MELBOURNE AND METROPOLITAN TRAMWAYS BOARD

EAST PRESTON DEPOT ROUTES - COMPARISON BETWEEN SERVICE REQUIREMENTS USING TWO BOGIE TRAMS ONLY AND A MIXED FLEET OF THREE BOGIE ARTICULATED TRAMS AND TWO BOGIE TRAMS.

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ENGINEERING DEPARTMENT

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The purpose of this study was to determine the number of trams required to operate the week day services on the routes operated from East Preston and North Fitzroy tram depots for firstly a fleet made up of modern 2 bogie trams only and secondly a mixed fleet comprising both modern 2 bogie trams and 3 bogie articulated trams.

As for the study for the Kew Depot (June 1965) it is based on the assumption that a base service would be provided throughout the day using two bogie trams for economy and in the mixed fleet case, three bogie articulated trams would be used to provide the additional capacity to meet peak demands. It also shows that such a mixed fleet could affect a saving of the order of 20% in the number of trams (and also crews) rostered to meet peak demand. For average conditions the ratio of two bogie to three bogie trams would be of the order of 2 to 3 but it could vary from 33% to 60% depending on the standards of service to be provided.

1. Introduction.

The probable capacities of new maximum capacity trams has been assumed as follows -

2	bogie	trams	50	seats	8.	70	standees	(]	161	squares)	80%	crush	=	95.
3	bogie	trams	70	seats .	&	145	EQ.	(18	18)	80%	crush	11	170.
C	f SW6	trams .	48/52	seats	8	43	18	(12	(a)	80%	crush	= 7	13/76.

All loads are based entirely on the results of the "Melbourne and Metropolitan Transportation Study" for June/ July 1964 which are shown on graphs appendix 5.

The loading in Collins Street for the Mont Albert trams has been ignored on the assumption that the ratios of both services and loadings would remain the same.

2. Basic services.

A basic service of 10 minutes headway has been assumed on the East Brunswick Route, the Latrobe Street Route, the West Preston Route and beyond Dundas Street on the East Preston Route.

A basic service of 5 minutes headway has been assumed on the East Preston Route from Spencer Street to Dundas Street and on the West Preston Route from Spencer Street to Victoria Parade.

Assuming an average reserve of 5 minutes and an average rest period of 10 minutes per trip the requirements would be -

East	Preston route	16	trams
East	Brunswick route	5	it
West	Preston route	11	u
Latro	obe Street route	2	10

3. Running times.

The present running times are -

Spencer Street to Tyler Street 7.70 miles 39 to 43 mins. = 11.8 to 10,7mph. Spencer Street to Blyth Street 4.18 miles 24 to 25 mins. = 10.5 to 10.0mph. Spencer Street to Regent Street 7.49 miles 40 to 42 mins. = 11.2 to 10.7mph.

As for the study for Kew Depot routes a scheduled speed of 4½ minutes per mile is assumed. Return trips off peak allowing 5 minutes reserve are assumed as follows.

City	Terminus	to	Exhibition	1.56	miles	20	minutes
19	13	18	Clifton Hill	3.72	th	40	12
19	t2	18	Beaver's Road	5,12	12	52	12
12	10	12	Dundas Street	6.18	22	61	12
69	12	53	Tyler Street (Term)	7.70	18	75	10
18	19	12	Park Street	3,30	18	35	12
11	ED.	12	Blyth Street (Term)	4.18	12	43	10
13	12	18	Victoria Parade	1.57	12	20	i2
19	18	11	Barkly Street	3.67	12	38	18
17	99	12	Thornbury	5,62	12	56	12
13	19	12	Regent Street (Term)	7.49	it	73	12

To these times an additional 20% was allowed for peak running. No rest period was allowed during peaks.

4. Rostering of crews.

No allowance has been made for problems associated with rostering of crews, as this study has been restricted to the minimum number of trams that must be run to meet the above stated conditions.

5. Basis of calculations.

The data which is the basis of this study is shown graphically in appendix 5 in the form of passengers per hour along each route for each hour throughout the day and also of passengers per hour passing selected stops throughout the day.

