1925.

NEW ZEALAND.

RAILWAYS COMMISSION

(REPORT OF THE).

COMMISSION

TO INQUIRE INTO AND REPORT AS TO MATTERS AFFECTING THE NEW ZEALAND GOVERNMENT RAILWAYS.

JELLICOE, Governor-General.

To all to whom these presents shall come, and to SIR SAM FAY, Kt., Justice of the Peace; and SIR VINCENT RAVEN, Knight Commander of the Order of the British Empire, Member of the Institution of Civil Engineers, Member of the Institution of Mechanical Engineers, Member of the Institution of Electrical Engineers: Greeting.

WHEREAS it is desirable that inquiry should be made into the matters hereinafter mentioned:

Now, therefore, I, John Rushworth, Viscount Jellicoe, Governor-General of the Dominion of New Zealand, in exercise of the powers conferred on me by the Commissions of Inquiry Act, 1908, and of all other powers and authorities enabling me in this behalf, and acting by and with the advice and consent of the Executive Council of the said Dominion, do hereby constitute and appoint you, the said

SIR SAM FAY and
SIR VINCENT RAVEN,

to be a Commission to inquire into and report as to the financial arrangements, management, equipment, and general working, including the administration, control, and economy, of the railway service in New Zealand, and more particularly—

(1.) The organization and running of the passenger and goods traffic, the services rendered, the scales of fares and freights operating, the finance and financial returns.

(2.) Matters appertaining to the organization and conduct of the mechanical section of the system in relation to the respective types of locomotives and rolling-stock adopted, cost, economy of life and use, equipment, renewal, and maintenance charges.

(3.) Matters relating to the construction, renewal, and maintenance of permanent way, including station equipment and the systems of signalling and interlocking adopted.

(4.) Improvements and new works that may be deemed to be essential to cope more economically with present and prospective traffic, including new station buildings, yards, deviations, &c., and the order in which such works should be carried out.

(5.) Whether the present discretionary powers held by District Traffic Managers are sufficient under existing conditions, having regard to the increasing competition by road and sea.

Whether more satisfactory and expeditious handling of traffic could be brought about by decentralization.

(6.) Delegating power to District Managers to enable them to make reduced quotations for traffic in exceptional cases to counteract competition or secure business.

(7.) The general viewpoint of the staff in dealing with the Department's business.

(8.) Whether the steps at present taken to secure excursion traffic in connection with big events are sufficient.

(9.) Whether the present statistical data compiled by the Department is sufficient to enable transportation officers to accurately gauge the cost of services in dealing with general transportation matters.

(10.) The policy of the Government in connection with the leasing and construction of private sidings.

(11.) The use of rail motor-cars and the type suggested for New Zealand conditions.

(12.) The construction of special rolling-stock, heavier or lighter, to meet special conditions in various districts.

(13.) The costing and statistical methods in the Maintenance, Workshops, and other branches.

And, for the purpose of better enabling you, the said Commission, to carry these presents into effect, you are hereby authorized and empowered to make and conduct any inquiry under these presents, at such times and places in the said Dominion as you deem expedient, with power to adjourn from time to time and place to place as you think fit and to call before you and examine, on oath or otherwise, as may be allowed by law, such person or persons as you think capable of affording you information in the premises. And you are also hereby empowered to call for and examine such books, papers, plans, writings, documents, or records as you deem likely to afford you the fullest information on the subject-matter of the inquiry hereby directed to be made, and to inquire of and concerning the premises by all lawful means whatsoever.

And, using all diligence, you are required to report to me under your hands and seals not later than the thirty-first day of January, one thousand nine hundred and twenty-five, your opinion as to the aforesaid matters.

And you are hereby strictly charged and directed that you shall not at any time publish or otherwise disclose, save to me in pursuance of these presents or by my direction, the contents or purport of any report so made or to be made by you.

And it is hereby declared that these presents shall continue in full force and virtue although the inquiry is not regularly continued from time to time or from place to place by adjournment.

And, lastly, it is hereby further declared that these presents are issued under and subject to the provisions of the Commissions of Inquiry Act, 1908.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this 18th day of October, 1924.

J. G. COATES, Minister of Railways.

Approved in Council.

F. D. THOMSON,
Clerk of the Executive Council.

REPORT.

To His Excellency the Administrator of the Government of the Dominion of New Zealand.

MAY IT PLEASE YOUR EXCELLENCY,—

In pursuance of the Commission issued to us by the Governor-General by Warrant dated 18th October, 1924, whereby we were appointed and authorized to inquire into and report to you upon the following questions, namely:—

The financial arrangements, management, equipment, and general working—including the administration, control, and economy—of the Railway service in New Zealand, and more particularly—

(1.) The organization and running of the passenger and goods traffic, the services rendered, the scales of fares and freights operating, the finance and financial returns;

(2.) Matters appertaining to the organization and conduct of the mechanical section of the system in relation to the respective types of locomotives and rolling-stock adopted, cost, economy of life and use, equipment, renewal, and maintenance charges;

(3.) Matters relating to the construction, renewal, and maintenance of permanent-way, including station equipment and the systems of signalling and interlocking adopted;

(4.) Improvements and new works that may be deemed to be essential to cope more economically with present and prospective traffic, including new station buildings, yards, deviations, &c., and the order in which such works should be carried out;

(5.) Whether the present discretionary powers held by the District Traffic Managers are sufficient under existing conditions, having regard to the increasing competition by road and sea;

Whether more satisfactory and expeditious handling of traffic could be brought about by decentralization;

(6.) Delegating powers to District Managers to enable them to make reduced quotations for traffic in exceptional cases to counteract competition or secure business;

(7.) The general viewpoint of the staff in dealing with the Department's business;

(8.) Whether the steps at present taken to secure excursion traffic in connection with big events are sufficient;

(9.) Whether the present statistical data compiled by the Department is sufficient to enable transportation officers to accurately gauge the cost of services in dealing with general transportation matters;

(10.) The policy of the Government in connection with the leasing and the construction of private sidings;

(11.) The use of rail motor-cars and the type suggested for New Zealand conditions;

(12.) The construction of a special rolling-stock, heavier or lighter, to meet special conditions in various districts;

(13.) The costing and statistical methods in the Maintenance, Workshops, and other branches,

we have the honour to submit the following report:—

I. INTRODUCTORY.

Conduct of the Inquiry.

We arrived in Wellington on the 13th October, and, having had the advantage of previously perusing detailed information relative to railway practice in the Dominion, this being supplied in reply to a questionnaire of ninety-four items submitted by us from Sydney, through the Minister of Railways, we were generally familiar with the nature of the problem to be faced. It was, therefore, decided to commence inspection tours over the whole of the main lines and, with few exceptions, the branch lines, of the New Zealand Government railways. We left Wellington on the 15th October to traverse the North Island system, and returned on the 24th October, after covering some 2,500 miles. We left Wellington again on the 27th October for the South Island, and between that date and 15th November, covered some 3,200 miles. During the two tours we traversed 4,850 miles by railway and 750 miles by motor, the latter being in part to inspect projected connecting-links, and for the rest to reach isolated sections of the railway.

In the course of our tours we inspected the track, locomotives, workshops, stores, stations, &c., of the system, acquainted ourselves with the traffic conditions of the various lines, took evidence from representative bodies desiring to tender views on railway matters, and generally obtained personal knowledge of the railway system in New Zealand. We were accompanied on our tours by Mr. R. W. McVilly, General Manager; Mr. F. J. Jones, Chief Engineer; Mr. E. E. Gillon, Chief Mechanical Engineer; Mr. H. J. Wynne, Signal and Electrical Engineer; and Mr. F. J. Murison, Divisional Locomotive Engineer; whilst district officers joined the inspection party within the confines of their districts. We also had the advantage of having with us Mr. F. W. Furkert, Chief Engineer, Public Works Department and Under-Secretary for Public Works, who accompanied the party at the request of the Hon. J. G. Coates, Minister of Railways, and whose assistance and advice proved very helpful.

At intervals on our tours, and subsequently in Wellington, we received evidence bearing on the subject of our inquiry. Evidence was taken on twenty-six days, and in all thirty-two departmental officers and representatives of twenty-eight public bodies and associations were heard. A list of witnesses is given in an appendix.

Our terms of reference, while very wide, may be summarized under four specific headings; and while in our conclusions we make recommendations in connection with each of the matters referred to us, we purpose dealing with the general question under the headings indicated below:—

Finance.

Organization.

Management—(*a*) Permanent-way and Works, including proposed New Works, (*b*) Signals, (*c*) Mechanical, (*d*) Stores, (*e*) Operation, (*f*) Rates and Fares, (*g*) Statistics.

Miscellaneous questions.

A final section contains a summary of our principal recommendations.

Railway Development in New Zealand.

On the 31st March, 1924, the New Zealand Government railway system comprised 3,053 miles open for traffic, the system being divided into eight separate and disconnected sections as follows:—

Section	Length. (Miles.)	Section.	Length. (Miles.)
North Island main lines and branches ..	1,151	South Island main lines and branches ..	1,588
Whangarei	88	Westport	36
Kaihu	24	Nelson	61
Gisborne	49	Picton	56
Total, North Island	1,312	Total, South Island	1,741

It may be well briefly to indicate the trend of railway development in New Zealand. Railway-construction commenced in 1860, when the building of the line from Christchurch to Lyttelton was started. It was not, however, until the 1st December, 1863, that the first portion of this line was opened, while the line was not completed throughout until 1867, when the Lyttelton Tunnel was pierced. Other lines, meanwhile, were being built through the Canterbury Plains, while the Provincial Councils of Southland and Auckland were developing lines from Invercargill to Bluff and from Auckland to Drury respectively.

By the year 1870 there were only 46 miles of railway open for traffic in New Zealand, and, as these were built on different gauges, it became evident that confusion and considerable loss would occur if some standard gauge were not adopted. Accordingly, in the year 1870, a Railway Act was passed to authorize the whole of the railways of New Zealand to be built to the 3 ft. 6 in. gauge. Railway-construction proceeded at a rapid rate, and by 1876, this being the year when the Provincial Councils were abolished and the whole of the lines brought into the hands of the General Government, there were 718 miles of railway open for traffic. By 1880, 1,172 miles were open, this mileage of track increasing in 1890 to 1,809, in 1900 to 2,104, in 1910 to 2,709, and during the succeeding decade to 2,996. Of particular importance in connection with the development of the New Zealand railways is the securing of a through connection between Wellington and Auckland, this being opened on 15th February, 1909, while it was as recently as last year (4th August, 1923) that the east and west coasts of the South Island were connected throughout by railway, by the piercing of the Otira Tunnel.

Nowadays practically all the lines are State-owned, but originally several railways were built by private enterprise and subsequently taken over by the Government. The most important lines built by private enterprise were the Midland (87 miles in length) and the Wellington–Longburn (84 miles in length), these being acquired by the Government in 1895 and 1908 respectively.

Railway Development over a Period.

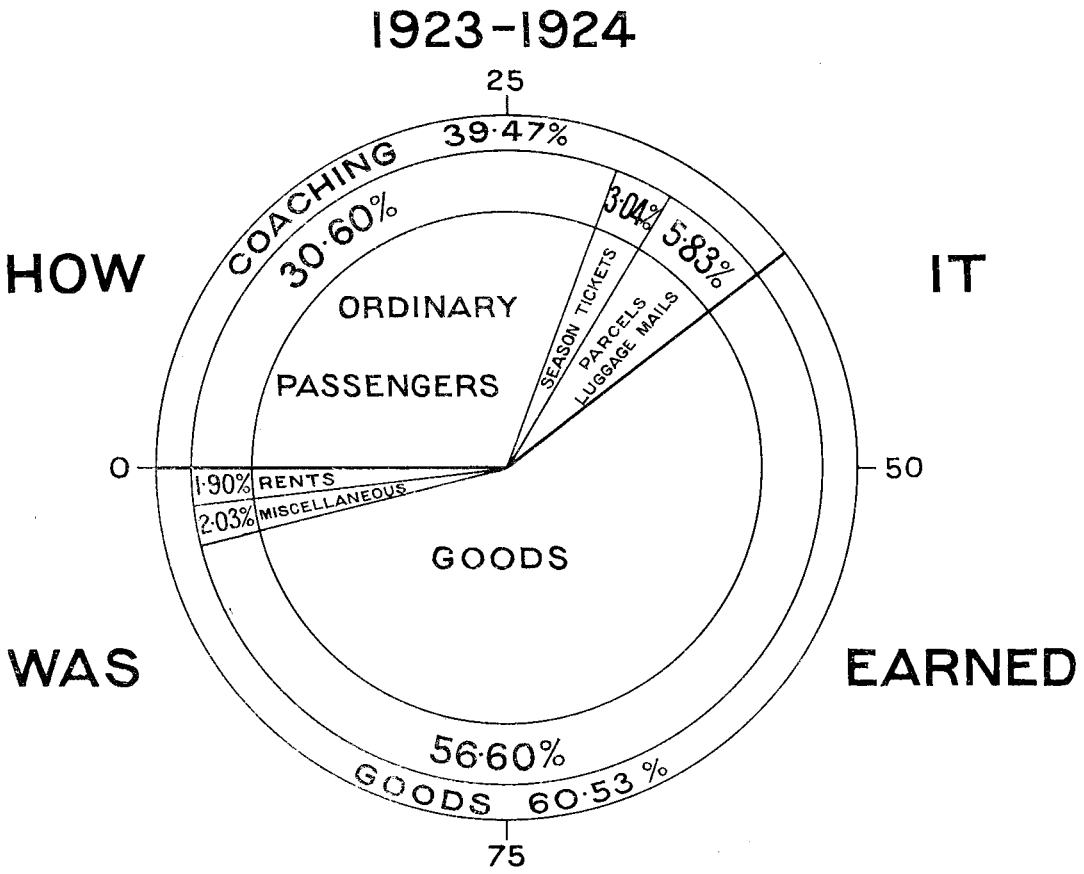
Before dealing in detail with the particular questions referred to us it may be of advantage briefly to review the financial results of the New Zealand Government railways over the past few years. In the table given at the end of this section comparisons over a period of eleven years are included, but it should be emphasized in this connection that such comparisons must be regarded with caution, owing to the fact that the disturbance due to the war period vitiates the accuracy of conclusions drawn wholly upon figures presented in this table.

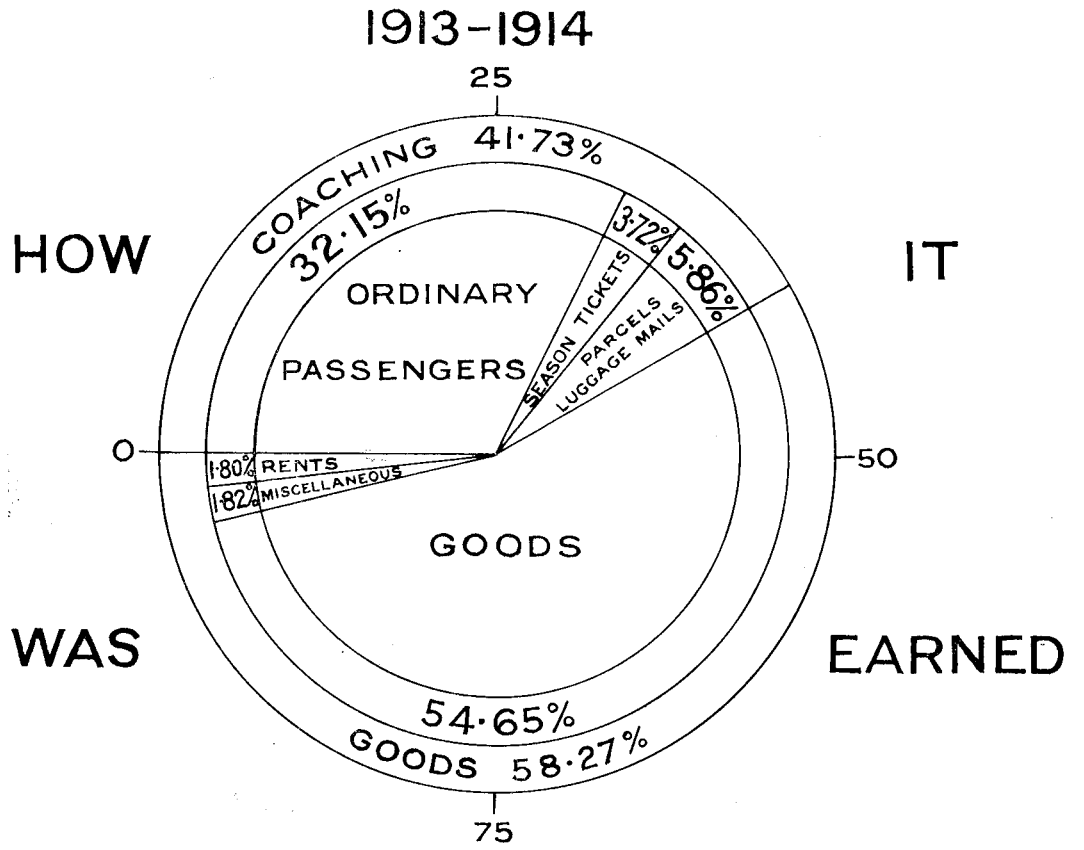
On 31st March, 1924, the New Zealand Government railways represented a capital of £48,738,821 9s. 3d., including £7,339,394 3s. the cost of lines and works not yet open for traffic. The capital expenditure is divided as shown below :—

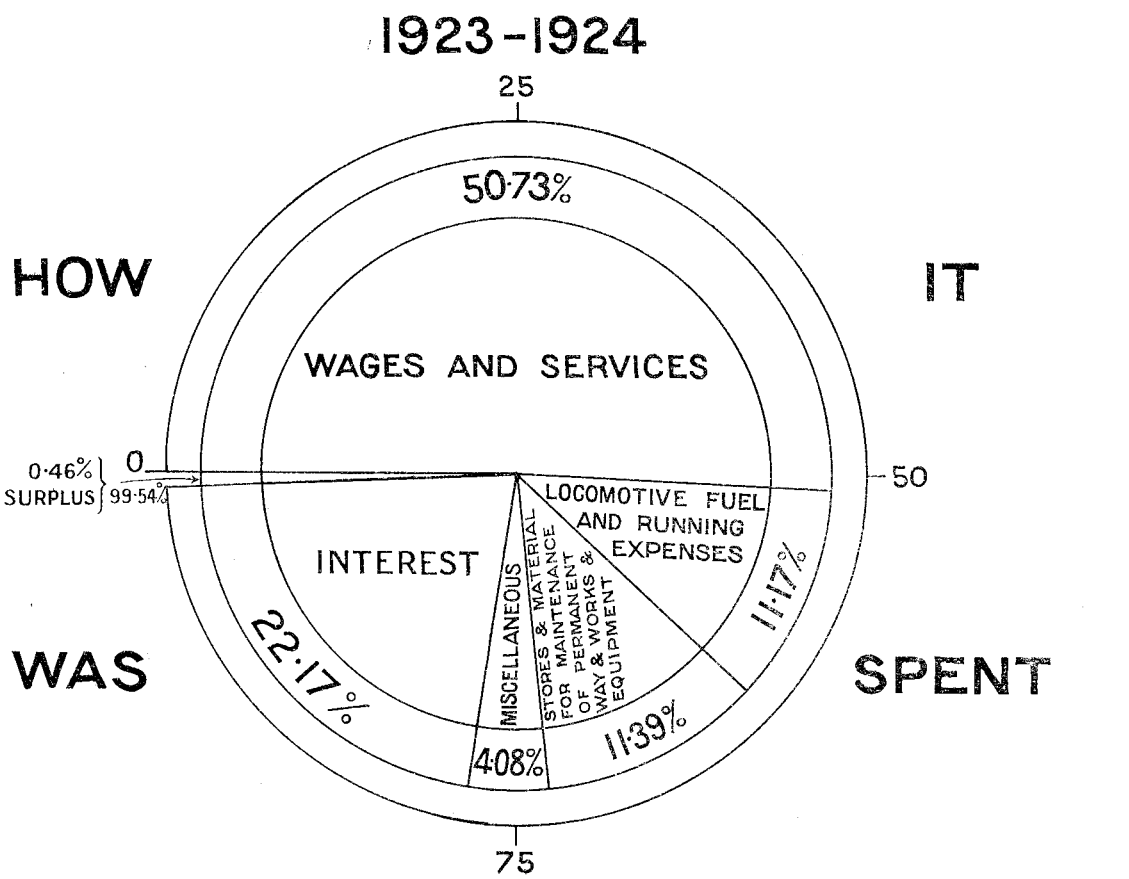
Analysis of Railway Capital Expenditure as at 31st March, 1924.

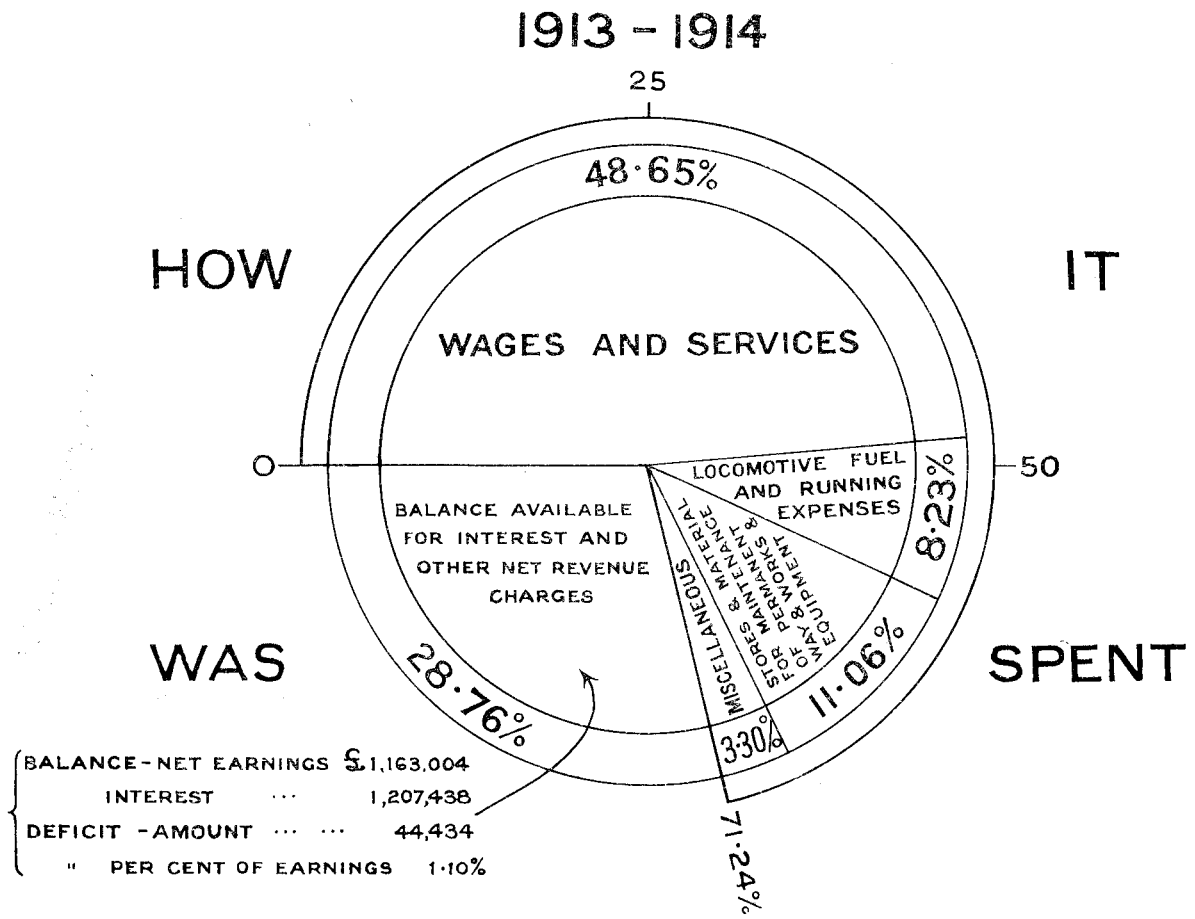
	£	s.	d.
Acquisition of land, property, &c., used in connection with railway working	928,104	0	0
Amounts paid for construction of lines and works open for traffic	30,350,851	1	9
Amounts paid for construction of lines and works (including lands) not open for traffic	7,339,394	3	0
Rolling-stock—			
Locomotives — £2,779,804 10 5			
Coaching stock — 1,644,010 0 0			
Freight stock — 4,942,600 0 0			
	9,366,414	10	5
Manufacturing and repairing works and plant—			
Land and building — 140,000 0 0			
Machinery and plant — 357,139 0 0			
	497,139	0	0
Miscellaneous expenditure—			
Lake Wakatipu steamers — 44,350 11 1			
Sawmills and equipment, including house-factory at Frankton — 110,262 15 0			
	154,613	6	1
Purchase of stores (on capital account)	102,305	8	0
	£48,738,821	9	3

Capital provided for construction of railways—	£	s.	d.
Opened lines	41,399,427	6	3
Unopened lines	7,339,394	3	0
	£48,738,821	9	3


1923-1924
25
39·47%
COACHING
30·60%
3·04%
5·83%
HOW
IT
ORDINARY
PASSENGERS
SEASON TICKETS
PARCELS
LUGGAGE MAILS
0
50
1·90% RENTS
2·03% MISCELLANEOUS
GOODS
WAS
EARNED
56·60%
GOODS 60·53%
75


1913-1914
25
41·73%
COACHING
32·15%
3·72%
5·86%
HOW
IT
ORDINARY
PASSENGERS
SEASON TICKETS
PARCELS
LUGGAGE MAILS
0
50
1·80% RENTS
1·82% MISCELLANEOUS
GOODS
WAS
EARNED
54·65%
GOODS 58·27%
75





BALANCE - NET EARNINGS	£1,163,004
INTEREST ···	1,207,438
DEFICIT - AMOUNT ··· ···	44,434
" PER CENT OF EARNINGS	1·10%

As indicated previously, the New Zealand railways are divided into eight separate and disconnected sections, four of these being in the North Island and four in the South Island, there being no through communication between the two Islands. In the North Island the system extends as far north as Opua and Okaihau, these being situated respectively 605 miles and 618 miles from Wellington, the headquarters of the Railway Department. In the North Island there are two avenues of communications between east and west, one via Frankton Junction and the other via Palmerston North. In the South Island, apart from the three short isolated sections in the Westport, Nelson, and Picton areas, the railways begin at Parnassus, 82 miles from railhead on the Picton Section, and are concentrated on Christchurch, Dunedin, and Invercargill, the only means of communication between the east and west being via the Otira Tunnel, this connecting the Greymouth Section of the railway with the remainder of the South Island system below Parnassus. The south-eastern sector of the South Island possesses a number of branches, some of which are unprofitable and are likely to remain so for many years to come. From Parnassus, the northern extremity of the main line system in the South Island to Bluff, the southern extremity, the distance is 467 miles.

The system comprises 3,053 route miles of line, of which, at the 31st March, 1924, only 43 miles were double track. Sidings account for 835 miles, so the double mileage reduced to single track is 3,942. This compares with 2,854 route miles and 3,679 single track miles at 31st March, 1914. During the year ended 31st March, 1924, the Railway Department carried 28,436,475 passengers, as compared with 23,173,472 in the year ended 31st March, 1914, this representing an increase of 22·71 per cent. Freight traffic in the last financial year amounted to 6,925,517 tons, as compared with 6,019,683 tons in the earlier period, an increase in 1923–24 over 1913–14 of 15·05 per cent. Over the same period the number of locomotives increased by 22·66 per cent., while tractive power rose by 49·42 per cent. Other increases in rolling-stock were 12·03 per cent. in carriages, this raising the seating accommodation by 13·90 per cent. and 29·67 per cent. in wagons, the increase in wagon stock representing 42·35 per cent. advance in carrying-capacity.

The total revenue for the year 1923–24 was £6,984,211, and the working-expenses £5,403,766, thus leaving £1,580,445 to cover the amount required to meet interest on loans. The percentage of working-expenses to receipts in the two periods was 71·24 in 1913–14 and 77·37 in 1923–24.

This brief summary shows the general trend of development during the last few years, and the following table indicates the financial results over the period. It is to be noted that capital expenditure has increased 27·95 per cent., revenue 72·73 per cent., working-expenses 87·61 per cent., and rate of interest payments 14·5 per cent.

FINANCIAL RESULTS, NEW ZEALAND GOVERNMENT RAILWAYS FOR PAST ELEVEN YEARS.

Twelve Months ended 31st March.	Total Railway Capital Expenditure (Open Lines).*	Gross Earnings.	Working Expenses.	Net Earnings.			Percentage of Interest on State Loans attributable to Railways.	Net Profit or Loss.
				Amount.	Percentage of Profit to Capital Invested.	Surplus or Deficit in Interest on the basis of 3¾ Percentage.		
	£	£	£	£	£	£	£ s. d.	£
1914 ..	32,355,087	4,043,328	2,880,323	1,163,005	3·61	— 44,434	3 16 5	—67,067
1915 ..	34,133,825	4,105,457	2,920,455	1,185,002	3·53	— 72,209	3 14 9	—69,846
1916 ..	34,857,882	4,548,356	2,910,883	1,637,473	4·72	+335,687	3 16 4	+312,429
1917 ..	35,378,664	4,800,810	2,926,864	1,873,946	5·30	+547,246	3 19 8	+464,596
1918 ..	36,001,432	4,687,700	3,042,907	1,644,793	4·60	+305,849	4 1 5	+187,884
1919 ..	36,167,681	4,988,632	3,308,575	1,680,057	4·65	+324,005	4 2 11	+180,808
1920 ..	36,390,115	5,752,487	4,105,067	1,647,420	4·53	+284,564	4 3 3	+134,830
1921 ..	37,235,254	6,908,531	5,636,601	1,271,930	3·42	—124,376	4 5 2	—313,650
1922 ..	39,309,097	6,643,591	6,237,727	405,864	1·07	—1,021,156	4 6 11	—1,247,893
1923 ..	40,275,161	6,727,802	5,502,497	1,225,305	3·04	—284,385	4 7 4	—532,779
1924 ..	41,399,427	6,984,211	5,403,766	1,580,445	3·83	+ 31,802	4 7 6	—226,345

* Accountants' figures on which interest is computed differ slightly as cost is only included proportionately to time during which lines opened each year were earning revenue.

II. FINANCE.

An examination of the Capital Account of the New Zealand railways indicates that comparatively small sums were paid for land purchases, that several branch lines were purchased from private companies, and Harbour Board funds provided for the construction of certain lines, the obligations upon them being assumed by the Railway Department. Some six to seven millions sterling were spent upon railway-construction out of accumulations of the consolidated revenue, and no loans were, therefore, issued for this amount.

The average capital cost per mile is £13,560, being about £3,000 less than New South Wales, which system is on the 4 ft. 8½ in. gauge and has heavier rails, but £5,500 more than Queensland and £4,900 more than South Australia, the former being a 3 ft. 6 in. gauge system, and the other partially so.

Railway Capital Commitments.

At the 31st March last, capital commitments upon lines open for traffic were £41,399,427. At the same date the State indebtedness upon those lines and works, plus lines under construction, totalled £48,270,352. Railway capital, therefore, represents between one-fourth and one-fifth of the total Loan Account of the State of £220,000,000 resting upon the Consolidated Revenue Funds. Whether this amount represents exactly the Loan Account of the State attributable to railways is not quite clear. It is on evidence £6,500,000 less, due, as before noted, to the employment of accumulated funds upon construction work.

In the last twenty years the Capital Account on lines open for traffic has been doubled, and since 1914 there has been an addition of £9,044,340, or, roughly, 28 per cent., whilst mileage of line has increased by 190 miles only, or 6·64 per cent. The railway capital, revenue expenditure, and interest figures from 1914 to 1924 are given in the preceding table, whilst the diagrams on previous pages show how the revenue was earned and how it was spent in 1913–14 and 1923–24.

"Policy Rate" of Interest.

The interest charged to the Railway Department is not the actual figure paid upon State loans, but is a "policy rate" fixed at 3¾ per cent. The history of the fixing of an arbitrary figure commenced in 1896, when the railways were regularly earning more than sufficient to meet the actual interest (3 per cent.) due upon State loans attributable to railways, and it was then decided as a policy of State to so reduce rates and fares that the net earnings should be no more than proved necessary to meet the actual interest paid. The 3 per cent. figure continued until 1910, when, due to a rising rate of interest upon loans, it was increased to 3¾ per cent., at which rate it has since remained.

Net receipts balanced, excepting in the years 1914 and 1915, the policy and loan interest up to 1920. From the latter date, however, the increased cost of working the lines, notwithstanding a general increase of 40 per cent. in goods rates and 25 per cent. in passenger fares from 1914 onwards, brought down the net receipts below the policy rate of 3¾ per cent. to the extent of £124,376 in 1921, £1,021,156 in 1922, £284,385 in 1923—a total of £1,429,917. In 1924 there was a surplus of £31,802 over the 3¾ per cent., but a shortage of £226,345 on interest paid by the State. The shortage during these years on interest actually paid on loans was £2,320,667. These figures prove that whilst an advance of rates and fares was sufficient to meet increased working-expenses from 1915 to 1920 and covered both policy and actual interest during those years, the increased charges were not sufficient to provide for the higher rate of wages and enhanced cost of stores, plus interest on increased capital coming into effect from 1919 onwards.

Increase in Capital and Interest on Loans since 1914.

Of the increase in capital since 1914 of £9,044,340 new lines (at a cost of £14,950 per mile) account for £2,884,368, new rolling-stock and machinery £3,622,298, grade improvements £307,091, while £2,230,583 has been expended in connection with additions and improvements to stations and works. Concurrently with the

increase in capital the rate of interest upon loans rose from £3 16s. 5d. to £4 7s. 6d. per cent., and working-expenses, as a consequence of advance in price of coal and materials, together with an enhanced labour bill of some £1,500,000, were nearly doubled.

