

*C. J. Munn*

# Prahran and Malvern Tramways Trust.

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## Proposed New Tramway Lines

Upon which the Trust has been asked to Report  
With a View to Constructing and Operating the Same  
in Connection with its Undertaking.

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The Prahran Telegraph Printing Co., King Street, Prahran.

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1915.

# Prahran and Malvern Tramways Trust.

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The Prahran and Malvern Tramways Trust has, at the request of the various Municipalities concerned, the honor to report upon the following proposed electric tramway lines in view of the Trust being asked to construct and operate the same.

## TOORAK ROAD.

From the terminus of the Cable Tramway in Prahran, to Burke Road, Hawthorn. Approximately 1.85 miles.

## GLEN EIRA ROAD.

From Murrumbeena Railway Station to Barkly Street, St. Kilda. Approximately 5 miles.

## BRIGHTON AND MOORABBIN.

From Glen Huntly Road, via Hawthorn Road, North Road, Milroy Street, to St. Kilda Street, and along Hampton Road to Sandringham. Approximately 7.4 miles.

## SOUTH MELBOURNE AND ST. KILDA.

Princes Bridge to Fraser Street, Middle Park, and Fitzroy Street, St. Kilda, and a connecting line from Commercial Road, via Queen's Place N., Queen's Road, Roy Street, to Albert Road. Approximately 4.85 miles.

## PRINCESS STREET AND WILLSMERE ROAD, KEW.

From the outer circle railway, to the existing line in High Street, Kew. Approximately 1 mile.

## TOORONGA ROAD, MALVERN.

From the intersection of Tooronga and Wattle Tree Roads, Southward to junction with the Waverley Road line, near Caulfield Station. Approximately 1 mile.

## BRIGHTON ROAD, ST. KILDA.

From the terminus of the Brighton Road cable tramway to join the Trust's Glen Huntly Road tramway. Approximately .830 miles.

Total route mileage proposed, approximately 22 miles.

## DENSITY OF POPULATION REQUIRED TO JUSTIFY AN ELECTRIC TRAMWAY.

It may be safely assumed that unless a district is sufficiently populous to require a tramway service of an *average* interval of 10 minutes (e.g., a five or seven minute service during the busy hours of the day, and on special days, and a fifteen minute service during the remainder of the time), the heavy capital outlay entailed in installing an electric tramway is unjustifiable.

A ten minute average service entails the running of 70,000 car miles per mile of route per annum.

The revenue required per car mile to cover all outgoings, including interest, Sinking Fund and Renewals Reserve Fund, is 15 pence, therefore the revenue required per mile of route is about £4375 per annum.

The revenue per head of population served varies greatly upon different systems, being highest, of course, in places where the tramway system constitutes the sole means, or practically the sole means of communication between the business area of a City and the Suburbs.

The following figures are from the published statistics of various systems:—

### ANNUAL REVENUE PER HEAD OF POPULATION SERVED.

Adelaide . . . . .	45/-
Wellington, N.Z. . . . .	45/-
Launceston, Tasmania . . . . .	14/9
Sydney . . . . .	42/-
Prahran and Malvern Tramways Trust	19/-
Fremantle . . . . . (1909)	16/6

The amount of 19/- per head of population served on the lines of the Prahran and Malvern Tramways Trust is the highest

figure yet attained by the Trust over a complete year, and the figures since the opening of these lines are as follows:—

Four months ending 30th September, 1910 . .	11/4
Twelve months ending 30th September, 1911	12/-
"    "    "    30th September, 1912	15/4
"    "    "    30th September, 1913	17/7
"    "    "    30th September, 1914	19/-
Six months ending 31st March, 1915 . . . . .	19/9

It will be seen, therefore, that there has been a steady growth in the travelling habit of the population in the districts served, and it would be inadvisable to assume an earning power of 19/- per head in respect of new lines.

It would, in the Trust's opinion, be safe to take 15/- per head as a figure likely to be attained within a reasonable time of the opening of suburban lines of the character of those proposed.

On the basis of an average service of ten minute interval, and a revenue of 15/- per head, it is evident that a population of about 5800 per mile of route is one of the essential requirements for a paying line.

