1943.

VICTORIA.

COUNTRY ROADS BOARD.

THIRTIETH ANNUAL REPORT

FOR YEAR ENDED 30TH JUNE, 1943.

PRESENTED TO BOTH HOUSES OF PARLIAMENT PURSUANT TO ACT No. 3662.

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COUNTRY ROADS BOARD.

THIRTIETH ANNUAL REPORT.

Exhibition Building,
Carlton, N.3.,
8th November, 1943.

The Honorable J. H. Lienhop, M.L.C.,
Minister of Public Works,
Melbourne.

SIR,

In accordance with the requirements of Section 96 of the Country Roads Act (No. 3662) the Board has the honour to submit to you, for presentation to Parliament, the report of its proceedings for the year ended 30th June, 1943.

MINISTER.

During the period under review, the Honorable Sir George Goudie, K.B., M.L.C., was Minister for Public Works, having held that position continuously since April, 1935.

FINANCIAL POSITION.

The amount received from motor registration fees and fines and paid into the Country Roads Board Fund during the year was £1,362,903, compared with £1,563,106 received during the previous year—a decrease of £200,203. Cost of collection and refunds totalled £114,477, making the net revenue £1,248,426.

Under the Federal Aid Roads and Works Agreement the sum of £276,883 was received, compared with an amount of £391,858 during the previous financial year. The total gross amount received from both sources was, therefore, £1,639,786, a decline of £315,178 in comparison with the financial year 1941–42.

From the loan authorization of £500,000 for the construction and reconstruction of metropolitan roads, under Acts 4188, 4414, and 4498, no expenditure was incurred, so that the balance of £246,742 remains at the same figure as at the 30th June, 1942.

COUNTRY ROADS BOARD FUND.

The total expenditure on maintaining State highways, main roads, tourists' roads and Murray River bridges was £521,588 for the year, compared with £630,670 for the year 1941–42.

The same difficulties that existed during the financial years ended 30th June, 1941 and 1942, were encountered throughout last year, namely, withdrawal of labour for defence works, scarcity of plant, equipment and materials and enlistments of municipal engineers in the defence forces or their transfer to Commonwealth departments on military works. In addition, the Board's staff was further depleted in the same manner, whilst important and extensive defence works carried out by the Board on behalf of the defence authorities had to be given precedence over its normal activities.

As a result, a substantial amount of work, for which provision had been made at the beginning of the year, could not be put in hand. On account of the restricted expenditure, signs of the detrimental effect of the enforced deferment of maintenance work is now being shown, and a considerable mileage of roads and bridge structures must inevitably deteriorate, necessitating heavy expenditure at a later date in restoring them to their original standard.

The Government, with the object of making provision towards the heavy expenditure which will ultimately be necessary to bring the deferred works up to an adequate state of utility, again directed that an amount be reserved out of the unspent balance of £409,044 accrued in the Country Roads Board Fund at the 30th June last, and £250,000 has been set aside for that purpose. After providing £110,000 to meet commitments on contracts and direct labour works in hand at the end of the financial year, a balance of £49,044 remained to the credit of the fund at the 30th June last.

Federal Aid Roads Account.

An amount of £276,883 was received under the Federal Aid Roads and Works Agreement during the twelve months, of which £5,707 was expended on main roads, £54,619 on works of a developmental nature, and an amount of £70,949 on the maintenance of roads previously constructed from Federal-aid sources, restoring and rebuilding bridges, and assisting municipalities to maintain roads constructed from loan and Federal Aid funds and unemployment relief funds provided by the State Government.

For the maintenance and repair of public roads adjoining or approaching properties of the Commonwealth within the State of Victoria an amount of £3,938 was made available under the terms of the Federal Aid Roads Agreement, together with the sum of £4,254 brought forward from the previous year. The total expenditure was £5,407 and £2,785 was carried forward to the ensuing financial year.

At the 30th June, 1943, the Federal Aid Roads Account showed a credit balance of £498,216, but after providing for unexpended amounts allocated during the year to assist in the maintenance of roads and bridges, commitments on contracts entered into and works in progress by direct labour, the actual credit balance at the 30th June is £459,370. The considerable amount carried forward is due to the factors already mentioned which prevented the carrying out or completion of works provided for from the Country Roads Board Fund.

Defence Expenditure.

During the twelve months under review, the Board continued to be actively engaged in Victoria and the Northern Territory on a large number of important defence works on behalf of the Federal Government, comprising the construction of aerodromes, levelling sites and laying concrete floors for war factories, and constructing 650 miles of bitumen-sealed road in the Northern Territory.

The expenditure for the year was £2,053,789, £723,388 being provided by the Commonwealth Government through advances made to the State Treasury and the balance, pending reimbursement by the Commonwealth, financed from the Country Roads Board Fund under State National Security Regulations. The total expenditure for the war period is £3,306,004.

The aggregate value of defence works completed or in hand is £4,024,000.

DEFENCE WORKS.

In association with the Allied Works Council and State departments and instrumentalities, the Board carried out during last year extensive and important defence works throughout Victoria and in the Northern Territory.

Many of the larger projects commenced during the previous year were completed during the year under review. The works comprised the construction of landing grounds, taxiways, runways and hangar floors at aerodromes, roads, paths, drains, and bituminous surfacing in other defence establishments.

Many of these works were of considerable magnitude, and some of the aerodrome jobs completed in Victoria during the year were of a type and size quite new to Australia, while the speed at which they had to be constructed provided excellent experience in the organization and technical control of large construction projects built at high speed.

Early in 1942 the State Government, at the request of the Allied Works Council, approved of the Board undertaking works of considerable magnitude in the Northern Territory. This involved the transfer to the Territory of a large section of its technical staff, a great amount of plant, and a considerable number of employees. Additional plant and labour was also made available by the Allied Works Council, bringing the total value of the plant (at initial cost) to nearly half a million pounds and the number of men to about 600. Owing to the diversion of officers, men, plant and equipment from Victorian works and their maintenance in the Territory, a considerable strain has been placed on a staff of which one-third of its pre-war quota is in the defence services.

While some fairly large aerodrome works are included in the programme undertaken in this area, the major job was the gravel strengthening and bituminous surfacing of the Alice Springs–Larrimah Road, joining the two rail heads, and carrying the heavy convoy traffic so frequently described in the daily Press. The Highways and Local Government Department of South Australia, Allied Works Council directly controlled gangs, and some Army units assisted in the gravelling, although the major part was carried out by the Board, as was the whole of the bituminous surfacing—the main part of the job.

Of the total distance of 630 miles, 386 miles was surfaced to 30th June, and the road is now virtually completed. Owing to the extraordinary conditions, particularly the almost entire absence of water, methods of bituminous construction previously used in Australia as recorded in technical literature were found to be inapplicable, and the successful development of surfacing methods to meet these conditions formed a very interesting and useful technical experience.

Owing to the high cost of maintaining large numbers of men in these remote areas, the works were mechanized to the greatest possible extent, with the result that few of the 600 men were actually engaged on ordinary manual labour.

The responsibilities undertaken by the Board have involved the much-reduced staff in an enormous amount of work that has been carried out with aptitude and efficiency, and it is considered that the experience gained by members of the staff and employees will be of considerable advantage to the Board in post-war projects, which will doubtless include a large amount of road construction.

In July, 1942, the Director-General of the Allied Works Council, under National Security (Allied Works) Regulations, authorized the Board to undertake on behalf of the Council the responsibility for the pay organization of the Civil Constructional Corps and for the purpose of discharging such responsibility to co-opt and or utilize the services of other instrumentalities, departments, and municipalities and their officers as well as officers of the Allied Works Council and members of the Corps seconded for duty with the Board.

