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Melbourne and Metropolitan
Tramways Board



Its Progress
— and —
Development

1919-1929

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INDEX

	Page.
Introductory	3
General Scheme	5
Industrial	7
The Powers of the Board	7
Requests for Tramway Extensions by Municipalities	8
Traffic Co-ordination	9
Checks on Traffic	9
Street Congestion	10
Medical Examination	11
Schools of Instruction	11
Discipline and Complaints	12
Preston Workshops	12
Tram Noises	13
Wattle Park	15
Replacement of Trams by Buses	15
Motor Omnibuses	16
Alleged Obsolescence of Tramways	17
Community Services	19
Financial Burdens	20
What the Board has Accomplished	21
Statistical Summary	23
Appendixes	25

The Growth and Development of the Tramway System of the Metropolis

Under the Melbourne & Metropolitan Tramways Board



EARLY 10 years have elapsed since the inauguration of the Melbourne and Metropolitan Tramways Board. The Board was constituted on 2nd July, 1919, for a period of six years only from the 1st November following, the intention of Parliament, as expressed in Section 10 of Act No. 2995, being that its constitution should be reviewed at the end of six years. The term of office of the Chairman was for five years, and for other members three years. Since 31st October, 1925, on the expiration of their respective terms of office, the Chairman and members were reappointed from time to time for periods ranging from one year in the case of the Chairman to from four to twelve months in the case of the other members. It is the expressed intention of the Government during the present Session of Parliament to review the Board's constitution, and give it a permanent character. The time is, therefore, opportune for briefly reviewing the activities of the Board during the period of its existence.

On 1st November, 1919, the Cable System, including the Royal Park Horse Tramway, became vested in the Board by virtue of the Act creating the Board above referred to. An Order of the Governor-in-Council appointed the 2nd February, 1920, as the day on which the assets and obligations of the Prahran and Malvern Tramways Trust, the Hawthorn Tramways Trust, the Melbourne, Brunswick and Coburg Tramways Trust, the Fitzroy, Northcote and Preston Tramways Trust, and the Footscray Tramways Trust, and the Northcote Cable Tramway became vested in and transferred to the Board. By a subsequent Act (No. 3247), assented to on 21st December, 1922, the North Melbourne Electric Tramways and Lighting Company Limited became vested in the Board. Of the respective tramways taken over from the various Trusts, the Footscray, and the Fitzroy, Northcote and Preston Tramways were only in process of construction at the time of taking over. The construction of the Fitzroy, Northcote and Preston Tramways was completed in April, 1920, and the Footscray Tramways in September, 1921.

Under the provisions of an Act passed on 30th December, 1915, the control of the Cable Tramways was temporarily vested in a Board styled the (Cable) Tramway Board. That Board operated the Cable Tramways (other than the Northcote Cable system) from the 30th June, 1916, until the 31st October, 1919, when it was dissolved by proclamation of the Governor-in-Council, and its assets and obligations became vested and transferred to the present Board. During the period of its administration the Cable Tramways Board accumulated surplus funds amounting to £866,319/17/10, including £115,000 received from the Melbourne Tramway and Omnibus Company Limited as compensation for the non-observance by the Company of the covenants in its lease from the Melbourne Tramways Trust. This sum, less £100,000 transferred to the present Board, was, in accordance with Section 72 of the Act, paid to the Melbourne and Metropolitan Municipal Loans Redemption Fund. As, however, the sum transferred was short by £60,682 of the sum of £827,000, which the Government had estimated would be received from the Cable Tramway Board, an Act passed on 16th December, 1919, required the Board to make good the difference.

On taking over the systems of the various Trusts, it was found that there were great differences in the designations of many of the classes of work performed by employees; different practices and customs prevailed, and the employees of each system sought to have preserved to them those privileges of their respective systems which were most advantageous to them. Anything that could possibly be construed as unfairness was regarded as a violation of the respective award or agreement affecting the particular Trust. It was only by careful handling over a considerable period that classifications of the men and their duties were made uniform throughout the entire system.

At the date of the inauguration of the Board business was buoyant throughout the community, and there was every appearance of general prosperity. In 1920, however, there was a universal demand for increased wages, due to the rapidly increasing cost of living. As a result wages soared up to an unprecedented extent. In the Board's case the total cost of the increased wages and concessions in connection with increased holiday leave, additional Sunday pay and improved rosters and working conditions amounted in round figures to the sum of £350,000 per annum. In order to partially meet these increased costs, fares were increased on two occasions, the average increase over the whole period being 39 per cent.—a sum which did not nearly meet the increase in wages alone.

The graph on page 24 gives comparative curves, showing the ratios of wages and costs of living to tramway fares from 1914 to 1929 inclusive.

In 1918 the first electrified suburban railway line came into operation. Early in 1923 the electrification of the suburban

railway system was completed. Between these dates the number of passengers carried by the suburban railways increased from 97,500,000 to 132,600,000, and by 1927 to 160,000,000. The former slow steam service, with long intervals between trains at the slack hours of the day, was changed into a fast electric service approximating to a tramway time-table. As the schedule speed of the trains is more than double that of the average tramway speed, a large number of passengers were necessarily attracted from the tramways to the railways.

In the meantime, also, the number of private motor cars used in street transport rapidly increased. The result was a decrease in the growth of the riding habit of tramway passengers.

About the middle of 1923 a number of motor omnibus companies established fleets of buses, which proceeded to pirate the cable tramway routes. They made considerable inroads on the cable passenger traffic. These buses ran at rates of speed much beyond the capacity of the roads which they traversed to sustain. The result was that not only did the municipally-owned tramways lose revenue, but also the municipalities in whose territories these buses operated were put to large expense in repairing the damage done to the roads, and for which they received no compensation. This state of affairs led to the passing of the Motor Omnibus Act 1925, and the imposition of a seat tax, varying from £4/10/ per seat for solid-tired and £3/7/6 per seat for pneumatic-tired buses within three miles of the General Post Office, to £2/5/ for solid-tired and £1/5/ per seat for pneumatic-tyred buses outside that area. The proceeds of the tax are divisible between the municipalities in whose territories the buses operate, on a basis fixed by the Minister of Public Works, proportional to the number of miles run in each municipality.

Within a few weeks after the passing of the last-mentioned Act, the most of these bus companies went into liquidation. Although it has been alleged that the Motor Omnibus Act brought these companies to grief, the fact is they were bankrupt before the Act came into operation. In many cases the proprietors had paid only a few instalments of the purchase price of their buses, which were acquired under hire-purchase agreements. From the public aspect the piracy of these buses caused serious losses to the tramways and railways, as well as to the public as a whole. Many thousands of pounds were lost. The buses left behind them a legacy of damaged roads, involving costly repairs, while the shareholders lost their capital and the creditors remained largely unpaid.

GENERAL SCHEME.

Concurrently with the taking over and co-ordination of the systems of the various Trusts was the obligation imposed on the Board by its principal Act to prepare and adopt "as soon

as practicable a General Scheme for the future development of tramways for the service of the metropolis." (Vide Sec. 34, Act No. 2995.)