Capital Expenditure charged to Working-expenses.

The working-expenses include certain items properly chargeable to capital, estimated at £22,000 per annum.

Provision of Funds.

For new lines, which are surveyed and engineered by the Public Works Department, moneys are provided by Parliament through a yearly Budget. At the present time ten new lines are under construction, one by contract with a time-limit, and others by Public Works employees or by contractors on small portions of earthworks. The time occupied in finishing the railways has been unduly long, and it is clearly not economical to carry out works in small sections on a yearly estimate, but the answer given is that all available labour is employed, and if more expeditious construction were attempted the labour-market would be upset to the general disadvantage of trade and the community generally. On capital spent on open lines and on working account a yearly Budget is also presented, together with an estimate of probable revenue. An exception to this was established in 1914, when the House of Representatives voted a sum of £3,200,000 for certain improvements recommended by the General Manager. This authority was coupled with a proviso that not more than £750,000 should be spent in any one year.

Estimates of expenditure on working account and on Loan Account for budgeting purposes are stated to be dealt with in the manner described hereunder :—

Revenue Account: Estimates of Expenditure to meet Working-expenses.

"These are compiled by the General Manager after reviewing the estimated requirements of the respective branch officers—Maintenance, Locomotive, and Traffic—and making a careful scrutiny of the actual expenditure during the previous year. Allowance is made for any probable increase or decrease in train-mileage, staff, and cost of materials so far as can be foreseen at the time, as also for the net revenue required to meet the interest charges at the "policy" rate. The estimates are then submitted for the approval of the Minister, with a statement of the estimated revenue and anticipated percentage return on capital. Cabinet then deals with the matter, and, when approval of Cabinet is received, the full details are set out and sent to the Treasury for inclusion in the general estimates submitted to Parliament."

Loan Account in connection with Open Lines.

"A general survey of requirements chargeable against capital is made. The works recommended by the local officers, together with any others that have been under consideration by the General Manager, are listed and classified under the heads 'Urgent,' 'Essential,' 'Desirable, but not essential.' These are reviewed by the Heads of Locomotive, Maintenance, and Traffic Branches, and the estimated cost is scheduled. The General Manager then goes through the schedule with the Heads of the branches, and afterwards places the proposals before the Minister of Railways with a request that the necessary funds be provided. The Minister of Railways in turn confers with the Minister of Finance, and the latter determines the extent to which funds can be provided. The amount finally decided upon is then placed in the estimates of the Public Works Department and submitted to Parliament. Where the financial arrangements make it impossible or inexpedient to grant the full amount applied for, the estimates are referred back to the General Manager for revision and reduction. Further discussion then takes place between the General Manager and his principal officers, and afterwards with the Minister. The programme of work is then recast so as to distribute the funds available to the best advantage, having regard to the relative urgency and importance of the various works. The final approval of the estimates before submission to Parliament rests with the Minister of Railways."

"After the estimates have been voted by Parliament, however, Ministerial authority is required for all expenditure over £100 and not exceeding £1,000, and Cabinet authority for all expenditure exceeding £1,000: no work involving a charge to the Loan Account can proceed until the authority has been obtained. Any surplus on the year's work is absorbed in the Consolidated Fund on the 31st March of each year, and is not available to be carried forward. Similarly, any deficit is met by the Treasury out of Consolidated Fund. Financially each year's working stands entirely by itself. The estimates are prepared in June and passed late in the year—that is, within three or four months of the end of the financial year to which they refer. This delay in giving authority for expenditure which must go on from day to day not only upon capital works, but also upon revenue, places the Railway Department in an extremely awkward position. It is the practice to authorize expenditure in anticipation at a rate proportionate to that of the previous year, but for anything additional there remains, as a rule, four or five months only of the financial year in which to carry out the work. The passing of a Budget by Parliament under such conditions as these has from a railway departmental point of view no practical value; on the contrary, it is subversive of economical working and management."

The Accountant, in answer to a question as to any difficulty in obtaining moneys from the Treasury within the vote, said, "There was difficulty in 1922, but not since then." Q. 54: "Parliament sanctioned the expenditure, but you had difficulty in obtaining the actual cash?—Yes." "To any large extent?—No, not to a very large extent; but we were asked to keep the expenditure down to the lowest possible limit." Q. 56: "Owing to financial stringency?—Yes; for the last two years there has not been much trouble."

So long as the Treasury is in a sanguine mood the estimates on revenue and betterment meet with approval, but in times of financial stringency the Railway is treated in the same way as Departments of State which are non-revenue-producing, and pressure is applied in the direction of reduction.

Separation of Railway Finance from Treasury Accounts.

New Zealand would appear to have escaped some of the more flagrant disadvantages due to the inclusion of revenue and capital receipts and expenditure in a consolidated State fund, but there is ample justification for the opinion expressed by the Minister of Railways as to the desirability of separating railway finance from Treasury accounts.

British budgeting methods, which are followed in New Zealand, were not at their inception formed for the purpose of administering a large industrial undertaking such as a system of railways, and they do not, and cannot, conform to the requirements of a revenue-producing establishment which needs not a yearly vote, but financial provision arranged from time to time as necessity arises, capable of dealing with a policy and programme over a period of years, and at the same time sufficiently flexible to meet any emergency that may arise.

We recommend that loans and obligations which can be earmarked as attributable to railways be transferred to a separate railway account, that railway revenue and expenses, including purchase of stores, be included in this account, the whole being dealt with by the Railway Department.

Provided there is a statutory obligation to keep railway funds liquid and available on demand, the Treasury might continue to be the banker to the Railway Department, although experience in other countries has shown that in times of financial stress moneys representing reserves or current remittances have proved too alluring to escape seizure in aid of other State obligations.

Absence of Reserves.

There are no reserves to meet wasted and wasting assets in the shape of wear-and-tear of rolling-stock or permanent-way. The accounts do not, therefore, disclose the actual position, inasmuch as depreciation in value is not charged against working expenses year by year and accumulated to meet renewals as they become due. This has been provided for in part by charging such renewals as

have been carried out to working-expenses, the idea being that this method maintains the stock at its original functional value. Particulars of these we deal with under the heads of "Management (Mechanical and Permanent Way)."

It is stated that "it is in the want of an account which runs on from year to year, and the existence of which is quite independent of annual appropriation, that the explanation of the fact that there is no depreciation account of the Railway Department mainly lies."

An adequate reserve is a necessity, not only for the purpose of meeting the cost of replacement, but in order to equalize the charge for renewals. An instance of misleading figures due to charging renewals only as they arise is furnished by the profit and loss shown on the Whangarei Section of railway during the past few years. In 1920 renewal of line accounted for £1,561 only, and a profit was published of £8,484. In 1921 renewals cost £8,310, and a loss of £540 resulted. In 1922 and 1923 the renewals were £12,511 and £27,061 respectively, and the losses were £10,670 and £18,622.

In our report upon "Management (Mechanical and Permanent-way)" we indicate the reserves that should be made.

Our recommendations under this head, whilst preventing a further slipping-back, will not provide for the past, which must be made good out of revenue as and when renewal arises.

Losses upon Branch Lines.

The loss upon the working of certain sections of railway is published in the accounts, and there is also special reference to the loss upon the Otira Tunnel Section. In the case of the latter we do not regard these figures as indicating fairly the result of construction of this very expensive tunnel, 5¼ miles in length, with its machinery and equipment for electrical working. To pick out 9 miles of line, including the tunnel, and show the loss upon that small section of a throughout run between Christchurch and Greymouth, a distance of 145 miles, does not exhibit a true picture, inasmuch as traffic could not be conveyed from one side of the South Island to the other but for tunnel-construction. A real figure of value can only be obtained by taking the earnings and expenses between Christchurch and Greymouth districts and applying them to the cost of construction of the throughout route.

In calculating losses upon branch lines no credit is given for earnings upon trunk lines from traffic passing to and from the branches. A branch line may, taken by itself, show a loss, whereas the earnings upon the main line due to branch-line construction may be sufficient to turn the loss into a profit. A case in point is the Fairlie line, which in 1923–24 shows a deficit (including interest) of £381, but the mileage earnings from the traffic on the main line were £15,607. In all countries there are sections of railway which do not pay their way, and New Zealand is no exception. Any country with its transport system not fully developed may be expected to have for many years portions of line regarded by the Railway Department as non-paying, especially if they are not connected up with the Main Trunk system, although from a State point of view the developmental value of such lines, apart from Crown land and forest improvement, amply justifies their construction. There is a further advantage to the State in which railway revenues do not share—*i.e.*, increased taxable income, not only adjacent to new lines but generally throughout the State, due to the opening-up of the country by transport facilities. It is a question for consideration whether or no the Railway Department should be relieved of any loss by aid from consolidated revenues. If the State decides to undertake the construction of more than a certain number of developmental lines within a given period, it is clear that railway finance may break down, followed by high charges and inefficient services as a result of pressure to economize. New Zealand's prospective railway system in the North Island is a linking-up of through routes, and there are few dead ends. It is different in the South, where there are many branch lines with no early prospect of forming them into through routes to and from more prosperous localities. It is not unreasonable that some share of general State increment should go to the agency producing the result,

where the absence of revenue is calculated to restrict transport facilities, not only in a particular area but throughout the country. We recommend, therefore, that loss on new lines should be borne by consolidated revenue, unless such lines form a connecting-link between two sections of the main system, and with the further proviso that the loss be reduced, in so far as liability on consolidated funds is concerned, by the value of traffic (less 70 per cent. working-expenses) contributed to the main line. It will be seen that the mileage opened during the past ten years has been small, but in the next decade there will be a considerable number of lines coming within such an arrangement as we propose. If an arrangement on the basis mentioned had been in operation during 1923–24 a credit to the Railway Department would have arisen of £136,064.

Financial Situation of the Future.

The prospective financial situation in so far as capital is concerned, taking past expenditure on existing lines and adding thereto obligations to which the Government is committed, together with proposals involving further expenditure during the next eight or ten years, is as follows:—

	£
(1.) Expended on existing lines and works to the 31st March, 1924	41,399,427
(2.) Expended on lines not yet open for traffic	7,025,809
(3.) Estimated expenditure necessary to complete new lines ..	12,911,058
(4.) Expenditure proposed on existing lines in respect of deviations, &c.	8,081,500
	£69,417,794

It will be seen that new capital (£21,000,000) will be needed to meet the construction-cost of new lines and improvements to existing lines, bringing up the total cost per mile to £18,696—that is, assuming 660 additional miles as shown in the Public Works report are completed. Spread over ten years this will mean raising £2,100,000 per annum on the average.

At the end of ten years interest charges upon the total capital figure of, say, £70,000,000 would, at 4½ per cent., amount to £3,150,000. The present interest payable on loans (£41,399,427) is at the rate of £4 7s. 6d. per cent. = £1,811,225. The problem is to see how and whether additional net revenue to the extent of £1,338,775 can be obtained during the next ten years to meet these interest charges.

Lines proposed and under construction are no doubt necessary as developmental railways, and in the main will link up the system, to the advantage of traffic receipts, as well as making for reduced working-expenses per mile. The expenditure upon existing lines we deal with under the head of "Management (Mechanical and Permanent Way and Works)," and although there may be some variation in the incidence of expenditure we may, for the purpose of estimating the results at the end of ten years, accept the figure of £8,081,500 as the amount needed to put the railways into a fair and economical working-condition.

In anticipating revenue it will be undesirable to base anything upon results since 1914, both receipts and expenditure bearing traces of war disturbance, and it is wiser to take the figures of 1904 and 1914 and see in what ratio traffic receipts have responded to increased mileage and facilities. Between those years 535 additional miles were opened, and gross receipts increased from £2,180,641 to £4,043,328, or 85·42 per cent. Assuming a like increase during the coming decade with 660 additional miles of track, we have a prospective revenue of £12,950,124, reducing this to 70 per cent. increase; and we think that, apart from unforeseen circumstances, this percentage of increase may fairly be expected to eventuate; we thus arrive at a gross revenue of £11,873,159. We do not base this upon past experience alone. We have regard to the increase of population, the opening-up of new producing areas, the revenue advantage brought about by the linking-up of detached sections of the railway system, and we include also proper payments for the conveyance of lime and road-metal as well as branch-line losses to be made good out of consolidated funds.

When we come to a forecast of future working-expenses we find estimates of reduced costs of operation, as submitted to the House of Representatives, varying from 17 per cent. to 5 per cent. upon certain works, mainly in reduction of grade, as a result of the proposed capital expenditure of £8,000,000-odd. If we take the whole of this amount as producing 2½ per cent. return upon the additional capital, it means a saving of £200,000, or nearly 4 per cent., upon present working expenses. As will be seen upon reference to our report upon "Management (Mechanical and Operating)," we are of opinion that the working-ratio can be reduced very considerably, and we put the percentage of working-expenses to receipts at 70 per cent. when the various changes have been made, the works proposed carried out, and a greater density of traffic, involving less cost in proportion to the tonnage conveyed, which may be anticipated in the ordinary course of events.

The position in 1934–35 may therefore be expected to be,—

		£
Gross revenue		11,873,159
Working-expenses at 70 per cent.	£8,311,211	
Reserves	350,000	
		8,661,211

leaving a net revenue of £3,211,948, and yielding 4·59 per cent. interest upon a capital of £70,000,000.

In making our recommendations we couple therewith a continuance of the present liability of consolidated revenue to meet interest during construction of new lines by the Public Works Department.

We recommend that stores be paid for out of railway funds, and that as soon as possible, by appropriation from net receipts, the cost of stores be eliminated from Loan Account.

We advocate the submission of quarterly and yearly reports to the House of Representatives in accordance with past practice, together with a yearly balance-sheet showing capital, revenue, and net revenue, followed by departmental accounts in the usual company form, and a forecast of the capital commitments for the following year. This should bear the signature of the Chairman of the Board and the Accountant, and be certified by the Auditor-General.

We recommend that the railways be so worked and managed that gross receipts shall not be more than sufficient to cover working-expenses, reserves, and the interest on capital, including sinking funds—that in the event of a surplus it be devoted to reduction of rates and fares. If, on the other hand, a loss appears, that rates and fares be increased to cover the deficit.

NOTE.

Since writing the above we have been advised the result of the stock-taking of stores on hand in the custody of Branches—and not under the control of the Stores Branch—as described in Part IV (*d*) of our Report under the heading of "Stores." It shows that material to the minimum value of £467,955, accumulated over several years, has been charged to working-expenses, although such material has not been used. There is an additional amount (estimated by the Comptroller of Stores at £100,000) representing the value of second-hand stock for which no credit has been given the permanent-way, locomotive, or signal branches. Altogether, the value of such stores represents 33 per cent. of the total expenditure of the Railway Department upon stores for the last financial year, as shown in the published accounts. In the ordinary course the branches concerned would be credited with these values in the present financial year, when, as a result, the published working-expenses of the railway would exhibit figures contrary to the actual facts. We suggest that, as an alternative, this amount of, approximately, £570,000 should be utilized as a reserve to meet arrears of rolling-stock renewal. It will be observed that this asset has the effect of making more favourable our estimate of the future prospects of the railways.

III. ORGANIZATION.

The organization of the New Zealand railways at the present time follows what is usually known as the departmental scheme, under which each department has an executive head, working under the direct instructions of the General Manager. There is, however, an exception to this general rule in the case of the New Zealand railways, in that on the recent retirement of the Chief Traffic Manager his position was not filled, his duties being undertaken by the General Manager through a First Assistant (for transportation) and a Second Assistant (for rates and staff).

There has not always been a General Manager in charge of the New Zealand railways. That was the original arrangement, but in 1889 a Board of three Railway Commissioners was appointed. This form of management, however, lasted only for five years, at the end of which period the control of the railways passed back to the Minister of Railways, who supervises the development of this great national asset through a General Manager, responsible directly for the administration of the undertaking. A chart shows the present organization.

We have given careful consideration to the question of organization. Our observations have shown that there is need for a general tightening-up, both in the direction of more clearly defining the actual responsibilities of the chief officers and of reorganizing the overhead administration so that it may better meet the peculiar needs of New Zealand. Centralization was perhaps desirable in the earlier days of the railways, but the time has come when decentralization to a certain extent is necessary. District officers lean too much upon the central authority in matters of detail, with the result that delay and consequent irritation to the public, as well as loss of traffic, follows. On the operating and commercial side this is especially noticeable, the Head Office being overburdened by correspondence on detail matters which should be capable of settlement through district authority. No regular conferences excepting an annual one (mainly upon staff questions) are held. Many of the lines, in addition to being isolated sections, are at considerable distances from Wellington, and frequent inspection by chief officers is not possible; thus many defects, which the eye of an experienced railway man would detect and remedy, continue in existence. A commercial organization until quite recently was non-existent, with the result that motor-car enterprise has made serious inroads on both passenger and goods traffic. From evidence given in the course of our investigations it is clear that the public expect something more in the shape of personal contact with responsible officers than has obtained hitherto. This has reference not only to charges, time-tables, and facilities, but also to small matters of equipment and regulations. A far better appreciation of the services rendered by the railways would, we feel sure, be the outcome of discussion on the spot between representatives of the public, who own the railways, and a responsible officer with authority to settle the minor questions so frequently arising. Relief from these would enable headquarters' officers to devote prompt attention to major questions which they alone should determine.

In connection with State railways there are invariably difficulties great and small, brought about by political pressure upon Ministers to give something which, whilst of local value, is not to the general advantage of the railways, or create an undue preference to one section of the community as compared with another. In the general interests of the country the farther away a railway administration can be removed from political control the better, in order that an impartial decision may be given upon all questions affecting transportation facilities. In stating this we recognize that where the people own the railways the Government must decide when and where railways are to be built, and what are to be the maximum charges levied upon passengers and merchandize. Having decided these things, however, and appointed competent men to manage the large industrial enterprise of which a railway system is comprised, it is wiser to leave it in expert hands rather than to have political pressure brought to bear upon Ministers, in season and out of season, to do things that ought not to be done and to leave undone those things that, in the general interest, ought to be done.

Having regard to the geographical and other aspects of the New Zealand railways, we consider that a Railway Board consisting of a Chairman and two other members, one to control mainly commercial affairs and the other competent

to direct the operation would prove the best type of management. We suggest the appointment of an Operating and Equipment Assistant, and in addition to the chief technical officers at headquarters we recommend the appointment of two General Superintendents, one for the North Island, with headquarters at Auckland, the other at Christchurch for the South Island, responsible directly to the Board, and acting under regulations and instructions applicable to the system as a whole, for operation, commercial matters, and maintenance within their respective areas, the keynote being centralization of principles with decentralization of details, thus making for greater economy, more efficient working, and improved relations with freighters and the public.

In each Island the District Engineers and Mechanical Assistants to report monthly through their General Superintendent to the Chief Engineer and Mechanical Engineer respectively upon work performed, the state of work, and machinery under their charge, and take instructions thereon. In addition to this the responsibility of the Chief Engineers, civil and mechanical, to be exercised by frequent inspection by themselves or their principal assistants. It is, of course, understood that workshops are under the complete control of the Chief Mechanical Engineer and Chief Engineer respectively.

The Divisional Superintendents, given a wide discretion with encouragement to develop areas under their charge, and being clothed with the necessary authority to deal with problems as they arise or seek advice when in doubt, would relieve headquarters from a mass of detail and correspondence. Being in direct contact with freighters and the people in general, they would be enabled to familiarize themselves with the conditions, ideas, and needs of each town and district, and obviate formal communications and orders from the Board. They should make management personal, as distinguished from distant management, which tends to appear impersonal. Many of the local grievances to which our attention has been directed could promptly be dealt with, or would probably never arise, under the more direct and authoritative supervision of the General Superintendent. We suggest that formal conferences at headquarters should be held once in three months.

The districts at present under the control of Traffic Managers should be rearranged as shown upon the following diagram, and placed in control of District Superintendents under the control of the General Superintendent. Whilst the latter would require a competent office staff, it is considered that there need be little, if any, increase in the total personnel, having regard to the reduction in the number of districts. The districts would have the approximate mileages indicated below:—

North Island.	Miles.	South Island.	Miles.
No. 1, Auckland	719¼	No. 1, Christchurch	878
No. 2, Western	485½	No. 2, Dunedin	486
No. 3, Wellington	601¼	No. 3, Southern	557¼
	1,806		1,921¼

Chief Officers at Headquarters.

The chief officers at headquarters would be as follows:—

A Secretary who should deal with publicity and advertising matters.*
An Operating and Equipment Assistant.
A Solicitor to deal with the legal and estate work of the Department.
A Chief Engineer.
A Chief Mechanical Engineer responsible for the design, maintenance, and renewal of rolling-stock, the management of locomotive workshops and plant, and the supervision of running-sheds.
A Signal and Electrical Engineer.
A Chief Accountant.
A Cashier.*
A Comptroller of Stores.
A Manager of Refreshment-rooms and Dining-cars.

With regard to the selection and appointment of members of the Board, the desideratum is to secure harmony and team work in its fullest sense at headquarters. This can only be achieved by selecting trained railway men, possessed of vision, zealous in carrying through the reorganization of the operating, mechanical, and commercial branches, and intent upon bringing the New Zealand railways up to the average world standard of cheap and efficient transport.

* New appointments.

DIAGRAM SHOWING ORGANIZATION OF THE NEW ZEALAND RAILWAYS.

MINISTER OF RAILWAYS.

GENERAL MANAGER.

ACCOUNTING DEPT.
Chief Accountant.
Asst.-Chief Accountant
- Divisional Clerk Passenger Accounts & Ticket Printing → Office Staff Ticket-sorters
- Divisional Clerk Goods & Parcels → Office Staff Mechanician Operators & Machinists Powers Tabulating & Statistical Machines.
- Divisional Clerk Expenditure Accounts → Office Staff
- Divisional Clerk Recoveries & Credit Accounts → Office Staff
- Divisional Clerk Statistical Accounts → Office Staff
- Divisional Clerk Locomotive & Workshops Operating Accounts → Office Staff
- Divisional Clerk Maintenance Accounts → Office Staff
- Divisional Clerk Superannuation Accounts & Pay-sheets → Office Staff

MECHANICAL DEPT.
Chief Mechanical Engineer
Asst. Chief Mechanical Engineer.
- Loco. Engineer
  - Asst. Loco. Engineer
    - Office Staff
    - Workshops Manager → Workshops Foreman → Workshops Tradesmen
    - Running Shed Foreman → Depot Chargeman → Engine-drivers Firemen Cleaners
    - Car & Wagon Inspector → Train Examiners
  - Loco. Inspector
  - Boiler Inspector
  - Brake Inspector
  - Chief Draftsman → Draftsmen

ENGINEERING DEPT.
Chief Engineer.
Asst. Chief Engineer
Inspecting Engineers.
- District Engineers
  - Asst. District Engineers
    - Draftsmen
    - Clerks
    - Foreman Works → Leading Hands
    - Workshop Foreman
    - Bridge Inspector → Gangers Platelayers &c.
    - Inspector, Permanent Way
- Land Officer
- Chief Clerk → Chief Engineer's Records, &c.
- Chief Draftsman → Draftsmen

STORES DEPT.
Comptroller of Stores
Chief Clerk
- Auditor
- Ledger Clerk Accounts Clerk Record Clerk
- District Storekeepers → Office Staff Stores Shipper Leading Storemen Labourers
- Timber Supervisor
  - Sawmill Managers → Office Staff Sawmill Foreman Leading Hands Timber Workers Engine-drivers Tram Gangers
  - Bush Managers → Office Staff Bush Foremen Bush Gangers Tram Gangers Bushmen Engine-drivers
- Stationery Clerk → Office Staff Leading Storeman Storemen Labourers
- Office Staff

ADVERTISING DEPT.
Officer in Charge
Chief Clerk
- Supervising Artist → Artists Signwriters
- Sales Manager → Salesmen
- Carpenters and Labourers
- Inspectors → Linesmen
- Printer
- Office Staff

SIGNAL DEPT.
Signal Engineer
Asst. Signal Engineer
Chief Clerk
- Chief Signal Inspector → Signal Inspectors → Signal Supervisors Signal Adjusters Signal Erectors Tradesmen Labourers
- Chief Electric Lines Inspector → Electric Lines Inspectors → Electric Fitters Electric Linesmen Line Erectors
- Superintendent of Signal Shops → Electrical Mechanicians Tradesmen Storemen Labourers
- Draftsman (Senior) Draftsmen Engineering Cadets
- Office Staff

ARCHITECTURAL DEPT.
Engineer and Officer in Charge
Chief Clerk
- Office Staff
- Surveyor Surveying Cadet
- Draftsman (Senior) Draftsmen
- Inspector of Building Construction → Leading Hands Tradesmen and Labourers
- Workshop Manager

REFRESHMENT DEPT.
Controller
Chief Clerk
- Office Staff
- Supervisors
  - Refreshment-room Managers → Waitresses in Charge → Waitresses
  - Cooks, Waiters, General Hands, &c.
- Depot Men (Sleeping-cars) → Sleeping-car Attendants

GENERAL MANAGER'S, TRANSPORTATION, AND RATES DEPARTMENTS.

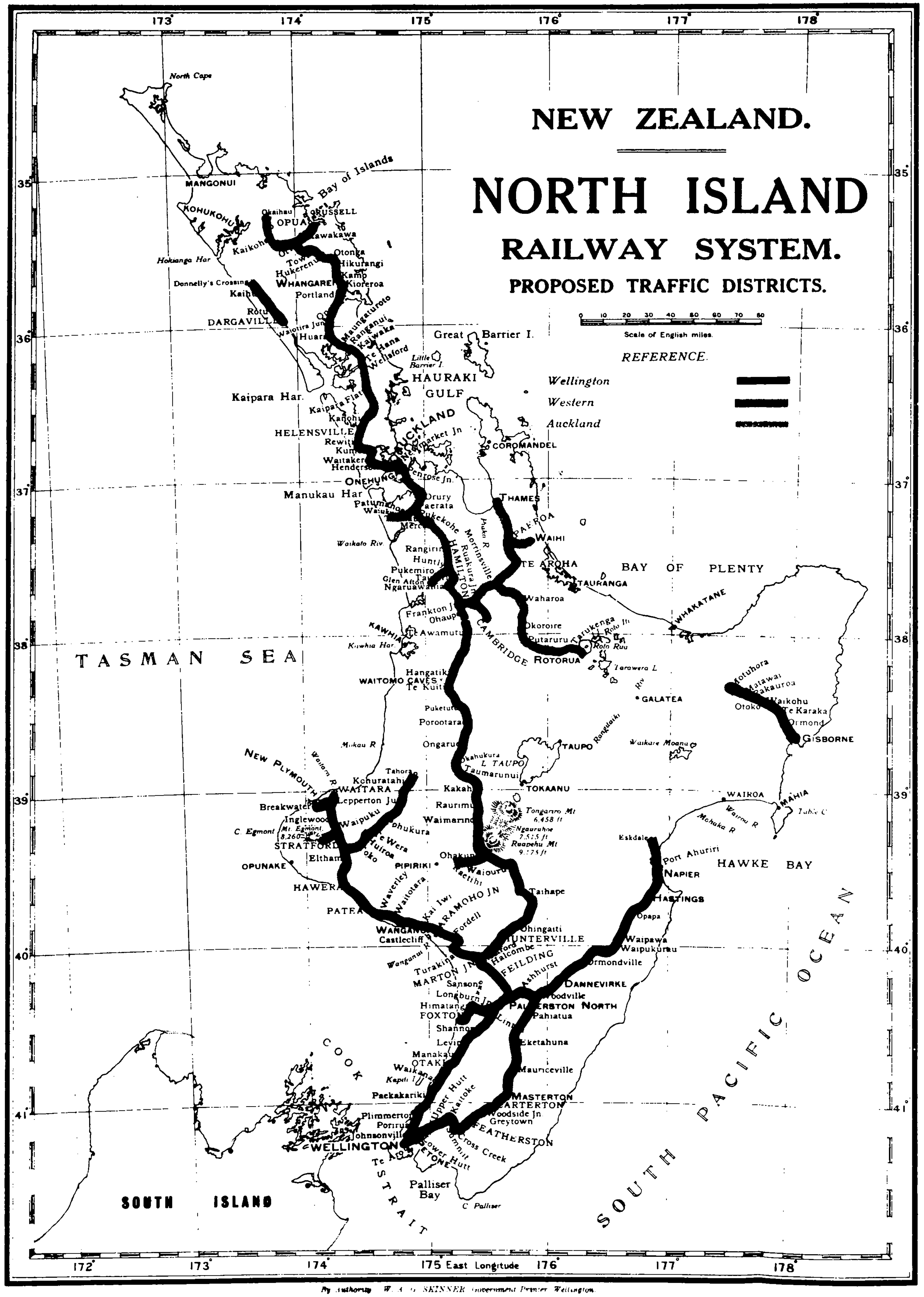
TRANSPORTATION DEPT.
First Assistant General Manager
- **COMMERCIAL DEPT.**
  Commercial Manager
  Business Agents
- **TRANSPORTATION DEPT.**
  General Superintendent

Chief Clerk
General Manager's Records

District Traffic Managers
Asst. District Traffic Managers, &c.

Traffic working
Goods Agents
Stationmasters
Traffic Inspectors, &c
Guards
Shunters
Signalmen
Porters
Steamship Employees
Waiting-room Attendants

RATES AND STAFF DEPTS.
Second Assistant General Manager
- Law Officer
- General Inspector
- Staff Clerk → Asst. Staff Clerk → General Staff
- **RATES DEPT.**
  Rates Clerk
  Rates Staff



NEW ZEALAND.

NORTH ISLAND RAILWAY SYSTEM.

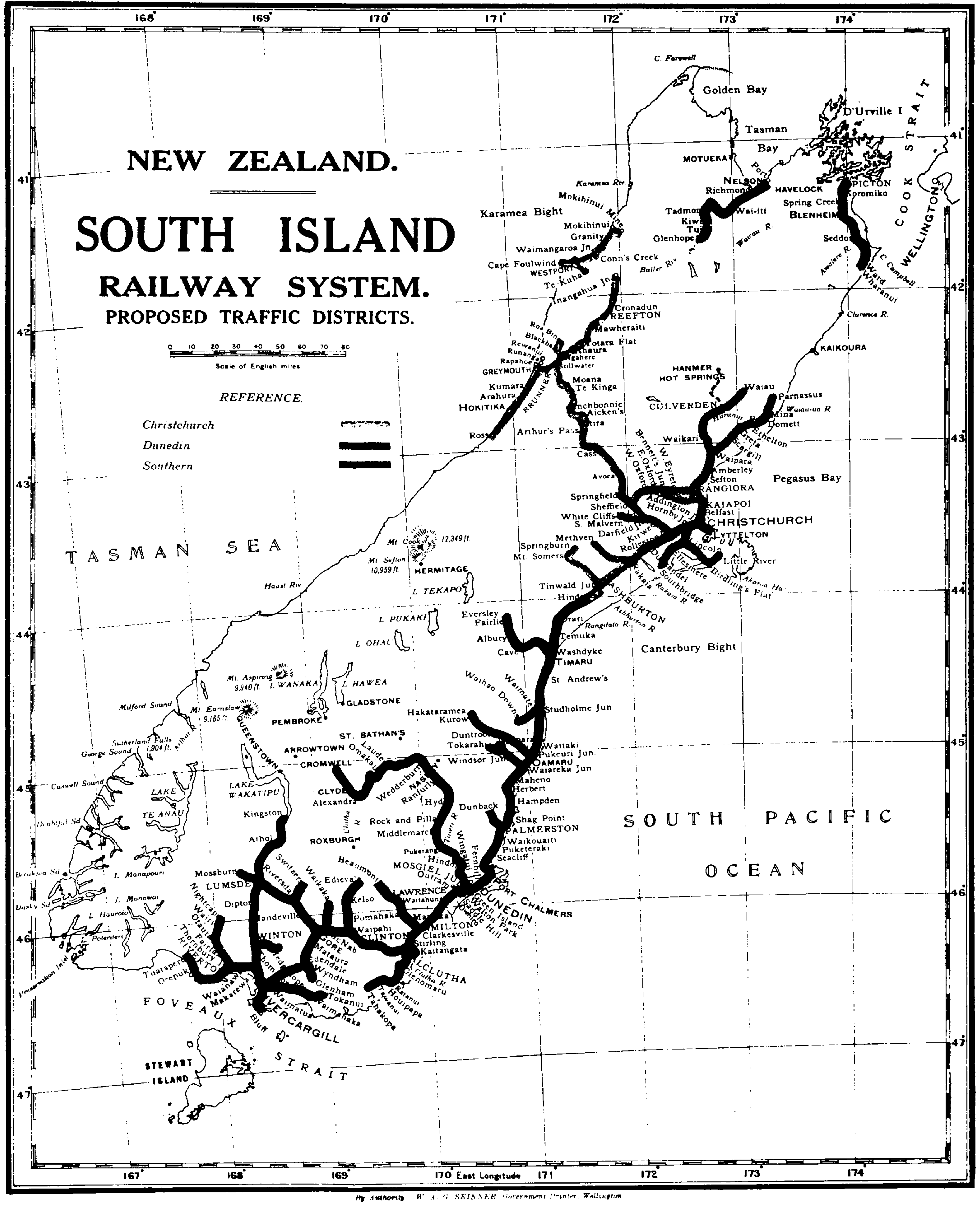
PROPOSED TRAFFIC DISTRICTS.

Scale of English miles.

REFERENCE.

Wellington	═
Western	▬
Auckland	▨

By Authority: W. A. G. Skinner, Government Printer, Wellington.



