PER-WAY FILE

MELBOURNE AND METROPOLITAN TRAMWAYS BOARD

GENERAL SCHEME

MINUTE OF BOARD MEETING - 30TH NOVEMBER, 1922.

General Scheme:

The Chairman submitted the Board's proposals for a General Scheme for future development of tramways in the Metropolis.

Approved. Resolved that two copies be sealed on behalf of the Board and forwarded to the Minister of Public Works for transmission to the Parliamentary Standing Committee on Railways.

MINUTE OF BOARD MEETING - 24th MAY, 1923.

General Scheme:

Hon. J. W. Pennington, Assistant Minister for Agriculture, 10th May, forwarding copies of the Report of the Parliamentary Standing Committee on Railways on the Board's General Scheme.

Copies of the report were forwarded to Members of the Board.

MINUTE OF BOARD MEETING - 26TH JULY, 1923.

Adoption of General Scheme:

Chief Engineer, 18th July, reporting upon the adoption of the Board's proposals for the tramway development of the Metropolis, copies of which had been forwarded to each Member of the Board.

Chief Engineer, 26th July, submitting alternative scheme for tramways in Brighton to avoid crossing the Railway at Brighton Station in Bay Street.

Noted.

Resolved that pursuant to Section 34, Act No.2995, the Board's proposals for the tramway development of the Metropolis as submitted to the Minister of Public Works and reported upon by the Parliamentary Standing Committee on Railways be now adopted under Seal as its "General Scheme for the future development of tramways for the service of the Metropolis".

THE PROPOSALS OF THE

MELBOURNE AND METROPOLITAN TRAMWAYS BOARD

for a

SCHEME FOR THE FUTURE DEVELOPMENT OF TRAMWAYS

FOR THE SERVICE OF THE METROPOLIS.

13th November 1922.

The REPORT OF THE RAILWAYS STANDING

COMMITTEE ON THE PROPOSED GENERAL SCHEME OF TRAMWAYS

FOR THE METROPOLIS.

19th April 1923.

MELBOURNE AND METROPOLITAN TRAMWAYS BOARD.

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GENERAL SCHEME FOR THE FUTURE DEVELOPMENT OF TRAMWAYS

FOR THE SERVICE OF THE METROPOLIS.

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The proposals of the Board are set forth in the map herewith marked "A".

Proposed new tramways are shewn on the plan colored green.

Existing Electric Tramways are shewn in red.

Existing Cable Tramways are shewn in brown.

Accompanying the said map are the plans and graph referred to in the Appendix hereto and a brief report explanatory of the above proposals.

DATED this Thirtieth day of November, 1922.

COMMON SEAL of the MELBOURNE AND)
METROPOLITAN TRAMWAYS BOARD was)
hereto affixed in the presence of) (SEAL)

Alex. Cameron, Chairman

W. W. Cabena)
Colin Templeton)
Thos. O'L. Reynolds) Members.
J. G. Membrey)
Ernest H. Willis)
H. H. Bell)

W. O. Strangward, Secretary.

INTRODUCTORY.

Under the Melbourne Tramways Act 1918, No.2995, Section 34, Subsection (2), the Board is required to submit proposals for a General Scheme for the future development of tramways for the service of the metropolis.

The problem of devising a comprehensive tramway system for Melbourne differs in important respects from that of any other City where a systematic attempt has been made to solve the like problem. In addition to making provision for the future development of tramways, a number of distinct electric systems have to be linked up and co-ordinated. Many of the natural routes, however, which are essential for connecting lines are already occupied by cable tramways. The conversion of the cable system forms an integral part of the problem. This is recognised by the Board's Act which gives the Board power to convert any cable line to electric traction.

As the City is, and always will be, in a state of growth the greatest difficulty is in formulating a plan for its transportation system which in the nature of things can never be complete. If, like the cable system, it is not capable of gradual and easy extension or variation, the system will fail for want of flexibility. It is well known that traffic increases at a faster rate than the population of the area served. The consumption of food and water, for instance, increases directly in proportion to the growth of the population, with some slight allowance for increase in consumption per head, due to the increase in wealth. In the case of transportation, however, if the City's population is doubled there are not only twice as many people to carry, but generally they travel more frequently, each one having potential business or social intercourse with every other person in the community. Moreover, as the City grows the average distance

travelled is increased. A plan that will meet the ultimate demands of the service must be capable of expansion up to the physical limits of the routes available.

