

APR 8 1968

REPORT ON
PROPOSED RAPID TRANSIT SYSTEM
for
THE CITY OF SEATTLE.

By A. H. DIMOCK,
City Engineer,
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Engineering Dept.

Seattle
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COPY.

THE CITY OF SEATTLE
Office of City Engineer.

December 16, 1920.

Honorable Mayor & City Council,
Seattle, Washington.

Gentlemen:

Sometime ago there was referred to the City Engineer by the City Council a plan submitted by Mr. A. L. Hawley for the construction of a rapid transit loop in the downtown district of Seattle. At the time the consideration of the construction of a rapid transit system in the near future seemed preposterous, especially in view of the fact that other cities have not considered such enlargement of their traffic system until they began to reach a population of nearly one million. Serious study, nevertheless, has been given to the underlying principles upon which an efficient rapid transit system must be based. As a result of such studies a definite plan or system has been outlined and detailed estimates prepared of the cost of operating such a system as compared with the cost of operating the present surface system. The outcome of these studies has been, indeed, surprising. They show that the following results may be obtained by the construction of a rapid transit system suited to present needs, but planned for future enlargement:

1. Saving in cost of operation of \$1,200,000. per year on basis of present traffic.
2. Reduced time of transit from residence districts to the city.
3. Removal of surface street-car tracks on certain downtown streets.

4. Abolition or reduction of congestion of traffic, contingent upon removal of surface tracks;
5. Increased facilities for motor traffic;
6. Elimination, or at least a very large reduction, of noise in downtown streets where tracks have been removed.

The remarkable saving of \$1,200,000. per year is made up as follows:

Saving in operation	\$890,000.
Saving in maintenance of cars and tracks	260,000.
Saving in accidents	<u>50,000.</u>
T o t a l	\$1,200,000.

The saving in operation is obtained by substituting for the present slow moving surface cars rapid transit trains running on underground, overhead, or special surface tracks and making comparatively few stops. The speed of streetcars is very largely a function of the number of stops. If the number of stops between any two given points can be largely reduced, it necessarily follows that the average speed of the car is greatly increased. If in addition the tracks are placed underground or overhead the slowing up caused by interference from vehicular travel will be eliminated and the speed still further increased. With greater average speed of trains fewer cars and fewer men will be required. Furthermore, the elimination of surface tracks with their expensive crossings and pavements will reduce maintenance charges, both of cars and tracks. In addition to these two items there will be a large saving in the number of accidents, which experience shows occur largely in the crowded downtown district.

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It is intended, as an essential part of this plan, to remove the surface tracks from certain downtown streets. An enormous benefit will accrue from this removal through the relief of congestion and the speeding up of vehicular traffic afforded thereby. This benefit it is impossible to estimate in dollars, but the saving in time for trucks, delivery wagons and automobiles has nevertheless a very real cash value. So great has been the estimated value of this relief in other cities that it has been thought worth while to consider the separation of streetcar traffic from vehicular traffic for this benefit alone.

It has been demonstrated by the experience of other cities that the construction of subways must be accompanied by the operation of rapid transit trains if the total cost of operation, including interest and depreciation, is to be kept within reasonable limits. The experiment has been tried of operating ordinary streetcars through such subways. The increased amount of traffic carried in this way, however, is but slight and the result has been that practically the entire interest charge on the investment for subways has been added to the ordinary cost of operation with but little offset in the way of increased revenue. The only possible way to make the heavy investment required for subways financially possible is to concentrate the traffic from several surface routes in each subway and to abandon surface operation on such routes. This concentration of traffic can only be handled by the operation of trains of from three to ten cars each.

Based on the above principles, the plan which has been worked out for the development of our present streetcar system is as follows:

At suitable points stations will be constructed in which passengers may be transferred from the streetcars operating in the residence districts to rapid transit trains. This transfer will be effected without the use of transfers/ tickets as it will take place under cover, the passengers simply walking across an enclosed platform from car to train. It is suggested that such stations be situated approximately as follows:

1. At Fremont.
2. Near the University.
3. At 15th Avenue North and East Pine Street.
4. At Pigeon Point.
5. At the foot of Queen Anne Hill near Third Avenue and Denny Way.
6. If the Rainier Valley lines should be acquired by the City, a station could be built at some suitable point.

