMS INVOLVED

There are no problems involved in the future expansion of the harbour that have not been solved in the past. For the south shore the methods used and types of pier construction required would be about the same except that from about Victoria Drive eastward, on account of the closeness to shore of deep water, the quay type of construction rather than slips and piers will be required. Additional room for much needed trackage can be made available along this section, as far as the Second Narrows Bridge.

On the North Shore construction will, in general, be comparatively much cheaper as there are extensive shallows of easily dredged material. With the exception of a length of about a mile and a half extending from Moodyville westward, pier and slip construction is practicable.

NEW BRIDGE AT
SECOND NARROWS REQUIRED

An essential feature of North Shore development is a new bridge at the Second Narrows of sufficient width to carry two railroad tracks and a highway deck for four traffic lanes capacity. It does not require great foresight to anticipate this improvement as present traffic conditions on this bridge are intolerable. When even a small portion of the expected concentration of harbour and industrial life takes place on the north shore, the mingling of vehicular and railroad traffic on this important structure will eventually force its reconstruction. It should be a free bridge.

WORK OF HARBOUR COMMISSION

Elsewhere the importance of encouraging the Harbour Commission's Terminal Railroad has been stressed. Unfortunately the extension of this road as well as the acquisition of much needed land is hampered by the lack of funds. The Harbour Commission must support itself by revenue derived from its own resources and it is remarkable that the Commission has successfully operated so long under these conditions. Many ports are supported either partially or wholly by the State or City in which they are located, and considering the tremendous influence for good that an efficient harbour at Vancouver has, not only on the Province, but the entire Dominion, its cost and maintenance should be borne by the entire population. The Port belongs to the Dominion more than to Vancouver. It is an essential national asset and should be recognized as such.

SPECIAL IMPROVEMENTS RECOMMENDED
FOR EARLY CONSIDERATION

Fish Dock

Considering the importance of the fishing industry and its volume, the present waterfront facilities for handling the business are pitifully inadequate. This industry requires an exceptional degree of supervision in order to preserve sanitary conditions and promote speed and efficiency in movement.

The present unloading pier, located at the foot of Gore Avenue, is built of wood and is of the floating type of construction. It is owned by the Canadian Pacific Railway and leased to several parties. There are fifteen dealers, each occupying separate premises.

There is no feature of the present fish dock that can be recommended or should be retained. What is required is a complete new pier, built along modern lines, with its own refrigeration, with mechanical appliances and abundant anchorage for the

great number of small boats that bring in the fish. It must have good access for teams and trucks. A packing and storage plant should be an integral part of the fish dock. So arranged that the product can be moved directly into cars for shipment or vessels for export.

The site chosen must necessarily be somewhere along the commercial section of the south shore, and of such size that all of the business can be concentrated in the one location.

The construction of a modern fish dock is one of the most useful improvements that could be made at this time and, if carried out, will immensely encourage an essential industry of the port and insure the proper preparation and marketing of one of Vancouver's principal source of food.

TUG BOAT WHARFAGE

It is recommended that more adequate tug boat wharfage be provided. The importance of this industry to Port business is very great and its requirements are immediate availability, fitness of equipment and prompt service. At present there are from 90 to 100 tug boats operating in the Port and there are five anchorages where these boats may be tied up. Scarcely any of these are adequate and at times are occupied by other vessels, making it necessary for the tug boats to seek some other temporary location.

If possible, a central location along the south shore should be sought and provided where all of this sort of craft may be concentrated.

The wharfage may be of the floating type, hence not unduly expensive, but it should have ample room for storage of supplies, duplicate machinery parts, quarters for the men and offices.

The obvious advantage of such an arrangement is that tugs would be available at one central point with a single call. For the anchorage of scows, dolphins or other means should be provided in the vicinity of the tug boat wharfage. Accommodations for approximately fifty scows appear to be needed at this time.

CHANNEL IMPROVEMENT

The Harbour Commission doubtless has plans for the widening and deepening of the channel through Lions Gate. This is an improvement of decided benefit to navigation as the channel is used for such a variety of craft that wide steering room is essential. The current is at times rather swift and some inconvenience is experienced when log booms and sea going vessels attempt a simultaneous passage. It is believed that a total width of 1800 feet may be obtained with at least 1200 feet at 35 foot depth, low water.

COAL HARBOUR

Coal Harbour is located at the extreme westerly end of the Harbour and has an area of approximately 160 acres. On account of its proximity to Stanley Park, its freedom from railroad operations and industry, and its accessibility to the public, Coal Harbour possesses both an aesthetic and a utilitarian value that should not be overlooked. It forms an admirable anchorage for yachts of all kinds during the winter months and indeed is now used extensively for this purpose. The Royal Vancouver Yacht Club has established their summer anchorage quarters on English Bay between Alma Road and the Jericho Country Club and have built there a club house to accommodate 600 members. This was a good move as passage through the Lions Gate Channel

is at times difficult for yachts of the sailing class, and in addition it removes from the main harbour a class of vessels for which a commercial harbour has no need.