It is necessary to emphasise the fact that the purpose for which the Board was created was to operate a metropolitan tramway system, and extend the system where and when practicable. The power conferred on the Board to operate buses was intended only to be subsidiary to its main function, and its exercise required the express consent of the Governor-in-Council. The Board's Act further provided that no tramway or portion of any tramway could be abandoned until after a notice expressing that intention had lain on the table of both Houses of Parliament for 24 days while Parliament is in session, thus enabling Parliament, if thought fit, to veto any proposed abandonment. It is clear, therefore, that the desire of Parliament, as expressed in the Act creating the Board, was, speaking generally, the preservation and extension of the tramway system as such and its continuous operation.

Immediately after the vesting of the various tramways in the Board, the Board set itself to the task of preparing the General Scheme of tramway development directed by the Act. In order to obtain the fullest information it sent out a questionnaire to all the leading tramway undertakings in Great Britain, Canada and the United States, to ascertain the amount of mileage laid down in cities per 100,000 of population, the rate of growth of their respective cities, and their proposals for future extensions, as a guide in determining the extent and period of the General Scheme. Local information was collected as to the population of the various municipalities within the Board's area; estimates were made of the areas available in each for settlement, and of the amount of additional population each could absorb for an assumed acre density. Topographical features were examined to determine gradients, and studies made as to the best methods of unifying the various systems, and welding them into one complete system, giving through transit from one part of the metropolis to the other without change of vehicle. The task was intricate and laborious, and occupied a large staff of highly-trained technical officers for upwards of two years. In February, 1923, proposals for the General Scheme were submitted to the Minister of Public Works, as required by the Board's Act, and he in turn referred them to the Parliamentary Standing Committee on Railways for consideration and report. This Committee, after hearing evidence on the matter, reported to the Minister its general approval of these proposals. In due course the Board adopted a General Scheme in accordance with the provisions of Section 34 of the Board's Principal Act.

The Chairman of the Board (Mr. Alex. Cameron), during his tour abroad in 1923 to inquire into the suitability or otherwise of the existing cable tunnels for an electric conduit system, had

the advantage of consulting with Mr. Daniel H. Turner, the technical adviser of the New York Transport Commission, and one of the leading transport authorities in U.S.A., as to the principles upon which such a General Scheme should be framed. Mr. Turner was supplied with a copy of the Board's scheme, together with the data upon which it was based. In the report made by Mr. Turner to the Board in August, 1923, he makes the following comment:—

"The scheme presents the problem and its solution admirably. . . . This is planning comprehensively as well as for immediate needs, and is essential if the best results in the interests of the community are to be attained. It means that transit facilities can be made to precede the population, not follow the population. The city, under such a principle of transit, is enabled to grow and expand in an orderly and pre-determined manner. This principle is fundamental. Failure to consider it is chiefly responsible for the transit conditions now prevailing in the largest cities. . . . Permit me to congratulate you upon the broadness of your visions."

INDUSTRIAL.

Like many other industrial undertakings, the Board has had on several occasions to deal with industrial disputes with its employees. There have been but six partial stoppages of work on the tramway system during the Board's tenure of office. Three of these took the form of "regulation" strikes, while on the other three occasions the services were interrupted. The most serious amongst the latter took place in 1924, and lasted from the 5th to the 19th May inclusive. It arose through a gripman refusing to train a student, in the mistaken belief that the student had applied for enrolment as a special constable during the Police strike of the previous November.

Notwithstanding these incidents, however, the relations existing between the Board and the Australian Tramway Employees' Association have, on the whole, been amicable. There is now a better understanding of each other's views, and when points of difference arise they are discussed in a spirit of mutual goodwill.

THE POWERS OF THE BOARD.

Much misapprehension prevails as to the powers possessed by the Board. There have been critics who have sought to represent the Board as an autocratic body. Even a superficial perusal of the Tramways Act will show that Parliament has severely limited the Board's powers. No new line can be constructed without the permission of the Governor-in-Council, where the cost of construction does not exceed £20,000, or, where the cost exceeds £20,000, until such proposed scheme of construction

has been investigated and reported on by the Parliamentary Standing Committee on Railways, and finally authorised by Act of Parliament. The power to convert cable lines to electric traction is the only unfettered power given to the Board in this regard. The extent of the borrowing powers of the Board is limited by Act of Parliament, while the exercise of borrowing powers within the limit imposed by the Act has to be approved by the Governor-in-Council.

All employees have a right to appeal against dismissal or punishment, while the wages, hours, and conditions of labour are determined by either a Wages Board or by the Commonwealth Arbitration Court. In fact, in regard to employees, the only unrestricted power possessed by the Board is to establish the relation of employer and employee. As soon as that is done the power of an outside tribunal can be invoked to vary and determine the conditions of employment. Fares are fixed by the Governor-in-Council after the Board's proposals have been submitted to the Railway Commissioners for their criticism. Although the power to convert cable tramways is expressly conferred upon the Board without restriction, the fact that the Board has to borrow to replace reserve funds invested in its business in order to carry out the work of conversion makes it necessary for the Board to secure the consent of the Governor-in-Council to such borrowing. This also curtails the powers of the Board in regard to conversions.

There are further restrictions as to the type of paving to be used in streets where the paving is other than macadam. In regard to the power supply, the Board is not permitted to generate its own power, and has, therefore, to purchase its electric current from the State authority or other electric power generating undertaking. Under the Public Contracts Act the consent of the Minister has to be obtained to the purchase of any goods or manufactures produced outside Australia, and before such permission is given it has to be shown either that the goods are not manufactured in Australia, that suitable deliveries cannot be obtained, that the prices are unreasonable, or that the type of goods manufactured in Australia are not suitable for the purpose for which they were required.

REQUESTS FOR TRAMWAY EXTENSIONS BY MUNICIPALITIES.

The list of requests made to the Board by the municipalities in the metropolitan area for new tramways, set forth in Appendix I. shows the nature of the demands made upon the Board for tramway extensions. Many of the lines suggested are far in advance of present traffic requirements. The Box Hill-Mentone, the Oakleigh, the Ashburton, the Essendon-Footscray-Williamstown, the Moorabbin-Brighton Beach, and the Altona lines would,

for the greater part of their length, run through districts sparsely populated, and for many years to come they would not earn even working expenses, let alone interest on the construction costs. Others would largely be a duplication of existing transport facilities. On the other hand, some of the requests were reasonable, and were given effect to. The construction of other lines, while desirable, had to be refused for the time being, because the Board had no surplus revenue out of which to make good losses while these lines remained in a developmental condition.

In the first year of the Board's control and management, municipal deputations frequently complained that the power to obtain local extensions at the risk of the municipality requesting these, under the powers conferred on the superseded Tramway Trusts, no longer existed. To meet this objection the Board secured the passing of an amending Act in 1923, enabling any municipality, or municipalities, on complying with certain provisions of the Act, to apply to the Board for the preparation of a Special Scheme for the construction of a tramway as desired, and to enter into an agreement with the Board guaranteeing the Board against loss on the operation of the tramway for a period of five years. Only one municipality so far has expressed its willingness to avail itself of the privilege.

TRAFFIC CO-ORDINATION.

Uniformity of traffic control of the cable and electric systems transferred to the Board has been established. The old division between the cable and electric and the several electric systems has been abolished. The metropolis has been divided into districts, irrespective of whether the motive power is cable, electricity or petrol, and District Superintendents have been put in charge of each. The Inspectorial and Ticket Examining Staffs have been consolidated, and the work divided into sections, each under the control of a District Superintendent. This has made for efficiency.

CHECKS ON TRAFFIC.