A table is appended showing mileage of tramway and population per mile in the various districts in which the Trust is now operating tramways, and also in cities in neighbouring States.

#### COST OF CONSTRUCTION AND OPERATION.

There has been a steady and continuous increase in the construction costs during the period of operation of the Trust, and at the present time, owing to the abnormal conditions resulting from the War, the cost of tramway construction, except in the case of a very payable line, is almost prohibitive.

Taking those items which are common to all lines, and ignoring extra expenditure, such as alterations to gas and water mains, sewer manholes, overhead wires, railway and tramway crossings, etc., the cost per mile of double track rose from about £11,300 per mile in 1912, to £12,500 in 1914, before the outbreak of War.

The cost at the present time of the items common to all lines, owing to extra duties, increased freight and insurance, and high cost of materials and manufacture, would probably be at least £14,000. At the same time, operating costs, largely as the result

of increased wages, due to the Agreement with Employees, approved by the Court of Conciliation and Arbitration, have risen from 8.458 pence in 1911, to 10.73 pence in 1915.

A comparative table showing the gradual increase in operating and interest charges since the inception of the Trust's tramways is given below:—

	1910.	1911.	1912.	1913.	1914	1915.
Operating Costs	8.424	8.458	8.409	9.563	10.374	10.730
Interest . . . . .	1.742	2.006	1.868	2.274	2.565	2.861
	10.166	10.464	10.277	11.837	12.939	13.591

With regard to the specific proposals now before the Trust, it reports as follows:—

#### TOORAK ROAD.

From the terminus of the Cable Tramway in Prahran, to Burke Road, Hawthorn. The length of the proposed line is about 1.85 miles.

A considerable portion of the road in Hawthorn is at present ungraded. Without making allowance for any extra cost that would be entailed in respect of this portion of the road, the cost of constructing the line would be about £27,000.

The annual car mileage on the basis of an average ten minute service would be 127,000, and the revenue necessary to meet the cost of the same £7900.

The district is very thinly populated, and apart from occasional traffic, the tramway would have to draw its revenue from a resident population, within a quarter of a mile of each side of the proposed line, not exceeding 1500 for the first year at least, which, at 15/- per head of population, would be £1125 per annum.

It is quite true that the line would open up a very desirable area for settlement, but there could not fail to be a heavy loss involved in the operation of it for some years.

With regard to the possible electrification of the Toorak Road Cable Line: if this should be carried out, and a connection with the line about to be constructed in Swan Street, Richmond, made, via Chapel Street, North, a direct electric route into Melbourne

would be obtained. This would materially improve the prospects of the Extension under discussion, but until that is done, the proposed line in Toorak Road would not be commercially justifiable.

#### GLEN EIRA ROAD.

From Murrumbena Railway Station to Barkly Street, St. Kilda. The length of this proposed line is approximately 5 miles. The cost of the line and equipment would be about £75,000, to which must be added the cost of the necessary rolling stock, say, 10 cars at £1100 each, making a total capital outlay of £86,000.

There is a population of 10,300 within a quarter of a mile of each side of the proposed line.

The annual mileage on the basis of an average 10 minute service would be 350,000, and the cost of same £21,875.

That portion of the line in Glen Eira Road (about 3 miles in length), from Booran Road to Barkly Street, St. Kilda, is situated midway between the Balaclava Road and Glen Huntly Road lines, at a distance of 40 chains from each.

It has no effective outlet to the Beach at the St. Kilda end.

To construct this line would be to provide extra travelling facilities for a district already adequately catered for by the Balaclava Road and Glen Huntly Road lines. Taking into consideration the lessened density of population as one goes Southward, it is evident that parallel lines must be farther apart, if they are to return a sufficient revenue to justify their existence.

The Trust is of opinion that a district in the stage of settlement of this one, is not inadequately served by lines not more than one mile apart.

With regard to the Eastern end of the proposed line, an extension of the existing line in Glen Huntly Road to Murrumbena Railway Station, via Grange and Neerim Roads, or alternatively via Mimosa Road into Neerim Road, would fulfill all the requirements of that district for some years to come. The suggested route via Truganini Road and Coorigil Road would involve running through 50 feet streets, which are too narrow for double track.