The duties comprise not only payment of the wages of members of the Civil Constructional Corps, but allotments made by members in Victoria and other States to their dependants residing in Victoria. This has involved a great deal of organization, responsibility and control. With the co-operation of the Allied Works Council, initial difficulties have been overcome and the system evolved has proved suitable and satisfactory.

The work carried through on behalf of the Council both in the field and in the office has been the subject of very favorable comment by the Director-General of Allied Works in a communication recently received by the Board.

STATE HIGHWAYS.

Due to difficulties occasioned by the shortage of man power and scarcity of materials, with the exception of some urgent reconstruction work, only essential general maintenance, which was limited by the number of patrolmen available, could be carried out over the total length of 2,804 miles. The only new construction work put in hand was the replacement of ten and partial reconstruction of twelve old bridges which were incapable of carrying the traffic.

Under ordinary conditions, it was the practice of the Board to recondition each year certain sections of highways and main roads so that the pavements would be capable of withstanding reasonable loads, but owing to this work having to be postponed, deterioration is now apparent.

Recent close investigations have indicated that in many cases there is little or no reserve to protect the pavement against any abnormal traffic or even against ordinary traffic over an extended period. Many unsealed sections have worn very thin, pointing to the necessity in the near future of expending a considerable amount in re-sheeting if relatively extensive failures are to be avoided.

During the year, between 6 and 7 per cent. of the sealed surfaces of the State highways were only very lightly resealed. At this rate, it means that, on the average, resealing of any section would be done at intervals of eleven or twelve years; actually, however, it is thought that the life of these light applications would not be more than four years as compared with ten years life of heavy reseals which were done before the war. This indicates that as far as the sealed sections of the highways are concerned maintenance work is not keeping pace with depreciation.

Since 1939 many lengths of State highways have regularly carried many vehicles probably more heavily laden than formerly. This would normally involve the early reconstruction of many old lightly-constructed sections. However, in view of the necessity for postponing this reconstruction, light seal coats only have been applied, in the hope that labour and materials for the permanent reconditioning may be available in the near future.

The Board has already been compelled to allow some sections of its sealed State highways to revert to the original gravel base, and it is feared that, unless matters improve, this condition may have to extend to a number of the more lightly constructed bituminous surfaced roads.

On State highways road traffic increased to a large extent over the few years prior to the outbreak of war, and it is expected that there will be a rapid increase in the future, after the cessation of hostilities. To meet the expected traffic demands, the Board foresees the necessity of widening many sections of existing State Highways, and keeping this in view, has purchased strips of land along the Hume Highway between Campbellfield and Donnybrook and the Murray Valley Highway between Yarrawonga and Rutherglen, with a view to carrying out the widening as a post-war work.

Owing to the impossibility of obtaining adequate supplies of bitumen during the past four years, the Board has been compelled to use some coke oven tar and distilled horizontal retort tar for surface sealing. From a study of the results it has been found, as expected, that the work done is much inferior to that done with bitumen.

The only sections of the State highways which were sealed for the first time were those originally required to meet some special defence need. The length of these seals totalled only 4 miles, while 106 miles was resealed. This is a reduction of 103 miles on the previous year's work on the highways.

The total amount expended on maintenance and repairs was £203,964 which included the cost of some urgent improvements. These improvements consisted largely of the erection of new bridges to replace defective structures, and the restoration of existing bridges to meet, generally, defence requirements. £197,663 was provided from the Country Roads Board Fund and £6,301 from Federal funds.

MAIN ROADS.

Although passenger traffic has decreased, many roads are now subjected to heavier traffic than formerly, such as military traffic and the transport of timber and other building materials, milk, &c., resulting in serious deterioration which the Board and municipal councils have not been in a position to overcome. Excepting on works having immediate significance to the war effort, normal construction has been suspended, necessitating the maintenance of roads which, in the ordinary course, would have been rebuilt.

In addition, municipal councils are now faced with the difficulty of securing the services of qualified engineers, and as an expedient have been compelled to engage engineers on a part-time basis. Due to these factors, depreciation of road surfaces is now becoming a serious problem, particularly in the case of lightly constructed roads.

The programme of resealing on main roads during the past twelve months extended over a length of 151 miles, while new seals on urgent short sections were restricted to 8·3 miles. The total lengths dealt with show a reduction of 219 miles, compared with the 1941–42 programme.

The average annual mileage of bituminous surface treatment work carried out on roads under the jurisdiction of the Board over the five year period ended 30th June, 1943, was 671 miles. In comparing the work done during the financial years 1938–39 and 1942–43, a decrease of 618 miles is shown.

It is estimated that the present lag in resealing will alone cost some £920,000 to overtake, and this will progressively increase as long as existing conditions continue. Post-war work will also involve immediate attention to the considerable mileage of State highways and main roads the reconstruction of which has been unavoidably held over. To these must be added the normal improvement of road surfaces and the repair or reconstruction of a very large number of bridges.

The expenditure on the maintenance, improvement, and reconditioning of 8,490 miles of declared main roads amounted to £317,962 for the year, compared with £397,148 during the previous year. Provision of £295,230 was made from the Country Roads Board Fund and £22,732 from moneys available under the Federal Aid Roads Agreement.

Where reconstruction and maintenance works have been carried out primarily to meet the demands of military traffic, the Commonwealth Government has contributed towards the cost.

The following statement shows the annual expenditure since the financial year 1938–39, from which it will be seen that last year's expenditure is £451,200 below that of the pre-war year.

EXPENDITURE IN MAINTENANCE OF DECLARED MAIN ROADS.

—	Country Roads Board Fund.	Federal Grant.	Total.
	£	£	£
1938–39	718,009	51,153	769,162
1939–40	623,914	46,996	670,910
1940–41	585,596	46,500	632,096
1941–42	372,335	24,813	397,148
1942–43	295,230	22,732	317,962

Municipal councils carried out the work generally, but in accordance with established practice the Board undertook the maintenance of certain through roads carrying traffic not of local origin.

In accordance with the powers conferred on the Board under the provisions of the Country Roads Act, municipal contributions towards the cost of maintenance were reduced below one-third of the total cost in the case of declared main roads carrying traffic not of local origin or timber traffic. The assistance given in this way amounted to £27,646 for the year.

Under Act No. 4415, relief to the extent of £221,040 was granted to country municipalities on account of interest and sinking fund payments in respect of main and developmental roads for the year.

DEVELOPMENTAL ROADS.

On account of the existing conditions, the work of constructing roads of a developmental character again had to be restricted, and provision was made only for permanent works for which funds had been allocated during the previous year, but which owing to various circumstances the Councils were then unable to carry out. In addition, it was found necessary to provide for works of an urgent nature, such as the reconstruction and restoration of bridges and approaches.

The total amount provided was £41,942 in addition to commitments amounting to £27,416 brought forward from the previous financial year, towards which the Councils were to contribute, but for the reasons already stated the expenditure was only £28,381 in addition to the sum expended by the Councils from their own funds.

To assist municipal councils in the maintenance of the more important developmental roads constructed from funds previously provided by the State Government and from Federal Aid sources, on the basis of the municipalities supplementing the amount from their own funds, a total amount of £45,263 was allocated and £34,302 expended from Federal funds, in addition to which municipal contributions amounted to £11,815.

ISOLATED SETTLERS' ROADS.

During last financial year £27,973 was allocated to municipal councils from Federal Aid funds for the construction of roads to farm properties isolated from the main road system. An expenditure of £26,237 was incurred, and this was supplemented by a contribution of 10 per cent. from the Councils concerned.

Four hundred and thirty-six roads and seven bridges were constructed or partially completed up to the end of June.

BRIDGES.

During last financial year 62 bridges were erected or restored or in course of erection or restoration, 22 of which were erected under the direct supervision of the Board and 40 by municipal councils. Added to the number previously completed since the establishment of the Board, 2,870 structures were completed at the 30th June last.