NEW ZEALAND.

SOUTH ISLAND RAILWAY SYSTEM.

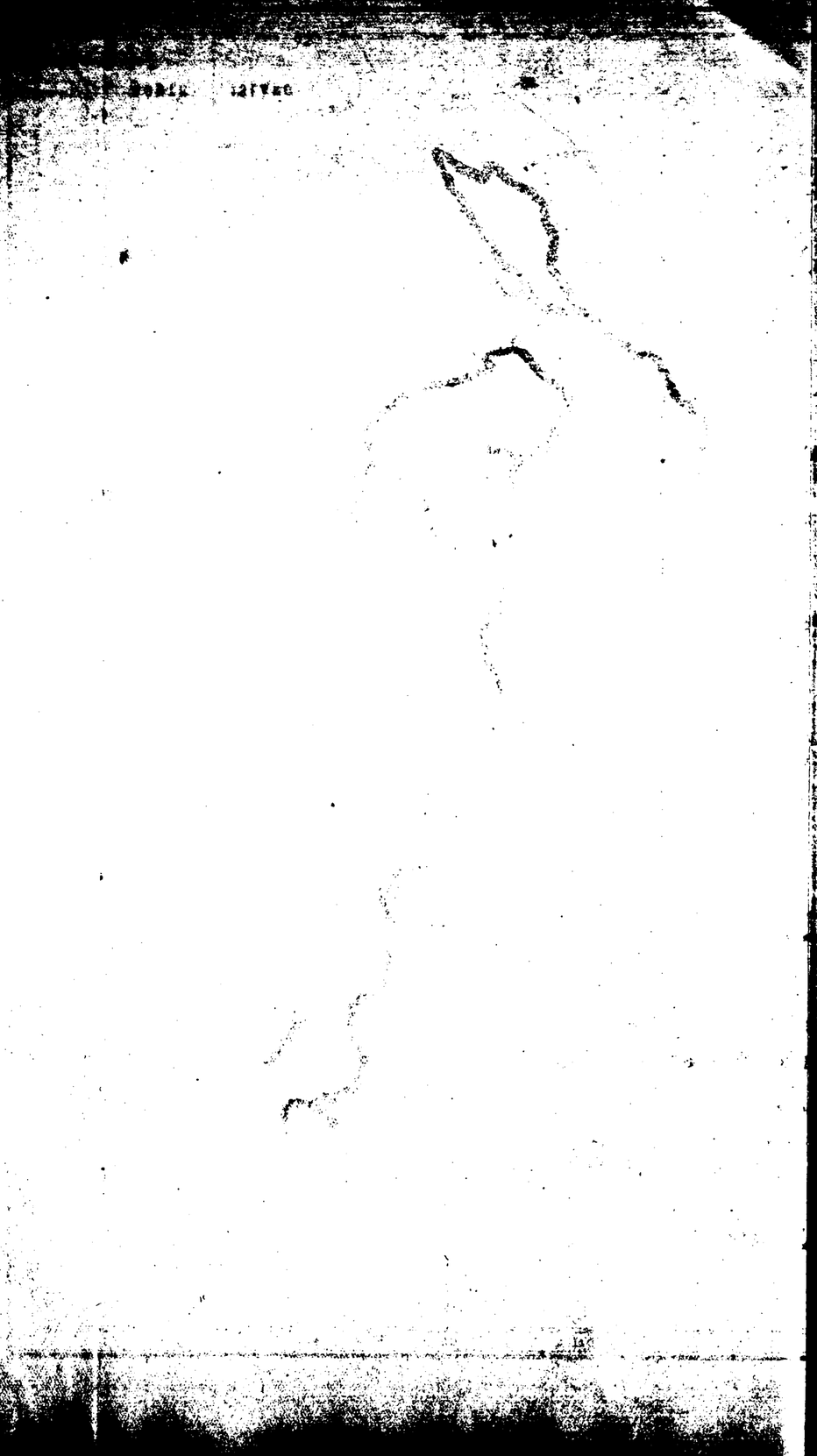
PROPOSED TRAFFIC DISTRICTS.

Scale of English miles.

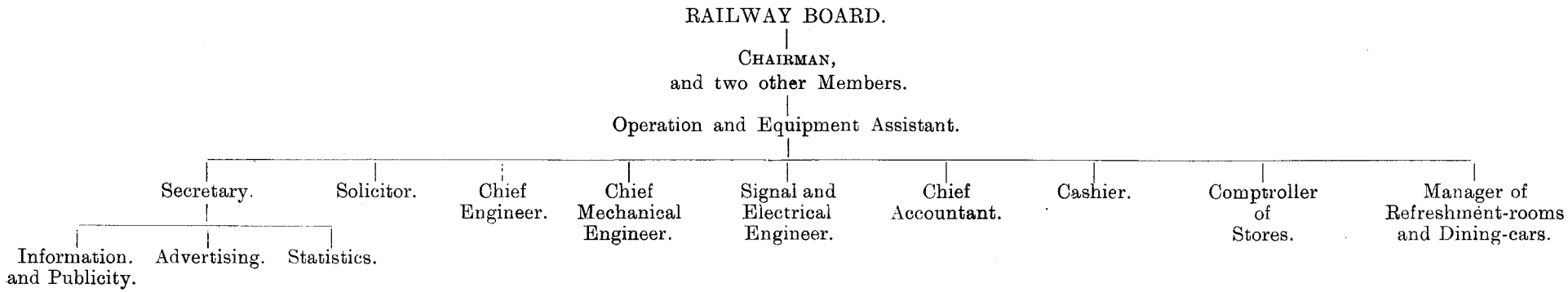
REFERENCE.

Christchurch	▨
Dunedin	═
Southern	▬

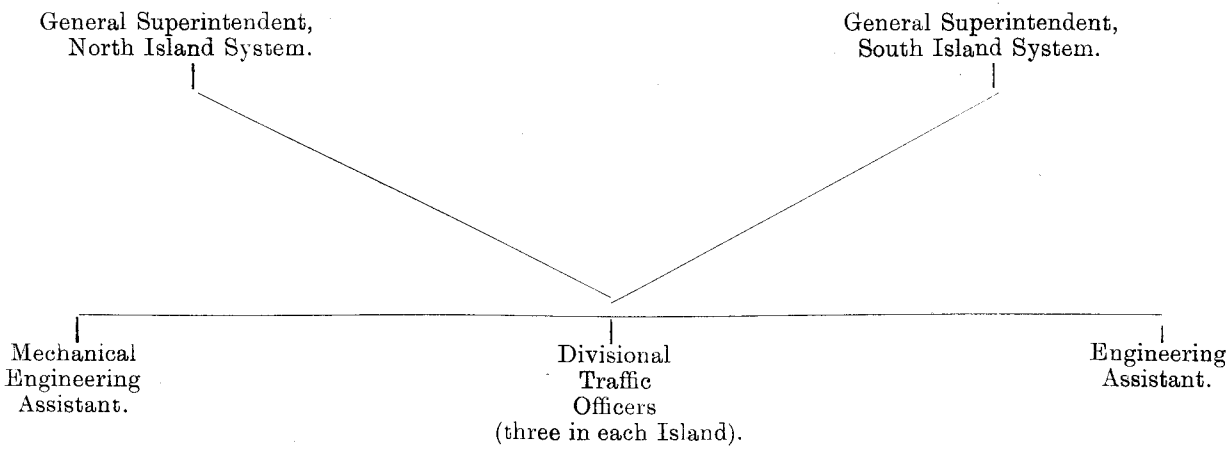
By Authority: W. A. G. Skinner, Government Printer, Wellington.



PROPOSED HEADQUARTERS ADMINISTRATION.



PROPOSED AREA ORGANIZATION.



IV. MANAGEMENT.

(*a.*) Permanent-way and Works.

The Permanent-way and Works Department is controlled by the Chief Engineer, stationed at Wellington, whose organization is shown on the accompanying chart.

Headquarters Staff.

There is an Assistant Chief Engineer at Wellington, and a headquarters staff of two Inspecting Engineers, a Land Officer, clerks, and draughtsmen.

An inspection of the several districts is made once each year by one of the Inspecting Engineers, with a view to co-ordinating the methods of work. The other Inspecting Engineer acts in the capacity of Designing Engineer. The Land Officer has charge of the arrangements in connection with the taking of land, keeping up of land-plans, leasing of land, private sidings, agreements, easements, &c.

District Engineers.

So far as the Engineering Department is concerned the system is divided into nine districts, five in the North and four in the South Island. Each of these is in the charge of a District Engineer, who has under him an Assistant District Engineer, Inspectors of Permanent-way, a Foreman of Works, and Bridge Inspectors.

The District Engineers are responsible for the maintenance of track, bridges, buildings, and all fixed structures and all new constructional work. The Foreman of Works is responsible to the District Engineer for the upkeep of structures and appliances and for any new structural or building works, while the Bridge Inspectors—under the Foreman of Works—inspect all bridges at least once in every three months, and examine and report on buildings, sanitary arrangements, appliances, &c. The Inspectors of Permanent-way attached to the District Engineer control the line gangs, relaying, ballasting, and earthworks gangs on the various sections of line.

Mileage.

The route-mileage of line for which the Chief Engineer is responsible was 3,064* as at the 31st March, 1924, with a track mileage of 3,107, consisting of 3,021 single and 86 double tracks.

The total track mileage, average single track, including sidings, maintained for the twelve months ended the 31st March, 1924, was 3,942.

Gradients and Curves.

The percentage of steep gradients on the New Zealand railways is comparatively large. Between Auckland and Wellington 6 per cent. of the track is steeper than 1 in 50, 27 per cent. is steeper than 1 in 100, and over 60 per cent. is steeper than 1 in 200. From Marton to New Plymouth there are some 12 miles of grades approximating 1 in 35, and of the total length 20 per cent. of the track has grades steeper than 1 in 50, 40 per cent. has grades steeper than 1 in 100, and over 70 per cent. has grades of 1 in 200 or steeper.

For the whole of New Zealand the average percentage of grades is as follows:—

Under 1 in 50	9 per cent. of total mileage.
Under 1 in 75	19 per cent. of total mileage.
Under 1 in 100	25 per cent. of total mileage.
Under 1 in 200	50 per cent. of total mileage.

So far as curvature is concerned, of the total mileage 6 per cent. has curves of 10 chains and under, 12 per cent. has curves of 15 chains and under, and a total of 26 per cent. of the track is curved.

* Annual Railway Report for 1924 shows 3,053 route-miles in general statement.

Rails, Sleepers, and Ballast.

The gauge of the track of the New Zealand railways is 3 ft. 6 in. The rails used are the steel Vignole pattern to British Standard Specifications: Main lines, 70 lb. per yard, 42 ft. long; branch lines, 55 lb. per yard, 36 ft. long. 100 lb. rails, 42 ft. long, are laid on the Otira electrified section—*i.e.*, between Otira and Arthur's Pass and in the Lyttelton Tunnel. With regard to rail strength, we are of opinion that all new lines likely to become main lines should be laid with rails having a minimum of 70 lb. section. It is unfortunate that a contract should have been arranged for 55-lb.-section rails for certain portions of the East Coast Main Trunk Railway.

There were at 31st March, 1924, 1,613 miles of track with 56 lb. rails or lighter, and 1,451 with 70 lb. rails or heavier (including 16 miles of 65 lb. track). The fish-plates are of British standard plain type. Bed-plates are used at joints on softwood sleepers and some on curves, the number depending on the sharpness of the radius.

The sleepers are of imported hardwood or New Zealand softwood, measurements being 7 ft. by 8 in. by 5 in.; jarrah from Western Australia has of late years been largely used. The total quantity of sleepers in track approximates 7,000,000, the annual replacements taken over the last ten years averaging 198,500. The ballast is, as a general rule, river-run shingle, but, where this is not obtainable, broken metal is used.

Maximum Speed of Trains.

The maximum speed allowed varies from 25 miles per hour on a 5-chain curve to 50 miles per hour on the straight, but the general instruction as to speeds is as follows:—

Description of Line.	Miles per Hour.		
	Express and Passenger.	Mixed.	Goods.
On curves 12 to 15 chains radius	35	30	25
On curves 9 to 11 chains radius	30	25	20
On curves less than 9 chains radius	25	25	20

In his evidence the Chief Engineer said that the trains could run with safety at a higher rate of speed than was the case to-day, but he had not been approached in the matter by either the Locomotive Department or the Traffic Department.

Rail-breakages.

The rail-breakages during the last five years totalled 347, 60 per cent. of these being at joints, 11 per cent. at split heads, and 29 per cent. fractures in web, head or bottom flange. The number of these breakages in terms of age of rail was:—

—	Age of Rail.								
Years	5	10	15	20	25	30	35	40	45
Number of breakages	4	37	104	59	30	25	51	21	16

Maintenance of Track.

Minor repairs to track, surfacing, &c., are carried out by line gangs. These men reside, as far as possible, at each end of their length, and make an inspection going to and from work. The length is also inspected by the ganger once a week.

On dangerous portions of the line, as also during stormy weather, special inspections are made at the discretion of the ganger. The average number of men employed in line gangs per mile is as follows :—

Section.	Number of Men per Mile.	Number of Miles per Man.
Main lines, North Island	0·667	1·500
Main lines, South Island	0·647	1·545
Branches, North Island	0·578	1·729
Branches, South Island	0·507	1·970
Average main line and branches, North Island	0·622	1·615
Average main line and branches, South Island	0·577	1·758
Average for New Zealand	0·600	1·686

It is not the practice on the New Zealand railways to employ flying gangs in connection with the maintenance of branch lines where the train service is light, and we think consideration might with advantage be given to this.

A normal gang consists of a ganger and three surfacemen, and the average length for such a gang is approximately 6¾ miles.

Relaying, Sleepering, and Ballasting.

The relaying programme is on the basis of an approximate annual mileage to be undertaken to keep the track up to standard. The present programme is 100 miles of relaying per year. Track worn to the limit, or where corrosion necessitates renewal, is first dealt with; then track necessitating heavier metals owing to the use of heavy engines; and then track where the traffic makes it advisable to raise the standard.

During the twelve months ended the 31st March, 1924, 81¾ miles of line were relaid, while 235,372 sleepers were used in connection with relaying and renewals, and 202,414 cubic yards of ballast. A comparative statement for the period 1915 to 1924 follows :—

Twelve Months ended 31st March.	Relaying.						Sleepers.	Ballast.
	100 lb.	70 lb.	55 lb.	Second-hand.	Total.	Exclusive of Second-hand.		
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Number.	Cub. Yard.
1915 ..	..	70¼	14	11¼	95½	84¼	228,644	371,835
1916 ..	..	36½	9	12	57½	45½	158,223	406,544
1917 ..	..	21½	7½	1	30	29	92,419	239,002
1918 ..	..	13¼	..	..	13¼	13¼	93,480	164,807
1919 ..	½	5¾	..	¾	7	6¼	79,485	88,918
1920 ..	..	5	..	1¾	6¾	5	82,968	86,805
1921 ..	..	20	1¼	¾	22	21¼	105,579	89,866
1922 ..	½	33	8¾	¼	42½	42¼	145,734	173,911
1923 ..	½	26¼	17¼	4¼	48¼	44	172,746	161,553
1924 ..	..	62	9½	10¼	81¾	71½	235,372	202,414

Relaying Gangs. — The usual strength of a relaying gang is twelve men, and their principal work is the relaying of the track, but they sometimes perform special work in connection with yard-construction. Rails are stacked at convenient places up to 20 chains apart alongside the track where relaying is in progress.

Cost of Maintenance of Way, Works, and Buildings.

As will be seen from the following statement, the milage of lines open for traffic increased by 3·32 per cent. during the period 1915 to 1925, while the maintenance of way, works, and buildings showed an increase of 54·80 per cent., and the cost per mile 49·60 per cent.

Twelve Months ended 31st March,	Total Miles of Line open for Traffic.	Maintenance of Way, Works, and Buildings.	Cost per Mile open.
		£	£
1915	2,955	738,550	250
1916	2,970	740,349	249
1917	2,970	720,840	243
1918	2,993	710,655	237
1919	2,993	752,558	251
1920	3,006	837,910	279
1921	3,018	1,053,049	349
1922	3,030	1,111,883	367
1923	3,037	1,040,892	343
1924	3,053	1,143,282	374
Increase 1924 over 1915	3·32 per cent.	54·80 per cent.	49·60 per cent.

It must, of course, be borne in mind that costs—both in respect of wages and material—have advanced very considerably since 1915.

The standard of maintenance on the New Zealand railways is a high one, and the only criticism that could be applied is that on certain of the branch lines it is unusually high. In his evidence the Chief Engineer stated that he was hoping to decrease his maintenance expenditure, at the same time keeping the line in as good a condition as it is to-day.

Life of Rails.—Except on steep grades carrying heavy traffic, the Department anticipate a life of from twenty-five to thirty years in respect of their rails.

Construction of New Lines.

The Chief Engineer, while carrying out deviations and yard improvements, does not construct new lines, this being in the hands of the Public Works Department. Having regard to the fact that that Department has the plant, equipment, and organization, and that the work is carried out on mainly contract lines under piecework, practically no day labour being used, it would be inadvisable to make any alteration in the existing arrangements.

The Chief Engineer has not until recently been consulted with regard to alignment, and is, therefore, in no way responsible for curves or gradients, or for the cost in deviation to ease grades, which is going on at present.

Expenditure Estimates.

At the commencement of the financial year the Chief Engineer forwards to the General Manager an estimate of the sum required during the ensuing year for the maintenance of track, structures, &c., and, when the estimates are passed by Parliament, an amount is allocated by the Chief Engineer to each district. In his evidence the Chief Engineer said he was not held up by the delay in the passing by Parliament of these estimates.

Permanent-way Workshops.

There are Maintenance workshops at the following centres: Penrose (Auckland District), East Town (Wanganui District), Kaiwarra (Wellington District), Addington (Christchurch District), Dunedin, Invercargill, and Greymouth. The work done at these shops is as follows:—

Carpenters' Work.—Joinery-work, fittings, furniture, &c., for buildings of all kinds; structural timber-work, such as water vats and stands, windmills, stock-yards, name-boards, notice-boards, &c.; making and repairing trollies, and velocipedes; making bridge spans, trusses, trestle piers, &c.

Plumbers' Work.—Making tanks, baths, lamp-cases, &c.; preparing for sanitary work, gas and water services, and building-work, &c.

Painting Work.—Painting and writing notice and name boards; priming wood and iron work for country jobs; glazing sashes and lamps; painting velocipedes, trollies, &c.; preparing and mixing paints for outside jobs.

Blacksmiths' Work.—Preparing all classes of ironwork for bridges, wharves, water services, cranes, pumps, buildings, velocipedes, &c.; making and repairing Permanent-way and Works staff tools; repairs to track material, points, rods, crossings, &c.; bending rails for overbridges, verandas, and other structural work.

Fitters' Work.—Repairing oil-engines, pumping plants, stone-crushers, wind-mills, rams, turntables, weighbridges, fixed cranes, velocipedes, trollies, and generally all fixed appliances.

In Dunedin, Kaiwarra, East Town, and Penrose small bridge-girder work is also done. Motor velocipedes are made at Dunedin and Penrose.

All work is carried out under job-numbers, with separate standing job-numbers for general shop expenses, tools, and supervision.

General Remarks.

In our opinion the New Zealand railway-track has been exceedingly well laid, and the standard of maintenance is a high one. Such a high standard naturally reflects itself in the cost, and we think that in the case of branch lines, where the traffic is light, flying gangs might be usefully employed instead of having men permanently stationed there.

We think consideration should be given to the question of reducing the number of District Engineers, of which there are nine. Three in each Island should adequately meet the case, thus enabling higher salaries to be given without increased cost.

Absence of Reserves.

No cash reserves exist to meet relaying, the work done year by year being relied upon to keep the lines up to standard. Based upon the life of rails, there should be an average of at least 100 miles relaid each year. It is not possible to determine future costs, but on the present price of material and labour a figure may be given of £3,000 per mile, a total of 100 miles representing £300,000 per annum. In the event of a less mileage being relaid in any one year, we are of the opinion that a reserve, representing wastage, should be set up to provide for the future and to keep accounts under this head level year by year.

Proposed Deviation of Existing Lines and Improvements in Terminal Accommodation.

The works foreshadowed in the programme of improvements, involving an estimated expenditure of £8,081,500 to be spread over the coming eight years, includes the balance of the cost of works authorized under the Railways Improvement Authorization Act, of 1914. In the main the proposed works are designed to facilitate traffic movement by reduction of grade and enlargement of terminal accommodation. Considering firstly the deviations and works proposed at and in the neighbourhood of Auckland and Wellington we have no hesitation is confirming the necessity for a rearrangement of approaching lines and of the stations and goods-yards at these places. The cost of manipulation of traffic and the running-expenses, due in each instance to excessively steep grades and inadequate station accommodation, accounts for the meagre return, in many cases, upon traffic conveyed to and from these centres.

Auckland Proposals.

The Auckland passenger lay-out we consider could be improved by the provision of a complete through-running station instead of a dead end main-line station as shown on the plan. As the city grows there will be suburban passenger traffic from north to south, and *vice versa*, and this could be provided for as well as the main-line services in one station. With regard to the yards and sidings, the present traffic does not justify such expensive sidings and accommodation as the plan provides.

Whatever lay-out may ultimately be decided upon, the work should only be carried out as traffic grows, care, as a matter of course, being taken that any addition made from time to time conforms to the complete scheme. As in the proposals for meeting traffic requirements at other places, the changes brought about by dividing passenger from goods traffic as far as possible will need study in conjunction with the operating staff so that the latter may have at their disposal sidings and connections best suited to the direction and volume of traffic at each station. The reduction of grade alone is justification for the Auckland–Westfield deviation line, which is urgent also by reason of traffic increase. The double tracking of the existing line between Westfield and Penrose Junction is also a pressing necessity.

Suggested Rearrangement at Wellington.

At Wellington the deviation-lines on the Tawa Flat and the Hutt Valley should prove financially successful and greatly improve the running of trains. As in the case of Auckland, the lay-out of the station and yard to the extent shown on the plan is not justified by the present traffic, and should be carefully studied with a view of meeting requirements from time to time, any additions being in accordance with the complete scheme. Here again a rearrangement of passenger and goods working may lead to some considerable modification of the scheme. Existing lines and sidings are certainly inadequate and costly to work; a considerable enlargement more or less on the lines shown on the plans is badly needed.

Palmerston North Deviation, &c.

Palmerston North deviation and the new station and yards are a necessity of traffic operation to-day. Congestion, with its consequent cost over and above the normal, is evident day by day, and during busier seasons it must obviously be far worse than it is at the time we are writing. It should without doubt be relieved as soon as possible. In this connection we may refer to the Levin and Marton new line, advocated as an alternative to some extent for expenditure at Palmerston North. Even if a direct line be made between Levin and Marton the necessity for a complete realignment and extension at the former place would still obtain. If no railways existed in New Zealand and it were desired to construct a direct line between Wellington and Auckland, it is more than probable that the Levin-Marton route would be chosen, but, unfortunately for the advocates of the new route, the lines centering upon Palmerston North do exist and must so continue, and be provided with train services not only for the district immediately adjacent to Palmerston North, but also as a junction point for traffic east (Hawke's Bay line) to and from south, north, and west, as well as the Wairarapa line to and from the same districts. The route from Levin to Marton does not, apart from bridges, offer any physical or costly difficulties of construction, and the district is a good one from an agricultural point of view, but the fact remains that two railways will have to be maintained and worked when this line is constructed. The time will come, no doubt, when a doubling of Main Trunk lines will have to be considered seriously, and then it will probably be found desirable to relieve the Palmerston North route by an alternative north and south line between Levin and Marton.

Christchurch and Lyttelton Tunnel Works.

The Government, having committed itself to the doubling of the Lyttelton Tunnel, no remark is called for from us, but the proposed site of a new shunting-yard at Woolston appears to us to need further consideration. Such a yard would without doubt deal effectively with traffic to and from Lyttelton; it would not however, serve traffic proceeding from north of Christchurch southward, and *vice versa*. When the complete railway system of the South Island becomes an accomplished fact a yard at Woolston would be available for a portion only of the traffic passing through Christchurch, and in our opinion it would be wiser to anticipate future requirements by selecting a site suitable for traffic movement north and south as well as to and from Lyttelton.

Rimutaka Deviation.

Engineering difficulties make any alleviation of the slow and costly movement of traffic over the present incline a matter of considerable expenditure, which, as traffic grows, will have to be faced. There is, however, a means whereby on the existing line an early and comparatively cheap method of expediting trains to some extent and reducing costs could be secured—viz., by building suitable articulated engines for this particular service—probably £50,000 would cover the cost of such machines, and they could be at work within twelve months.

Other Proposals.

With regard to the proposed expenditure upon locomotive workshops and equipment, our report upon "Management (Mechanical)" deals fully with the needs of the railway under this heading.

The various items of proposed expenditure upon doubling of lines and smaller deviations, together with strengthening of bridges, should doubtless be carried out as soon as possible, and the same remark applies to the electric lighting, signals, telephones, and telegraphs.

There are a number of items of expenditure proposed for rearrangement of stations; our remarks upon the Wellington and Auckland lay-out apply to these. They should be studied in the light of changed train-operation facilities. It may be that some of these will be found unnecessary under altered conditions.

New Lines.

The location and order of construction of new lines for developmental purposes are questions upon which we do not feel competent to express a decided opinion; only those who know the country and its possibilities are competent to offer suggestions of value upon these subjects; there is, however, one important link in the chain of railway communication upon which we think it desirable to express an opinion—viz., that of the gap between Ward and Parnassus. It is not so much in the local advantage of such a line that we view its completion as of greater importance than some other railways upon which considerable sums have been spent; it is because of the possibilities offered by its construction of making a complete railway transport system between all parts of the North and South Islands without change of carriage in the case of passengers or break of bulk or delay in the incidence of goods traffic that we advocate its construction.

Train Ferry between Picton and Wellington.

With this line in being a train ferry between Picton and Wellington (or, if possible, a bay with sheltered water and easily available by a short railway nearer the South Island) would give all the advantages of throughout rail transit between the two Islands. Some day, no doubt, this form of communication will be established. The sooner it is done, looked at from a railway administration point of view only, the earlier will be the time when it will be possible to operate the system as a whole as economically and efficiently as in countries where lines are not disjointed. The public aspect needs but little demonstration.

Throughout communication would make the two Islands one in so far as transport is concerned. Internal trade would benefit by through rates and fares and avoidance of break of bulk. The cost of landing stations and ferry-boats capable of conveying upwards of fifty ordinary goods vehicles need not entail very great expenditure in proportion to the advantages foreshadowed and the prospects of revenue to be obtained. Probably £500,000 would be found sufficient.

Wherever train ferries have been provided they have developed travel and traffic to a very much greater extent than obtained under former shipping conditions. Between Denmark and Sweden, Germany and Sweden, in North and South America, this form of bridging the seas has been adopted with success. Recently a train-ferry service has commenced to run across the North Sea between Harwich and Zeebrugge.

IV. MANAGEMENT—*continued.*

(*b.*) Signal and Electrical Engineering.

Under the present organization of the New Zealand railways the Signal and Electrical Branches are amalgamated under the supervision of a Signal and Electrical Engineer. The technical staff includes an Assistant Signal and Electrical Engineer, Chief Signal Inspector, Chief Electric Lines Inspector, Signal Instruction Assistant, Superintendent of Signal Shops, and a Chief Draughtsman. The total number of employees in the department is 416, of which 32 are in the shops and 384 on the outside staff.

The Signal and Electrical Engineer is responsible for the installation and maintenance of all signal interlocking appliances, line wire and poles for telegraph, telephone, and safe working instruments, all electrical machinery and lighting (except at Otira), and the overhead gear in connection with the electrified line between Arthur's Pass and Otira.

Workshops.

The workshops are situated in Wellington, and deal chiefly with the assembling of apparatus supplied on indent from England, maintenance repairs to mechanical and electrical apparatus, rewinding of motors and transformers, and the manufacture of switchboards and certain small pieces of apparatus for special purposes. The shops are divided into a mechanical and electrical shop and a small test-room, and, in spite of the fact that they were not built for the particular work for which they are used, are sufficient for present-day requirements. However, the construction of the new Wellington Station and yard will necessitate the removal of the shops, and it is proposed to erect new ones elsewhere.

All the work done in the shops is charged against a job-number, which is entered on an order form. A return of labour and material used on each job is forwarded to Head Office, where 20 per cent. is added to the labour charge for overhead expenses. Raw materials are obtained from the Stores Branch on requisition, the Stores Branch making a charge of $2\frac{1}{2}$ per cent. for transport and overhead costs. No piecework or premium methods of payments are in force.

Safe-working Equipment.

Of the 3,053 route-miles open for traffic there are 1,653 miles equipped with block working (tablet), $33\frac{1}{2}$ miles of double line with block and lock, 8 miles of double and 82 miles of single line with automatic signalling, 198 miles signalled without block working; 2,016 miles of track are signalled, leaving 1,037 miles which are unprotected by any form of signal. On these lines the train order system is in operation.

Electrical Equipment.

The electrical installation for lighting of houses, stations, signals, &c., provides for a total lighting and heating load of 1,196 kilowatts. Electric motors and dynamos are installed at twenty-five places. In addition there are five substations and transformers. The total number of motors maintained by the Department is 283.

Standardization of Signals.

Prior to the time when electric signalling was brought into use on the New Zealand railways the two-position lower-quadrant mechanical signal, pivoted in the centre, was the standard installation. With the advent of electric signalling, however, the three-position upper quadrant was brought into operation. This was immediately followed by the three-position daylight colour-light signal, which, in view of the economy arising from the elimination of all moving parts, has been adopted as a standard type of signal.

The standard signal system for single-line working is the absolute permissive block system, the departure signal being normally at "Danger," while the intermediate signals are normally at "Clear," with the opposing departure signals electrically locked.

Advantages of Automatic Signalling.

The signalling and safe-working appliances all over the line are up to modern standards, and are well maintained, reflecting credit on the Department. The policy of installing automatic signalling is, in our opinion, a sound one, in view of the greatly increased facilities afforded to train operation, the relatively high wages, and the eight-hour day.

Increased Expenditure.

During the last ten years the exigencies of traffic-working and the increased wages have entailed the provision of more up-to-date signalling-appliances. This is reflected in the maintenance expenditure. The annual maintenance expenditure in 1914 was £22,493, as against 70,912 in 1924, showing the average cost per mile open for traffic as £7·85 in 1914 and £22·96 in 1924.

The programme for the next five years allows for a total expenditure of £710,000, made up as follows:—

	£
Signal Section—	
Automatic signals	400,000
Signal interlocking generally	100,000
Telegraph and telephone	65,000
Electrical Section—	
Lighting of stations and houses	75,000
Electrification of locomotive workshops	70,000

Stores.

The Signal and Electrical Department does not manufacture articles for use in signal and electrical installations as a general practice, but make certain small items. The major portion of the requirements come from overseas, and this necessitates a large amount of stores on hand, mostly small electrical material, over which an adequate check must be maintained.

We are satisfied that due regard has been paid to the importance of keeping the stores in an orderly manner. The card system adopted enables those responsible to regulate the supply, and at the same time to keep a close check on the material on hand. This is in marked contrast to the practice in the Stores Branch, upon which we comment in Section IV (*d*) of our report.

IV. MANAGEMENT—*continued.*

(*c.*) Mechanical.

The Locomotive Department is under the control of the Chief Mechanical Engineer, who is responsible to the General Manager for maintaining in working-order the rolling-stock of the railway. He also inspects and maintains all steam boilers (stationary and portable). In the case of the boilers of the lake steamers, which are under the control of the Government Marine Department, these are maintained by the Locomotive Branch to the satisfaction of an officer of the Marine Department. In addition, he inspects some fifty boilers which are worked under the control of the Public Works Department.

The Locomotive Department inspects and maintains all steam-cranes, power-drivers, and steam shovels used in connection with the railway, all pneumatic coaling-cranes, both portable and stationary, and all portable cranes (hand or power) that run on the line on their own wheels.

