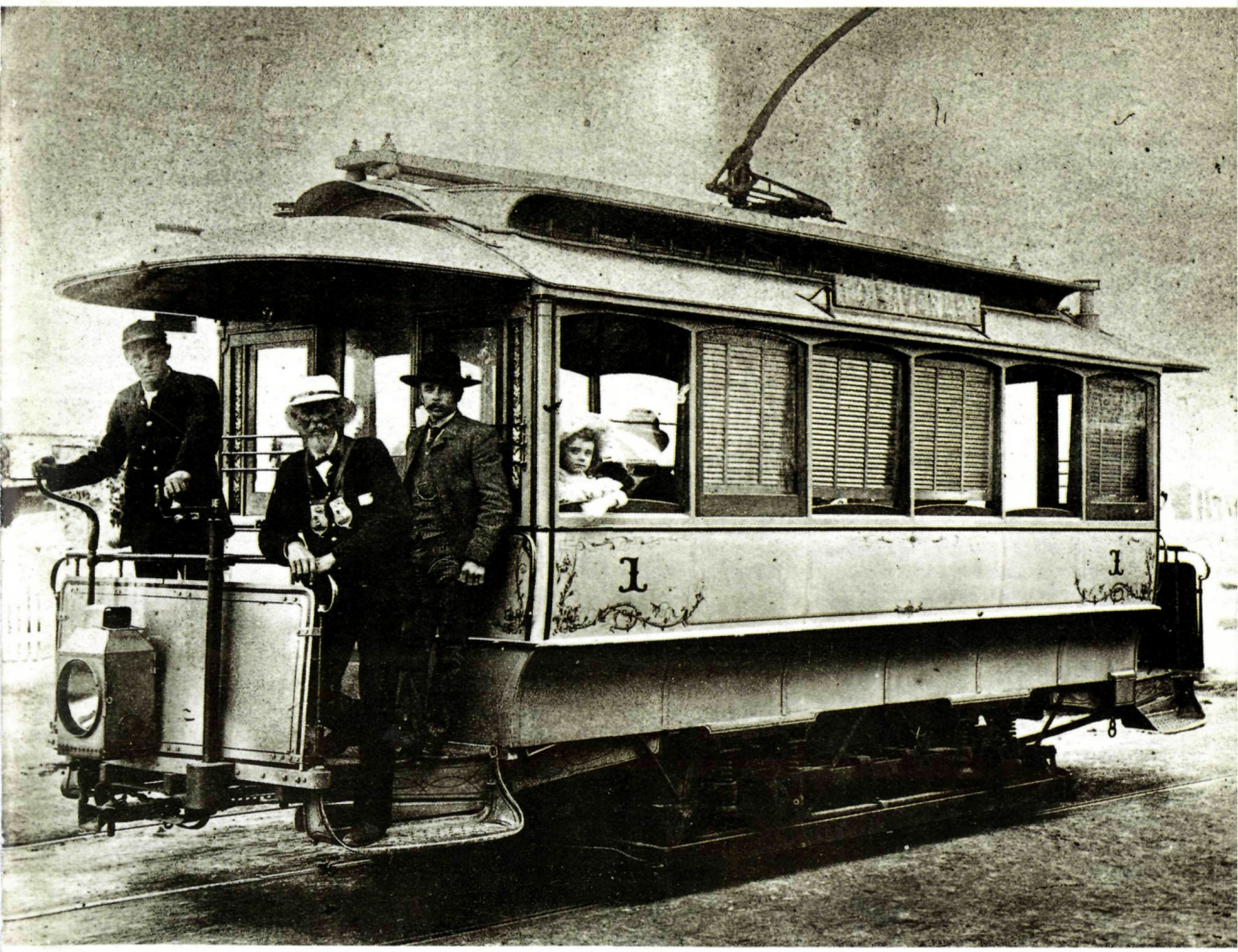
TROLLEY WIRE

No. 243 NOVEMBER 1990



SYDNEY'S EXPERIMENTAL ELECTRIC TRAMS

TROLLEY WIRE

AUSTRALIA'S TRAMWAY MUSEUM MAGAZINE

NOVEMBER 1990

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A Word from your Publisher

Following changes in the Australian Postal Commission's regulations, *Trolley Wire* no longer qualifies for the cheap bulk postage rate for registered publications. This will mean postage on *Trolley Wire* will increase by more than 160% for copies posted interstate and would allow us no margin to cover increases in printing and production costs. The South Pacific Electric Railway Co-operative Society is not in the financial position to subsidise any losses on the production of the magazine.

A number of options were carefully considered by the members of the SPER Publications Department. These included ceasing publication in its present form, reducing the number of pages, deleting the colour covers and so on. These measures were not acceptable to SPER's Publications people, and after careful consideration it was decided to continue publication for next year.

The subscription rate for next year has been increased to cover the increase in postage costs. However, it should be pointed out to all our readers that the new subscription rates give a much cheaper per issue price than the 1991 cover price of $6.00.

The continued production of *Trolley Wire* at its existing standard relies on the continued support of our subscribers. We, the production staff, would like to increase the number of colour photographs and the number of pages per issue to provide an even greater spread of news and historical articles. Please encourage your fellow museum members, and other readers you may know of who do not subscribe to the magazine, to take out a subscription so we can continue to bring you news of Australia's tramways and tramway museums.

Postscript: The cost of the additional pages in this issue are being subsidised by *Trolley Wire's* publishing staff.

Happy reading!

Front Cover:

Thomson-Houston/Stephenson electric car No. 1 on the Waverley to Randwick experimental electric tramway during 1890. The tramcar is mounted on a Thomson-Houston truck manufactured by the "Bemis Car Box Company".

NSW GOVERNMENT PRINTER from R. MERCHANT Collection

Back Page:

Top: Baldwin built steam motor 102 and its 70 seat trailer are typical of the suburban steam working in Sydney in the 1890s. The crew pose with their charge while working the shortlived Woollahra branch. NSW GOVERNMENT PRINTER from R. MERCHANT Collection

Bottom: Inward bound from Coogee, Sydney R1 class 2012 leaves Peter's Corner, Randwick, junction until 1954 of the cross country connection to Waverley over which the 1890 experimental electric tramway trials were carried out. R.I. MERCHANT

THE EXPERIMENTAL ELECTRIC CARS

WAVERLEY TO RANDWICK TRAMWAY — 1890

By K. A. McCarthy

November 1990 marks the centenary of the introduction of electric tram running trials on the Waverley to Randwick cross-country route in the eastern suburbs of Sydney.

An account of these trials was presented in Volume 1 of *A Century of NSW Tramcars*. This expanded material has been prepared for a possible reprint of that work.

* * * * *

Tramway practices introduced in the United States of America during the nineteenth century greatly influenced the transportation scene in New South Wales. That dynamic, but eccentric, American entrepreneur George Francis Train (1829-1904) influenced the design of the 1861 to 1866 Pitt Street horse tramway in Sydney. Captain Martindale, the NSW Government Railways Comissioner, selected Train's patent step rails and ordered two of Train's tramcars when he visited the first British street tramway in Birkenhead soon after its opening on 30 August 1860.

About twenty years later, when Sydney witnessed a tramway revival in its streets during 1879, U.S. technology was again employed by the adoption of Baldwin steam tram motors and Gilbert Bush & Company double-deck trailers.

By 1890, 8100 tramway track miles (13000km) served by 33,000 tramcars operated in the USA. Of these totals 1300 miles (2100km) were worked by 2900 electric cars. It is not surprising that on embarking into the realms of electric traction during 1890 the New South Wales Government Tramways (NSWGT) decided to use American rolling stock and equipment for their new venture.

The Centennial International Exhibition in Melbourne

To mark the centenary of the establishment of the first British settlement in Australia at Sydney Cove in 1788, Melbourne staged an extravagant "Centennial International Exhibition" in the large Exhibition Building and the surrounding grounds. This structure had been erected for a similar trade display held in 1880. The exhibition extended from 1 August 1888 until 11 March 1889 and one exhibit available to the public for part of this period was a working electric tramway provided by the Thomson-Houston Electric Company of Boston, USA.

.This exhibit was so successful that it won a first prize, an Award of Merit and a special mention in the relevant judging sections.

The official guide book to the exhibition described the standard gauge electric tramway worked by a single four-wheel open crossbench car in the following terms:

Page 61

No. 284 — Thomson-Houston Electric Company. The exhibit of the Thomson-Houston Electric Coy includes an electric tramway in complete working order, arc and incandescent lighting worked from the same dynamo . . .

Page 143

The Thompson (sic) Houston electric tramcar which is constantly running in the Exhibition Grounds is the first thing of the kind that the untravelled Victorians have seen, and the smoothness and noiselessness with which it runs are warmly commended. It is in contemplation to introduce the electric tram in Ballarat and other cities but the cable system works so admirably in Melbourne that there seems little chance of it being displaced.

This equipment was sold to a land boom company registered as "Box Hill and Doncaster Tramway Coy Ltd" where it opened Australia's first commercial overhead trolley electric tramway on a 2-1/4 mile (3.6km) route in the eastern outskirts of Melbourne on 15 October 1889.

Background to the Waverley-Randwick Experiments

With the passing of the Railways (Reorganisation) Act of 1888 by Sir Henry Parkes' administration, the NSWGR Commissioner Charles Goodchap was replaced by a triumvirate of a Chief Commissioner, E.M.G. Eddy and two Assistant Commissioners, W.M. Fehon and C.N.J. Oliver.

The Act aimed at improving the efficiency of the Government Railway and Tramway services in New South Wales by removing these organisations from direct political control. These gentlemen took up their new appointments on 22 October 1888. An announced intention of the

new board of commissioners was to consider the relative merits of steam, cable (of which examples already operated in Sydney) and the infant electric forms of tramway propulsion.

Overseas advice received during 1889 on the development of electric traction proved encouraging, which, with technical details furnished by the Thomson-Houston representatives in Australia, resulted in approval being given for the trial electrification of portion of the Waverley to Coogee 'cross-country' tramway. These operations would be conducted by the Thomson-Houston Company in conjunction with the Tramway Department.

The Parliamentary Public Works Committee of 1890-91, which conducted an enquiry into the type of traction to be used on the proposed steeply graded tramway between King Street, Sydney and Ocean Street, Woollahra, and the George Street to Pyrmont route, were eager that the Waverley experiment should be undertaken. They also voiced the desire that similar trials of the Sprague Company and a further experiment of the Julien accumulator tramcar would also be of importance in aiding the selection of the mode of traction most suitable for these new tramways.