## TRAMWAYS IN BRIGHTON AND MOORABBIN.

The proposals put forward for tramways in Brighton and Moorabbin are as follows:—

From Glen Huntly Road, along Hawthorn Road, to Union Road; along Union Road to Hampton Street; along Hampton Street to Melrose Street, Sandringham, distance = 5.096 miles; also a branch line along South Road to Brighton Beach Railway Station, distance = 0.804 miles; also a line from Hampton Street, along Bay Street, to St. Kilda Street, distance = 1.2 miles; or alternatively along New Street and Grosvenor Street, to St. Kilda Street, distance = 1.5 miles. The total of the lines comprised in these proposals is 7.4 miles, of which one mile is in Caulfield, and 1.68 miles in Moorabbin.

On the basis of the local population, these lines would not be justifiable.

The true consideration, however, is their value as pleasure traffic lines to Sandringham and the Brighton Beaches.

The traffic upon these lines would undoubtedly be largely non-residential. Lines of similar character in Adelaide and Sydney have an earning power greatly in excess of the revenue derivable from the resident population. Having regard to the attractiveness of Sandringham as a holiday resort, and that there would be direct tramway communication established with districts as remote as Kew and Camberwell, there is a good prospect of the through line via Hampton Street being remunerative during the period of Summer traffic.

It would, however, only justify an infrequent service during the winter months, except upon fine Saturday afternoons and Sundays. It is undoubtedly a line which should be included in any general scheme of tramways for the Metropolis, but one which would be too speculative an undertaking for the Municipalities of Brighton and Moorabbin to assume financial responsibility.

It is also a line which the Prahra and Malvern Tramways Trust should not undertake until its present outlying lines have reached a paying point.

With regard to the route; the Trust is of opinion that the connection with the Trust's lines should be from Hampton Street, via Milroy Street and North Road and Hawthorn Road, to the

intersection of the latter road with Glen Huntly Road, in view of the fact that it is proposed to have an extension to the Beach along Bay Street.

The Bay Street line, in order to be sufficiently revenue producing, must depend largely upon traffic from the more densely populated area lying to the North.

To form the connection to Hawthorn Road, along Union Street, would add to the length of the line and the time occupied on the journey to those passengers.

It would also cause a perpetual addition to the operating expenses in unnecessary car mileage, and therefore could not be recommended as part of a connected scheme of tramways.

With regard to the Bay Street route, an alternative route has been suggested, via New Street and Grosvenor Street, to the Beach. It is considered that this diversion is objectionable for the reason that that portion of line along New Street runs parallel to the St. Kilda-Brighton Electric Street Railway at so short a distance as almost to amount to a duplication of the latter line in that section of it.

If a diversion is to be made, the Trust is of opinion that a preferable route would be obtained via St. Andrews Street and Park Street, to the Beach.

The operation of any of these lines by this Trust would involve the provision of a Depot in Brighton, with accommodation for at least twenty (20) cars, and a source of power supply independent of the Melbourne Electric Supply Company.

This area is outside the radius that can be economically supplied with power from the Melbourne Electric Supply Company's power station at Richmond, and in view of probable early developments in the direction of a Greater Melbourne Tramways Authority, it would be inadvisable to provide a small generating station for it. The most convenient source would be the Victorian Railways Department, one of whose substations is located at Brighton Railway Station. It is questionable, however, whether the Railway Department would enter into such an arrangement.

If the Railway Commissioners are willing to provide a supply for tramways, the cost would probably be lower than the Trust's present average cost of power.

An additional depot to contain 20 cars, with necessary offices, would cost about £7000.

If the through line via Hawthorn Road, Milroy Street and Hampton Street to Sandringham were constructed to commence with, leaving the other proposals for later consideration, the capital expenditure would be about £75,000 for permanent way and overhead work, £7000 for Car Depot, and £11,000 for 10 cars; in all, £93,000.

### SOUTH MELBOURNE AND ST. KILDA TRAMWAYS.

With regard to the proposed line in South Melbourne, between Princes Bridge and Fraser Street, this has been dealt with in a report presented to the South Melbourne Council by Messrs. McCarty, Underwood & Co. in 1913. In this report, the estimated construction costs approximate very closely to what the Trust's costs were at that date.