From these stations rapid transit trains will run, for the present, on surface routes set apart for their special use. For instance, the trains from the Fremont Station may run on the surface along Dexter Avenue, Broad Street, and Third Avenue to Lenora Street. At this point the surface tracks will begin to descend so that at Virginia Street and Third Avenue they will be entirely underground and will so continue on Third Avenue to Yesler Way, where they will emerge on an elevated line connecting with the railway

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stations and with the present elevated line on Railroad Ave. South. At Olive Street and Third Avenue traffic destined for the Broadway, Caoitol Hill and other eastern districts will turn to the east, passing under 4th Avenue and thence over Westlake Avenue on an elevated line. This elevated line will continue approximately to the intersection of Olive Street with East Pine Street produced. The tracks will then go under East Pine Street to the easterly side of Broadway, then again on an elevated line to the vicinity of 15th Ave. It is proposed to remove surface tracks on Pine and Union Streets, and on Second Ave. and Third Ave., thus concentrating all of the streetcar travel now taken care of by these streets into the subway. Inasmuch, however, as the subway will have stations distributed along its length, the congestion of a large number of people at any one central point is avoided. In order to handle this traffic and properly to provide for future growth, the subway on Third Avenue should consist of four tracks. In all other cases two tracks will be sufficient. A map showing the general features of the plan, together with a few general plans which will illustrate it more fully, is submitted herewith.

In carrying out the plans for the proposed system, it may be necessary in certain places to construct a small mileage of new streetcar tracks. If, for instance, the rapid transit line occupies the present route of the Eastlake car line, local traffic will require an additional line to be built on Fairview Avenue. Or it may be found better to reverse this plan and construct a rapid transit

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line on Fairview. Before constructing such lines, however, the handling of such local traffic by motor busses which will deliver their passengers to the nearest rapid transit station should be carefully considered. The motor bus may also be used to handle local traffic in the downtown district. Such auxiliary use of the motor bus as a part of the general problem of handling light passenger traffic may work out to the best advantage. This seems to be the opinion to which traffic experts are now tending.

As another auxiliary to the proposed system, escalators should be constructed on certain selected streets extending from First Ave. to Fourth Ave. Escalators would afford a ready means of gathering up the traffic on the lower streets and carrying it to the rapid transit stations on Third Ave. Second Avenue, however, may be reached by the construction of approaches leading directly to the subway on easy grades. Such use of escalators in connection with a streetcar system will be somewhat unique. Nevertheless they are in use in other cities in transferring people from the lower to the upper levels of certain stations. The construction of such escalators in the business district of Seattle will tend very greatly to develop this district and to do away with the present handicap occasioned by the steep grades between our main north and south streets. We have no doubt that once in use they will find themselves immediately in favor.

The construction of a system such as has been outlined will serve to direct and stimulate the growth of the city. Business will naturally follow the course of the rapid transit system. The

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object of an efficient streetcar system should be to gather up and to distribute traffic in such a manner as best to serve the needs of the people. Mr. Edward Dana, General Manager for the Boston Elevated Railway, has stated in a recent article that the primary purpose of a street railway system is to develop community growth and intercourse for the greatest number of inhabitants. The modern city under traffic conditions as they have developed in the last ten years, must seek to avoid an undue centralization by a proper and suitable distribution of the various classes of business. This distribution can be assisted by the operation of trains along properly selected rapid transit routes. The rapid transit system or route is the link which supplies rapid intercommunication between the different sections of the business district and so permits the spreading out of the district and the avoidance of congestion. The construction of a terminal to which all trains run is directly opposed to all sound principles of transportation, for the reason that it increases congestion in a limited area, with a consequent enormous enhancement in value of a very limited amount of property, the construction of high buildings, the overloading of the streets with traffic and all of the various evils which accompany such a condition. The value of a real rapid transit system in properly distributing business and directing the growth of the city is an element of great importance to Seattle at the present time.