Due to the merger of the Sprague Electric Railway and Motor Company with the Edison General Electric Company in 1889, and the fact that the Edison and Thomson-Houston companies commenced negotiations for a merger in 1889 (but which did not eventuate until 1892), the Sprague test in Sydney did not take place.

E. Julien, an electrical engineer in Brussels, experimented with battery-propelled electric tramway systems after 1881 with some success. From 1886 to 1889 he endeavoured, with the encouragement of US patent lawyer William Bracken, to establish his system in the USA. The only original item in Julien's system was his heavy duty batteries, which were fitted to standard horse cars together with motors and chain transmissions provided by other firms.

A double deck accumulator car provided by the Australian Electric Tramway Company and fitted out with the Julien battery system, made a trial trip on the Sydney to Botany line on 1 June 1888. It possibly operated further trials on the Kogarah steam tramway later in that month. As with the US operations the batteries were unsuitable for the task and proved more expensive than established steam and horse propelled systems.

A Julien trial was not repeated under the 1890 Public Works Committee directive but a later experiment conducted in Sydney with car 197 (modelled on the 70 seat C2 type steam tram trailer), fitted with Plante accumulators during 1894-5, proved more successful. By this stage the running costs of overhead wire trolley systems of electric traction had been reduced to a degree which made further battery demonstrations unnecessary.

The NSW Railways' Board of Commissioners were willing to authorise expenditure of up to £5000 on the Waverley electric trials but this sum only proved adequate for the erection of overhead wire between the Randwick Workshops to Randwick Junction and Waverley. This route provided some 3.3km of track with grades of 1 in 18 and curves of 33 metre radius. Due to the 'cross country' location various tests could be conducted without interruptions to the trunk Sydney steam services, but it would not be possible to witness performances under heavy routine passenger loadings.

The three tramcars for the experiment were initially furnished at the expense of the Thomson-Houston Company and arrived in Sydney together with some electrical equipment during June 1890.

Initial interest in electric tramway propulsion by the NSWGT was expressed while the exhibition line was in operation in Melbourne during 1888. The Thomson-Houston Company considered the possibility of transferring the equipment to Sydney at the conclusion of the exhibition but its sale to the Box Hill company, and the rapid improvements made in electric tramway technology over the intervening 18 months, resulted in newer material being imported from the USA for the Sydney trials.

Construction

On 12 May 1890 the *Sydney Morning Herald* reported that satisfactory progress was being made towards the electric tramway trials on the Randwick to Waverley line. The Randwick and Waverley Councils approved the erection of overhead wires in their areas while the Thomson-Houston engineer, Mr J. Mahoney said that the three tramcars were nearing completion in the USA and were expected in Sydney in two months time.

The equipment for the trial arrived in two batches. The initial material arrived on the RMS *Mariposa* on 28 May 1890 accompanied by Thomson-Houston engineer Mr Bailou. The remaining items, together with the three electric tramcars, reached Woolloomooloo on the RMS *Zealandia* on Thursday 26 June 1890. By this stage almost 1km of overhead wire had been erected along the 3.3km route.

The overhead suspension "differed from place to place with the state of the road". The trolley wire, located over the centre of the track, was

suspended from span wires linking each pair of roadside span poles located at 36 metre intervals. These poles were a collection of undressed ironbark, turpentine, grey gum and blue gum timbers to test the durability of each species. Although the trolley wire was suspended in a position which was later to be standard for the NSWGT electric system, in some places the wire was not fastened directly to the cross span wires but linked by triangular suspension to two longitudinal wires located one above each running rail and these in turn were held by the cross span wires.

From the trolley wire the current was transmitted to the car motors through an insulated metal fixed head trolley pole mounted centrally on an insulated trolley bridge located on the car roof.

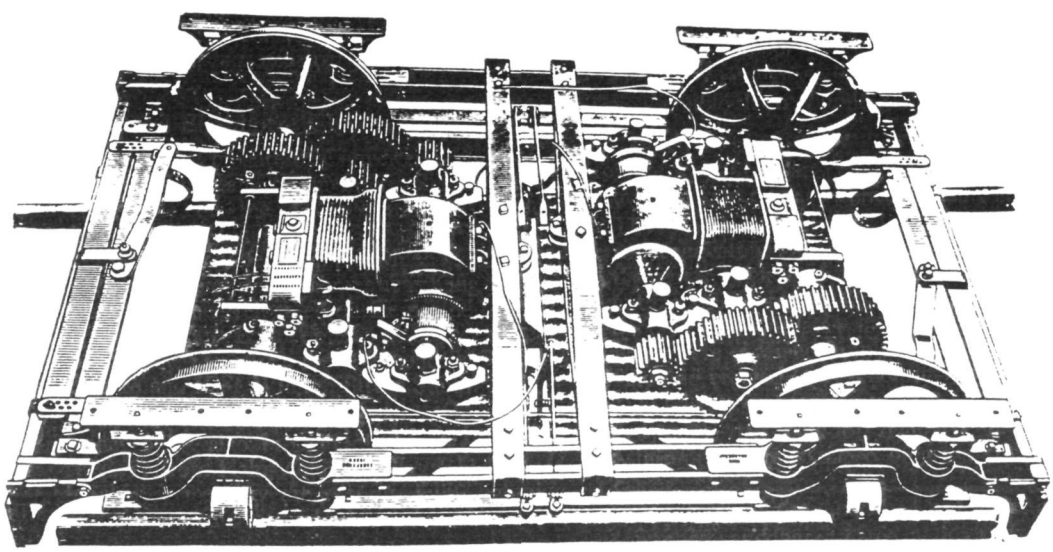
To energise the electric line an Armington Sims high speed 300 rpm 120 hp steam engine was coupled directly to a Thomson-Houston generator of 80 hp capacity capable of generating power at a 500 volt potential. This equipment could not function at full efficiency as steam was usually provided by two locomotive type boilers (steam motor type) of 30 hp capacity each. These boilers were 1.05 metres diameter and 1.65 metres long between tube plates, which carried 101 x 45mm diameter tubes. The total heating surface amounted to 26.9 square metres and the grate area provided 0.92 square metres of fire space. It is believed that the Randwick workshop steam plant was able to assist these two boilers when full capacity electrical tests at 550 volts needed to be conducted.

To house the plant and provide cover for a total of four electric cars a special building was erected at the Randwick steam tram depot. The main switchboard located within this structure carried an automatic circuit breaker, amp and volt meters, a voltage control rheostat and a lightning conductor. This equipment was supplied by the 'Thomson-Houston International Electric Coy'.

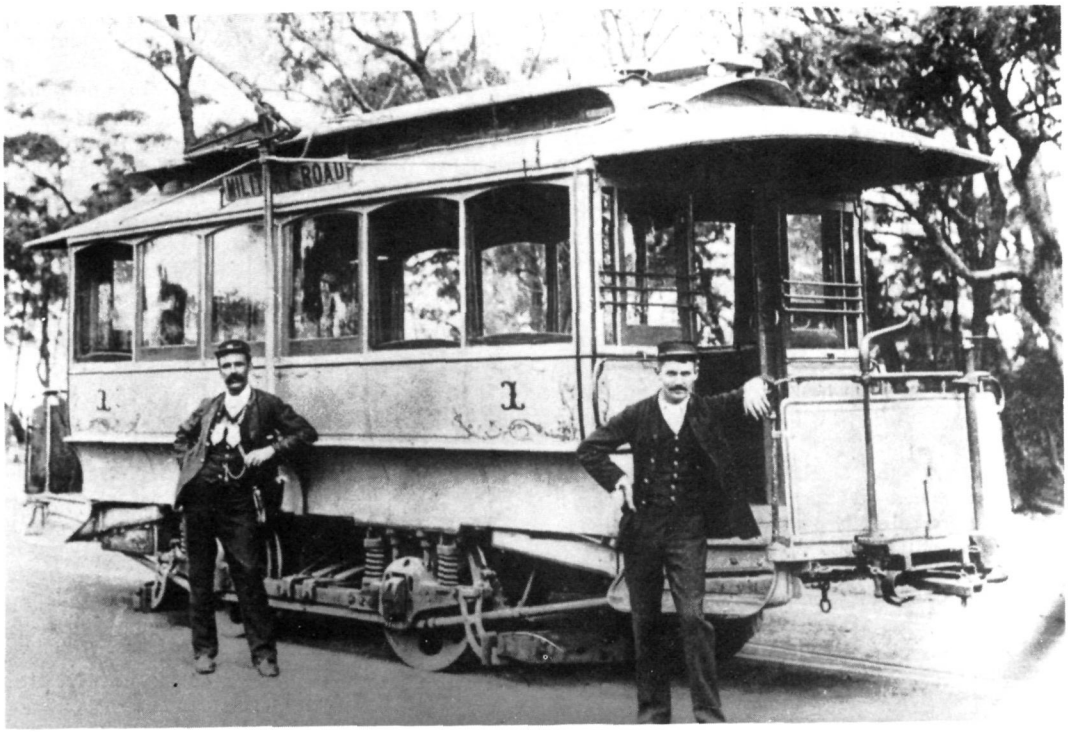
Rolling Stock

The three electric cars provided for these initial electric trials were straight from the catalogue of John Stephenson of New York, being identical in body design to cars used by many of the electric operators in the USA during the the 1890s.

John Stephenson commenced manufacturing horse cars in 1832 and by the 1870s was constructing tramcars for customers throughout the world. His factory on 27th Street, New York saw many changes. During the 1890s cable and electric cars were leaving the plant at the rate of five per day and during 1904 Stephenson reached the pinnacle of his career when the cars



Thomson-Houston Electric Co. tramway truck equipped with F-30 double-reduction motors, the first produced by the company that were equipped with the carbon brushes patented by Charles Van Depoele in 1888. C.B. Fairchild, Street Railways, 1892



Electric car No. 1 at North Sydney after 1893. This tram is mounted on a Bemis No. 26 truck and still retains the primitive controller gear. K. McCARTHY Collection

for the first subway system in the USA were constructed by this firm. J.G. Brill purchased the plant in 1904 but continued production under the original name at Elizabeth, New Jersey until 1917.

Each of the Sydney electric cars were fitted with two 15 hp motors (but only rated as 10 hp due to the lower power in Sydney) which transmitted power to the wheels by means of open, double reduction gearing. This arrangement was necessary as only high speed motors could be manufactured at that period to fit between the axles under the car floor. The motors were of the Thomson-Houston F30 type having carbon brushes and a 'bi-polar' type of surface-wound armature. The armature, fields and gears were exposed to road dirt and water which resulted in noisy operation and high maintenance costs.