It is necessary, however, for present consideration, to add a sum of about £5500 to the estimated costs of permanent way and overhead construction, and it should be pointed out that Messrs. McCarty, Underwood & Co.'s estimates provided for a depot capable of housing only 12 to 15 cars, and to be constructed of galvanised iron.

If the construction and operation of these lines be undertaken by this Trust, it would probably be found advisable to build accommodation for at least 20 cars, in view of the probable heavy Beach traffic to be dealt with in Summer time.

A sum of £5000 should be added to the estimate on this account, making an addition of £10,500, and increasing the estimated cost from £63,373 to £73,873.

An extension of the proposed South Melbourne line, from the intersection of Danks and Fraser Streets, via Patterson Street and Park Street, to Fitzroy Street, St. Kilda, or alternately via Patterson, Park and Mary Streets, and the Beaconsfield Parade, to Fitzroy Street. The length of this proposed extension is approximately 46 chains = 0.575 miles via Park Street, and 52 chains = 0.650 miles, via Mary Street. The additional capital cost would be about £8350 and £9440 respectively. The annual car mileage due to the extension to Fitzroy Street would be about 46,000 C.M.

This would, in the Trust's opinion, be a much better terminus for the South Melbourne line than Fraser Street, for the reason that it is near the principal points of attraction to visitors to the St. Kilda Beach, and if the proposed South Melbourne line be constructed the Trust submits that it should, in any case, be extended to Fitzroy Street.

There are two alternative proposals for a line to link up the Trust's present system with the South Melbourne line.

One is to continue the line past Fraser Street and join the Balaclava Road line via Park and Acland Streets, and the other to extend the Commercial Road line across St. Kilda Road via Queen's Place, Queen's Road and Roy Street to Albert Road.

The latter of these lines would be preferable.

An Act of Parliament is necessary to authorise the construction of this section, as it traverses a route not within the scope of the Tramways Act 1890.

The consent of the City of Melbourne Council would also be necessary. The length of this line is approximately 1.6 miles.

The only difficulty apparent is in the crossing of the cable tramway in St. Kilda Road.

Owing to there being no cross street into Queen's Road opposite Commercial Road, it would be necessary to cross the cable line at two separate points with the "Up" and "Down" electric lines, so as to obviate the necessity of any of the electric cars going in a direction opposite to the stream of general traffic.

This line would join the other South Melbourne line at Albert Road, and terminate at the corner of Kerferd Road and Beaconsfield Parade, opposite the Kerferd Road Pier.

It would cost approximately £25,000, and would provide an additional and much needed outlet to the sea front of South Melbourne and St. Kilda, besides materially improving the prospects of the other South Melbourne line.

## PRINCESS STREET AND WILLSMERE ROAD, KEW.

From the outer circle railway, to junction with the existing line in High Street, Kew. The length of this proposed line is approximately one mile. Whilst for about half a mile from the High Street end of the proposed route there is a sufficient density of population to justify a tramway, beyond that point, the population in the Willsmere Road section thins out rapidly until North of the outer circle railway line there is practically open country.

The line, therefore, would be largely developmental, and if constructed would depend for its financial success very largely upon the early settlement of the area near Willsmere Road and North of the railway.

The cost of construction would be about £14,500.

The annual car mileage, assuming a service to be run to the Victoria Street Bridge, would be about 90,000, allowing for a 10-minute service during the busy hours of the day and a 20-minute service for the remainder.

The annual cost of such a service would be £5625.

The population served by the line is estimated by the Town Clerk of Kew to be 1828.

No allowance should be made for the population resident along the line from Victoria Street Bridge to Princess Street, as that population is being adequately catered for by the services on High Street and Cotham Road.

To stop the Princess Street service at High Street would be very unsatisfactory.

The only solution of the difficulty appears to be to provide another outlet for one of the three lines which would, if all run to Victoria Street Bridge, overburden the Victoria Street end of the High Street line with mileage.

This could be very well done by constructing the short length of line in Church Street, Hawthorn, and joining the line, which is to be constructed by the Hawthorn Tramways Trust, at a point just East of the Hawthorn Bridge.

In this case it would be necessary to enter into an agreement with the Hawthorn Tramways Trust for running rights over the

Bridge. Such an arrangement should not present any difficulty.