It is therefore necessary not only to estimate the growth of population, but also to provide for an increased number of journeys per head of population per annum.

It is more important that the system should be susceptible of extension as the population spreads out rather than that it should be laid out beforehand to follow definite routes within fixed limits, outside the area at present served. The Act properly provides for amendment of the Scheme from time to time, as it is impossible to foresee all the changes which may take place over a lengthy period.

The construction of large works West of Spotswood or the settlement of the Fishermen's Bend area, would render lines necessary where, in the absence of some special inducement, no settlement is likely to take place. In the last-named case a direct tramway connection to Williamstown could be given by a line from Boundary Street, Port Melbourne, along Williamstown Road, and over the Yarra by a car ferry.

The Board's aim is to construct a framework upon which systematic extensions can be made to meet further possible needs, without disturbing the proper functioning of existing and projected tramways, or altering the location of any of the main lines.

One important object of a General Scheme should be to avoid the mere duplication of transport facilities. An instance can be given of tramways running parallel to each other at a distance of less than half-a-mile, with an electric railway between, all serving the same people in a district not sufficiently settled throughout the length of the competing lines to support them all.

A study of the growth of cities shows that they develop both by expansion and aggregation. The tendency is always to spread out from the centre, and at the same time there is a reflex action causing congestion at the heart of the city. Modern transportation methods have so revolutionsed social conditions that both of these conflicting tendencies have become accentuated. The continuous growth of the area of settlement makes the problem of providing public services more and more difficult. The daily movement of a large part of the population to and from the business centre in such circumstances results in congestion in thoroughfares leading to the city. These tendencies have to be taken into consideration in devising a transportation system which is intended to serve for a generation to come. The system must not only be suitable for extension in the suburbs, but also be capable of development at the centre.

In many communities population gathers around separate business centres. This is particularly noticeable in Melbourne. In addition to centres of business and trade, there are places of education and amusement, beaches and football grounds, etc., which cause aggregations of people. For all these provision has to be made. In Melbourne the problem of conveying the population to the beaches or foreshores in summer is second in importance only to that of conveying the people to and from the City.

Traffic develops along natural lines, and due regard has been given to this in the treating of new routes.

The Board has, however, preserved the existence of practically all lines authorised prior to its taking office, although several of these lines are not well located in relation to the system as a whole.

Passengers should be able to reach their destinations without unnecessary changes of car. The Board's aim has been to lay out a system which will, in conjunction with the Railways, enable passengers to travel, with the fewest exceptions possible, from one point in the metropolis to any other point with not more than two changes in the streets.

Consideration has been given to the fact that in the metropolis there is an electrified suburban railway system offering cheap and rapid transport to most suburbs. The relative functions of railways and tramways were kept in mind.

Description of Existing System. Plan "B" shows the tramways existing in Melbourne and the suburbs of which the Board has control. These are as follows :-

	Route Miles.
The Cable System	45.927
The Zoo Horse Tramway	.625
The Prahran & Malvern System ...	35.152
The Hawthorn System	11.174
The Preston System	5.822
The Coburg System	7.0728
The Footscray System	4.725
The North Melbourne & Essendon Tramway System	7.240
	117.7378

Also the following tramways not under the control of the Board :-

	Route Miles.
The St. Kilda/Brighton Tramway (Government)	5.160
The Sandringham/Black Rock Tramway (Tramways)	2.410
	7.570

There are in addition a number of tramways (shown on the plan) authorised by the Board's Act but not yet constructed, viz. :-