The examination in detail of bridges throughout the State was resumed by the Board's Bridge Inspector to enable the classification of all structures to be made with a view to the preparation of a programme of replacement and repair to be carried through as soon as an opportunity offers.

The total amount expended on new bridges and in repairing and restoring existing structures was £49,880 for the year.

Under the provisions of Act No. 4458, a number of bridges and ferries over the River Murray, together with approaches, were maintained by the Board in conjunction with the Department of Main Roads, New South Wales, and the Victorian Railways Department. Each State pays a moiety of the cost of maintenance of the crossings over the river, whilst the Railways Commissioners pay a proportion where the railway crosses the river. The amount expended from the Country Roads Board Fund during the year was £2,555.

METROPOLITAN ROADS.

No works of construction were carried out on main roads adjacent to Melbourne either by the Board or municipalities, the work done being confined to urgent maintenance together with bituminous resealing which was necessary for the preservation of the surface.

The amount expended was £4,381.

TOURISTS' ROADS.

The total expenditure on tourists' roads was £27,879 for the twelve months. £26,139 was provided from the Country Roads Board Fund and £1,740 from Federal Aid funds. General maintenance by patrolmen was carried out including the repair of roads and bridges.

The only major work undertaken was on the Ocean-road between the Sheoak Creek and Wye River. This work involved expensive resheeting and reconditioning of the road to meet demands for the transport of sawn timber required for defence purposes. The expenditure incurred in carrying out this work amounted to £7,951.

SUPERVISION OF WORKS.

One of the most serious problems with which municipal councils and the Board are at present confronted is the difficulty of securing the services of qualified engineers for the adequate supervision of road and bridge works, brought about by the enlistment of a large number of their officers in the fighting forces or their transfer to Commonwealth departments on defence works. This matter has been referred to in reports to the Honorable the Minister of Public Works, but present indications do not point to any way of ameliorating the position.

It is recognized that, apart from maintenance and reconditioning works and with the exception of several urgent projects on State highways and other strategic roads, construction jobs of any great magnitude have not been undertaken since the outbreak of war, owing to the scarcity of men and difficulties in obtaining essential materials.

Nevertheless, these very difficulties have made it more than ever necessary that properly qualified supervision be given to the very important work of maintenance, in order that the most efficient use may be made of the limited amount of labour and materials available.

As an expedient, the Government has approved of municipal engineers acting in more than one municipality, in a part-time capacity, and this arrangement has to some extent alleviated a position which still presents considerable difficulties. In several instances, municipal councils have persistently urged that their foremen be allowed to act in place of the engineer, but the Government has rightly insisted that the provisions of the Local Government Act requiring the engagement of a qualified engineer must be complied with to ensure the preservation of the assets already created and the proper supervision of works.

TRAFFIC LINES.

The record of work done with the Board's traffic line marking machine shows that 940.57 miles of lines were painted or repainted on State highways and main roads. On behalf of various municipalities, 94.02 miles of lines were painted on roads under municipal control, most of them in the metropolitan area.

The total cost was £6,400, of which £610 was charged to municipalities concerned.

OFFENCES UNDER ACTS AFFECTING THE BOARD.

Under the provisions of the Motor Car Act a number of offenders was proceeded against for exceeding the limits allowed in respect of weight and speed of motor cars carrying goods for hire, or in the course of trade, on State highways and main roads. In 154 cases fines totalling £551 were imposed for travelling at excessive speeds and £216 in 53 instances for carrying weights in excess of those permitted under the Act.

For allowing stock to wander unattended on State highways, 63 prosecutions were launched and fines totalling £112 were imposed. In addition, 897 cattle and 99 horses were impounded by the Board's ranger and patrolmen.

The total number of prosecutions for all offences under Acts administered by the Board during the year was 488. The total fines imposed amounted to £897 and costs to £62.

RESEARCH WORK.

During the year an investigation of the application of the California Bearing Test to the design of roads and runways was commenced. While the work is restricted owing to difficulty in obtaining apparatus and suitable personnel, it appears that the test will be of value for determining the most economical method of using local materials, as well as for estimating the thickness of pavement required.

A summary of the laboratory tests carried out during the year is as follows:—

	Number of Samples.	Number of Tests.
Soil, gravel, concrete, aggregate ..	711 ..	1,300 approximate
Bituminous and tarry materials ..	53 ..	166
Traffic marking lacquer	43 ..	148
Lubricating oil	3 ..	25
Miscellaneous	21 ..	21

APPORTIONMENT OF COSTS.

In accordance with the provisions of section 287 of the *Country Roads Act* 1928, the cost of maintenance was apportioned for the year ended 30th June, 1942, the amount apportioned to municipalities in respect of such expenditure being £96,355.

MOTOR REGISTRATION.

During the year a total of 239,154 motor vehicles, including traction engines and motor cycles, were registered.

The number of motor vehicles of various classes registered for the past two financial years, as set out in the following statement, shows an increase of 8,374 in the figures of last financial year.

The decrease in registrations during 1940–41 against those of 1939–40 was 9,386, whilst there was a decrease of 31,863 in 1941–42 against 1940–41, so that the total decline in 1942–43 compared with 1939–40 was 32,875.

Vehicles.	Financial Year 1941–42.		Financial Year 1942–43.		Increase.	Decrease.
Private—						
New	1,242		833		..	409
Secondhand—re-registered	13,216		17,923		4,707	..
renewals	106,671	121,129	109,911	128,677	3,240	..
Commercial—						
New	1,190		805		..	385
Secondhand—re-registered	2,836		2,665		..	171
renewals	3,020	34,046	29,337	32,807	..	683
Primary Producers—						
New	381		252		..	129
Secondhand—re-registered	3,079		3,635		556	..
renewals	46,061	49,521	47,471	51,358	1,410	..
Hire		2,465		2,553	88	..
Licensed under Omnibus Act		636		666	30	..
Trailers		6,086		6,757	671	..
Traction Engines, &c.		209		79	..	130
Motor Cycles		16,688		16,267	..	421
Total		230,780		239,154	10,702	2,328

From the above statement it will be noted that private and primary producer second-hand motor vehicles registered during last year increased by 5,263 in comparison with the previous year, whilst renewals of registrations of these classes of vehicles increased by 4,650.

ACCOUNTS.

Statement of accounts for the year ended 30th June, 1943, of the Country Roads Board Fund and balance-sheets as at that date appear in the Appendix.

The following statement shows the expenditure on road construction, maintenance, &c., from funds provided from moneys at the disposal of the Board in the Treasury, including expenditure under special appropriations :—

—	£ s. d.	Under Board's Supervision.	Under Council's Supervision.	Total.
		£ s. d.	£ s. d.	£ s. d.
1. State Highways—				
Maintenance and reconditioning		181,817 14 1	22,145 17 1	203,963 11 2
2. Main Roads—	£ s. d.			
Construction and restoration ..	5,707 7 8			
Maintenance and reconditioning ..	323,836 10 0	35,511 6 5	294,032 11 3	329,543 17 8
3. Developmental Roads—				
Construction and maintenance ..	62,682 15 7			
Roads for isolated settlers ..	26,237 8 11	12,997 3 0	75,923 1 6	88,920 4 6
4. State Unemployment Relief Works —				
Main and Developmental roads, &c.		..	20 2 0	20 2 0
5. Tourists' Roads—				
Maintenance and reconditioning		25,576 18 8	2,302 15 4	27,879 14 0
6. Murray River Bridges and Punts—				
Maintenance		2,477 1 9	78 1 0	2,555 2 9
7. Roads adjoining Commonwealth Properties—				
Maintenance		4,432 13 4	973 19 11	5,406 13 3
8. Commonwealth Defence Works (Unemployment Relief Funds)—				
Construction and reconstruction		9,443 10 1	..	9,443 10 1
9. Commonwealth Defence Works (Northern Territory)—				
Construction and reconstruction		670,101 17 1	..	670,101 17 1
10. Commonwealth Defence Works (Allied Works Council)		43,842 9 11	..	43,842 9 11
Totals		986,200 14 4	395,476 8 1	1,381,677 2 5

In addition to the amounts shown in the above statement, an expenditure of £1,330,401 was incurred from the Country Roads Board Fund on defence works carried out by the Board on behalf of the Commonwealth Government under State National Security Regulations. The cost is recouped by the Commonwealth as the works progress. The amount outstanding on account of these works at the 30th June was £210,745.

