

The Commonwealth of Massachusetts.

BOSTON TRANSIT COMMISSION, 15 BEACON STREET,
BOSTON, Jan. 9, 1914.

To the Senate and House of Representatives.

Chapter 69, Resolves of 1913, reads as follows:—

RESOLVE TO PROVIDE FOR INVESTIGATING THE ADVISABILITY OF CONSTRUCTING A STATION FOR THE WASHINGTON STREET TUNNEL AT OR NEAR BENNET STREET IN THE CITY OF BOSTON.

Resolved, That the Boston transit commission shall investigate the desirability and practicability, and estimate the cost, of constructing a station for the Washington street tunnel in the city of Boston at or near Bennet street. The commission may give public hearings, if it deems them necessary, and shall report to the next general court on or before the tenth day of January.

In compliance with this resolve the Boston Transit Commission begs leave to report to the General Court of 1914 as follows:—

The commission has, in compliance with the resolve, investigated the desirability and practicability and estimated the cost of constructing a station for the Washington Street tunnel at or near Bennet Street. It has given one public hearing and another hearing upon request of interested parties.

The distance between Boylston Street station, the most southerly station in the Washington Street tunnel, and Dover Street station, the next station on the line to the south, is about 3,200 feet. Bennet Street is located between these two stations and is about 770 feet from Boylston Street and about 2,430 feet from Dover Street.

Proceeding southward from Boylston Street, the tracks in

the tunnel, after passing under Eliot Street, begin to rise, so that at Bennet Street it was necessary in constructing the tunnel to raise the grade of the street. The grade of the tracks at Bennet Street is 5 per cent. This grade continues to the south, the tracks emerging entirely from the tunnel a short distance north of Oak Street, and from this point south, being carried on the elevated structure and passing over Oak and Pine Streets, Broadway and Noanet Street, and the tracks of the Boston & Albany Railroad Company and the New York, New Haven & Hartford Railroad Company. The grade becomes level a short distance south of Noanet Street and remains level across the railroad tracks and southerly along Washington Street toward Dover Street.

The consideration of the desirability and practicability of constructing a station at or near Bennet Street involves the following elements:—1, physical practicability and safety of operation; 2, cost; 3, economic desirability from the traffic standpoint.

1. *Physical Practicability and Safety of Operation.*—As above explained, tracks in the subway at Bennet Street are on a 5 per cent. grade which continues for some distance to the south, but which gradually flattens toward the north. This is the steepest grade allowed on the Washington Street line. There are serious objections to placing a subway station on such a grade. All trains would stop at this station, and northbound trains so stopping would be in danger of collision with trains coming from the south down the grade. In case a station were located at or near Bennet Street the Commission believes that it would be necessary to flatten the grade at this point, or else to locate the platforms of the station entirely to the north of Bennet Street, where the grade is not so steep.

If the station platforms were located entirely to the north of Bennet Street with entrances from said street, the southerly end of the platforms would be on a 5 per cent. grade and the northerly ends would be on a grade of slightly more than 2 per cent. From the operating point of view such a location would be much safer than any other which is practicable. If the station were so located, however, its northerly

end would be only 264 feet distant from the southerly end of the Boylston Street station and about 600 feet from the southerly end of the Essex Street station platforms, so that trains going in either direction would hardly get under way before they would have to slow down for the next stop. It is estimated that to construct a station in this location would involve a total cost of about \$340,000, including land damages.

If the station platforms were placed with Bennet Street near the center, it would be necessary, as above explained, to flatten the grade. If the grade were reduced even to 4 per cent. the point where the tracks would reach the full height of the elevated structure would be moved to the south, Oak Street would be closed to traffic on account of the lowering of the structure where it crosses that street, and the head room over Pine Street and over Broadway would probably have to be reduced. Furthermore, the level portion of the track extending from the junction with the Atlantic Avenue loop line south of the railroad tracks northerly would be reduced in length. If the grade at the station were made less than 4 per cent. the head room over the various streets to the south would be still more reduced. It is estimated that the cost of constructing a station having the center of the platforms at Bennet Street and with the grade reduced to 4 per cent. would be some \$480,000, or considerably more than the estimated cost if the platforms should be entirely north of Bennet Street.

It would be a questionable policy from the point of view of safety of operation to recommend the placing of a station even on a 4 per cent. grade. While such a station might be operated for a long time without accident under proper rules and with proper signals, nevertheless, the commission does not consider it wise to place a station on such a grade if it can be reasonably avoided. This also is the view of the officials of the Boston Elevated Railway Company, whose experience in operation gives their opinion great weight. Furthermore, the commission believes it desirable to preserve the present length of level track on the elevated structure between the Castle Street junction and the incline.

2. *Cost.*—The expense of a station at Bennet Street would, as above stated, be from \$350,000 to nearly \$500,000 for construction and land damages. But in addition to this expense a station involves other elements of cost which should be considered, such as station operation, train wages, wear and tear, motive power and additional equipment.

The expense of operating the station is estimated by the Boston Elevated Railway Company at about \$6,000 per annum. The cost of train wages is increased, because the introduction of a station involves a short delay, which in the aggregate amounts to a considerable loss of time. This is estimated by the Boston Elevated Railway Company at about \$7,000 per annum. Wear and tear on rolling stock is increased because the introduction of a station means more stops and more wear of wheels, rails and brake shoes. This is estimated by the Boston Elevated Railway Company at about \$2,200 per annum. Expense of motive power is increased because to stop and start a train requires more power than to keep it moving continuously. This element is estimated by the Boston Elevated Railway Company at about \$5,200 per annum. Additional equipment may be fairly said to be called for if a station is introduced, on account of the considerable aggregate loss of time. This is estimated by the Boston Elevated Railway Company at about five cars, the interest, taxes and depreciation upon which would involve an annual charge of about \$6,000.