The cost of construction of the system which we have outlined has not been estimated in detail. Rough approximations, however,

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based on similar construction in other cities, modified and adapted to the present unit costs of labor and material, indicate that the interest and depreciation charge on such cost will probably not exceed one-half of the total saving in the cost of maintenance and operation. A very considerable balance will thus be left in favor of the new system and to meet contingencies. Inasmuch as the saving in operation is figured on present traffic and the adoption and construction of the proposed plan will necessarily require several years time, the actual saving by the time the system can be placed in operation will be considerably increased.

In these days when the wages necessarily and justly paid for the operation of the system have increased so greatly, it is all the more necessary to substitute for human labor mechanical equipment wherever possible, and the greater wages paid the greater will be the amount of money which can be invested in such equipment. The increase in wages is, therefore, another argument for immediate consideration of the adoption of a plan for a suitable rapid transit system.

The plan which we have outlined is so extraordinary in the showing made -- and this showing has not been obtained by exaggeration but rather by very conservative estimates -- that it warrants a very careful and serious consideration by your honorable body and by our citizens generally. We do not urge that the exact plan as herein sketched be now adopted, but that provision be made for further studies, for the completion of general plans and for detailed estimates of cost. It goes without saying, of course, that there should be ad-

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equate and thorough publicity and discussions before the adoption of a plan of such far reaching influence. The adoption of the system, however, will in our judgment provide for the City of Seattle a transit system unequalled in America, and one the benefits of which will be more and more marked as the city grows.

