COUNTRY ROADS BOARD

VICTORIA

1913 – 1963

FIFTY YEARS OF PROGRESS

INTRODUCTION

Fifty years ago, when the Country Roads Board first commenced its operations in 1913, roads in Victoria were generally in a deplorable condition. Many of them, particularly in hilly country, were little better than primitive tracks and even those which had been well constructed as the principal coach routes before the advent of railways had been allowed to deteriorate to a very serious extent. Travel by road in 1913, even for comparatively short distances, was often difficult, sometimes impossible, and generally uncomfortable.

Certainly all roads were not equally bad. In parts of the Western District of the State, where suitable road-making materials were readily available and the nature of the country provided little difficulty in the matter of road location and alignment, and in the older established areas around Bendigo and Ballarat, there were considerable stretches of good traffickable roads. But generally, settlement had far outpaced road construction and a comprehensive road system linking all parts of the State did not exist.

In half a century all this has changed. Today there are practically no "isolated settlers" and communication by road between the centres of population is, in the main, fast and easy. Over 80,000 miles of traffickable roads run throughout Victoria and contribute materially to the well-being of every citizen in the State. Out of very humble beginnings there has developed in this period of fifty years a vast national asset capable of expansion to meet whatever needs the future might bring. How this has come about is told in the following pages.

In the preparation of this booklet by the Board and its staff, the co-operation of the Archives and Research staff of the State Library is gratefully acknowledged.

C.R.B. Head Office, Kew. From 1913 until 1929 the C.R.B. was accommodated in the Titles Office and from 1929 until 1960 in the Exhibition Buildings. The present offices were occupied in December, 1960.

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ROAD ADMINISTRATION IN VICTORIA 1836 TO 1912

While road administration in Victoria, prior to the constitution of the Country Roads Board in 1913, was pervaded by the view that the provision of roads was primarily the concern of local enterprise, early legislation did assume distinction between roads of national and of purely local importance, and provided for the apportioning of costs accordingly. However, the brunt of the burden fell upon Local Government bodies, which in rural areas at least were brought into existence for the primary purpose of providing the administrative machinery necessary for the construction and maintenance of roads.

1836 - 1851. BEFORE SEPARATION FROM NEW SOUTH WALES

From the time of first settlement in 1836 until 1851, the authority responsible for the construction and management of roads was the Government of the Colony of New South Wales. During this period, road administration was marked by an almost complete lack of planning and Government finance. The Public Roads Act of 1833, which provided for the making of roads in the Colony, empowered the Governor to declare what roads were to be made and whether they were to be maintained at the public expense or at the expense of the parishes through which they passed, but this power was not applied to the newly-settled Port Phillip district, as Victoria was then known. Many sections of land were surveyed and sold without provision for roads, and the trail made by the original settler was, in most cases, adopted and proclaimed the public highway. The sums allocated for the construction of roads and bridges were niggardly in the extreme, and the responsibility for the provision of roads was, in the main, relegated by the Central Government to local enterprise.

ROAD TRUSTS AND DISTRICT COUNCILS

In 1840 the Parish Roads Act provided for the establishment of Trusts to make and maintain roads. The owners of land within three miles of a road could elect trustees for a period of three years, the trustees being empowered to levy a rate not exceeding 6d. per acre per annum on land owners in their area, and collect tolls from those using the road. A Trust could also borrow money by mortgaging the rates and tolls.

In 1842 another Act provided for the establishment of District Councils with powers similar to those of the Trusts. Roads continuing to be a problem beyond the resources of local enterprise, the Government appointed a Commission in 1847 "to consider the question of the construction and maintenance of the roads and bridges of the Colony". The Commission recommended a reversion to the system of local Trusts for the

construction and maintenance of "district" roads and bridges, with the Central Government undertaking the responsibility for arterial routes. The recommendation of the Commission did not find expression in the Port Phillip District since the move for Separation from New South Wales was well advanced.

Although little was accomplished in the way of actual road construction during the period of government by New South Wales during the years of 1836-1851, a number of important principles of road administration were established, and some valuable lessons learned. The principle of the road user and the land owner who benefited from the road, each contributing to its construction and upkeep by the payment of tolls and rates on properties respectively, was established by the Acts of 1840 and 1842, and the need for a division of responsibility as between local and arterial routes, by the Commission of 1847.

AFTER SEPARATION FROM NEW SOUTH WALES

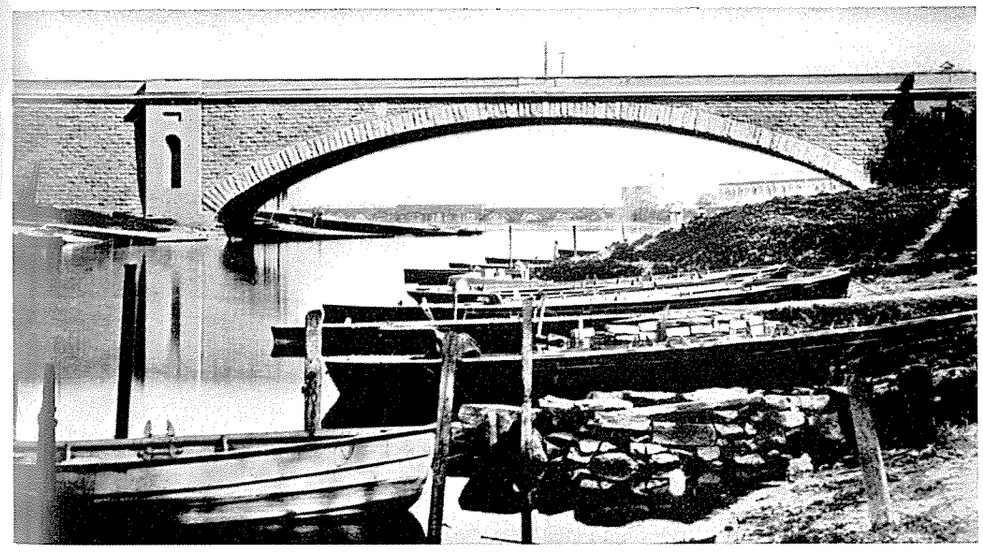
In November, 1851, within six months of taking office, the Government of the newly-created Colony of Victoria appointed a Select Committee of the Legislative Council on Roads and Bridges "to enquire and report on their present state, and how the funds placed at the disposal of Government may be expended to the best advantage throughout the Colony". The Committee heard evidence from a number of individuals, including Robert Hoddle, the Surveyor-General; David Lennox, the Superintendent of Bridges; D. C. McArthur, a bank manager, who had been responsible for the first Road Trust at Heidelberg, established under the Act of 1840; and a Major Campbell, who had been connected with the Central Road Board in Adelaide.

The Report of the Committee, published in 1852, provides a graphic description of the roads as they existed in 1851 — "the succession of quagmires impassable by wheel carriages and traversed by pack horses, conveying goods and merchandise at enormous cost of transit", and roads were often so badly surveyed that it would be "found a work of difficulty and great expense to construct them on many of the reserved lines". The Committee considered that "some system should be adopted by which lines of internal communication may be aligned according to a general plan, commencing the formation of macadamised roads at the towns, and extending them into the interior; these roads to be constructed as the resources of the Government will admit, so as, by degrees, to open up the country and develop a perfect network of roads throughout the Colony". The Committee recommended the establishment of a Central Road Board with exclusive powers over main roads and the establishment of District Road Boards to undertake works on local roads. A further recommendation was to the effect that main roads should be financed by the Government, which should also subsidize local roads on a pound for pound basis with the local settlers. In both cases, roads once constructed should be maintained by the collection of tolls. The Committee also recommended that His Excellency the Lieutenant Governor should appoint an Inspector-General of Roads and a sufficient staff of engineers, clerks and other officers to act under the direction of the Central Board.

As a result of the report of the Select Committee, an Act for making and improving roads in the Colony of Victoria was passed by the Legislative Council and received assent on the 8th February, 1853. A Central Road Board consisting of three members was appointed and held its first meeting on the 15th March, 1853, sixty years to the month before the first meeting of the Country Roads Board. This Act also provided for the establishment of District Road Boards as recommended by the Committee.

While the constitution of a central authority responsible for roads throughout the Colony working in close co-operation with local administration marked a major development in road administration, circumstances in other directions were not altogether propitious. The Central Road Board lacked the freedom that it needed to carry out its task. It was responsible to the Colonial Secretary for policy, the Treasurer for financial administration and to the Surveyor-General for co-ordination of its works programme with other public works. In spite of this division of control it established excellent relations with the District Road Boards which came into existence during its period of office and achieved some worthwhile road and bridge construction, particularly on the arterial roads which were its prime responsibility. In 1857 the Central Road Board was abolished by the Act of Parliament which established the Board of Land and Works. This Act transferred the responsibility for road administration to the Department of Roads and Bridges of that Board, but did not otherwise alter the system established by the Act of 1853, which remained in operation until the management of roads passed to the local government bodies

Original Princes Bridge designed and constructed by David Lennox, Superintendent of Bridges. The original stone bridge was in service until 1888 when it was removed so that the River Yarra could be widened.



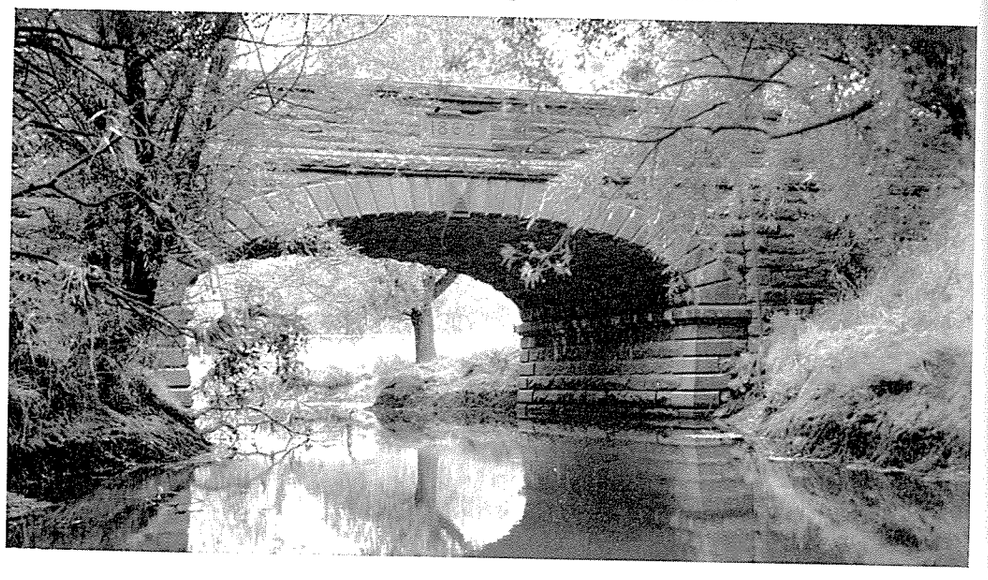
established under the Municipal and Local Corporations Act of 1863.

The Act of 1863 authorized the constitution of Shires, making them, together with the Road Districts which remained, bodies corporate. All roads within a Shire or Road District were placed under the control of the Council of the Shire or the Board of the Road District. All other roads outside a Road District or a Shire remained the responsibility of the Central Government, the responsibility being discharged until 1877 by the Commissioner of Railways and Roads, and thence forward by the Public Works Department. Railway construction by this time had gained momentum and the care of roads was to the Central Government a matter of secondary importance. The vast influx of population caused by the finding of gold in 1851, and the opening of the goldfields around Bendigo and Ballarat, had necessitated improved communication and railways were the answer in view of the slowness of horse and bullock-drawn vehicles.

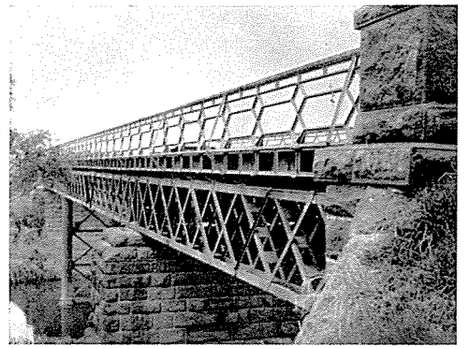
By 1860, large-scale alluvial gold-mining had practically ceased and, although quartz mining continued to occupy a considerable proportion of the population, the number of miners looking for a more settled occupation rapidly increased. Considerable settlement took place from 1862 onwards, and the cares and responsibilities of local government increased.

The toll system intended to place the burden of road maintenance equitably on the road user, had in practice proved unsatisfactory. The costs of collection were high and the revenue uncertain. Never popular with road users, the system came to be regarded as "barbarous, vexatious and costly". The Shires and Boroughs Statutes of 1869 provided that tolls could be abolished if the councils so desired but since these Acts did not offer an alternative means of providing revenue for roads, the toll system remained until 1877, when it was finally abolished by Act of Parliament.

Bridge on Calder Highway at Woodend constructed by the Roads and Bridges Department of the Board of Land and Works in 1862. The bridge has since been widened by the C.R.B. and faced with the original stone to preserve its character.



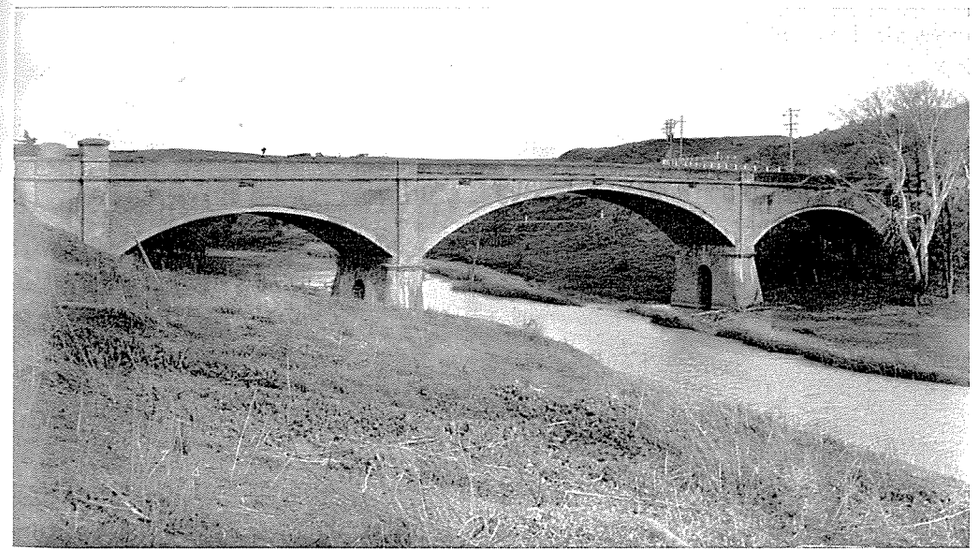
Woady Yaloak Creek Bridge at Cressy on the Hamilton Highway, constructed 1854, reconstructed 1880.



The Local Government Act of 1874 provided for municipalities a total endowment of £310,000 per annum for five years, but the means of distribution set out in the Act was inequitable and well-established Districts received much more favourable treatment than did the newer and more isolated Districts. In 1879 the financial provisions of the Act ceased, but the endowment was continued as a subsidy which reached the sum of £450,000 in 1890 and 1891. The Local Government Act of 1891 continued the provision at the rate of £450,000 and placed the distribution on a much more equitable basis but, by 1894, the amount had been reduced to £100,000, at which figure it remained until 1914.

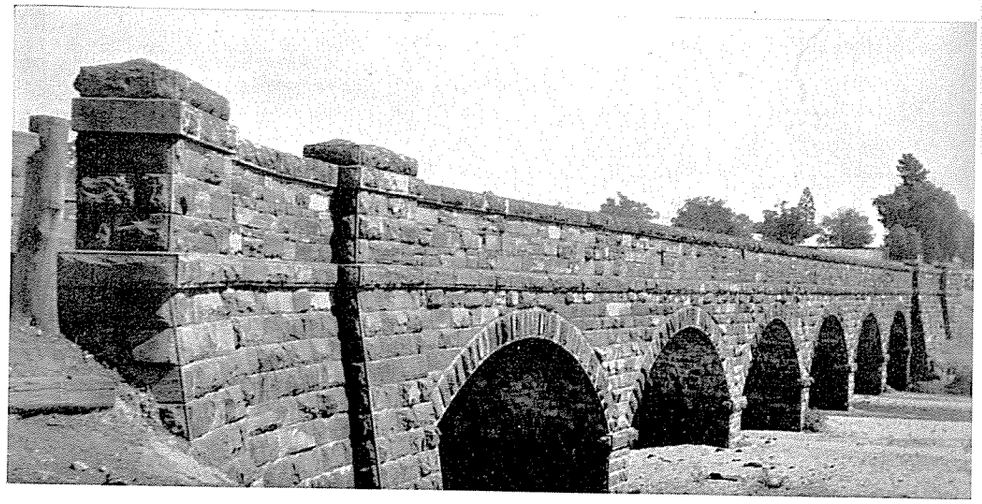
The Land Act of 1862 permitted selection before survey, and, as in the early days of settlement, badly located roads, with resulting high costs of construction and maintenance, were a natural consequence. The area of the State most particularly affected in this regard was Gippsland.

Concrete arch bridge over the Moorabool River at Fyansford; constructed 1899/1900.



Crawford River bridge on Portland-Casterton Road at Hotspur. Constructed in 1870 during the period of Local Government administration. Bridge is now about to be replaced.

Bridge at Avenel. Typical of many fine masonry structures erected during the period of centralised administration, 1853-1863. This bridge is still in service, 1963.



EVENTS LEADING TO THE ESTABLISHMENT OF THE COUNTRY ROADS BOARD

At a meeting held in Warragul on the 15th August, 1911, representatives of eighteen councils met together and passed a resolution to the effect "That the Government be asked to form a Gippsland development trust, subject to the consent of the Councils, the Government to lend £1,000,000 to the trust at 3¾ per cent., with 1½ per cent sinking fund, taking as security for the interest and sinking fund the subsidies, special grants (averaged) and money received from the unused roads and water frontages in Gippsland, the Government to find the balance of interest and sinking fund; this £1,000,000 to be expended by the Shire Councils, under the supervision of the trust, upon the main roads leading to stations, the trust to recommend to the Government, from time to time, proposals for railways and ports required for the development of Gippsland". The following day, a deputation conveyed the resolution to the Acting Premier and the Acting Minister of Public Works and was assured that its representations would be sympathetically considered.