The routing of the several former independent services having been co-ordinated, the Board arranged for a section of the staff to periodically check the passenger movement on all cable, electric and bus lines, and adapt the services to the traffic. A special Roster Department has been created to take over the work of rostering the duties of the men, so as to comply with awards and agreements, which have, from time to time, been varied in respect to hours of duty, meal relief periods, etc., any change in which has to be met by a change in the rosters. Prior to this several varying practices and industrial agreements were in force, which gave rise to friction and misunderstandings.

STREET CONGESTION.

In answer to the assertion that trams are the real cause of street congestion, it might well be argued that prior to 1923 no one regarded trams in such a light. With the extraordinarily rapid growth of motor car traffic from that time onwards, and the continuous parking of cars in the main business thoroughfares, the tramcar became the traffic scapegoat. That mobile traffic steadily became more dense is not disputed. That tramcars are responsible for any large share in the congestion is contradicted by the fact that, while in 1923 the Board's stock of tramcars numbered 805, the total this year is but 925, and of that number a large proportion do not enter the city. These figures represent an average annual increase of little more than 2 per cent. In the same period the annual average increase in the number of motor vehicles was 28 per cent. It seems idle, however, to blame any particular type of vehicle for street congestion. The more reasonable view surely is that congestion is a question of the degree to which the available street space is utilised. In this connection the census taken by the Town Planning Commission is instructive. In its first report presented in March, 1925, the Commission points out that only 9.09 per cent. of Melbourne's vehicular traffic belongs to the tramways. Another traffic census taken when the tramway strike of 1924 was in progress showed that "the absence of trams added to the traffic so many as 3485 extra vehicles of various kinds, or an increase of 21 per cent." Those who rail against trams as the real cause of street congestion are faced with the difficulty of explaining away the Town Planning Commission's traffic figures, and must, if they are to be logical, advocate the abandonment of trams throughout the whole metropolis, and accept the consequences set out by the Parliamentary Committee of Public Accounts.

Swanston street and Prince's Bridge form the main artery of traffic, north and south, over the River Yarra. At the evening peak hour, between 5.10 and 6.10, the tramway headway in each direction is 27 seconds. During that period 276 tramcars enter and pass through Swanston street. These cars transport 22,000 people. A traffic check taken in May, 1928, between the hours of 4.15 and 6.15 p.m. showed that during that period 1281 motor cars crossed Prince's Bridge southwards and 679 northwards, making a total of 1960. Of these no fewer than 484 carried the driver only. On the basis of seating capacity, these 484 single motor car passengers occupied approximately five times more road space than the passengers in the tramcars. Put in another way, these 484 motor car passengers could have been transported comfortably in nine tramcars occupying 3879 square feet of road space. Instead, they were carried in 484 motor cars, which occupied 19,360 square feet of the street. As the Melbourne trams have large floor space, which permits of a considerable

number of standing passengers at the hours of peak load, the space occupied per tram passenger by tram passengers at this period becomes reduced by 50 per cent. Careful investigation shows that the average carrying capacity of the Board's trams during peak loading hours is 90 per car. In the census which has been quoted 33 motor buses, 1960 private motors, 440 commercial motors, 87 horse vehicles, 301 motor cycles and 236 bicycles went through Swanston street—a total of 3057. If two motor buses replaced each tramcar, the total would rise to 3933, which would mean 33 vehicles each minute.

In this connection the safety features of electric tram operation cannot be overlooked. In the first year of electric trams in Swanston street the accidents in which tramcars were concerned dropped from 156 to 29, and the Superintendent of the Traffic Police stated that he attributed the diminution to the substitution of electric cars for cable cars.

MEDICAL EXAMINATION.

A Medical Officer was appointed seven years ago to take charge of the work of examining all employees, so as to ensure that a uniform standard of physical fitness would obtain in the service. All new men entering the service must pass the doctor, who also periodically re-examines old employees to check their fitness for duty. This has served to improve the physical standard and protect the public against unfit men being in charge of cars.

SCHOOLS OF INSTRUCTION.

Schools of Instruction have been established. The school for drivers at Hawthorn is equipped with a complete truck and electrical apparatus for the efficient training of the men. It is in charge of an Instructor, who gives recruits a thorough training in the equipment of the car. The Instructor is assisted by follow-up officers, who subsequently travel with new employees, and periodically check up the work of all employees to ensure the maintenance of the required standard.

There is also a school for conductors, and all new men must pass through this school before taking up duty on the road. Their work is also supervised by follow-up officers. The conversion of the cable lines has entailed a transfer and training of a large number of drivers to the electric systems, and the training of cable gripmen as electric tram drivers. All these men have had to pass through the training school before being allowed to take charge of electric cars. This work has been done with a minimum of friction and without loss of efficiency.

DISCIPLINE AND COMPLAINTS.

A special Disciplinary Department has also been created to deal with all cases of failure to observe the regulations or carry out the allotted duties. Complaints received from the public are thoroughly investigated by the Disciplinary Officer.

Complaints relating to service and like matters are always carefully investigated. In most cases the matter is taken up with the complainant and discussed with him. For this purpose an officer visits the complainant at his home or place of business, and explains the circumstances or provides the explanation desired. By doing so the passenger is brought into personal touch with tramway management, the result being a gain in knowledge and goodwill.

THE PRESTON WORKSHOPS.

With many different types of electric cars in use, it was at once recognised by the Board that future cars should be built to standard designs, and that the provision of a modern workshop for the building and repairing of electric tramcars was essential, but until such a workshop was available little progress could be made towards the standardisation of equipment. A site of 17 acres was secured at Preston for £7850. Up to the present the Board has erected, to plans prepared by the Chief Engineer's Department, various shops at a cost of £223,910, and installed in them up-to-date tools and machinery at an expenditure of £102,390, the total expenditure to date thus amounting to approximately £326,300.

At present there are 508 persons employed in the shops, and the weekly wages bill amounts to £2490. For the year ended the 30th June last 45 new cars were constructed in these workshops, while 13 more were on the point of completion. By the end of this year more than 200 cars will have been constructed at Preston, apart altogether from the cars which have been rebuilt, overhauled, repaired and renovated generally. The average number of cars owned by the Board out of service on any one day is less than 5 per cent.

The present installation is designed for the maintenance of 600 running cars and the building of 30 new cars per annum. When the Board came into office the number of cars withdrawn from service owing to defects was approximately one per 4000 miles. During the financial years of 1928 and 1929 the full effect of careful maintenance was felt. For the year which ended on 30th June, 1929, for instance, the figure mentioned above was improved to one car per 20,000 miles. This noteworthy improvement naturally left greater space in the shops for the building of new cars, the result being that in the years mentioned

no fewer than 98 cars were constructed. The general lay-out of the works has been so designed that extensions can readily be made without interruption to the normal daily flow of work in any way. The shops are arranged in four main groups:—

- 1.—Engineering and electrical.
- 2.—Blacksmithing, platework and foundry.
- 3.—Woodworking and lifting; and
- 4.—Painting.

In addition, there are stores designed on the most modern principles, mess and recreation rooms, and administrative offices. The works have met with the highest commendation from all Australian workshop engineers, while visiting engineers from overseas have expressed the opinion that the lay-out of the works is superior to anything that they have visited either in the United Kingdom, the United States, or elsewhere.