It is evident from the figures of population and annual mileage, that a loss would be incurred by the operation of a line from Victoria Street Bridge via Princess Street to Willsmere Road. But if the Church Street line were laid and worked in conjunction with either the Princess Street or Strathalbyn Street lines there would, no doubt, be a considerable stimulus given to the whole of the Kew lines, including, of course, the proposed line under discussion.

The density of population resident along the Church Street line is good, but is not the principal factor to be taken into account in considering the advisability of constructing this line. It would form a connecting link with the densely populated area of Richmond, which population has at present no convenient means of access to Kew.

It would also, in conjunction with the cable tramway, provide an alternative route to the City, and Flinders Street and Princes Bridge Railway Stations.

The cost of a double track tramway in Church Street would be about £9000.

It is submitted, therefore, that the construction of the Princess Street line should be made contingent upon the Church Street line connection being given, and that the two lines regarded together would be a justifiable extension of the system, which should be included in any programme of extensions to be undertaken when conditions become more favourable.

#### TOORONGA ROAD, MALVERN.

From the intersection of Tooronga and Wattle Tree Roads, southward to junction with the Waverley Road line, near Caulfield Railway Station. Approximately one mile. The cost of constructing this line at present rates would be about £14,500.

This is a connection which would serve a useful purpose in providing a direct route to the population in East Malvern, along and near Waverley and Darling Roads, to the shopping centres of Glenferrie Road, Malvern, and Chapel Street, Prahran.

It would also doubtless be very much availed of by passengers to Caulfield on Race Days.

The traffic upon the Waverley Road line at present is light.

and the reason is, no doubt, that beyond Caulfield Station the service along Balaclava Road is not one which meets the general requirements of Malvern residents. If that service were diverted to join the Wattle Tree Road service, via Tooronga Road, there is little doubt that considerable improvement in the earning power of the Waverley Road line would follow. This is a connection which is, in the Trust's opinion, justifiable, and which should be made as soon as normal conditions are re-established.

### BRIGHTON ROAD TRAMWAY.

A tramway in Brighton Road, from the present terminus of the cable tramway, to join the Glen Huntly Road line, at the intersection of that line with Brighton Road. Approximately 66 chains = 0.830 miles. This is virtually an extension of the cable line, which would, in the Trust's opinion, probably have been made as a cable track, but for the high cost of construction inseparable from that system.

If it be carried out as suggested, as an extension of the electric system, it would involve an alteration in the method of dealing with the car service.

The amount of traffic upon the Point Ormond line, West of Brighton Road, is insufficient at ordinary times to justify an increase of service over the 20-minute service now running.

It is therefore not practicable to run the Brighton Road cars to Point Ormond.

The best method of dealing with such an extension would probably be to run the Glen Huntly Road cars from Grange Road through to the Cable terminus at Brighton Road, and to stop the Point Ormond service on the West side of the Railway Gates at Elsternwick.

Except that, on occasions when the Beach traffic is heavy, additional cars would be run from Grange Road or Darling Road, via Glen Huntly Road, through to Point Ormond.

This is an extension which would, under normal conditions, be financially justifiable, but for the reasons stated in the concluding paragraph of this report, the Trust is of opinion that its construction should be deferred until conditions are more favourable.

## GENERAL.

Whilst the Trust has, in accordance with the requests of the Councils concerned, enquired into the prospects of the above proposed extensions, it desires to draw attention to the fact that, although several of the proposals would undoubtedly open up the districts to be served and would, by encouraging settlement, serve to relieve the more congested areas of the metropolis, there are other considerations which must be kept in view.

The Trust submits that the best interests of its Constituent Councils will be conserved by a policy which will promote the construction of tramways in adjoining districts at present without adequate travelling facilities, always bearing in mind that the operation of the system as a whole should not become a charge upon the revenues of the Municipalities. The system at present operated by the Trust (without taking into consideration the fact that any losses upon the Caulfield Extension will, until 30th September, 1916, be recouped by the Caulfield and St. Kilda Councils) is earning a total revenue sufficient to meet all outgoings and a substantial provision for Sinking Fund and Renewal Reserve Funds on the basis contemplated by the Trust's Acts.

