

a higher standard would be required for the running of passenger traffic. The ballast consists for the most part of the subsoil adjoining the railway, and although this contains a fair amount of clean pumice, it is not suitable for a high standard of maintenance, but is sufficient while speeds are moderate. The nature of the permanent-way, the large proportion of curved track, and the severe gradients limit the speed which can be run. On the sharp curves the speed should not exceed from six to eight miles an hour. On straight track and on the easier curves a speed of twenty miles an hour could be allowed if a satisfactory standard of maintenance is observed. A through speed of about $12\frac{1}{2}$ miles an hour, apart from train-stops, is about the limit of safe speed.

Clearance.—As already indicated, the cuttings are too narrow. There are comparatively few structures, but these, such as tank-stands, &c., require alterations to give clearances which would be satisfactory for passenger traffic.

Stations.—There are eight sidings in addition to those at Putaruru and Mokai. Of these, two at least are principally used for train purposes (double-banking, &c.). There are in addition to these sidings, a considerable number of "stopping-places" where goods are received and delivered, and in some cases it appears to be the practice to leave wagons on the running-track to be discharged or loaded, and picked up by the next train. Such a practice could not be permitted where trains carrying passengers are run, and the stoppage of trains to discharge or load goods at frequent intervals would lead to undue delays. Additional sidings should be provided to deal with such traffic. For passenger traffic shelter-sheds and conveniences would have to be provided.

Water-services.—For the present traffic the water-supplies appear to be sufficient.

Maintenance Staff.—Apart from the train-running staff I understand that the staff engaged on repairing and maintaining the track numbers eighteen. For the running of passenger-trains it would be necessary to adopt a somewhat higher standard of maintenance, and a daily patrol or examination of the railway. To do so would involve the employment of a larger staff. An increased staff would also be required for the maintenance of the additional structures which are necessary.

Rolling-stock.—The engine stock consists of—One Class A (old N.Z.R.) type; one Mallet compound (weight, 42 tons); one Barclay (four wheels coupled, 5 ft. wheel-base); two Heisler (geared). These engines, with the exception of the Class A, appear to be of a very suitable type for working trains on the railway. For passenger traffic the speed of the Heisler (geared) engines is too low. The passenger and goods vehicles comprise—Two composite passenger and goods vans; one goods-van; twenty-five "U" wagons for timber and general-goods traffic; one "U" wagon for bush work. All these vehicles are of the bogie type, with length over buffers of 32 ft. 6 in., 20 ft. centre to centre of bogie, wheel-base of bogies 4 ft. 7 in., and width over all 7 ft. 6 in. The present stock of engines and wagons is fully occupied with the existing traffic. For the carriage of passengers and general-goods traffic a substantial increase in both engines and wagons will be required, to be added to as settlement advances.

1. *Estimated Cost of Making the Railway Suitable for Passenger and General-goods Traffic.*

To enable passenger and general-goods traffic to be carried on the railway with reasonable efficiency and safety, and without material alteration of the existing curves and gradients, I am of opinion that the following works should be carried out and conditions observed:—

Cuttings and embankments to be not less than 10 ft. wide, with slopes sufficient to ensure stability. The track to be strengthened, especially on sharp curves. Bridges to be put in thorough order (in some cases renewed altogether), and made of sufficient strength to carry the maximum loads safely. Structures to have greater clearances. Stations to be provided with shelter-sheds and conveniences, and additional stations to be provided wherever local traffic is dealt with. Additional rolling-stock to be provided to meet the increase in traffic. Speeds not to exceed twenty miles an hour on straight track and easy curves, six to eight miles an hour on curves of $1\frac{1}{2}$ to 3 chains radius, and ten to fifteen miles on curves from 3 to 10 chains radius. The 10 ft. adopted for width of cuttings is the absolute minimum which I consider should be allowed for passenger traffic, and would involve the adoption of special precautionary measures to prevent accidents.

The cost of these works I estimate as follows:—

						£
Formation, track, and structures	...	...	...	...	...	40,000
Rolling-stock	...	...	...	...	...	30,000
Total	...	...	...	...	...	<u>£70,000</u>

Detailed statement of estimate is enclosed.

If the traffic developed to a large extent, involving the use of heavy trains, it might be considered necessary to have trains fitted wholly or partially with automatic brakes. The cost of this has not been included in the estimate.

2. *Estimated Cost of bringing the Railway up to the New Zealand Government Standard for Secondary Railways.*

The principal requirements of the standard referred to may be assumed for the present purpose to be—(1) Cuttings 15 ft. wide; (2) embankments 12 ft. to 13 ft. wide; (3) minimum curvature 5 chains radius; (4) steepest gradient 1 in 35, eased for curvature; (5) bridges to be sufficiently strong for all classes of Government railway wagon stock (10 tons axle-load); (6) rails to be 55 lb. per yard in weight; (7) structures to have N.Z.R. standard clearances; (8) stations to standards for flag stations.