With the view of further encouraging the spirit of goodwill existing between the administration and the men employed in the workshops, a Welfare Committee was formed early in 1928. Composed of representatives of the management and of all sections in the shops, this Committee meets regularly and discusses in a mutual spirit of friendliness all matters pertaining to the welfare and comfort of the staff, and of the better operation of the shops. All forms of sport are encouraged, and short lectures on interesting subjects are delivered during the luncheon hour.

In the messroom a three-course luncheon is served daily for the low charge of 1/. For those who prefer to bring lunch with them boiling water is provided, and the men find their "billies" waiting for them when they enter the messroom.

An ambulance service is established throughout the works, and ambulance classes, financed by the Board, have been well attended.

TRAM NOISES.

The question of minimising noise has always received special attention from the Board's officers engaged in design and maintenance of tracks and rolling stock, and many improvements have been made in the tracks and cars to that end.

The Board is required by its Act to pave tracks with materials conforming with those in the adjacent portions of the roadway. Where these portions are paved with asphalt or wood blocks, it becomes necessary to support the tracks on concrete instead of on ballast. Such tracks are necessarily more noisy than the ordinary ballasted tracks.

The mileage of tracks laid on concrete has, of course, materially increased during the last few years with the improved paving now adopted in many of the municipalities. An endeavour

has been made to reduce the noise on such tracks by using a continuous timber stringer between the rail and the concrete, and different types of track have been laid with the same object. In one case the rails were laid on and faced with a sound-absorbing material without sensible effect on the noise. It has now been demonstrated that, as far as the track is concerned, the condition of the rail surface is the most material factor.

Tracks laid on concrete, however, are more susceptible to corrugation than those laid on more resilient material, and rail corrugation, which was at one time observable only in a few special places on the Melbourne tramways, developed very rapidly during the last few years, and became serious on some tracks before the Board could obtain the necessary equipment for dealing with it. It was this corrugation of the main routes near and in the city which was undoubtedly the basis of the serious complaints made a year or eighteen months ago. The Board has now two planing machines in service, and the improvement on the tracks which have been treated is most marked. Over 15 miles of tracks have already been planed, while incipient corrugation is dealt with on other tracks by means of a special scrubber car designed in the Board's workshops.

Even where the tracks have been ground noise is occasionally produced by the presence of grit on the rails, blown from the adjoining street surfaces. Street cleaning is, of course, a matter for the councils, but the Board has recently constructed a special car for washing the dirt out of the rail grooves.

In the city considerable noise is created at the crossings, particularly those where the electric track crosses the cable, and where the continuity of the rail is necessarily broken to permit the passage of the grip. In all-electric crossings flange bearing special work is adopted as standard, and this is the subject of special maintenance, as it is necessary to build up the work by welding from time to time. Tenders have been obtained for special grinding machines with a view to improving these crossings.

In the rolling stock the most fruitful source of noise is the gears, and of these the Board has always purchased the best quality. All the so-called "noiseless" gears developed in recent years have been tried without any improvement, but experiments are still being continued. The Board was amongst the first to start on the development of a worm gearing for use in tramcars, and is also experimenting in other directions. Many changes have been made in the minor portions of the equipment of the car. The Board's standard of maintenance is higher than that adopted elsewhere, in that the amount of wear allowed before renewal is very small.

The question of flat wheels, a common source of noise, receives very careful consideration. A special plant is now being installed for grinding the wheels without removing them from the cars. Up to now the practice has been to use carborundum brake blocks until the flat is removed, or, if the flat is very bad, to turn it out in the wheel lathe.

WATTLE PARK.

Wattle Park was purchased by the Hawthorn Tramways Trust in 1917 for £9000, for which the Trust issued debentures. It has an area of 137 acres. The Board took over the debenture liability on the Park, which has since been paid off. It is developing the Park as a place of recreation and amusement as well as a beauty spot. On the north-eastern slopes the natural timber has been preserved and improved. The area has been proclaimed a bird sanctuary. Over 7000 trees have been planted, and of these 6000 are wattles, most of which are in plantations around the boundary of the Park. Willows and poplars are being planted along the sides of the watercourse running through the Park, while native shrubs and wattles have been put in by the Field Naturalists' Club, the Wattle League of Victoria, and by State School scholars. A chalet for refreshments has been built, and a sports oval and a miniature lake constructed; children's playgrounds have been made and equipped, and picnic stances arranged and supplied with water and other conveniences. Cable car dummies have been transformed into shelters and places where more formal meals can be enjoyed. The Park is becoming increasingly popular. A frequent service is maintained on Saturday and Sunday afternoons, and as many as 30,000 people visited the Park on one day. The land value of the Park is now estimated at £125,000.

REPLACEMENT OF TRAMS BY BUSES.

This matter has been the subject of investigation and report by the Parliamentary Committee of Public Accounts. Exhaustive evidence on the question was submitted to the Committee by the late Mr. W. O. Strangward, Secretary to the Board. The findings of that Committee were reported to Parliament on 22nd November, 1927. Stated shortly, the Committee estimated that it would require 1500 buses, running 45,000,000 bus miles, to carry 224,000,000 passengers (the number carried by the tramways in 1927), which would mean an annual cost, exclusive of interest or capital depreciation, of £3,375,000. On the other hand, the cost of carrying these 224,000,000 passengers by electric car would be only £1,799,000. The extra cost, therefore, if motor bus transport was in operation would be £1,576,000 per annum. Against that loss should be placed a saving of £190,000 per annum in capital charges, but such saving is offset by the necessity to pay the interest charge of £192,500 on a debt of £3,500,000.

1927

In addition, the obligation to pay off the debenture liabilities outstanding of the tramway undertaking would still remain. It would also be imperative to reconstruct many roads in order to render them capable of carrying motor bus traffic. These roads, the Committee estimated, could not be made for less than £4,000,000, which would mean an annual expenditure of £320,000 in interest and sinking fund charges. Probably one-half of that amount would be charged against the bus undertaking by the municipalities, though before that could be done a special Act of Parliament would be necessary. Summing up, the Committee expressed the view that the total additional annual cost to the community of substituting motor buses for electric trams would be £1,878,500, and that "the suggestion of a bus service in place of the existing tramway service cannot be entertained."

MOTOR OMNIBUSES.

The Board is using motor omnibuses during the conversion of the cable lines and for the development of outlying sections of the metropolis. A small fleet was put into service at Williamstown, and another between Balwyn road and Victoria Bridge. The Board in 1925 made an application to the Minister for Public Works for a route between Essendon and Ivanhoe. This application was refused, and the route was allocated to private bus operators. Only certain sections of the route, however, were, or are being, operated. The Board has had prepared for the councils interested an estimate, showing the cost of operating the route between Essendon and Heidelberg by trolley buses and petrol-driven buses.

For a certain class of service the bus has an advantage over the tramcar. It eliminates the tram tracks, sub-station plant, feeders and overhead lines. Its mobility permits of the testing of routes and the varying of such as occasion may require; passengers may be picked up at the kerb. The development of outlying districts where a close headway is not required can best be met by the use of buses.

These advantages are offset by the heavier operating charges. This is due mainly to the fact that each bus has to carry its own small power plant, which has characteristics less suitable for traction work than the electric motor supplied with current from a generating station, as it has to be combined with an elaborate transmission system. Both engine and transmission are costly to maintain. The cost of maintenance of tires alone is equivalent to a considerable proportion of the average cost of maintenance and renewals of track in Melbourne, which includes the upkeep of the paving of 19 feet of the roadway.