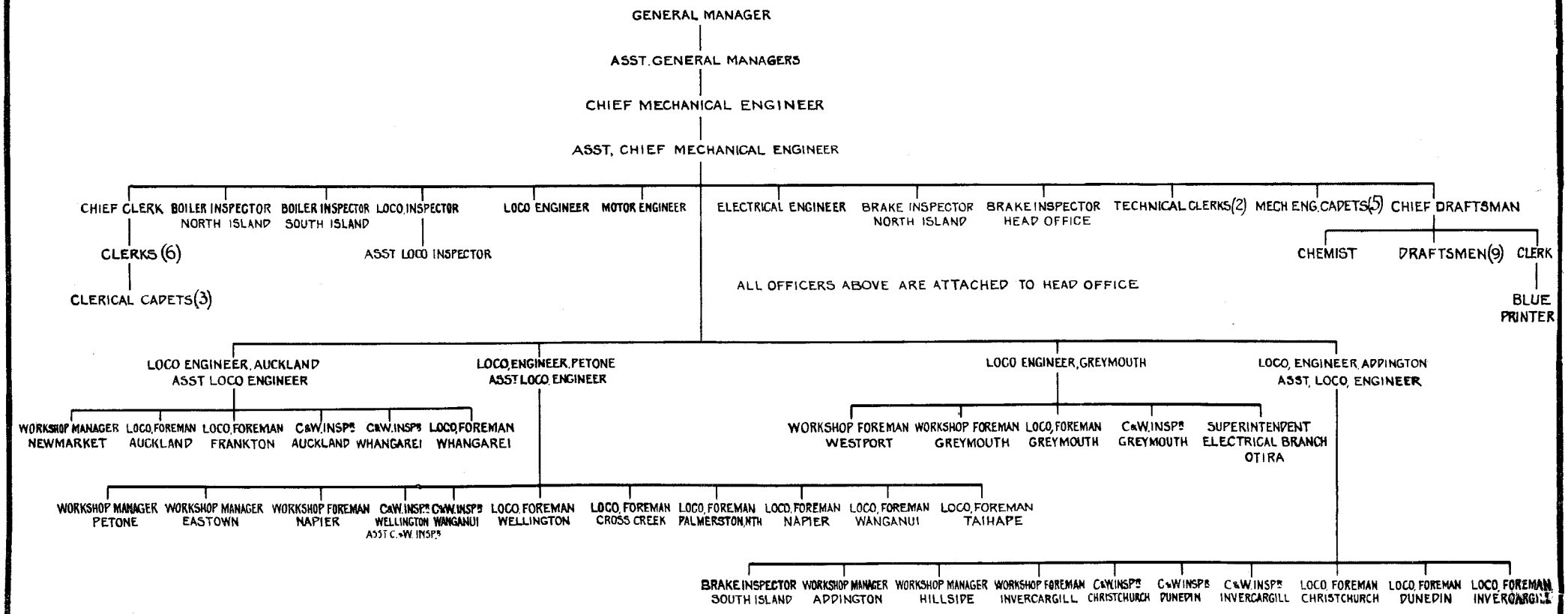
This department also operates and maintains hydraulic power-house and hydraulic cranes, and maintains hydraulic capstans used for the transfer of goods between rail and ship at Greymouth; and also operates and maintains steam-cranes used for a similar purpose at Westport and Whangarei. In cases where cranes are operated by other branches of the Service the men operating them are first required to pass an examination conducted by the Locomotive Department. The power plant at Otira supplying power for the electrified section between Otira and Arthur's Pass is operated and maintained by the Locomotive Department, and such repairs and maintenance work to engines, boilers, and equipment of the three lake steamers at Queenstown as can be dealt with by the Locomotive Department are carried out as directed by the Inspector of Machinery and Surveyor of Ships.

In the workshops at Addington are manufactured the cast-iron turntables and points and crossings required by the Railway Department and by the Public Works Department.

Organization.

The organization of the Chief Mechanical Engineer's Department is shown on the accompanying chart. It will be seen that the railway system is divided into four districts, each district being under the control of a Divisional Locomotive Engineer, two being stationed in each Island. The accompanying maps show the extent of the districts supervised by these officers, and also indicate the various locomotive-depots. The Head Office of the Department is situated at Wellington.

GENERAL ORGANIZATION
OF
LOCOMOTIVE BRANCH



NOTE. SMALL ISOLATED SECTIONS AT KAIHU, GISBORNE, PICTON, AND NELSON HAVE MODIFIED DIVISIONAL ORGANIZATION UNDER STATION-MASTERS-IN-CHARGE: THE LOCOMOTIVE STAFF, HOWEVER, ON THESE SECTIONS IS DIRECTLY UNDER THE CHIEF MECHANICAL ENGINEER.

Rolling-stock.

Particulars of the rolling-stock maintained by the Chief Mechanical Engineer as at 31st March, 1924 (the end of the last financial year) are set out below. It will be seen that there are 655 locomotives, 1,527 carriages, 461 brake-vans, and 25,734 freight vehicles, including service stock.

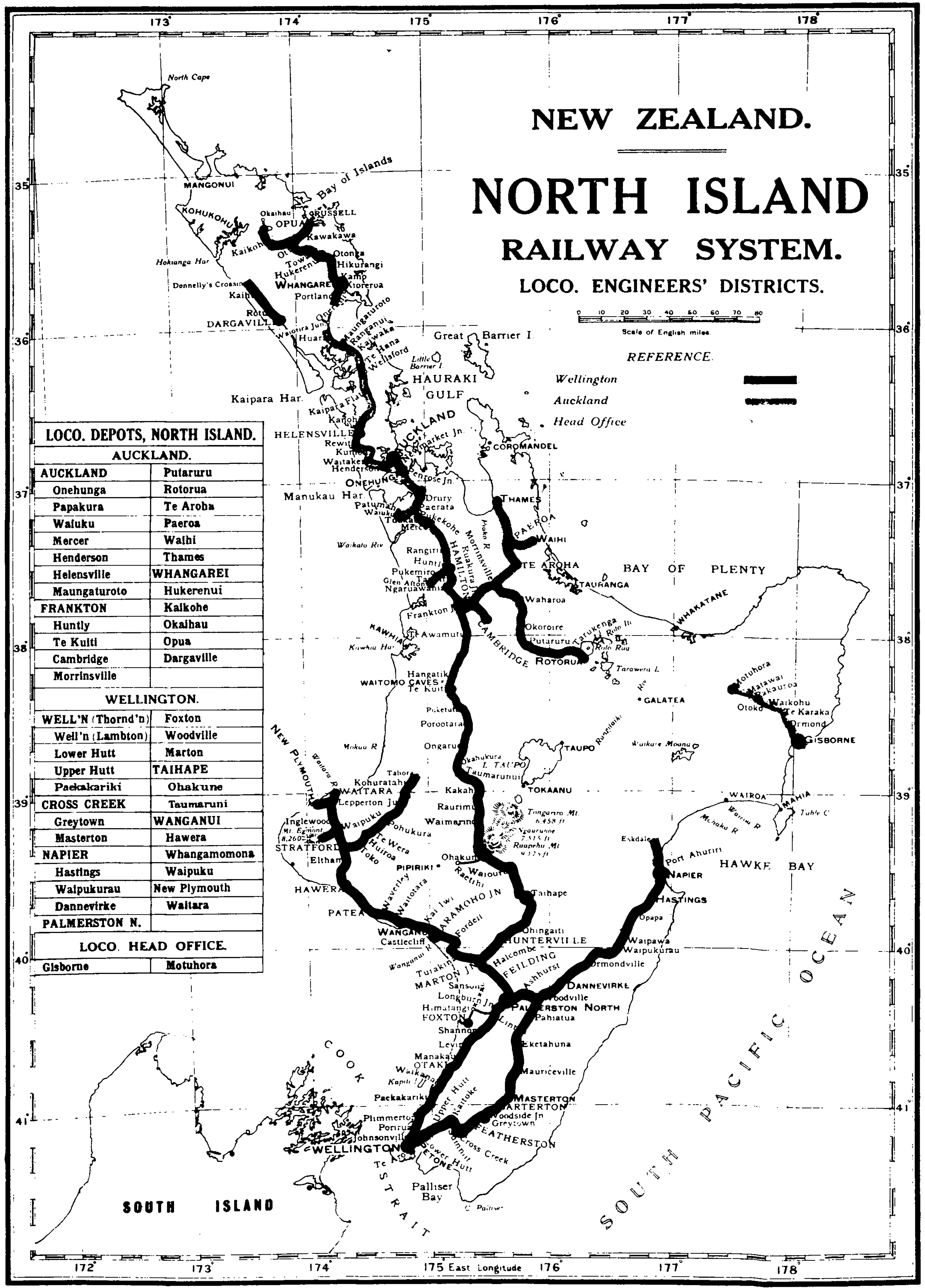
LOCOMOTIVE STOCK.

Class.	Type.	Number in Class.	Average Tractive Effort per Engine.	Class.	Type.	Number in Class.	Average Tractive Effort per Engine.
			lb.				lb.
A ..	Tender (4-cyl. balanced compound)	57	21,170	S ..	Single Fairlie	3	9,480
AA ..	Tender (superheated) ..	10	21,580	T ..	Tender	5	14,300
AB ..	Tender (superheated) ..	86	20,000	U ..	Tender	9	15,170
B ..	Tender	8	18,500	UA ..	Tender	6	14,590
BA ..	Tender	10	18,500	UB ..	Tender	22	14,590
BB ..	Tender (superheated) ..	30	20,940	UC ..	Tender	10	18,340
BC ..	Tender (compound) ..	1	16,080	UD ..	Tender	2	15,280
D ..	Tank	2	5,700	V ..	Tender	11	9,890
F ..	Tank	71	6,960	W ..	Tank	2	14,600
FA ..	Tank	18	9,090	WA ..	Tank	11	13,420
H ..	Tank (Fell)	6	21,320	WA ..	Tank (converted) ..	4	11,810
J ..	Tender	28	11,810	WAB	Tank (superheated) ..	2	22,250
K ..	Tender	5	7,500	WB ..	Tank	12	13,420
L ..	Tank	5	7,800	WD ..	Tank	18	15,780
LA ..	Tank	4	6,450	WE ..	Tank	2	19,080
M ..	Tank	4	10,240	WF ..	Tank	38	15,330
N ..	Tender	12	9,890	WG ..	Tank	20	15,330
NA ..	Tender (compound) ..	2	9,700	WH ..	Tank	2	7,850
NC ..	Tender (compound) ..	2	9,720	WJ ..	Tank	1	21,510
OA ..	Tender (compound) ..	1	13,175	WW ..	Tank	50	16,900
OB ..	Tender	2	15,720	WS ..	Tank (superheated) ..	8	22,250
OC ..	Tender (compound) ..	1	13,175	X ..	Tender (4-cyl. balanced compound)	18	26,620
P ..	Tender	8	11,850		Small tank	1	2,856
Q ..	Tender	13	18,350				
R ..	Single Fairlie	12	8,420		Totals	655	..

COACHING STOCK.

Class.	Type.	Number in Class.	Average Seating-capacity.	Class.	Type.	Number in Class.	Average Seating-capacity.
AA ..	First-class suburban, bogie, 50 ft.	11	60	A ..	Second-class bogie, 43 ft. ..	18	37
	Second-class suburban, bogie, 50 ft.	5	72		Second-class bogie, 44½ ft...	208	48
	Saloon bogie, 50 ft. ..	2	12		Second-class bogie, 46 ft. ..	4	52
	First-class bogie, 50 ft. ..	28	30		Second-class bogie, 47½ ft...	157	48
	Compo. (ladies') bogie, 50 ft.	6	37		Second-class bogie, 50 ft. ..	90	47
	Sleepers, bogie, 50 ft. ..	5	27		Second-class bogie, 52 ft. ..	1	60
	Sleepers, bogie, 50 ft. ..	5	30		4-compartment bogie, 44 ft.	49	40
	Second-class bogie, 50 ft. ..	36	44		4-compartment bogie, 47½ ft.	1	44
	Postal bogie, 50 ft. ..	1	..		4-compartment bogie, 47½ ft.	9	52
A ..	Ladies' bogie, 47½ ft. ..	4	29		3-compartment and guard bogie, 47½ ft.	1	40
	Royal saloon bogie, 44 ft. ..	1	12		3-compartment and guard bogie, 46 ft.	7	40
	Ministerial bogie, 41 ft. ..	1	12		2-compartment and guard bogie, 44 ft.	1	40
	Saloon bogie, 35 ft. ..	3	23		1-compartment and guard bogie, 44 ft.	13	36
	Saloon bogie, 37½ ft. ..	2	30		Postal bogie, 39½ ft. ..	2	..
	Saloon bogie, 39½ ft. ..	12	27		Postal bogie, 44 ft. ..	8	..
	Saloon bogie, 39½ ft. ..	2	30		Postal bogie, 50 ft. ..	9	..
	Saloon bogie, 41 ft. ..	1	22		Suburban, first-class bogie, 47½ ft.	5	64
	Saloon bogie, 41 ft. ..	7	27		Suburban, compo. bogie, 47½ ft.	4	64
	Saloon bogie, 44 ft. ..	1	33		Suburban, second-class bogie, 47½ ft.	2	64
	Corridor, first-class bogie, 47½ ft.	15	32		Suburban, second-class bogie, 47½ ft.	44	72
	Corridor, compo. bogie, 47½ ft.	28	41		Motor train, compo. bogie, 60 ft.*	8	88
	Corridor, second-class bogie, 47½ ft.	19	46		Motor train, 2-compartment and guard bogie, 60 ft.*	5	72
	Gallery bogie, 44 ft. ..	5	30	B ..	First-class bogie, 30 ft. ..	1	32
	First-class bogie, 43 ft. ..	11	36		Compo. bogie, 30 ft. ..	32	32
	First-class bogie, 44 ft. ..	1	30		Second-class bogie, 30 ft. ..	27	32
	First-class bogie, 44 ft. ..	4	38		Postal bogie, 30 ft. ..	1	..
	First-class bogie, 47½ ft. ..	99	34	C ..	Compo., six wheels, 30 ft. ..	10	32
	First-class bogie, 50 ft. ..	34	33		Second-class, six wheels, 30 ft.	25	32
	First-class bogie, 50 ft. ..	5	36	D ..	Second-class, four wheels, 20 ft.	3	20
	Compo. bogie, 39½ ft. ..	3	39				
	Compo. bogie, 39½ ft. ..	7	44		RAIL MOTOR-CARS.		
	Compo. bogie, 42½ ft. ..	2	35	R.M.	Second-class bogie, 42½ ft.	1	48
	Compo. bogie, 42½ ft. ..	43	44		Second-class bogie, 52 ft. ..	1	52
	Compo. bogie, 43 ft. ..	7	36				
	Compo. bogie, 44½ ft. ..	109	44		Total carriages in service ..	1,527	..
	Compo. bogie, 47½ ft. ..	169	44		Total seating-accommodation	..	65,447
	Compo. bogie, 50 ft. ..	15	38				
	Compo. (ladies') bogie, 50 ft.	3	38				
	Compo. bogie, 50 ft. ..	35	45				
	Second-class bogie, 35 ft. ..	3	34				
	Second-class bogie, 39½ ft...	13	44				
	Second-class bogie, 42½ ft...	17	46				

* Suburban type of carriage, not a motor train, as designated.



NEW ZEALAND.

NORTH ISLAND RAILWAY SYSTEM.

LOCO. ENGINEERS' DISTRICTS.

Scale of English miles
0 10 20 30 40 50 60 70 80

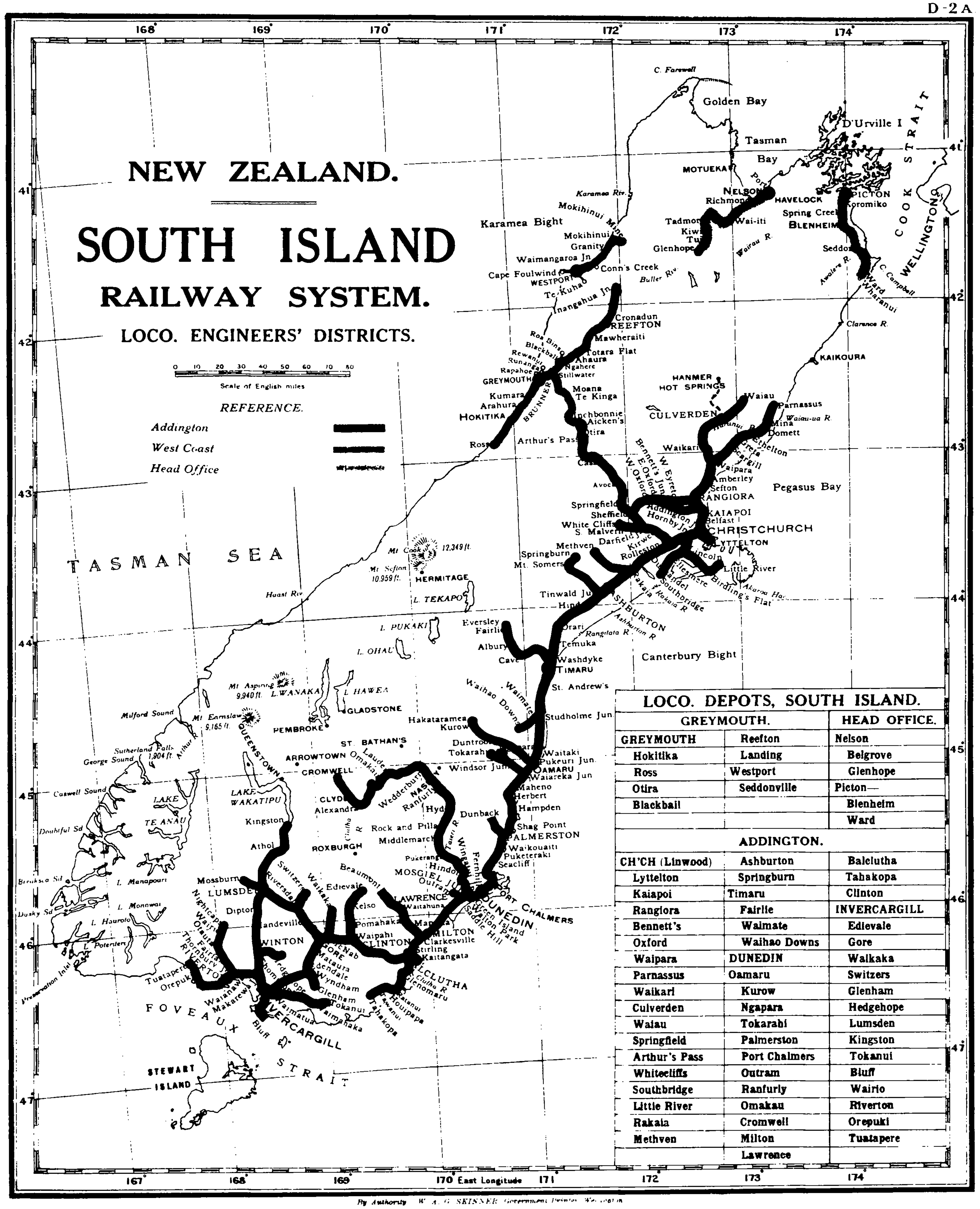
REFERENCE.

Wellington	▬
Auckland	▬
Head Office	●

LOCO. DEPOTS, NORTH ISLAND.

AUCKLAND.	
AUCKLAND	Putaruru
Onehunga	Rotorua
Papakura	Te Aroha
Waiuku	Paeroa
Mercer	Waihi
Henderson	Thames
Helensville	**WHANGAREI**
Maungaturoto	Hukerenui
FRANKTON	Kaikohe
Huntly	Okaihau
Te Kuiti	Opua
Cambridge	Dargaville
Morrinsville	
WELLINGTON.	
WELL'N (Thornd'n)	Foxton
Well'n (Lambton)	Woodville
Lower Hutt	Marton
Upper Hutt	**TAIHAPE**
Paekakariki	Ohakune
CROSS CREEK	Taumaruni
Greytown	**WANGANUI**
Masterton	Hawera
NAPIER	Whangamomona
Hastings	Waipuku
Waipukurau	New Plymouth
Dannevirke	Waitara
PALMERSTON N.	
LOCO. HEAD OFFICE.	
Gisborne	Motuhora

By Authority: W. A. G. Skinner, Government Printer, Wellington.



NEW ZEALAND.

SOUTH ISLAND RAILWAY SYSTEM.

LOCO. ENGINEERS' DISTRICTS.

Scale of English miles
0 10 20 30 40 50 60 70 80

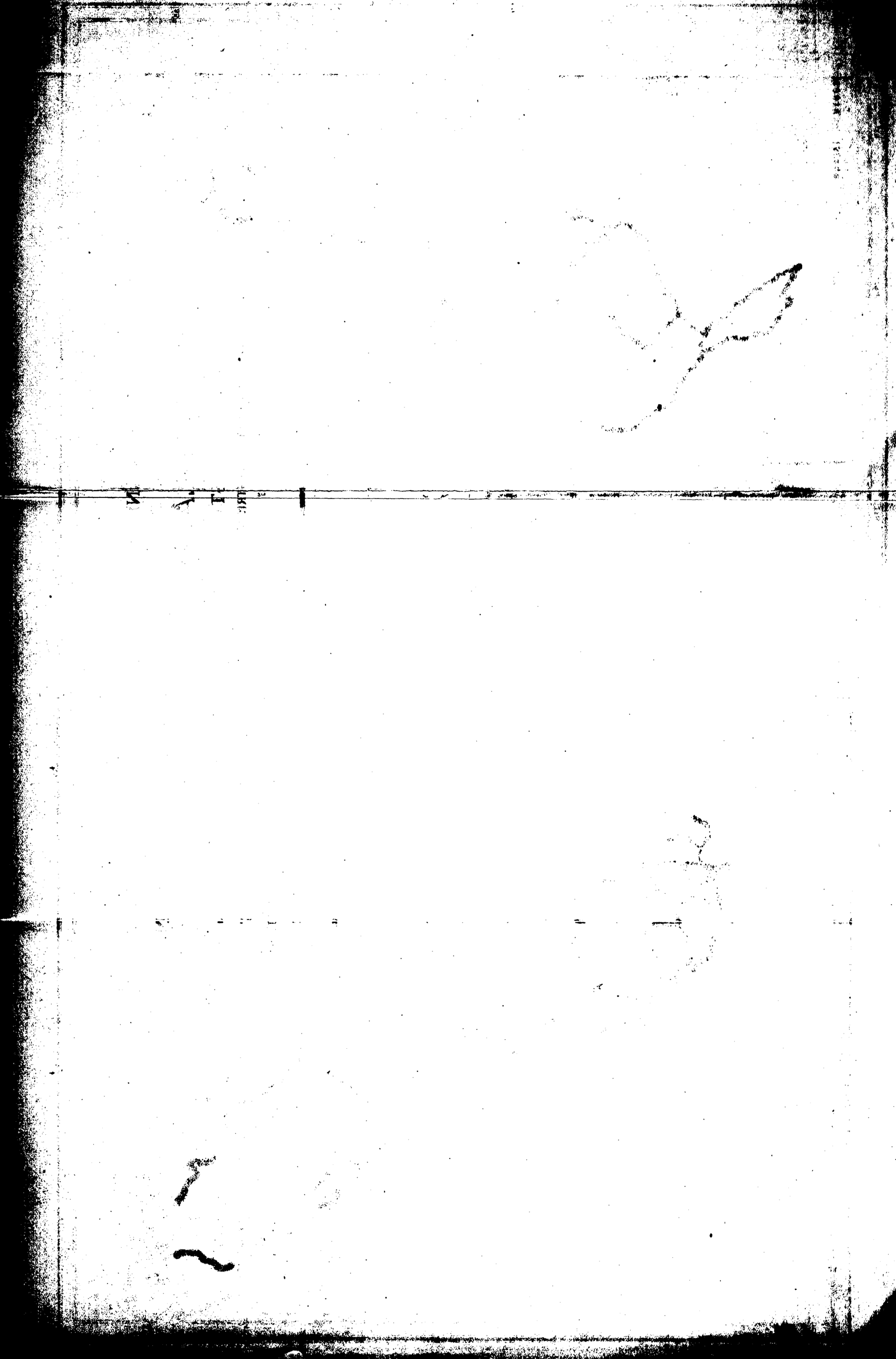
REFERENCE.

Addington	▬
West Coast	▬
Head Office	▬

LOCO. DEPOTS, SOUTH ISLAND.

GREYMOUTH.		HEAD OFFICE.
GREYMOUTH	Reefton	Nelson
Hokitika	Landing	Belgrove
Ross	Westport	Glenhope
Otira	Seddonville	Picton—
Blackball		Blenheim
		Ward
ADDINGTON.		
CH'CH (Linwood)	Ashburton	Balclutha
Lyttelton	Springburn	Tahakopa
Kaiapoi	**Timaru**	Clinton
Rangiora	Fairlie	**INVERCARGILL**
Bennett's	Waimate	Edievale
Oxford	Waihao Downs	Gore
Waipara	**DUNEDIN**	Waikaka
Parnassus	**Oamaru**	Switzers
Waikari	Kurow	Glenham
Culverden	Ngapara	Hedgehope
Waiau	Tokarahi	Lumsden
Springfield	Palmerston	Kingston
Arthur's Pass	Port Chalmers	Tokanui
Whitecliffs	Outram	Bluff
Southbridge	Ranfurly	Wairio
Little River	Omakau	Riverton
Rakaia	Cromwell	Orepuki
Methven	Milton	Tuatapere
	Lawrence	

By Authority W. A. G. SKINNER Government Printer Wellington



STOCK OF BRAKE-VANS.

Type.	Number.	Average Tonnage Capacity.	Type.	Number.	Average Tonnage Capacity.
50 ft.	29	10	30 ft.	253	10
47½ ft.	30	10	Four-wheel	81	4
44 ft.	54	10	"Fell" incline, four-wheel..	11	..
39½ ft.	3	10	Total	461	..

STOCK OF WAGONS.

Class.	Type.	Number in Class.	Average Tonnage Capacity.	Class.	Type.	Number in Class.	Average Tonnage Capacity.
FOUR-WHEEL				FOUR-WHEEL			
G	Horsebox	168	4	X	Dairy-produce	31	6
	Horsebox	94	8		Dairy-produce	180	8
H	Cattle	204	5	XA	Fruit	8	6
	Cattle	371	8		Fruit	210	8
J	Sheep	648	4	XB	Fish, meat, milk	32	6
	Sheep	1,195	8		Fish, meat, milk	122	8
K	Sleeping-van	12	4	Y	Work-train hoppers ..	12	8
	Sleeping-van	56	6	YB	Work-train hoppers ..	363	10
	Sleeping-van	2	8				
	Covered goods	138	6	DOUBLE BOGIE			
	Covered goods	584	8	R	High-side	251	16
L	High-side, wood	1	4		High-side	57	20
	High-side, wood	850	6	RB	High-side	91	25
	High-side, wood	7,512	8	RD	High-side	48	12
	High-side, wood	146	10		High-side	16	13
	High-side, iron	847	8	RN	High-side	40	12
	High-side, iron	1,399	10	S	Sheep, double floor ..	113	8
LA	High-side, iron	4,551	12		Sheep, double floor ..	12	12
LH	Wharf	45	6	T	Cattle	75	12
M	Low-side	9	4	U	Platform	310	16
	Low-side	475	6		Platform	75	20
	Low-side	849	8	UA	Gas storeholders	18	16
	Low-side	31	10	UB	Platform	286	25
	Work-train hoppers ..	68	6	UG	Horsebox	23	8
	Work-train hoppers ..	18	8		Horsebox	38	12
MA	Low-side, steel	160	12	V	Frozen meat	4	10
MB	Work-train hoppers ..	145	6		Frozen meat	125	12
N	Timber, short wheel-base ..	6	4	VB	Frozen meat	16	14
	Timber, short wheel-base ..	303	6		Frozen meat	159	20
	Timber, short wheel-base ..	64	8	Z	Covered goods, 30 ft. ..	40	12
	Timber, long wheel-base ..	54	6		Covered goods, 30 ft. ..	21	16
	Timber, long wheel-base ..	30	8		Covered goods, 33 ft. ..	6	16
O	Iron hoppers, fixed ..	39	10		Covered goods, 47½ ft. ..	19	12
OB	Iron hoppers, for ballast ..	10	10		Covered goods, 47½ ft. ..	9	20
P	Platform coal	138	6		Covered goods, 50 ft. ..	6	20
	Platform coal	90	8	ZF	Covered goods, 33 ft. ..	84	16
Q	Movable hoppers, iron ..	830	8				
	Movable hoppers, wood ..	338	8		Total wagons.. ..	25,734	..
W	Frozen meat	18	6		Total carrying-capacity ..	..	237,355
	Frozen meat	336	8				

Locomotive, Carriage and Wagon Works.

There are four locomotive works situated in the North Island and five in the South Island, as follows :—

North Island.—Petone (Wellington), Napier, East Town (Wanganui), Newmarket (Auckland).

South Island.—Addington (Christchurch), Hillside (Dunedin), Invercargill, Greymouth, Westport.

In addition there are small repair shops at Whangarei and Gisborne in the North Island, and at Picton and Nelson in the South Island.

The works at Petone, East Town, Newmarket, Addington, and Hillside are controlled by Workshop Managers, while at Napier, Invercargill, Greymouth, and Westport a Workshop Foreman is in charge. These officers are supervised by the Divisional Locomotive Engineer in whose division the shops are situated.

PETONE WORKS.—The machine-shop appears to be fairly well arranged, and has ample accommodation. It is understood that machines have recently been rearranged in order to provide for an electric drive which will soon be available.

A number of the machines are of modern type, but there is also a certain proportion considerably out-of-date.

It was observed in the pattern-shop that the patterns are arranged in compartments in a satisfactory manner. The accommodation here appears to be ample for requirements. An automatic gauge is installed in the wheel-press shed, all wheel-presses being recorded in a journal set apart for the purpose. The erecting-shop is very much congested, and the centre road, which should be set apart as a run-out, is being used for carrying out repairs. The foundry supplies all castings required for Petone, as also for East Town repair shops, and for all locomotive-running depots as far north as Taumarunui. This shop is also much congested.

In addition to boiler repairs, carriage and wagon steel underframes are being built in the boiler-shop, which entails considerable difficulty in dealing satisfactorily with the work. New fireboxes are manufactured at Petone, but no new boilers. The blacksmiths' shop has sufficient accommodation to meet present requirements. It was ascertained that very few broken springs come to the shop for repairs. The carriage-repair shop appears to be crowded, and it was noticed that, in addition to carriage repairs, the building of new carriages and wagons was being carried on. The machinery in the sawmill is out-of-date, and the accommodation provided is insufficient for the work offering. The accommodation in the paint-shop is also inadequate, and this applies to the carriage and wagon lifting shop, where the work is being carried out under very great difficulties.

NAPIER SHOP.—The majority of the machinery in the erecting, machine, carpenters' and blacksmiths' shops at Napier is out-of-date, and generally the shops appear overcrowded. Owing to lack of accommodation, practically all the wagon repairs and a certain portion of carriage repairs are being dealt with in the open yard. If circumstances justified, it might be possible to roof in a portion of the yard where the wagon repairs are carried out, in order to ensure their being dealt with under cover. With up-to-date machinery it is considered that a certain amount could be done in the direction of expediting the output of work—*e.g.*, the provision of electric cranes when power is available, modern milling and drilling machines, and capstan lathes. It is doubtful whether it is necessary to continue the use of these works, as there should be ample accommodation elsewhere to deal with repairs in the North Island.

EAST TOWN WORKS.—The erecting-shop at East Town has two roads, and is equipped with two 20-ton overhead hand-operated travelling-cranes. The shop is congested, and, in addition, one portion has to be used as a tool-shop. The carriage-shop has three short roads, and the accommodation is totally insufficient to meet the demands made upon it, necessitating the bulk of the repairs to both carriages and wagons being dealt with in the open. This shop is provided with a few obsolete types of woodworking-machines, which are inadequate for the work required, but, having regard to the smallness of the shop, there is no room for additional machinery.

The machine-shop is provided with a miscellaneous assortment of out-of-date machines, and there is not enough room to deal with the work satisfactorily, the finishing-bench being mixed up with the machines. The lifting-shop is an open-sided building, is badly lighted, and is totally inadequate and unsuitable. The blacksmiths' shop appears to meet present requirements, and it is understood that a new steam-hammer is on order. The tarpaulin-shop is adequately fitted with machines, but the accommodation is limited; while the paint-shop would appear to meet present needs.

Generally speaking, the shops at East Town are out-of-date and entirely unsuitable for carrying out work in an efficient manner. Most of the machinery is old-fashioned and inadequate, and this must be reflected in maintenance costs.

NEWMARKET WORKS.—The erecting-shop consists of three roads, the centre road, although intended as a run-out, having to be utilized for engine repairs owing to the very congested state of the shop. Necessarily, therefore, when an engine is ready to be taken out of the shop the centre road has to be cleared.

The existing lifting-appliances consist of two 20-ton cranes, operated by hand, and are exceptionally slow of movement both for travelling and lifting. These, however, will shortly be replaced by electric cranes. Owing to there not being

sufficient accommodation in this shop a certain number of light repairs is undertaken outside. The shop holds only twelve engines even when the centre road is occupied.

It was observed that parts taken from locomotives under repair are temporarily stored under benches and in all sorts of places, the reason given for this being the inadequate space available. It was also noted that repairs to the heavier type of boilers have to be undertaken in the erecting-shop owing to there being no proper boiler-shop.

The machine-shop is electrically driven, and undertakes all work in connection with repairs to locomotives and steam and hand cranes. A considerable amount of work is also performed for the Permanent-way and the Public Works Department. There would appear to be ample accommodation in this shop; but a large number of machines are of obsolete type, and should be replaced by modern machinery. It is understood that a certain proportion of up-to-date machines is on order, but not sufficient to meet requirements.

The lean-to used as a boiler-shop is provided with an old-fashioned overhead travelling hand-crane capable of lifting only the lightest of boilers. As has already been stated, some of the boiler repairs have to be undertaken in the erecting-shop, and, in addition to this, a certain amount is dealt with in the open. There is very little machinery in this shop, and what there is should be replaced by something more up-to-date. A modern punching and shearing maching is on order. The blachsmiths' shop appeared to satisfactorily meet present requirements. An up-to-date bolt-making machine is in course of erection.

The moulding-shop, while meeting present needs, will require to be provided with an electric crane to replace the existing hand-crane, which is far too slow for the work to be performed. The present number of moulding-machines is inadequate. The tarpaulin-shop has ample accommodation. This also applies to the paint-shop.

The woodworking-machine shop is very crowded and badly laid out, but it is not possible of extension owing to the site, which is situated on the side of a gully, being limited in extent. The machinery is fairly up-to-date.

The carriage and wagon repair shop is also very congested, both new work and repairs having to be undertaken on the same line. There are five roads, one being reserved for Westinghouse-brake overhaul. No extension of the existing shop is possible owing to the position of the site, as previously explained. A certain amount of the work is undertaken in the open.