Appendices 1 to 4 tabulate the loading for cases where it is in excess of the basic service capacity only namely 300 per hour for 10 minutes headway and 600 per hour for 5 minutes headway.

In calculations some allowance has been made for non uniform loading over stated periods.

- 2 -

TRAMS REQUIRED FOR "UP" SERVICE

Refer appendice 1 & 3

Route	Seated	Load	80% Crush Load				
	2 Bogie	3 Bogie	2 Bogie	3 Bogie			
<u>Basic service</u>							
East Preston route East Brunswick route West Preston route Latrobe Street	16 5 11 2		16 5 11 2				
Additional trams to mee	t peak de	emand					
East Preston Route							
From Tyler Street Dundas Street Beavers Road Clifton Hill	22 6 8 5	16 4 7 4	8 - 5 2	5 - 3 1			
East Brunswick Route							
From Blyth Street " Park Street	3 8	- 6	3	2			
<u>West Preston Route</u>							
From Regent Street Thornbury Merri Creek	13 20 7	10 15 5	3 12 3	2 7 2			
Totals - All 2 Boqie	126		70				
Totals - Mixed Fleet	34	+ 67	34	+ 22			
Saving in trams		25		14			

6.

TRAMS REQUIRED FOR "DOWN" SERVICE

Refer appendice 2 & 4

Route	Seated	Load	80% Cri	ish Load
	2 Bogie	3 Bogie	2 Bogie	3 Bogie
Basic service				
East Preston route East Brunswick route West Preston route Latrobe Street	16 5 11 2		16 5 11 2	
Additional trams to mee	t peak de	mand		
East Preston Route				
City to Tyler Street ¹⁰ ¹⁰ Dundas Street ¹¹ ¹¹ Beavers Road ¹⁰ ¹¹ Clifton Hill	22 4 9 6	16 4 5 3	6 - 4 3	4 2 2 1
East Brunswick Route				
City to Blyth Street " " Park Street	3 8	3 7	- 3	3
<u>West Preston Route</u>				
City to Regent Street " " Thornbury " " Merri Creek	12 16 7	10 10 5	5 7 4	3 4 2
Totals - All 2 Bogie	121		66	
Totals - Mixed Fleet	34	+ 63	34	+ 21
Saving in trams		24		11

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8.	Summary.	Seated Load	80% Crush	Mean
	<u>Fleet of two bogie trams only</u>	2000		
	No. of two bogie trams to run full servi	ce 126	70	98
	Mixed fleet of two and three bogie trams			
	No. of two bogie trams to run basic service	34	34	34
	No. of three bogie trams to meet peak demand	_67	_22	45
	Total	101	56	7 9
	Saving in number of crews at peak	25	14	19
	% saving in number of crews at peak	20%	20%	20%
	Allowing 12½% surplus trams			
	No. for two bogie fleet only	142	79	110
	No. of two bogie trams for mixed fleet	38 (33%)	38 (60%)	38 (43%)
	No. of three bogie trams for mixed fleet	76 (67%)	25 (40%)	51 (57%)
	Total for mixed fleet	<u>114</u>	<u>63</u>	<u>89</u>
	Saving in number of trams	<u>28</u>	<u>16</u>	21

Note - The present peak traffic requirement is 84 trams from East Preston Depot and 14 trams from North Fitzroy Depot.

9. Conclusion.

The savings in the number of trams required and also the number of crews to be rostered to meet the peak demand is of the order of 20%. The proportion of three bogie articulated trams would be from 70% to 40% depending on the frequency of the basic service and the proportion of the maximum crush load capacity provided in the peak. For the mean condition it would be approximately 3 three bogie articulated trams to 2 two bogie trams.

The case of 3 bogie articulated trams on the East Brunswick route appears to be doubtful.

PLANNING ENGINEER.