There is no hesitancy in recommending that Coal Harbour be reserved for the use of the lighter craft of a recreational nature and for equipment and club houses devoted essentially to aquatic sports.

At present much of Coal Harbour frontage is occupied by nondescript buildings and some residential house boats, all of which should be removed. An extension of the Landscape treatment similar to that already done along the west shore of Coal Harbour would be appropriate.

SHIP YARDS AND DRY DOCKS

There appears to be no particular reason why Vancouver should not become a shipbuilding centre. Certainly it would be of great advantage for so important a sea port to be able to accommodate in docks any vessel able to make the port. Once well established and properly encouraged, the shipbuilding industry is fairly permanent in nature and constant in operation. It attracts quite a number of allied industries and employs many men of a desirable class.

There is at present, one very well equipped dry dock, that of the Burrard Dry Dock Company, which is located on the north shore between Lonsdale Avenue and St. George Street. The dry dock has over all length of 566 feet, a width of 98 feet and a 30 foot draft. Its lifting capacity is 20,000 tons. There are two shipbuilding butts, one a pier of concrete 50 feet wide and 700 feet long. The machine shops are very complete.

The North Shore is a suitable location for this industry and in the future harbour plan, space for at least three times the present ship building capacity may be safely reserved.

The magnificent graving dock at Victoria for the present relieves the necessity for any immediate expenditure for similar elaborate facilities here.

LUMBER MILLS IN BURRARD INLET

This is a type of industry that should not be encouraged in Burrard Inlet, for the principal reason that they occupy too much water frontage and their operation interferes with navigation. Yet it is essential that so great an industry should be fostered. It has frequently been said that the Fraser River District is the logical place for mills of this sort and while it may be a loss to Vancouver to prohibit the use of its harbour for milling purposes, it is believed good policy to do so. The complaint most often encountered was that directed toward the interference of log rafts with vessels especially when both are entering the channel.

DEADMAN'S ISLAND

This bit of land in the fore bay of Coal Harbour does not appear to fit into any utilitarian schemes for harbour development. It is therefore suggested that it be dedicated to park purposes for which it appears to have exceptional possibilities. It is prominent in location and visible from many points. With proper treatment something of unique distinction may be made of it.

APPENDIX

COMPARISON OF VARIOUS HARBOURS

	<u>Width of Channel</u>	<u>Depth at low Water</u>	<u>Ocean Vessels Entering 1926</u>
VANCOUVER	1200'	36'	1029
SAN FRANCISCO	1800'	42'	6836
WELLINGTON	1000'	42'	442
NEW YORK	1000' 950' 1600'	30'	4639
BOSTON	1000' 1200' 1500'	35'	1390
COPENHAGEN	308'	33'	
AMSTERDAM	164'	32'	3199
AUCKLAND		34'	
SEATTLE		150'	2128

NEW PIER B-C
CANADIAN PACIFIC RAILWAY

The Canadian Pacific Railway has just completed a modern pier located between Burrard Street and Granville Street. The approximate cost of this Pier is Five Million Dollars. The Pier was built to meet the rapid increase in this Railway's Pacific trade, particularly with Japan, China, Australia and New Zealand. As the cargo is very mixed and of general character, the Pier must necessarily be complete in every detail for handling such cargo.

In addition to its own boats, the largest of which is 640 feet long and of 22,000 tons gross register, the new Pier is intended to accommodate the Canadian Australasia Royal Mail Line, the Royal Mail Steam Packet Company, boats of the Isthmian M. Y. K. and O. S. K. Lines as well as other vessels. It is also intended to take care of much of the local coastwise service at this Pier.

The Pier will provide berthing accommodation for at least five large vessels simultaneously.

The structure, which is located practically midway between the existing Piers "A" and "D" is 1100 feet long and 331 feet wide. It is evidence of the faith in the future of the Port of Vancouver. It is the first construction of a permanent nature which the Canadian Pacific Railway has undertaken in the Port of Vancouver, the other piers of this Railway being of temporary construction. With this new Pier in service, the way is open for gradually replacing the older timber piers with the latest type of construction.

No small portion of the cost of the Pier is due to the elaborate method of approaching it, from the streets. In order to avoid grade

crossings with the railroad tracks, a steel viaduct with a re-enforced concrete roadway, approximately 1200 feet long and of sufficient width to accommodate four lines of traffic and connecting both Granville Street and Burrard Street with the upper deck of the Head House, has been constructed. Dropping from this elevated structure there are two ramps one from the Granville and one from the Burrard Street approach, each of which are on a grade of six per cent.

The deck sheds are 109 feet wide and are separated by a depressed track area containing four tracks. They are also two tracks on the aprons or docking edges.

The total freight storage space is 2200 square feet and there is sufficient trackage to provide a capacity for 200 freight cars. An elevator system is a part of the equipment, one of which having 20 ton capacity is designed to raise and lower teams and trucks on the upper floor to the lower floor. Ample arrangements for supplying fuel oil to the steamers while at dock is a feature of special importance.