As the capital cost of track and overhead is independent of the number of cars used, the fixed charges per car mile are considerable on routes carrying a light service, but become

relatively unimportant on densely loaded routes such as the main lines in the city and inner suburbs. Fixed charges per bus mile on the bus system, on the other hand, do not vary materially with the number of buses employed.

Buses are, therefore, peculiarly suited for developmental services in the suburbs where definite traffic routes have not been established, and where the demand for transport is satisfied by a regular though infrequent service, and where the full seating capacity of the vehicle is not generally exceeded.

When, however, as occurs on our main routes, the number of passengers is the dominating factor, the true basis of cost is the passenger mile—the superior economy of the tram then becomes manifest.

Intermediate between the petrol omnibus and the electric tramcar is the electric trolley bus, taking its power from the overhead wires like a tramcar. It is more economic as an adjunct to a tramway system when the interval or headway between cars is more than six and less than twenty minutes.

The Board's view in no way differs from that of authorities the world over. This is that the electric tramcar is, par excellence, the vehicle for dense city transport, and that the trolley and petrol bus are the most suitable vehicles for providing transport in more sparsely settled areas. The Board's policy is, however, to extend the use of the electric tram as far as is possible by using the profits of the central system to balance the losses on tramway extensions during their developmental period. This is done in order that the residents of the outer suburbs may make the journey without changing vehicles, as they would have to do were each type of vehicle restricted to its own economic sphere.

ALLEGED OBSOLESCENCE OF TRAMWAYS.

At frequent intervals statements have appeared in certain sections of the press in Australia and elsewhere to the effect that tramways have become obsolete as a means of street passenger transport, and are everywhere being superseded by motor buses. A list of more than 50 cities in Great Britain has been given, which it is alleged have abandoned, or are about to abandon, their tramways. The statements made are quite misleading. The annual report of the British Ministry of Transport, issued in November last, reviewed the position of tramways in Great Britain for the five years ending the municipal year of 1928. Over that period the track mileage of tramways showed a net increase of 62½ miles. Six towns in England and one in Scotland abandoned their tramways. With the exceptions of Wolverhampton and Ipswich, which had 13.95 miles and 10.64 miles of track respectively, none of the others exceeded seven

track miles. On the other hand, nine cities (the largest outside London) actually added to their systems. Fuller particulars are given in Appendix II.

As to the towns which abandoned their tramways, the necessity for so doing arose from the fact that the tracks required complete renewal. It was found that the cost of such renewal, having regard to the earning capacity of the tramways in question, was prohibitive. A form of transport had, therefore, to be found which would not involve such high fixed charges. Faced with the task of renewing worn-out tracks and rolling stock put down or built 25 years ago, these municipalities changed over mainly to trackless trolley buses, operated from overhead wires in a manner similar to tramcars.

So far as large cities are concerned, it can be stated quite definitely that not only in Great Britain, but generally throughout the world, tramway authorities are spending large sums on extensions and new rolling stock. Glasgow, for instance, is considering the erection of another large generating station, and has embarked upon an extensive tramcar building programme, the new features of which are upholstered seats and electric heating in winter. Liverpool has just completed tramway workshops at a cost of £500,000. Last year the municipal tramways of Great Britain carried the record number of passengers—viz., 4,140,472,553, or 36 per cent. more than the number carried in 1913. In the United States the electric tramways for 1928 dealt with 15,250,000,000 passengers—more than eight times the population of the earth. Every twenty days the same electric tramways transported more passengers than all the railways of the United States carried throughout the year. In analysing the returns showing the number of passengers carried by electric tramways and motor buses for the years 1922 to 1928 inclusive, the "Electric Railway Journal" says:—

"The important fact is that neither the increased use of buses nor the enormous increases in the registration of private automobiles has materially reduced the number of passengers who depend upon electric tramways for their daily transportation."

Every large city in the world employs tramways, and in every case (except London) they carry the bulk of the surface passenger traffic. In Berlin, for instance, the trams last year dealt with 825,000,000 passengers as compared with 156,000,000 carried by the buses. In Brussels the bus traffic is negligible. In Buenos Aires the trams transported 675,000,000 passengers as against 190,000,000 bus passengers; in Glasgow, 466,142,258 passengers as compared with 6,271,172 carried by the buses; in Manchester, 328,013,199, as against 14,831,488; in Birmingham (one of the cities alleged to be abandoning tramways), 254,125,984, against 62,353,311; and in Bradford, 112,367,506, against 8,477,742; while in Melbourne the tramways transported

220,000,000 passengers and only 4,500,000 by buses. On one day—the 21st December last—Melbourne's trams carried no fewer than 906,219 passengers.

Regarding London, the tramways owned by the London County Council alone carried 714,175,261 passengers in 1928. There is no movement to "scrap the trams" in London. On the contrary, Lord Ashfield, the Chairman of the London General Omnibus Company and the Underground Group of London, has stated that no vehicle yet invented can compete with the modern tramcar in mass transportation, while Sir Henry Jackson, a member of the London Traffic Advisory Committee, speaking in the House of Commons in February last, said:—

"Any person who says that the London tramways ought to be scrapped should be in Bedlam."

Further confirmation of these views may be found in the statement made to the press by Mr. S. A. Maddocks, Traffic Expert to the New South Wales Government, on his recent return from a tour of the Continent, Great Britain and the United States, taken with the object of investigating transport problems. Mr. Maddocks said:—

"Statements have been made that tramways are obsolete and should be replaced by buses. There is not a single city of importance in the world where trams have been scrapped in favour of buses. The value of bus transportation is recognised everywhere, and buses are being used to supplement the tramway systems. It is the opinion, however, of the experts with whom I conferred that whenever there is a considerable concentration of population to be moved at the peak hours trams are still the most efficient and economical method of transport."

COMMUNITY SERVICES.

One of the scarcely realised services rendered by the Board to the municipalities, and, therefore, to the ratepayers of the metropolitan area, is that in connection with road paving. Generally the best roads in the suburban districts are those on which tramways run. The Board makes and maintains that portion of the roadway between the outer tramway rails and 18 inches on either side. The municipalities concerned are thereby saved the expense of making and maintaining on the average 17 feet in width of roadway. When it is remembered that at present costs this extent of road paving would, in the absence of tramways, have involved the municipalities concerned in an expenditure estimated at £1,500,000, with an added annual expenditure of £250,000 for maintenance, interest, etc., it can fairly be claimed that the Board has provided a liberal endowment for the municipalities. The Board also pays rates upon its tram tracks amounting to £15,000 a year. The Board has expended £650,000 in maintaining street surfaces for the use and benefit of non-tramway traffic.

In conformity with the practice followed by certain of the Municipal Tramway Trusts, the Board continues to provide lighting for 80 miles of streets traversed by the electric tramways at a cost of £9000 annually.

The Board's contribution towards the cost of the erection of bridges, the abolition of railway crossings, the widening of streets, and the rounding of corners has up to date amounted to the sum of £103,619. The advantages arising from the above expenditure are enjoyed by all non-tramway road users without any contribution by them to their cost.

Further, the Board grants free travelling to disabled soldiers, police in uniform, blind soldiers and their attendants, and blind persons. "Workmen's" fares are issued on the cable lines, giving a return journey for the price of a single fare. School children on all lines are carried to and from school at rates much below cost. It is estimated that these concessions amount to over £30,000 per annum.