DOWN-EAST PRESTON & EAST BRUNSWICK ROUTES NPRENDIX2

	0600	0700	0800 - 0859	0900 - 0959	1000 -1059	1100-1159	1200	1300 - 1359	1400 - 1459	1500	1600-1644	1645	1700	1745	1800
EAST PRESTON ROUTE		Surge Land	(833)				(719)	(739)	(638)	(997)	(939)	(416)	(1678)	(187)	
SPENCER ST TO ALBERT ST			17/12+4	a stranger			15/12+2	15/12+2	13/12+1	20/12+6	19/9+7	9/3+4	33/9+18	4/3+1	
(MAX HEADWAY 5 MIN.)			-				- 4	-	-		10/9+1	5/3+1	18/3+5		
	NOTE	(A)							1 all a look	(1343)	(1439)	(475)	(1652)	(170)	
ALBERT. ST TO JOHNSTON ST		BIC+D						N. S. C. M.		27/12+11	29/9+14	19/3+5	33/9+17	4/3+1	
		E/F+G								14/12+2	15/3+4	5/3+2	18/9+5	-	
Invitation of The manager of	A=	NO OF	PASSENU	SERS F	OR PER	RIOD	and the states		Sec. Market	(1343)	(1493)	(475)	(1652)	(170)	
JOHNYSTON ST TO WALKER ST	B=	NO OF	2 BOGIL	TRAM	TONE	ET FUL	L DENT	AND		27/12+11	30/9+15	10/3+5	33/9+17	4/3+1	
	C=	11 11		,,	" 50	PPLY B	H SEATL	ED LOAD	RS WII	14/12+2	16/9+4	5/3+2	18/9+5	-	
and the second		1. Charles have		1. Walter		WI	TH SEAT	ED LOA	as	(1179)	(1493)	(415)	(1398)	(159)	
WALKER ST TO BEAVERS RD	D=	1. 1. 1.	3 "	"	" MIE.	ET ADD	H SEAT	L PEAK	DEMAND	23/12+8	30/9+15	9/3+4	28/9+14	3/3+1	
	Er	21 11	2 "	-		FULL	DEM	NO		13/12+1	16/9+4	5/3+1	15/9+4	-	
		AS FO	R C&D	BUT N	TH 80	Vo CRUS	H LOAD	5 CRUSH L	OADS-	(965)	(1275)	(333)	(114)		
BEAVERS RD TO DUNDAS ST		A. S. Markell					1 Carlos Carl			19/12+5	25/91/2	7/3+3	22/9+10		
										-	14/9+3	4/3+1	12/9+2		
		(4/4)								(784)	(848)	(210)	(749)	States and	
DUNDAS ST TO TYLER ST		9/6+2							Palanti	16/5+7	17/440	5/2+2	15/4+8		
(MAX HEADWAY 10 MIN.)		-			atter in					-	9/4+3	3/2+1	-		
EAST BRUNSWICK ROUTE			(4 73)		denter contract state		(472)	(676)	(347)	(293)	(450)	(316)	(707)		
SPENCER ST TO ALBERT ST			10/6+3	•			10/6+3	14/6+6	7/6+1	6/6+0	9/4+4	7/2+3	14/4+8		
(MAX HEADWAY IOMIN)		Lain S	-		MARINE S		-	7/6+1	-	-	5/4+1	3/2+1	8/4+2		
The second s		1	(312)	C. C	1 au					(378)	(573)	(316)	(693)		
ALBERT ST TO HOLDEN ST			7/6+1							8/6+1	12/4+6	7/2+3	14/4+7		6 3 6
	Den and		-	L. Harrison	128.20			Minister .	2344	-	6/4+2	3/2+1	8/4+2		
				Real Strength	States States	Sales San	1	The second	1	THE REAL PROPERTY	(289)	(116)	(236)	SALENC.	A Change
HOLDEN ST TO BLYTH ST			Section 1	A CANERA	Bielennis	116263	NAME OF	La desta desta	No.		6/4+2	3/2+1	5/4+1		
	A Carlos and	Long Caller	Sall Joseph	A State State	a la		President.	C. Startes	1 the all the			ale - win	-	Station of the	

