

This for total equipment is equal to £11,338 per mile of single track.

The cost of the power plant appears high; but the maximum load—which would probably be only required a few times a day and only for a few minutes on each occasion—has to be provided for: the maximum load will be at least three times the normal. The power plant which it is necessary to provide would be capable of dealing with a very much larger traffic at proportionately only a small increased annual cost by running a continuous service, which of course can only be sustained where there is a heavy and regular suburban passenger traffic to deal with.

It is almost exclusively to this class of traffic that the application of electric traction on existing railways has so far been adopted; and, when all charges, including interest and depreciation, on the electrical installation are taken into account, the cost per ton-mile has in most cases been found to be higher than for a steam traction.

The net cost of generating electric current with an up-to-date steam plant, with cost of coal at about £1 5s. per ton, if power-house is erected at Lyttelton in such a position that the coal can be unloaded direct from the steamer to power-house bins, would be about 1d. per unit, and another $\frac{3}{4}$ d. per unit should cover all distribution and general maintenance charges.

The annual charges on the basis of existing traffic would be about as follows:—

	£
Interest and depreciation on capital cost, £147,400 at $7\frac{1}{2}$ per cent., say	11,055
Cost of generating current and general maintenance, 1,900,000 units at $1\frac{3}{4}$ d., say	13,854
Total	24,909

As an alternative proposal, instead of supplying new passenger-trains the existing stock could be used, drawn by electric locomotives—say, three at £3,000 each: this would reduce the capital cost by £15,000, and the annual charges by £1,125.

Train-mileages.—The train-mileages for the service upon which the calculations are based would be about 118,000 per annum, and the annual charges for steam traction would be—locomotive charges, 17·36d.; other charges, 45·62d.; or a total of 62·98d. per train-mile.

For electric traction, equivalent locomotive charges, including supplying electric current and maintenance of plant, would be 31·30d.; other charges, 45·62d.; or a total of 76·92d. per train-mile, to which should be added interest and depreciation on cost of electrification, 22·48d. per train-mile, or 20·19d. for the alternative proposal.

	d.
Total cost steam traction	62·98
Total cost electric traction	99·40
Total cost alternative proposal	97·11

Extra cost under electric traction, 36·42d., or 34·13d. per train-mile: 118,000 train-miles at 36·42d. = £17,906 10s. So that the cost of working electrically will exceed the present cost by about £18,000 per annum.

The electrification of main lines of railways for dealing with both passenger and heavy goods traffic is at present practically only in an experimental stage, but from experiments now being carried out experts are of opinion that a considerable reduction will be effected both in initial and working costs in the near future.

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