Contemporary technical descriptions of the equipment described these motors as having "a nominal output of 15 hp; the armature was smooth core, drum wound; resistance of armature was 1.93 ohms; total weight of motor without gears 1975 lbs (896kg); gearing ratio 9.4; speed of motor at 25 amps was 1000 revolutions per minute."

Not until the introduction of the Westinghouse No. 1 motor in the USA during July 1890 was it possible to obtain a fully enclosed mechanism with gears operating enclosed in a grease-filled case. In October 1890 the small Wenstom Company of the USA produced the first modern single gear set reduction tramcar motor and this forced the established firms of Westinghouse, Thomson-Houston and Edison-Sprague to hasten research and market similar motors during 1891.

The three Waverley electric tramcars, which carried numbers 1 to 3, were originally mounted on Thomson-Houston trucks constructed under contract by the Bemis Car Company of Springfield, Massachusetts, USA under the patents of Sumner A. Bemis. The trucks carried four wheels of 32 inches (812mm) diameter.

The power passed from the trolley arm cable to the main switch mounted under the roof canopy at one end and through an automatic switch behind the driver on the opposite end platform. From these switches the power cable

passed through a fuse box and a lightning choke to the single controller and resistance coils mounted under the car floor. These 'flat face' controllers were regulated through a chained sprocket mechanism actuated by the controller handle and shaft carried by bracket bearings on the end aprons. These functioned through the usual series and parallel connections and could be turned through one complete circle, less the thickness of the stop.

From the resistance coils, through the motors, the current returned to the Randwick Workshops power house by way of the wheels and rails. These rails were each connected to a buried No. 0 soft copper wire cable which ran parallel with the track to the powerhouse.

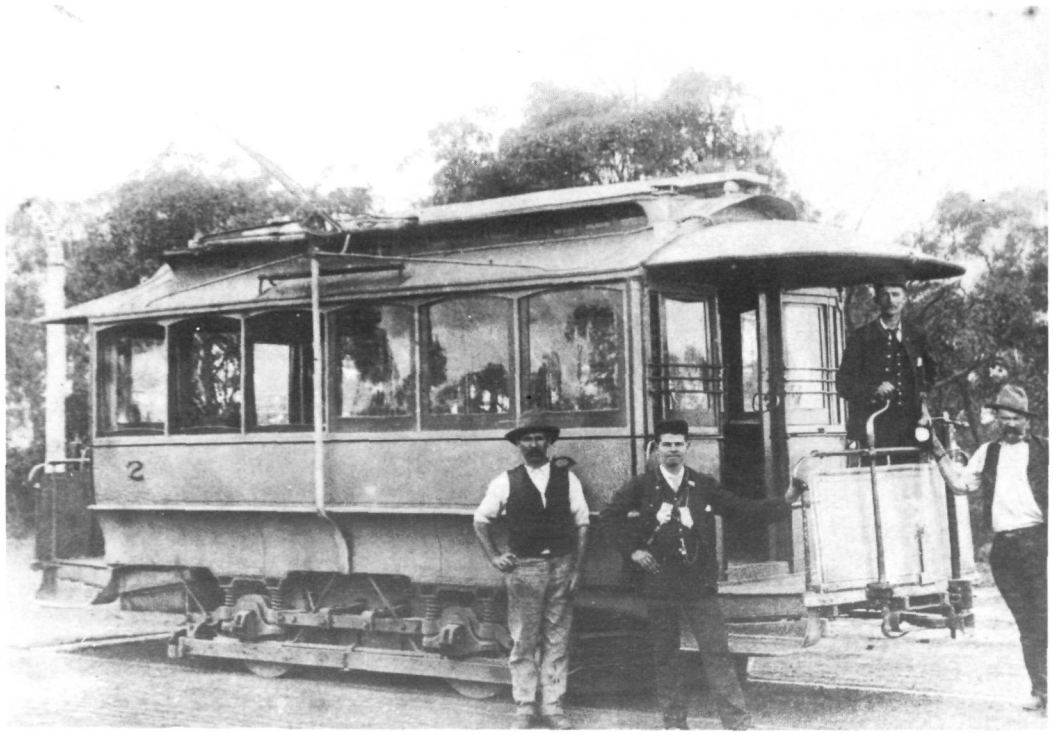
Two types of braking were available to the motorman; the hand operated wheel brake and the rheostatic motor brake. The interiors of the vehicles were illuminated at night by five carbon filament 100 volt incandescent lamps connected in series but all other illumination was provided by kerosene lamps. A large demountable kerosene headlamp similar to that carried by cable grip cars, was fitted on the front apron while two small interior bulkhead lamps, each with its own small chimney ventilator, threw a feeble light into the saloon and a red light outwards, when the trolley pole was off the wire at terminals.

Twenty-six passengers could be seated in comparative comfort on the interior longitudinal seats which were of laminated timber (plywood) pierced with ventilation holes and covered with Wilton carpet.

The Thomson-Houston Electric Company

Elihu Thomson and Edwin Houston collaborated in 1878 to produce a more efficient arc lighting system after Thomson had conducted experiments with, and made improvements to, the Brush system. To market and develop the Thomson Houston patents and techniques the American Electric Company was established in 1880. By 1882 Thomson felt that the company was not exploiting the patents efficiently so, with the backing of Boston businessmen, was able to establish the Thomson-Houston Electric Company at Lynn, near Boston, in 1883.

By 1885 the firm was successfully manufacturing and marketing complete arc and incandescent lighting systems while by 1886 production had expanded to include direct



Stephenson electric car No. 2 at North Sydney in 1893. At this stage the tram still retained the original controller gear. L. GORDON Collection

current motors. By 1888 the Thomson-Houston Electric Company was able to supply complete electric railway and tramway systems.

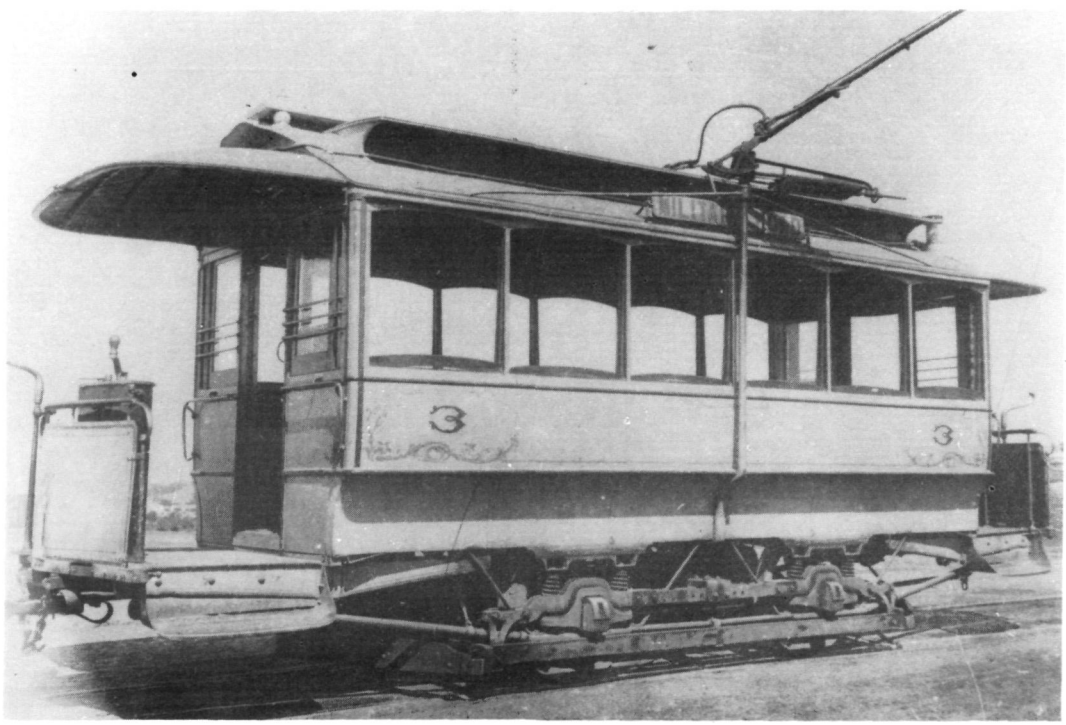
Bentley and Knight established the first commercial electric street railway in the USA at East Cleveland in 1884. It operated on the conduit supply system located between the running rails. This one mile (1.6km) electric working closed after a year's operation due largely to the high cost of operation when compared with horse traction. The comparative efficiency of the venture, when compared with other forms of tramway traction, prompted the establishment of another experimental line in a Rhode Island factory which enabled Bentley and Knight's work to remain available for examination. In 1887 Bentley and Knight won the contract for a 37 car electric system in New York city and the Thomson-Houston Electric Company was the subcontractor selected to supply the motor and generating equipment. During 1889 the Bentley and Knight company was purchased by Thomson-Houston of Boston.

Earlier in 1888 the Thomson-Houston Electric Company had also purchased the growing electric tramway business of Charles J. Van Depoele who had pioneered an electric line at the Toronto Exhibition in Canada in 1884.