In 1910 the Inspector General of Public Works, Mr. Wm. Davidson, had submitted a report recommending the establishment of a Roads Board to take over the care and management of main roads and subsequently Mr. J. A. Norris, then Sub-accountant of the Treasury, was directed to investigate and

Sledge in use in Gippsland, 1913.

report upon the road needs of the State. In his report, published on 21st December, 1911, Mr. Norris also recommended the establishment of a central road authority stating, inter alia, that lack of co-operation between municipalities in the construction and maintenance of arterial routes, the distribution of such State aid as was available without supervision over the expenditure or "thorough investigation into actual needs, and the absence of a central authority to supplement, guide and weld together the efforts of local bodies" were equally to blame.

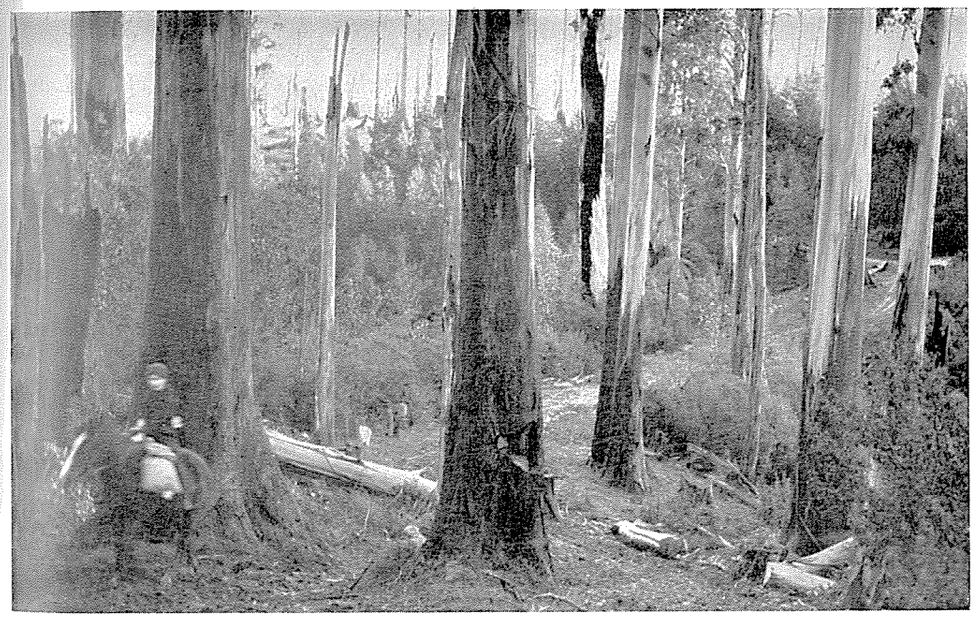
The development of the motor vehicle accelerated by rapid improvements in construction of the petrol engine and pneumatic tyres was bringing a new class of traffic to roads. Motor vehicles were first used for pleasure and later for carting small loads. This traffic accentuated the demands for better roads. These demands, and the representations of Mr. Davidson and Mr. Norris, were not to be denied and, in 1912, the Country Roads Bill was before Parliament. On 1st January, 1913, the Country Roads Act was proclaimed and after 38 years of disintegrated control there was once more a central road authority.

Corduroy construction on Beech Forest-Lavers Hill Road, 1913.

Mail coach on Forrest-Apollo Bay Road, showing road conditions in the early 1900's.

Road works in progress, Woorayl Shire, in the early 1900's.

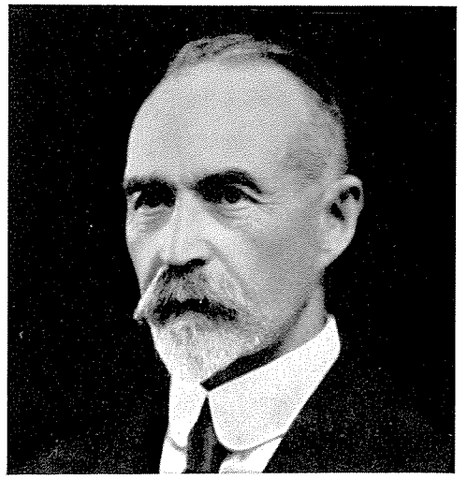
Typical Gippsland Track, 1913.



ORIGINAL BOARD MEMBERS AND FIRST STAFF

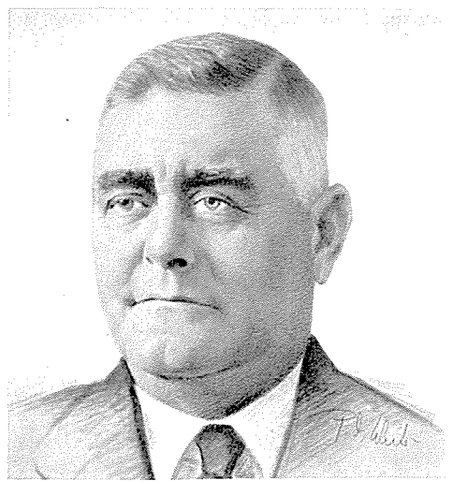
The original Board Members, Mr. W. Calder, Chairman; Mr. W. T. B. McCormack and Mr. F. W. Fricke were appointed on the 28th March, 1913, and held their first Statutory Meeting in the office of the Minister of Public Works three days later on March 31st.

Mr. W. Calder; *Before his appointment to the Board, Mr. Calder was City Engineer, Prahran.*



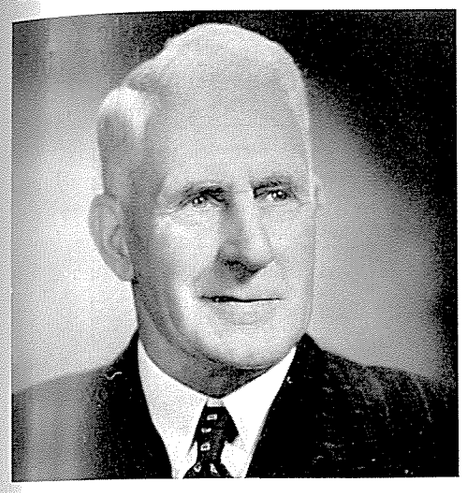
ORIGINAL BOARD MEMBERS

Mr. W. T. B. McCormack; *Before his appointment Mr. McCormack was engineer for Roads and Bridges, Department of Public Works.*



Mr. F. W. Fricke; *Before his appointment Mr. Fricke was on the staff of the Lands Department.*

Mr. W. L. Dale, Secretary; *Before his appointment as Secretary, Mr. Dale was on the staff of the Melbourne City Council.*



Mr. A. E. Callaway, Chief Engineer; *Before his appointment as Chief Engineer, Mr. Callaway was Shire Engineer, Woorayl Shire.*

FIRST STAFF

Miss Kathleen Handley; *Miss Handley was the first staff member to be appointed. She was appointed on the 29th April, 1913, and in 1963 is still a member of the staff.*

CONSTITUTION AND POWERS OF THE C.R.B.

The Country Roads Board, Victoria, is a statutory corporation consisting of three members appointed by the Governor-in-Council. Its powers and responsibilities are set out in the Country Roads Act. Although these powers and responsibilities have been extended from time to time to meet the demands of changing conditions, the basic provisions of the original Act have remained unaltered. Experience in Victoria, and overseas, had indicated that if the problems of road construction and maintenance in a rapidly-developing country were to be overcome, it would be necessary to appoint a strong central authority with wide discretionary powers to work in close co-operation with the existing machinery of local government, and to provide expert technical knowledge of recently-developed techniques and to disseminate information regarding surveys and investigations made. The Act of 1912 was, therefore, framed with these requirements in mind, and the Board was constituted and financially endowed in such a way as to preserve its independence from sectional pressures and enable it to discharge its duties to the greatest benefit of the State as a whole. Since its inception the Board has been responsible to the Minister of Public Works and gratefully acknowledges the support, advice, and assistance received from the various Ministers over the years.

POWERS UNDER THE ACT OF 1912

The Act of 1912 provided that the C.R.B. should carry out all such surveys and investigations as were necessary or expedient to ascertain—

(i) what roads should be main roads;

(ii) the nature and extent of the resources of Victoria in road-making materials and the most effective and economical methods of utilizing them;

(iii) the most effective methods of road construction and maintenance in the whole or any part of Victoria;

(iv) what deviations in existing roads, or what new roads should, in its opinion, be made so as to facilitate communication and improve the conditions of traffic;

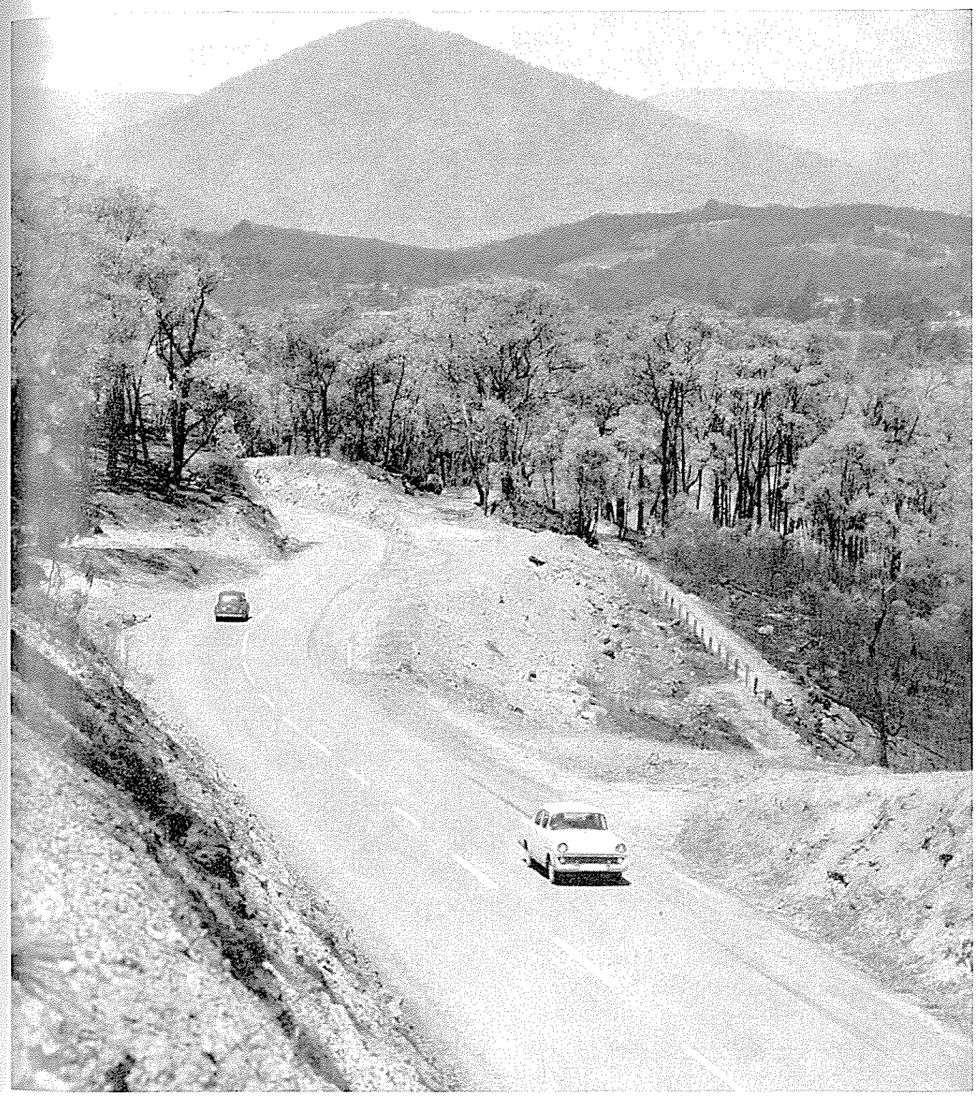
(v) record, publish and make available for general information the results of all such surveys and investigations;

(vi) purchase all land, machinery, tools and materials necessary for the purposes of the Act.

MAIN ROADS

The original Act, which made available £2,000,000 of loan money to be expended at the rate of £400,000 per annum on permanent works, provided that the cost of maintenance works on main roads should be shared equally by the C.R.B. and the municipalities. Municipalities were also required to repay half the expenditure incurred on permanent works. In 1924 the Highways and Vehicles Act reduced the statutory contribution from municipalities on maintenance to a maximum of one-third. Provision was made for a municipality's contribution to be reduced in certain circumstances and by the application of this procedure, and later by the use of Federal Aid moneys without charge to the municipalities, the contribution made by the C.R.B. to total main road expenditure had increased to over 85 per cent by 1962. Today there are 9,111 miles of main roads, upon which a total of £76,079,000 to 30th June, 1962, has been spent since 1913.

Healesville-Yarra Glen main road, west of Healesville, 1963.



DEVELOPMENTAL ROADS

It was soon realized by the Country Roads Board that the original Act, applying as it did only to main roads, was insufficient to meet the problem of providing the farmer with access to the railways and markets. Consequently, in 1918, the Developmental Roads Act was passed. This Act empowered the C.R.B. to declare as a developmental road any road which, in its opinion, would serve to develop any area of land by providing access to a railway station or to a main road leading to a railway station. Loan money was provided by the Government, and municipalities which benefited were required to pay annually for 20 years an amount of approximately 2 per cent towards interest on capital expenditure. In 1922 when further funds were provided the period was extended to 31½ years. Repayment of the loan and of portion of the interest was originally from Consolidated Revenue, but the responsibility was transferred to the C.R.B. in 1930. Maintenance was the responsibility of the relevant municipality. By 1937, when the last of the works undertaken under this Act was completed, a total amount of some six and a half million pounds had been expended.

Typical isolated settlers' road before reconstruction.

ISOLATED SETTLERS ROADS

The importance of providing road access for isolated settlers was recognized by the Roads to Isolated Settlers' Appropriation Act of 1925. £9,000 was provided, and provision was made for the expenditure of £2,000 per annum for the construction of short lengths of road from farm properties to main or developmental roads in cases where settlers were not directly served by such roads. Later, during the depression years, funds provided for unemployment relief, together with increased amounts from the Board's revenue, were made available for the construction of these roads. Between 1930 and 1943 over £330,000 was expended in the construction of some five thousand access roads.

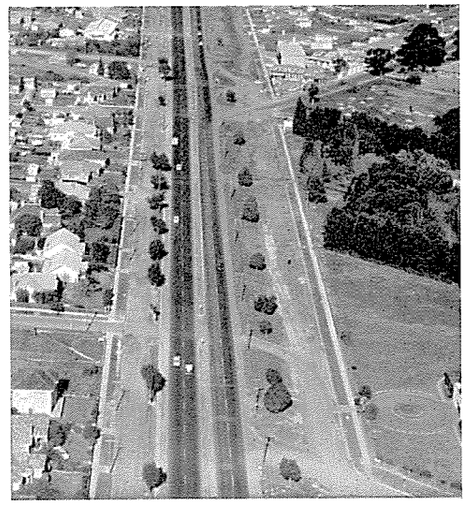
STATE HIGHWAYS

Following the return of the Chairman, Mr. W. Calder, from a mission abroad, the Government in 1924 passed the Highways and Vehicles Act which provided for the declaration of State highways. This Act recognized the growing importance of the motor vehicle and of the longer lines of communication to the economy, and removed the burden of providing for long-distance "through" traffic from the municipalities through which the routes passed. Since the passage of the Act, the full costs of both construction and maintenance on State highways, for that portion of the carriageway required for through traffic, have been charged to the Board's funds. Today, there are 4,502 miles of State highways upon which a total of £61,351,000 had been spent to 30th June, 1962.

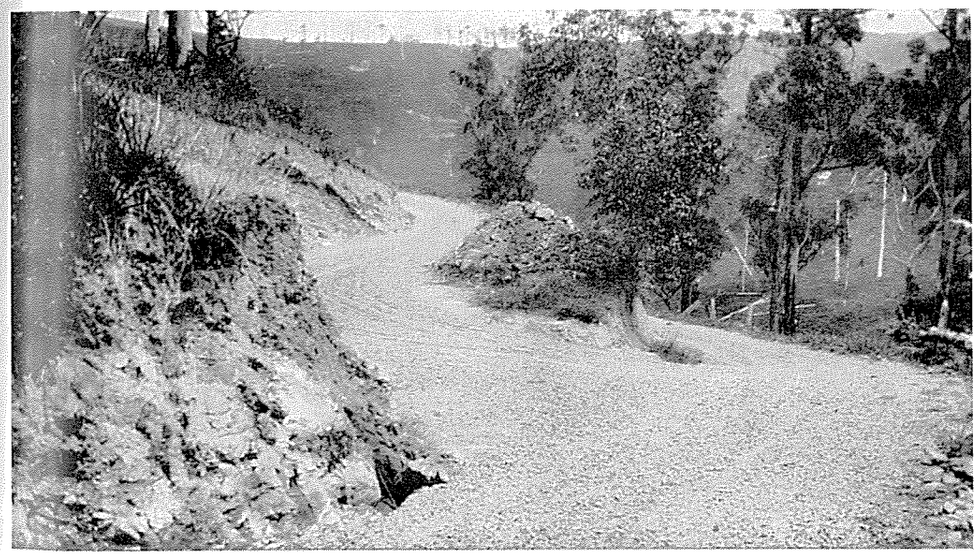
TOURISTS' ROADS

During the financial year 1923/24 funds were provided by the Government for improving and making accessible places of interest, tourist resorts, etc., and a Tourist Committee was appointed to administer the funds. Owing to the fact that the Committee did not have at its disposal any professional or administrative staff, the C.R.B. was appointed by the Government to be the road constructing authority. In 1936 the Tourists' Roads Act was passed, under which the Governor-in-Council, on the recommendation of the Board, may proclaim roads of sufficient interest to be tourists' roads. This Act also empowered the Board to

Nepean Highway between Moorabbin and Cheltenham, showing duplication, 1963



Typical isolated settlers' road constructed under C.R.B. supervision.



carry out permanent works on and maintain such roads. The C.R.B. bears the full cost of the works required for these roads and has expended a total amount of £5,220,000 to 30th June, 1962, since 1936. There are now 426 miles of proclaimed tourists' roads in the State.