Very respectfully,

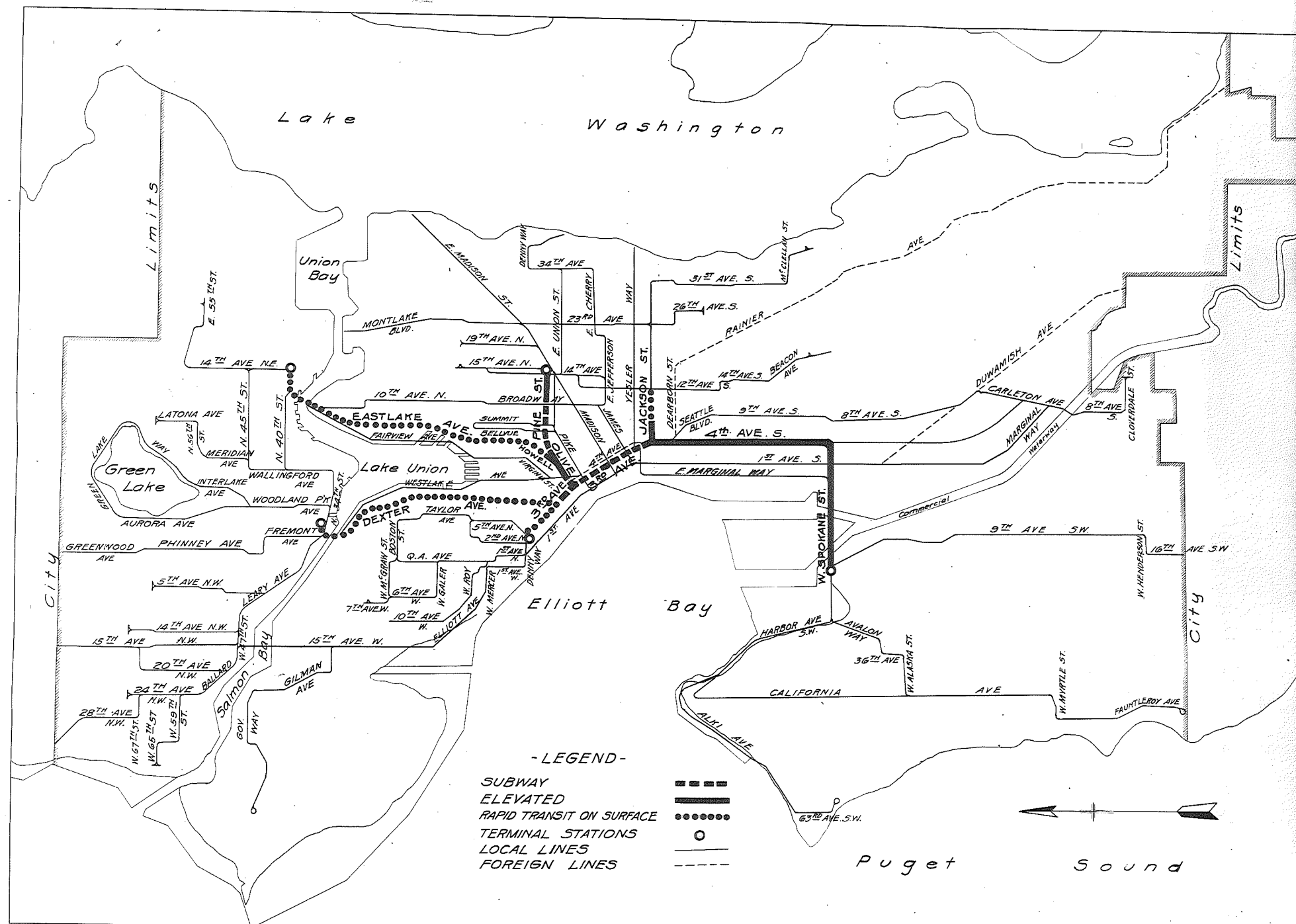
(Signed) A. H. DIMOCK,
City Engineer,