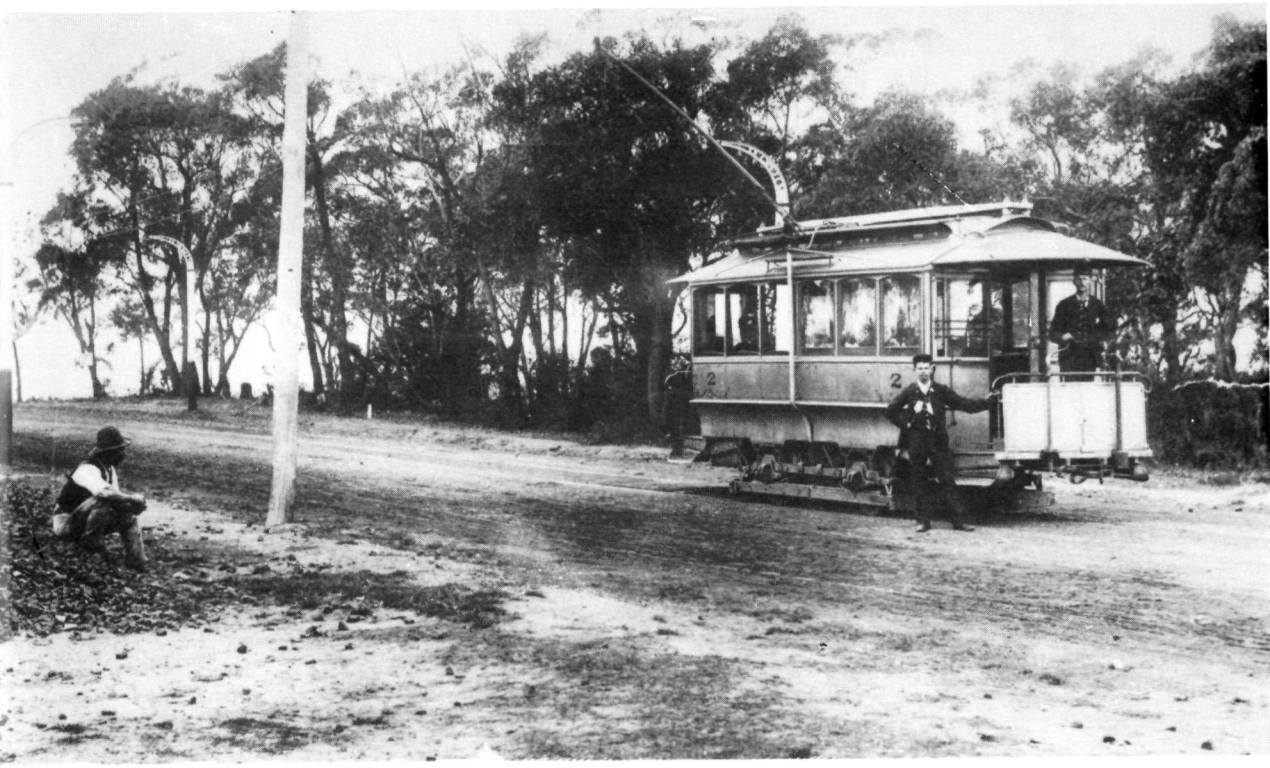
The first installation of the Thomson-Houston Company electric railway system took place in July 1888 on the Lynn Railway in Massachusetts. The items displayed at the Melbourne Centennial Exhibition in 1888 were certainly early examples of the Thomson-Houston products as not until late in 1888 was similar equipment used in the USA.

The truck used under the Melbourne Exhibition car was constructed by the J.G. Brill Company with Thomson-Houston electrical equipment. That firm's archives state that this was the first electric truck constructed by Brill.

The pioneer electric traction firms of Sprague Electric Railway and Motor Company and Edison Electric Light Company merged to form the Edison General Electric Company and in 1892 Thompson-Houston joined to form the giant General Electric Company. Thus the best features of each firm were combined by the new GEC into their products at a time when the world wide change from animal and steam traction to electric operation of street railways was being initiated.



The third of the Thomson-Houston/Stephenson cars on the North Sydney electric tramway, circa 1900. At this stage No. 3 had received the K type controllers and higher horsepower electric motors. The arrangement of the side mounted trolley pole is clearly seen in this view. **Late C.B. THOMAS Collection**



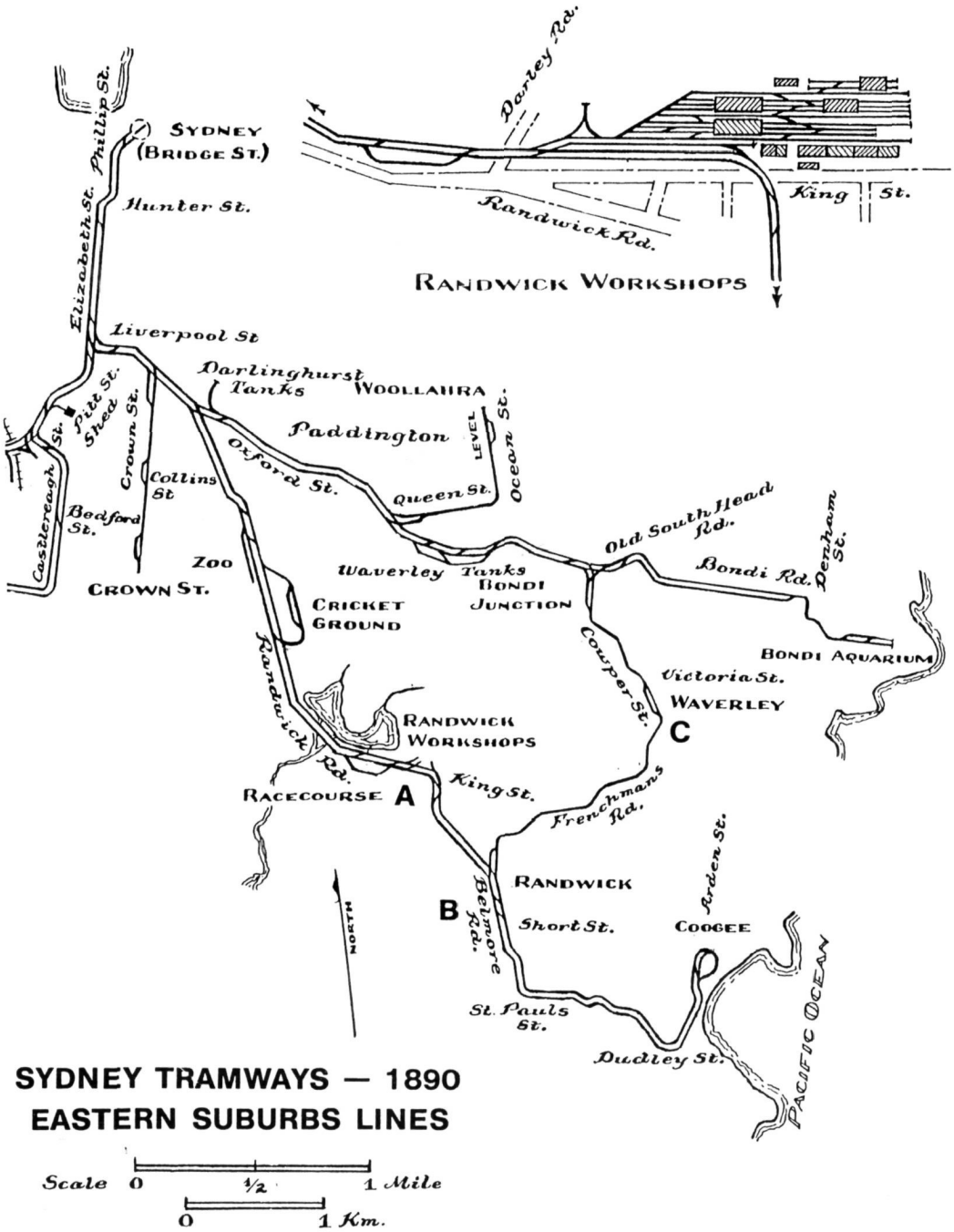
Car 2 on the Military Road electric tramway in North Sydney circa 1893. The tram is still fitted with its original electrical gear. The unusual curved brackets on the span poles are prominent. R. MERCHANT Collection

This situation became closer to a monopoly when the General Electric Company and the Westinghouse Electric and Manufacturing Company organised a patent exchange agreement.

Inauguration of Experimental Operation in Sydney

The introduction of electric traction was alarming to some prospective passengers used to horse and steam operation on the city streets. At the Public Works Committee enquiry on 6 November 1890, Mr Mahoney stated that 600 miles (960km) of Thomson-Houston equipped electric tramways were in service in the USA while a further 400 miles (645km) were being currently constructed. He added that the current required to drive the car was not enough to kill a person. On 3 December 1890 the Hon. J.M. Creed asked the Vice-President of the NSW Legistative Council, the Hon. W.H. Sutton about the danger "by proximity of the electric machinery, to the watches of passengers travelling by electric tram..." The reply that "every available information on the subject will be obtained" did not help to dispel fears in this matter.

The official trial of the new electric tramway at Waverley took place on Wednesday, 5 November 1890. A large party of tramway officials, members of the Public Works Committee on Tramway Construction, municipal officers and Thomson-Houston representatives departed from Bridge Street Yard in Sydney at 1.35pm on a special steam tram and transferred to two of the new electric cars at Randwick Depot at 2.00pm. The party was "propelled with great steadiness up and down hills and around the severe curves" at 12 to 16 miles per hour (20 to 27 kph) on the level and at 8-1/2 mph (14 kph) on steep grades. The drivers easily controlled the cars and "the merest tyro could learn the duties in a few moments". The trial proved a complete success, but due to the large crowd in attendance a thorough investigation of the workings could not be conducted.



SYDNEY TRAMWAYS — 1890
EASTERN SUBURBS LINES

Scale 0 ½ 1 Mile
0 1 Km.

The tramway was electrified between points A, B and C.
The line between points A and B was for depot working only.
Passengers were carried over the tramway between points B and C.

The electric service opened to the public on Sunday afternoon 9 November 1890 and during the following day, a public holiday to celebrate the Prince of Wales' (later King Edward VII) birthday, heavy traffic of curious passengers was conducted by the electric cars over a usually lightly patronised route.

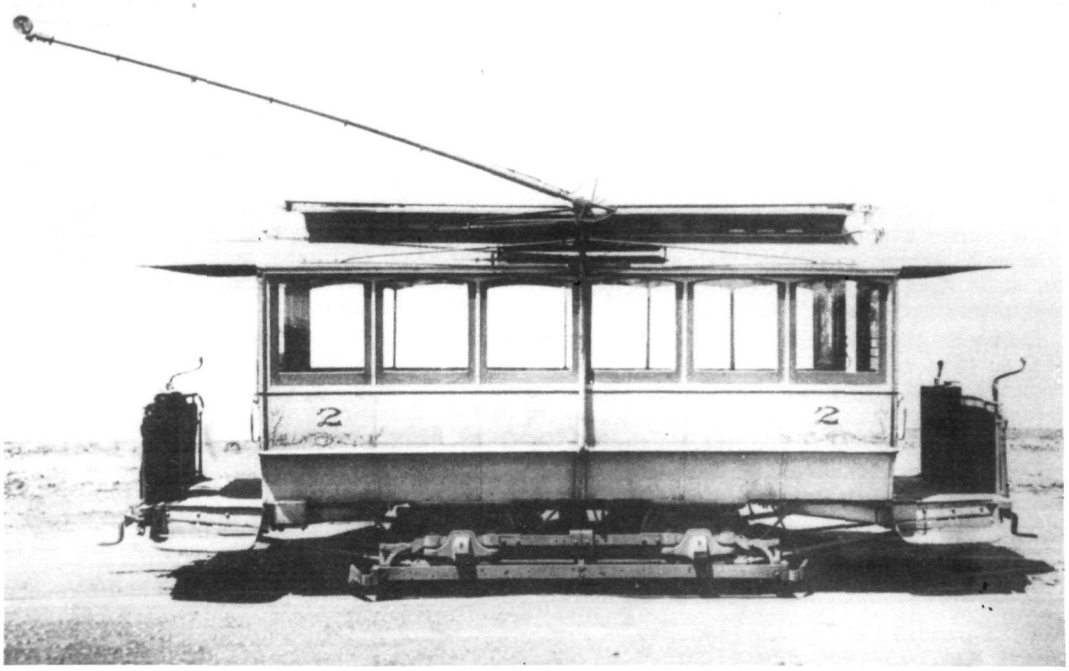
On Wednesday, 12 November 1890 a more serious trial than the junket undertaken on the previous week was conducted on the electric line by the members of the Parliamentary Public Works Committee on Tramway Construction, Professor Threlfall of the University of Sydney, and Mr Musgrave Fischer, Assistant Engineer of the Tramway Department under the direction of Mr J. Mahoney of the Thomson-Houston company. This trial, to demonstrate the power and speed of the system, commenced at Randwick Depot at 1.30pm. One 4 ton electric car loaded with passengers hauled a 5 ton bogie steam tram trailer to Waverley without difficulty and returned as a single unit at considerable speed. After this practical demonstration the party inspected the Randwick powerhouse plant and no doubt returned to Sydney well pleased with the results.