STAFF.

The responsibilities placed upon the technical and clerical officers of the Board in coping with the important and extensive programme of defence works on behalf of the Allied Works Council and Commonwealth Departments have caused a heavy strain on an already depleted staff.

All officers and employees responded readily to all demands made upon them. For the loyal and efficient manner in which the tasks have been undertaken the Board records its full appreciation.

Forty-eight officers and 542 employees of the Board were serving in the fighting forces at the 30th June. In addition, twelve members of the staff were loaned to Commonwealth Departments for special defence work.

ACKNOWLEDGMENTS.

The Board in carrying out its defence works has been largely associated with other State instrumentalities working on other parts of the same projects. the necessary co-ordination being arranged by the Chairman of the Board in his capacity as co-ordinator of State instrumentalities for allied works.

It is desired to acknowledge the very helpful and harmonious manner in which the other instrumentalities and their staffs have co-operated.

The Board also extends thanks to municipal councils and their officers and the State Road Authorities in the other States for their many courtesies and assistance.

We have the honour to be, Sir,

Your Obedient Servants,

L. F. LODER, Chairman.

W. L. DALE, Member.

F. M. CORRIGAN, Member.

R. JANSEN,
Secretary.

CHIEF ENGINEER'S REPORT.

Country Roads Board Office,
Melbourne,
3rd November, 1943.

THE CHAIRMAN,

SIR,

I have the honour to submit brief particulars of matters of special engineering interest in the Board's work during the last year.

Officers of the depleted engineering staff, both in Victoria and the Northern Territory, have again dealt with a large volume of work, and as far as permitted by the exacting demands of these works, and by many restrictions on resources, have also made headway with pressing technical problems. Fresh problems continually arise in devising and improving scientific control of works by laboratory tests. They also occur in increasing numbers in many phases of survey, design, construction and maintenance of works, as well as in such jobs as preserving a minimum of essential records in compact form. For brevity, only a few topics can be mentioned.

BEARING CAPACITY.

Preparations are now well advanced to intensify local research into the bearing capacity of subgrade and flexible pavement materials.

In Victoria there has been hitherto little need, when constructing flexible pavements, to provide for any but relatively light and sparse traffic. The most heavily trafficked sections of State Highways were carrying only about 2,000 vehicles in a 12-hour day, only about 15 per cent. being commercial trucks over 4 tons gross load. Owing to the increased demands for certain commodities, the war has brought about a marked increase in the number of heavy vehicles travelling certain sections, and owing to petrol and man-power restrictions there is, without doubt, a general increase in the average gross truck load. On many rather lightly constructed pavements the effect of heavier wheel loads and of cumulative repetitions is to cause subgrade failures, frequently commencing near the shoulders.

Furthermore, on spongy or highly plastic soils there is evidence that in a few years the moisture content of the subgrade under the relatively impervious pavement may gradually increase. The bearing capacity thus decreases, and failures develop. Where fine grained pavements with plastic binders have been employed (such as many pit gravels) a similar tendency within the pavement may assert itself. On the other hand, quite thin low-cost pavements on adjoining sections may carry the same traffic quite satisfactorily.

Divisional Engineers have reported typical conditions from many sections of road, especially on State Highways, where some traffic data and job records over many years are available.

Municipal engineers are also co-operating in supplying other cases. An investigation of the conditions in each case is now commencing, and from this it is hoped to secure much valuable design data applicable to Victorian conditions.

During the year a third mobile laboratory was provided (the two previous units being in Northern Territory). This is being chiefly used in the preliminary field study, e.g., for measuring subgrade and pavement densities and moisture content and also Proctor needle resistances. Selected samples are brought back at intervals for more complete laboratory examination. An extension of the Board's laboratory has been completed, containing the necessary new ovens and benches, and giving more space for soil tests such as the Atterberg tests and compaction tests. Apparatus for the Californian Bearing Ratio test has also been completed and installed. This test has become of special interest and importance since certain authorities in the United States of America have adopted it and extended its use to deal with the design of runway pavements.

The first localities investigated have been those where reconstruction could no longer be postponed, and it was necessary to decide what pavement material and thickness should be adopted. In last report reference was made to critical conditions prevailing on an important deviation of Princes Highway constructed in 1940. On the basis of cohesion tests a flexible pavement thickness of 8 inches was then deemed to be the minimum desirable, and numerous failures occurred where the actual pavement (which was being constructed by stages) was slightly thinner than this. A Californian bearing test on a typical sample of the subgrade (L.L. about 50, P.L. about 23) compacted to Proctor optimum density gave 6.8 per cent. C.B. ratio. From the Californian charts for very light traffic (4,000-lb. wheel load) this corresponds to a thickness of 9 inches, or, for light traffic, 11 inches. Table A gives the results of field penetration resistances, moisture contents, and thicknesses at various point of the road.

Assuming that the pavement at 89,800 is on the point of failure under wheel loads of 4,000 lb. at 80 lb. per square inch, then for an equivalent contact circle of 8 inches diameter and assuming a conventional 45 degrees distribution through the pavement, the critical bearing pressure would be 8.15 lb. per square inch on the subgrade. At 91,600, however, the soil was much softer, and its critical bearing pressure (if proportional to the Proctor resistance) would be 4.7 lb. per square inch. With the same conventional assumption this would require a pavement 12.4 inches thick. It seemed wise, therefore, to adopt a total new thickness of 13 inches at actual points of failure. The reasoning is only slightly affected by the size of wheel load assumed to be causing failure, but the bearing capacities inferred have little absolute significance.

TABLE A.—PRINCES HIGHWAY WEST. SECTION 1.
SOIL TESTS.

Chainage	89,700	89,800	90,100	91,400	91,600	91,700
Remarks	Failed.	Not Failed.	Failed.	Failed.	Failed.	Failed.
Depth of fine crushed rock	7¼″	8″	4½″	6¼″	6¼″	5″
Depth of ashes	½″	½″	½″	¾″	¾″	½″
Moisture Content	17·5	18·3	20·6	21	29·6	33·6
Penetration resistance (1/10 sq. in. needle) lb. per sq. inch	780	780	855	530	450	540

Field bearing tests were conducted at 89,800 feet, an Army tank transporter carrying a 26-ton tank being used to provide the load through a hydraulic jack. Deflections were measured by surveyor's level, and estimated to 1/500 inch. Tests were made first on the pavement surface with 22-in. diameter rigid plate and then on the subgrade with 30-in. diameter plate.

In the first test readings were taken at 2 and 4 minutes and in some cases 6 minutes after each load increment. The settlement was nearly proportional to

load up to a total of 0.158 inch at 90 lb. per square inch with 2 minutes delay, and an increase of 0.015 inch was noted when the final load was maintained for an hour. Using a relation between contact area and supporting capacity developed by Middlebrooks (Highways Research Board 1941, p. 138) it is approximately estimated that for 4,000-lb. load on 8-in. diameter (rigid) contact area the deflection of the surface would be about 0.06 inch. This is close to the critical deflection of 0.05 inch at which Porter states that serious failures may develop rapidly. (*Engineering News Record* 1943, p. 66.)