FOREST ROADS

From time to time requests had been made by municipalities for Government assistance towards roads carrying timber traffic from State forests and privately-owned timbered land. In order to enable assistance to be given in these cases, the Forest Roads and Stock Routes Act was passed in 1943. Under this Act the Governor-in-Council on the recommendation of the C.R.B., after consultation with the Minister of Forests and the Commissioner of Crown Lands and Survey, and on the recommendation of the Commissioner of Public Works, may proclaim any existing road or part of any existing road to be a forest road, or approve of a new forest road or deviation. Forest roads shall only be proclaimed or constructed in those areas of the State within or adjacent to any State forest area or as the Board considers to be timbered, mountainous, or undeveloped areas. Under the Act, municipalities are relieved of all costs of construction and maintenance of such roads. Total expenditure to 30th June, 1962, amounted to £1,950,000 on 461 miles of proclaimed forest roads.

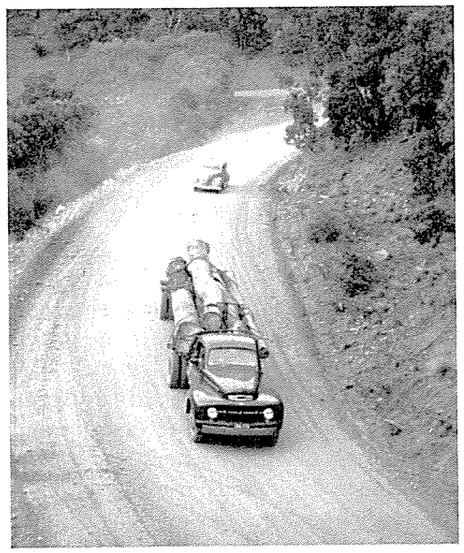
UNCLASSIFIED ROADS

In 1926 the Federal Aid Roads Agreement Act was passed by the Federal Parliament, and money was provided from Federal Funds for State roads. In the following year, the C.R.B. began to make available to the various municipalities throughout the State, funds for the improvement of unclassified roads, that is, roads generally of local importance which are the statutory responsibility of the municipalities in which they lie. Today there are some 90,000 miles of this category of road and each year the C.R.B. contributes funds towards works on 20,000 to 25,000 miles of them. Of each year's expenditure, the C.R.B. contribution accounts for nearly 70 per cent of the total spent on construction and approximately 80 per cent on maintenance. Total funds contributed, to 30th June, 1962, amount to £37,998,000.

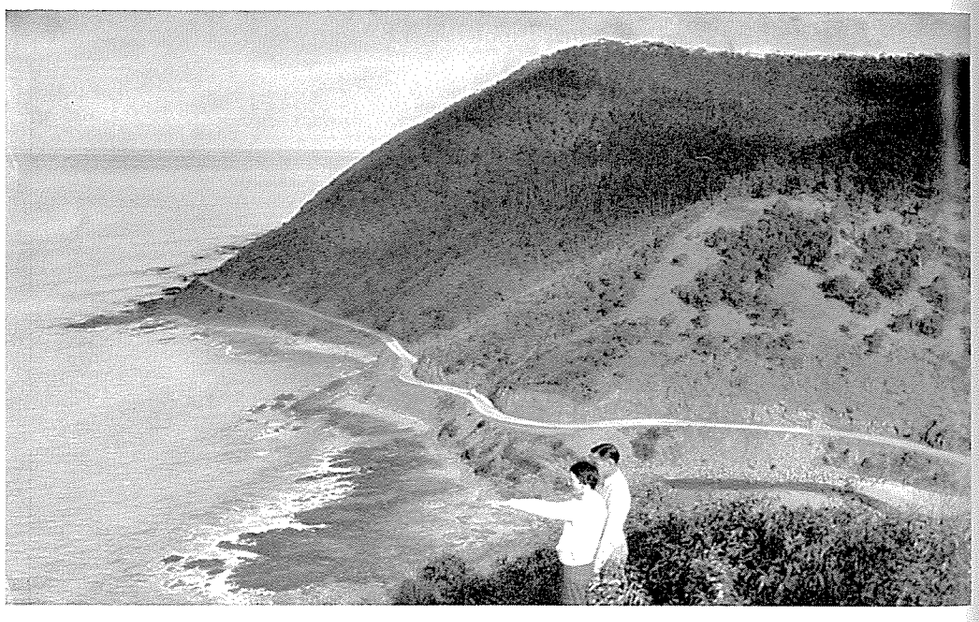
BY-PASS ROADS (Freeways)

In 1956 the C.R.B. was empowered to construct freeways, described in the Act as 'by-pass roads'. This has enabled the Board to plan and construct those roads with restricted access which are essential in the development of an efficient State-wide road network. To date 28.34 miles of freeways have been constructed by the C.R.B.

Heavy timber traffic on Licola forest road.



Ocean Road looking west from Teddy's Lookout.



Hume by-pass road between Chiltern and Barnawartha, completed 1962.

SCOPE AND EXTENT OF THE C.R.B. ACTIVITIES

THE FIRST TWO YEARS

When introducing the Country Roads Bill in the Legislative Assembly in 1912, the Hon. H. McKenzie outlined the Board's duties and stated that its first duty would be:

> "to make a thorough investigation into existing highways, so that it may have the materials on which to exercise sound judgment".

Since the Act gave the Board very wide discretionary powers in determining which roads should be main roads, but required that councils were to be consulted before the declaration of any main road, it was also necessary that councillors should have a clear conception of its provisions, of the manner in which it was to be administered, and of the benefits expected to ensue from its operation. The Board, therefore, immediately set about the task of visiting every municipal district in the State, to inspect the roads in each and to explain the provisions of the Act to the respective councillors.

To facilitate the investigation, the Board divided the State into ten districts, taking them in the order considered to be the most necessitous, and formulated certain principles for its own guidance. First, it was decided that the inspection of a district should be completed before determining what roads should be main roads within any one municipality and, second, that in deciding what roads should be main roads the following criteria should apply:

(i) whether they were main arterial roads carrying extensive traffic, or likely to carry extensive traffic between centres of population, or from one district to another;

(ii) whether they were subject to considerable traffic from rural districts to the railway systems;

(iii) whether they were developmental in character, that is, whether their construction would be likely to lead to improved settlement or increased production.

With these considerations in mind the Board commenced its investigation with an inspection of the Gippsland District. This was carried out between May and September, 1913, when conditions were at their worst, and the greater part of the journey had to be made on horse back. Inspections of East Gippsland, the Cape Otway District, the North-Eastern District and the South-Western District followed in 1913, the remaining parts of the State being visited in the following year. In its Second Annual Report the Board was able to state that

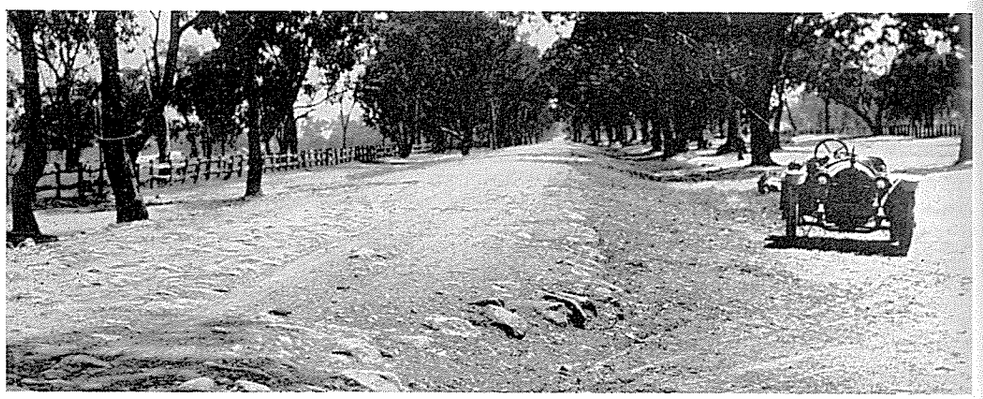
> "In the course of the investigation, every shire and borough in the State was visited . . . and without exception the Board was most cordially received."

As a result of the investigation of road conditions throughout the State, the Board declared some 5,000 miles of roads to be main roads, and outlined, for the guidance of municipalities, some considerations which were to be followed in the construction of the system.

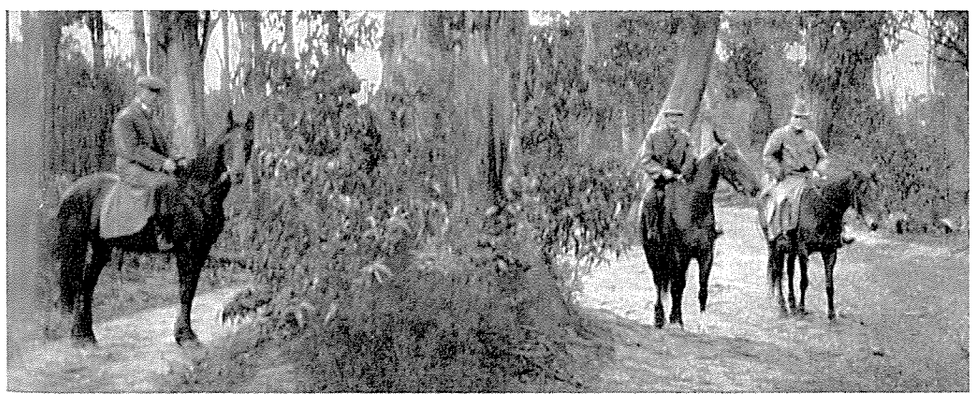
The investigation had revealed that a wide diversity of constructional methods operated throughout the State and that design standards varied from shire to shire. Frequently, little attention was given to the provision of adequate foundations and drainage. The lack of adequate thickness in the pavement and faults in its construction due to poor materials and improper methods had resulted in many of the failures noted. Many municipalities lacked proper equipment, some having no road-making appliances whatsoever, and few had a proper appreciation of the need for regular and systematic maintenance. In its discussions with the councils, therefore, the Board found it necessary to discuss these matters and, subsequently, to provide the necessary instruction and advice in the adoption of suitable standards, methods and equipment.

Occupied as it was with its investigation, the Board could devote little attention to road construction, particularly as it was decided that no construction would be approved until surveys and investigations had determined the most suitable location for the road. Faulty alignment had proved most expensive in the past, and old mistakes were not to be repeated. However, in its first year the Board was able to approve contracts for permanent works amounting to a total of £94,876, of

Sydney Road, now the Hume Highway, in 1913. Old pitched formation showing deterioration due to lack of maintenance.



Board on horseback, Gippsland, 1913.



which £23,440 represented contracts let directly by the Board and £71,436 by the municipalities. The first contract under the Country Roads Act was let for metalling on the Olinda Road in the Shire of Fern Tree Gully on 23rd December, 1913, while the first to be completed was on the main Gippsland Road in the Shire of Warragul, adjacent to the site where the Calder Memorial now stands on the Princes Highway 2 miles on the Melbourne side of Warragul. In the following year contracts for permanent works amounting to £496,878 were approved, £80,647 of which represented contracts let directly by the Board and £416,191 by the municipal councils. In the first year, 28 municipalities were affected by these works and in the second year, 92.

WORLD WAR I

In 1915 when the C.R.B. commenced the third year of its operations it was hoped that a start could be made on a major construction programme but, owing to the outbreak of war and the consequent enlistment of large numbers of men, who could otherwise have been engaged on road works, this hope was not realized. Contractors who employed horses were embarrassed by the high cost of fodder and the war caused considerable rises in the prices of materials such as cement and steel required for bridges. The prospect of a bumper harvest also had its effect on wages as such manual labour as was available was eagerly sought by the farmers.

In view of these conditions it was decided by the Government that, while such contracts as had been let should be completed, no further contracts should be entered into after the 31st October, 1915, until the return to normal conditions.

As a result of the C.R.B.'s advice to councils of the need for acquiring road-making plant, a considerable number of councils had purchased machinery such as road rollers, scarifiers, rock-breaking machines, grading machines and other types of equipment, and since the only direction, in view of the increasing cost of skilled labour, in which economy could be looked for was in the efficient use of plant, the C.R.B., during the war years, paid particular attention to this matter.

The fact that some councils had spent considerable sums on plant and had also made extensive arrangements for the supply of road-making material resulted, in 1916, in a partial lifting of the decree that no further contracts should be entered into so that these resources which would otherwise have remained idle could be put to effective use.

Insolvent track—Dargo Road. C.R.B. inspection, 1913.

WORTHWHILE ACHIEVEMENTS

The financial year 1917-1918 marked the close of the first quinquennial period for the Board and, although the difficulties created by the war had greatly hampered its operations, it was able to refer to some worthwhile achievements in its Fifth Report.

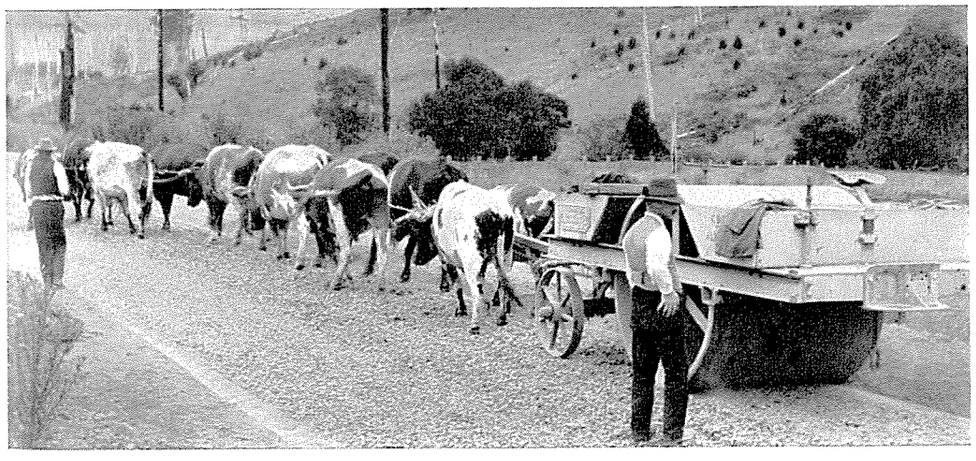
"To all road users and others interested in the problem of highway construction and maintenance, and in the question of rural development and industry, which are so dependent upon and interwoven with an efficient road system, the period has been of absorbing interest.

"The complete change of policy in the care and management of the more important highways of the country districts of the State, which the passing of the Country Roads Act involved; a change from a system of disintegrated local municipal control to one of partnership between the State, represented by the Board as the central authority, and the local municipal councils, was received in many quarters with considerable misgiving; but it is satisfactory to record that, in districts where there was not only passive resistance, but actual hostility, the merits of the new scheme of finance and control are at last being appreciated.

"In many parts of the State road construction for many years had been almost non-existent, in fact, of some districts it can be said that it had scarcely been commenced. The reason is obvious.

"Councils and ratepayers they represented did not appreciate the value of good roads. They were loath to recognize that their road system could not be built out of their limited revenues any more than that the State could build its

Bullock-drawn roller, 1914.



railways system without borrowed money; and being reluctant to avail themselves of the borrowing provisions of the Local Government Act, they were content to remain as they were.

"Not only were they unable to build new roads, but with their limited revenue, often the product of a 1s. or 1s. 3d. rate on a low valuation, they could not even efficiently maintain the roads that already existed, with the result that, in many instances, well-built roads constructed many years ago under a different system of road management were allowed to deteriorate to a very serious extent.

"The experience of the past five years, however, has convinced those local bodies that have availed themselves of the financial provision of the Act, and also the travelling public throughout the State, of the advantages of the present system over that which existed previously.

"They realize that the new system means regular and adequate provision of funds for maintenance, the provision of funds for new construction work, including bridges, to an extent that could not be contemplated by the unaided efforts of local councils and the execution of works of a standard and character of permanency that could not previously be entertained.

"The educative effect of the new policy on public opinion has also been most encouraging, in that the question of road construction and maintenance which previously had been relegated to the background, has been now raised to a foremost position amongst State activities in public expenditure.

"An important and unlooked-for effect of the execution of the higher standard of work has been that it has acted as an incentive to local authorities and the people they represent to demand an improved standard of work on roads entirely under their control, which in some districts is most marked."

The community had indeed become road conscious and the close co-operation with the councils which has proved so valuable was initiated.

In 1918, Parliament passed the Developmental Roads Act and provided, initially, a sum of £500,000 which was to be expended over five years. A further £1,500,000 was, however, provided almost immediately and the C.R.B. was thereby enabled to develop a policy with regard to the selection and construction of these roads so that they could play their proper part in the developing road system. As with main roads, the Board concerned itself with ensuring that they were constructed on the most suitable locations and that any work undertaken would form part of a properly designed scheme for the ultimate completion of the road throughout on satisfactory gradients. One hundred and thirty roads, affecting thirty-seven municipalities, were selected in 1918.

The following table shows the total expenditure incurred on main roads in the first five years:

Financial Year	*Permanent Works*	*Maintenance*	*Total*
1913-1914	£24,439 17 8	£9,490 0 10	£33,929 18 6
1914-1918	342,680 19 0	49,887 17 3	392,568 16 3
1915-1916	464,787 2 11	98,878 13 8	563,665 16 7
1916-1917	226,574 4 11	130,565 4 4	357,139 9 3
1917-1918	226,599 2 2	173,757 5 10	400,356 8 0
	£1,285,081 6 8	£462,579 1 11	£1,747,660 8 7

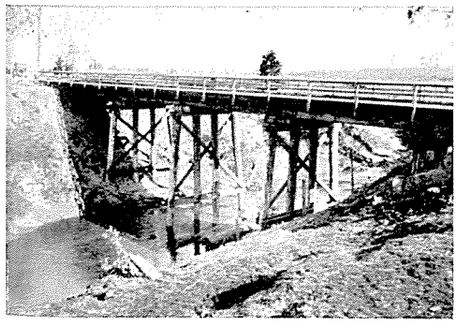
After the conclusion of hostilities at the end of 1918, the C.R.B's activities continued to be hampered by increasing costs and shortages of labour and materials. These factors, together with industrial unrest, resulted in contractors becoming unwilling to tender for the contracts advertised and the Board, as well as a number of Shire Councils, adopted the direct labour system in order to carry out essential road and bridge works.