The workshop yard accommodation is totally inadequate, all the lines converging into a bottle-neck at the entrance gate, and the shunting, therefore, is necessarily expensive. This shop is situated about a quarter of a mile away from the main shops, and all blacksmiths' work, casting, and machine work have to be conveyed by rail between the two. The arrangement is for two deliveries each way daily, but, having regard to the fact that the vehicles containing the materials have to pass through the busy and congested yard, serious delay necessarily takes place.

Addington Works.—The accommodation in the Addington shops is inadequate, and, owing to this, certain boiler repairs have to be undertaken in the erecting-shop. This shop consists of three roads, but the centre road, which should be used as a run-out, has to be utilized for repair work, thus causing a certain amount of delay. There is insufficient room between the roads for the work to be satisfactorily performed. The shop is fitted with two electric overhead cranes, each of 20-ton capacity.

In the machine-shop it was observed that the greater part of the machinery is considerably out-of-date, and should be replaced with modern tools. The general lay-out of the shop is not satisfactory, and, when modern tools are provided, it should be remodelled.

The foundry, where steel, iron, and brass castings are manufactured, is very congested. In this foundry the whole of the steel castings required by the railways throughout the Dominion are turned out. The moulding-machines appear to be suitable, and it is understood that further machines are on order.

The boiler-shop is totally inadequate to deal with the work required, and, as stated, a certain amount has to be undertaken in the erecting-shop. There are

two electric cranes installed, and one out-of-date hand-crane. Owing to the lay-out of the shop and its inadequacy, the work undertaken must necessarily be costly. All new boilers required by the Department in the Dominion are manufactured in this shop. The blacksmiths' shop did not seem to be large enough to deal with the amount of work passing through it. In the carriage-shop the building of new carriages and wagons, as also repairs to existing stock, is undertaken. This shop is far too small, and the machinery is out-of-date and inadequate to carry on work cheaply.

The building described as a paint-shop is used for painting carriages, the overhaul of Westinghouse brakes on carriages and wagons, and the manufacture of all points and crossings required by the railways. The shop is not sufficiently large to deal with the whole of the work, and it is considered that a separate shop should be provided for the manufacture of points and crossings. The stores maintained in the paint-shop have been built up from surplus of previous orders, but it was explained by the Chief Mechanical Engineer that a scheme was under consideration for having a storekeeper—on the staff of the Stores Department—attached to each workshop, which would do away with the necessity of foremen holding stocks on hand. In the tarpaulin-shop are manufactured all the tarpaulins used by the railways.

Generally speaking, the workshops had a neat and tidy appearance, but they did not seem to be adequate for the amount of work passing through, and the whole place needs remodelling.

New tender locomotives required by the New Zealand railways are built at Addington.

HILLSIDE WORKS.—The major portion of the machinery in the machine-shop is old-fashioned. A grinding-machine is just being installed, and is of the most modern type. It is considered that much remains to be done in the way of replacing out-of-date machinery, which would naturally expedite output and decrease costs. At the end of this shop a carriage and wagon wheel-making plant is located.

Boiler repairs are effected in the erecting-shop, a portion of which is set apart for that purpose. The work of preparing plates for use in connection with boiler repairs is, however, carried out in a part of the blacksmiths' shop. This, of course, must add to the costs, owing to the increased handling required.

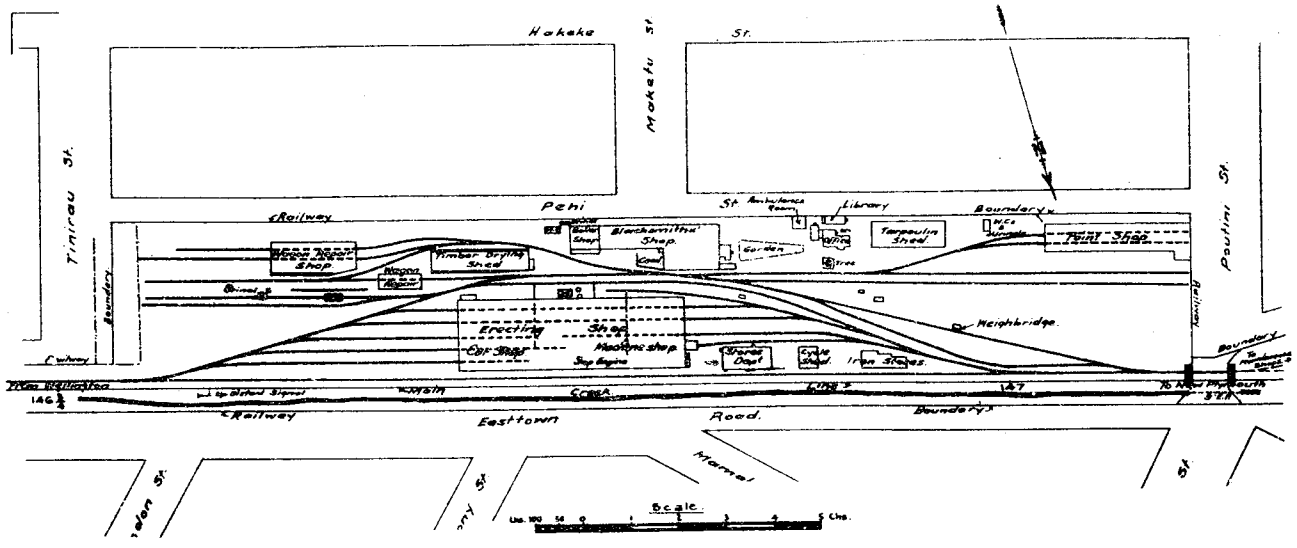
The erecting-shop is very congested, and the roads—of which there are three—are situated too close together for economical working. The centre road, which should be a "run-out" road, has to be made use of for repair work. New tank locomotives are built in this shop. Tender tanks were being built in another shed which is used by the boilermaking staff. Wagon underframes are constructed in the open, as there is no accommodation elsewhere. The blacksmiths' shop called for no special comment. Open fires are used.

The trimmings for carriages and carriage-lifting is carried out in the paint-shop. In connection with the painting of new carriages, the practice is to give one coat of priming, three of colour, and one of varnish. This is understood to last from eighteen months to two years. In the carpenters' shop a number of sheep-trucks were in process of construction, and repairs to wagons were also being dealt with. There is a very limited number of machines, and mostly out-of-date.

The pattern-store called for much comment on its untidy appearance and the fact that from the stacking of patterns great difficulty must be experienced in obtaining the one required. This shop is far too small. When greater strides are made in the direction of standardization it should be possible to get rid of a certain number of the patterns now in stock. The foundry is small, but meets present requirements.

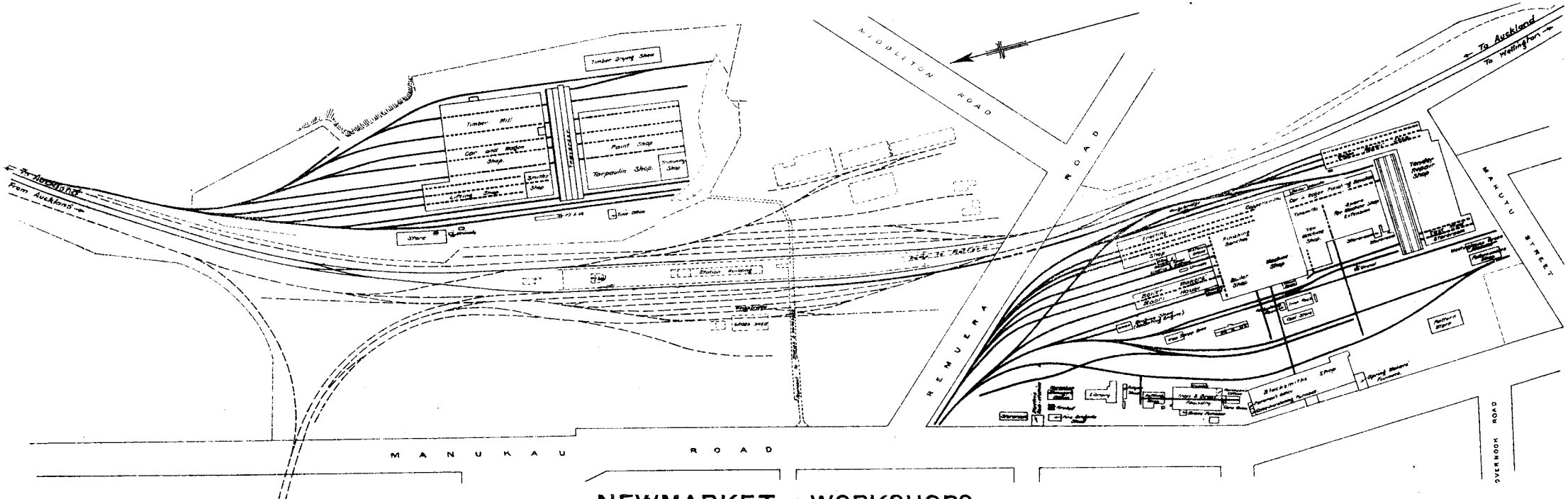
The condition of the shops indicates that a better system of getting the repairs through might be adopted. Most of the machinery is antiquated and obsolete, which no doubt causes delay in dealing with the work.

INVERCARGILL WORKS.—The erecting-shop, which has three roads, each capable of holding two tender or three tank engines, is provided with two overhead hand-operated travelling-cranes of 20-ton capacity. As also at certain of the other shops, the centre or run-out road is made use of for repair work. One half of the shop is set aside for carrying out boiler repairs. The machine-shop is equipped with



EASTTOWN

---WORKSHOPS YARDS.

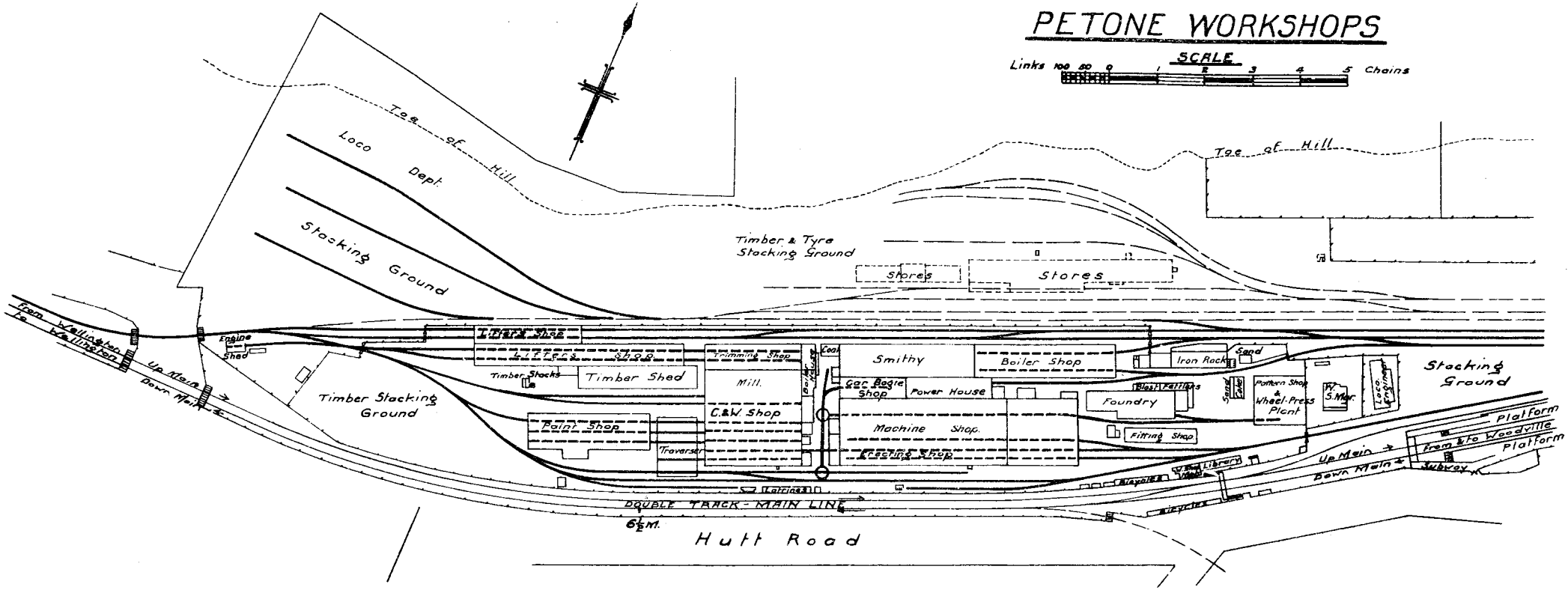


NEWMARKET WORKSHOPS

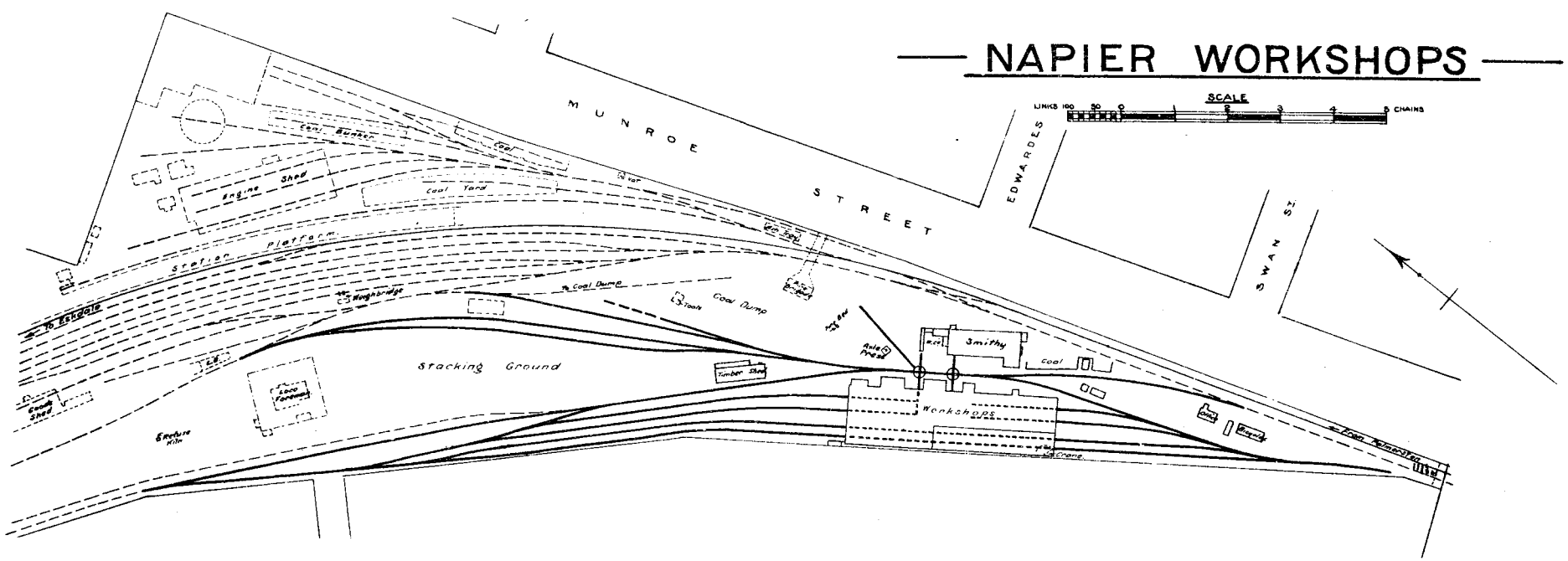
SCALE

NEWMARKET
WORKSHOPS

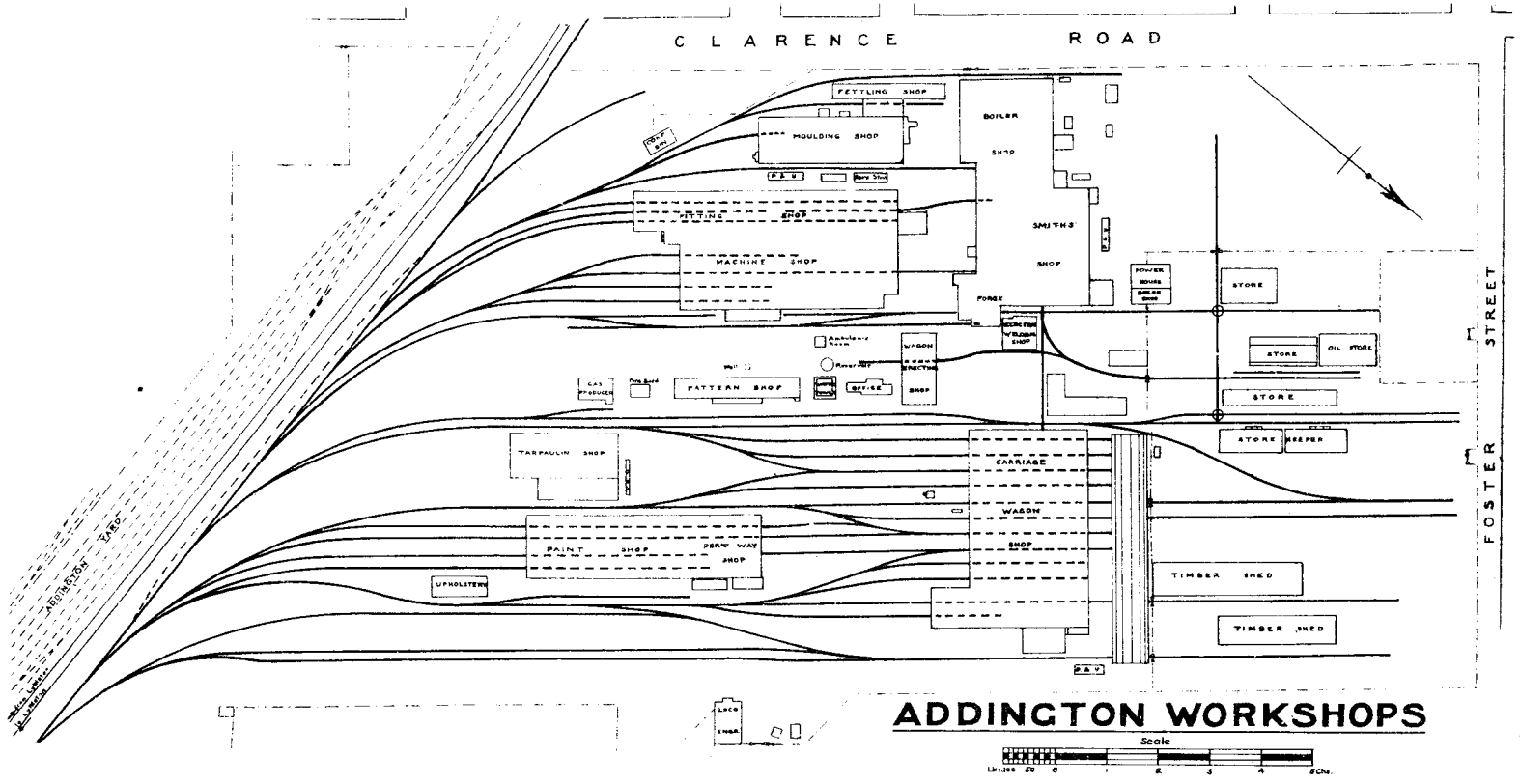
PETONE WORKSHOPS

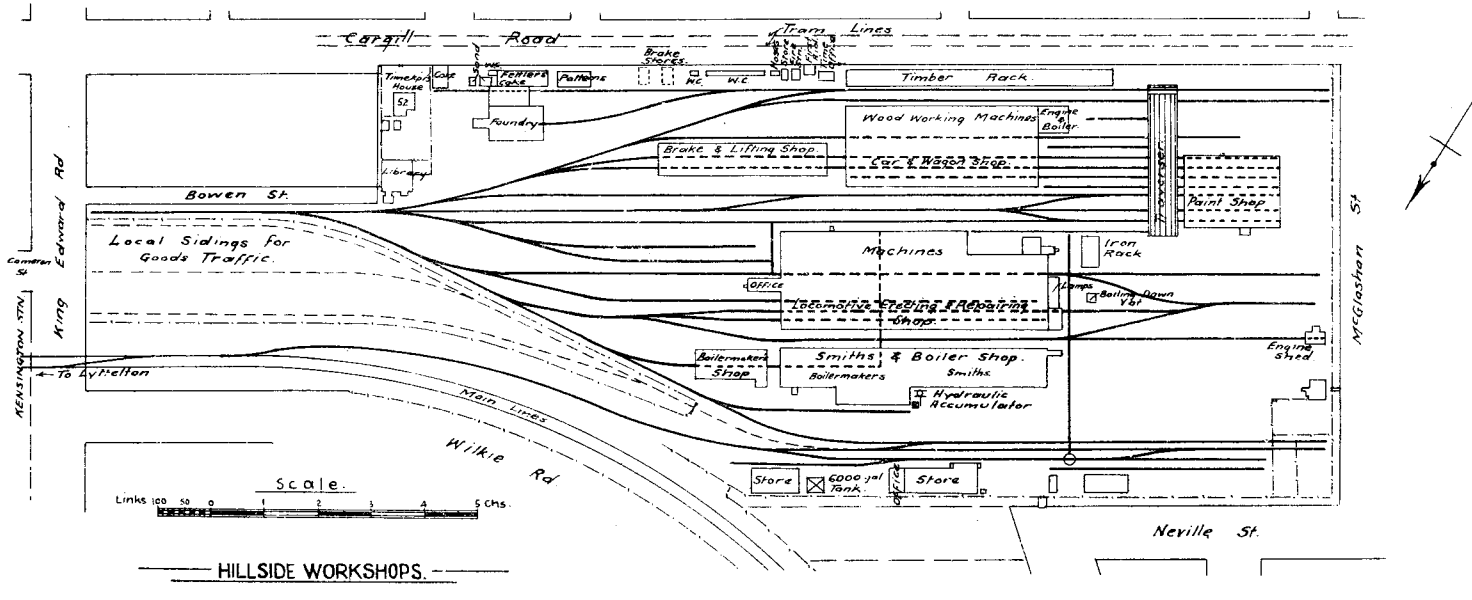


NAPIER WORKSHOPS

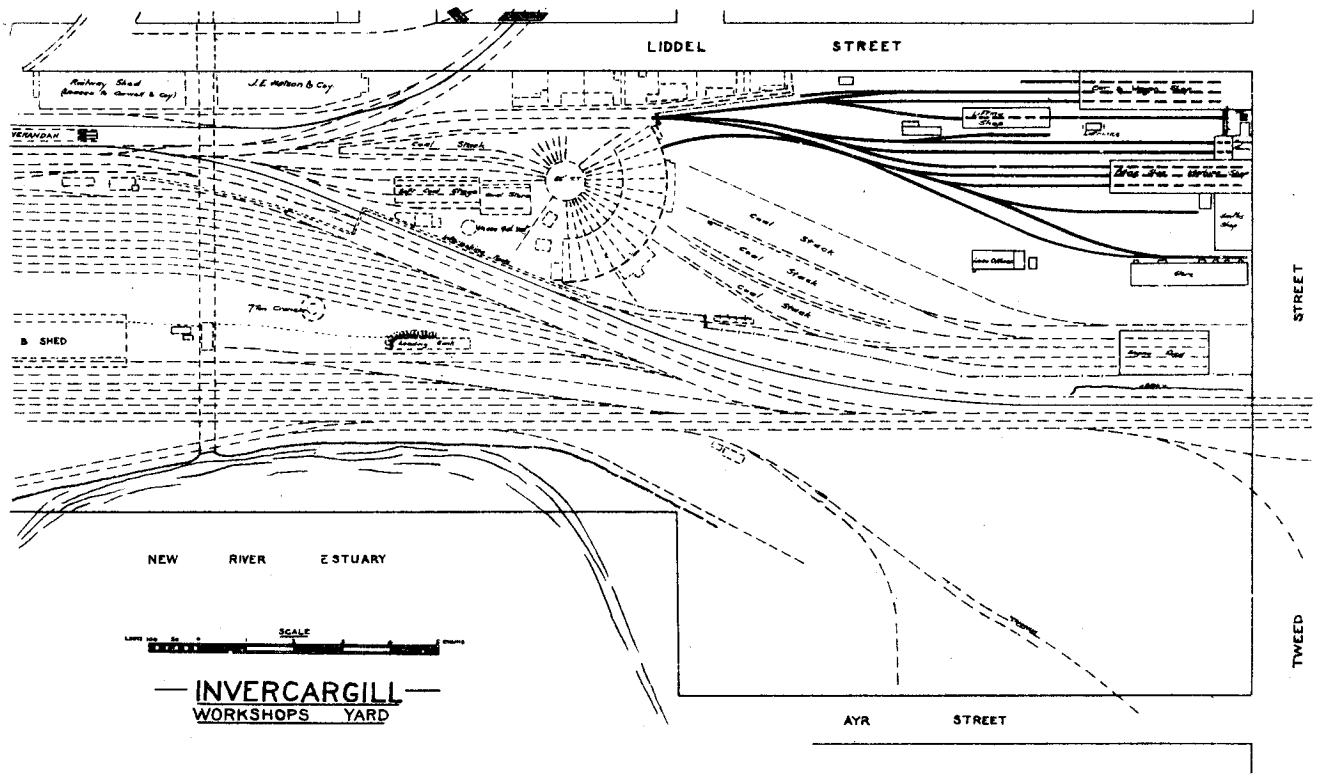


BOHANNON ROAD

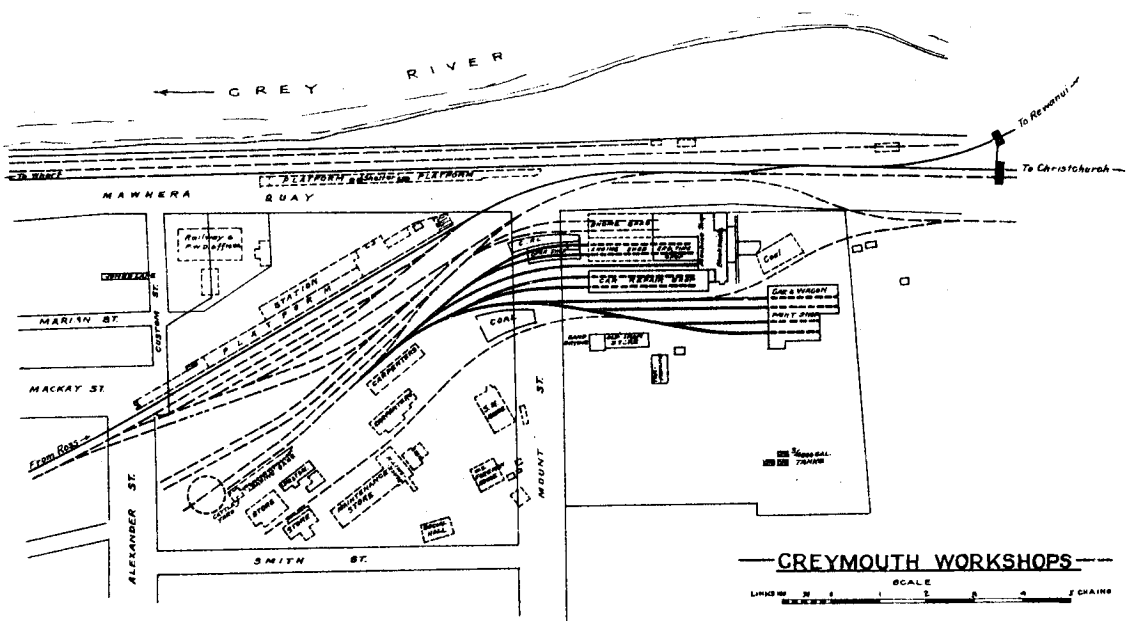

CLARENCE ROAD
FOSTER STREET
FETTLING SHOP
MOULDING SHOP
BOILER SHOP
FITTING SHOP
MACHINE SHOP
SMITHS SHOP
FORGE
POWER HOUSE
BOILER SHOP
STORE
OIL STORE
STORE
STORE KEEPER
WAGON BUILDING SHOP
PATTERN SHOP
OFFICE
GAS PRODUCER
TARPAULIN SHOP
CARRIAGE
WAGON
SHOP
PAINT SHOP
DRAY WAY
SHOP
UPHOLSTERY
TIMBER SHED
TIMBER SHED
P.W.
LOCO ENGR.
ADDINGTON WORKSHOPS
Scale
Links 100 50 0 1 2 3 4 5 Chs.


Canal Road
Tram Lines
Brake Shoes
Timekeeper's House
Coke
Foreman's Office
Pattern
N.C.
W.C.
Timber Rack
Foundry
Wood Working Machines
Engine & Boiler
Brake & Lifting Shop
Carr & Wagon Shop
Paint Shop
Bowen St
Local Sidings for Goods Traffic
Machines
Iron Rack
Office
Boiling Down Vat
Locomotive Erecting & Repairing Shop
Boilermakers Shop
Smiths & Boiler Shop
Smiths
Boilermakers
Hydraulic Accumulator
Engine Shed
Cameron St
King Edward Rd
KENSINGTON STN
To Lyttelton
Main Lines
Wilkie Rd
Store
6000 gal Tank
Store
Office
Neville St
McGlashan St
Scale
Links 100 50 0 1 2 3 4 5 Chs.
HILLSIDE WORKSHOPS.

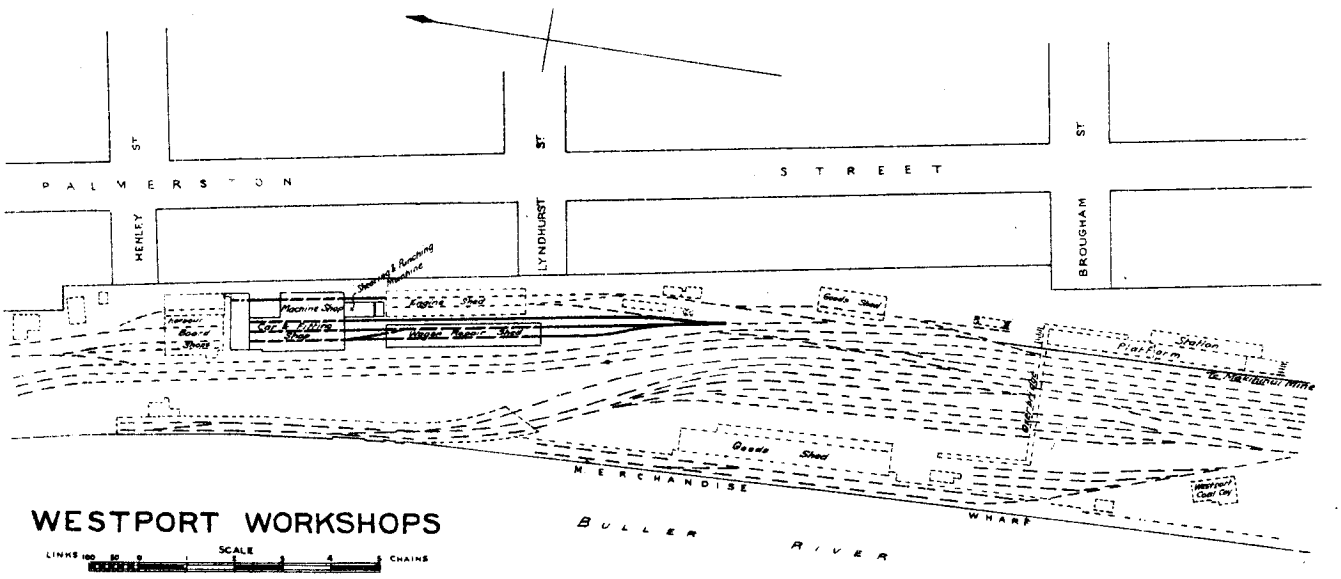
ADDITION NO. 4 SHOPPING CENTRE



— INVERCARGILL —
WORKSHOPS YARD



— GREYMOUTH WORKSHOPS —



WESTPORT WORKSHOPS

INVERCARGILL
WORKSHOPS YARD

WESTPORT WORKSHOPS

machinery which is very much out-of-date. The blacksmiths' shop meets present requirements, but is only provided with one steam-hammer and an old-fashioned punching and shearing machine. In the carpenters' shop there are three roads, one being set aside for heavy wagon repairs, another for carriage repairs, and the third for painting carriages. There is very little machinery provided, and what there is is old-fashioned. The wagon-lifting shop has two roads, and is too small for immediate requirements.

Generally speaking, the shops are very congested, and the work is only carried on under very adverse conditions.

GREYMOUTH WORKS.—The shops and the running depot are under one roof. The repair shop is very small and inadequate, and is not fitted with any modern lifting appliances, all engines having to be hoisted by means of jacks.

Most of the machinery in the machine-shop is out-of-date, and everything is in a very untidy and dirty condition. On the occasion of our visit two engines were in process of being stripped, and there was one stripped in the yard upon which no work was being performed. On inquiry it was found that the men had been taken from the engine in the yard and put to work on the two in the shed, which were more urgently required. The carriage and wagon shop is too small to meet requirements. The appearance of the erecting and machine shops is not satisfactory, although the engines turned out there appear to be in a clean condition.

It is, however, understood that within two years the whole of the workshops at Greymouth, and also the running-shed, will be pulled down and new shops erected at Elmer Lane, some three-quarters of a mile on the south side of Greymouth.

WESTPORT WORKS.—The shops at Westport repair the rolling-stock working on the isolated line between Westport and Seddonville, 32 miles in length. There are fourteen engines on the section, ten carriages, and some 700 wagons, including 673 of the hopper type, the traffic on the line being practically all coal. The works consist of blacksmiths' shop, machine-shop, and a combined erecting and carriage and wagon repairing shop. There is a separate shop for the repair and tarring of coal-hoppers. The shops are sufficiently large to meet present requirements, but the machinery is old-fashioned.

General Methods of Working in the several Shops.

The general methods of working are on similar lines in the various shops. New tender locomotives are constructed only at Addington and tank locomotives at Hillside.