FINANCIAL BURDENS.

The Board started on its career with high hopes and an eager desire to meet the reasonable wishes of municipalities with regard to tramway extensions. Very early, however, it found that the dominating problem would be that of finance. Under the constitution of the Suburban Tramway Trusts the most that could be set aside per annum to the Reserve Funds was 2½ per cent. **upon the renewable portions of the undertakings.** Under the Board's Act, the minimum sum to be transferred to the Renewals and General Reserve Funds was 4 per cent. **upon the Capital Cost of the Undertaking.** That was a tremendous difference. It formed, indeed, as the Board soon discovered, an obligation greater than could be fulfilled by the electric lines taken over from the Suburban Tramway Trusts. The burden of meeting this charge, therefore, largely fell upon the Cable System. That was not all, however. Two other burdens were imposed upon the Board. The first was, as already explained, the taking of £61,000 from the revenues of the Board in order to fulfil the estimate that £827,000 would be at the credit of the Cable Tramways Board on 31st October, 1919, and the second was the contribution to the Consolidated Revenue of the State in respect to the Fire Brigades Board, the Infectious Diseases Hospital, and the Licensing Fund. When the Bill was being discussed in Parliament, it was estimated that these payments would amount to £70,000 per annum. Actually the lowest payment by the Board was £56,783 for the nine months which ended on June 30th, 1920. For the year which closed on June 30th last, the payment reached £118,000. In all the Consolidated Revenue has received from the Board £971,931. The annual

payments and their allocation are set out in Appendix III. Notwithstanding these facts, which were made fully known from time to time in the Board's Annual Reports, and explained in detail to numerous deputations, the demand for tramway extensions became more and more insistent from year to year. The failure of the Board to react favourably to these requests for tramways by municipalities and Progress Associations became a source of increasing criticism of the Board's policy and its activities by those who were indifferent to the financial consequences so long as they could get their desires gratified.

Had the sums paid into the Consolidated Revenue of the State (amounting to £971,931) been available for general tramway purposes, the utility of the tramways could have been greatly increased. Extensions could have been effected, the rate of conversion of the cable system could have been hastened, and obsolescent rolling stock retired and replaced by new and modern designs of tramcars. The public demand is for increasing comfort in transport vehicles, and the Board has to face the matter of obsolescence by retiring types of rolling stock which are no longer popular, and make available to the community the latest developments in the transportation art.

There are several phases of car design which would have been pressed forward much more rapidly if the Board had had at its disposal the necessary funds for the purpose.

WHAT THE BOARD HAS ACCOMPLISHED.

Notwithstanding the many difficulties under which it has laboured, the Board may claim a record of steady accomplishment. The work of unification, conversion and extension has proceeded uninterruptedly. By the St. Kilda road conversion, suburbs which had previously possessed truncated lines were brought into direct communication with the city, thereby avoiding the change of cars at inconvenient points, while that electrification, allied with the extension of the Brighton road line to Elsternwick, made possible the through-routing of cars from south to north. Examples of long through runs are:—St. Kilda-East Preston, 11.761 miles; St. Kilda-West Preston, 11.659 miles; North Coburg-Esplanade, 11.290 miles; Elsternwick-East Coburg, 10.517; Camberwell-City, 9.980 miles. The details of conversions will be found in Appendix IV.

For the general improvement of the system many duplications of single track have been effected, and additional loops and crossovers have been constructed. This work has involved an expenditure of over £300,000. Details are given in Appendix V.

The increased service given by the Board is illustrated by reference to the number of miles run and the number of passengers carried. From 1920 the mileage has advanced year

by year from 18,800,000 to 24,500,00 in 1926, and the passengers from 194,000,000 to 234,000,000. Slight decreases have taken place since, due partly to a redistribution of traffic between the various competing modes of transport, and partly to through-routing, under which only one journey is counted in place of two. The industrial depression which has been so marked, particularly during the later months of the last financial year, has also been a contributing factor.

There has been a steady increase also in the track mileage of tramways. Beginning with 201 single track miles, the Board has now 270 track miles of tramways in operation.

Two years ago the Board decided to try an experiment with tourist traffic. For that purpose a special tram, with good observation features, was put into commission. From Monday to Friday inclusive the tram toured the southern and eastern suburbs twice daily during the spring, summer and autumn months. The experiment was most successful. Visitors from the United Kingdom, the United States, Canada, New Zealand, South Africa, India, Ceylon, France, Germany, Spain, Malta, Italy, and every State in the Commonwealth found in the tram a cheap and comfortable method of obtaining a good idea of the extent and beauties of the metropolis. The conductor in charge directed attention to the points of interest en route, and helped considerably to make the tour attractive. More than 42,000 people have patronised this tour. This year the Board has placed a tourist motor bus in service. Six trips, varying from 18 to 22 miles, and including all the districts of the metropolis, have been arranged. These promise to be as popular as the tram tour.

The Board is fortunate in the possession of a highly-trained technical staff, who have at all times rendered loyal and disinterested service. No review of the Board's work during the last nine and three-quarter years would be complete which omitted to mention the ability which the staff has shown at all times, and particularly during the difficult task involved in the conversion of the cable system.

By authority of the Board,



Chairman.

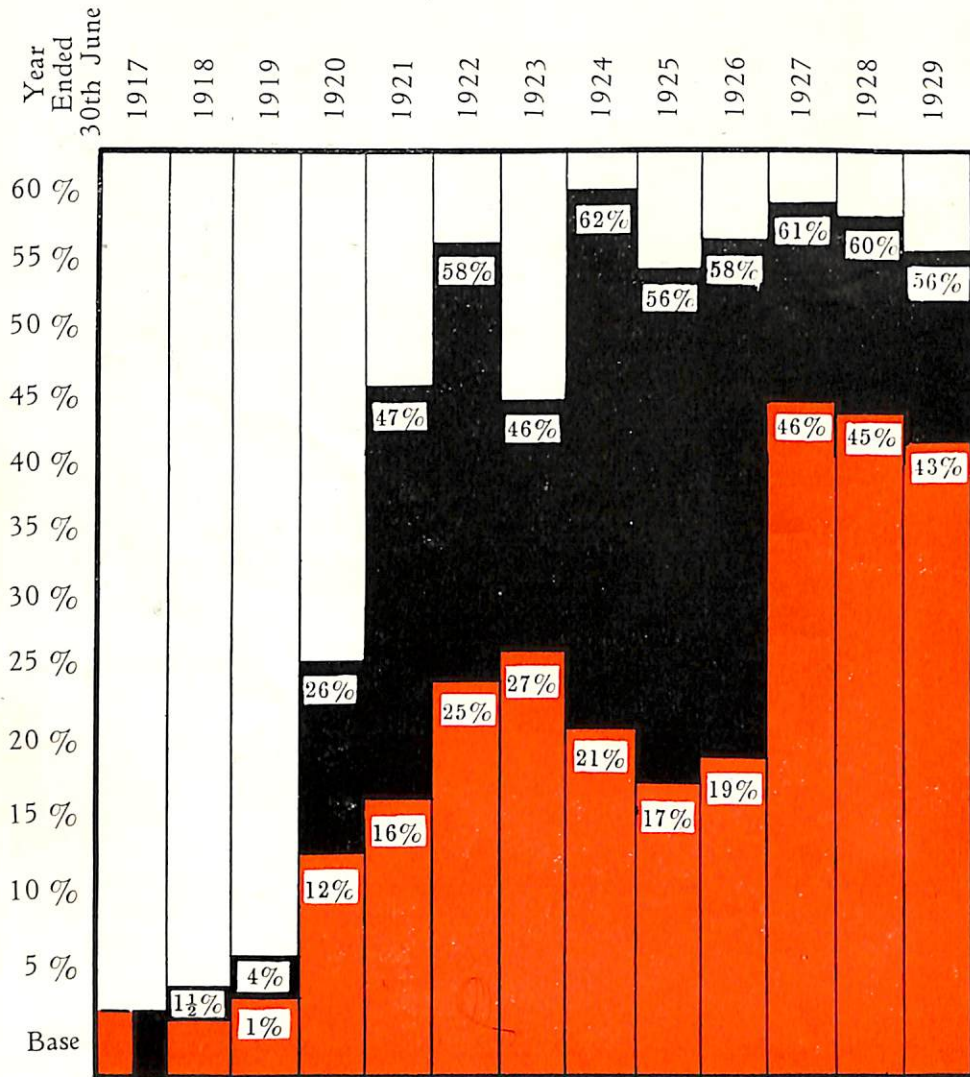
20th September, 1929.