In the second test readings were taken for up to 16 minutes after each increment until it appeared that settlement was complete. Analysis of results indicates that actually, complete settlement was not reached above about 20 lb. per square inch. At 0.1 inch deflection the bearing pressure was 14.5 lb. per square inch, and the plotted curve departs from a straight line at about this point, indicating a yield value of from 15 to 20 lb. per square inch. The moisture content of the subgrade at 89,800 was, however, fairly low, and moistures within the plastic range are believed to be commonly attained. Laboratory tests indicate that this soil, when initially compacted at Proctor maximum density and confined under a surcharge equal to 10 inches of pavement, will slowly absorb water up to a moisture content of about 40 per cent. This would probably represent rather prolonged wet conditions in the field, with high water table. At 91.600 the moisture was 29.6 per cent., and assuming that bearing capacity is roughly proportioned to Proctor resistance, then by comparison with the observed value at 89,800 of 14.5 lb. per square inch at 0.1-in. deflection, the bearing capacity at 91,600 may be assumed to have been only about 8.4 lb. per square inch at the same deflection. These trials suggest that the Proctor needle or some similar instrument may be of value in rapid field diagnosis.

The field bearing tests, while directly more applicable to estimation of modulus of subgrade reaction required for design of rigid pavements, afford some insight into the laws of settlement, and indicate agreement with the contention that the allowable deflection for plastic soils is less than 0.1 inch and is probably nearer 0.05 inch. For the work in question all failures were removed and replaced by 10 inches of new material, and the lengths affected were shortly afterwards resheeted with a minimum of 3 inches consolidated. However, some lengths where there were no failures were for the time being merely resealed.

SOIL CEMENT.

The trial sections of soil cement constructed on the Henty Highway in 1941 and lightly sealed with bitumen in 1942 are still in quite good condition, but the traffic on this road is at present very light, and the amount of steel-tired traffic is quite small. Two short sections were left unsealed, one in which the soil consisted of a heavy clay, and the other in which it was a fine sand. On the clay the cracks, which are typical of the material, form a mosaic varying from about 4 inches to 12 inches square, and there are several transverse cracks extending across the pavement. On the sandy soil the cracking is quite slight.

In view of the cost of this medium of construction and the general availability of cheap local pavement materials, no further similar work has been done on the Board's road system, but during the year two experimental sections which formed parts of runways were constructed for the R.A.A.F. in different parts of Victoria. Although each experiment occupied only two or three working days, it was necessary to assemble a considerable amount of plant. Mixing was performed by rotary hoes, disc cultivators and harrows, and tamping rollers and pneumatic-tired rollers were used for compaction.

In one locality the soil consisted of heavy clay (L.L. 47, P.I. 31) and the work was done in three strips, using cement contents of 12 per cent., 16 per cent. and 12 per cent. by volume respectively. The thickness was 5 inches. Rather extensive cracking occurred on all sections. Sand was used for curing, and the shrinkage cracks became partly filled. After thorough drying the experimental sections, in common with the gravel forming the rest of the runways, received an application of crude horizontal retort tar at 1-5th gallon per square yard. After six months the film of tar is still ductile, and the cracks have remained sealed with tar.

In the second locality the soil consists of well graded sandy loam. Here two strips each 30 feet wide were constructed, using 7 per cent. of cement by volume, one strip being 2½ inches thick, and the other 4 inches. The sandy soil was nearly all finer than 36 B.S. sieve, having L.L. 17, and P.I. 2. Sand curing was employed. After four months there is some sign of spalling away of thin finishing layers, but only minor cracking has occurred.

In another locality soil cement has been used to construct hard standings for aircraft. Pit gravel was used, some being mixed in place and some pre-mixed, in each case with 10 per cent. of cement by volume. At the same locality large paved areas were rapidly constructed in bituminous sealed pit gravel, and a large output of gravel from the pit had to be obtained. In such conditions it was difficult to prevent inclusion in the pavement of some lumps of clay, which occurred in quite thin seams and pockets in the pit. Accordingly there have since been some failures of a few square feet in area, where lumps of clay have eventually softened underneath the seal coat after absorption of water. Very satisfactory patches have been put in, using selected pit gravel pre-mixed with 10 per cent. of cement by volume, and cured by a light application of bituminous emulsion.

Cost of the heavy clay soil cement has been about £3 per cubic yard; the cost of the gravel-cement was about the same amount, but the individual hard standings were of small area. The cost of the sandy loam soil-cement was about £3 per cubic yard on the 2½-in. section and £2 on the 4-in. section. Even where the thickness was only 2½ inches the cost was about 4s. per square yard, so that the process is very much dearer than priming and bituminous sealing, which is quite a satisfactory alternative on the sandy loam in question. Moreover, with any great density of traffic a similar coat has to be applied to protect soil cement. Nevertheless, it is felt that the medium is one which will have its uses where conditions are favourable, e.g., where the available local granular materials are of poor grading or poor stability, and require in any case some treatment to make them satisfactory as a pavement.

PRE-MIXED BITUMINOUS MACADAM AND SAND ASPHALT.

The principle work in progress in the Northern Territory has been the "strengthening and bitumenizing" of about 630 miles of road. The early part of 1942 was spent in establishing the Board's organization in the area, the available forces being concentrated at that stage upon an endeavour to hold the gravel road under the convoy traffic. The gravel, which is very plentiful, consists of sandstone, quartzite, or laterite gravels, which generally contain a non-plastic or feebly plastic binder, although in some pits a more clayey binder is encountered. Gravel with a maximum size of 1½ inches is readily obtained on the northern half of the length, and generally has 80 per cent to 90 per cent. passing ¾-inch, 60 per cent. to 80 per cent. passing ⅜-in., and 40 per cent. to 60 per cent. passing 3/16 inch sieves, but finer materials are encountered towards the northern end.

Owing to the absence of water along the route, it was realized from a preliminary inspection by the Chairman with the Divisional Engineer, that ordinary surface treatment work as practiced in Victoria would not be generally applicable, since it was not possible to maintain a bonded surface free of corrugations up to the time of sealing. It was therefore necessary to adopt some corrective process, either of a road-mix or a plant-mix type, and owing to the general looseness of the gravel surface and the necessity to use a minimum of bitumen and so a thin coat, plant-mix was considered the only possible procedure. Some trials were made using concrete mixers, but early in the financial year the special mixing plant required arrived from the United States of America. The mixers are of a portable continuous cold-mix pugmill type, with a maximum output of about 2 cubic yards per minute. The aggregate required was obtained by screening the oversize and dust out of the local gravel, using vibrating screening plants manufactured in Victoria. The product averaged 100 per cent. passing ¾-inch, 60 per cent. passing ⅜-in., and 15 per cent. passing 3/16-in. sieves with a calculated surface area of 7 square feet per lb.

Strengthening, widening and shouldering proceeded ahead of the sealing work. Owing to the need for rapid reconstruction it was only possible to provide a pavement thickness of from 2½ to 4 inches prior to priming. The gravel was generally spread dry and consolidated merely under traffic and grading. Where water was available it was used; generally it was not, and the road was prepared for priming without any water. This generally meant removal of the top portion of corrugations to the side of the road. Where possible the road was primed whilst damp. The primer consisted of 80/100 penetration bitumen, fluxed with furnace oil to give a viscosity of from 1½ to 2 poises at 122 degrees. Fahr. It was generally applied at 0.20 gallons per square yard, and soaked in fairly rapidly, so that the primed surface could generally carry traffic in two days. In some instances the primed surfaces remained uncovered for several weeks before showing signs of failure under traffic. Before applying the pre-mixed material, a tack coat of medium curing cut-back was sprayed at an average rate of 0.08 gallons per square yard.