The fitting-shop, boiler-shop, blacksmiths' shop, foundry, carriage-shop, and paint-shop are controlled by foremen. The work undertaken in these shops is dealt with in the following manner:—

Fitting-shop.—When a locomotive is sent to the shops it is allocated by the Foreman Fitter to one of the leading fitters in the erecting-shop, and such leading fitter carries out the repairs which are necessary and watches the progress of all parts dissembled for repairs. He orders, through the Foreman Fitter, any new material or parts required, and allocates the various jobs to be done on the engine to the several members of his gang. The leading fitter examines the various parts of the locomotive, and, if in doubt as to the necessity for repairs or renewal of any part, he consults the Foreman Fitter. The overhaul of side-rods, boiler-mountings, cylinder-cocks, valve-motion, pistons and valves of engines under repair are dealt with by the leading fitter in charge of the finishing-bench. The leading turner distributes metal turning-work to the various machines, the work being dealt with in the order of urgency. A leading machinist is in charge of milling-machines, planners, slotters, grinders, shapers, and other machines not worked by tradesmen, and he supervises the distribution of work to such machines. The coppersmiths' and tinsmiths' work is in the charge of a leading coppersmith, who is responsible for the copper-pipe work, for locomotives and brass work, for lagging boilers, running white metal in bearing-brasses.

Boiler-shop.—Locomotive boilers are manufactured only at Addington, both for the engines built at that place and at Hillside, and also to replace condemned boilers, this being the only workshop with sufficient boiler equipment for the purpose. All flanging is done by hand, as there is no flanging-press.

The nature of the boiler repairs undertaken in the various workshops on the New Zealand railways ranges from the fitting of new fireboxes and the fitting of superheaters in boilers not previously superheated, to minor repairs such as renewal of stays. Other work dealt with in the boiler-shop includes engine-frames, tender underframes and tanks, ash-pans, cabs, smoke-boxes, and all new and repair riveted work on locomotives. The acetone and electric welding plants are under the Foreman Boilermaker.

Blacksmiths' Shop.—The bulk of the blacksmiths' work in the larger shops is general smiths' work at open fires, each smith being provided with a striker, and heavy work being forged at a steam hammer. The only forge turning out heavy forgings is at Addington, and this is principally occupied on buffer-heads, blooms for draw-hooks and forging foundation-rings, a few heavy forgings for new locomotives also being dealt with. The smiths' shop at Hillside has the only hydraulic-forging plant. No drop forging is done in any of the shops.

Foundry.—The only workshops provided with foundries are Newmarket, Petone, Addington, and Hillside, the most important being at Addington, which is the only one turning out steel castings in addition to iron and brass. At Hillside no brass work is undertaken, and the work carried out is not of a heavy character, but at Petone and Newmarket both iron and brass castings are made. In addition to the Foreman Moulder, there is a leading ironmoulder and a leading brassmoulder in charge of the respective classes of work, while at Addington there is also a leading steelmoulder. As most of the ironwork is for repairs and renewals, the majority of the moulding is hand-moulding, the scope for machine-moulding being limited.

Method of Dealing with Locomotives under Repair.

Locomotives are not sent in to the workshops for overhaul on any basis of mileage run. The practice is for Locomotive Foremen to advise the shops what repairs are considered necessary to engines. As a consequence there is no uniformity regarding the extent of repairs required to engines sent to shops, the work to be done ranging from the renewal of a few broken boiler-stays, boring of cylinders, or repairs after a breakdown, to complete overhaul of engines. As soon as it is ascertained in the shops exactly what work is required to be done to an engine, the practice is for the Works Manager and Foreman to confer and fix a date for the completion of the work.

Having regard to the number of different types of locomotives in use on the New Zealand railways, no steps are taken in the direction of anticipating requirements by stocking in shops spare parts of locomotives that require replacing from time to time.

Where an engine is sent to the shops for repair the Locomotive Foreman supplies to the workshops a list of repairs to be carried out. This list is given to the leading fitter to whom the engine is allocated, and the repairs referred to on the list are carried out in addition to any other work which may be found necessary when the engine is dissembled.

Boiler Repairs.

The Boiler Inspectors report direct to the Chief Mechanical Engineer the result of their examination of every boiler. Copies of these reports are sent to the district officers, who in turn distribute them to the workshop and locomotive-running officers concerned, to indicate what boiler repairs are required. Any repairs specified on these reports must be carried out when the engine is in the shops, and a certificate must be rendered that such repairs have been completed. The leading boilermaker will also carry out any additional repairs which are found necessary when the boiler is under observation.

Owing to the variation in the quality of the water in the several districts, boiler repairs and tube renewals are in some places much heavier and more frequent than with similar engines in other districts.

At the annual inspection of locomotive-boilers defects are noted by Boiler Inspectors, who may specify that certain repairs must be done before a given date, failing which the boilers may not be used after such date.

Boiler-tubes are drawn at intervals to enable a thorough internal examination to be made, and, since tubes are not drawn until the engine is received into the shops, the nature and extent of boiler repairs is not known until the boiler has been examined in the shops by the Boiler Inspector.

Progress System.

No progress system dealing with repairs is in force on the New Zealand railways, and it is considered that such a system might be introduced with considerable advantage. This would tend to expedite the completion of repairs, and would enable those responsible to know when particular engines would be ready for service.

Standard Gauges.

No system of standard gauges is in force, and, as a consequence, the interchangeability of parts cannot be relied upon. This naturally must be reflected in delays to engines and in maintenance cost.

Charging of Repairs to Individual Engines.

In each workshop there are order numbers to which wages and material for the workshops may be debited. Each workman is provided with a time-sheet, on which he notes daily the time worked on any particular job on which he is engaged, against the order number for such job. The time booked to the various orders is checked both by leading hands and foremen. From the time-sheets the time worked is summarized, and debited to the various orders, an average rate of pay being used for this purpose. All material is ordered by means of requisitions showing the order number on which such material is to be used. These requisitions for material are similarly debited to the respective orders, and are costed out. Overhead charges are also debited to the particular order.

Foundry Charges.

So far as the foundry is concerned, the work done is debited to a Manufacture Account, separate accounts being kept for steel, iron, and brass. All castings turned out of the foundry are charged to the various shops on which they are used at "issue rates," such rates being the price per pound or per hundredweight which would equal the average cost of manufacture. These "issue rates" are varied from time to time mainly owing to fluctuations in prices of raw materials.

Locomotive Workshop Staff.

The following are particulars of the staff employed in the various workshops in connection with the repairs to locomotives :—

Workshop.	Officers.	Clerical Staff.	Wages Staff (other than Running).	Total.
Petone	7	5	369	381
Napier	1	1	78	80
East Town	5	3	171	179
Newmarket	7	5	334	346
Addington	7	5	481	493
Hillside	7	6	345	358
Invercargill	1	1	62	64
Greymouth	1	1	49	51
Westport	1	1	32	34

Staff Comparisons.

In considering the mileage run by the locomotives—which is the only indication where there is no gross ton-mileage basis of the work performed—as the factor in deciding when it is necessary to bring engines in for a thorough overhaul, it is clearly indicated that the engines are in the shops too frequently. It is only possible to give a definite opinion with regard to this by comparison with what is done by other

railways, and experience shows that at least twice as much mileage should be done by the locomotives on the New Zealand railways before they enter the shops. Information has been furnished showing that repairs to engines in New Zealand average a little more than one per engine per annum, while on the North Eastern Railway of England the engines, including heavy and light repairs, did not average through the shops more than once in two years, and this without taking into consideration the difference in the character of the traffic working required. If this practice had been carried out in New Zealand it would mean that not more than 328 engines should have passed through the shops during the twelve months ended the 31st March, 1924, whereas in actual fact 677 engines were dealt with.

Petone and Addington Locomotive Shops sufficient to meet Requirements of both Islands.

Carrying this still further, it would appear that the shops at Petone and Addington could deal with the whole of the necessary repairs in the two Islands, and, assuming this to be so, it would be possible to dispense with the services of some 900 men, representing a saving of about £200,000 per annum. This is borne out also by comparing the repair staff employed per 100,000 engine-miles in New Zealand with one of the large railway groups of Great Britain, as it will be observed from the following table that if the Great Britain basis applied in the Dominion the staff could be reduced by 899 men :—

Railway.	Locomotive Repair Staff.	Stock of Engines.	Number of Engines repaired.	Number of Staff employed per Engine in Stock.	Total Engine-miles.	Average Engine-miles per Engine repaired.	Number of Staff employed per 100,000 Engine-miles.
New Zealand ..	1,921	655	677	2·93	12,450,796	18,391	15·43
A Great Britain railway group	18,628	10,292	5,165	1·90	226,868,021	43,924	8·21

Further Savings in Staff Costs.

This clearly indicates that a great saving is possible in the locomotive workshops in New Zealand, even without expenditure on new machinery and reorganization of the existing shops, but if such were carried out a further saving should be effected. It is obvious that the arrangement outlined would have to take place by degrees to avoid hardship to those displaced. In our opinion, reorganization of the existing methods should be put in force at an early date, and modern machinery procured.

Machinery in Workshops.

It is generally held that machinery in locomotive workshops possesses a utility life of twenty years. On this basis £162,607 should have been expended on renewals during the period 1915 to 1924, but, as will be seen from the following table, only £1,106 was so spent, leaving a balance of £161,501 which should have been set aside in a renewals fund and be available for use.

Twelve Months ended 31st March.	Capital Value.	Value of Machinery renewed during Year.	Amount which should have been renewed on Life Basis during Year.	Balance which should have been set aside in a Fund.
	£	£	£	£
1915	301,539	..	14,522	14,522
1916	309,366	..	15,077	15,077
1917	318,049	..	15,468	15,468
1918	324,178	..	15,902	15,902
1919	330,823	..	16,209	16,209
1920	336,380	570	16,541	15,971
1921	340,520	..	16,819	16,819
1922	348,676	50	17,026	16,976
1923	352,183	..	17,434	17,434
1924	357,140	486	17,609	17,123
Totals ..	..	1,106	162,607	161,501

The absence of any renewals fund to provide for obsolescence and wasting assets is dealt with in another section of our report, but on the capital value of machinery at the 31st March, 1924, of £357,140, the sum of £17,857 should be spent annually on renewals or set aside in a renewals fund. Unfortunately, in the past nothing approaching this has been expended, and this naturally accounts for the present position of extremely antiquated machinery in the shops.

Additional Locomotives and Renewal of Existing Stock.

As will be seen from the following table, the stock of engines was increased by ninety-eight during the financial years 1915 to 1924—an increase of 17·59 per cent.—while the miles of line open for traffic increased by 3·32 per cent. only, and the engine-miles actually showed a decrease of 195,791, or 1·55 per cent. This shows that if the number of engines was at all satisfactory in 1915 the additional stock was entirely unnecessary, and this is borne out by the fact that in New Zealand the average miles per engine per annum is 19,009, while in Great Britain it is 22,498.

Twelve Months ended 31st March.	Stock of Locomotives.	Train-miles.	Shunting and Empty Miles.	Departmental Miles.	Total Engine-miles.	Miles of Line open for Traffic.
1915	557	9,383,420	2,692,164	571,003	12,646,587	2,955
1916	585	9,356,522	2,752,144	610,822	12,719,488	2,970
1917	607	9,146,331	2,686,688	461,436	12,294,455	2,970
1918	624	7,468,646	2,332,243	361,052	10,161,941	2,993
1919	620	7,477,583	2,342,931	172,360	9,992,874	2,993
1920	616	7,408,608	2,442,499	172,202	10,023,309	3,006
1921	608	9,303,392	2,913,445	218,055	12,434,892	3,018
1922	637	8,717,265	2,846,094	266,164	11,829,523	3,030
1923	639	8,346,731	2,859,648	265,973	11,472,352	3,037
1924	655	9,024,503	2,984,096	442,197	12,450,796	3,053
Percentage increase or decrease, 1924, compared with 1915	17·59%	—3·83%	10·84%	—22·56%	—1·55%	3·22%

The utility life basis of a locomotive is generally regarded as thirty-five years, and, as the statement set out below will show, 172 locomotives should have been renewed in the period 1915 to 1924; instead of this only sixty-seven engines were renewed, and this must have had a considerable bearing on the maintenance costs. In addition, although 17·59 per cent. extra engines have been constructed since 1915, the average age of the total stock as at 31st March, 1924, was 22·72 years.

Twelve Months ended 31st March.	Capital Stock of Locomotives.	Value.	Number renewed during Year.	Value.	Number which should have been renewed on Life Basis during Year.	Amount which should have been spent on Renewals during Year.	Balance which should have been set aside in a Fund.
		£		£		£	£
1915 ..	557	1,605,513	2	5,637	15	43,002	37,365
1916 ..	585	1,725,969	8	23,059	16	45,872	22,813
1917 ..	607	1,827,231	4	11,801	17	49,313	37,512
1918 ..	624	1,888,077	4	12,041	17	52,207	40,166
1919 ..	620	1,910,201	5	15,129	18	53,945	38,816
1920 ..	616	1,921,170	8	24,648	18	54,577	29,929
1921 ..	608	1,954,247	8	24,950	18	54,891	29,941
1922 ..	637	2,299,064	1	3,214	17	55,836	52,622
1923 ..	639	2,664,002	24	86,621	18	65,688	—20,933
1924 ..	655	2,779,805	3	12,507	18	76,114	63,607
Totals ..	..	..	67	219,607	172	551,445	331,838

Based on the capital value of locomotives as at 31st March, 1924, the sum of £79,423 should be spent annually on renewals or set aside in a Renewals Fund.

Multiplicity of Locomotive Types.

There are some forty-eight different types of locomotive in service on the New Zealand railways, some of which are very antiquated. With such a variety, standardization of parts is not practicable and must add to maintenance costs. The renewal of locomotives recommended should do away with a number of these types.

Boilers and Fireboxes.

The age of the boilers is far higher than any experience on English or American railways, the average age of those condemned being 27¾ years in New Zealand as compared with 16 in England. At the same time it was stated by the Chief Mechanical Engineer in evidence that the water is bad, and that, other than putting a composition into the boiler, no steps to combat this are taken. The only reason that can be given for this great age is that the engines are not getting the same amount of work in their lifetime as those in England or America; but, whatever the cause, the effect should be a lower maintenance cost per year and a speedier output for the locomotive.

Steel fireboxes are used, and these apparently also have an unusually long life as compared with copper boxes, and, under these conditions, the costs should compare favourably with railways using copper boxes.

Locomotive Coal.

In the Chief Mechanical Engineer's evidence he stated that Welsh coal was far better than any he could get either in Australia or in New Zealand, and that his experience showed that there would be a saving of 30 per cent. in coal-consumption. As it would appear that Welsh coal could be procured at practically the same price as Newcastle coal, and if the reduction anticipated by the Chief Mechanical Engineer is realized, there would be a saving of some £200,000 per annum on the purchase of Welsh coal.

As shown by the Chief Mechanical Engineer in his evidence he is responsible for selecting and recommending the coal that should be used. No doubt he will give due consideration after careful trials to what extent it is possible economically to use the New Zealand coal.

Running Department.

The running of both passenger and goods engines is under the control of the Locomotive Department. At the larger engine-sheds it is the practice to post a daily duty-sheet providing for the running of time-table and special trains, and showing the booking-on time of each of the men, the engine allocated, and the train to be worked. At the smaller stations a weekly list is in operation. In our opinion a weekly list could be advantageously adopted at all running-sheds. The existing arrangement of laboriously copying out each day the names of all the men and the trains they are to work occupies a great deal of valuable time, and, in addition, there are numerous telephone calls from the men as to what their duties are to be on the following day. From cases brought to our notice the special trains—after eliminating conditional trains—formed a small proportion of the train service, and arrangements could easily be made to adopt a weekly roster, probably resulting in a certain saving in staff.

Should occasion arise after an engine has left the engine-shed for it to be diverted from the train which it is booked to run, such alteration is arranged by consultation between the traffic train-running officer and the locomotive officer concerned. In our view this appears to be a satisfactory arrangement.

Responsibility of Locomotive Department in providing Engines.

The Locomotive Department is responsible for the provision of engines suitable for running the trains, in having engines ready to go into traffic at the recognized times at which they are required to enter the traffic yard, and in arranging the distribution of engine-power at various centres and terminal stations so that engine-power is available to cope with all traffic offering.

When the engine has left the engine-shed it is under the control of the Traffic Department, in that the enginemen must carry out any movements, shunting or marshalling, required of the train they are booked to run—*i.e.*, running of the train after departure from the starting-station is controlled by the Traffic Branch, and the enginemen are required to carry out all necessary shunting as directed by the train staff.

Reporting of Delays to Trains through Engine Trouble.

Engine-drivers are required to report any unusual circumstance by reason of which serious delay to a train is caused, and all such causes of delays due to engine failure or engine trouble are investigated by the locomotive officers concerned. Should such delays or engine trouble be found to be attributable to the enginemen, a punishment is inflicted upon those concerned, or, if they are due to faulty construction of the engine, steps are taken to prevent a repetition of such failure. Locomotive Foremen make periodical visits to the various outstations under their control to investigate the running.

Delays to trains owing to engine failures are not numerous, and trains keep good time, but it must be borne in mind that their running-time is easy, and that, generally speaking, they are lightly loaded.

Road Foremen, who are under the supervision of the Locomotive Foremen, periodically travel on various engines with a view to instructing the enginemen on the more efficient handling of locomotives, economical use of fuel and stores, and the handling and braking of trains and methods to be adopted in dealing with various breakdowns.

Hours of Duty of Enginemen.

As far as practicable the work of all enginemen is arranged on an eight-hour-day basis, with a maximum of twelve hours for any one shift. In the event of any delay occurring to cause the hours of any shift to exceed twelve the driver must advise his Locomotive Foreman by wire so that arrangements may be made to relieve such enginemen of the putting-away of their engines on arrival at the home station, or to send out a relieving set of men to ensure that the working of the excessively long hours is reduced to a minimum.

On an examination of the drivers' tickets it is observed that numerous occasions occur of engine-drivers filling up their day in washing out, cleaning of engines, &c., and, having regard to the rate of wages applicable to engine-drivers, this appears to us as being an expensive matter. It is quite obvious that drivers are not worked to the best possible advantage, and a revision of the time-table is necessary.

Working of Engines.

In practice the majority of the engines are not restricted to a particular class of train, either passenger or goods, and there is considerable variation in the nature of train-running by locomotives from day to day. In a number of cases enginemen change locomotives at crossing-stations on the road in order to avoid long hours on duty. Where such changing-over occurs endeavour is made to work engines back to their home station by other trains to permit of the same cleaning and repair staff dealing with engines stationed at their own depot.

Running-repairs at Locomotive Depots.

At the conclusion of each day's run the engine-driver is required to enter in the repair-book, kept at the locomotive running-shed, any matters concerning the condition of the engine that need attention, and the running-shed repairs staff carry out all repairs booked in this register before the engine is again sent in to service.

Running-repairs, such as adjusting brasses, attending to hot bearings, working-piston and valve-rings, maintenance of packings and joints, attention to boiler-tubes and superheaters, replacing broken springs, worn brake-blocks, brick arches, and cleaning boiler-tubes are undertaken at the various running-sheds.

Particulars of the repair staff employed and of the running staff attached to the various sheds are set out below.

Running-shed.	Number of Engines.	Repair Staff.	Running Staff.			Total Staff.
			Drivers.	Firemen.	Cleaners and Shed Hands.	
Wellington District—						
Wellington	38	19	46	36	54	155
Lower Hutt	2	..	4	4	1	9
Upper Hutt	4	..	7	7	4	18
Paekakariki	8	2	9	11	9	31
Cross Creek	14	4	7	15	10	36
Greytown	1	..	1	2	..	3
Masterton	4	..	5	6	5	16
Napier	16	5	11	9	13	38
Hastings	2	..	3	3	1	7
Waipukurau	3	..	5	5	3	13
Dannevirke	1	..	2	3	1	6
Palmerston North	29	8	27	25	22	82
Foxton	1	..	2	2	..	4
Woodville	4	..	5	4	6	15
Marton	2	..	4	6	2	12
Taihape	19	12	20	25	23	80
Ohakune	13	5	12	17	18	52
Taumarunui	14	5	15	17	22	59
Wanganui	19	9	21	19	26	75
Hawera	8	..	7	9	8	24
Whangamomona ..	2	..	2	2	1	5
Waitara	1	..	2	2	..	4
New Plymouth	8	3	11	10	10	34
Marton	1	..	1	1	1	3
East Town	1	..	1	..	..	1
Aramoho	..	..	..	..	1	1
Auckland District—						
Auckland	66	22	68	69	82	241
Onehunga	2	..	3	3	2	8
Mercer	4	..	6	5	5	16
Waiuku	1	..	1	1	1	3
Papakura	2	..	4	8	2	14
Henderson	2	..	4	5	2	11
Helensville	2	..	3	3	2	8
Maungaturoto	1	..	2	2	..	4
Frankton	36	13	34	30	48	125
Huntly	3	..	4	4	5	13
Cambridge	1	..	1	1	1	3
Morrinsville	..	..	1	2	1	4
Putaruru	1	..	1	1	1	3
Rotorua	3	..	4	6	4	14
Te Aroha	1	..	1	1	2	4
Paeroa	3	..	3	3	2	8
Waihi	1	..	2	2	..	4
Thames	1	..	1	2	1	4
Te Kuiti	7	..	9	11	10	30
Whangarei	10	8	5	12	4	29
Hukerenui	1	..	2	2	1	5
Kaikohe	2	..	1	1	1	3
Opua	1	..	2	..	2	4
Christchurch District—						
Christchurch	45	20	62	54	72	208
Lyttelton	5	..	4	7	3	14
Rangiora	2	..	2	2	..	4
Oxford	1	..	2	2	..	4
Bennett's	1	..	1	2	..	3
Waipara	1	..	1	2	..	3
Parnassus	1	..	1	..	1	2
Waikari	1	..	2	2	1	5
Springfield	2	..	3	4	3	10
Arthur's Pass	1	..	1	2	..	3
Whitecliffs	1	..	2	1	1	4

Running-shed.	Number of Engines.	Repair Staff.	Running Staff.			Total Staff.
			Drivers.	Firemen.	Cleaners and Shed Hands.	
Christchurch District—contd.						
Christchurch—*continued.*						
Southbridge	1	..	1	2	1	4
Little River	2	..	1	1	2	4
Methven	1	..	2	2	..	4
Ashburton	2	..	3	7	3	13
Springburn	1	..	2	1	1	4
Timaru	13	2	12	13	15	42
Fairlie	1	..	1	2	1	4
Waihao Downs	1	..	2	1	1	4
Dunedin District—						
Dunedin	53	21	59	67	70	217
Oamaru	12	2	11	11	10	34
Kurow	1	..	2	2	..	4
Ngapara	1	..	1	1	..	2
Tokarahi	1	..	..	2	..	2
Port Chalmers	1	..	2	3	1	6
Palmerston	2	..	5	6	4	15
Outram	1	..	2	1	..	3
Ranfurly	..	..	..	..	2	2
Cromwell	1	..	1	2	2	5
Lawrence	2	..	2	2	1	5
Tahakopa	1	..	1	1	..	2
Balclutha	2	..	3	4	4	11
Clinton	2	..	3	4	2	9
Hillside	1	..	1	..	..	1
Invercargill District—						
Invercargill	32	12	22	30	37	101
Bluff	2	..	3	4	2	9
Clinton	2	..	3	3	2	8
Edievale	1	..	1	1	1	3
Gore	2	..	2	2	3	7
Glenham	1	..	1	1	..	2
Hedgehope	1	..	1	1	1	3
Kingston	1	..	1	1	..	2
Lumsden	2	..	4	4	2	10
Orepuki	1	..	1	2	1	4
Switzers	1	..	1	1	..	2
Tokanui	1	..	2	2	..	4
Tuatapere	1	..	2	2	1	5
Wairio	2	..	3	4	2	9
Waikaka	1	..	1	1	..	2
Milton	..	..	..	..	..	..
Westland-Westport District—						
Greymouth	22	5	19	25	26	75
Blackball	1	..	2	2	..	4
Reefton	1	..	2	2	1	5
Hokitika	1	..	1	1	..	2
Ross	1	..	2	2	..	4
Otira	2	..	1	6	3	10
Otira electrical	6	14	4	2	7	27
Westport	12	..	11	12	11	34
Seddonville	1	..	1	1	1	3

In our opinion it would be an advantage to reduce the number of running-sheds as far as possible, having due consideration to traffic conditions and the proper working of the trains.

Carriage and Wagon Section.

Carriage and Wagon Inspectors are stationed at the larger depots under the control of each of the Divisional Locomotive Engineers. This branch of the

Locomotive Department controls the upkeep of all carriages and wagon stock in service. It also covers the examination of trains for defects in rolling-stock and for overhauling of vehicles. Carriage and Wagon Inspectors are responsible for the sending of vehicles to shops for overhaul or repairs as are required, and also deal with the oiling of carriage and wagon axle-boxes, the manufacture of Pintsch gas and the gassing of carriages and vans, and the carrying-out of minor repairs, such as attending to hot boxes, damaged draw-gear, &c.

Building of New Carriages and Wagons.

Carriages and wagons are constructed at Newmarket, Petone, Addington, and Hillside only.

Arrangements for Overhaul of Carriages and Wagons.

The carriage and wagon stock requiring workshop repair are overhauled as marked for the shops by the carriage and wagon staffs, and, except in the case of wagons sent in for brake overhaul only, no stock after being received in the shop for repair may again be returned to service without being "passed out" by the Carriage and Wagon Inspector, the "pass out" being a personal examination of such vehicle by the officer mentioned. Where, however, there is insufficient carriage and wagon work to justify the appointment of a Carriage and Wagon Inspector the passing-out is dealt with by the Workshop Foreman.

In the fitting-shop at the various works there is a leading fitter responsible for the overhaul of the Westinghouse brake on vehicles passing through, and for attending to the steam-heating and Pintsch-gas lighting of carriages. There is a leading fitter responsible for the manufacture of bogies for new stock and for all necessary fitting-work on carriage-seats, door-locks, parcel-net fittings, &c., and another leading fitter in connection with stores and electric lighting on carriages.

Carriage-shop.

Work in the carriage-shop embraces the building of new carriages and wagons (except all steel stock), and repairs to existing stock, under the charge of a Foreman Carpenter. The repairs include the lifting of vehicles for changing wheels on account of worn tires or axles, examination and replacement of damaged draw-gear, adjustment of hand and air brakes, replacement of worn brasses, &c.

Paint-shop.

A Foreman Painter is responsible for the painting of rolling-stock, glazing of carriage-windows, and upholstering-work for carriage seats and cushions. The condition of the carriages generally appears to be satisfactory.

Tarpaulins.

New stocks of tarpaulins are made at Addington, and repairs to and replacements of worn-out tarpaulins are carried out there, and also at Newmarket and East Town.

Westinghouse Brake.

The Westinghouse brake is used on practically all the rolling-stock of the New Zealand railways. Periodical overhaul is carried out at Newmarket, Addington, Hillside, Invercargill, and Greymouth Workshops, and at the Carriage and Wagon Inspectors' repair depots at Frankton Junction, Wanganui, Woodville, Wellington, Timaru, and Oamaru.

Carriage- and Wagon-wheel Centres.

The manufacture of carriage- and wagon-wheel centres is undertaken at Hillside, piecework rates being in operation. This is the only class of work in which such rates apply.

Carriage and Wagon Repair Staff.

The following are details of the staff employed in the several workshops and sheds in connection with the building and repair of carriages and wagons :—

Workshop or Running-shed.	Repair Staff.	Train Examiners.	Gasmen.	Total Staff.
Workshop—				
Petone	328	..	..	328
Napier	65	..	..	65
East Town	142	..	..	142
Newmarket	273	..	..	273
Addington	323	..	..	323
Hillside	237	..	..	237
Invercargill	68	..	..	68
Greymouth	53	..	..	53
Westport	39	..	..	39
Running-sheds—				
Wellington	22	12	2	36
Paekakariki	..	1	..	1
Cross Creek	..	2	..	2
Napier	..	2	..	2
Waipukurau	..	2	..	2
Palmerston North	1	8	2	11
Woodville	5	3	..	8
Taihape	..	2	..	2
Ohakune	..	1	..	1
Taumarunui	..	3	..	3
Wanganui	5	4	..	9
Hawera	..	2	..	2
New Plymouth	1	2	..	3
Marton	..	4	..	4
Stratford	..	1	..	1
Auckland	16	6	3	25
Mercer	1	1	..	2
Helensville	..	2	..	2
Frankton	10	4	..	14
Huntly	..	2	..	2
Morrinsville	..	2	..	2
Rotorua	1	..	..	1
Paeroa	..	1	..	1
Te Kuiti	..	1	..	1
Whangarei	12	1	..	13
Christchurch	6	6	3	15
Lyttelton	..	1	..	1
Rangiora	..	1	..	1
Waipara	..	1	..	1
Springfield	..	2	..	2
Ashburton	..	2	..	2
Timaru	3	2	..	5
Dunedin	10	5	2	17
Oamaru	6	2	..	8
Invercargill	5	3	..	8
Wairio	..	1	..	1
Milton	..	1	..	1
Kaitangata	..	1	..	1
Greymouth	..	3	..	3
Otira	1	2	..	3
Westport	..	2	..	2
Conn's Creek	..	1	..	1

Comparative Costs of Carriage and Wagon Maintenance.

The following table will show that the average cost of maintenance per vehicle in stock is higher in New Zealand than in Great Britain, even after making allowance for increased costs, which have been put to us as 60 per cent. higher than Great Britain in respect of wages and 20 per cent. material :—

Railway.	Cost of Coaching-stock Maintenance.	Number of Coaching Vehicles.	Average Cost per Coaching Vehicle.	Revised on Great Britain Basis.	Cost of Goods-wagon Maintenance.	Number of Goods-wagons (excluding Service Wagons).	Average Cost per Wagon.	Revised on Great Britain Basis.
	£		£	£	£		£	£
New Zealand	193,403	1,527	127	90	357,500	25,486	14	10
Great Britain	5,328,765	68,033	78	78	5,886,207	706,452	8	8

It should, of course, be remembered that the wagon stock in New Zealand is fitted with the Westinghouse brake. The cost of repair for this in New South Wales, which is fitted in the same way, was 17s. 3½d. per wagon per annum. The British wagons, however, are of a higher carrying-capacity and in every way larger and heavier. It would, therefore, seem that the cost of repairs in New Zealand should be reduced considerably.

Existing Wagon Stock.

The number of wagons appears to be high as compared with the amount of work done on the New Zealand railways and on those of Australia, and this is to a certain extent explained by the number of wagons under or awaiting repair. The Chief Mechanical Engineer in his evidence stated this number to be 6 per cent. of the stock. The North Eastern Railway of England, which owned 150,000 wagons, regarded 3 per cent. as an outside figure, and it was only very occasionally that as many as this were out of traffic under and awaiting repair.

Renewal of Carriages, Brake-vans, and Wagons.

It will be seen from the statements set out below that very little has been done in the direction of renewing coaches, brake-vans, and wagons. The utility life of coaches and brake-vans may generally be regarded as twenty-eight years, and wagons twenty-five years. We have previously pointed out that no renewals fund is in existence, and, bearing in mind that since 1915 the coaching stock has increased 9·31 per cent. and goods-wagons and brake-vans 23·41 per cent., while the average age of the existing stock at the 31st March, 1924, was carriages 22·77 years, brake-vans 27·45 years, and wagons 22·79 years, we are of the opinion that something should be done to place the matter on a proper footing :—

Twelve Months ended 31st March.	Capital Stock.	Value.	Number renewed.	Value.	Number which should have been renewed on Life Basis during Year.	Amount which should have been spent on Renewals during Year.	Balance which should have been set aside in a Fund.
			COACHING STOCK.				
		£		£		£	£
1915 ..	1,397	1,180,267	3	2,514	49	40,791	38,277
1916 ..	1,451	1,227,344	3	2,535	50	42,152	39,617
1917 ..	1,478	1,259,365	1	846	52	43,834	42,988
1918 ..	1,486	1,285,283	..	..	53	44,977	44,977
1919 ..	1,487	1,286,831	..	..	53	45,903	45,903
1920 ..	1,490	1,289,530	..	..	53	45,958	45,958
1921 ..	1,490	1,294,262	2	1,731	53	46,055	44,324
1922 ..	1,494	1,300,070	1	869	53	46,224	45,355
1923 ..	1,496	1,337,903	..	..	53	46,431	46,431
1924 ..	1,525	1,417,188	13	11,626	53	47,782	36,156
Total ..	..	..	23	20,121	522	450,107	429,986
			BRAKE-VANS.				
1915 ..	410	176,319	3	1,251	15	6,044	4,793
1916 ..	440	186,983	2	860	15	6,297	5,437
1917 ..	440	190,704	4	1,700	16	6,678	4,978
1918 ..	444	193,606	..	..	16	6,811	6,811
1919 ..	444	193,367	..	..	16	6,915	6,915
1920 ..	444	193,554	..	..	16	6,906	6,906
1921 ..	443	194,478	1	436	16	6,913	6,477
1922 ..	450	205,046	1	439	16	6,946	6,507
1923 ..	461	213,698	4	1,823	16	7,323	5,500
1924 ..	461	215,772	1	464	16	7,632	7,168
Total ..	..	..	16	6,973	158	68,465	61,492
			GOODS-WAGONS.				
1915 ..	20,816	3,046,286	107	15,619	794	115,870	100,251
1916 ..	21,554	3,181,276	82	12,000	833	121,851	109,851
1917 ..	21,940	3,279,791	60	8,856	862	127,251	118,395
1918 ..	22,073	3,334,622	53	7,923	878	131,192	123,269
1919 ..	22,214	3,350,362	14	2,115	883	133,385	131,270
1920 ..	22,493	3,408,957	24	3,620	889	134,014	130,394
1921 ..	22,676	3,476,063	131	19,854	900	136,358	116,504
1922 ..	23,524	4,211,771	88	13,490	907	139,043	125,553
1923 ..	25,645	4,726,316	45	8,057	941	168,471	160,414
1924 ..	25,734	4,818,816	64	11,795	1,026	189,053	177,258
Total ..	..	..	668	103,329	8,913	1,396,488	1,293,159

Based on the capital values as at 31st March, 1924, the sum of £251,073 should be spent annually on renewals or set aside in a Renewals Fund, made up as follows: Coaching stock, £50,614; brake-vans, £7,706; and goods-wagons, £192,753.