In 1920, H.R.H. The Prince of Wales visited Australia and to commemorate his visit the main coastal road from Adelaide to Sydney was named the Princes Highway. Of the 593 miles of this road in Victoria, fully 500 miles were at the time in good order and traffickable at all seasons, despite the fact that, in 1913, the C.R.B's First Annual Report records that

> "the main Gippsland road between and adjacent to centres of population such as Drouin, Warragul and Trafalgar is in an impassable condition in the winter months".

By 1922 a certain amount of stability in the general economic situation was apparent and the Board was able to report that fully 90 per cent of all construction works, as distinct from maintenance, which had been undertaken by municipalities during that year, had been carried out under the contract system, and that there had been a decided reduction in costs compared with the high cost which prevailed during and immediately after the war. This satisfaction, unfortunately, was short lived as the stable conditions rapidly deteriorated and it was not long before the Government was providing funds for the relief of unemployment.

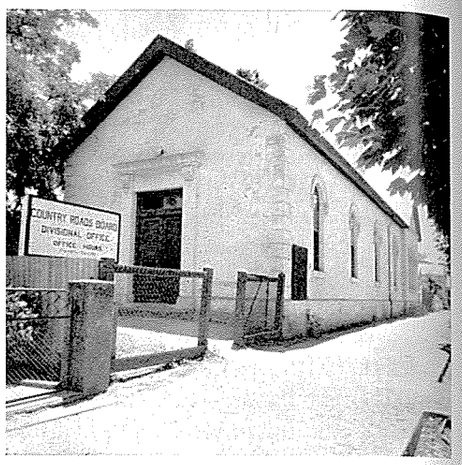
Bridge over Albert River. Constructed with flood damage grant, 1935-36.



The Country Roads Act of 1912 provided that works on main roads should be undertaken by the municipalities and so far as possible this direction was adhered to, fully 90 per cent of the work of construction and maintenance being so carried out. The developmental roads legislation and other legislation providing for the construction of roads in remote parts of the State and the "almost revolutionary change in the character of traffic" in the post-war years "necessitating the use of bituminous material, and the employment of highly-skilled workmen and expensive machinery in its application", led to the Board undertaking an increasing proportion of the work of construction and maintenance. In 1924 legislation providing for the declaration of State highways which were to be the direct responsibility of the C.R.B. increased this proportion still further. The Board accordingly appointed a specially-qualified engineer as Highways Engineer, and a number of District Engineers to represent the Board in various portions of the State and to directly control the work to be undertaken by the Board in their districts. In 1925 district headquarters were established at Benalla, Bendigo and Sale.

By 1924, the C.R.B. had already begun to carry out works on behalf of other authorities. In every instance where the Closer Settlement Board had acquired a large area for subdivision the C.R.B. co-operated with the local council and the Closer Settlement Board in the provision of at least one arterial road through each area. Works were also at the time undertaken for the Tourist Committee, these being construction of the Hall's Gap-Wartook Road, between Stawell and Horsham in the Grampians, the Warburton-Narbethong Road, and a section of the Great Ocean Road, between Lorne and Wye River.

Benalla Divisional Office, occupied until 1963.



FEDERAL AID ROADS AGREEMENT

The year 1926 marked a major change in the provision of road finance and greatly increased the C.R.B's ability to carry out its responsibilities. Hitherto permanent works had been financed by loan funds and special grants, but the Federal Aid Roads Agreement passed by the Commonwealth Parliament in this year provided funds from revenue on a systematic basis. The additional finance enabled work on State highways to be increased and by 1927 the total length of State highways declared amounted to 1,474 miles, 684 miles of which were directly controlled by the C.R.B's staff. During 1926 a further district headquarters was established at Beaufort to look after the Stawell and Warrnambool districts, headquarters being established at the latter, two years later.

Typical timber bridge in existence, 1913.

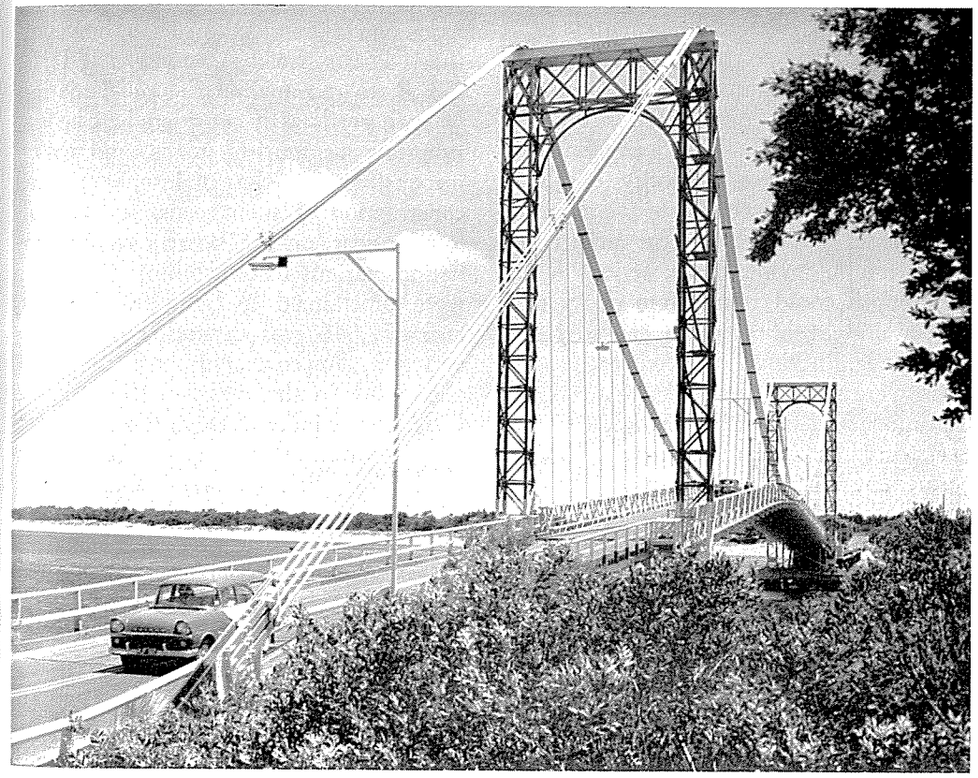
In 1928 a comprehensive series of traffic counts was begun on arterial roads and this has been continued ever since. Also in 1928 a headquarters district was established at Head Office and the Location Engineer at that time was made responsible for works in certain parts of Gippsland.

THE DEPRESSION (1930 - 1940)

The continuing financial depression restricted the activities of the community to such an extent that in 1930 the revenue derived from motor registration fees declined considerably. The C.R.B., therefore, was compelled to reduce expenditure on maintenance and curtail the programme of construction works. The work of reconstruction and surfacing of State highways continued, but at a much reduced rate.

The financial restrictions also reduced the work on main roads, and only the most urgent works could be undertaken. With the provision of funds for unemployment relief, however, consid-

San Remo Bridge, constructed 1936.



erable work was undertaken on the construction of subsidiary roads.

In 1931, following discussions between representatives of the Commonwealth and the States, the Federal Aid Roads Agreement was amended. The Commonwealth agreed to provide the States with revenue derived from a tax on petrol and thereby the principle that the road user should contribute directly to the cost of road construction and maintenance was more firmly established.

In the early thirties the C.R.B. was still faced with the necessity to construct roads, in certain cases, which were suitable for both motor vehicles and horse-drawn traffic. In order to prevent excessive damage to these pavements, the Board found it necessary to take action under the appropriate legislation to reduce the weight carried on such vehicles.

In 1933, the district headquarters at Sale was moved to Bairnsdale and in 1936 the headquarters at Beaufort was moved to Stawell.

When the C.R.B. first commenced operations, the great majority of the bridges throughout the State were timber structures. Unless careful attention was given to maintenance, serious loss of strength could result from decay of timber and bushfires often caused loss or damage. In times of flood, many of them were washed away. As good quality timber became scarce, many old timber structures were replaced with more permanent structures of concrete and steel. While State highways and main roads were being progressively developed, many bridges were widened and strengthened to carry increasing traffic and heavier loads.

Prior to 1936, no definite system had been in force for the maintenance of roads to tourists' resorts with the result that considerable deterioration in these

Old Bairnsdale Divisional office.

roads had taken place. In 1936, however, the Tourists' Road Act empowered the C.R.B. to recommend the proclamation of such roads as it considered to be appropriate as tourists' roads, and to be responsible for the maintenance and construction of such roads. In the following year, on the Board's recommendation, various roads totalling 350 miles were proclaimed to be tourists' roads, and £52,046 was expended on reconstruction, improvement and maintenance work in that year on these roads. For the remainder of this period progressive improvements were continued to State highways and main roads by realigning, widening, relocating and superelevating curves and reconstructing pavements to meet the increasing needs of traffic.

The C.R.B. continued its programme of experimental work. Further investigation into soil mechanics and improved means of stabilization were carried out and many experimental sections were

constructed. Considerable progress was also made in the developmental roads programme and many short lengths of road giving access to isolated settlers were constructed with funds provided for unemployment relief.

WORLD WAR II (1940 - 1945)

In 1939, Australia's entry into the war resulted in the immediate calling up for the Services of many of the C.R.B's senior officers as well as many of the personnel engaged in construction works. Numerous requests were received from the Defence Authorities for the C.R.B's services resulting in more and more men being diverted from normal operations, until only a skeleton staff remained to carry out essential maintenance. The Defence works carried out in Victoria included such projects as aerodrome runways, taxi-ways, aprons and hardstandings and roads within or giving access to R.A.A.F. and other service establishments. In addition, it was necessary to carry out extensive strengthening of bridges on arterial routes to carry heavy Army traffic and to undertake heavy earthwork projects which included the provision of mounds and preparation of building sites in explosive depots. Defence works were undertaken by the C.R.B. not only in Victoria, but also in the Northern Territory.

Early in 1942, the Commonwealth Government asked the State Government to allow the C.R.B. to undertake the reconstruction and sealing of the Stuart Highway which joined the railhead at Alice Springs to the railhead at Larrimah. The C.R.B. accordingly established a depot at Tennant Creek and, whilst the bituminous surfacing plant and men were being assembled, undertook the strengthening of the road, involving the spreading of more than 400,000 cubic yards of new gravel. The main work of surfacing the road began in July, 1942, and by the following February the northern half of the road was finished, the southern half be-

Stuart Highway in the Northern Territory.

Snow blower in operation on Mount Buffalo, 1962.

ing completed during the subsequent year. The road was later extended northerly towards Darwin.

The C.R.B's experience in low-cost construction work proved invaluable since in some eighteen months 623 miles of road were converted from an impassable, corrugated, dusty and worn-out track into a perfectly smooth and satisfactory bituminous all-weather highway.

During the war period a number of changes took place in the divisional organization. In 1940 headquarters district was divided into the Dandenong and Geelong divisions. In 1944 a divisional headquarters was established at Traralgon and in the immediate post-war years the present divisional structure was completed by dividing the Stawell district into the Ballarat and Horsham divisions (1948) and establishing a Metropolitan division at Head Office.

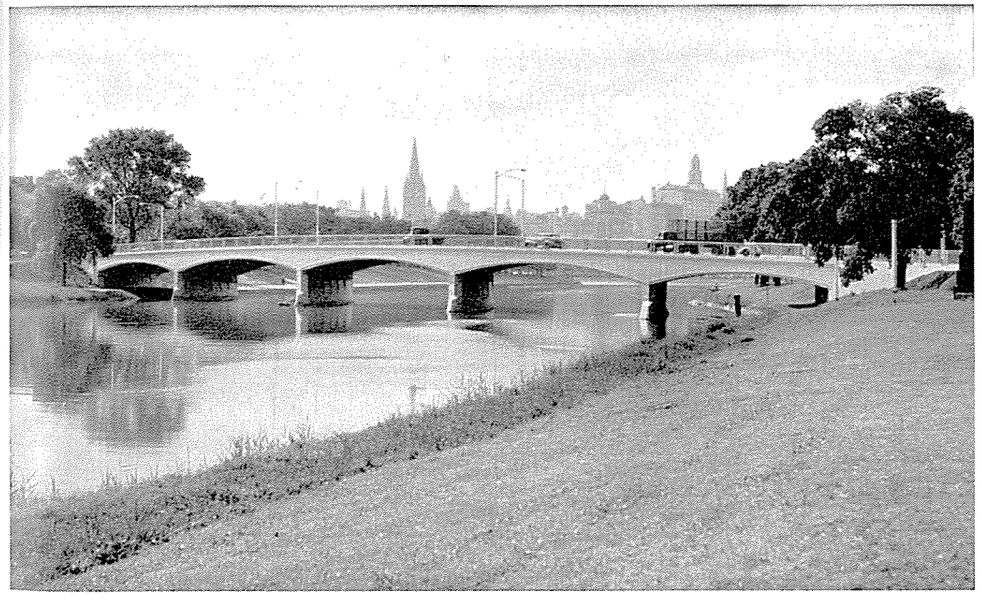
THE POST-WAR PERIOD, 1945 - 1963

At the beginning of the financial year 1945-1946, Australia was still at war with Japan and, although hostilities ceased in August, the effects of war continued to be felt throughout the year. The initial allocation of funds was made on a restricted basis as in the previous years of the war, but with the possibility of labour becoming freely available on demobilisation a supplementary grant for main road maintenance and reconditioning works was made in February, 1946, in order that surveys might be made and plans and specifications prepared.

This was possible as during the war years funds had accumulated and at 30th June, 1940, the Board had a credit balance of £1,807,790 available.

The State highway system by this time

Bridge over River Yarra at Swan Street constructed by Country Roads Board, completed 1952.



comprised a length of 2,918 miles. Owing to the deficiencies which had accumulated during the war, the C.R.B. was anxious to begin work again as soon as it could and made provision immediately for a number of urgent works. Money was also made available for urgent works on main roads and thirty-eight new bridge projects were initiated.

For some years consideration had been given to the question of constructing a bridge over the Yarra River in the City of Melbourne at Swan Street. In 1938 it was decided this should be the next bridge over the Yarra to be built and, in 1945, the project was authorized with the C.R.B. as constructing authority and with finance provided by the State Government and the Melbourne City Council. In the previous year the Cremorne Bridge Act had given effect to the recommendations of the Parliamentary Public Works Committee regarding the construction of a new railway bridge over the River Yarra between Richmond and South Yarra and improvement to Alexandra Avenue and Harcourt Parade adjacent thereto. Roadworks were begun by the Board in May, 1946. The C.R.B., at the time, was also requested, following a conference with representatives of the Preston and Heidelberg Cities, to investigate the question of erecting a new bridge on an improved alignment over Darebin Creek in Bell Street at the boundary of the two municipalities.

The total amount allocated for reconditioning works and maintenance on main roads, State highways, tourists' roads, forest roads, and Murray River bridges during the financial year 1946-1947 was £2,390,195, the highest allocation made from the Country Roads Board Fund since the Board's inception. Work, however, was not to proceed as quickly as anticipated since industrial unrest and shortage of materials were prevalent and the approved programme was subjected to many frustrating delays.

As mentioned before, the curtailment of works during the war years had resulted in an accumulation of revenue and the C.R.B. was able to declare additional sections of road in the various categories. In the financial year 1947-1948 the State highways system was increased by 925 miles, bringing the total length to 3,846 miles, and a further 26 miles of forest roads were proclaimed, increasing the total length of 241 miles. Main roads by this time totalled 9.806 miles and tourists' roads, 402 miles.

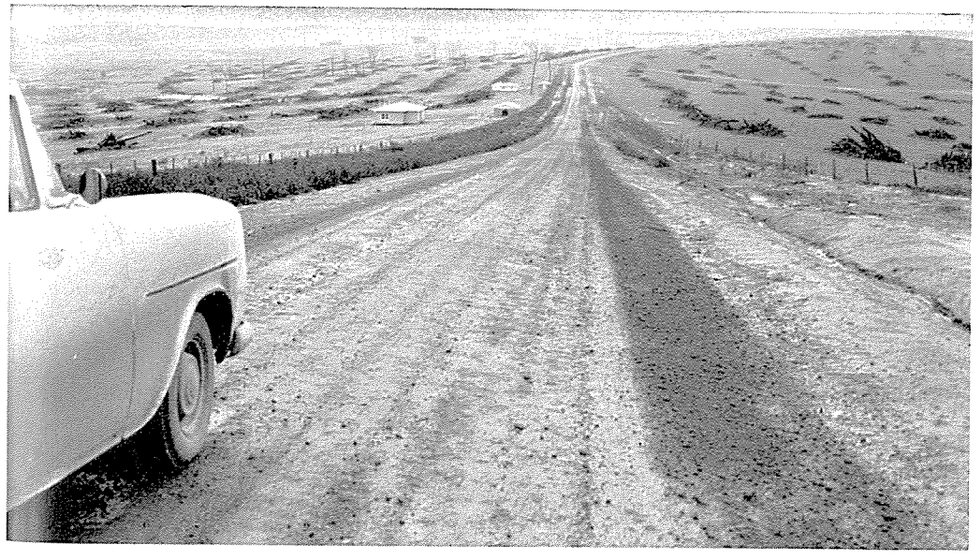
A wartime survey of bridges on roads under the C.R.B's control and on many important classified roads had indicated that not less than £1,000,000 was required for the reconstruction of the worst of the old bridges throughout the State. In considering applications from municipal councils, the Board, therefore, gave special attention to providing for bridge renewals. Provision was also made for maintenance and repairs on a more liberal scale than previously.