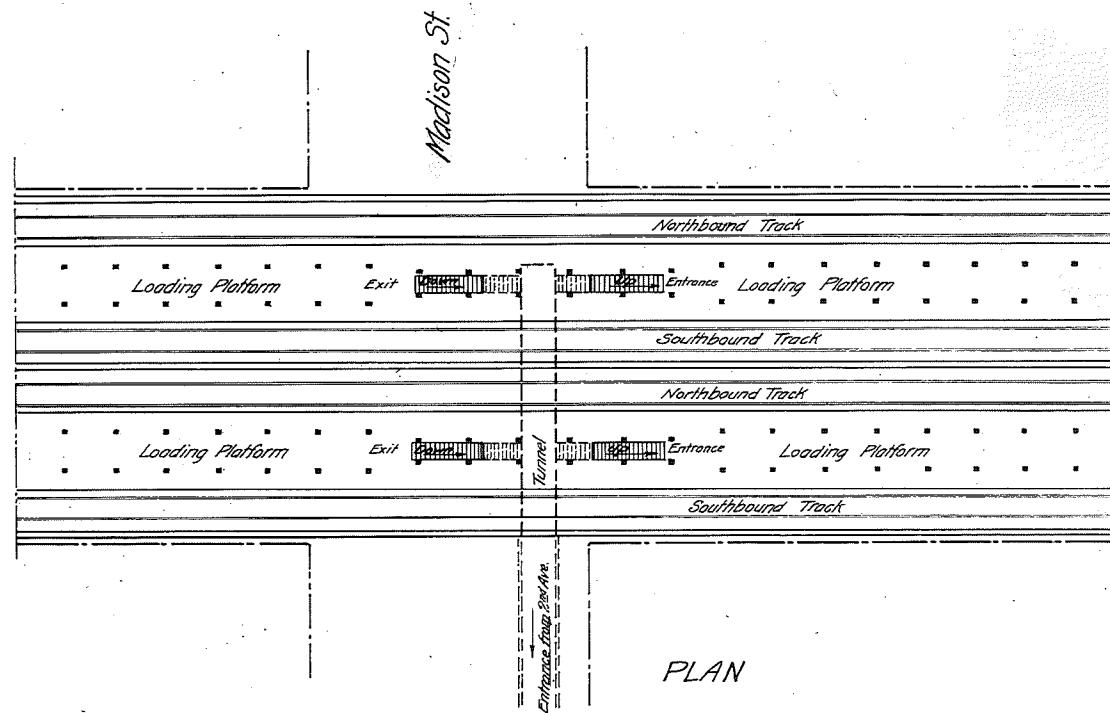
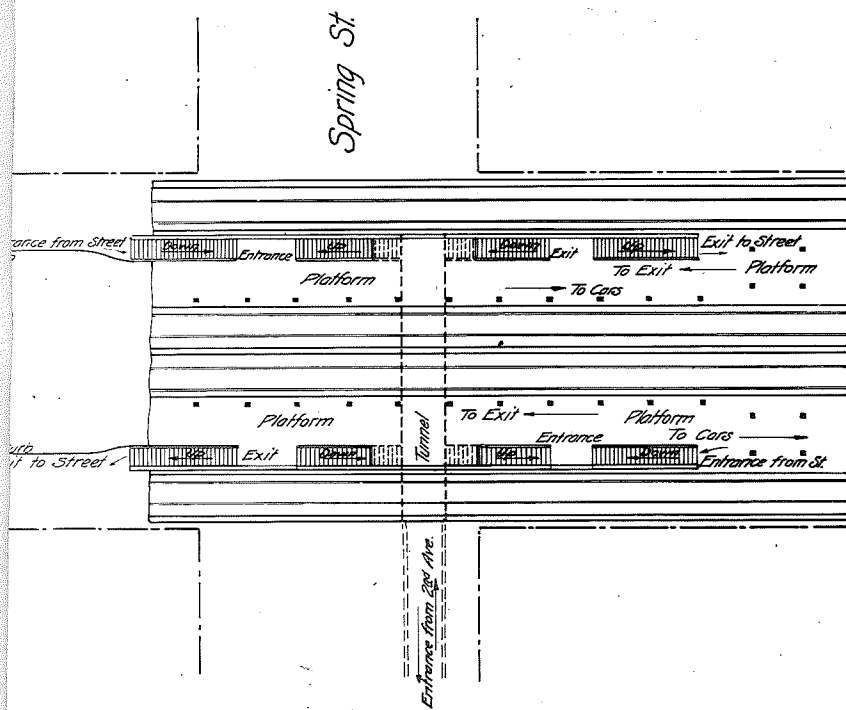
CARL H. REEVES,