UP WEST PRESTON

APPENDIX 3

	0600 -0659	0700 -0759	0800	0900 -0959	1000 -1059	1100	1200	1300	1400	1500	1600		1700	Tank	1800	T
WEST PRESTON ROUTE REGENT ST TO ST GEORGE'S RD (NIAX HEADWAY 10 MIN)		(4.82) 10/6+3	(849) 17/6+8 9/6+2	(4.63) 10/6+3											-7839	
MILLER ST TO MERRI CREEK		(983) 20/6+10 11/6+3	(1836) 36/6+22 20/6+8	(756) 15/617 8/672	(328) 7/611								(308) 6/6+/	•		+
MERKI CREEK TO VICTORIA PDE	(375) 8/6+1	(1 380) 27/6+16 15/6+5	(2241) 44/6+28 24/6+10	(850) 17/6+8 9/6+2	(385) 8/6+2						(471) 10/6+3		(457) 9/6+3			
VICTORIA PDE TO SPENCER ST-VIA COLLINS ST (MAY HEADWAY 5 MIN) EXCLUDES MONT ALBERT ETC		(1098) 22/6+12 12/6+4	(1345) 27/6+15 14/6+5													
VICTORIA FOE TO SPENCER ST - VIA LA TROBE ST (MAX HEADWAY IOMIN) EXCLUDES NONI ALBERT ETC			(4 0 2) 8/6+2													
			NOTE	(A) 8/c+D E/F+G	A B C D E F	= NO = NO = NO = NO = NO & G AS	OF PAS OF 2 BC OF 2 BC OF 3 BC OF 3 BC OF 2 E FOR C	SENCER DGIE TRI DGIE TRI DCIE TR DCIE TR DCIE TR DCIE TR	S FOR P AMS TO AMS TO AMS TO AMS TO MITH	MEET SUPPLY MEET MEET 80%	FULL DEN BASE S ADDITIONA FULL DEN RUSH L	HAND ERVICE AL PEA HAND LOADS	WITH SEI OWLY WI K DEM. WITH BO	TH SEA AND WIT	0105 TEO 40 H SEATE 10105 SH 604	10

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DOWN WEST FILSTON

APPENDIX4

and the second			0000	00001	1000	1100	1200	1300	1400	1:00	100	14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	17.20	1745	1800	
California and a second second	-0600	0700	-0859	-0353	-1059	-1153	1259	-1359	-1459	15.59	HAA	14.5.9	-1-44	-1759	-1859	_
ENCER ST TO VICTORIA PDE VIA TROBE ST EXCLUDES MONT LBERT ETC. (MAX HEADWAY IOMIN)												2/2+0	6/4+2			
PENCER ST TO VICTORIA POE VIA OLLINS ST EXCLUDES MONT ALBERT TC (MAX HEADWAY 5 MIN)		(1470) 29/12+13 16/12+2	State State					(663 13/2+1 -		6)2) J2/IZ+0	15/9+4	9/3+4 4/3+1	25/9112 3/9+3	3/3+0		
ICTORIA PDE TO MERRI CREEK (MAX HEADWAY IO MIN)		(420) 9/6+2								(8:6) 17/6+8 9/6+2	11168) 23/4+14 13/4+5	13/2+8 7/2+3	30/4+19 16/4+7	4/2+1	(413) 9/6+2	
MERRI CREEK TO MILLER ST										(826) 17/6+8 9/6+2	(8 85) 18/ 4 110 10/4 +3	(512) 10/2+6 572+2	(1195) 24/ 4+14 13/4+5	(171) 4/2+1		
ST GEORGES RD TO REGENT ST										(403) 8/612	(550) 11/4+5 6/4+1	(232) 5/2+2 3/2+1	(532) 12/416 7/4+2			
NOTE	(A) 8/CHL E/F+6		A = B = D = F & G	NO OF NO OF	9155E 2.80612 3 2 2 2 2 2	VGERS TRAM	FOR 5 TD A 11 5 11 11 11 11 11 11 11 11 11 11 11	PERIOL NEET F URPLY NEET F BO% CA	D BASE S DDITH TULL D RUSH 4	ENTAND ERITE ONAL A ENTAND OADS	WITH ONLY ZEAK D WITH	SEATE MITH S EMAND 80%	Ю 20А ЕАТЕЦ WITH С СRUSA	OS LOARS EATED LOAD	10A QS	



TIMES AT UP TERMINUS