ASSISTANCE TO SOLDIER SETTLEMENTS

In 1949-50, the Board received requests from the Soldier Settlement Commission for assistance in the investigation of road requirements in additional estates which the Commission proposed to develop. Grants made during the year for such road works totalled £80,176 by the Commission, £26,273 by the C.R.B. and £14,615 by the various municipalities in whose areas the estates were located.

Johnston Street bridge, completed 1957.

Soldier settlement road, Heytesbury, 1961.



In dealing with the extensive engineering problems of developing, constructing and maintaining the roads of Victoria, the Board must periodically determine objectives and formulate means of attaining them on a continuing and progressive basis. The Board at its inception received the task of determining those roads which should be main roads, of seeing that they were constructed and ensuring that afterwards they were adequately maintained.

Objectives have been progressively stated over the years and means of achieving them have been planned. In 1926, the Chairman, Mr. W. Calder, after a mission abroad, reported:

"To enable reasonable and continued progress in a general improvement of the roads of the State, there should be sufficient funds assured for a five-year programme of work . . ."

"The process of road construction is slow and costly. At the most a limited mileage of new high-class roads can be constructed annually, it being impossible physically and financially to cover the State with first-class roads for many years to come; the first and most urgent work that will return the quickest dividends for the expenditure is the restoration and maintenance of our neglected main roads."

"For this most essential work, large funds are also necessary. As these funds are made available, the principal traffic-bearing roads will be declared State highways . . ."

In the early 30's, the then Highways Engineer, Mr. C. G. Roberts, formulated a five-year programme covering the State highway system as it then existed.

In 1937, the Chairman of the Board, Mr. W. T. B. McCormack, after a mission abroad, reported:

"One of the great essentials of a successful road policy is what may be termed long-range planning. The constructing authority, to function properly, must plan not for this year alone, or even for next year, but for a number of years ahead . . ."

In 1947, the then Chief Engineer, Mr. C. G. Roberts, upon returning from inspections abroad, recommended the adoption of planning procedures involving State-wide research surveys of road deficiencies and needs and of revenues likely to be available for road purposes over the planning period.

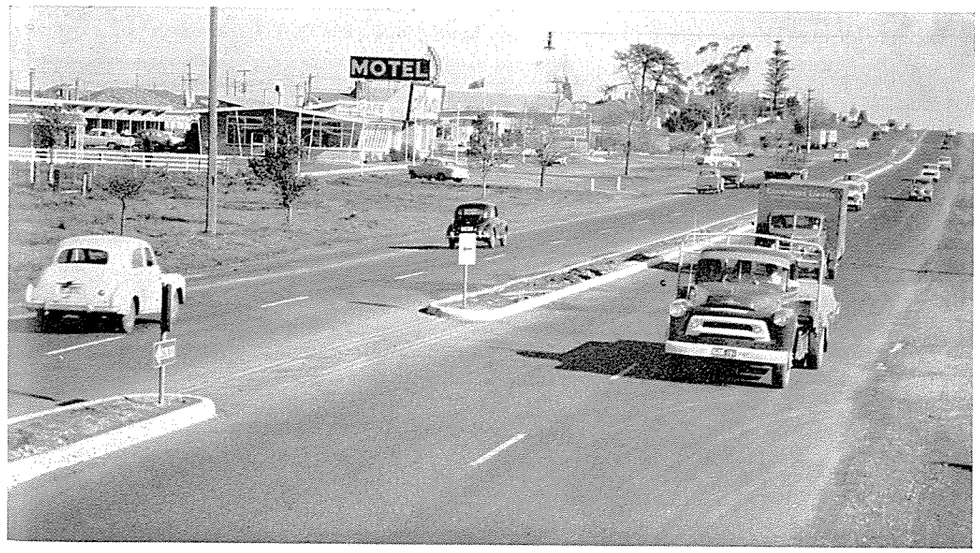
These procedures involved

(a) an assessment of existing conditions of all roads in the system;
(b) traffic studies to determine traffic which will be using each section of road in the future;
(c) determination of the widths, thicknesses and types of pavement to carry predicted traffic and of appropriate standards of alignment and grade;
(d) determination of the nature of the work to bring each section of road up to the standard required for the predicted traffic;
(e) assessment of the cost of this work on each section;
(f) summation of the above costs with the addition of the cost of maintaining the system over the period under consideration;
(g) assessment of the revenues and other funds likely to become available during the period under consideration.

Using these procedures, the Board has, since 1950, carried out State-wide surveys with the co-operation and assistance of the municipal councils. The first survey concerned roads outside the metropolitan area and covered the period 1949-1959. The results indicated that to carry out the programme required and to provide for other expenditure, purchase of plant and equipment, etc., at least £100,000,000 would be required. This sum amounted to £10,000,000 a year for the ten-year period and exceeded the combined cur-

Additional climbing lane for slow-moving traffic, Western Highway, west of Bacchus Marsh, constructed 1955-56.

Princes Highway East. First stage duplication of pavement between Oakleigh and Dandenong.

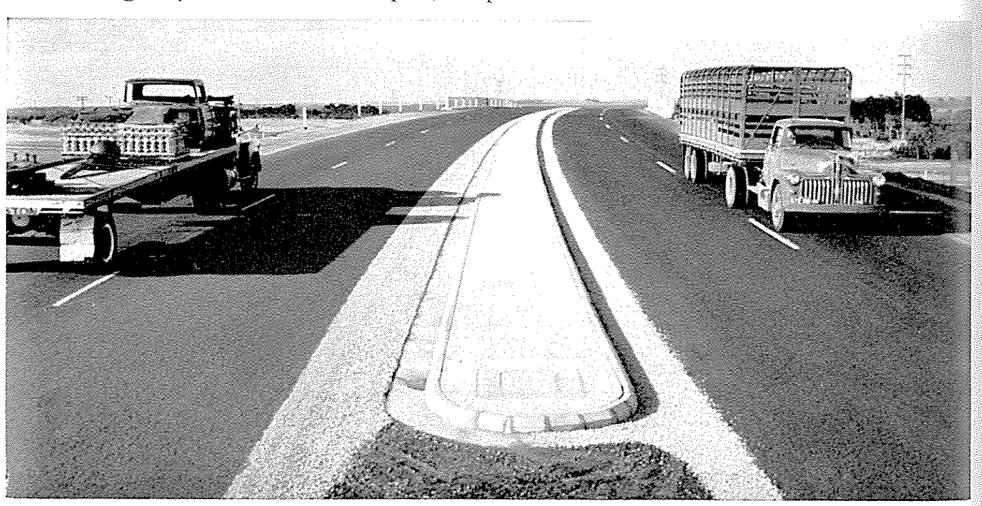


rent revenue then available to the Board and the municipalities affected by some £3,500,000 per annum. The estimated requirements were by no means extravagant, representing the bare essentials to bring the rural road system to a standard adequate for the traffic estimated at the end of the ten-year period.
Road needs were more precisely established by an intermediate survey which covered the period 1955-1965 and a recently-completed survey has covered the period up to 1970 by including needs for arterial routes in the metropolitan area. This survey indicated that a total amount of £570,000,000 would be required in the decade whereas available revenues to meet these needs would total only £434,000,000. There would therefore be a deficit in road revenues of £136,000,000 in the period under consideration. A further survey will be made for the period 1964-1974.

DUPLICATION COMMENCES

As part of its programme of progressive improvements, the C.R.B. in 1955 commenced the duplication of the pavements of certain sections of the State highways, notably on the Princes Highway East between Oakleigh and Dandenong and between Brooklyn and Norlane on Princes Highway West. By 1962, duplication of the section between Oakleigh and Dandenong was already proving insufficient, and it had become necessary to further widen the section to a six-lane facility.
In urban areas the phenomenal growth of traffic and the very large cost of widening major routes in such highly-developed areas made necessary the planning of entirely new arterial roads. It is, of course, essential that if these are to be adequate for future traffic, ample capacity must be built into them from the inception.

Princes Highway West—Corio Overpass, completed 1958.

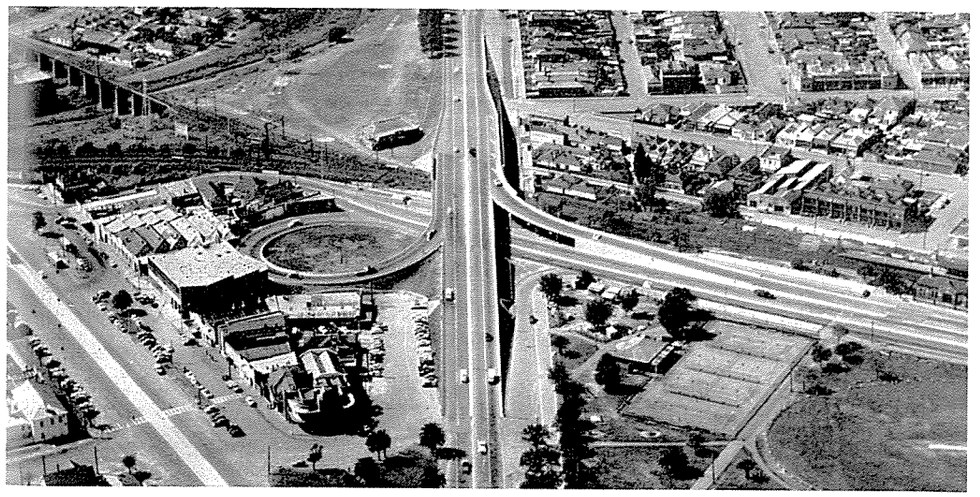


In 1956, on the recommendation of the Board, the Government increased motor registration fees by 50 per cent. This was the first increase for many years. Since the amount required for maintenance varies little year by year, the additional revenue so gained enabled the Board to greatly accelerate its programme of reconstruction, improvements and the provision of new road facilities.

FREEWAYS

When it is realized that a rural highway with limited access can carry twice the volume of traffic carried by a conventional road of similar width, and that arterial routes in urban areas with restricted access three to five times the volume of traffic carried by similar streets of conventional design, the saving to the community by the construction of roads of this type with limited access can be appreciated.
The economic value to the community includes savings due to decreased accident rates, increased land value on estates served by such routes and reduced costs of operation of vehicles travelling on these roads.
Since 1956, the C.R.B. has constructed a number of by-pass roads and is planning further roads of this nature. The first constructed was the Maltby By-pass at Werribee. This was a case where the proportion of "through" traffic was sufficient to warrant a by-pass of the township. The benefits to local business interests from freedom of congestion in the township are already apparent and will increase as the town develops. Other sections of by-pass roads constructed are the Whitelaw By-pass Road at Korumburra and the Hume By-pass Road between Chiltern and Barnawartha. This latter comprises two sections, one of eight miles and one of four miles, the eight-mile section being the longest controlled access road in the State. A ring road system round Dandenong is in an advanced stage of planning and certain arterial routes in the metropolitan planning area are also under consideration.

Clifton Hill Overpass, completed 1957-58.



Early morning traffic on Kings Bridge, 1961.

Maltby by-pass road at Duncans Road overpass, completed 1961.

DEVELOPMENTS IN ENGINEERING PROCEDURE

There have naturally been considerable developments in engineering procedures since 1913. These may be roughly divided into those affecting design, construction, plant and control of works.

PAVEMENT DESIGN

It is interesting to note that in the Board's First Annual Report reference is made to the principles governing the necessary depth of pavement, stating that this depends upon the nature of the soil, the amount and kind of traffic, drainage and climate.

Consideration of these factors led to the conclusion that, generally speaking, a pavement should be 6 inches thick when constructed on good bearing soil and 8 inches on material of poorer quality. The advances made since then have been in providing us today with means of assessing these factors in some quantitative way. Prediction of the amount of traffic which would use a road was almost impossible in the very early stage of development of the motor vehicle, whereas today, from experience over the years, with techniques developed by specialists, and more logical definitions of load limits, it is possible to make reasonable forecasts of both the amount and kind of traffic which will use a road. Similarly, tests for assessing the bearing properties of a soil under varying conditions of moisture content have been evolved.

Both these advances have led to a rational method of determining pavement thicknesses in terms of the estimated number of heavy vehicles which will use a road, and the California

Horse-drawn roller in use on Main Gippsland road (now Princes Highway East) on Moe River flat, in second decade of this century.

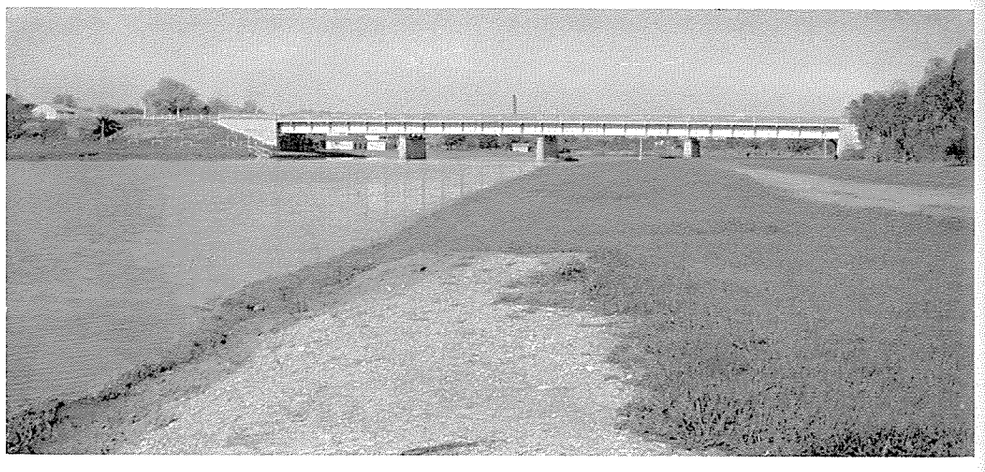
Bearing Ratios of the successive layers of which a pavement is composed from the natural soil upwards, the California Bearing Ratio being an empirical method of defining the strength of a soil. While this method of design makes some allowance for climatic and drainage conditions, final decision in this respect, so vital when dealing with a material whose properties vary with moisture content, still remains a matter of judgment to a great extent.

ROAD GEOMETRY

When most of the rural roads were required to cater for horse-drawn traffic, quantitative consideration was given to the capabilities of a horse when hauling standard loads up different grades of varying lengths from which it was determined that, generally speaking, a maximum gradient of 1 in 20 was desirable. Even though the motor car was beginning to be used, no serious consideration was given to the need for providing the curves of large radius which became so obviously necessary as the speed of the average motor vehicle increased. A traffic lane 8 feet - 10 feet wide was considered generous in these early days.

With increase in the dimensions and speed of vehicles over the 50 years, provision is now made for safe travel of speeds up to 70 m.p.h. where the topography will allow of this, while the standard traffic lane for a heavily-trafficked road carrying a mixture of motor cars and trucks has increased to 12 feet. On the other hand, advantage is now taken of the capability of the motor vehicle to haul heavy loads up long, steep grades by increasing allowable gradients on rural roads to 1 in 16, or even 1 in 12, where the nature of the country requires this if reasonable alignment is to be attained and economy preserved. On heavily-trafficked roads the use of an additional climbing lane for slow-moving traffic is commonly adopted.

Barwon River bridge on Princes Highway West, Geelong, completed 1926.



FREEWAYS

As in other parts of the world, the growth in volume and speed of motor traffic has led to the need in Victoria for special roads to carry traffic between important centres of traffic generation. The distinguishing features of these roads, which are generally known as "freeways", are that no access is permitted to them from side roads or from abutting property, that any roads which cross them are taken either over or under them, while vehicles can only enter or leave roads of this type at specially-selected points where the design provides for these manoeuvres to be effected with safety and without interference to the flow of through traffic. To satisfy this need, the Board was empowered in 1956 to construct roads of this kind, the definition in Legislation being that of "by-pass roads".

BRIDGES

Prior to 1913, municipalities and District Road Boards of Victoria had constructed many excellent permanent bridges of masonry arch construction, wrought iron or steel girder and or truss construction. The majority of bridges were, however, of timber construction, and the C.R.B. in its First Annual Report drew attention to the large number of these bridges in poor condition and indicated the desirability of replacement with bridges of more durable materials such as reinforced concrete.

In the early years, many reinforced concrete bridges were constructed and in 1916, plans were produced for standard reinforced concrete beam bridges of various spans and widths. In this period continuous reinforced concrete T-beam bridges were also being constructed. One of the pioneers of this type of construction was Sir John Monash. For economic reasons, it was still necessary for the C.R.B. to construct many timber bridges and, in addition to the simple stringer type, a large number of through timber truss bridges were constructed. These trusses were of standard designs and spans of 50 ft., 60 ft., and 80 ft., and many are in use to this day.

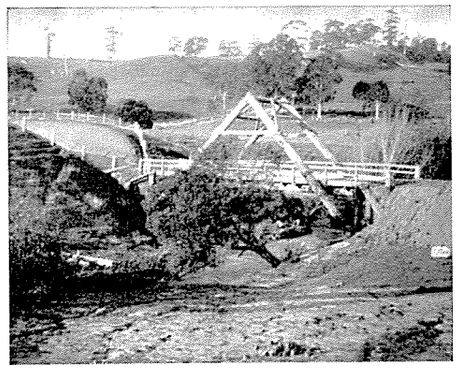
In 1924, the C.R.B. entered into the largest contract since its inception for the construction of a reinforced concrete and steel plate girder bridge over the Barwon River at Geelong.

In this period the C.R.B. was making more use of combined rolled steel joist and timber construction, which enabled longer spans to be constructed than previously possible with timber stringers.

During 1930, work commenced on the construction of a welded truss bridge over Sunday Creek on the Hume Highway south of Seymour. It is thought that this bridge was the first welded highway bridge in Australia. Welded plate girder construction was used in the Tambo River Bridge at Swan Reach which also commenced in 1930.

A significant change in timber bridge construction occurred in 1931, with the

Typical A-frame bridge constructed about 1936.



change from transverse to longitudinal timber decking.