For the pre-mixed material the screened gravel generally had a dry weight of about 100 lb. per cubic foot. The binder consisted of bitumen fluxed to a penetration of about 120, and the mixture generally adopted contained 10 gallons of binder per cubic yard loose, i.e., approximately 3.8 per cent. by weight. One experimental length containing only 8 gallons of binder per cubic yard was laid down, and carried traffic quite satisfactorily for some months As mixing is carried out practically at air temperature, about 15 per cent. of kerosene was generally used to cut back the binder to facilitate mixing, and also to assist in the dragging of the mixed material on to the road with the drag spreaders.

Los Angeles Abrasion tests carried out on samples of aggregate used, gave losses varying from 30 per cent. to 40 per cent. In one length material having a loss of 75 per cent. was used and stood surprisingly well. The pre-mixed material was generally spread at a rate of about 1 cubic yard to 36 square yards (measured as dry screenings) producing a finished thickness averaging about ¾-inch after consolidation.

On the southern portion of the road the available sandstone gravels are much coarser and less suited for either road construction or the production of screenings for pre-mixing. However, the best available local gravels were used in general for strengthening, while on some sections rather dusty limestone gravel deposits were used. Long lengths of natural sand clay of rather fine texture exist, but there is not generally sufficient water available to make a formation which can be satisfactorily compacted or held in such a condition until surface treatment can be applied, so that it was necessary to gravel them. Fortunately the creeks in the south contain large deposits of rather clean, coarse sand, and after some preliminary trials it was decided to adopt sand asphalt instead of pre-mixed screenings for a large mileage of the work. A typical material available has 95 per cent. passing 3/16-in. sieve, and 3 per cent. passing No. 200, with a calculated surface area of 25 to 30 square feet per pound of sand. When using this sand a binder content of about 12 gallons of bitumen per cubic yard was adopted, with about 15 per cent. of power kerosene cutter. It was generally possible to reduce the thickness of the coat so that one cubic yard (measured as loose sand) covered 50 square yards, giving an average consolidated thickness of 0.6 inch. Rolling was commenced about four hours after laying, construction traffic was admitted after one day, and convoys under control after three days. The material behaves quite satisfactorily, although it takes about three months for the cutter to evaporate, and for the road to harden. There is, however, no evidence of instability or a tendency to form corrugations on the one hand, or for the material to ravel on the other hand.

BITUMINOUS SURFACE TREATMENT.

On the Board's road system during the year only urgent retreatment was carried out. The work was all resealing of the lightest nature, the minimum to prevent rapid wastage of the bituminous surface treated system. As shown in Table B, over the whole system of some 5,880 miles only 256.6 miles of retreatment was carried out, a rate of 4.4 per cent. per annum. As this rate presumes a life of some 23 years it will be seen that considerable depreciation of the asset is taking place. The 726.4 miles carried out in 1940-41 was necessary to bring up arrears of retreatment work. The 1941-42 programme of 563.9 miles is probably the minimum necessary to maintain the system without serious loss. Some wastage must be anticipated even on State Highways, but more especially on the less important main roads, where the antiquity of seal coats is steadily rising.

TABLE B.—TOTAL MILES OF WORK ON C.R.B. ROADS CARRIED OUT BY BOTH C.R.B. AND MUNICIPALLY-OWNED PLANT.

Year.	New Work (First Seals).	Miles of Work.				Grand Total.
		Retreatments.				
		Reseals.	R.M.S.	P.M.S.	Total.	
1938–39 ..	595·2	..	246·3	45·9	292·2	887·4
1939–40 ..	332·1	252·3	105·2	37·6	395·1	727·2
1940–41 ..	147·8	429·5	253·1	43·8	726·4	874·2
1941–42 ..	30·3	561·4	1·3	1·2	563·9	594·2
1942–43 ..	12·3	256·6	..	..	256·6	268·9

Seven of the Board's 400 gallon sprayers were working in Northern Territory and only two such units together with one 600 gallon sprayer remained for use in Victoria. For a few weeks a new 1,000-gallon sprayer was used prior to its despatch to Northern Territory. In addition to these units it was necessary to hire one 300-gallon, one 600-gallon, and one 800-gallon sprayer for the Victorian programme. Some of these units were not as susceptible to exact control as the Board's own sprayers, and accordingly some of the work done was less uniform than usual.

In addition to the 269 miles of C.R.B. roads treated, 1,358,800 square yards of Commonwealth works in Victoria were executed, comprising 132,200 square yards of light priming and 540,000 square yards of heavy priming of runways, and 606,600 square yards of priming followed by a two-coat seal.

The average annual mileage of Bituminous Surface Treatment work on C.R.B. roads for the five year period 1938-39 to 1942-43 is 671 miles per season.

The total work carried out on roads during 1942-43 was as follows—

	Miles.
Plant operated by C.R.B. on C.R.B. roads..	259
Municipal plant on C.R.B. roads	10
Total work on C.R.B. roads	269
C.R.B. plant on Municipal roads	4
Grand Total ..	273

Table C refers to work done by the fleet of sprayers on first seals and re-treatments. There is a tendency to do less work from each dump than formerly. As however the sprayers, kettles, aggregate loaders and spreaders, brooms, roller carriers, and portable cook-houses are all designed for rapid travel, the cost of work is not greatly affected by this factor.

Table C.—Details of Job.

	Season.		
	1940-41.	1941-42.	1942-43.
Number of jobs	529	388	161
Longest job (miles)	16·4	12·2	9·75
Shortest job (miles	0·02	0·02	0·09
Average job (miles)	1·64	1·5	1·67
Total number of spraying dumps	209	157	75
Miles of work done from each dump (average)	4·1	3·7	3·4

Table D.—Cost of Sealing (pence per square yard).

Item.	First Seals.	Reseals. Nominal Rate of Application of Binder in Gallon per Square Yard.			
		0·1	0·15	0·2	0·25
Area costed (sq. yds.)	107,239	207,679	1,157,492	901,556	85,942
Material ..	7·95	4·16	5·24	6·04	8·21
Labour ..	2·39	1·00	1·19	1·26	1·80
Stores ..	0·28	0·13	0·17	0·20	0·35
Plant ..	1·69	0·59	0·90	1·09	1·34
Total ..	12·31	5·88	7·50	8·59	11·70
Previous total costs for comparison— Year—					
1939-40 ..		..	..	..	7·42
1940-41 ..		2·88	4·76	7·46	7·92
1941-42 ..		3·30	6·06	7·55	8·27
1942-43 ..		5·88	7·50	8·59	11·70

The sprayers operated by the Board treated 259 miles of the Board's road system, 10.7 miles being first seals and the rest re-treatments, 21.3 miles being at 0.1 gallon per square yard, 120.5 miles at 0.15, 98 miles at 0.2, and 8.7 miles at 0.25. Municipal plant treated 9.7 miles of the Board's road system, 1.6 miles being first seals, 5 miles re-seals at 0.15 gallon per square yard and 3.1 miles at 0.2. For economy, there were no retreatments involving corrective features (Road Mix or Plant Mix).

The cost of aggregate averaged 16s. 7d. per cubic yard as compared with 12s. 10d. in 1939. Table D shows costs of various types of work. Rates of application of aggregate were generally as shown in the report for 1942.

Yours obediently,

D. V. DARWIN,
Chief Engineer.

APPENDIX.

COUNTRY ROADS BOARD FUND.

RECEIPTS.

