system generally has been most satisfactory, and, in conjunction with the installation of carrier-current telephone systems (which has been fully dealt with elsewhere in this Report), has resulted in a considerable improvement in the range and standard of Dominion-wide toll service.

The cost of the year's operations in effecting improvements and extensions to the toll and telegraph facilities throughout the Dominion, including the installation of carrier-current telephone systems, was £114,243. In addition, an expenditure of £21,178 was involved in renewing or replacing plant and equipment which had become worn out, inadequate, or obsolete.

The various additions to and rearrangements of toll and telegraph circuits during the year are detailed hereunder:—

By the erection of a new metallic circuit between Auckland and Waiuku heavy delay on toll traffic between these two places was considerably relieved.

By the erection of two 200 lb. copper circuits between Kaitaia and Mangonui the special work designed to provide improved toll facilities for stations in the Mangonui and Hokianga Counties was completed.

Telephone facilities at Kerikeri were augmented by the rearrangement of circuits between Kaeo and Ohaeawai.

The efficiency of the Taupo–Tokaanu toll circuit was improved by the reconstruction of the circuit, and its traffic-carrying capacity increased by the conversion of the earth-working section to metallic-circuit working.

By the rearrangement of circuits between Ohaeawai and Kaikohe an additional telephone outlet was provided to carry toll traffic from stations between Whangarei and Kaikohe.

An additional metallic circuit was erected on the branch line connecting Wairakei with the Taupo–Oruanui telephone circuit, and at the same time the existing branch line was overhauled. As a result the delay on telegraph and toll traffic from Wairakei was considerably reduced.

The erection of a metallic circuit connecting Auckland, Te Kauwhata, and Huntly provided an additional outlet for toll work between Auckland and Huntly.

The north and south sections of the Wellington–Auckland main metallic circuit were terminated at Hamilton and Palmerston North respectively, and used as Hamilton–Auckland and Wellington–Palmerston North circuits respectively. The intermediate section provided for the superposing of the three-channel carrier system between Palmerston North and Hamilton. The immediate effect of this rearrangement was to relieve traffic-congestion in many directions, and to provide speedier and better communication.

A reconstruction of the line between Blenheim and Havelock was carried out, the existing metallic circuits being re-erected on the twist system, thus permitting an efficient phantom circuit to be brought into use. This rearrangement provided additional toll outlets for stations between Blenheim and Nelson.

Improved toll facilities were provided for intermediate stations by the erection between Waipukurau and Porangahau of a metallic circuit, replacing the existing earth-working circuit, which had become obsolete.

An additional metallic circuit was erected between Pahiatua and Palmerston North, and at the same time a phantom circuit was formed over the existing circuit. As a result traffic-congestion was considerably relieved between these two places.

By the erection of a new metallic circuit between The Chateau and National Park, direct outlets were provided to Taumarunui on the one hand and Ohakune on the other.

A considerable amount of reconstruction work was carried out in the Nelson District for the purpose of improving the stability and increasing the accommodation of pole-lines. At the same time many of the circuits were rearranged in order to increase their earning-power. The principal sections affected were Blenheim–Havelock, Nelson–Motueka, and Riwaka – Upper Takaka.

To relieve traffic-congestion an additional copper metallic circuit was erected between Seddon and Ward. This also resulted in the elimination of delays which occurred on the old through circuit carrying the Nelson–Blenheim–Christchurch traffic.

In order to provide adequate line accommodation to cope with the rapid increase in inter-Island toll traffic, it was necessary to erect an additional metallic circuit between Blenheim and Seddon. The erection of this circuit enabled a further outlet between these stations to be provided by means of a phantom circuit superimposed over the existing physical circuits.

The number of faults and also the maintenance costs on the Richmond–Mapua–Mahana section were greatly reduced by the deviation of one and a half miles of the line which previously crossed the water-channels near Mapua.

By the substitution of a physical circuit between Mount Somers and Mayfield for the existing phantom circuit, faults on the Mayfield–Springburn toll line were appreciably reduced.

The two toll circuits serving Woodlands and Invercargill were relieved of congestion by the extension of the existing Invercargill–Kennington telephone circuit to Woodlands.

Traffic congestion on the Invercargill–Thornbury–Riverton–Tuatapere circuit was eliminated by the erection of an additional metallic circuit between Invercargill and Riverton.

Other improvements to the plant and equipment used in connection with the toll and telegraph services include the following:—

The provision of a new test-board at Wairoa.

The installation of teleprinter apparatus for operation between New Plymouth and Wellington for the purpose of speeding up the telegraph traffic between the Taranaki district and Wellington.

The rewiring of several telegraph operating-rooms.

The installation at the Hamilton telegraph office of a 40-volt secondary battery for telegraph local batteries.