

APPENDIX B.

REPORT ON ELECTRIFICATION OF NEW ZEALAND RAILWAYS.

To the Hon. J. G. COATES, M.C., Prime Minister of the Dominion of New Zealand,
Wellington, New Zealand.

SIR,—

August, 1925.

New Zealand Railways.—Report on Electrification.

In accordance with your request we have prepared the following report dealing with the proposed electrification of certain suburban sections of the New Zealand Railways. The areas included are those of Auckland, Wellington, Christchurch, and Dunedin. The report deals with capital cost and operating-expenses, and is based upon our study of statistics, documents, and plans submitted to us by the Railway Department, and upon the investigations of our representative, Mr. E. P. Grove, who visited New Zealand for this purpose. The information supplied to us referred both to suburban trains and to through trains in the suburban zones, and both classes of traffic are included in the report. No figures as to shunting in main yards, as distinct from shunting by train-engines in wayside stations, were supplied to us, and we understand that for the present no such electrification is contemplated.

The report is arranged in five parts. The first deals with the general question of the application of electric working; the remaining four deal with the four centres mentioned above, and include tables showing details of our estimates, and maps.

It appears to us that three factors in the situation are of particular importance—namely, the mountainous nature of the country, the need for increased suburban passenger facilities, and the low cost of electric power relative to the cost of coal.

The first of these applies particularly to the suburban zones of Auckland, Wellington, and Christchurch, where the railways are handicapped by adverse grades or difficult tunnels, and where very costly measures to afford relief are already sanctioned. In these three cases we have, as a preliminary step, compared the cost of working the existing traffic by steam with the cost of working the same traffic electrically, showing at the same time to what extent electrification would render these other proposed works unnecessary.

The principal figures are as follows :—

CAPITAL COST AND ANNUAL SAVING DUE TO ELECTRIFICATION.—EXISTING SERVICE.

	Auckland.	Wellington.	Christchurch.
	£	£	£
Gross capital outlay on electrification	815,700	830,800	428,400*
Credit for steam locomotives released	97,500	38,000	10,800
Net capital outlay	718,200	792,800	417,600*
Annual saving in working-expenses due to electrification (including depreciation)	27,700	26,700	1,400
Return on capital	3·86%	3·37%	0·3%

* Includes whole line, Rangiora to Lyttelton. Cost of Christchurch-Lyttelton only—Gross, £203,100; net, £198,300.

We have shown in our report that if these lines were electrified certain alternative works could be postponed, possibly for many years to come. These are the Westfield* deviation (£450,000), the Tawa Flat deviation (£950,000), and the new Lyttelton Tunnel (£265,000), as well as certain smaller works. The figures in the above table contain no allowances for possible credits on this score.

The saving shown in annual working-expenses due to electrification of the existing service is attributable mainly to the lower cost of power as compared with coal and the lower cost of locomotive repairs. At Auckland and Wellington the savings are sufficient to pay between 3 per cent. and 4 per cent. on the net capital outlay, apart from any of the savings in capital expenditure mentioned in the preceding paragraph. At Christchurch, where the traffic is small, the saving is only sufficient to pay a fraction of 1 per cent. on the capital outlay, and in this case the only justification for electrification is that it would completely eliminate the discomforts due to smoke and fumes in the existing tunnel and so render the construction of a second tunnel unnecessary. We have suggested in the report that in this case it will only be necessary to electrify the line from Lyttelton to Christchurch, and not the whole line from Lyttelton to Rangiora.

The second factor to which we have referred is the need, which has already been expressed in the report of the Royal Commission of Inquiry and elsewhere, for an improvement in the suburban service, and particularly for the elimination of mixed trains. We have assumed that these changes will in any case be made, and we have prepared a set of estimates for all the sections on the basis of an

* The Westfield deviation may, however, be considered desirable in any case, since it opens up new suburban territory, and also provides an easy access to the new Auckland yard.