	Route Miles.
The South Melbourne Electric Tramway ...	3.187
Tramway in Princes Street & Willsmere St., Kew ...	1.48
High Street, Kew, Extension to Bourke Road..	.75
Wattle Park Tramway ...	.725
Toorak Road Extension ...	.1875
Chapel Street, Extension ...	.25
Hyde Street, Footscray ...	1.2
Nicholson Street, Footscray ...	.8875
Barkly Street, St. Kilda ...	1.7875
Gellibrand Street, Kew ...	.350
Essendon, Maribyrnong Rd. to Keilor Rd. ...	1.8125
Total	12.617

As the Board's preliminary investigations showed that there were certain districts quite unserved by tramways, a special Act was passed authorising the Board to submit special construction schemes to the Minister, prior to the preparation of the General Scheme

The following are the lines which have been submitted as Special Construction Schemes, and reported on by the Parliamentary Standing Committee on Railways :-

		Route Miles
Tramway in West Brunswick	...	3.19
Tramway in William St., Peel St., and Flemington Road	...	2.09
Tramway in Church St. Richmond, and Chapel St. Prahran	...	2.01
Tramway in East Northcote	...	2.6
		9.89

The following tramway has been submitted to the Parliamentary Standing Committee on Railways but not yet reported on :-

		Route Miles
Tramway in West Coburg	...	1.47

The following are lines for which Orders-in-Council for authority to construct have been obtained :-

		Route Miles
Tramway in Church Street, Hawthorn	...	.66
Tramway in Brunswick Road Brunswick, and Holden Street, Fitzroy	...	.99
Tramway in Bell Street, Coburg and Preston	...	.61
Cable Tramway in Lonsdale Street	...	.15
		2.41

Grand total excluding Government tramways 141.56

THE CABLE SYSTEM.

The dominating consideration in any transport system is that all cars should be capable of operating over the entire system. It is in this feature that the combination of a cable and an electric system fails.

Amongst the evil consequences of such a combination are the following :-

Passengers have to change wherever the cable tramway meets the electric tramway on a through journey. This involves inconvenience, loss of time, and the payment of a second fare. This deprives the passenger of the advantage of tapering rate on through fare, so that in addition to losing time the passenger loses money. The tramways also lose passengers who, if a through journey were provided, would be picked up or set down within say a quarter-mile of the point of change, but who at present prefer to walk the short distance to or from the junction. Congestion is created in the streets at the points of change, and in places this is very serious, and will be still more serious the nearer such points are to the heart of the city. At such junctions one or more cars can always be seen standing idle or shunting. This results in the loss of the services of a large number of cars and crews. The total loss to the Board in operating expenses at the present time at these transfer points is estimated at £20,000 per annum. In addition there is the capital value of some 20 trams (with their car shed accommodation, etc.) practically earning no revenue. Serious as this loss is, the public inconvenience is of even greater importance. It is estimated as the result of counts made at the more important transfer points, including only those which will be eliminated by complete conversion, that at least $7\frac{1}{2}$ million passengers per annum change twice daily. The value of the time thus lost by passengers is considerable : there is also

the discomfort in wet weather and the risk of accident.

Except where transfers are given, each change involves an extra charge of ½d., equivalent to a total of £15,000 per annum taken from the public as a partial offset against the above cost.

It is well known that traffic increases at a greater rate than the population, to a degree depending upon the facilities provided. The total capacity of a system is limited by the capacity of the routes passing through the heart of the city. In Melbourne most of the city routes are now fully loaded. It is therefore futile to add lines in the suburbs with an increasing population, unless more routes can also be provided in the city or the capacity of existing congested routes be increased. This view is emphasized by Mr. McElroy, the late General Manager of the Manchester Corporation Tramways, in his report on the Passenger Transportation Problem of Manchester, as follows :-

> "The ultimate volume of traffic which a tramway "system can deal with is limited by the capacity of the "arterial lines near the central parts of the city. "When the traffic on these lines approaches the "saturation" "point; then additional main arteries must be opened out "or other transit facilities provided."

Traffic returns show that several routes on the cable system are already overloaded. It is recognised that Electrification will give at least double the capacity. This increased capacity will be required for handling the anticipated future traffic.

In the end a tramway system must be judged by its effectiveness in the performance of its function, which is to transport the largest possible number of passengers over the routes available in a limited time. It is owing to its shortcomings in this respect rather than to its disadvantages in minor points, that the cable system has been abandoned wherever it has been used, except on grades too heavy for self-propelled cars to negotiate.