On the day of this trial the Colonial Treasurer stated in the press that the electrification of the line had been carried out by the Thomson-Houston Company of Boston for the Railway Commissioners and the engines, cars, motors, etc., had been purchased from the firm for about £9000.

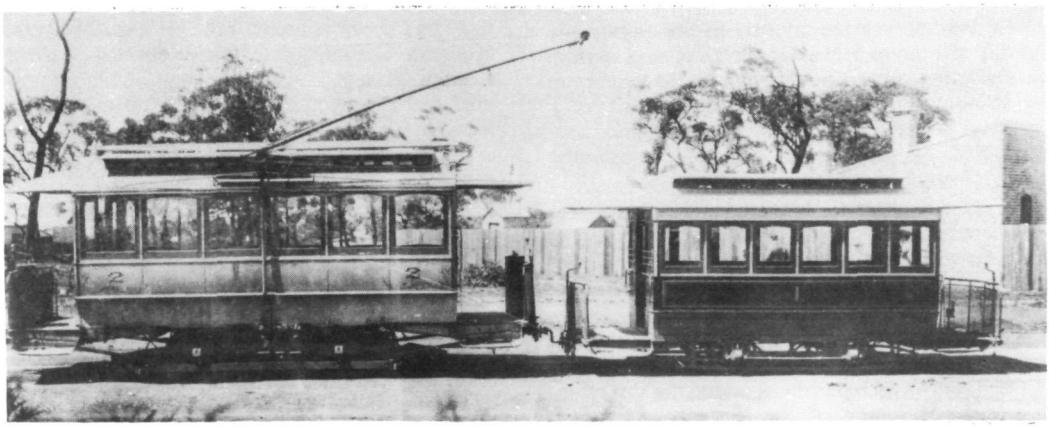
The ownership of the tramcars, which were originally provided by the Thomson-Houston Electric Company for the trials, was still unclear in the NSWGT Annual Report for 30 June 1891 as a discreet blank appeared in the table concerning the number of electric tramcars in service. In the 1892 report this same table listed three electric cars under tramway ownership for both June 1891 and June 1892.

Operation of the Waverley Electrical Experiment

The three electric cars were available for traffic on the Waverley to Randwick tramway for a period of about 17 months. Initially some trouble was experienced with the steam plant but this was soon corrected. From time to time both minor and major faults caused delays in the service but few of these were of lengthy duration and the proximity of the Randwick steam tram depot made it a simple matter to replace the electric vehicles on these occasions.



Thomson-Houston/Stephenson electric car No. 2 on the North Sydney tramway circa 1900. The side mounted trolley pole is still in use but more modern K type controllers and higher powered motors have been fitted. D. O'BRIEN Collection



Electric car 2 hauling North Sydney cable trailer No. 1 on the Military Road electric line circa 1900. Late C.B. THOMAS Collection

Considering the pioneer nature of the experiment the electric operation at Waverley proved a mechanical success. In that environment, however, the fact emerged that it was more economical to operate the service with steam trams. The conventional steam vehicles could work the service at an average cost of 13.68 pence per mile while the electric vehicles amounted to 16.46 pence per mile. This difference in costs proved too extravagant at that juncture. Until 1890 the Colony had suffered a prolonged drought which was followed by extreme flood conditions; this produced an economic recession in a country dependent on its primary industry. Added to these problems was a period of industrial unrest (from which emerged the Australian Labor Party) while the London money market cut off loan funds to Australia as a result of the land and company 'boom and bust' which caused many investors to be satisfied with a 1/4 penny in the £1 (1/960th) compensation after the land sharks and the boom companies were wound up and their assets sold. So on 20 April 1892 the experiment concluded and steam trams returned to the route.

During the eight months from November 1890 to June 1891, the electric cars carried 132,240 passengers yielding £575. During the same period of the previous year/s the steam trams on the service carried 86,570 and received £407.

Comprehensive details of the electric operation on the Waverley extension line can be summarised as follows:

Operation Details	*Costs — Steam*	*Costs — Electric*
Steam November 1889 to June 1890	£1423	—
Electric November 1890 to June 1891	—	£1796
Anticipated steam July 1891 to April 1892	£1915	—
Electric July 1891 to April 1892	—	£2459

During 1908 a correspondent described as 'Pioneer' presented some reminiscences in the *Recorder*. "Old No. 1, the first electric car, was called the 'rheostat car'. There were no controller cases on it at all. There were two brake handles, the reversing handle was placed in the left hand handle and you kept turning the handle until it came to a stop, then you had full speed. When you wanted to stop you would rewind again. This winding would work an arm 2 feet (60cm) long under the corner of the car round a half circle contrivance. No air brakes, only hand brakes.

"With this car you would want plenty of fuses in your pocket because just underneath the side of the car there were two naked wires, and when the the car would begin to bounce the two wires would touch each other with the result the car would 'prop' and bang would go the fuse.

"If you found it necessary to cut out a motor at any time this was done by breaking the leads off the defective motor. The first electric drivers in NSW were William Phillips and Jimmy Russell. Both were gripmen on the cable line at North Sydney before going to Randwick. They were selected as electric drivers because of their youth and were given six months tuition by the

American experts who brought the system to Randwick. A self storage car (the Plante battery car No. 197 of 1894-5) was run by Driver C. Kendall but this was found to be too expensive."

Closure of the Waverley Experimental Line

Although the electric line officially reverted to full steam tram operation in April 1892, a press report of 5 October 1892 throws some doubt on this date. A return dealing with the operating costs of the electric tramway was published and read:

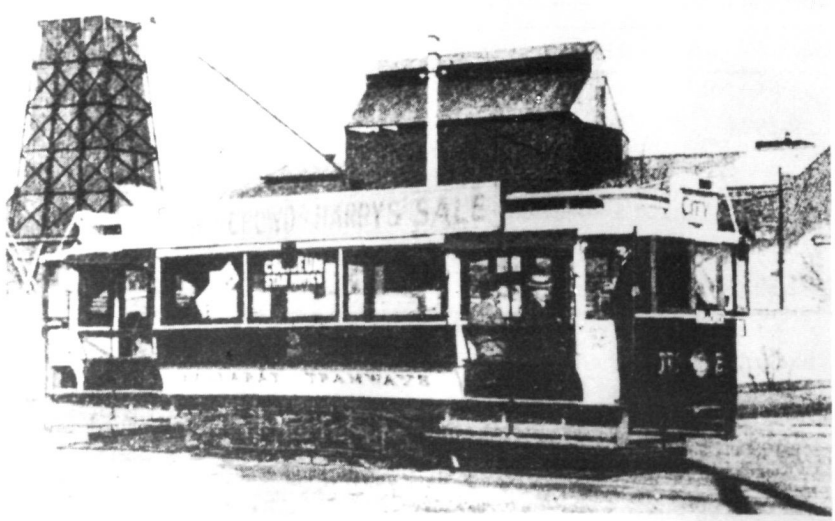
"Ten men are engaged per day at present on the electric system". No other references, however, have been discovered to throw further light onto this query.

The same report of October 1892 revealed some interesting figures on the trials. The expenditure on account had amounted to £10,110, while expenses on repairs had reached £954. The relative costs of electric versus steam operation were respectively £2909 and £2302 per annum. The electric trams were able to travel at 15 mph consuming 2 tons 18 cwt (3 tonnes) of fuel per day. In comparison with the ten men required on the electric undertaking the steam working on the same route to an identical timetable only needed seven men and a fuel consumption of 13 cwt (0.66 tonnes) of coal per day.

Transfer to North Sydney

During October 1892 a contract was let for a tramway to be constructed from Ridge Street on the North Sydney cable tramway to Mosman along Military Road. This extension was planned as a steam tramway but the firm of H.H. Kingsbury was engaged to dismantle the plant along the Waverley tramway and re-erect it at North Sydney. The *Tramway Contracts Register* reveals that H.H. Kingsbury dismantled and re-erected the overhead wiring for a cost of £200 while several abrupt curves on the track were eased and the overhead wiring extended from the Falcon Street and Miller Street intersection to the Ridge Street cable car sheds for an additional £92-17-11. The contract register shows the job as being completed on 14 September 1893 while the contract was not officially awarded until 17 November 1893! This could possibly indicate that H.H. Kingsbury carried out the transfer and re-erection at their own cost with payment being made after a three month trial period.

At 5.55pm on Tuesday 19 September 1893, a trial trip was conducted with the electric tramway using one of the three former Waverley cars in charge of Mr G.F. Clements of the Electrical Engineering Branch of the Railways Department. Public operation commenced on the following morning and from this small beginning Sydney was to be served by electric tramways for the next 67 years.



One of the former Sydney experimental electric cars in Ballarat circa 1920. The three former Sydney cars carried numbers 2, 5 and 7 of which number 2 appears in this view. At Ballarat the firm of Duncan and Fraser converted the enclosed saloon cars to the California combination body style while the six side saloon windows were reduced to three.

Late W. JACK Collection

THE MANLY TRAMWAYS — 1903-1939

PART G. 1922 TO 1925

THE SPIT BRIDGE CONSTRUCTION AND THE HARBORD EXTENSION

By K. McCarthy

The previous parts of this series appeared in *Trolley Wire* for October 1979, December 1980, August 1981, June 1983, December 1984 and February 1987. This section deals with the construction of The Spit bridge and the tramway extension to Harbord.

The Manly to Sydney Land Route

Until the 1920s the most direct method for passengers to reach Manly and the Warringah Shire beaches from Sydney was by ferry from Circular Quay. Although motor buses were serving the beaches north of Manly as early as February 1906, the time taken on waiting for the arrival of, and then crossing the waterways by, vehicular ferries at Milson's Point and The Spit were barriers to this mode of transport and created a challenge to the ferries between Sydney and Manly.