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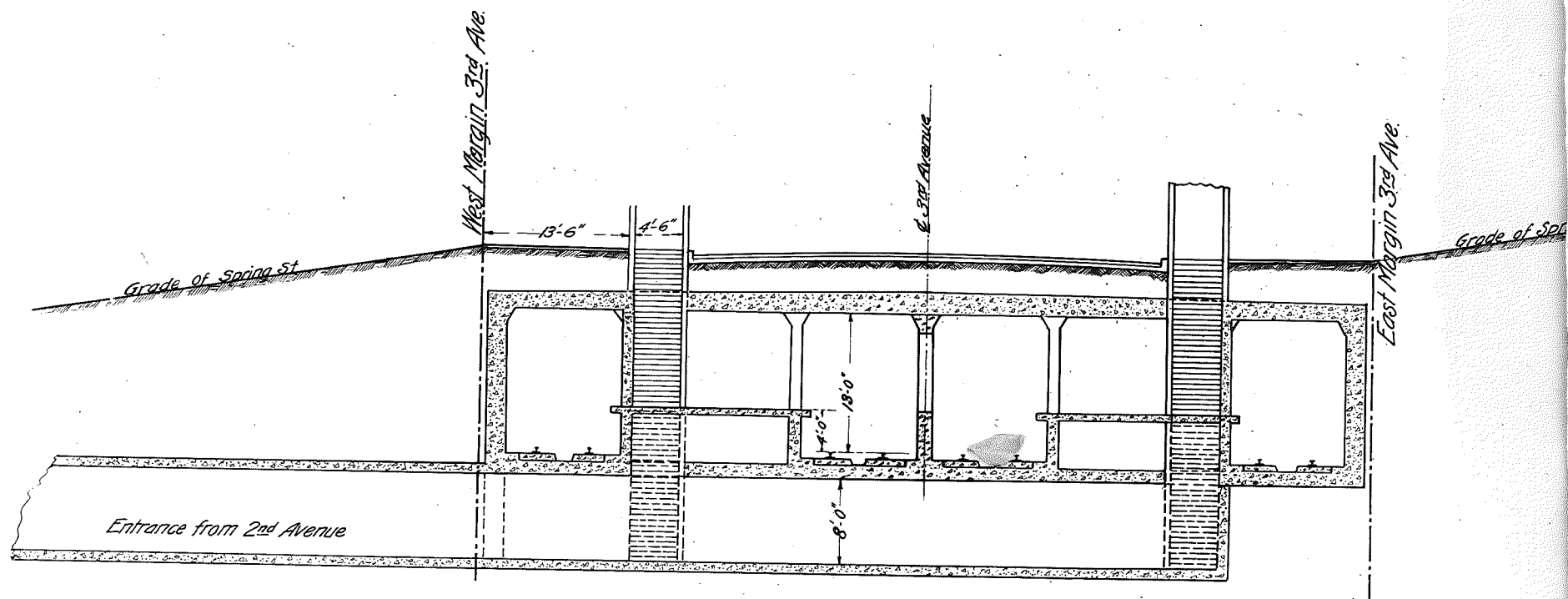