Proposed Standard Types of Locomotives, Carriages, and Wagons.

The varying types of locomotives, carriages, and wagons—many of which are of great age and obsolete—should be reduced to the lowest number of standards, consistent with working the traffic satisfactorily.

Dealing first with locomotives: there are at present forty-eight different types, as shown in the table referring to locomotive stock. It will, of course, take a considerable time to reduce these to a definite number of standards.

The first types, however, that are proposed to be eliminated are the following: D, F, Fa, K, L, La, M, N, Na, Nc, Oa, Ob, Oc, P, R, S, T, Ud, V, Wh, Wj, of which there are 173. Others will follow, but it is proposed to perpetuate the A, Aa, Ab, Wab, and Ws classes, which seem to be satisfactory. It would be an advantage to design a powerful type of shunting-engine with three cylinders, also a main-line-express engine, having 5 ft. 6 in. driving-wheels and three cylinders.

The great advantage of three cylinders is that a quicker and a more even start is secured, as with the cranks set at 120 degrees there is less chance of being on a dead centre in starting; also to get the same power the cylinders are much smaller, and consequently all the moving parts of the motion proportionately lighter and more easily handled.

For taking goods-trains of heavier weight over steep gradients, such as the spiral on the Main Trunk line and where the load per axle is restricted, a suitable Garratt engine might be designed and used with great saving. After having specified the work required it would be advisable to ask the makers of this type of locomotive to submit a design together with estimate of cost.

So far as carriages are concerned they are of very varying types, numbering sixty-six classes of passenger-coaches and five classes of postal vans. These should be reduced so far as the working arrangements will allow. The method adopted should be to standardize the length of carriages over headstock, and these ought not to exceed, say, three, or at the outside four, different types. All carriages should be of the bogie type, and these bogies should be standardized. The underframes should likewise be standardized. So far as the bodies are concerned, these and the various lengths should be fixed by the Mechanical and Operating Departments in consultation, and submitted to the General Manager for agreement.

With regard to wagon stock, there are seventy-four different types now in service, and we are of the opinion that steps should be taken to reduce the number of classes. As is pointed out in this section of the report, our view is that with the existing stock there should be no shortage of wagons, and concentration should be given to the renewal of the stock, at the same time reducing the number of types, rather than in the direction of increasing the capital stock of wagons. All new types of stock should be designed to suit the traders, and they should have an opportunity of making suggestions during the time these are in hand.

General Remarks.

Repairs and Renewals.

The most suitable and economical method of dealing with the repairs and renewals of rolling-stock would be to have two works built—one for the North and one for the South Island—in a convenient position, with ample yard accommodation, and laid out so as to pass the stock through when being repaired or built without twice handling it. These shops should also be arranged on a site and in such a way as to be able to be enlarged without undue expense when necessity arises.

As this, however, would mean a large expenditure in money and take a considerable time in selecting suitable positions and designing the best lay-out, it does not appear a reasonable proposal without a recommendation as to how the repairs and renewals should be at once dealt with so as to bring the costs down to a more reasonable basis.

In the North Island the shops at Napier, Whangarei, and East Town, so far as locomotive work is concerned, might be closed down, the necessary repairs being

carried out at Petone and Newmarket. In the South Island, Greymouth and Invercargill should be closed for locomotive work, repairs being undertaken at Addington and Hillside.

While the present methods of carrying out repair work in the shops are very antiquated, they could not be dealt with here in any detail. As regards the four shops which it is recommended should be retained for dealing with such work, the only course to take would be to get some one thoroughly conversant with up-to-date practice to advise generally, after having carefully considered the present lay-out and methods adopted in the shops. Unless this is done, there is little hope of being able to deal with the work as suggested.

At present it would be well to concentrate on repairs and to purchase locomotives rather than build in the existing shops, which are not laid out for doing this economically; and we should judge there is no saving or advantage in building if they can be bought outside at an equal or lower cost.

The methods of bringing in the engines for repairs should be revised, and they ought not to be put through a heavy repair or thorough overhaul unless the work they have done warrants this. Better methods for getting them through the shops should be arranged, as the average time for heavy and thorough overhaul in 1924 was about twelve weeks. This, considering the long life of boiler and firebox and the comparatively short mileage between repair, is far too long.

Organization.

It is essential that there should be a Chief Mechanical Engineer fully qualified and thoroughly conversant with up-to-date methods of railway working, who should have one Divisional Engineer in each Island to assist him. It is a question whether the Divisional Engineer in the North Island could not act as assistant to the Chief Mechanical Engineer, thus saving three officers. This would enable better salaries to be given, with no increased cost, and would also put the Works Managers on a more substantial footing.

Running-sheds.

There is a good deal of money which it is suggested should be spent on the running-sheds. We think that the proportion of engines under cover is such that a large expenditure in this connection is not warranted. At any rate, it is not one of the most important needs of the Mechanical Engineering Department.

Statistics.

There seems a great want of suitable returns comparing costs, &c., with other railways. It is impossible to be satisfied that the best is being done without a comparison of some kind.

Technical Training.

It would not appear that the young engineers are encouraged to qualify for any technical degree. In fact, the Chief Mechanical Engineer deprecated any introduction of a method by which this might be carried out, having a poor opinion of the technical training in Wellington, as will be seen by his evidence. Should this be continued, it will be impossible for engineers trained in the Railway service to rise to important positions in the future. We consider this matter worthy of careful consideration.

Rail Motor-cars.

There are many difficulties to be overcome with regard to rail motor-cars using internal-combustion engines on railways with heavy gradients, frequent stops, and requiring high acceleration. We are, therefore, unable to recommend any particular design which might be expected to fulfil the requirements on the New Zealand railways. It is noted that it has been decided to make trials of certain petrol-driven vehicles. The information gained by these should be of value.

For a light train service a suitable steam-locomotive would seem to be preferable, and as a Sentinel-Cammell steam rail coach is on order, and this appears to

have worked traffic satisfactorily and economically in Jersey over heavy gradients of 1 in 40 and round 5-, 7-, and 9-chain curves, with frequent stops from Corbière to St. Heliers, useful information will be gained, our knowledge of the work done being second-hand.

The North Eastern Railway of England ran steam-trains with the locomotive in between two coaches and with a driver's compartment at each end, so designed as to allow of the driver working the train from each passenger-coach, the fireman alone being on the engine. An old light locomotive was used and worked satisfactorily. It had the advantage that old stock was utilized which had become obsolete for heavier work, but was in every way suitable for light work of this description.

On the New Zealand railways there would appear to be engines of light design, which it is understood are unable to deal with the work for which they were intended—*i.e.*, Classes L and LA, and these might be made use of by attaching a coach for light train service such as would be expected of a rail motor-vehicle. These could take an extra coach, if necessary. We would strongly recommend that these be tried before experimenting with a light type of steam-engine which, if not successful, would be absolutely useless. We also think it unwise and injudicious to work these engines with only one man.

On looking into the working on branch lines it shows that engines taking mixed trains are kept standing for many hours. It would be possible and desirable to rearrange the working so as to allow for the running of a light passenger-train by the same engine and carriages. This would enable more use to be made of the men and also of the rolling-stock, instead of using a motor-vehicle. We do not recommend any further money being expended on motor-coaches at present.

IV. MANAGEMENT—*continued.*

(*d.*) STORES.

The Stores Branch is in the charge of a Comptroller of Stores, who is directly responsible to the General Manager for the purchase and distribution of all stores, stationery, timber, and materials of every description, with the exception of coal and hard coke, required by the Working Railways. The purchase of coal and coke is a responsibility of the Locomotive Branch, General Manager's approval being obtained before contracts are arranged. All purchase vouchers and credit issues are, however, dealt with through the Stores accounts, the Stores Branch being responsible for ensuring that all particulars of receipt, vouchers, &c., are in proper order, and conform with the Treasury and Audit Regulations. While the purchase and distribution of stores, as also the conservation of items in his charge, are thus under the direct supervision of the Comptroller of Stores, he has no control over the conservation of stores and materials supplied to branches, as on the issue of these items, as requisitioned by the branches, the responsibility of their custody becomes a matter for the particular branch concerned. Such stores once having been issued are, in fact, lost to the Comptroller of Stores, who neither keeps any record of them nor takes stock of them at any time. Reference will be made to this at a later stage.

Organization of Branch.

The headquarters of the Stores Branch are situated in Wellington, and at the date of inquiry the authorized staff numbered 398 in all. The Comptroller's staff numbered thirty, this including an Assistant Comptroller, a Chief Clerk, a Second Clerk, a Record Clerk and staff, and a Stores and Sawmills Accounts staff. The Stores Branch staff is generally divided as follows:—

Management, Accounts, and Records	30
Stores and Stationery	126
Sawmills and Bush Areas	242
	398

There are eight Stores districts—seven for general stores and one for stationery only—these being located as shown below :—

North Island :—

1. Newmarket, for Auckland Store District.
2. Petone, for Wellington Store District.
3. Stationery Store, Wellington, for whole system.

South Island :—

4. Addington, for Christchurch Store District.
5. Hillside, for Dunedin Store District.
6. Invercargill, for Invercargill Store District.
7. Greymouth, for Westland Store District.
8. Westport, for Westport Section.

A District Storekeeper is in charge of each Store district, and a Stationery Clerk in charge of the Wellington stationery store. These officials are assisted by means of a "Stores Instruction-book," which is issued to all permanent members of the branch, and which describes in considerable detail the procedure to be followed.

Railway Sawmills.

For some considerable time past the Comptroller of Stores has been engaged in organizing railway sawmills, these having been established owing to the difficulty experienced by the Railway Department, particularly in the North Island, in obtaining suitable native timbers for railway-works. This difficulty has been overcome by the purchase and installation of sawmills for native timbers, sawmills now being in operation at Mamaku, near Rotorua, and Frankton Junction. Each sawmill is under the direction of a Sawmill Manager, while each logging-area is in charge of a Bush Manager. There is also a Timber Supervisor engaged in this work, his special duty being to advise and inquire into the questions relating to the use and issue of timber, and the working of bush areas and sawmills under the control of the Railway Department. The staffs employed at these sawmills and in the bush logging-areas are as follows :—

Frankton Junction Sawmill	97
Mamaku Sawmill	87
Pokaka and Erua bush logging-areas	57
	241

Means of obtaining Stores.

The stores purchased in New Zealand are obtained from local manufacturers where material is suitable, or under a system of tender, quotation, or contract from local merchants and local agents. In connection with these purchases the quotations are sent direct to the District Storekeeper, who deals with them so far as his local requirements are concerned. Tenders, however, are forwarded to the General Manager, who appoints two officers to open the tenders and schedule them. They are then referred to the Comptroller of Stores for analysis, after which they are submitted, in conjunction with the opinion of the technical officers concerned, with a recommendation to the General Manager. The policy of the Department has been, broadly, to encourage the local merchants in the Store districts to hold stocks for the use of the Department. Stores stocked in bulk are purchased in England through the High Commissioner direct from the manufacturers, and in this case payments are made through the High Commissioner. Certain items, however, are ordered through the New Zealand agents of British firms, all the contracts being arranged by the Comptroller subject to the approval of the General Manager. All orders of £250 in value and over are submitted to the General Manager for approval. The coal bill is very high. We consider that having regard to the large quantity purchased, viz., 316,383 tons, better contract prices for freight as well as coal should be possible.

Stores Control Board.

In 1922 the New Zealand Government established a Stores Control Board, the function of which Board is to standardize and co-ordinate the whole of the purchases of State Departments in New Zealand. In other words, the Stores Control Board arranges the contracts and the various Departments order their

supplies under them. Three purchasing Departments have been appointed—viz., the Railway, Public Works, and Post and Telegraph Departments—and it is left to each of these Departments to call for tenders for particular items. Contracts are let for specific quantities and for estimated quantities, the latter usually being on annual or two-yearly contracts. In each of the Store districts there is a Supplies and Tenders Committee, this being composed of the District Storekeeper, Railways; District Storekeeper, Public Works Department; and the District Engineer, Post and Telegraph Department. They meet regularly to deal with stores matters and to agree on purchases.

The following table shows the stores and materials purchased during the year ended 31st March, 1924:—

STORES BRANCH.—PURCHASE OF STORES AND MATERIAL DURING YEAR ENDED 31ST MARCH, 1924.

Classification.	Payments made in New Zealand.	Payments made through High Commissioner.	Totals.
	£ s. d.	£ s. d.	£ s. d.
General stores	304,023 17 6	119,963 10 3	423,987 7 9
Oils	54,272 9 10	83 6 5	54,355 16 3
Permanent-way material	2,625 19 1	113,635 1 11	116,261 1 0
Sleepers, native	8,129 3 10	..	8,129 3 10
Sleepers, Australian	49,195 8 7	..	49,195 8 7
Timber, native	21,533 14 7	..	21,533 14 7
Timber, imported	19,921 9 0	..	19,921 9 0
Stationery	32,001 1 0	6,944 7 11	38,945 8 11
Stores expenses—including salaries, wages, transport costs, maintenance, inspection, and all charges	57,341 18 10	4,940 15 4	62,282 14 2
Intermediate totals	549,045 2 3	245,567 1 10	794,612 4 1
Sawmills	148,213 15 1	..	148,213 15 1
Coal and coke	637,492 1 8	..	637,492 1 8
Intermediate totals	1,334,750 19 0	245,567 1 10	1,580,318 0 10
A.O.L. stores	88,920 13 11	91,517 10 3	180,438 4 2
A.O.L. sawmill and factory	12,593 9 8	..	12,593 9 8
R.I.A. stores	9,920 1 3	372 19 11	10,293 1 2
Grand totals	1,446,185 3 10	337,457 12 0	1,783,642 15 10

The annexed table gives the value of stores stock on hand and sawmill balances for the last eleven years. These figures, of course, exclude value of stores in hands of other branches, as previously noted.

STORES BRANCH.—VALUE OF STORES STOCK ON HAND AND SAWMILL BALANCES AT THE END OF FINANCIAL YEARS 1914–24.

Year ending 31st March.	Stores, Stock, including Coal.	Value, Sawmills, Plant, and Timber.	A.O.L. Stocks.	R.I.A. Stocks.	Total.
	£	£	£	£	£
1914	403,454	43,561	38,205	..	485,220
1915	351,270	62,708	13,689	..	427,667
1916	345,153	80,372	25,945	..	451,470
1917	287,272	98,023	15,212	..	400,507
1918	312,204	111,924	13,244	..	437,372
1919	418,897	131,544	19,439	..	569,880
1920	721,062	113,323	46,378	14,176	894,939
1921	1,436,890	116,832	137,264	13,525	1,704,511
1922	1,375,644	169,864	542,770	11,920	2,100,198
1923	793,156	214,433	132,729	12,383	1,152,701
1924	558,258	257,408	93,132 56,770*	9,173	974,741
Totals	7,959,253	1,401,646	1,242,090	61,177	10,664,166

*Sawmill and factory.

Charging out of Stores.

All stores obtained, either locally or imported, for works charged to revenue and used for the purpose of "stock" are paid for by the Treasury, and are not charged against working-expenses until the stores are actually issued by the Stores Branch in response to requisitions for stores issued by the Department requiring them. Until the stores are issued in this way no interest charges thereon are paid by the Railway Department. On the other hand, all stores purchased for works charged to Capital Account are paid for out of the Public Works Fund, bearing interest from the date the money is provided to meet the cost of such stores.

The stores are charged out to the various branches at actual cost, plus 2½ per cent., this addition being made to cover salaries, wages, and the general upkeep of the stores. Stores expenses—*i.e.*, cost of transport, salaries, wages, maintenance, inspection, and all charges for the last financial year—represented £62,282.

The quantity of ordinary stores held in stock by the Comptroller of Stores is limited as follows:—

Contract stores—not more than three months' supply.
Non-contract stores—not more than six months' supply.
Under special approval—up to twelve months' supply may be stocked if of distinct advantage to do so.

The Comptroller of Stores, in reply to a question with regard to stock, stated that a maximum and minimum stock is being fixed, and this will give the stocks to be held in each store district. Reserve stocks of imported railway materials are based on six months' or twelve months' normal consumption, according to the character of the stores, while reserve stocks of coal are based, when possible, on at least six months' normal consumption.

Issue of Stores.

Stores are issued from the various stores upon requisition forms signed by authorized approving officers. Upon receipt of the stores the requisition forms are returned duly signed by requisitioning officers to the District Storekeepers. The system of internal check in connection with the purchase, receipt, and issue of stores is fully dealt with in the Stores Instruction-book, and, within the limitations imposed by the absence of complete control of all stores, appeared to be satisfactory. No stock ledgers are kept by the District Storekeeper, all purchase and debit vouchers being forwarded each week by the District Storekeeper to the Comptroller's Office, Wellington, where each item is duly entered in the Stores ledgers. The payments for all purchases of stores from private firms are made on Treasury contingency vouchers, which are carefully scrutinized by the Comptroller, Ledger-keepers, and their checking staff, and are forwarded to the Chief Accountant, who forwards them in due course to the Treasury Department for payment. All issues made by Storekeepers are summarized on special forms and forwarded each month to the Comptroller, where they are rated and priced out, and returns forwarded to the Chief Accountant. A separate ledger is kept for each store district; in addition, a stock ledger is kept for many lines—principally imported stores—showing the stocks, receipts and issues of each store in comparison, under item headings, but values are not shown.

The sawmills belonging to the Department are almost exclusively engaged in milling timber for the general needs of the Department, including present house-building operations. These mills issue timber and account for it in the same manner as the various stores.

The Stationery Store Clerk purchases all stationery, with the exception of certain bulk lines ordered by the Comptroller of Stores, and issues it in the same manner as the stores. The accounting stationery ledger is kept by the Stationery Clerk, who sends each year to the Comptroller stock-sheets of all stationery in hand, any discrepancies being inquired into by the Audit Inspector during his inspection visit.

The Comptroller's accounting staff records all purchases, transfers, and issues; keeps analysis of all expenditure, transfers and issues of stores; and generally does all the accounting-work of this branch.

Stock-taking and Inspection.

Stock-taking is carried out by the District Storekeepers, the stock on the Comptroller's books being completely taken at the end of each financial year. Stock-taking, however, only covers the stock held by the District Storekeeper, those issued and charged out to branches being excluded. After stock-taking, the stock-sheets are forwarded to the headquarters office for examination and comparison with stores ledger balances. The result of each stock-taking is also examined by the Stores Audit Inspector, who checks the sheets and locates discrepancies, &c. At each annual stock-taking values of stores are averaged if the stock in hand is made up of several purchases at different rates, but such average does not increase or reduce the total value under the item heading.

In addition to the annual stock-taking, the District Storekeepers are required to take stocks of a reasonable proportion of the stores in their custody at intervals, the idea being that the whole of the stock in each store will be progressively checked during the year prior to the annual stock-taking.

Interim stock-taking is also performed, as instructed by the Comptroller. This interim and progressive stock-taking is of advantage in that it should ensure a closer knowledge of the quantities of each item on hand, and should enable the stock of many articles to be kept to the minimum compatible with the requirements. With regard to the annual stock-taking, however, we are of opinion that this should be performed by headquarters or other staff so that the check is an absolutely independent one. In addition, the stock-taking should be complete in that the whole of the stock should be recorded.

Comptroller should have Charge of all Stores.

In the course of our visits of inspection to the railway workshops we found a very large quantity of material (all presumably charged out to different jobs) lying in the hands of various branches. Inquiry elicited the information, subsequently confirmed in evidence, that the Stores Branch had no responsibility at all for stores and materials once these were issued on requisition. This is a bad practice. We are of the opinion that the Stores Branch should have complete control of all stores and materials throughout the service, and that sub-stores in charge of Stores Branch staff should be established at the various workshops.

It is necessary to have sub-stores in connection with the workshops, and these should be under the supervision of the Comptroller of Stores, who should see that the workshops are not waiting for material that is required. In some cases we discovered that orders issued by the works were not carried out by the Storekeeper for many months. A complete revision of this is essential. The Stores Accountant should be directly under the Chief Accountant.

After an examination of the Stores depots, shops, &c., we recommended an immediate stock-taking, the result given us being as under :—

Statement of Stores on Hand by Branches, not in Custody of Stores Branch, 6th December, 1924.

Locomotive Branch	160,578
Maintenance Branch	247,600
Signal and Electrical Engineer	59,777
	£467,955

This figure does not, however include second-hand material estimated (by the Comptroller of Stores) as of the value of not less than £100,000. The stock-taking was hurriedly performed, and could scarcely have been done with detailed accuracy. At the same time it should give a fair idea of the minimum value of the stores on hand not in the custody of the Stores Branch. This accumulation of stores, which, as we understand the position, has been charged against working-expenses during past years and does not appear in the accounts of the Department as value of stores on hand, affects all departmental figures apart from the Traffic Branch.

Reorganization of Stores Branch essential.

In the course of our tours of inspection we visited the stores all over the system, and are compelled to say that they are by no means satisfactory. The stores held by the Comptroller of Stores are housed in somewhat dilapidated buildings, often most inconveniently arranged with regard to internal fixtures. Moreover, oils and other dangerous stores are not properly housed, and in many cases are mixed up with the general stores. Although buildings and equipment are faulty, there is no excuse for the general disorder such as we found existing, for example, at Greymouth. The stores held by the Engineering Branch are in better shape, but those under the Locomotive Branch are characterized by want of care and system. Valuable stores are lying about in shops and yards open to any one. We found stores that had been charged to this branch two years since still lying where they were delivered by the District Storekeeper.

The conservation of the stores required by a great railway is, in modern practice, a matter of scientific arrangement, and, in view of the large amount of money involved, reasonable expenditure upon the systems of storage and records —*e.g.*, properly designed shelving, trays, bins, and card index systems—is abundantly justifiable. We think that it would be of advantage to send some responsible officer to Sydney to study the working of the railway stores there, and to return charged with the duty of reorganizing the Department on a similar basis. A recent rearrangement in New South Wales has put the Stores Branch there upon a good footing, and New Zealand cannot do better than follow that example.

Arrangements for purchase of stores may, under prevailing conditions, be satisfactory, but the method of charging out the cost is complicated. As we have noted, some are charged direct to the Railway Department, some are held on charge by the Treasury until used, or supposed to be used, whilst others on Capital Account are charged through the Public Works Account. We suggest that all Railway stores (excepting such as may be purchased for new lines constructed by the Public Works Department), be charged direct to the Stores Comptroller's Account, and that he be responsible for debiting the branches as and when such stores are actually used.

IV. MANAGEMENT—*continued.*

(*e.*) Operation.

In any criticism of traffic movement on the New Zealand railways the detached sections of line and the outstanding topographical features involving steep grades and sharp curves must be borne in mind.

The supervision of train-running and general operation is theoretically under the First Assistant General Manager, assisted by a General Superintendent of Transportation. Actually, however, there is but little supervision at headquarters, excepting direct communication by the General Manager. The District Traffic Managers are responsible with few exceptions for train-timing and train-running, the manipulation of rolling-stock, and arrangements with the Locomotive Branch for supply of engines. There are at present nine District Managers covering the main lines, and five officers in charge of isolated sections. At the principal stations Goods Agents, acting under District Traffic Managers, have been appointed; their duties covering clerical work and the supervision of goods trains and traffic within the yards and sidings of their respective stations.

Passenger Traffic.

The evidence given on behalf of the public, a perusal of the time-tables, a record of the actual times kept by the trains, and statistics of train-earnings show that, as a result of slow and infrequent services, general discontent exists, and the inhabitants of New Zealand do not make use of railways for the purpose of travel to the same extent that under ordinary circumstances they might be expected to do. Comparisons are not always reliable as a guide, but the record of the total number of passengers travelling on the Queensland, South Australian, and Western

Australian lines, as compared with New Zealand, does indicate that there is less railway travel in the latter country in proportion to the population than in the States mentioned. There were in 1923–24 only 28,436,475 passengers on the New Zealand railways, with a population of 1,347,723, whereas in Queensland, with a population of 805,636, the number of passengers who travelled by railway in 1923 was 29,535,981. South Australia with 515,135 residents had 25,107,379 passengers by rail, and Western Australia had 18,133,168 passengers, for a population of 343,430. The average number of journeys per head of population in the year was—New Zealand, 21·08; Queensland, 35·82; South Australia, 47·46; and Western Australia, 51·27.

Train Services.

We cannot but think that the reason for this disparity is to be found in the train service. On some parts of the system trains cannot be run at any great speed by reason of grades and curves; but when it is found, as a sample, that on one line the only trains run in a day take two and a half hours to cover thirty-nine miles, it cannot be considered as a reasonable rate of progression, and it is not to be wondered at that the motor-car is used by everybody who possesses, or who can hire, such a vehicle, in competition with the rail. Not only is travelling slow—it is irksome; because, with the exception of main-line mail and some suburban, all trains are mixed. Passengers have to sit as patiently as they can in the trains whilst goods-shunting operations are carried out, often at each station at which the train stops. It was stated in evidence (Q. 2503) that "in the case of journeys up to about 40 to 50 miles, where road and rail facilities are about equal, the passenger who is able to choose between rail transit and road transit will usually choose rail. For such short journeys, however, rail facilities are usually both too slow and infrequent, and as a result the passenger chooses road." The evidence goes on to say, "We are confident that if the rail can economally give equal facilities to the road it can rapidly recover much of the traffic that it has lost to the road. In the case of journeys over about 50 miles very few (if indeed any) passengers travelling on business choose the road unless rail facilities are so poor that they do not provide a practicable alternative. In spite of this undoubted preference for rail transit for journeys over 50 miles the rail is losing a tremendous number of passengers to the road." In some cases it is not possible to travel to and from business centres situated 80 or 100 miles apart and return the same day. In addition to the disadvantages of slow travel, there are in many instances long waits at junction stations for connecting trains.

Motor Competition.

Many members of the staff, who were questioned as to any remedy they could suggest for recovering traffic lost to the motor-car, were of the opinion that nothing could be done without running unremunerative trains. They were apparently of the opinion that a single additional train cost 12s. per mile to run. They had evidently taken this idea from the yearly Railway Report, as they also took the loss upon certain lines and deprecated the running of better services upon those lines for that reason. In one instance it was stated, "There is no likelihood of increase in passenger traffic if better services are provided, as there are too many motor-cars in the district." Other officers were convinced that, as motor competition is becoming more and more acute, a better passenger service should be provided and fares reduced, but they are disheartened by the absence of any determined attempt to meet the competition.

As noted in the "Mechanical" section of our report, there is a waste of engine-power by the standing of engines in steam for many hours when they might be utilized for the additional trains which reasonable public facilities demand. Evidence was given that on a branch line an engine stands from 11.19 a.m. until 3.30 p.m., and in another case from 8.20 a.m. until 6.17 p.m.

The running of mixed trains is, from one aspect—viz., that of avoiding the cost of separate trains for passengers and goods—an economical arrangement, but, apart from the tedium of travel inflicted upon the public, there is without doubt a disadvantage by shunting having to be performed where every train has goods-

wagons upon it. The ratio of shunting-mileage to total locomotive-mileage is 22·50 on the New Zealand Railways, as against 13·90 in New South Wales, 12·52 in Victoria, 17·71 in Queensland, and 17·35 in South Australia. This shunting-mileage in New Zealand does not include shunting by train-engines at stations *en route*. The inclusion of the latter would show total shunting-mileage at still greater disadvantage.

Reorganization of Time-tables essential.

We recommend a complete reorganization of the time-tables with the object of meeting public requirements, and providing at suitable times as many passenger-trains as can conveniently and economically be run, leaving goods traffic to be conveyed by goods service, excepting only in those instances where the running of mixed trains is not calculated to divert traffic. In revising the time-tables regard should be had to the profitable employment of engine-power in order to eliminate the waste caused by engines standing in steam and earning nothing for many hours. The closest co-operation between the operating and locomotive branches is necessary to achieve this. At the same time all trains should be speeded up. They are not at present running to the speeds determined by the Chief Engineer, and many of the maximum speeds could, without danger, be increased, especially if stops are eliminated at unimportant stations in the case of business trains between populous centres. It is difficult to particularize the districts demanding prior attention, but we consider the Auckland–Hamilton, the Dunedin–Invercargill, the Wanganui and Christchurch district services should receive special attention. Limited trains have recently been arranged between Wellington and Auckland. To make these trains popular we would suggest that carriages of modern type, replete with the best form of sleeping and lavatory accommodation, be specially constructed. At the same time the attaching of a breakfast-car to these trains at the last stopping-place short of Wellington or Auckland would be appreciated. Only by making trains comfortable as well as speedy can the motor competition be countered. The latest type of the South African (3 ft. 6 in. gauge) railways express trains is an example likely to meet with general approval in New Zealand.

Suburban Traffic.

Suburban traffic upon railways in general is profitable, more particularly so where, by reason of transport facilities and other inducements, suburbs extend many miles from city centres. In arranging a revised time-table it will be well to extend suburban facilities in an effort to induce those who live and work in the towns to reside in the country and travel daily to and from their offices and workshops.

Tourist and Excursion Traffic.

It should be possible to extend this traffic very considerably by judicious arrangement and advertisement. No yearly or seasonal general programme has hitherto been published. The beauty-spots of New Zealand are known more or less the world over, but facilities for reaching them are by no means as convenient or as well advertised as they might be. The Tourist Bureau and the Railway administration working in close co-operation, spending freely in advertisements and more still upon convenient train services, should in the course of two or three years make the tourist and excursion traffic a very valuable addition to Railway revenue. The New Zealand climate in summer, in conjunction with convenient transport facilities, might be expected to prove attractive to Australian tourists, but visitors from that direction can only be secured through attractive advertisement, preferably in conjunction with steamship companies. When excursions are advertised the records show that the public respond, especially in the South Island; and we suggest that more frequent opportunities should be given, with faster trains, not only to and from tourist centres, but also between one town and another. It has been urged that in the latter case traffic at ordinary fares is jeopardized, but experience

has proved that on balance there is great gain. A fast train at excursion fares, one day in the middle of each week, leaving in the morning and returning at night, from country stations to the nearest town, has been found a profitable arrangement, and we suggest that experiment should be made in this direction. Only by testing the possibilities of new traffic can the full value of railway facilities be gauged. In view of road motor activities, every avenue should be explored. We refer to the effect of cheap fares in another section.

Reservation of Sleeping-berths and Seats.

Reservation of seats and sleeping-berths must of necessity be concentrated in one office at the starting-point of the trains, and unless great care be taken in the registration of applications there is risk of disappointment and dispute. Tourist offices and stations receiving inquiries should make certain by communication with the central registration office that all is in order before promising a sleeping-berth or a seat. There has occasionally been some trouble in this connection. There would appear to be reason in the request that seats should be reserved for journeys of 50 miles and upwards.

Platform Tickets.

The issue of platform tickets through a machine situated in the booking office is the usual form of meeting the application at Auckland for access, by friends of passengers, to the platform, and this we recommend. The idea of issuing platform season tickets, as at Timaru, is also worthy of extension.

Collection of Tickets.

All stations being open and tickets collected upon trains means constant examination of tickets upon long journeys, causing irritation to passengers, especially at night. We recommend that at the larger stations the platforms be enclosed and tickets collected at the doors. This may mean some increase of staff at the stations, but it should be more satisfactory from a public point of view as well as to the Department. A label indicating sleeping-berth passengers' destination would also be a convenience, and obviate the waking up of passengers unnecessarily. The fares should be printed upon the tickets, as we understand was formerly the practice.

Parcels Traffic.

The parcels traffic on the New Zealand railways is a considerable one. For the year 1923 receipts were £304,306. The present method of issuing consignment-notes and waybills, as in the case of goods traffic, necessitates a great deal of clerical labour and delay, both at the despatching and receiving stations.

We are of the opinion that considerable economy would result in the adoption of the stamps system, as used in England and elsewhere. Under this system, parcels up to a determined value are not waybilled, adhesive stamps to the value of the freight being affixed to the parcels. Travelling inspectors are employed to keep a check upon the work performed, and in practice it is found that considerable advantages accrue by its use. We recommend that the Railway Department should take steps to bring this system into operation.

Goods Traffic and Trains.

As in the case of passengers, so with goods traffic the road motor has become a serious competitor of the railway. No arrangement exists at present for the collection of goods from their source or delivery to destination. It is in being able to haul goods from door to door that the strength of this competition lies. Evidence from all quarters shows a general desire to consign traffic by railway rather than by road, if for no other reason than the avoidance of damage to the roads; but the advantages offered in convenience, if not in cost, outweigh the public-ownership aspect, which is so fully recognized by traders. Without doubt the Railway Department could, by establishing a well-organized fleet of road motor-vehicles, secure practically all the traffic to the rail, the alternative being a combination on mutually advantageous terms between motor-owners and the Railway Department. We are disposed to recommend the latter course, at any rate, as a trial. If within

a defined area adjacent to stations, conveniently grouped, a motor service for collection and delivery could be arranged by agreement with motor-owners on the basis of payment by the Department of so-much per ton on goods hauled to the stations, and provided also that the charges levied upon traders by the motor-owners were subject to departmental approval, we think a service satisfactory to the public and the Railway would result. This would meet the evidence given at Murchison upon the subject of collection and delivery to and from the railhead of the Nelson section. At the same time we recommend that in one, or possibly two, localities the Department should set up its own service as a guide to the value of the arrangement made with motor-owners, and as forming a nucleus for extension if the joint transport agreement fails. It would be desirable to detail a suitable officer attached to each General Superintendent's Office to organize and supervise any such scheme as we suggest. In some instances it might be advantageous to reduce rates, but it is clear that in the majority of cases it is not rate but facility that is the governing factor.