The inflexibility of the cable system renders it particularly unsuitable for handling special services, whereas by Electrification the Board will be able to deal satisfactorily with crowds from football matches and racecourse and beaches, or on festive or other public occasions which lead to aggregations of people.

The conversion of the cable system is therefore an essential factor in the General Scheme. The retention of any portion of such system in the city, would be directly opposed to the principle above enunciated.

It is well to indicate the important difficulties in the work of converting the cable system, as the considerations involved have a bearing on the question of the selection of any system maintaining a portion of the cable system in use, and also affect the order in which the conversion can be carried out.

The spacing of the tracks is such that they cannot be used safely with the Board's electric rolling stock, even if the tracks could stand the heavier loading ; consequently the rails have to be laid in a new position. This makes it imperative to fill in the slot to form a proper foundation for the inside rail, which will be almost over the conduit. On this account, and since for obvious reasons single line working is impossible, it is necessary to convert both tracks at once. The public convenience makes it desirable to convert only a short length of track at a time. Every section, however, involves the building of a terminal sheave pit which must be drained and fitted with sheaves and pulleys at considerable expense. For this reason the sections should be as long as possible. Alternatively a bus service may be provided.

Conversion must proceed either from the city or from the outer end of a rope towards the engine house, but as the depots are in every instance (except on Toorak line) placed at the end of the lines, the first portion of track converted, if a start be made at the suburban end, cuts off the cars from their regular depot. Accommodation must therefore be provided for the cars elsewhere. As, however, there is practically no spare accommodation at any of the depots, a new depot must be provided if a considerable proportion of the cars are to be kept in service for the portion of the line not being converted. Conversion from the city end wuld block the through route, forcing through passengers to change twice.

SYSTEMS AVAILABLE

It has been pointed out above that any combination of an electric system with the existing cable system cannot offer a satisfactory solution of the transportation system of the metropolis in the future.

The electric lines must either pass round, but within walking distance of the centre of the city, or terminate on loops convenient thereto, or pass through the city.

In its simplest form, neglecting natural or artificial barriers, the system of feeding on to a square surrounding the centre of the city, provides four (4) through routes or eight (8) exits, and would have a capacity which would be adequate for some years. If, however, too large a square be taken, many passengers will be landed at some distance from their destinations. If, to overcome this objection the trams are routed along two sides of the square, junctions are introduced at the intersections, and the capacity of the system halved. Taking the Post Office as the centre, the obvious square is formed by Latrobe, Russell, Flinders, and William Streets, to the use of which little exception can be taken.

William Street may be connected through to South Melbourne as already suggested in the West Brunswick-City extension proposal. Russell Street has, however, no outlet across the railway. If, to overcome this difficulty, cars were turned along Flinders Street and across Princes Bridge, the capacity of the Flinders Street-Richmond line would be cut down, and a most inconvenient junction introduced at Princes Bridge. Alternatively, the Russell Street cars could be routed east to Richmond, and cars from St. Kilda Road west along Flinders Street : this would necessitate another awkward junction and loading point at the most congested pedestrian crossing in Australia.

The general use of a looping system in the city is only warranted where through routing is impossible. A large number of loops would be necessary, each surrounding one or more blocks in the city : if certain streets are barred to tramway traffic, these loops could only be connected to the main lines by indirect routes involving a number of curves - the wiring at these curves would be objectionable. The placing of the loops of the southern lines at the south side of the River would be inconvenient and lead to most serious congestion,

The system of through routing along the main arteries of traffic, wherever it can be employed, therefore is by far the best from every point of view. Passengers are enabled to pass through the city without change, they have the advantage of the tramways in the main streets for travelling short distances ; junctions on the main streets are avoided, and there is less congestion of traffic. This system has, therefore, been adopted as far as possible in laying out the General Scheme, and an effort has been made to avoid numerous right-angled junctions in the city where the overhead wiring would be objectionable. Little exception can be taken to the overhead wiring necessary for a through line.