PLAN

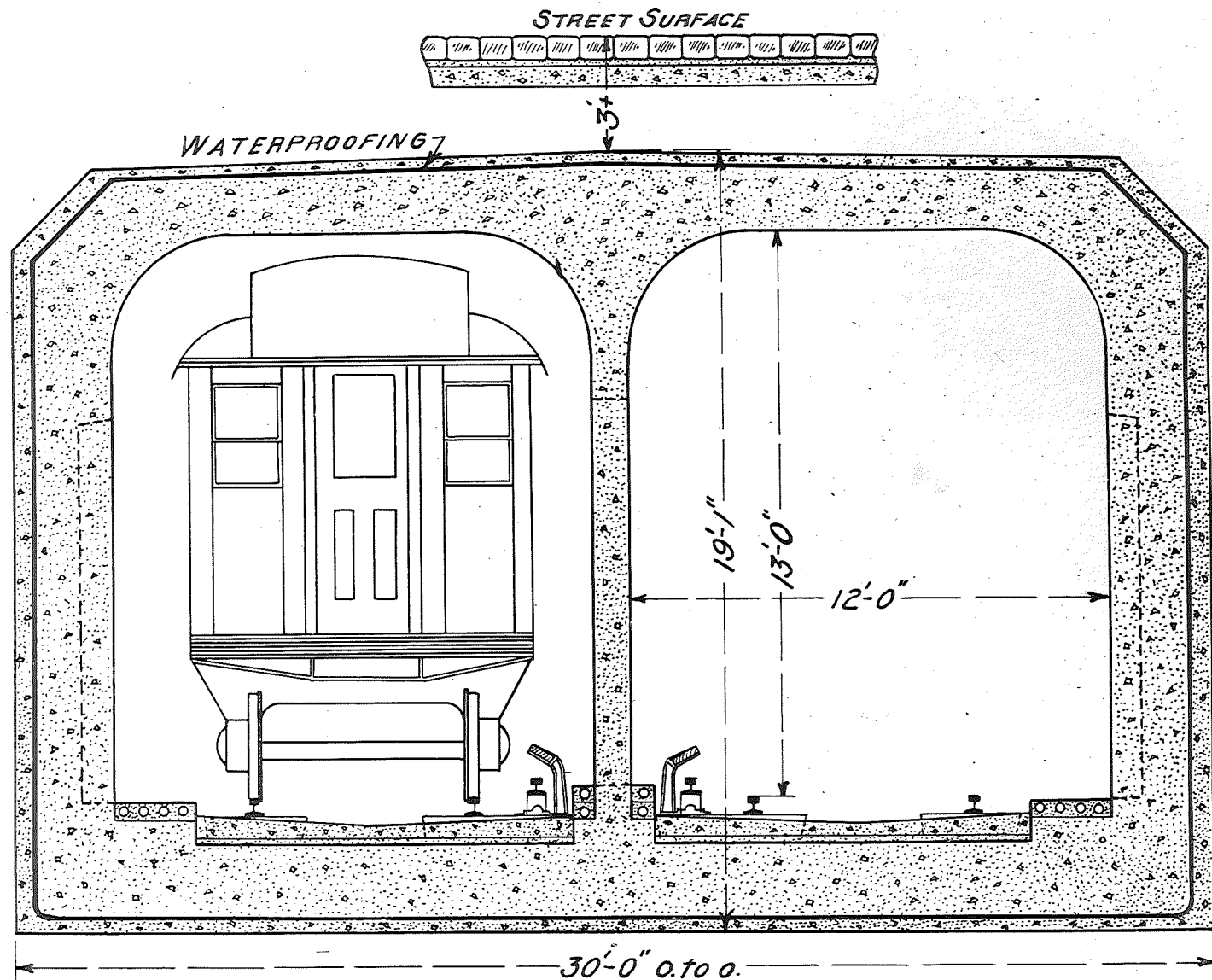
TYPICAL THIRD AVENUE SUBWAY STATION

Scale 1 Inch = 20 ft.