As noted previously, nearly all the trains are mixed; these give a fair goods service, and there are but few complaints of the time taken in transit. The practice of staging from one subterminal to another is not conducive to economy. There should be more through goods trains, to the relief of subterminals. It may be convenient to keep engines within a certain district, but when goods traffic is held up and costs increased by regard solely to engine-working an attempt should be made to get more remunerative mileage out of the engines by longer runs, irrespective of locomotive districts. This should not be difficult, given co-operation between the Traffic and Locomotive Branches.

Train-loads.

The train-loads are light by reason of mixed trains and the limitation of tonnage per train. There is no reason why trains of 1,000 tons should not be hauled upon the level or where grades are easy. At the top of a grade where for many miles beyond it is all downhill, as in the instance of the line from Arthur's Pass to Christchurch, after reaching Cass, it is a waste to haul to Christchurch only the same load as between the tunnel and three miles east of Cass. The provision of one or two suitable sidings at the top of the grade for accumulation of traffic, and the blending of two or three trains into one for the down grade, would be economy of power.

Wagon-distribution and Wagon-loads.

There have been some complaints of shortage of wagons. This should not be, having regard to the number of wagons available. There are in New Zealand, according to the last Railway Report, 26,195 wagons and brake-vans for the conveyance of 6,925,517 tons of goods. In New South Wales there are, for 5,317 miles of line and 13,801,310 tons of goods, 23,897 wagons. In Queensland, 4,208,989 tons of goods are conveyed in 15,364 wagons. South Australia, with 9,833 wagons, conveyed 3,283,594 tons; and Western Australia, with 10,208 wagons, carried 3,006,063 tons of goods. The average capacity of the wagons is, as to New Zealand, 9·57 tons; New South Wales, 14·9 tons; Victoria, 13·6 tons; Queensland, 9·29 tons; South Australia, 9·6 tons; and Western Australia, 10·36 tons. The detached sections of line in New Zealand call, no doubt, for more wagons than would be sufficient if the North and South Islands were linked up by railway, and the isolated sections on both Islands were connected with the main lines. There is also the variation of commodities and quantities to be taken into consideration when comparing one State railway with another, but, after giving full credit for these differences, there does appear to be quite enough wagons for the tonnage in New Zealand, and complaint should not arise if wagon-distribution is well and speedily regulated. It is unfortunate that no statistics are collected of wagon demand and supply, as these would enable the position to be focused more clearly. It is said that wagons are held up by traders, but we do not think there is more reason to complain of this than in the States with which comparison is made. In any case, delay in discharge of wagons can be met by charging demurrage after a certain time.

Wagon-control is exercised by the Traffic Managers, who have an allocation of so-many wagons for their respective districts. When a shortage arises in one district, appeal is made to the neighbouring district. In theory, assuming the allocation to each district is correct in proportion to the tonnage and haul, the

system should function satisfactorily. It has been found, however, that where a similar arrangement has obtained, there has developed a tendency to hold up empty wagons in a district for fear of being short later on. Under modern practice, and as the result of experience, the control of wagons is in the hands of a central office with sub-control. We recommend that, with the appointment of General Superintendents for each Island, this system be adopted. With the connecting-up of the detached sections of line the position should further be improved, and there should be no demand for additional wagons, apart from specialities, for some years to come.

There are no statistics of average loads, but wagon-loads appear to be light. We mention the possibility, in our remarks under "Rates and Fares," of increasing the weights by minimum wagon-load rates. There is in some districts unbalanced wagon-mileage. This is so, more or less, in every country, and it needs very careful watching with a view to minimizing it as far as possible.

Checking of Freight Traffic.

Complaint was made at Auckland that checking of goods into truck upon the wharves was not performed by the Railway Department in ordinary course. Where the Railway takes charge of a consignment into truck direct from a ship or wharf there should be a check upon the quantities received, to the same extent and in the same manner as goods are dealt with when loaded at a station.

Train-control.

The control of train-running should be centred at the District Traffic Offices, with telegraphic or telephonic communication to all stations within each district. At certain important junction stations, sub-control offices in touch with the District Traffic Manager's Office should be established, the object in both cases being the watching and control of the trains from start to finish.

There are long lengths of line without either tablet or automatic safety devices. In the event of a train getting out of course and running late, the practice is to give instructions by telegraph or telephone to the Stationmasters concerned to stop the train running late at a station other than that provided for as a crossing-place and to send the other train on. This method of working, even if all possible precautions are taken, is a fortuitous one. New Zealand has, fortunately, been free from trouble in this direction, but many serious accidents have occurred elsewhere as the result of carelessness or misunderstanding. In Great Britain the practice is prohibited, all single lines being equipped with train tablet or train staff. We recommend that similar safety appliances be provided in New Zealand. Pending the fixing up of these instruments, we suggest that instructions be issued in very definite form. We give the following as an example of the wording and order in which messages should be sent in the event of a crossing being changed:—

EXAMPLE.

(1.) From Control
To Stationmaster, Pukerau.

ALTERED-CROSSING ORDER.

Hold train No. 27 at Pukerau until arrival of train No. 30 from McNab.

(2.) From Stationmaster, Pukerau
To Control.

ALTERED-CROSSING ORDER.

Have obtained signatures of guard and driver, and will hold No. 27 train at Pukerau until arrival of No. 30 from McNab.

(3.) From Control
To Stationmaster, McNab.

ALTERED-CROSSING ORDER.

Send train No. 27 on to Pukerau to cross No. 30.

(4.) From Stationmaster, McNab
To Control.

ALTERED-CROSSING ORDER.

Have signatures of guard and driver, and will send No. 27 on to Pukerau to cross No. 30.

(5.) From Control
To Stationmaster, McNab.

ALTERED-CROSSING ORDER.

No. 27 to cross No. 30 at Pukerau. Correct.

Until the last message, "Correct," is received, a train should not be despatched out of its regular course.

Tarpaulins.

Complaint was made of shortage of truck-covers. The stock if fully used and correctly distributed should be sufficient. The control of these would follow the control of wagons.

Live-stock Conveyance.

Live-stock, representing, as it does, so large a proportion of the wealth of New Zealand, demands special consideration. Vehicles in which stock is conveyed should be better cleaned and disinfected than they are at present. Live-stock trains should be run at passenger-train speed and, where distances are long, detailed arrangements for attention and water should be made.

Level Crossings.

The great number of level crossings in the Dominion are a danger—as all level crossings are—as well as hindrance to the movement of traffic. Some £200,000 have been included for crossings in the proposed capital expenditure, to be spread over the ensuing eight years; this amount, however, will not go very far towards meeting the cost of bridges. At main roads in the larger towns it is desirable to obviate crossings by bridges or subways in the interest of public safety, but it is not practicable to deal with the numerous county roads in the same way. Where signal-boxes are near crossings the provision of electrically operated gates to be worked by signalmen would be a safeguard, although it would not get rid of obstruction. We have examined the latest form of automatic swinging-light warning-device, which goes as far as possible, short of physical protection, in the direction of preventing the railway being crossed by road vehicles or pedestrians when trains are approaching. Bells are also provided at some of the crossings. Short of erecting gates and building gatehouses we do not see that more can be done to give warning at crossings.

Private Sidings.

Agreements for the construction and maintenance of private sidings provide for the cost and renewal, but not maintenance, to be paid for by the grantee. An annual rental levied, it is said, to cover the cost of shunting is an addition to the cost and renewal of the siding. In the event of the siding being removed from one site to another at the instance of the grantee, the cost of such removal is charged to him. To charge a rental after the whole expenditure upon material and labour has been paid for by the grantee gives rise to resentment and a feeling of unfair treatment. We do not think that a rental, so called, in addition to the cost of construction and protection by signals, if any, should be levied. If there is anything extra in the shape of shunting services, or otherwise, that would not be performed by the Railway Department for the traffic if put on rail at the nearest station to the private siding, then the rates charged should be so adjusted as to meet the extra cost.

Weighbridges.

Some complaint is made that railway weighings are unreliable. All weigh-bridges and weights are tested and adjusted periodically by competent artisans under the control of the Permanent-way and Works Department. The weights are further tested by the Weights and Measures Inspectors. There should be no difficulty in securing accuracy providing the instructions to the staff are carried out faithfully. Recent legislation, we understand, provides for the acceptance of Railway weights by buyer and seller of produce. It is especially necessary under these circumstances that the selection of men charged with the weighings should be made with care, in order, apart from the need for accuracy in Railway charges, that disputes should not arise between producers and merchants.

IV. MANAGEMENT—*continued.*

(*f.*) Rates and Fares.

In common with the rates and fares of other countries, the war has left traces of disturbance upon railway charges in New Zealand, and some rearrangement both with regard to classification of merchandise and the incidence of rates and fares is desirable. The increase of percentages—25 per cent. in the case of passenger-fares and 40 per cent. upon goods rates—has not been sufficient, in the absence of growth of traffic, to cover additions to the wages bill, plus the increase in cost of material since the war.

Passenger-fares.

Dealing first with ordinary passenger-fares, which before the war were based on 1½d. first and 1d. second class per mile, plus a terminal charge of 1d., the increase of 25 per cent. has probably not affected the revenue to any appreciable extent, except the short distance traffic, but when we come to the period or excursion fares designed to encourage tourists, which are made up of the ordinary single fare plus 50 per cent., there is evidence that the volume of travel has declined seriously. We think it would be wise to reduce these fares to the sum of the ordinary single fare, plus 25 per cent. Very few day-excursion facilities have been offered on any part of the system. These might with advantage be extended considerably, a round fare being charged for short distances up to 30 miles at about the ordinary single fare for the return journey, and for longer distances something less than the ordinary single fare, the desideratum being to get down to the level of passengers' pockets and thus induce them to travel. In these cases slow trains fail to produce satisfactory results: there must be fairly rapid transit. Week-end tickets, available from Saturday to Sunday or Monday, might again be tried. We understand the result of previous attempts in this particular direction were not very successful. Occasional town to town bookings at the day-excursion fares have proved popular in some other countries and might pay well in New Zealand. Complete advertisement is necessary in this, as in other attempts to attract passengers.

Suburban fares, having as their objective an encouragement to live outside city limits, consist of ordinary fares at a slightly less price per mile than in the country. The fares for short distances of from 1 to 3 miles are too high to compete with the road. It would be advisable to charge 3d. second class for distances up to 3 miles and grade fares beyond that limit up to the standard per mile. Our observations on these short-distance fares apply to the country as well as the suburbs. There is no particular reason why ordinary passengers, as distinguished from weekly- or season-ticket holders, should travel cheaper in the suburbs than in the town. The best incentive to the selection of a suburban residence in preference to the town has been found in the issue of cheap weekly, monthly, or yearly season tickets. In addition, if on one day of the week excursion tickets are issued by midday trains from suburban stations to the town, available for return by any train, including a late train after theatres close, a still further inducement is provided.

Goods Rates.

We understand that a revised classification of goods traffic is in course of preparation, and will shortly be published. Experience has proved the impracticability of framing a classification pleasing to all interests; but it is advisable, before bringing a new classification into operation, to publish it and give time for those who may complain to give their reasons for asking that any particular commodity should be put into a lower scale. The objective of a goods classification is to secure a given amount of revenue to cover expenditure, including interest, by an equitable division of conveyance charge as between the various classes of traffic, having regard to the character, value, and other considerations attaching to each item. The present classification is based mainly upon what the traffic will bear in the shape of a conveyance charge. Other factors, such as encouragement

of local industries, and, to some extent, cost of haulage, were elements in the decision to include produce and articles in a certain class.

In addition to the general tariff, many special rates, designed to meet competition or help certain industries, have been given. Some of these are obsolete, and should be cancelled, others probably need revision, but could not be merged in the general system of rates without disturbance of trade. There have not been many complaints regarding rates, but there has undoubtedly been loss of traffic by motor competition. We do not think, however, as stated elsewhere, that rates have had so much effect upon the traffic as the facility of door-to-door conveyance.

The experience of the past four years has shown that there is no margin for reduction of rates, unless by so doing more traffic can be secured. Any reduction, therefore, should be made with great care and caution. There are some rates, particularly those applicable to coal, which should be increased. For certain distances, when traffic is hauled over steep grades, the freight charges secured at present involve a loss which has to be made up by other industries.

The conveyance of lime free over certain distances, whilst helping agriculture—that is, if the farmer gets the advantage of it—is unfair to the Railway Department. We understand this is being remedied by arrangement with the Department of Agriculture. Again, road-stone is charged at rates involving direct loss, which has to be met by other users of the railway. This material should at least pay a rate equal to that for brown coal. We have included this, and the lime charges, in our estimate of future revenue.

Minimum Truck-load Rates.—There are to-day reduced rates for minimum truck-loads. These might be increased to include other articles.

Differential Rates.

The practice of charging less for imported than for local produce has been the subject of comment. This is a question of policy rather than a railway matter, and we must leave it at that.

The tapering of rates according to distance needs careful study before decision. The taper should not be too steep, especially as with the linking up of detached sections of the railway longer throughout-distance conveyance will become possible.

Cattle and Machinery for Shows.

In the interest of the Railways as well as of encouragement to agriculture it is desirable that stock and machinery exhibited at shows should be conveyed free upon the return journey.

IV. MANAGEMENT—*continued.*

(*g.*) Statistics.

The advantages to be gained from the use of statistics in connection with railway operation and working cannot be emphasized too strongly. It is observed that, so far as the New Zealand railways are concerned, certain of their statistics appear in the *Bulletin* issued by the Australian Bureau of Railway Statistics, but in a large number of instances it is shown that the information is not available.

While it may not be practicable to adopt *in toto* the statistics compiled by Great Britain, we consider there should be no difficulty in the New Zealand railways coming into line with the Australian States, and these figures—in addition to providing information essential to effective railway management and working—must afford a satisfactory basis of comparison. The statistics now being compiled by the Dominion are not sufficiently wide to be of the greatest value, nor is the full use being made of them. It may be well to enumerate certain of the statistics which the management of the British Railways adopt:—

Passenger Traffic.—Number of journeys (separating ordinary passengers from season-ticket holders); receipts and average receipts per journey, under the headings of "full fares" and "reduced fares"—*i.e.*, excursion, week-end, work-

men, &c.—showing each item as a percentage of the total and dividing the figures into first and second class.

Parcels and Miscellaneous Traffic charged at Passenger-train Rates.—Number of parcels; receipts, and average receipt per parcel.

Goods-train Traffic.—Tonnage of goods-train traffic (excluding free haul), separated into—general merchandise; live-stock; coal, coke, and patent fuel; other minerals; receipts therefrom; the average receipt per ton; the net ton-miles and the average receipt per net ton-mile. Selected commodities are specially ton-miled each month, taking same two years to get through the list of seventy-two commodities.

Engine-mileage.—Train-miles; assisting-required miles; assisting-not-required miles; light-miles and shunting-miles are compiled in respect of both passenger and goods, to which are added the departmental miles, which represent the total engine-miles run.

Engine-hours in Traffic.—Train-hours; shunting-hours and other hours are compiled for both passenger and goods, to which are added the departmental hours, making the total of engine-hours in traffic.

Train-miles per Hour.—Passenger and goods-train miles per passenger and goods train-hour are compiled to show the average speed of trains. Passenger and goods train-miles per passenger and goods engine hour are also compiled, this statistic showing in comparison with previous periods whether there has been any increase in time taken in connection with unproductive running.

Average Train-load.—This shows average net load of freight trains, irrespective of the number of wagons attached, and is obtained by dividing the net ton-miles by the goods train-miles.

Wagon-miles.—These figures are compiled separately in respect of loaded and empty wagon miles.

Wagons per Train.—This is obtained by dividing the loaded and empty wagon miles by the freight train-miles.

Average Wagon-load.—Obtained by dividing the average freight train-load by the loaded wagons per train.

The following are also prepared, being compiled from the statistics enumerated above: Shunting-miles per 100 train-miles; assisting required; assisting not required and light miles per 100 train-miles; wagon-miles per train and engine hour; net ton-miles per engine-hour and per route-mile.

Average Length of Haul.—This figure is obtained by dividing the net ton-miles for the several classes of traffic by the tonnage of those classes.

Locomotive Working.—The following statistics are compiled: The consumption of coal by steam locomotives per engine-mile, and of lubricating-oil per 100 engine-miles; the number of engines in stock; the average number in stock, shown also as a percentage of stock; the average number in use on week-days and the maximum number in use on any one week-day, these figures being also shown as percentages of the average number of engines available.

The practice which is now being generally adopted, both in Great Britain and America, is to appoint a Statistical Officer, whose duty it is to arrange for the proper compilation of statistics required in connection with railway working, and to prepare them in a concise form for the information of the principal officers. In Great Britain the Statistical Officer is, as a rule, attached to the General Manager, and we consider that such an appointment on the New Zealand Railways would be a great advantage.

V. MISCELLANEOUS QUESTIONS.

Railway Refreshment-rooms.

Up to the end of 1917 dining-cars were run on the New Zealand railways between Dunedin and Christchurch, Wellington and Napier, Wellington and Auckland, and also on the Auckland–Rotorua express. At the end of 1917, however, owing, it is stated, to the heavy cost of running the dining-cars, and to the fact that they did not give satisfaction to travellers, the dining-cars were stopped, and refreshment-rooms were provided at Frankton Junction, Marton, and Oamaru.

For the last three years of their running the dining-cars were worked at a loss of £2,605 in 1915, at a profit of £2,045 in 1916, and at a profit of £4,611 in 1917. These figures exclude any charge for the haulage of cars.

As opportunity offers, refreshment-rooms hitherto held on leases are being taken over by the Refreshment Branch, which now controls eighteen rooms and performs the catering-work on the Lake Wakatipu steamers. Since the opening of the Railway refreshment-rooms at the beginning of 1918, net revenue, after deducting the rental of the rooms and interest on capital invested, has averaged £4,900 per year. The receipts last year were £96,342, the expenditure £85,405, leaving a profit of £10,937. The accumulated profit to date on account of refreshment-room services is £49,200.

In the course of our tours we have inspected many of the refreshment-rooms, stores, &c., and are satisfied that they are being conducted on good lines. The food supplied is of the best quality, the equipment is clean, the rooms are well arranged, and the prices charged reasonable. No single complaint has been received by us with regard to the working of the refreshment-rooms, and, in view of the difficulty attendant upon catering for an indeterminate number of people at intermittent intervals, this speaks well for the administration. We have no recommendations to make in this regard, except to suggest that it might be found desirable—it will be essential in time—to run dining-cars, or at least buffet cars, on some of the principal expresses.

Information, Advertising, and Publicity.

Advertising at stations and in trains, &c., as also the publicity work carried on, is under the control of an Officer in Charge of Advertising. Prior to 1915 it was the practice to let advertising by contract, when the revenue derived was approximately £4,000 per annum. During the last four years the aggregate revenue of the branch has been £16,609. The revenue from book-stall leases during the year ended 31st March, 1924, amounted to £3,994, but as the majority of the leases expired on the 30th June last, and were renewed at higher rates, the estimated revenues from this source for the 1924–25 year is £6,500.

Publicity work in connection with the Railway Department's activities has only recently been developed, and considerable activity is proposed during the next few years. There is certainly great need for more vigorous and intensive publicity work in connection with the railways of New Zealand, with regard to the circulation of information as to ordinary tourist and excursion-train facilities, and generally in connection with the activities of the Department. It is now definitely recognized that there is a real need for the development of a "railway" sense among the general public, and this can only be done by a forceful Publicity Branch working in close touch with the management in this important field.

The cost of publications and advertising during the last financial year amounted to approximately £5,000, an insignificant amount viewed in the light of developmental possibilities. We recommend that energetic steps be taken to improve this aspect of the Railway Department's work, and that on the appointment of a Secretary, as suggested in our report on "Organization," he be placed in charge of information, advertising, and publicity work, and be assisted by a competent staff.

Training of Railway Men.

There is yet another matter upon which we must make adverse comment, and that is the absence of any facilities for the training of the younger members of the staff in railway work. It is understood that some scheme of training is in operation for the teaching of station work, the foundation of all general railway knowledge, but there is no regular arrangement applicable to the whole of the staff, and subject to examinations at regular intervals. Nearly all railways have realized the need for the systematic training of their employees in order to develop a more enlightened personnel, and it is a matter of urgency that a definite scheme

of this character should be introduced in New Zealand. Classes might advantageously be arranged in conjunction with the educational authorities at the various centres—Wellington, Auckland, Christchurch, Dunedin, and Invercargill. The Railway Department should co-operate in such classes, both by providing the men qualified to teach railway subjects, by donations towards the cost, and by providing free travelling facilities for their employees to attend such classes. Advantage would also accrue from the publication, by the Railway Department, of an official journal, as is customary on most railways.

Theoretical training is, of course, of little avail unless it is allied to practical experience in the various departments, but it affords the ground-work for the building-up of a comprehensive railway education, signs of which are wanting in New Zealand.

Closely associated with this question is the need for experience on other railways. Practical education can only be fostered by this means, and we consider that those who indicate the possession of suitable qualifications should be induced to study the railway problems of Australia, Great Britain, and America, in order to obtain the wider vision necessary in the future officers of the Railway Department; alternatively, tours on the railways of South Africa and the Argentine, which are developing their railways rapidly, would be advantageous. Apparently no recognized system has been followed in the selection of officers to visit other countries. Now and again an individual officer has been to Australia, but visits to more distant countries have apparently been very infrequent. We recommend that three or four officers be selected annually to visit the railways of other countries, and upon their return to report upon their experience. In 1925 the Railway Centenary celebrations are to be held in England, and delegates from the world's railways will be present. This would be a most opportune time for selected officers to visit the Old Country, and we think that consideration might well be given to this.

"Safety First" Education.

In connection with railway education it is noticed that there is no system of inculcating "Safety First" principles among the railway staff. This is a scheme inaugurated in England and followed in America, Australia, and elsewhere with marked success. We think it advisable that steps should be taken to interest Railway employees and the public to protect themselves from danger by means of suitable posters, cinema films, and through the medium of a Railway journal, the development of which is proposed elsewhere in this report.

VI. SUMMARY OF RECOMMENDATIONS.

We give below a summary of our principal recommendations.

Finance.

(1.) That railway finance be taken out of the control of the Treasury, and the Railway Department be given full control of its own funds.

(2.) That reserve funds be established to provide for obsolescence and wasting assets of permanent-way and rolling-stock.

(3.) That the Railway Department be recouped by consolidated revenue for losses incurred upon development lines, less the net value of traffic contributed by such lines to main lines.

(4.) That the Railway Department pay the actual rate of interest upon loans raised for railway purposes.

(5.) That the railways be so worked and managed that the gross receipts shall be sufficient to cover working-expenses, reserves, and interest on capital, including sinking funds. In the event of any surplus, this to be devoted to reductions of rates and fares, and in the case of a deficit rates and fares be increased.

(6.) That a yearly balance-sheet, showing capital, revenue, and net revenue, followed by departmental accounts in the usual company form and a forecast of capital commitments for the following year, be rendered to the House of Representatives.

(7.) That the value of stores found on hand with branches and not on charge in the books of the Comptroller of Stores be used as the nucleus of a reserve fund for arrears upon rolling-stock.

ORGANIZATION.

(8.) That the Railway Department be managed by a Railway Board, comprising a Chairman and two other members.

(9.) That a Secretary, Cashier, and an Operating and Equipment Assistant be appointed.

(10.) That a Chief Mechanical Engineer, fully qualified and thoroughly conversant with up-to-date methods of railway working, be appointed.

(11.) That General Superintendents, one for the North Island system with headquarters at Auckland, the other for the South Island system with headquarters at Christchurch, be appointed, responsible to the Board and acting under regulations and instructions applicable to the system as a whole, for operation, commercial matters, and maintenance within their respective divisions.

(12.) That the number of traffic and civil engineering districts be reduced to six, three to each Island.

(13.) That one Divisional Mechanical Engineer in each Island is sufficient, and that consideration be given to the question as to whether the North Island Divisional Engineer could not act as assistant to the Chief Mechanical Engineer.

ENGINEERING.

(14.) That new lines likely to become main lines be laid with 70 lb. section rails as a minimum.

(15.) That consideration be given to the employment of flying gangs for the maintenance of branch lines.

(16.) That modifications be made in the proposals for improvements and new works essential to cope with present and prospective traffic.

MECHANICAL.

(17.) That modern machinery be provided in the locomotive workshops and the general arrangements reorganized.

(18.) That a progress system for dealing with repairs be adopted in the works.

(19.) That a system of standard gauges be introduced in connection with locomotive maintenance and renewal.

(20.) That at Addington works a separate shop be provided for the maintenance of points and crossings.

(21.) That the methods of bringing in locomotives for repair be carefully reviewed, to avoid engines being brought in for thorough overhaul too frequently.

(22.) That Petone and Addington works deal with the whole of the locomotive requirements in both Islands.

(23.) That Napier, Whangarei, East Town, Greymouth, and Invercargill be closed down for locomotive work.

(24.) That improved methods for getting engines through the shops be introduced, in order to reduce the average time for heavy repair and thorough overhaul.

(25.) That large expenditure on running-sheds is not warranted, as the proportion of the engines under cover would appear to be sufficient.

(26.) That the capital stock of locomotives be regarded as ample for requirements, bearing in mind the small annual mileage per engine.

(27.) That as the average age of the existing stock of locomotives is high, indicating a number of obsolete types, these be replaced as early as possible.

(28.) That, in addition to perpetuating the A, AA, AB, WAB, and Ws Classes, a powerful type of shunting-engine with three cylinders, also a main-line express engine having 5 ft. 6 in. driving-wheels and three cylinders, be designed, and for taking goods-trains of heavier weight over steep inclines a suitable Garratt engine be utilized.

(29.) That new locomotives be purchased from outside, rather than built in existing shops, which are not laid out for doing this economically.

(30.) That consideration be given to utilizing old classes of engines, such as L and LA, with one or two vehicles attached instead of ordering special rail motors.

(31.) That consideration be given to the purchase of Welsh coal, which, as has been stated in evidence, would reduce consumption.

(32.) That trials be given to ascertain to what extent it would be possible economically to use New Zealand coal.

(33.) That consideration be given to the maintenance costs of carriages and wagons, which would appear to be capable of reduction.

(34.) That as the wagon stock appears to be high, careful consideration be given to this matter.

(35.) That as the average ages of carriages, brake-vans, and wagons are respectively 22·77, 27·45, and 22·79 years, indicating a number of obsolete types, these be replaced as early as possible.

(36.) That standardization be introduced in connection with the length of carriages over headstocks. The types should not exceed three, or at the outside four. Bogies and under-frames also to be standardized.

(37.) That suitable statistical returns comparing costs, &c., be introduced.

Operation.

(38.) That a complete revision of time-tables is essential.

(39.) That mixed trains be reduced to a minimum.

(40.) That tourist, excursion, and half-day suburban traffic be encouraged by increased facilities and popular fares.

(41.) That the control of train movement and distribution of wagon stock be centralized.

(42.) That collection and delivery of goods and parcels in combination with motor-owners be introduced.

(43.) That no rental in addition to cost of construction and renewal be charged on private sidings.

Rates and Fares.

(44.) That excursion fares be reduced.

(45.) That fares for distances up to 3 miles be reduced.

(46.) That great caution be exercised in reducing rates.

(47). That certain coal rates be increased.

Stores.

(48.) That the Stores Branch be reorganized so that the whole of the stores, including coal, be brought under the direct supervision of the Comptroller of Stores.

(49.) That improved methods of conservation, distribution, and stock-taking be introduced.

(50.) That the method of charging out stores be simplified and arranged so that the Railway Department assumes responsibility for items immediately they are delivered.

General.

(51.) That more complete statistical data be compiled.

(52.) That a graduated scheme of railway-training be instituted.

(53.) That a programme of officers' visits to other railways be arranged.

In this report under the several headings we make a number of suggestions which we consider should follow on the adoption of the above-mentioned recommendations.

VII. CONCLUDING REMARKS.

In concluding our report we would express appreciation of the manner in which the officers of the Railway Department, from the General Manager downwards, have assisted us. A large amount of information, statistical and otherwise, was required in connection with our investigation, and this was collated and supplied with a promptitude that merits record.

In conclusion, we desire to acknowledge the valuable work performed by our Secretariat—Messrs. Charles Travis, J. A. Warren-King, and S. E. Fay—who have carried out their duties in an assiduous manner and helped us materially in the course of our investigation. Reference should also be made to the useful work done by the reporting staff—viz., Messrs. Mitchell, Duckworth, Manderson, Harrison, and Cryer.

Your Commissioners have the honour to be,
Your Excellency's obedient servants,
SAM FAY, Commissioner.
VINCENT L. RAVEN, Commissioner.

Dated at Wellington this 11th day of December, 1924.

ADDENDUM.

To His Excellency the Governor-General of
the Dominion of New Zealand.

Sydney, New South Wales, December 25, 1924.

YOUR EXCELLENCY,—

We have the honour to submit a short supplementary Report to that handed to the Administrator of the Government of the Dominion of New Zealand on December 11. This Report covers a few matters, primarily of a relatively minor character, on which we feel that we should make some remarks, and we trust it will be included with our original Report.

RATE BOOKS AT STATIONS.

In a letter dated December 12, and addressed to the Hon. J. G. Coates, Minister for Railways, we referred to the desirability of compiling and sending to the stations a complete list of rates from each station to each station between which rates exist, in order that traders should be able to ascertain exactly what the charges are. As we then pointed out, the provision of rate books at stations (for the inspection of the public, as desired) is a statutory obligation upon railway companies in several countries, and we consider it would be advisable to give similar facilities and protection in New Zealand.

SHOULD DISTRICT MANAGERS BE GIVEN AUTHORITY TO QUOTE RATES?

A second point (also mentioned in our letter of December 12 to the Minister for Railways and dealt with by inference in our Report) is the question as to whether District Managers should be given authority to quote reduced rates. We are definitely of opinion that this should not be done, as we consider it would undoubtedly lead to undue preference. The General Superintendents, and the District Superintendents also, would advise applicants of rates in existence, in the ordinary course, and any representation to the Board that reduced rates might with advantage be put into operation should receive immediate attention. The Board would, as a matter of course, have regard to the effect of a reduction upon other rates. There should be no difficulty in ensuring that the District Managers receive prompt replies to communications on rates matters from the General Superintendent.

WHARF CHARGES AT WESTPORT.

Complaint was made at Westport that wharf charges for overtime exceeded the amounts actually paid by the Department. There appears to be ground for this complaint, and we think it would be advisable to remove this grievance by clearly showing that only sums paid out in addition to the day pay are added to the wharf and labour charges.

We have the honour to be,
Your Excellency's obedient servants,
SAM FAY, Commissioner.
VINCENT L. RAVEN, Commissioner.

Dated at Sydney this 25th day of December, 1924.

Approximate Cost of Paper.—Preparation, not given; printing (1,000 copies, including maps, &c.), £210.

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1925.

Price 2s. 6d.]

APPENDIX.

To His Excellency the Governor-General of the Dominion of New Zealand.

Sydney, New South Wales, December 25, 1924.

YOUR EXCELLENCY,—

We have the honour to submit a short supplementary Report to that handed to the Administrator of the Government of the Dominion of New Zealand on December 15. This Report covers a few matters, primarily of a relatively minor character, on which we feel that we should make some remarks, and we shall in it will be included with our original Report.

RATE BOOKS AT STATIONS.

In a letter dated December 12, and addressed to the Hon. J. G. Coates, Minister for Railways, we referred to the desirability of compiling and sending to the stations a complete list of rates from each station to each station between which rates exist, in order that traders should be able to ascertain exactly what the charges are. As we then pointed out, the provision of rate books at stations (for the inspection of the public, as desired) is a statutory obligation upon railway companies in several countries, and we consider it would be advisable to give similar facilities and protection in New Zealand.

SHOULD DISTRICT MANAGERS BE GIVEN AUTHORITY TO QUOTE RATES?

A second point (also mentioned in our letter of December 12 to the Minister for Railways and dealt with by reference in our Report) is the question as to whether District Managers should be given authority to quote reduced rates. We are definitely of opinion that this should not be done, as we consider it would undoubtedly lead to undue preference. The General Superintendents, and the District Superintendents also, would advise applicants of rates in existence, in the ordinary course, and any representation to the Board that reduced rates would accompany be put into operation should receive immediate attention. The Board would, as a matter of course, have regard to the effect of a reduction upon other rates. There should be no difficulty in ensuring that the District Managers receive prompt replies to communications on rates matters from the General Superintendent.

WHARF CHARGES AT WESTPORT.

Complaint was made at Westport that wharf charges for overtime exceeded the amounts actually paid by the Department. There appears to be ground for this complaint, and we think it would be advisable to remove this grievance by clearly showing that only sums paid out in addition to the day pay are added to the wharf and harbour charges.

We have the honour to be,

Your Excellency's obedient servants,

SAM FAY, Commissioner.

THOMAS L. RAVEN, Commissioner.

Dated at Sydney this 29th day of December, 1924.

By Authority: W. A. G. SKINNER, Government Printer, Wellington.—1925.