Prior to the 1920s, the 'all land' route between Manly and Sydney occupied 30 miles. Between 1924 and 1932 this was gradually reduced by the opening of the following bridges:

Date	*Bridge*	*"All Land" Route*	*Distance*	
		Manly to Sydney via:		
20-9-1924	Roseville	French's Forest-Chatswood-Hunters Hill-Gladesville-Drummoyne-Glebe Island-Prymont.	23 miles	40km
23-12-1924	The Spit	Balgowlah-Mosman-St. Leonards-Lane Cove-Hunters Hill-Gladesville-Drummoyne-Glebe Island-Prymont.	19 miles	33km
20-3-1932	Harbour	Balgowlah-Mosman-North Sydney	9 miles	15km

The ferry service continued until the opening of The Spit bridge in December 1924.

The ferries on this 700-foot crossing were guided by two cables which were also used for traction purposes by the early hand-wound and later steam-propelled vessels.

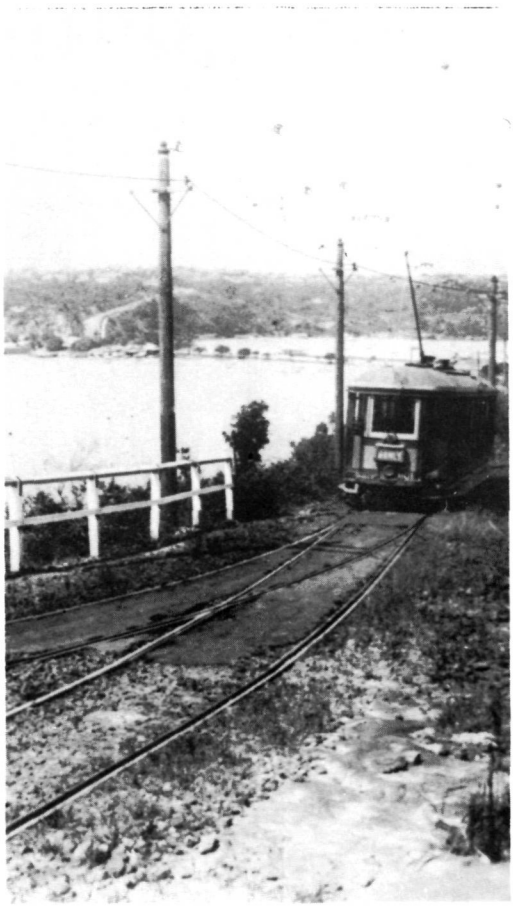
During February 1911 a duplicate set of punt slips and cables were brought into use at The Spit to handle the rapidly increasing vehicular traffic. The original steam punt slips consisted of stone ramps. The duplicate crossing was located 60 feet (between centre lines) downstream and docked at wooden plank slips. During 1911 the two ferries operated on Saturday afternoons, Sundays and public holidays.

The Spit Vehicular Ferries

Peter Ellery's hand-operated vehicular ferry service was established across Middle Harbour at The Spit in 1850 and was connected by bush tracks to Manly and Mosman. The Colonial Government gained responsibility for the punt crossing from Ellery during 1888 and introduced a steam-worked ferry during the following year.

The northern ferry slip was resumed as a public ferry landing on 5 November 1886 while the adjacent approach road was not dedicated as a public thoroughfare until 14 August 1914.

By the early 1920s a third ferry was added to the crossing in an ingenious manner. A non-powered hull was fitted with the standard vehicular ferry decking and ramps. This was lashed at the Manly end of the downstream ferry. The smaller upstream ferry was used during light loading periods, the double combination functioned during normal peak loading periods and the two slips were in use during heavy holiday and summer weekend traffic times.



O class tramcar 1101 leaving Parsley Loop on the downhill trip to The Spit circa 1935.

D. O'BRIEN Collection

Readers are referred to the April and June 1982 issues of *Trolley Wire* for details of the Sydney Harbour vehicular ferry crossings.

The Spit Bridge

The Public Works Committee considered the construction of a bridge at The Spit during 1889. A sum of £62,000 was placed on the loan estimates for this work. The planned structure was more substantial than the bridge eventually built in 1924. The proposed bridge had two central openings of 60 feet width with two spans of 135 feet each on either side. The roadway was 32 feet wide and provided head clearance of 30 feet above high water. The Public Works Committee decided tat, as the vehicular ferry could cater for the crossing traffic for many years to come, the bridge should not be constructed at that time.

The bridge eventually constructed at The Spit across Middle Harbour was financed by Manly Municipal Council and erected by the Sydney Harbour Trust at a cost of £60,000 in 1924.

The Railway Commissioners were approached by the Town Clerk of Manly Council on 5 March 1923 concerning the construction of tram tracks on the proposed bridge. At that stage a high level bridge was planned to cost £200,000. If a tramway was included in its design the structure would need to be 33% wider than a bridge for vehicular traffic only. This increase in width was expected to cost £50,000, a sum which the Railway Commissioners were asked to contribute.

Tramway Traffic Manager Edward Doran reported to the Railway Commissioners on 6 April 1923 that the bridge tramway crossing would be made on interlaced or gauntlet tracks protected by automatic signals similar to those then in use on the Iron Cove Bridge at Drummoyne. As the crossing would amount to only 10 chains, additional fares could not be charged so no additional revenue could be expected from this expenditure.

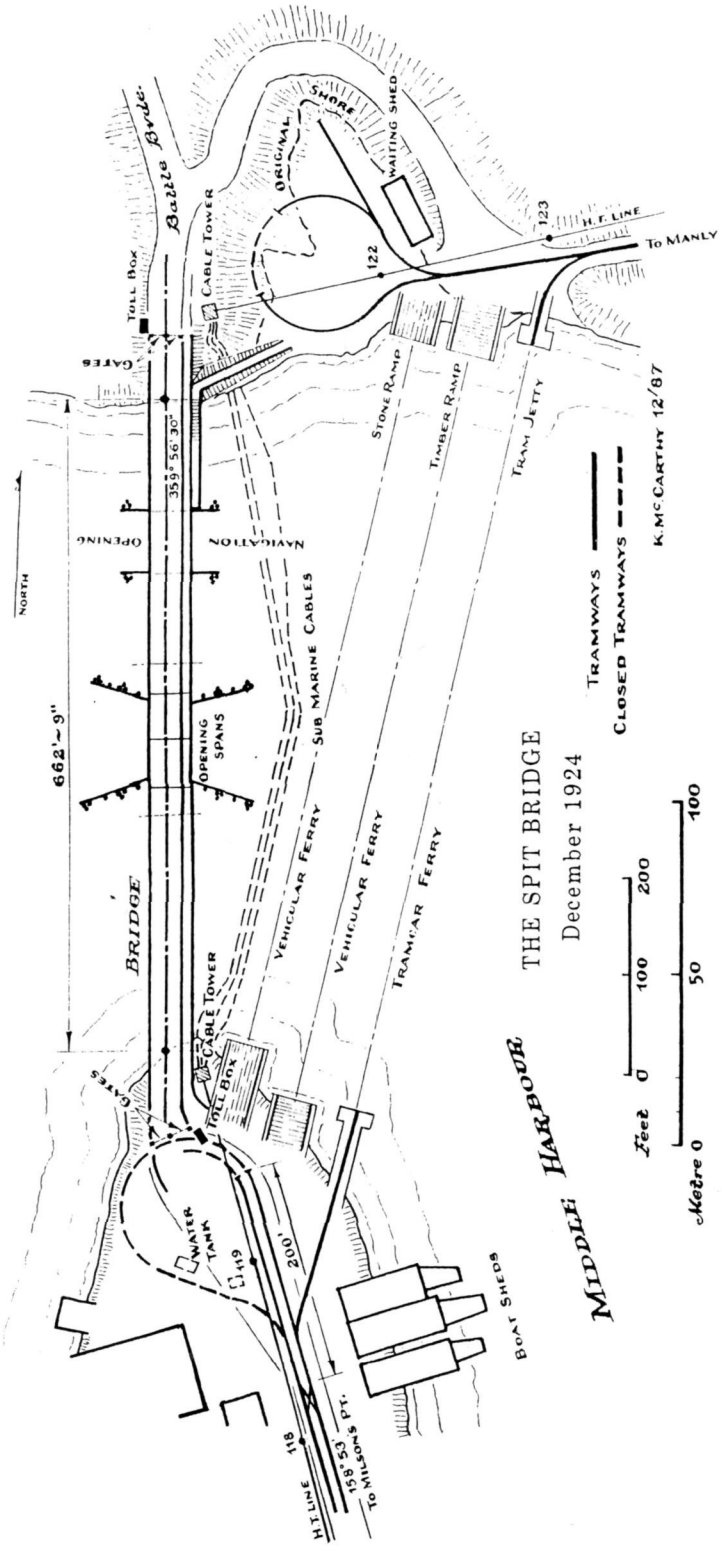
The Tramway Engineer calculated that while the track on the actual bridge structure would cost only approximately £1000 the approaches and trackwork for the entire deviation would reach £20,000.

The Tramway Department would save £326 per annum (p.a.) by the removal of the tram-carrying punt but the annual cost of maintaining the new bridge track would reach £126. This saving was of minor account as the capital cost of the project at 6% p.a. would amount to £3333 p.a. against the Tramway Department's operating costs.

The Railway Commissioners decided that a tramway service would not cross the new bridge and the tramway punt would be retained to transfer cars between the North Sydney and the isolated Manly tramway routes. The Commissioners stated that the additional expense could not be justified for such a short period of time as the electric railway was expected to reach Manly from North Sydney by way of a railway bridge at Northbridge in "ten years time". With the arrival of the railway the Manly trams were expected to act as a feeder service to the proposed Manly station.

Bridge Construction

On 24 October 1923 an Act of Parliament was passed (Act No. 24 of 1923) which permitted the construction of The Spit bridge. The first pile was ceremoniously driven by the Mayor of Manly, Alderman A. Samuels, on


THE SPIT BRIDGE
December 1924
K. McCARTHY 12/87
TRAMWAYS
CLOSED TRAMWAYS
Feet 0 100 200
Metre 0 50 100
MIDDLE HARBOUR
BRIDGE
662'-9"
NORTH
OPENING SPANS
NAVIGATION
359° 56' 30"
GATES
TOLL BOX
CABLE TOWER
VEHICULAR FERRY
SUB MARINE CABLES
VEHICULAR FERRY
TRAMCAR FERRY
STONE RAMP
TIMBER RAMP
TRAM JETTY
ORIGINAL SHORE
WAITING SHED
122
123
H.T. LINE
To MANLY
WATER TANK
119
200'
118
158° 53'
To WILSONS PT.
BOAT SHEDS

Sunday 5 May 1924. As a high level bridge planned to cost £150,000 would be constructed between Beauty Point and Seaforth to carry the railway across Middle Harbour, this bridge across The Spit was to be a temporary wooden structure just wide enough to carry two 9 feet traffic lanes and a covered 6 feet 6 inch walkway for pedestrians. This reduced the construction costs from £200,000 to £60,000.