STATISTICAL SUMMARY.

Route Mileage of Double Electric Track Constructed	55½
Route Mileage of Double Cable Track Converted	15
Single Track Mileage of Existing Tramways ...	270
Number of Employees	5,308
Tram and Bus Miles Run	224,106,116
Passengers Carried	2,188,961,871
Traffic Receipts	£20,174,457
Obligations Transferred to the Board	£1,383,532
New Loans Raised	£4,500,000
Repayments	£419,165
Board's Indebtedness at 30th June, 1929	£5,464,367
Salaries and Wages	£12,245,396
Paid to the Consolidated Revenue	£971,931
Cost of Conversions	£762,413
Cost of Extensions	£667,866
Cost of Duplications	£225,105
Cost of Tracks in Depot Yards	£60,306
Cost of Loops	£15,871
Preston Workshops	£326,300
New Trams Built	£1,116,000
Street and Track Maintenance	£738,688
New Tram Depots	£161,000
Depots Taken Over by Board and Completed ...	£16,500
Extensions to Tram Depots	£91,600
Converter Stations	£45,000
Contributions to Bridges, Street Improvements, etc.	£103,600
Lighting 80 Miles of Streets	£70,000
Wattle Park	£31,000

CABLE AND ELECTRIC TRAMWAYS

GRAPH showing PERCENTAGE INCREASE of TRAFFIC RECEIPTS per CAR MILE (Red) compared with PERCENTAGE INCREASE in WAGES of DRIVERS and CONDUCTORS per CAR MILE (Black).



TRAFFIC RECEIPTS per Car Mile and WAGES of DRIVERS and CONDUCTORS per Car Mile for YEAR ENDED 30th JUNE, 1917, taken as BASE.

Fares were INCREASED on 7th March, 1921, and again on 1st May, 1926.

APPENDIX I.

REQUESTED TRAMWAY EXTENSIONS.

	Approx. Length in Chains.
North Road to Sandringham, by Hawthorn Road, Union Street, Point Nepean Road, Bay Street, Hampton Street, South Road to Railway Line	276
Bay Street, from Hampton Street, to Port Phillip Bay	108½
Point Nepean Road to Bay Street	36
From Dendy Street to St. Kilda Street, at Park Street	108½
North Road—Ormond R.S. to the Bay	231½
Centre Road—Bentleigh R.S. to Hampton Street	133
South Road—Moorabbin R.S. to Brighton Beach	217
South Road—Hampton Street to Sandringham R.S.	124
South Road, Bluff Road, and Royal Avenue	149
Bentleigh R.S. to Boundary Road	100
Footscray—Summerhill Road to Sunshine	282
East Brunswick—Nicholson St. Cable Terminus to Albion St. Brunswick—Nicholson Street to Holmes Road	100
Brunswick Road East and Nicholson Street Intersection to Essendon, Footscray, and Back Beach, Williamstown	123
Brunswick and Coburg—Queen Street, from Flinders Street Corner, to Sussex Street, at Corner of Gaffney Road	910
Caulfield—From the River Yarra at Heyington to North Road, and so down to the Beach	663
Continuation of Brighton Road Line along Point Nepean Road and North Road to Ormond R.S.	463
Glenhuntly Road—Extension to Oakleigh	304½
Gleneira Road—From Beach to Byron Street, to Caulfield R.S. Koornang Road—From North Road, by Lower Malvern Road, to Burke Road	220½
Camberwell—From Gleneira R.S. to Boundary Road	278
Boundary Road, from High Street to Norwood Road	293
Preston—Regent Street to Edwardes' Park	162
Extension to Reservoir R.S. along Bell Street from Plenty Road, Preston, to Nicholson Street, Coburg	81
Footscray—Barkly Street to Braybrook Boundary	86
From Intersection of Napier and Nicholson Streets to Maribyrnong River, Dudley Street, and Docks Road to Intersection of Flinders and Spencer Streets	174
Gleneira Road Tramway League—From Murrumbeena by Gleneira Road to the Beach	50
Hawthorn—Burwood Road and Camberwell Road	319
Heidelberg—Station Street, from Heidelberg Road to Edwin Street	400
Livingstone Street, from Darebin Creek to Waterdale Road	150
Heidelberg Road, from Queen's Parade to Railway Opposite Rocke Street	78
Upper Heidelberg Road, from Rocke Street to Bell Street	52
Lower Heidelberg Road, from Rocke Street to Corner Plenty Road and Bell Street	278
Waterdale Road, from Upper Heidelberg Road to Bell Street	118
	256
	94

	Approx. Length in Chains.
Kew—Along Willsmere Road, Princess Street, Church Street to Burwood Road East of Hawthorn Bridge	133
Extension of High Street Line from Strathalbyn Street to Burke Road	59
Barker's Road—High Street to Burke Road	157
Studley Park and Johnston Street Bridge Roads, from High Street to Johnston Street Bridge	118
Coburg—Baker's Road to Cemetery Gates	78
Malvern—Electrification and Extension of Tramway along Toorak Road from Burke Road to Chapel Street, Church Street and Swan Street, and on to Victoria Parade	467½
Tooronga Road, from Wattletree Road to Dandenong Road	55
Burke Road, from Malvern Road to Waverley Road	119
Extension of Waverley Road Line, from Darling Road to Malvern Road	37
Extension of Wattletree Road Line to Malvern Road, and by Belgrave Road to Dandenong Road	150
Further Extension from Belgrave Road to Warrigal Road	106
Nunawading—From Boundary Road to Elgar Road, and then on to Box Hill R.S.	203
Northcote—From High Street to U.K. Hotel, Clifton Hill	301
Oakleigh—Darling Road Line to be Extended via Waverley Road to Box Hill Road, Oakleigh	266
Extension of Glenhuntly Road Line to Warrigal Road	220½
Point Nepean Road—Ormond R.S. to Warrigal Road and on to Dandenong Road	205
Extension from Burwood Road Terminus to Beach Road, Mentone	795
Prahran—Intersection High Street and St. Kilda Road to St. Kilda, by Lorne Street, Albert Park	87½
Preston—From Nicholson Street, Coburg, to Plenty Road, Preston, via Bell Street	124
Werribee—From the Intersection of Geelong and Williamstown Roads to Altona Beach	500
Intersection of Blackshaw Road and the Proposed Main Brunswick-Williamstown Line, along Blackshaw Road, to Connect with the Altona-Geelong Road Line	193
Intersection of Somerville-Williamstown Roads, along Yarra or Somerville Road, to Geelong Road	60
Williamstown—Intersection of Melbourne and Station Roads to Morris Street at the Railway	100
Nunawading—Along Whitehorse Road from Union Road to Middlesborough Road	175
Burwood Road Terminus to Station Street	107
Northern Municipalities—Essendon to Heidelberg	740
Approximate Total Length	162 Miles

APPENDIX II.