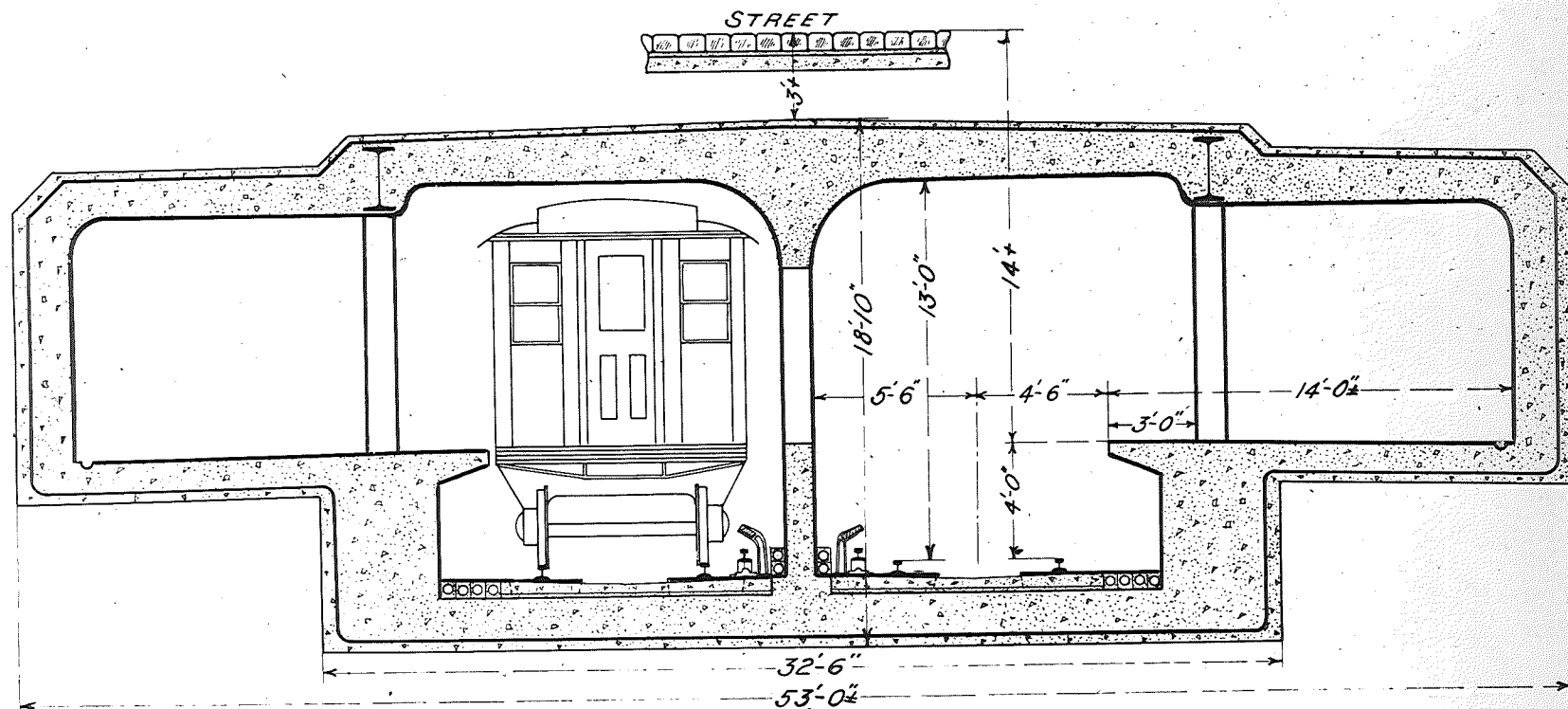


CROSS SECTION OF STATION AT SPRING STREET

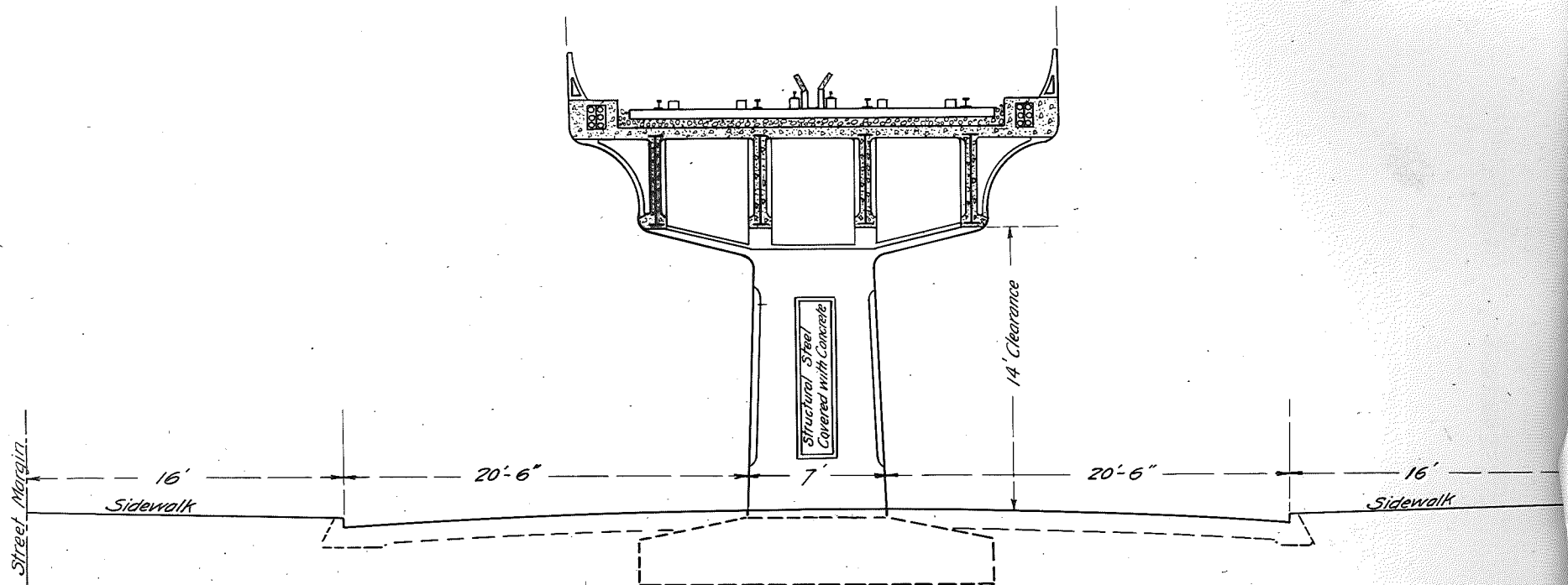
Scale 1 inch = 8 ft.



DOUBLE TRACK SUBWAY
PROPOSED FOR EAST PINE STREET



SUBWAY STATION
PROPOSED FOR EAST PINE STREET



ELEVATED RAILWAY
SINGLE POST BENT