APPENDIX B

GROWTH OF QUAY AND SHED PROVISION

<u>PIERS AND QUAYS</u>	<u>QUAYS</u>	<u>INITIAL CONSTRUCTION</u>		<u>ENLARGEMENT</u>		<u>REPAIRS</u>		<u>NET CONDITION</u>		
		<u>DATE</u>	<u>QUAYS</u> <u>LINE FT.</u>	<u>SHEDS</u> <u>LINE FT.</u>	<u>DATE</u>	<u>QUAYS</u> <u>LINE FT.</u>	<u>SHEDS</u> <u>LINE FT.</u>	<u>DATE</u>	<u>QUAYS</u> <u>LINE FT.</u>	<u>SHEDS</u> <u>LINE FT.</u>
<u>PIER A</u>	C.P.R.	1908	1,250	56,000	1912	1,250	67,000	1908	1,250	56,000
		1912	1,250	67,000	1915	1,400	81,000	1912	1,250	67,000
		1915	1,400	81,000				1915	1,400	81,000
<u>SHED No 1</u>	C.P.R.	1887	600	30,400	1910	600	35,720	1887	600	30,400
		1910	600	35,720	1917	760	39,900	1910	600	35,720
		1917	760	39,900				1917	760	39,900
<u>PIER "B-C"</u>	C.P.R.	1927	2,570	200,000				1927	2,570	200,000
<u>SHED No 2</u>	C.P.R.	1887	560	17,900				1887	560	17,900
<u>PIER "D"</u>	C.P.R.	1914	500	70,000	1917	970	36,500	1914	500	70,000
		1917	970	36,500				1917	970	36,500

PIERS AND QUAYS	OWNER	INITIAL CONSTRUCTION			ENLARGEMENT			REMOVAL			NET CONDITION		
		Date	QUAYS Lin. Ft.	SHEEDS Sq. Ft.	Date	QUAYS Lin. Ft.	SHEEDS Sq. Ft.	Date	QUAYS Lin. Ft.	SHEEDS Sq. Ft.	Date	QUAYS Lin. Ft.	SHEEDS Sq. Ft.
<u>SHEED NO 3</u>	C.P.R.	1898	380	26,448				1914	80 <i>For Pier Derrick</i>	5,168 <i>For Derrick</i>	1898	380	26,448
<u>SHEED NO 4</u>	C.P.R.	1900	380	28,000				1916		13,040 <i>For Derrick</i>	1900	380	28,000
<u>SHEEDS NOS 5 & 6</u>	C.P.R.	1902	400	32,376				1909		960 <i>For Boring Siding Plant</i>	1902	400	32,376
<u>SHEED NO 7</u>	C.P.R.	1913	500	27,816							1913	500	27,816
<u>UNION COY</u>	U.S.S. COY.	1896	150	2,000	1907	250	6,500	1907	150	2,000	1896	150	2,000
					1910	260	8,125				1910	510	14,625
					1915	240	8,125				1915	750	22,750
					1920	260	8,450				1920	1,010	31,200
					1924	340	4,875				1924	1,350	36,075
<u>PIER H</u>	C.P.R.	1908	1,350	46,550							1908	1,350	46,550

<u>PIERS AND QUAYS</u>	<u>OWNERS</u>	<u>INITIAL CONSTRUCTION</u>		<u>ENLARGEMENT</u>			<u>REMOVAL</u>			<u>NET CONDITION</u>			
		<u>Date</u>	<u>QUAYS Lin. Ft.</u>	<u>SHEEDS Sq. Ft.</u>	<u>Date</u>	<u>QUAYS Lin. Ft.</u>	<u>SHEEDS Sq. Ft.</u>	<u>Date</u>	<u>QUAYS Lin. Ft.</u>	<u>SHEEDS Sq. Ft.</u>	<u>Date</u>	<u>QUAYS Lin. Ft.</u>	<u>SHEEDS Sq. Ft.</u>
<u>EVANS COLEMAN</u>	E.C.C. E.	1892	150	10,500	1898	650	21,200	1892	150	10,500	1892	150	10,500
					1904	1,000	51,800	1898	800	31,700	1898	800	31,700
					1912	300	—	1904	1,800	83,500	1912	2,100	83,500
		1913	460	10,200	1913	460	10,200	1913	2,560	93,700	1913	2,560	93,700
<u>CANADIAN NATIONAL</u>	C.N.R.	1912	1,100	35,000				1912	1,100	35,000	1912	1,100	35,000
<u>BALLANTYNE</u>	V.H.C.	1923	2,870	400,000				1923	2,870	400,000	1923	2,870	400,000
<u>GREAT NORTHERN</u>	G.N.R.	1913	1,260										
					1913	40,500							
<u>G.N.R. SHED</u>		1913		61,000				1913	1,260	101,500	1913	1,260	101,500
<u>BALFOUR-GUTHRIE</u>		1913											
<u>LAPOINTE</u>	V.H.C.	1915	2,150	138,400				1915	2,150	138,400	1915	2,150	138,400
		1925	200	—				1925	2,350	138,400	1925	2,350	138,400
<u>TERMINAL DOCK AND WAREHOUSE COY</u>	T.D. & W. COY.	1925	900	30,000				1925	900	30,000	1925	900	30,000