1942.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
July 1.	To Balance	.. ..	.. ..	.. ..	299,879 12 0
1943.					
June 30.	,, Motor Car Act No. 3741—Registration Fees ..	1,352,516 1 2			
	Less Refunds	16,761 7 9			
			1,335,754 13 5		
	Fines ..	10,387 7 0			
	Less Refunds	28 17 0			
			10,358 10 0		
			1,346,113 3 5		
	Less Cost of Collection ..		97,686 16 2		
				1,248,426 7 3	
	,, Motor Omnibus Act No. 3742—Fines		.. ..	14 0 0	
	,, Country Roads Board Acts Nos. 3662; 3741, Sec. 13; and 4332—				
	Fees and Fines		268 13 6		
	Registration of Traction Engines		76 9 0		
				345 2 6	
	,, Acts Nos. 3662, 3741, 4332—Costs		.. ..	67 9 6	
	,, Municipalities' Repayments—				
	Permanent Works—Outer Metropolitan Roads ..	4,839 5 2			
	Relief Acts Nos. 4140 and 4415	143,668 4 10			
			148,507 10 0		
	,, Main Roads—Maintenance ..		96,248 15 7		
				244,756 5 7	
	,, Hire of Plant		58,625 17 10		
	,, Stores and Materials		286,366 8 0		
	,, Sundries		271,971 7 7		
				616,963 13 5	
	,, Special Works—Outstanding 30.6.42—Recoup ..			141,670 1 11	
					2,252,243 0 2
					£2,552,122 12 2

PAYMENTS.

1943.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
June 30.	By Maintenance	.. ..	.. ..	.. ..	519,032 11 6
	,, Murray River Bridges and Punts	.. ..	.. ..	.. ..	2,555 2 9
	,, Interest and Sinking Fund—Municipalities' Repayments	.. ..	.. ..	.. ..	110,257 13 2
	,, Interest and Sinking Fund—Great Ocean Road ..	.. ..	.. ..	.. ..	1,000 0 0
	,, Recoup to Revenue—Act No. 3944—				
	Interest—Main Roads	.. ..	102,419 1 4		
	Developmental Roads	.. ..	173,290 1 1		
	Sinking Fund Contributions	.. ..	25,785 16 11		
	Exchange	.. ..	39,876 18 2		
	Loan Conversion Expenses	.. ..	2,097 4 1		
				343,469 1 7	
	,, Relief to Municipalities—Acts Nos. 4140 and 4415	.. ..	.. ..	.. ..	221,040 8 8
	,, Stores and Materials	.. ..	350,900 0 5		
	,, Plant Purchase and Repairs	.. ..	94,713 10 11		
	,, Storeyard	.. ..	58,121 19 11		
	,, Sundry Debtors	.. ..	192,705 12 1		
	,, Traffic Administration—				
	Motor Car Acts	.. ..	3,473 3 5		
	Country Roads Acts	.. ..	1,488 10 0		
	,, Bridge Inspections	.. ..	352 4 7		
	,, Act No. 4332—Impounding of Cattle	.. ..	797 16 6		
	,, Act No. 4609—Tourists' Resorts Fund	.. ..	7,886 11 5		
	,, Act No. 4585—Traffic Line Marking	.. ..	5,875 15 3		
	,, Recoup to Revenue—Act No. 3782—Superannuation Charges	.. ..	1,507 5 0		
	,, General Expenditure—				
	Salaries, &c.	96,248 1 10			
	Less Recoup	79,092 9 2			
			17,155 12 8		
				734,978 2 2	
	,, Special Works—Outstanding	.. ..	.. ..	.. ..	210,745 5 7
	,, Balance	.. ..	.. ..	.. ..	*409,044 6 9
					£2,552,122 12 2

RECONCILIATION.

	£ s. d.
Balance as per Treasury Books	414,155 10 8
Add Transfers Outstanding	8,780 5 10
	422,935 16 6
Deduct Accounts in Transit	13,891 9 9
Balance as per Country Roads Board Accounts	409,044 6 9

* Includes amounts of :—

(*a*) To meet liabilities on contracts and direct labour works .. £110,000

(*b*) Reserve for reconstruction of roads and bridges .. £250,000

1943.		£ s. d.	£ s. d.	£ s. d.
June 30.	To Maintenance Works—General		290,521 10 9	
	,, Mansfield-Woods Point Road ..	2,176 18 10		
	,, Woods Point Road	1,621 3 7		
	,, Walhalla Road	910 10 5		
	,, State Highways	197,663 3 2		
	,, Tourists' Roads	26,139 4 9		
			228,511 0 9	
				519,032 11 6
	,, Murray River Bridges and Punts		.. ..	2,555 2 9
	,, Contribution to Sinking Fund		27,564 8 3	
	,, Interest on Loans		82,693 4 11	
				110,257 13 2
	,, Recoup to Revenue—Act No. 3944—			
	Interest—Main Roads ..	102,419 1 4		
	Developmental Roads	173,290 1 1		
			275,709 2 5	
	,, Sinking Fund Contributions		25,785 16 11	
	,, Exchange		39,876 18 2	
	,, Loan Conversion Expenses		2,097 4 1	
				343,469 1 7
	,, Act No. 4395—Great Ocean Road—			
	Interest		543 1 0	
	Sinking Fund		456 19 0	
				1,000 0 0
	,, Tourists' Resorts Fund—Act No. 4609		.. ..	7,886 11 5
	,, Recoup to Revenue—Act No. 3782—Superannuation Charges		.. ..	1,507 5 0
	,, Relief to Municipalities		.. ..	221,040 8 8
	,, Audit Fee		574 16 9	
	,, Insurance of Staff		129 7 4	
	,, Instruments		166 13 5	
	,, Motor Expenses		6,866 16 3	
	,, Offices, Exhibition Building		2,065 3 0	
	,, Divisional Offices		621 3 3	
	,, Divisional Storeyards		1,451 13 5	
	,, Promontory Huts and Garages		2 2 5	
	,, Storeyard Equipments Repairs Account ..		498 17 7	
	,, Storeyard No. 2		8,943 6 0	
	,, ,, No. 3		1,162 17 10	
	,, ,, No. 4		911 10 7	
	,, Office Expenses		4,162 14 0	
	,, Office Furniture		447 16 6	
	,, Patrolmen's Cottages and Engineers' Residences ..		329 5 3	
	,, Patrol Garages		8 9 1	
	,, Plans Purchase		562 11 9	
	,, Plant Purchase		57,284 18 4	
	,, Postage and Telegrams		1,981 10 8	
	,, Printing and Stationery		1,637 11 4	
	,, Salaries		51,112 4 4	
	,, Pay Roll Tax (Staff)		1,201 1 1	
	,, Telephones		1,593 17 11	
	,, Testing Materials		1,296 3 5	
	,, Gravel Sites and Metal Investigation		50 0 10	
	,, Travelling Expenses		1,009 2 5	
	,, Timber, &c., Revenue Account		3 12 0	
	,, Motor Car Acts Nos. 3741, sections 11–13, and 3901, sections 24–36		3,473 3 5	

1942.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
July 1.	By Balance				815,008 12 11
1943.					
June 30.	,, Motor Car Act No. 3741—				
	Registration Fees		1,352,516 1 2		
	Less Refunds		16,761 7 9		
			1,335,754 13 5		
	Fines ..	10,387 7 0			
	Less Refunds	28 17 0			
			10,358 10 0		
			1,346,113 3 5		
	Less Cost of Collection ..		97,686 16 2		
				1,248,426 7 3	
	,, Motor Omnibus Act No. 3742—Fines			14 0 0	
	,, Country Roads Act No. 3662—				
	Registration of Traction Engines			76 9 0	
	Fees and Fines			268 13 6	
	Costs—Acts Nos. 3662, 3741, and 4332 ..			67 9 6	
	,, Plant Earnings		57,966 17 7		
	,, *Deduct* Working Costs ..		37,428 12 7		
				20,538 5 0	
	,, Sundry Earnings			29 3 10	
	,, Old Roads, Sale of			54 18 4	
	,, Rents			1,242 13 6	
	,, Royalty on Gravel and Metal			541 10 1	
	,, Storeyard			6,207 2 8	
	,, Timber, &c., Revenue Account			239 15 9	
	,, Materials, Sale of		61 3 6		
	,, Pistols		3 0 0		
				64 3 6	
	,, Great Ocean Road—				
	Interest			94 15 0	
	,, Maintenance Works—				
	Contributions Payable by Municipalities			76,159 1 10	
	,, Permanent Works—				
	Contributions Payable by Municipalities—				
	Outer Metropolitan Roads	4,839 5 2			
	Other Main Roads ..	143,668 4 10			
				148,507 10 0	
					1,502,531 18 9

