The street railway business requires larger amounts of capital than it is possible to supply from its earnings, and we must turn to the investing public to secure the funds necessary; and there is nothing which attracts the public to an investment in street railway enterprises in preference to other lines of business. If the profits of the business are decreasing beyond that point, what is to be done about it?

Economies in Operation.—It is evident that the returns will be increased if we can reduce the expenses without changing the earnings or the investments, so during the last decade the efforts of every street railway manager have been directed toward securing economies in his operation. Power stations, transmission lines, car equipment, carhouses —every part of the system has been considered with a view to reducing the cost of operation and of maintenance, and the savings effected in these directions have been very satisfactory; but, as I have pointed out before, the average length of haul at the same time has been increasing steadily with a consequent increase in the cost of operation. Further than this, the cost of living has been increasing, so the final result has been that the gain by economy has been practically offset by the increase in the expenses which were beyond the control of the management. The forty-third annual report just issued by the Board of Railroad Commissioners of Massachusetts shows an average percentage of expenses to earnings in 1902 of 67.75 per cent., while that of 1911 was 65.35 per cent. I think you will agree with me that an improvement of a little les than 2½ per cent. in nine years is not, by itself, of great economic significance.

It is evident, too, that the return on the investment will be increased whenever we increase the earnings of the property without a corresponding increase in the expenses and investment. This, however, would have to come from an increase in the rate of fare, or by reducing the amount of transportation which is given for a single fare; that is, we might adopt some form of zone system or we might charge a passenger for a transfer. These sources of relief have been tried to only a very limited extent in this country.

The third factor entering into the return on the investment, and one which is not generally understood, is the ratio which the investment bears to the gross earnings of the business. Many know, in a general way, that in a street railway the investment may profitably be four or five times the gross earnings, but it appears not to be so generally understood that this ratio varies with the operating ratio of the business, and will increase or decrease as the operating ratio goes up or down, moving always in the opposite direction.

I believe there has been a decided increase in the ratio of investment to gross earnings (and please note that I say investment and not par value of capitalization) in our street railway enterprises. I base this idea largely upon the returns which are made to the Massachusetts Railroad commissioners, for these returns are unusually complete; they cover companies doing a railway business only and the capitalization is carefully supervised by the Railroal Commissioners and is based on the investment in the property.

Ratio of Investment and Earnings in Massachusetts.—I find that in 1891 the net investment in the traction system of the State was approximately $27,500,000, while the gross earnings for that year were $8,900,000, so that the investment was 3.1 times the annual gross earnings. Ten years later, in 1901, the investment was approximately $99,500,000 and the earnings $23,000,000, so the investment was 4.3 times the gross. In 1911 the investment was $172,100,000, and the gross earnings approximately $37,000,000, a ratio of 4.65 to 1. This increase in the investment ratio without a marked reduction in the ratio of operating expenses has, of course, produced a reduction in the amount available for interest, depreciation and similar charges and, since the property must be maintained, it must mean that the return on the investment has been reduced.

For example, a company earning $100,000 in 1891 represented an investment of 3.1 times the gross, or $310,000. If we assume the operating expenses at that time were 70 per cent., $30,000 was left to take care of taxes, interest, depreciation, etc., this being 9.65 per cent. on the investment. In 1911, however, a company earning $100,000 gross would have an investment of $465,000 and, if operated for 65 per cent., there would be $35,000 to apply against the above charges, which is at the rate of 7.55 per cent. of the investment.

The profit may be improved by proceeding along one or all of three general lines. We may reduce the ratio of the investment to the earnings, or reduce the operating expenses, or increase the earnings, and if we can do the last without an increase in the investment, we will have accomplished the first automatically; that is, the ratio of investment to earnings will be reduced. You will agree with me that we cannot reduce the investment which we have already made and I am slow to believe that our effort to reduce expenses will be more successful in the future than in the past. Trackless trolleys, pay-as-you-enter cars, campaigns against accidents have promised good results, but the effect of their adoption has not been marked. I believe that our city lines cannot secure additional business at a rate of investment less than the present average. It would seem, therefore, that the only solution of this vexing situation, and the one which will put the street railway business upon a firm and equitable basis, is a readjustment of our system of fares. Just what this readjustment should be I am not prepared to say, but I believe that the situation should be well understood, and an educational campaign should be carried on. The problems which confront us are not new. The horse railroads had the same difficulty and their fares were made 6 cents or 7 cents or 8 cents or 9 cents, as circumstances justified, and the people paid these fares, not without grumbling, it is true, but nevertheless they paid.

Effect on Electric Railway Development.—I have seen it stated that there has been a decided letting up in the development of electric railway enterprises during the last ten years, and tables showing the total mileage of electric lines in this country have been quoted to show that this is the case. Statistics of this sort are extremely difficult to obtain and still more difficult to check with accuracy, but I am inclined to believe that the figures quoted do not fairly represent the conditions; for instance, this table shows an increase of only 1,200 miles in the total trackage from 1907 to the end of 1910, yet the statistics published each year in the Electric Railway Journal show that during this same period almost 3,400 miles of new track were constructed. To bring this up to date we must add approximately 1,000 miles constructed during the year 1911, so it would appear that during the last four years over 10 per cent. has been added to the total existing track.

I have tried to analyze these figures somewhat; and, while the results are probably somewhat inaccurate, I think they show fairly well the conditions which exist. In 1907 the interurban mileage was rouhhly one-fifth of that in the cities, and during the four years I have mentioned the addition to the city track was 2,048 miles, or approximately 7 per cent., while the addition to the interurban was 2,419 miles, or approximately 43 per cent. As I said before, these