The period 1937-39 saw the development of the C.R.B. of standard designs for continuous reinforced concrete flat slab bridges with spans up to 30 ft. maximum. Construction of these bridges required a large amount of falsework and formwork which was generally "built on site".

In this period the C.R.B. was taking an active part in the construction of bridges in the Metropolitan area including Lynch's Bridge, a reinforced concrete and steel plate girder bridge over the Maribyrnong River, and the Hoddle Bridge, a reinforced concrete continuous T-beam bridge over the Yarra River. In the post-war period this policy has continued with the construction of a large number of Metropolitan bridges including Swan Street Bridge, Johnston Street Bridge, Napier Street Bridge, King's Bridge and Banksia Street Bridge.

The year 1939 saw a departure from the C.R.B.'s normal types of bridge design with the construction of a suspension bridge connecting San Remo and Newhaven on Phillip Island.

The pre-war period also saw the rapid development of "composite construction" which is the basis of a great deal of present day bridge construction. This method utilizes the main beams (either steel or concrete) for supporting the formwork and the weight of a concrete deck during casting. On setting, the deck and beams act as a composite T-beam to carry the traffic loads.

At the end of the second world war, because of the curtailment of work for four years, the condition of many bridges was poor. Shortages of labour and finance made it necessary to revert to timber, and steel and timber construction to replace many bridges in urgent need of replacement.

The shortage and high cost of "on-site labour" and shortages of structural steel led to the development, in 1949, of precasting reinforced concrete "U"-shaped slabs and beam units at central depots and then transporting them by road or rail to the bridge site. This policy has enabled the C.R.B. to economically replace a great number of old timber bridges with more durable materials. With modifications, this policy of precasting has continued to the present day. 1956 saw the development and use of the first precast prestressed bridge units of 15-ft. span.

The development of prestressed concrete construction has been extremely rapid and to date a complete range of standard slab units up to 42-ft. span and standard beam units up to 70-ft. span are available.

Recent modifications to precast reinforced concrete units have included the use of high-strength concrete and the use of hard grade deformed bar reinforcing steel which permit greater spans than formerly to be economically employed.

Today, as in 1913, the main problem in Victorian road bridging is the replacement of old timber bridges. As fast as its finances permit, the C.R.B. is overcoming this problem by standardization of design and construction methods which include precasting of structural units and other modern techniques.

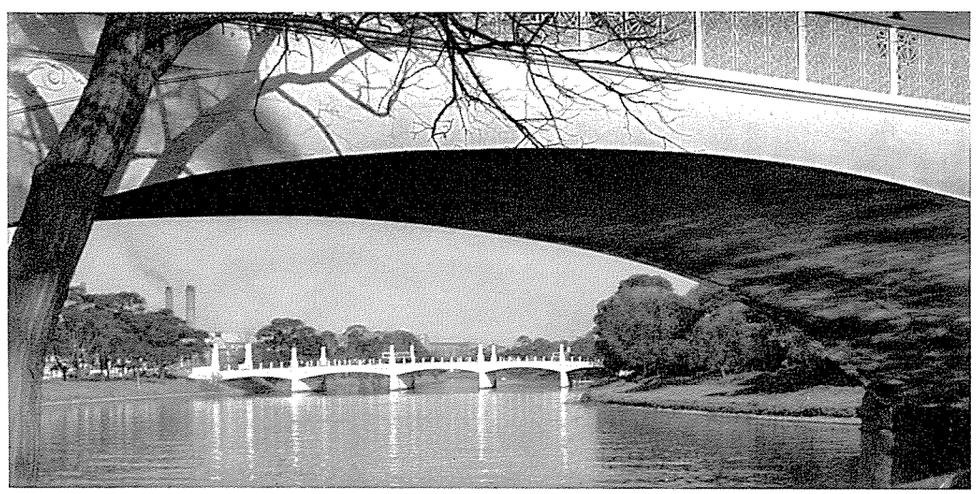
CONSTRUCTION METHODS

In the early days of the C.R.B., while waterbound macadam was still the established form of construction for country roads, it was recognized that "good results could be achieved by the judicious selection and use of materials at hand", an example quoted being the use of granitic sand in Benalla Shire.

In the early and middle 1920's, with increasing funds available to it, the C.R.B. constructed a number of sections of high-class pavement in the metropolitan and outer metropolitan areas. These included concrete roads and 2-inch hotmix bituminous pavements supported by strong waterbound macadam bases. When sole responsibility for the State highways was given to the C.R.B. in 1925, it was at first intended to use the second of these two types of high-

Bridge over the Campaspe River at Elmore, completed 1962.

Hoddle Bridge from Anderson Street, 1938.



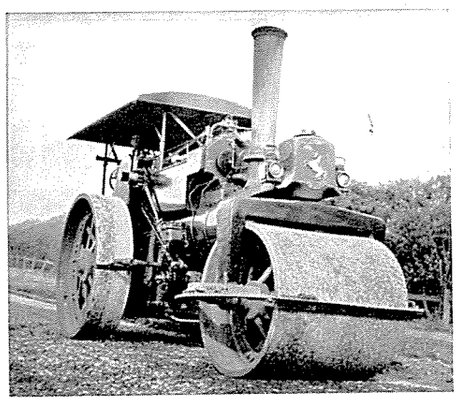
class construction between Melbourne and important centres such as Warrnambool, Ballarat, Bendigo, etc.
However, appreciation of the high cost of work of this kind, and the ability of a good macadam road to carry the traffic, resulted in the adoption of waterbound macadam and later penetration macadam surfacing on the more inlying sections referred to and the use of local materials for the extensions of the State highways to the borders of the State.
From about 1930, with the growing use of the power grader and ability to produce an extremely good riding surface, if the particles of stone on a pavement did not exceed about 1¼ inches, the use of fine-crushed rock instead of macadam became the common practice where good, natural gravels were not available. The use of local materials has been — and is being — extended by the use of various means of improving materials which would otherwise be unsatisfactory for use in a sealed pavement. These include stabilization by the addition of other local materials to produce a satisfactory mixture or by the addition of lime or cement in small quantities, where a naturally occurring material contains too much clay. Attention is now being given to improving the quality of the soil which supports the road, so that the total thickness of the pavement required above it may be reduced.

STAGE CONSTRUCTION

With the increased use of motor cars and trucks, the latter of comparatively small capacity, and the corresponding decrease in the use of steel-tyred horse-drawn vehicles, a policy of low-cost stage construction was adopted, beginning in the late 1920's and continuing through the 1930's. This led to many pavements being built with the knowledge that they would have a limited life but that the work carried out would not be wasted when increases in traffic, which would be accompanied by greater revenues, made strengthening necessary. The acceptance of this principle made it possible to provide a reasonable service to the public over many thousands of miles of the State's road system, wihch would not have been possible in the same period if the expenditure had been concentrated on final construction of very much shorter lengths of road.
Although development on the lines originally foreseen was upset by the shortage of men and materials during the war, and the devaluation of the currency following it, no serious failure in service to the public occurred, the majority of the roads standing up to the increased traffic very much better than would have been expected.
Today, the application of stage construction is more limited and, at least on important roads, permanent construction is undertaken with pavement thicknesses based upon the design procedure to which reference has been made previously.

Hand-spreading road metal for waterbound Macadam, in early 1930's.

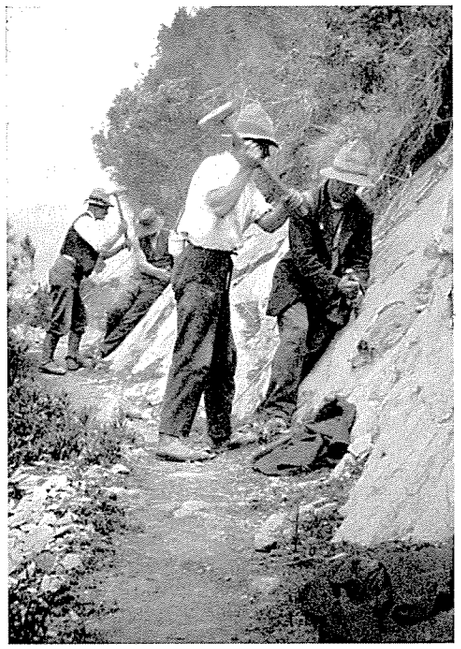
C.R.B.'s first steam-roller working on Point Nepean Road.



PLANT

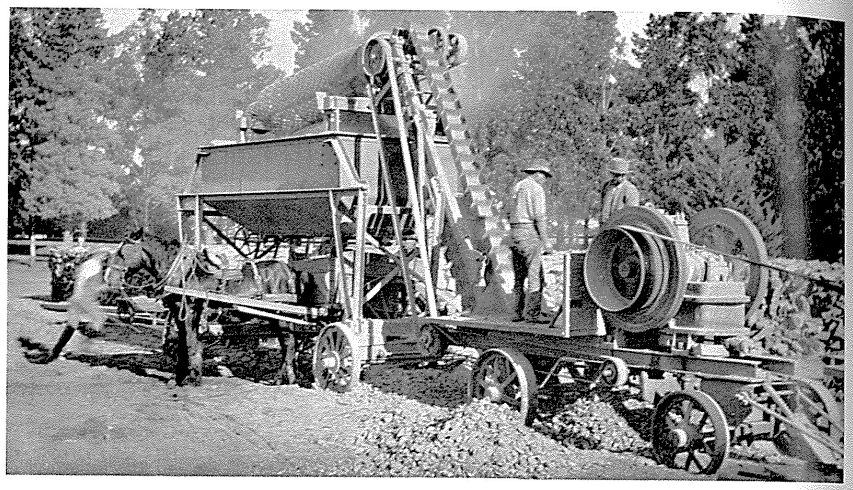
The Board's earliest reports referred to the need for making greater use of mechanical plant, two items of particular interest at that time being mechanical rollers, and crushing and screening plants. It is in this field that most spectacular changes have taken place since the Board's inception. The stages of handling materials used in road construction remain unchanged, and in following a natural material from its source to its use in the road consist of loosening, loading, transporting, processing — in some cases, spreading and consolidating. The loosening of rock has been facilitated by the use of pneumatic instead of hand drills, while in many cases materials which once would have been loosened by explosives are now dealt with by rippers drawn by heavy crawler tractors. The laborious process of loosen-

Hand-drilling rock for blasting, 1919.

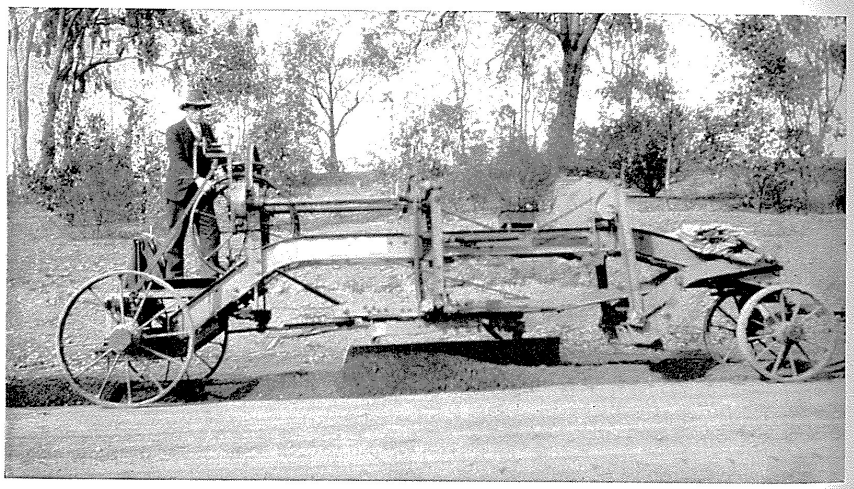


ing with picks and loading with shovels into vehicles for transport has been taken over by front-end loader or mechanical excavator.
Transport by wheelbarrows on short leads has been replaced by the use of the bulldozer and its variations. This type of plant eliminates loading and, in many cases, the need for loosening. The tractor-drawn scoop, the pneumatic-tyred carryall, and the motor truck have replaced the horse dray or the tram line for movement of material on longer leads, while the consolidation of materials both in the formation and pavement of a road have been improved by the greater use of the mechanical roller and its developments such as the grid and the vibrating rollers which are becoming more commonly used today.

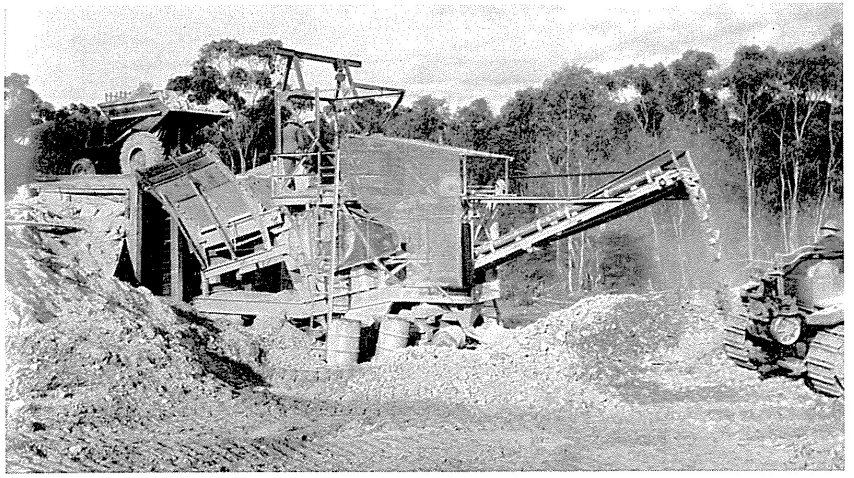
Typical early portable crushing plant for production of road metal.



First type of grader used for maintaining gravel pavement.



Modern primary crusher at Stawell Quarry.



Heavy plant on Ramrod Flat road near Ensay, 1961.

Grid-roller crushing limestone on Midland Highway in the Shire of Waranga.

Loading a tournapull scoop with the assistance of an HD16 bulldozer. When loaded the tournapull scoop can transport material at relatively high speeds.

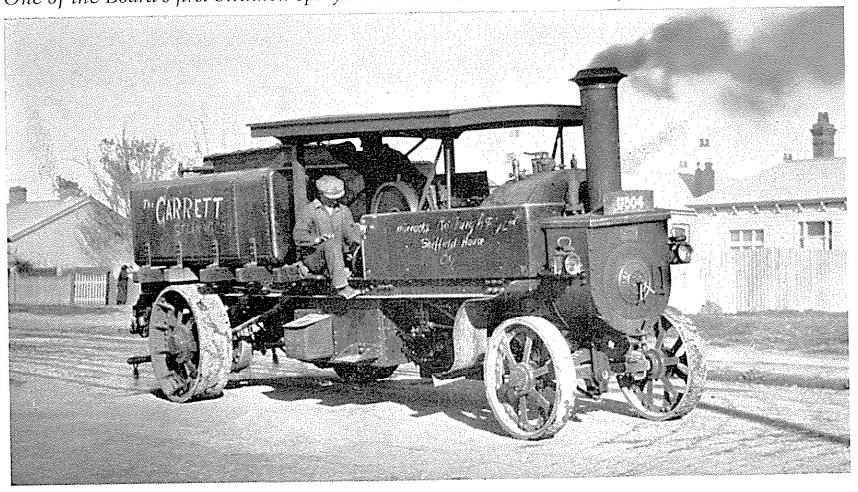
BITUMINOUS SURFACE TREATMENT

In 1913, bituminous surface treatment of roads was looked upon as impracticable in rural areas owing to its cost, but it is interesting to note that the Board bought its first steam-driven sprayer in 1915. Early work consisted of spraying with tar and covering with sand or fine gravel, but the virtues of bitumen as less likely to harden with age and exposure were recognized very early.
Principles have not changed basically since the procedure was adopted in the early 1920's of applying tar to a road one year and resealing it with bitumen the year after, although modifications have taken place since, including the use of primers to which a sealcoat of bitumen can be applied without waiting a year. The principal development has been in relation to the choice and use of the aggregate used to cover the sprayed bitumen and in the plant with which the work is carried out. Today, 11,500 miles of the Board's declared road system is protected by a bituminous surface, the bulk of it carried out by plant belonging to the Board. In 1962, 991.6 miles of sealing and 772.1 miles of resealing were carried out with this equipment.

CONTROL

Recognizing the need for controlling the more important materials used in road construction, the Board, in 1923, established a laboratory in conjunction with the engineering school of the University of Melbourne. Its primary tasks were to test stone, gravel, and tarry and bituminous materials.
The need for quantitative rather than qualitative methods of design and assessment of the value of materials has involved not only the routine application

One of the Board's first bitumen sprayers mounted on a Garret steel-tyred steam wagon.



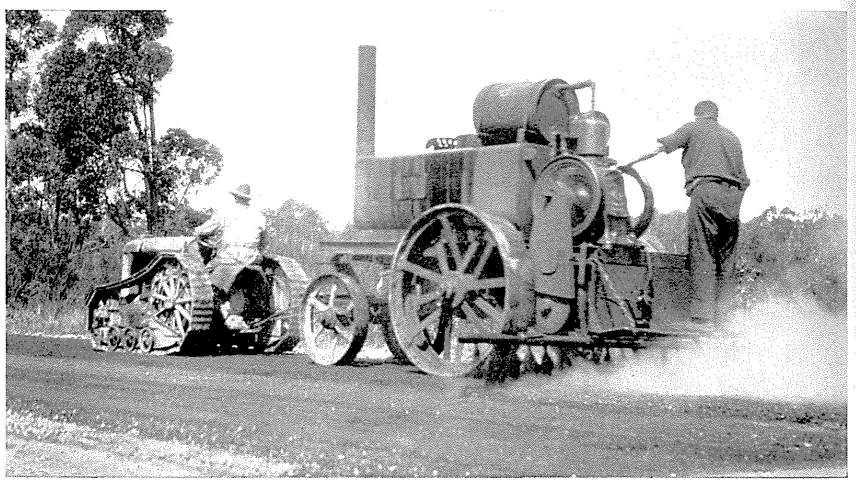
of methods adopted elsewhere, but research into new procedures to suit our local conditions, thus fulfilling one of the Board's tasks which is defined in the Country Roads Act as follows:

> "To carry out all such surveys and investigations as may be necessary or expedient or ascertain the most effective methods of road construction and maintenance in the whole or any part of Victoria".