1943.									
June 30.	To Country Roads Acts				1,488	10	0		
	,, Bridge Inspections				352	4	7		
	,, Act No. 4332—Impounding of Cattle				797	16	6		
	,, Act No. 4585—Traffic Line Marking				5,875	15	3		
	,, Direction Boards and Warning Signs				392	12	3		
	,, War Damage Insurance				6,021	1	6		
	,, Defence Leave—Employees				132	5	9		
	,, Advertising—Government Printer				148	17	0		
	,, Legal Work—Crown Solicitor				300	0	0		
	,, Insurance—Public Risk				59	6	6		
	,, Photography				113	7	7		
	,, Engineers' Conference				4	16	8		
					165,235	3	9		
	Less Recoup				79,092	9	2		
								86,142	14 7
	Balance				..		..	1,024,649	3 0
								£2,317,540	11 8

£2,317,540 11 8

BALANCE-SHEET AT 30TH JUNE, 1943.

LIABILITIES.	£	s.	d.
Contractors' Deposits	8,328	6	4
Sundry Liabilities	9,274	4	7
Revenue Account	1,024,649	3	0
	£1,042,251	13	11

ASSETS.	£	s.	d.	£	s.	d.
Country Roads Board Fund				409,044	6	9
Maintenance Expenditure—						
Contributions Payable by Municipalities	76,159	1	10			
Contributions in Arrears	1,109	19	10			
				77,269	1	8
Permanent Works—						
Contributions Payable by Municipalities—						
Outer Metropolitan Roads	4,839	5	2			
Other Main Roads (Subject to Relief)	143,668	4	10			
				148,507	10	0
Outstanding Accounts	22,030	4	8			
,, Special Works	210,745	5	7			
				232,775	10	3
Materials—Stock—						
Storeyard	153,293	1	7			
Branches	13,033	17	4			
				166,326	18	11
Trust Fund				8,328	6	4
				£1,042,251	13	11

SUMMARY SHOWING VALUE AS AT 30TH JUNE, 1943, OF BOARD'S ASSETS CHARGED TO FUND (not included in Balance-sheet).

	£	s.	d.
Patrol Cottages	11,830	17	3
Divisional Engineers' Residences	6,317	12	0
Quarries, Gravel Pits, &c.	1,618	8	10
Garages, &c.	1,393	12	0
Shelter Huts, &c.	254	15	0
Storeyard and Offices—Divisional	3,729	19	0
Great Ocean Road Mortgage (Mrs. A. M. Bird)	1,895	0	0
Workshop Plant, Tools, &c.	4,646	6	3
Furniture and Fittings	7,678	1	1
Testing Laboratory Equipment	1,751	17	9
Survey Instruments	864	9	10
Pistols	18	13	4
Motor Cars	7,458	0	0
Storeyard No. 1	6,832	18	0
,, ,, 2	14,093	11	10
,, ,, 3	500	0	0
,, ,, 4	500	0	0
Carried forward	£71,384	2	2

	£	s.	d.
Brought forward	71,384	2	2
Works Film	2	8	0
Motor Registration Branch	6,438	17	3
Motor Testing Branch	20	11	0
Weighbridge	476	17	0
Police Sergeant's Office	11	4	6
Police Cycles	980	0	0
Police Motor Cars	6,933	15	0
Police Motor Accessories	30	0	0
Board Motor Accessories	30	0	0
Concrete Pipe Tester	6	0	0
Loadometers	260	0	0
Police Enquiry Section	8	14	6
	86,582	9	5
Working Plant at Valuation	160,194	5	1
	£246,776	14	6

COUNTRY ROADS BOARD LOAN ACCOUNT—ACT No. 3662.

BALANCE-SHEET AT 30TH JUNE, 1943.

Liabilities.	£ s. d.	£ s. d.	£ s. d.
Interest on Permanent Works			18,755 17 10
Loan Securities Issued		4,860,784 7 1	
Less Amount Repaid		80,000 0 0	
		4,780,784 7 1	
Deduct Discount and Expenses		71,916 11 3	
		4,708,867 15 10	
Less Securities Repurchased and Cancelled from National Debt Sinking Fund		379,705 1 6	
		4,329,162 14 4	
Less—			
Redemption Funds	85,219 1 1		
Main Roads Sinking Funds	285,688 7 7		
Repaid to State Loans Repayment Fund	516,053 17 8		
		886,961 6 4	
			3,442,201 8 0
State Loans Repayment Fund			338,258 6 1
Contribution to National Debt Sinking Fund		402,889 12 8	
Less Net Loss on Repurchase of Securities (including Exchange)		14,936 10 10	
			387,953 1 10
Loan Redemption as Itemized above			886,961 6 4
			£5,074,130 0 1

Assets.	£ s. d.
Permanent Works	5,047,126 1 11
Interest Capitalized on Permanent Works (Act No. 3662)	18,755 17 10
National Debt Sinking Fund (Cash in Hand)	8,248 0 4
	£5,074,130 0 1

DEVELOPMENTAL ROADS LOAN ACCOUNT—ACT No. 3662.

BALANCE-SHEET AT 30TH JUNE, 1943.

LIABILITIES.	£ s. d.	£ s. d.	£ s. d.
Loan Securities Issued		6,299,024 7 0	
Deduct Discount and Expenses		113,163 2 2	
		6,185,861 4 10	
Less Securities Repurchased and Cancelled from National Debt Sinking Fund		578,940 11 2	
		5,606,920 13 8	
Less Redemption Funds	646,386 7 4		
Developmental Roads Sinking Fund	55,083 0 2		
		701,469 7 6	
			4,905,451 6 2
State Loans Repayment Fund			239,896 6 1
Contribution to National Debt Sinking Fund		614,290 6 4	
Less Net Loss on Repurchase of Securities (including Exchange)		22,773 18 5	
			591,516 7 11
Loan Redemption Itemized above			701,469 7 6
Interest, Act No. 3662 (Sec. 86/1)		77,372 3 10	
Contributions Postponed		16,656 13 7	
			94,028 17 5
			£6,532,362 5 1

ASSETS.	£ s. d.
Permanent Works Expenditure	6,425,757 10 11
National Debt Sinking Fund (Cash in Hand)	12,575 16 9
Contributions Payable by Municipalities, Act No. 3662, Sec. 86/1. (Subject to Relief)	94,028 17 5
	£6,532,362 5 1

DEVELOPMENTAL ROADS INTEREST—ACT NO. 3662—(SECTION 86/1).

RECEIPTS.	£ s. d.
1943. June 30. To Interest on Account of Municipalities—Provided by Relief—	
Act No. 3662—Sec. 86/1	77,372 3 10
	£77,372 3 10

EXPENDITURE.	£ s. d.
1943. June 30. By Payments to Treasury (Relief)	77,372 3 10
	£77,372 3 10

AUDITOR-GENERAL'S CERTIFICATE.

The Accounts have been audited and compared with the books, with which they agree. Reconciliations have also been made with the books of the Treasury. Subject to the qualification that the balance-sheets do not include as assets permanent works and improvements resulting from expenditure from revenue moneys and extraneous funds, the several statements, in my opinion, exhibit a correct view of the affairs of the Board at the 30th June, 1943.

E. A. PEVERILL,
Auditor-General.
9th December, 1943.

E. J. HICKS,
Accountant,
23rd November, 1943.

By Authority: H. E. Daw, Government Printer, Melbourne.