It is not necessary to assume the entire correctness of the above estimates. That for station operation is probably close. Regarding the others there may be some differences of opinion. It is evident, however, that in addition to the actual cost of the station there would be an additional expense, which capitalized might easily amount to from \$250,000 to \$500,000, making the total cost of the station from \$600,000 to perhaps \$1,000,000. It is a serious question whether the conditions warrant the expenditure of such a sum.

3. *Economic Desirability from the Traffic Standpoint.*—As already stated, the station having platforms entirely to the north of Bennet Street would have its northerly end only 264 feet from the southerly end of the Boylston Street

station. The distance from Bennet Street itself to the nearest entrance (on Lagrange Street) of the Boylston Street station is only about 780 feet for southbound trains and less than 1000 feet for northbound trains to the nearest entrance (on Washington Street) of the Essex Street station. If a station were located at Bennet Street the distance between the Bennet Street and Boylston Street stations would be smaller than between any other two stations on the line, even in the most congested parts of the city.

It is undoubtedly true that property owners in the neighborhood of Bennet Street would be benefited if a station were constructed at that point. The interests of the traveling public as a whole, however, must not be lost sight of and it must be remembered that on a rapid transit line the introduction of frequent stations involves a delay to thousands of through passengers. The Washington Street tunnel line was constructed to facilitate rapid transit to Dudley Street and Sullivan Square and the suburbs of the city beyond these points. Any question as to the introduction of a new station involves a balance of arguments bearing upon the interests of local property owners on the one hand, of through passengers on the other hand, and also a careful consideration of the question as to whether the cost is justified by the exigencies of the case or whether the money could be expended elsewhere to the better advantage of the traffic as a whole. If the elevated trains were the only means of reaching Bennet Street and adjoining portions of Washington Street the argument in favor of constructing a station at this point would be stronger. It must be remembered, however, that there are two tracks for surface cars throughout this portion of Washington Street, on which service is maintained.

Conclusions. — As a result of its study of this question the commission has arrived at the opinion that it is physically practicable to construct a station at or near Bennet Street, but that such construction is not desirable, and the commission does not recommend it.

In the first place, the commission does not believe that a subway station on a 4 per cent. grade is desirable, if it can be avoided, from the point of view of safety of operation,

and it does not consider that any flattening of the grade at Bennet Street is desirable, because it would result in closing Oak Street to traffic and would diminish the length of level track just north of the signals at Castle Street junction.

In the second place, the cost of such a station, which (as above explained) would be from \$350,000 to nearly \$500,000 for construction and land damages, and probably from three-quarters of a million to a million dollars if the capitalized operating expenses are included, is not justified.

In the third place, a station at Bennet Street would be a very short distance from the existing station at Boylston Street, and the district in the neighborhood is already served by surface car lines in Washington Street. The distance of more than 3,000 feet between the Boylston Street station and the Dover Street station is greater than the distance between stations in Washington Street to the north, but on the other hand it is less than the distance between the stations at Dover Street and at Northampton Street. It must be borne in mind that the object of the Washington Street tunnel is primarily to promote rapid transit between the suburbs and the congested center of the city. A station at Bennet Street would delay this traffic.

Appended to this report is the report of the chief engineer of this commission.

Respectfully submitted,

GEORGE F. SWAIN,
HORACE G. ALLEN,
JOSIAH QUINCY,
JAMES B. NOYES,
DAVID A. ELLIS,

Boston Transit Commission.

CHIEF ENGINEER'S REPORT.

BOSTON TRANSIT COMMISSION, 15 BEACON STREET,
BOSTON, Oct. 9, 1913.

Boston Transit Commission Office.

GENTLEMEN:— Referring to your instructions in regard to investigation as required by chapter 69 of the Resolves of 1913, "Resolve to provide for investigating the advisability of constructing a station for the Washington Street tunnel at or near Bennet Street in the city of Boston," I beg leave to submit some sketches made on blueprints of our record plans, showing a station having grades varying from 2.12 per cent. to 5 per cent. with its southerly end under Bennet Street, entrances to the station from Bennet Street, and platforms 350 feet in length:—

Estimated cost of construction,	\$180,000
Land damages,	160,000

Total,	\$340,000

The distance between the northerly end of this platform and the southerly end of the Boylston Street platform is about 264 feet.

This plan does not contemplate the change of grade of the tracks. I understand that the Boston Elevated Railway Company has made an estimate changing the grade to 4 per cent.

It is assumed that the provisions of this bill contemplated that the entrance to the station should be at Bennet Street. If the station were located so that one-half would be north of Bennet Street and the other half south of Bennet Street, the grades of the portion of the track where the cars would stop would vary from 4 per cent. to 5 per cent., and the dif-

ference in distance by the two schemes between what the public would have to go to reach their cars is very little. If the station were located with Bennet Street at its center and the track lowered to 4 per cent. grade, it would be necessary to lower the grade of Oak Street and of the elevated structure to a point south of Broadway, as indicated on the "Copy of sketch accompanying letter from C. S. Sergeant, vice-president, to F. E. Snow, Esq., and others, dated March 13, 1913." The estimate of cost of such a station as prepared by Mr. Fernald, first assistant engineer of the Boston Elevated Railway Company, is \$480,000 (which seems to be reasonable), or \$140,000 more than the estimated cost of the station as located with its southerly end in Bennet Street.

Yours respectfully,

EDMUND S. DAVIS,

Chief Engineer.