TRAMWAYS IN GREAT BRITAIN.

Decreases in Period 1923-1928.

	Route Mileage. 1923.	Route Mileage. 1928.	Decrease.
Chesterfield	3.61	—	3.61
Ipswich	10.64	—	10.64
Keighley	3.30	—	3.30
Matlock	0.50	—	0.50
West Hartlepool	6.99	—	6.99
Wolverhampton	13.95	2.83	11.12
Kilmarnock	4.19	—	4.19

Increases in Period 1923-1928.

	Route Mileage. 1923.	Route Mileage. 1928.	Increase.
Glasgow	113.51	148.91	35.40
Manchester	106.59	119.09	12.50
Birmingham	69.00	78.58	9.58
Edinburgh	33.09	42.21	9.12
Sheffield	41.95	49.12	7.17
Bolton	27.15	32.98	5.83
Newcastle	45.69	50.83	5.14
Leeds	65.04	70.04	5.00
Liverpool	79.33	84.26	4.93

APPENDIX III.

PAYMENTS TO CONSOLIDATED REVENUE.

Year Ended 30th June.	Total Annual Payments.	Metropolitan Fire Brigades Board.	Licensing Fund.	Queen's Memorial Infectious Diseases Hospital.
1920 (9 months)	£56,783	£23,806	£19,699	£13,277
1921	84,355	39,016	25,070	20,269
1922	98,106	41,898	24,870	31,338
1923	93,010	40,903	24,726	27,380
1924	92,998	43,956	24,194	24,848
1925	106,211	50,406	23,934	31,871
1926	104,392	52,680	23,342	28,370
1927	108,453	56,651	22,678	29,124
1928	109,252	59,256	22,518	27,478
1929	118,368	60,848	22,498	35,022
	£971,931	£469,422	£233,529	£268,979

(Shillings and Pence Omitted.)

APPENDIX IV.

CONVERSIONS.

Flemington Road (Portion of Essendon Tramways)	£31,851
Wellington Street, Esplanade	80,154
St. Kilda Road, Swanston Street	243,543
Prahran and Toorak	215,932
Richmond	167,494
Queensberry Street to Lonsdale Street	18,100
Victoria Street and Fitzroy (Preliminary Work)	4,006
Clifton Hill (Preliminary Work)	909
South and Port Melbourne (Preliminary Work)	420
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	£762,413

(Shillings and Pence Omitted.)

APPENDIX V.

DUPLICATIONS.

Footscray—	Buckley, Victoria, Charles & Gamon Streets	£14,643
	Barkly Street	20,999
	Droop Street	13,145
	Ballarat Road	10,052
Whitehorse Rd.—	Railway to Breubeal Road	16,067
	Wharton Street to Union Road	6,955
Waverley Rd.—	Tennyson Street to Darling Road	4,957
Riversdale Rd.—	To Wattle Valley Road, from Burke Road	24,307
	Wattle Valley Road to Middlesex Street	5,184
Glenhuntly Rd.—	Hawthorn Road to Laura Street	6,541
	Laura Street to Railway	5,795
Pascoe Vale Rd.—	Buckley Street to Dean Street	9,567
Maribyrnong Rd.—	Union Road to Hotham Street	2,743
Camberwell Rd.—	Bowen Street to Smith Street	10,028
Preston—	Plenty Road	8,094
	Miller St.—St. George's Rd. to Gilbert Rd.	7,665
	Gilbert Road—Miller Street to Bell Street	5,117
	Plenty Rd.—Dundas St. to Garnet St.	7,948
	Surfacing Gilbert Road	121
	Plenty Rd.—Garnet St. to Near Terminus	4,934
	Gilbert Road—Bell Street to May Street	10,256
Coburg—	East Ccberg	6,294
	Nicholson Street—Edna St. to Bell St.	2,040
	Sydney Road—North of Gaffney Road	2,108
Norwood Rd.—	Through Road to Smith Street	9,293
High St., Malvern—	Edgar Street to Burke Road	10,238
	<hr/>	
		£225,105

(Shillings and Pence Omitted.)

APPENDIX V.—Continued.

EXTENSIONS.

Keilor Road to Gillies Street, Essendon	£5,811
Church Street, Hawthorn—Bridge Road to Barker's Road	16,491
Napier Street, Essendon	2,327
Chapel Street—Church Street, Richmond	79,408
High Street, East Kew—Strathalbyn Street to Burke Road	13,203
	3,048
Hawthorn Road, Caulfield—Glenhuntly Road to North Road	20,909
Holden Street—Lygon Street to St. George's Road	32,772
South Melbourne—Princes Bridge St. Kilda Esplanade	122,409
West Brunswick—Collins St., Melbourne—Bell St., West Coburg	212,559
Hanna Street and Park Street, South Melbourne	6,418
Brighton Road Extension to Elsternwick Station	21,990
Chapel Street Extension to Brighton Road	12,366
Glenhuntly Road—Grange Road—Kcoornang Road	10,391
Toorak Road Extension—Irving Road to Glenferrie Road	21,154
Spencer Street, Melbourne—Bourke Street to Lonsdale Street	7,064
Wattletree Road, Malvern—Glenferrie Road to Dandenong Road	31,468
Riversdale Road, Surrey Hills—Boundary Road to Elgar Road	10,635
Wellington Street (East Melbourne) Siding	5,227
Flemington Road to Swanston Street Connection	12,964
Lonsdale Street Cable Tramway	19,243
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	£667,866

(Shillings and Pence Omitted.)

LOOPS.

Mount Alexander Road, at Glen Street	£354
Trafalgar Road Loop	677
Camberwell Road Loops at Norwood Road and Through Road	1,887
Bowen Street Loop	2,680
Riversdale Road Loop at Railway	1,350
Two Shunts at Hawthorn Bridge	170
Fletcher Street Loop	881
Racecourse Road Crossover at Ascot Vale Road	441
Preston—Loop at Gower Street	613
Loop at Dundas Street	1,385
Flinders Street to Swanston Street Curve	1,129
Brighton Road to Point Ormond Curve	4,299
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	£15,871

(Shillings and Pence Omitted.)

DEPOT YARDS.

Glenhuntly—Depot Yard and Roads into Depot and Special Work	£11,181
Essendon—Depot Extension, etc.	6,651
Coburg—Depot Extension, Tracks and Special Work	2,977
Preston Workshops—Tracks, Special Work, etc.	25,370
South Melbourne (Hanna St. Depot)—Tracks and Special Work	8,971
Kew Depot Extension—Tracks and Special Work	5,154
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	£60,306

(Shillings and Pence Omitted.)

MOORE-YOUNG
-- LITHO CO. --
MELBOURNE