The bridge was an ungainly pier and beam structure which commenced about three metres above sea level on the southern end and joined the northern shore at an elevation of about 15 metres. Although major earthworks were required at the northern end to reach Battle Boulevarde, the only alterations made to the adjacent Seaforth tram terminus was the covering of the balloon loop in the northwest sector to form two dead end sidings.

Two bascule (drawbridge) opening spans provided a 60 feet wide clear passage for river traffic. With the exception of the opening spans, the pedestrian walkway and the staircase at the northern end, which provided access to the tram terminus on the Manly side, were covered.

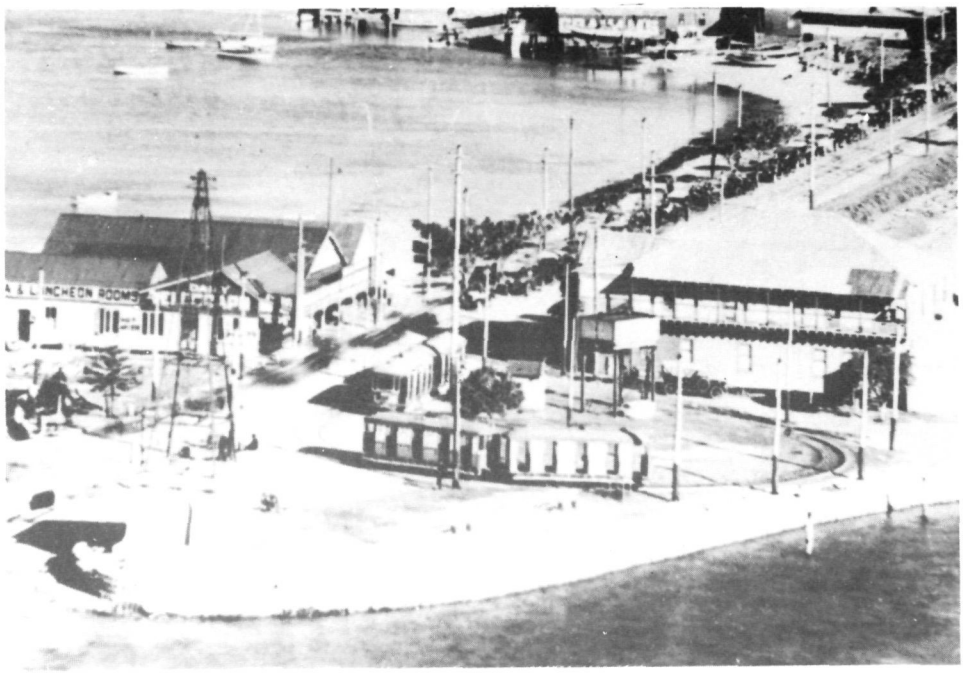
Major alterations were required to the tram terminus on the North Sydney side of The Spit. A balloon loop had been constructed at this location during September 1914.

On Wednesday 11 June 1924 work commenced on the removal of the south side balloon loop. This was replaced with a two-road dead end connected by scissors crossovers. While this work progressed an existing crossover was used for turning back cars and the southern approach road to the tramway punt doubled as a parking siding.

Half the cost of the tramway alterations on the southside of The Spit was met by the Sydney Harbour Trust. On 26 March 1924 the conversion work was estimated to cost:

Removal of balloon loop and construction of scissors crossover	£1181
Removal and alterations to overhead wires	£95
Removal and transfer of water tank and starter's office	£380
Total:	£2356

The new scissors crossover was completed on 20 August 1924 but a later directive from Tramway Engineer George Cowdery to Tramway Traffic Manager Edward Doran on 8 April 1925 stated that the new tracks on the Mosman side of The Spit would be inspected on 10 April 1925 and then placed in use!



Two sets of E class cars stand on the balloon loop at The Spit. The loop, together with the Starter's cabin and water tank, was removed to make way for the bridge approach.

R. MERCHANT Collection

Trams or Motor Buses?

On 20 June 1924 the Outdoor Superintendent proposed to the Traffic Manager that the tramway service between Manly and The Spit should be truncated to Ethel Street, Balgowlah, when the new bridge opened. A motor bus service operated by the Tramway Department could then be introduced between Ridge Street, North Sydney, and Manly Pier to avoid the physical break in the tramway route at The Spit.

An alternative proposal envisaged the retention of the smaller vehicular ferry at The Spit to carry tramway passengers between the two isolated tramway terminals. Traffic Manager E. Doran recommended to the Railway Comissioners that this proposal not be adopted due to the high costs involved. He did suggest that the crossing problem be kept under review and the question of providing a Government bus service be reconsidered later. This proposal was approved by the Railway Commissioner on 12 July 1924 and formed the basis for the inauguration of the first Government motor bus service on 25 December 1932 on the North Sydney to Manly route.

The Spit Bridge Opening

The Spit bridge was completed in the short space of eight months. On 23 December 1924 the Premier, Sir George Fuller, declared the structure open.

From 23 December 1924 until 28 March 1930 the Spit Bridge operated as a toll road.

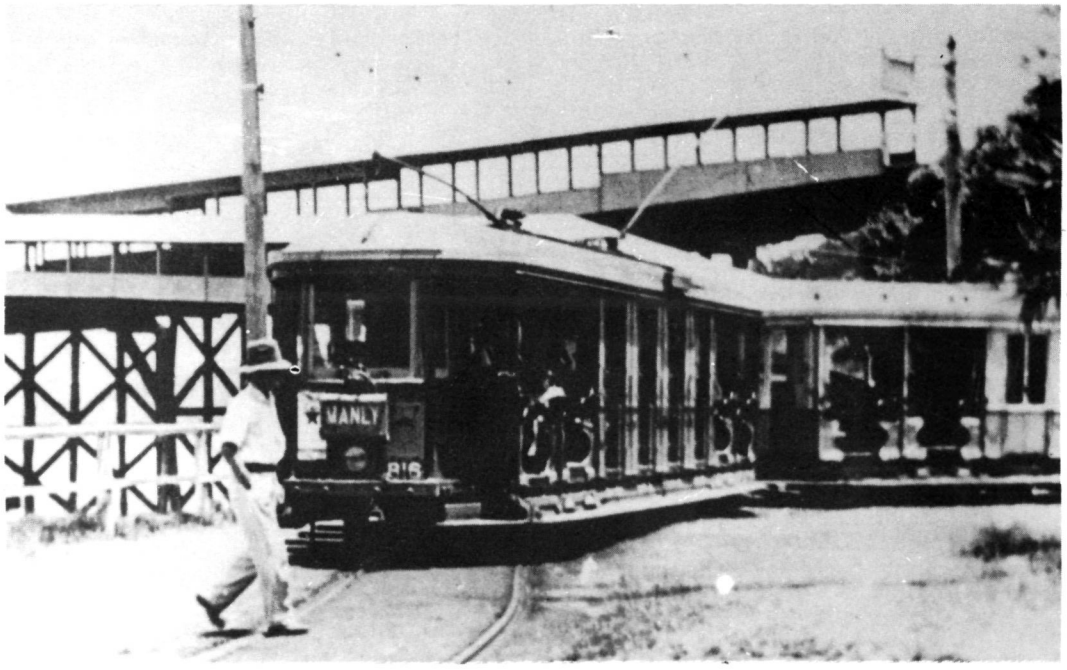
Crossing fees were:

Bicycle	1d
Motor cycle	2d
Motor cycle and side car	3d
Horse	3d
Two or four wheel vehicle with one horse	3d
Each extra horse	3d
Motor cars	6d
Trailers	1d
Motor bus	1/–
Motor lorry up to 3 tons	1/–
Motor lorry up to 6 tons	1/6
Motor lorry over 6 tons	2/–
Loose horses or cattle	2d per head
Sheep and pigs	1d per head

Between 23 December 1924 and the end of 1928, 80,012 vehicles had crossed the bridge. On 1 January 1929, 8677 vehicles made the

THE SPIT, MANLY, N.S.W.

This view of the bridge at The Spit shows O class trams on both sides of the waterway and the tramcar punt moored against the southern shore. K. McCARTHY Collection



O class 816 about to depart from the Seaforth (north side of The Spit) terminus for Manly circa 1937. The covered pedestrian ramp from the tram terminus up to The Spit Bridge can be seen in this view. Late A. RENWICK Collection from MRS. McINDOE

crossing on that single day. By the time the tolls were abolished £107,000 had been collected.

The 'temporary' Spit Bridge remained in use until 1958 when a more substantial structure, still retaining the unfavourable low level location and opening style of the 1924 bridge, was commissioned.

The Manly to Harbord Tramway

Until 1923 the attractive surfing beach contained in the bay to the north of Queenscliff was known as Freshwater. Since September 1923 the beach and district has been named Harbord but in recent years a strong tendency has existed to revert back to the former name.