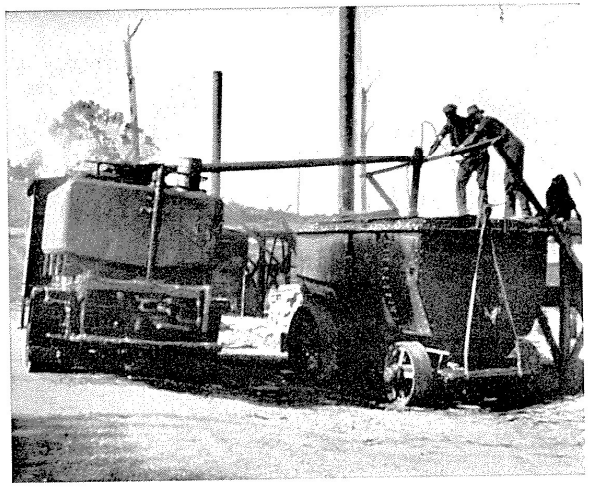
The information obtained from these investigations and improvement in methods of design and construction are not only made available to the Board's own staff, but also to municipal engineers through the Board's Divisional Engineers.

Early horse-drawn sprayer.

300-gallon, tractor-drawn sprayer, still used in late 1920's.



Hand-pumping bitumen from 800 gallon heater into steam sprayer unit.



Surface painting with tar on Ararat main road, 1915.

Penetration macadam, hand-pouring bitumen 1928.

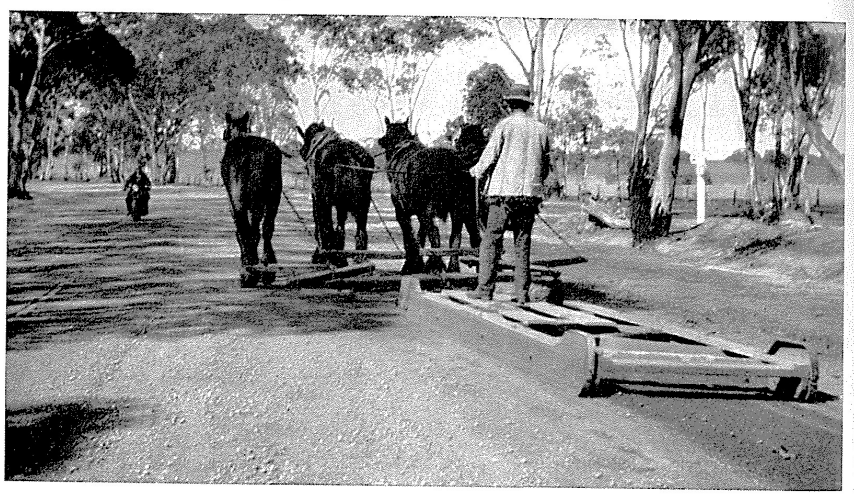
Road tanker being filled from rail-storage bitumen tanker, 1960.

Modern 800-gallon sprayer in operation, 1962.

Since its early days, the Board has emphasized the essential need for proper maintenance of a road if the asset provided by its construction is not to be lost. In early days maintenance was carried out by patrolmen equipped with horses and drays, each looking after a length of the order of 5-10 miles. Where the pavement was of gravel, the patrolman was also provided with a drag to assist him in maintaining a good riding surface.

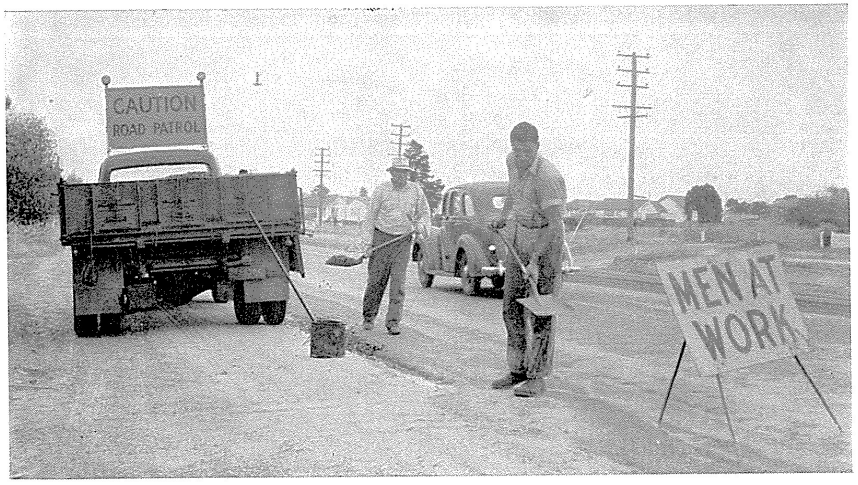
With the increase in the length of roads to which a bituminous surface had been applied, it was determined that the necessary work could be carried out more economically by truck patrols generally responsible for lengths of up to 40 or 50 miles of "black" road in rural areas. As a result of economies obtained, this form of patrol was extended in the 1930's to cover unsealed roads by providing the patrols with small graders which could be towed behind the truck. This system is now practically universal, while on more heavily trafficked roads occasional assistance of a heavy power grader to clean up shoulders and drains is often necessary.

Road planer used to maintain gravel roads.



Triangular Webster drag used in maintenance.

Truck patrol at work.



CO-OPERATION WITH COUNCILS

While it is true that the Victorian State road system could not have been developed to the extent which it has during the last fifty years without the assistance of a strong State road authority, endowed with substantial financial resources, and entrusted with considerable autonomy in using them, the manner in which the municipalities of the State have co-operated with the C.R.B. has contributed to the successful results attained.

This co-operation has been facilitated by the appointment of Board's Divisional Engineers who have two roles to perform, first to represent the Board in matters affecting each Council, and second to represent the Board's Chief Engineer in engineering matters. The latter function is essential as the main activity of the Board is the construction of roads and bridges and the Chief Engineer has responsibilities for the quality and design for the Board's direct work and also for setting standards of design which are transmitted through the Divisional Engineers to Council's officers. Development and improvement of design and construction methods are made possible by the existence of specialist divisions at C.R.B. Head Office and the Board's ability to send officers abroad and to other States while the Councils' officers contribute their knowledge of local materials and conditions.

Annually, since 1939, the C.R.B. has convened a conference of Municipal Engineers where problems, particularly those of an engineering nature, are discussed and solutions developed by municipal engineers or the C.R.B. officers are disseminated.

The Board itself visits Councils about once every six years and the direct contact with councillors and inspections of road developments enable the Board to have a good knowledge of requirements in all portions of the State.

Municipal engineers assembled in theatrette at C.R.B. Head Office.

THE COUNTRY ROADS BOARD ORGANISATION

The functions carried out by the C.R.B. fall naturally into three main divisions: those connected with engineering and technical matters, those concerned with administration, and those concerned with financial matters. The C.R.B's organizational structure has developed along these three functional lines, and branches have been established under the control of the Chief Engineer, the Secretary and the Accountant. This form of structure has proved sufficiently flexible to accommodate the changes brought about by the ever-increasing scope and complexity of the Board's activities, and the need to keep abreast of modern methods and techniques, both in the engineering and administrative fields. Considerable collaboration between the branches is constantly necessary at various levels, and a number of committees on which the branch heads or their representatives sit have been established to advise on various aspects of the Board's work.

To facilitate close contact with municipalities and to decentralize supervision of works under the direct control of the Borad, ten regional divisions, each headed by a Divisional Engineer, have been established. Two divisions, Dandenong and Metropolitan, are located at Head Office, while the remaining eight are respectively based at Bairnsdale, Ballarat, Benalla, Bendigo, Geelong, Horsham, Traralgon and Warrnambool. The regional divisions of the latter group all have accounting sections, headed by Divisional Accountants, and Divisional Workshops have also been established.

CHIEF ENGINEER'S BRANCH

The Chief Engineer directly controls the road and bridge works undertaken by the C.R.B. and co-ordinates and supervises technical aspects of those works undertaken by the municipalities to which the Board contributes financial assistance. He is assisted by four Deputy Chief Engineers in charge of the following sub-branches — Works, Bridges, Road Design and Mechanical.

WORKS SUB-BRANCH

The Deputy Chief Engineer, Works, is responsible for all works on State highways, forest roads and tourists' roads, and for all other works carried out directly by the Board. He is responsible for the preparation of programmes for each year's works on these roads, item by item, and exercises an overall control over the execution of the works by the regional divisions. In the preparation of annual programmes he is assisted by the Programme Engineer. Field investigations of methods of work, of new materials and new equipment are constantly being made. The officer directly responsible for developing new methods and techniques is the Construction and Maintenance Engineer, while the routine testing of materials and experimental work on new materials is the responsibility of the Materials Research Engineer. The Deputy Chief Engineer, Works, is also responsible for all bituminous surfacing carried out by the Board, this work being the immediate responsibility of the Asphalt Engineer.

BRIDGE SUB-BRANCH

The Deputy Chief Engineer, Bridges, is responsible for the design and supervises the construction of major bridges, both in the Melbourne metropolitan and country areas, and assists Shire Engineers with the design of smaller bridges in country areas.

There are, in Victoria, some 13,250 bridges, and although many new structures are built each year, a large number of weak, old bridges remain. To accelerate the rate of replacement, standard designs of many types have been produced, and these are employed where appropriate to reduce the planning and construction periods.

Continual maintenance of bridges must be carried out as well as temporary improvements to existing bridges where replacement may not be warranted for some years. Bridge inspecting engineers are constantly at work examining bridges, particularly the timber ones, and reporting in detail the condition of the members, any load limits which must be imposed, and any temporary repairs which may be required.

THE ROAD DESIGN SUB-BRANCH

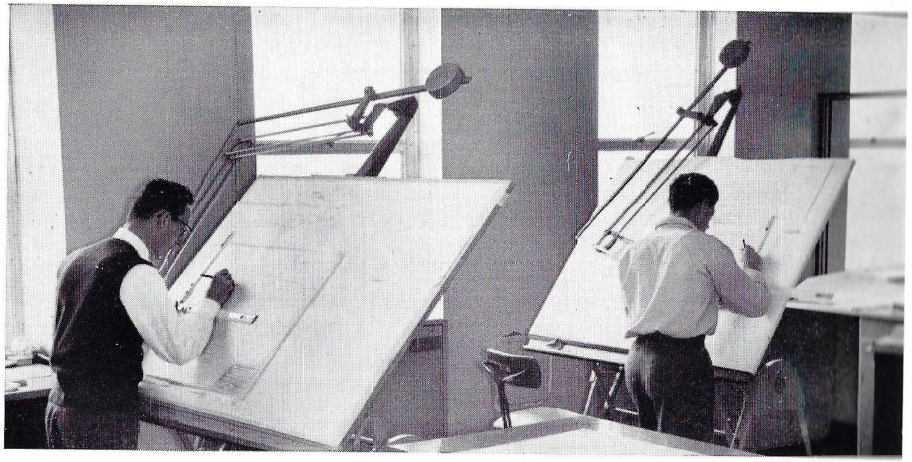
The Deputy Chief Engineer, Road Design, is responsible for location and geometric design of roads. For projects under C.R.B. direct control the section supervised by the Engineer for Plans and Surveys handles the bulk of the surveys for new roads and the reconstruction of existing roads, and prepares both preliminary and final plans and the specifications and quantities.

The standards of construction for various types of road and traffic conditions, from roads of access for isolated settlers to the most congested sections of arterial streets, are kept constantly under review so as to effect the maximum economy whilst providing sufficiently for the changing conditions of traffic. Increasing attention has had to be given to the improvement of congested traffic arteries and to methods of building safety into the road, particularly by designing divided roadways and channelized intersections. The Traffic and Location Engineer is responsible for the investigations necessary to determine traffic volumes and patterns and for the locating and designing of these facilities to the stage where the land requirements for right of way are determined.

Before land can be acquired for road purposes, it is necessary to establish the metes and bounds and the registered proprietor of the land affected. The Principal Title Survey Officer is responsible for this, and his staff carries out the necessary surveys on the ground and conducts searches of titles. The section also undertakes survey computations required for approved deviations or for those being considered, and prepares all technical descriptions for Orders-in-Council for deviations and for declarations of new roads. It records all these, as well as major works, marking their location on a master set of parish plans. Plan printing is also carried out in this section.

The Planning Research Division was constituted in 1948 to collate information for forward planning and to undertake the preparation of a ten-year-needs survey for road work throughout the State, so that the Board could advise the Government of road requirements on a factual basis. Investigations are also carried out into the economics of road construction, taking into account the effects of changing values of money and the relative real effort being put into road construction. The Division also controls the C.R.B's photographic section. This section undertakes still photography, exhibits motion picture programmes in remote camps and prepares and exhibits educational films on both technical and more general aspects of road and bridge work.

Section of Drawing Office.



THE MECHANICAL SUB-BRANCH

The Deputy Chief Engineer, Mechanical, controls the Board's Central Workshops at Syndal and is responsible for the technical control of Divisional Workshops. He is responsible for maintaining in a satisfactory condition the many hundred units of mechanical plant that the C.R.B. uses in its operations.

Many types of road-making plant have been designed by the Board and many modifications of commercially produced plant have resulted from the C.R.B's research. A notable example is the development of plant for the bituminous surface treatment of roads. This plant has enabled the attainment of a standard of work rated very highly by overseas engineers. The well-being of those engaged with these mobile units has not been overlooked, and the Board has developed mobile cookhouses complete with refrigerators and cooking stoves fired with liquid petroleum gas.

SECRETARY'S BRANCH

The Secretary is responsible for the preparation of the agenda for Board meetings and for ensuring that the Board's decisions are conveyed to all concerned.

He is also responsible for the general administration of the Secretary's Branch which includes a number of separate sections formed to fulfil particular functions.

ALLOCATIONS

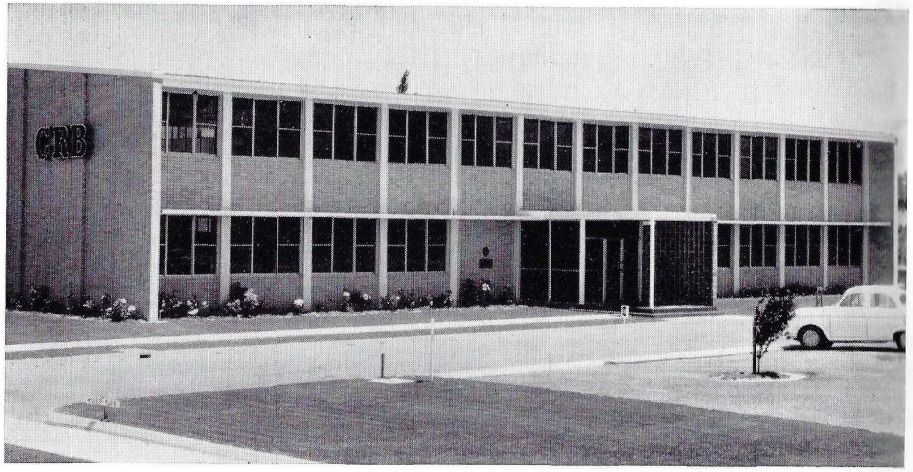
The Allocations Section is responsible for—

(a) recording applications for funds received from municipal councils and the Board's engineers for work on main roads, forest roads and unclassified roads;
(b) recording allocations made by the Board for work on main roads, forest roads and unclassified roads;
(c) recording approvals to carry out work by direct labour or contract as a charge against the allocations made;
(d) correspondence arising from the above activities.

CONTROL OF HEAVY TRAFFIC

The Traffic Section is responsible for the control of commercial vehicles in relation to the limits prescribed in the Motor Car Act for weight, length, height, width and speed.
Excessively heavy vehicles can cause rapid deterioration of road foundations and greatly increase road maintenance costs. Vehicles exceeding legal dimensions are a source of danger to other road users unless adequate safeguards are taken. The activities of the Traffic Officers are therefore designed to preserve the existing road assets from undue harm from overweight vehicles and to ensure that commercial vehicles generally travel in a manner which is safe for all road users.
The Traffic Section issues permits in certain circumstances for vehicles to exceed the limitations prescribed in the Motor Car Act. Officers of the section are available for advice on the movement of heavy loads and on problems of vehicle design on the aspects of load capacity and load distribution.

New Benalla office, completed 1962.



CORRESPONDENCE AND FILING

The Correspondence Section is responsible for general correspondence and attends to matters concerning insurance. The Correspondence Registry is responsible for the registration of all inward letters and reports and their placement on the relevant files together with maintaining records of the movement of files between officers.

LAND ACQUISITION

Many of the C.R.B. operations involve the acquisition of land. Such operations include the construction of new roads, deviations from existing roads to improve alignments, and general widenings of road reserves. The Estates Section is responsible for handling the negotiations with property owners for the purchase of land required. The negotiations commence by forwarding a formal notice of acquisition to the owners concerned and finish when agreement is reached on the amount of compensation to be paid by the Board.

METHODS STUDY

Methods study and improvements to procedures have always been conducted within the C.R.B. as a means of improving efficiency. In 1959, this type of work was placed on a formal basis by the establishment of an Office Methods Section. The activities of the section were shortly afterwards increased to include the study of engineering methods and the title of the section was changed to the Methods Section. The section now includes qualified accountants, cost accountants, a Bachelor of Commerce and a Bachelor of Engineering (Civil). Each officer has received extensive training in the field of methods study and work simplification procedures.

PERSONNEL

The Personnel Section is responsible for—

(a) all staff records and correspondence arising from appointments, promotions, salaries, leave, superannuation and associated matters;
(b) the interpretation and implementation of industrial awards;
(c) providing representation on behalf of the Board in court activities on industrial matters;
(d) attending to the requirements of the Workers' Compensation Act;
(e) maintaining records of employment statistics.