The margin thus available will not, however, at present allow of further extensions of the Trust's lines in sparsely populated areas on any extended scale without exposing all its Constituent Councils to the possibility of requiring to contribute to a deficiency.

The Trust is of opinion that the construction of further extensions should be governed by the foregoing considerations.

It is further of opinion that, should the Trust's tramways be extended into Municipalities outside the boundaries of the Municipalities having representation on the Trust, such Municipalities should join the Trust, and assume liability for its indebtedness in common with its present constituent Municipalities.

In view of the economic dislocation consequent upon the war, the increase in the cost of imported materials and a diminution of the spending power of the people, combined with increasing difficulty in obtaining money on advantageous terms, the Trust is of opinion that in any case no proposals for extension of its tramways, beyond those already arranged for, should be entertained until normal conditions prevail.

This opinion is further strengthened by the fact that the Electrification of the Suburban Railways may possibly adversely affect Electric Tramway traffic.

By order of the Trust,

ALEX. CAMERON,  
CHAIRMAN.

H. S. DIX,  
ENGINEER AND MANAGER.

Melbourne, August 29th, 1915.

## APPENDIX

MUNICIPALITY.	Cable.	Electric.		Total Miles of Tramway Route.	Population.	Population served per mile of Tramway Route.	Railways Track Mileage.	Population served per mile of Tramway and Railway Route.
		P.M.T.T.	Govt.					
TRACK MILES								
PRAHRAN ...	6.736	9.653		8.195	48.341	5,899	9.00	3,808
MALVERN ...	—	15.431		8.227	24.183	2,939	5.63	1,885
ST. KILDA ...	8.261	5.670	2.936	8.516	30.165	3,542	4.08	2,858
CAULFIELD ...	—	13.154		7.202	23.080	3,205	8.75	1,994
HAWTHORN ...	<sup>Horse</sup> 5.531	3.613		4.572	28.238	6,176	6.00	3,700
KEW ...	—	8.724		4.283	11.600	2,708	.25	2,559
BRIGHTON ...	—	—	5.500	2.750	15.000	5,455	7.00	2,400
TOTAL ...	20.528	56.245	8.436	43.745	180.607			

### Statistics of Passenger Journeys and Revenue of Melbourne Tramways and Suburban Railways for the Year ended 30th June, 1915,

	Passenger Carried.	Revenue.	Journeys per Head of Population of Metropolis.
SUBURBAN RAILWAYS ...	108,721,181	£1,123,100	161
CABLE TRAMWAYS ...	88,060,123	735,645	131
P. & M. T. T. TRAMWAYS ...	17,542,303	115,345	26
OTHER TRAMWAYS (Estimated) ...	8,750,000	59,500	13
	223,073,607	£2,033,590	331

Amount expended per head of population on Suburban Railways and Tramways travelling, £3/0/4  
Population of Melbourne and Suburbs estimated at 674,000.

ST. KILDA ...	8.261	5.670	2.936	8.516	30.165	3.542	4.08	2,858
CAULFIELD ...	—	13.154		7.202	23.080	3,205	8.75	1,994
HAWTHORN ...	<sup>Horse</sup> 5.531	3.613		4.572	28.238	6,176	6.00	3,700
KEW ...	—	8.724		4.283	11.600	2,708	.25	2,559
BRIGHTON ...	—	—	5.500	2.750	15.000	5,455	7.00	2,400
<b>TOTAL ...</b>	<b>20.528</b>	<b>56.245</b>	<b>8.436</b>	<b>43.745</b>	<b>180.607</b>			

**Statistics of Passenger Journeys and Revenue of Melbourne Tramways and Suburban Railways  
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Amount expended per head of population on Suburban Railways and Tramways travelling, £3/0/4  
Population of Melbourne and Suburbs estimated at 674,000.

**Tramways in Cities in Neighbouring States.**

	Miles of Tramway Track.	Population.	Population Served Per Mile of Tramway Track.
ADELAIDE ...	92,590	145,000	1566
LAUNCESTON ...	9,289	24,000	2583
SYDNEY ...	212,000	752,500	3549
WELLINGTON (N.Z.) ...	31,687	70,000	2209