STAFF TRAINING

Until January, 1962, staff training within the C.R.B. was largely undertaken by the on-the-job training, guidance and instruction by senior officers and employee supervisors and external courses of study.
In January, 1962, training was placed on a formal basis with the appointment

of a highly-qualified educationalist to the new position of Training Officer. With the assistance of a Training Steering Committee consisting of senior officers of each of the Board's three branches, the Training Officer has co-ordinated the training activities and programmed specialized courses of training for both officers and employees.

THE ACCOUNTANT'S BRANCH

The Accountant is responsible for the recording of the C.R.B's receipts and expenditure, for co-ordinating records with the State Treasury and municipalities, for the operation of the Board's costing system and for the control of and accounting for stores.

The Board's ledgers, which for many years now have been fully mechanized, are designed to record expenditure under the different classifications of road works, including special works on behalf of other instrumentalities, as well as under the many headings of general and administrative expenditure. Sections have been constituted within the branch to deal with the reimbursement of claims submitted by municipalities seeking recoupment of expenditure on works financed by the C.R.B. and for the checking and passing for payment of accounts rendered by business firms for equipment or material supplied. Other special sections deal with the payment of salaries and wages, the recording of staff and employees' tax and earnings records, and the maintenance of assets and equipment records.

The Controller of Stores is located at the Central Depot, Syndal, and is responsible for purchasing throughout the State and for the receipt, storage and issue of all spare parts for plant and construction equipment and other stocks which are kept on hand at Central and Divisional Depots.

Divisional Accountants are located at each of the Board's eight country Divisional Offices and are responsible for all accounting, costing, and stores accounting in their respective Divisions.

Mechanised Ledger Section.

ROAD FINANCE

SOURCES OF FUNDS AVAILABLE TO THE BOARD

To enable the C.R.B. to carry out its responsibilities two main sources of money are available—

1. Money paid into the Country Roads Board Fund from State sources;
2. Grants under the Commonwealth Aid Roads Act.

In addition, some small amounts of loan money are made available from time to time.

FUNDS FROM STATE SOURCES

(a) All motor registration fees (except from buses), less cost of collection;
(b) two-thirds of motor vehicle transfer fees, less whole cost of collection;
(c) half drivers' licence fees, less half cost of collection;
(d) drivers' licence testing fees, less cost of collection; ;
(e) Fines under the Motor Car Act, less certain Police Department costs;
(f) the whole of proceeds from Commercial Goods Vehicles Act, cost of collection being borne by the Transport Regulation Board;
(g) municipal repayments on account of main road works;
(h) loan money.

items (a) to (g) inclusive are paid into the Country Roads Board Fund. An amount of 2 per cent of the total of items (a) to (e) inclusive is paid by the Country Roads Board to the Tourist Fund, administered by the Tourist Development Authority.

Proceeds from the Commercial Goods Vehicles Act can only be used for maintenance of public roads. Money in the Country Roads Board Fund is used for maintenance or construction works on classified roads, and to meet costs of administration, interest and sinking fund on loans, costs of buildings and depots, purchase of plant, etc. Loan money may only be used for works of a capital nature.

GRANTS UNDER COMMONWEALTH AID ROADS ACT

Since 1922, the Commonwealth Government has made grants available to the various States to assist their road programmes.

In 1926, the Commonwealth Government adopted the principle of road grants being made proportional to use of petrol, the petrol tax being increased in that year and a definite amount per gallon being "hypothecated" for roads. The proportionality of road grants and petrol taxation was retained for thirty-three years but in 1959 the connection between petrol tax and road grants was abandoned, and the new Commonwealth Act provided for allocations of the following amounts from consolidated revenue for distribution to the States.

Year	Basic Grant £ Million	Matching Grant £ Million
1959-60	40	2
1960-61	42	4
1961-62	44	6
1962-63	46	8
1963-64	48	10

These amounts are distributed 5 per cent to Tasmania and the balance among the mainland States, one-third in proportion to population recorded at the most recent census, one-third in proportion to area of State, and one-third in proportion to number of motor vehicles registered in each State at the previous 31st December.

Qualification for the matching grant is based on the State concerned having increased its own allocation for road purposes above that of the base year 1958-59 by an amount at least equal to the Commonwealth matching grant.

The funds to be received in 1962-63 from this source by Victoria are placed in separate accounts as follows—

Commonwealth Aid Roads No. 1 Account (General Roads)	£6,324,768
Commonwealth Aid Roads No. 2 Account (Other transport works)	201,426
Commonwealth Aid Roads No. 3 Account (Rural roads)	4,350,796
TOTAL FOR VICTORIA	£10,876,990

Details of the Country Roads Board Fund for three years are as follows, estimated figures being given for the year 1962-63—

	1960/61 £1000	1961/62 £1000	Estimated 1962/63 £1000
Motor car registration fees	9,170	9,530	10,000
Motor vehicle transfer fees	592	583	700
Drivers' licence fees	257	260	320
Drivers' testing fees	39	77	80
Fines	213	260	270
Sub-Total	10,271	10,710	11,370
Less cost of collection	694	844	850
NET registration fees, etc.	9,577	9,866	10,520
Municipal repayments	789	778	882
Commercial Goods Vehicles Act	2,254	2,262	2,550
Loan Funds	283	683*	301
Commonwealth/State assistance	1	500*	—
General Receipts, etc.	50	26	85
Total State Receipts	12,954	14,165	14,338
Balance brought forward	644	3	5
TOTAL AVAILABLE FROM STATE SOURCES	13,598	14,168	14,343

* (In the year 1961-62 the Commonwealth granted money to the State to obviate unemployment. The State allocated £900,000 to the Board, of which £400,000 was loan money repayable by the Board.)

Of the total amount available to Victoria under the Commonwealth Aid Roads Act, 40 per cent can be used only on rural roads other than highways, trunk roads or main roads, while the remaining 60 per cent (less an amount prescribed as available for other works connected with transport) can be used on road works without regard to classification of the road or its location.

The amount prescribed for other works connected with transport is made available to the Public Works Department for work on jetties, breakwaters, slipways and dredging.

Moneys in both the 60 per cent and the 40 per cent classifications may also be used for the purchase of road-making plant. Payments for or in connection with research relative to the construction, maintenance, or repair of roads may be made from the 60 per cent proceeds.

TOTAL FUNDS AVAILABLE TO COUNTRY ROADS BOARD

	1960-61 £1000	1961-62 £1000	Estimated 1962-63 £1000
State	13,598	14,168	14,343
Commonwealth	8,984	9,878	10,676
COUNTRY ROADS BOARD EXPENDITURE TOTALS	22,582	24,046	25,019

Statements of payments by Country Roads Board for years 1960-61, 1961-62, and estimated figures for year 1962-63—

	1960-61 £1000	1961-62 £1000	(Estimated) 1962-63 £1000
Main Roads	5,919	7,427	7,050
State Highways	6,881	6,836	7,693
By-pass roads	1,097	683	500
Tourists' roads	600	573	500
Forest roads	275	295	300
Unclassified roads	4,228	5,193	4,890
Murray River Bridges	89	69	80
Traffic lines	40	41	45
Plant purchases	708	175	770
Traffic lights	5	9	20
Aust. Road Research Board	2	9	25
Interest and Sinking Fund	888	928	960
Tourist Fund	188	192	200
Kew Office	528	19	375
General and administration	1,131	1,592	1,561
	22,579	24,041	24,969
Balance carried forward	3	5	50
TOTALS	22,582	24,046	25,019

THE NATIONAL ASSOCIATION OF AUSTRALIAN STATE ROAD AUTHORITIES

Following earlier meetings to discuss specific problems, the C.R.B. and road authorities of the other States established the Conference of State Road Authorities, Australia, in 1934 as an organization to record and implement decisions reached at the annual meetings. The primary objects of the organization were to provide a means of exchanging information on engineering and administrative practices with the natural development of establishing standards in procedure and design throughout the Commonwealth. For example, the first steps towards the standardization of road signs were taken at early meetings and resulted in a code which formed the basis of that which has later been amplified by the Standards Association of Australia. In furthering this work of securing uniformity of practice wherever possible, a subcommittee consisting of the Chief Engineers of the various authorities was formed before World War II with the later addition of specialist committees as has become necessary from time to time. As a result of their work a number of codes of practice have been — and are being — prepared. Examples of those already published are, "Policy for the Geometric Design of Rural Roads" and "Highway Bridge Design Specifications". Since the termination of the Second World War, the Commonwealth Department of Works has been represented on the conference (later the Association) by the Director-General of Works. Because of the nature of its work, the name of the conference was changed to that of the National Association of Australian State Road Authorities in 1958.

Of recent years the Association has coordinated the surveys of road needs carried out by the constituent State Road Authorities in order that Governments and the public may be informed on a sound basis of the funds required if a satisfactory road system capable of carrying present and future traffic is to be provided.

In Victoria, as in other States, considerable investigation and research have been carried out into materials and methods of design and construction for many years. It was recognized that many of these investigations were common to all authorities, and that in some of them more advanced research as opposed to that dealing with "ad hoc" problems, was necessary. For these and other reasons the Association established the Australian Road Research Board in 1960. The objects of the Board as set out in its constitution are—

(a) To provide a national centre for road research information and for the correlation and co-ordination of road research activities;

(b) to ascertain the nature and extent of road research work required;

(c) to encourage and promote the undertaking of road research, including research into road planning, location, design, safety, materials, construction, maintenance, structures, equipment, traffic, transport, economics, administration, financing, management, accounting and into any other matters affecting the provision, upkeep, use, protection and development of roads;

(d) to provide by means of conferences or symposiums opportunities for the presentation and discussion of the results of road research;

(e) to make grants for carrying out road research;

(f) to undertake research studies;

(g) to publish the results of road research, including those presented at conferences convened by the Board;

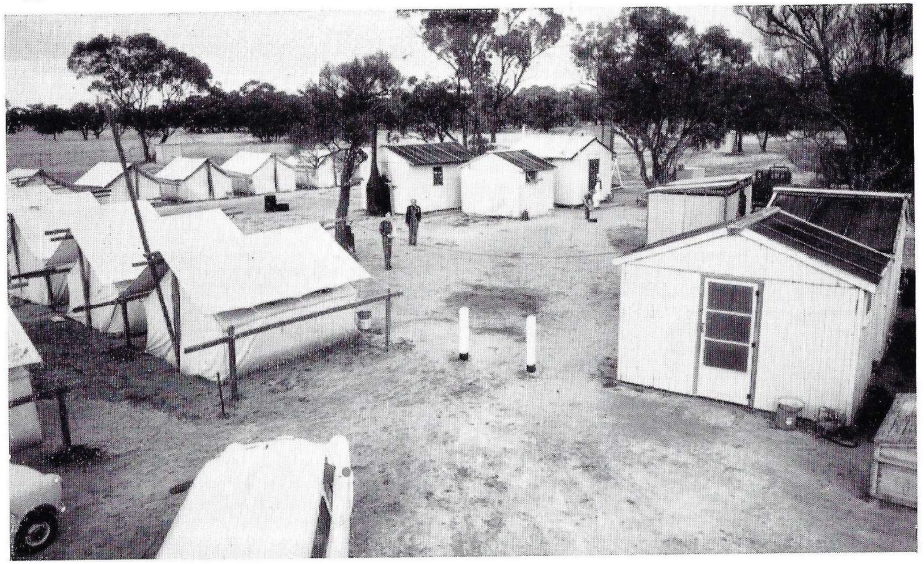
(h) to appoint specialist committees to assist investigations authorised by the Board and to provide financial and other assistance to such committees;

(i) to make available to appropriate bodies or persons information relating to road research matters.

The Australian Road Research Board intends to organize national conferences every two years and the first of these was held in Canberra in September, 1962. A journal, "Australian Road Research", is published quarterly.

The Australian Road Research Board is financed by the six State Road Authorities from portion of the grants made available to them by the Commonwealth Government. Subjects in which research is being — or will be — carried out include road safety, economy of design, traffic problems, and economics of road transport. The headquarters of the Board are at present in Melbourne.

Typical C.R.B. construction camp.



"Hansard" records that the Hon. H. McKenzie stated in Parliament during the debate on the Country Roads Bill in 1912, "Unless you appoint a body of men who will devote themselves to the business of looking after the main roads and seeing that the money that comes into their hands is expended in the most judicious way, you will always court failure". The truth of that statement is evident from a comparison of the road development that was achieved in the periods before and after 1913.

The first Board members, as well as being experts in their respective fields, were essentially humane men to whom the desperate plight of the out-back settler was very real and a problem that was to be overcome whatever the effort that might be entailed. Their regard for their staff, too, was high. The Second Annual Report contains the following passage—

"The Efficiency of the Road Man.

"The important part played by the workmen, particularly on road maintenance, is not sufficiently recognized.

"The roads of England and France are conceded to be the best-maintained roads in the world, a condition due largely to the fact that they are constantly cared for by thoroughly experienced and trained workmen, known in these countries respectively as length-men or patrol men, who, with years of training, have become highly-skilled tradesmen and who take an interest and pride in their work."

The attitude of the first members and the high qualities of leadership they displayed set a pattern and established within the organization a climate of work which has persisted through the years.

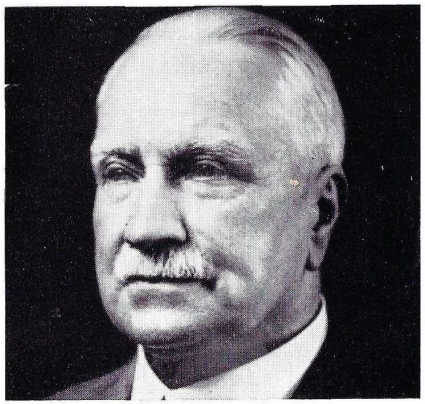
The involved nature of modern engineering projects is reflected in the organization required to serve them. Very few problems today can be solved to the best advantage by an individual or even by a group of individuals of the one profession. Engineers, chemists, architects, accountants, administrative people and members of many trades all have a vital part to play in the overall operation and all can equally claim a share in the satisfaction of a job well done. The Country Roads Board and its staff are a team and while, today, this is a matter of necessity, it is as well in this instance that necessity does not conflict with choice.

Although, as a result of this complexity, the sole responsibility for any large project is less than it was in the past, the team approach still makes it possible for the Board, the engineers in charge of the work, the overseer and the unskilled labourer, and even those remotely involved, to point to the completed work and think and say that that is "my" road or "my" bridge.

The Board recognizes that in carrying out its task conscientious and loyal work of the whole of its staff from the Chief Engineer to the road patrolman is involved, and wishes to pay tribute to the magnificent work done by the staff and employees over the past fifty years. It has every confidence that the same loyal and efficient service will be given to the public in the years ahead.

Honble. W. H. Edgar					1912–1913
Honble. A. McLellan					1913
Honble. F. W. Hagelthorn					1913–1915
Honble. W. A. Adamson					1915–1917
Honble. J. McWhae					1917–1918
Honble. Sir A. Robinson, K.C.M.G.					1918
Honble. Sir Frank Clarke, K.B.E.					1919–1923
Honble. H. I. Cohen, K.C.					1924
Honble. A. E. Chandler					1928–1929
Honble. R. Williams					1932
Honble. J. P. Jones		1924	1929–1932	1932–1935	1927–1928
Honble. Sir G. L. Goudie			1923–1924	1924–1927	1935–1943
Honble. J. J. Holland					1943
Honble. J. H. Lienhop					1943–1945
Honble. L. H. McBrien					1945
Honble. P. J. Kennelly					1945–1947
Honble. Sir J. Kennedy					1947–1950
Honble. P. T. Byrnes					1950–1952
Honble. C. P. Gartside					1952
Honble. S. Merrifield					1952–1955
Honble. Sir Thomas K. Maltby, E.D.					1955–1961
Honble. H. R. Petty					1961

Honorable W. H. Edgar.

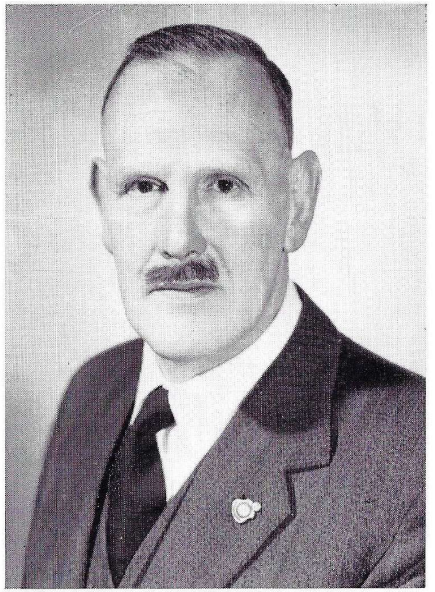


Honorable H. R. Petty.

MEMBERS OF C.R.B. 1913 – 1963

W. Calder	*Chairman*	1913–1928
W. T. B. McCormack	*Member*	1913–1928
	Chairman	1928–1938
F. W. Ficke	*Member*	1913–1938
	Chairman	1938–1940
A. E. Calloway	*Chief Engineer*	1913–1928
	Member	1928–1929
L. F. Loder	*Chief Engineer*	1928–1940
	Chairman	1940–1944
A. D. MacKenzie	*Member*	1938–1940
W. L. Dale	*Secretary*	1913–1929
	Member	1929–1945
	Chairman	1945–1949
R. F. Jansen	*Secretary*	1929–1949
	Member	1949–1956
F. M. Corrigan	*Member*	1940–1950
	Deputy Chairman	1950–1956
D. V. Darwin	*Chief Engineer*	1940–1945
	Member	1945–1949
	Chairman	1949–1962
W. H. Neville	*Secretary*	1949–1956
	Member	1956–1962
C. G. Roberts	*Chief Engineer*	1945–1956
	Deputy Chairman	1956–1962
	Chairman	1962–
I. J. O'Donnell	*Deputy Chief Engineer*	1956–1962
	Deputy Chairman	1962–
R. E. V. Donaldson	*Secretary*	1956–1962
	Member	1962–

Mr. C. G. Roberts, *Chairman.*



MEMBERS OF THE C.R.B., 1963.

Mr. I. J. O'Donnell, *Deputy Chairman.*

Mr. R. E. V. Donaldson, *Member.*