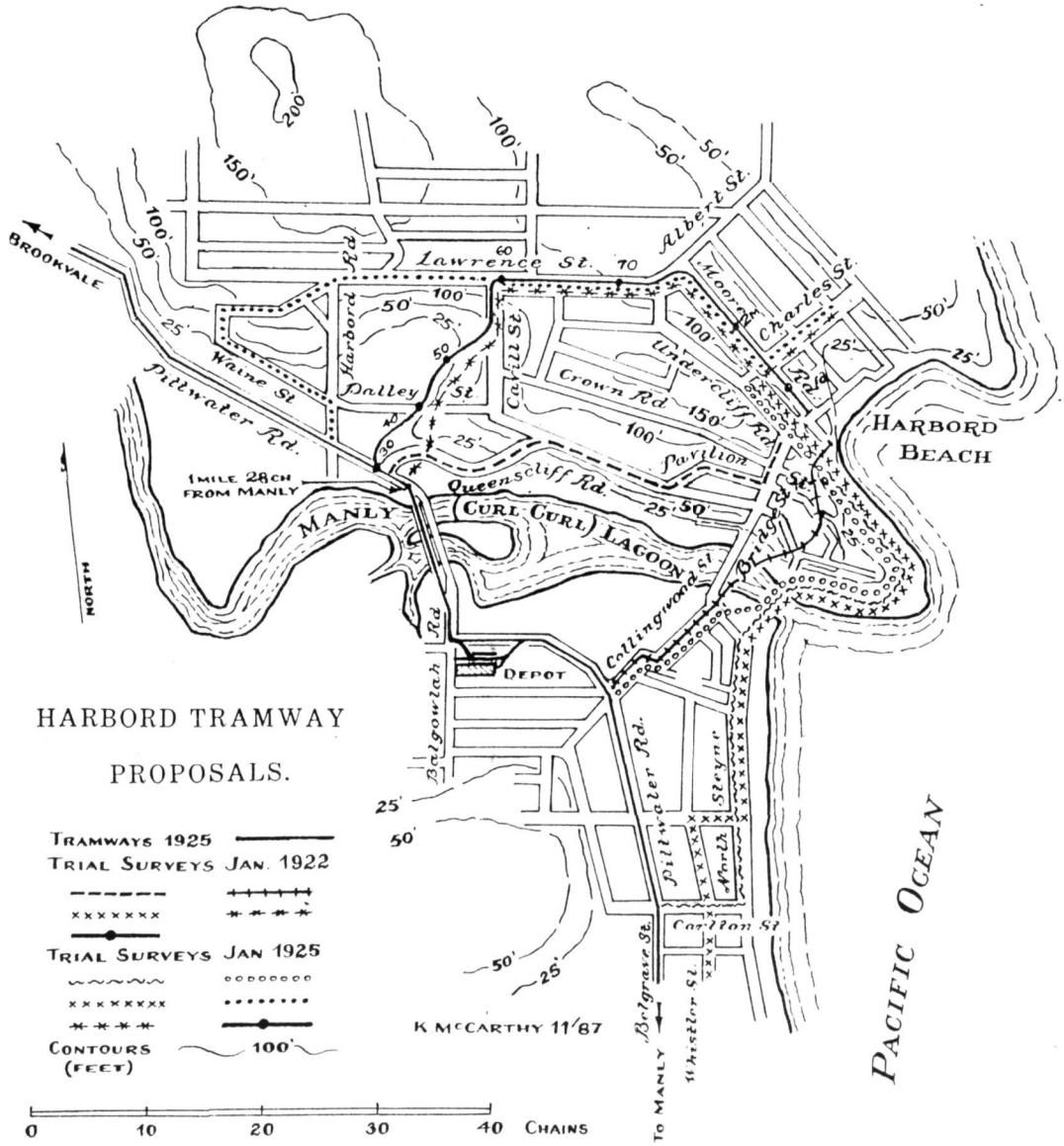
The proposal for a tramway branch linking the main Manly to Brookvale (later Narrabeen) route was lodged for Public Works Committee consideration in 1909. In 1911 the matter was considered by the Tramway Proposals Committee. The proposals had been supported by the (Freshwater) Harbord Tramway League and Progress Association and the Warringah Shire Council.

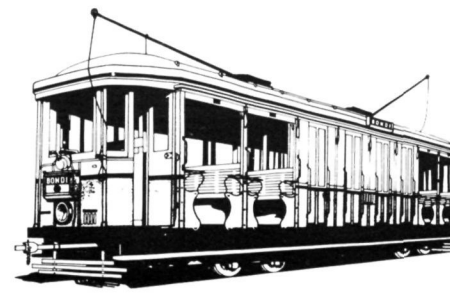
Although the Tramway Proposals Committee favoured a connection with the Brookvale line at Harbord Street or Queenscliff Road, in their report of 30 May 1911 the Works Minister of that period, Mr A. Griffith, decided that no action could be taken unless a guarantee against loss could be provided as the tramway would serve an area of sparse settlement.

During June 1924 the Warringah Shire Council and Freshwater residents intimated that they were willing to guarantee against an operating loss. This cleared the way for a survey to be undertaken of the proposed route along Queenscliff Road, Lawrence, Albert and Moore Streets. The construction cost of £2841, exclusive of land resumption, was considered too expensive for such a short tramway of 70 chains so Griffith ruled that the proposed construction would be premature at that stage.

The next Minister, Hon. J.H. Cann, had trial surveys made along the ocean foreshores and across the Queenscliff headland. The total construction cost for these routes, which were in the vicinity of 70 chains, was £16,542. The project was still considered premature and the Chief Railway Commissioner ruled that land resumption was dearer by these routes and less people would be served by the tramways.

During May 1919 the Minister for Works (Hon. R.T. Ball) announced that if local


HARBORD TRAMWAY
PROPOSALS.
TRAMWAYS 1925
TRIAL SURVEYS JAN. 1922
TRIAL SURVEYS JAN 1925
CONTOURS (FEET)
100'
0 10 20 30 40 CHAINS
0 100 200 300 400 METRES
K McCARTHY 11/87
BROOKVALE
1 MILE 28 CH FROM MANLY
MANLY
NORTH
Lawrence St.
Albert St.
Harbord Rd.
Dalley St.
Carill St.
Crown Rd.
Undercliff Rd.
Pavilion St.
Queenscliff Rd.
(CURL CURL) LAGOON
Collingwood St.
Belgowlah Rd.
DEPOT
Pittwater Rd.
Stryner
North
Carlton St.
Belgrave St.
Whistler St.
TO MANLY
HARBORD BEACH
PACIFIC OCEAN



residents would financially support the tramway he would place his recommendations before cabinet. Dr Arthur MLA said that £10,000 would be raised by people in the district and invested in treasury bonds at 5% p.a. for ten years. The Colonial Treasurer ruled that the full amount of the estimated construction costs as well as a cover against operating losses over a certain period would be needed in treasury bonds and only then would the tramway be considered. The branch line would then be constructed if the Railway Commissioners agreed.

On 22 January 1920, the Railway Commissioners revealed that the construction cost of the Harbord tramway now amounted to £18,887 and this figure did not include land resumptions. The annual working costs were estimated as £6865 but the revenue was calculated as only £4800 p.a. which would result in a working loss of £2465 each year. The Commissioners recommended that the tramway be constructed if the loss for the first ten years of operation was covered. The residents' committee did not respond to this offer.

During February 1920 the residents formed a deputation which waited upon the new Minister, Hon. J. Estell, who instructed the Railway Commissioner to include the cost in the draft loan for the 1920-21 estimates. This was later removed due to a drastic revision of the estimates for Public Works projects.

In February 1921, Mr Weaver MLA offered £20,000 at 6% p.a. interest on behalf of the Financial Corporation. The loan would be for a period of 20 years repayable in rests of five years. The Railway Commissioner's reaction to this offer was to issue a statement that the construction cost for the Harbord tramway was now estimated at £21,966 excluding land resumptions, the annual working costs including 6% p.a. interest would exceed revenue by £2392. The Commissioner was confident, however, that the pleasure traffic would grow and home construction would be encouraged. The project was considered favourable but not urgent.

The Harbord Tramway proposal was placed before the Public Works Committee on 22 December 1921 but State Parliament disolved on 22 November 1922. The review committee, under the chairmanship of W.T. Dick, recommended on 11 December 1923 that the Harbord tramway be constructed.

The committee not only reviewed various routes which would negotiate the steep terrain which formed Queenscliff, but investigated various modes of tramcar. One-man operated cars could result in a saving of 40% when compared with the operating costs of two-man cars but, due to the heavy traffic experienced in the Manly district during summer weekends and public holidays, a duplicate fleet of small and large cars would need to be housed on the system to provide one-man operation during light loadings periods and coupled sets of high capacity vehicles during peak traffic times.

The following estimates of construction costs and revenue were presented at the various enquiries between 1915 and 1921:

Date	*Construction Cost*	*Operating Costs Interest+Expenses*	*Revenue per Annum*	*Loss per Annum*
13-4-1915	£18,887	£5341 £756+£4585	£2500	£2841
24-11-1919	£18,887	£6865 £944+£5921	£4400	£2465
20-4-1921	£21,966	£7992 £1208+£6784	£5600	£2392
July 1921	£22,966	£7937 £1263+£6674	£5600	£2337

A survey of bus operations serving the Freshwater (Harbord) and Queenscliff district from Manly Pier was presented on 11 February 1922. This revealed the following daily income on these bus services:

Operator	*Route*	*Weekday Income*	*Saturday Income*	*Sunday & Holiday Income*
G. Holt	Manly to Freshwater	£9	£13	£13
Slocombe & Rose	Manly to Queenscliff Steps	£4-10s-0d	£5	£5
Curtis	Manly to Queenscliff Steps	£4-10s-0d	£8	£9

Further bus route details were revealed in a report compiled during December 1922:

Route	*Fares*
Manly Wharf to Freshwater Beach via Curl Curl (North Manly) Bridge	Wharf to Tram Depot ..... 2d Wharf to Curl Curl (North Manly) ..... 3d Wharf to Terminus ..... 4d 1d additional Sundays, Holidays and after 11pm with a through fare of 6d.
Manly Wharf to Queenscliff Steps via Whistler and Pine Streets then along Ocean Beach to Curl Curl (North Manly) Lagoon.	Fare ..... 2d Increased to 3d on Sundays, Holidays and after 11pm.

Manly Tramway Revenue

At this period some interesting figures were released concerning tramway traffic on the Manly system:

For the year ended 30 June 1922: Tramway earnings per car mile 32.43d
Passengers carried per car mile 9.57

Sample taken on Monday 18 December 1922:
Tramway earnings per car mile 29.84d
Passengers carried per car mile 9.13

Manly-The Spit:
Earnings per car mile 32.64d
Passengers per car mile 14

Manly-Narrabeen:
Earnings per car mile 29d
Passengers per car mile 7.63

Percentage of Traffic for each Section

Percentage of tramway traffic for each fare section on the Manly Tramways for the year ended 30 November 1922:

SECTION LOCATIONS

Fare Section	*Manly-The Spit*	*Manly-Narrabeen*
1st	Manly Wharf-Melbourne Street 1m 16ch 2km	Manly Wharf-Balgowlah Road 1m 1.7km
2nd	Melbourne Street-Dudley Street 1m 10ch 1.8km	Balgowlah Road-Spit Road 1m 9ch 1.8km
3rd	Dudley Street-The Spit 0m 70ch 1.4km	Spit Road-Brookvale 1m 5ch 1.7km
4th	—	Brookvale-South Creek Loop 1m 68ch 3km
5th	—	South Creek Loop-Collaroy Loop 1m 30ch 2.6km
6th	—	Collaroy Loop-Narrabeen 1m 30ch 2.6km
Total	3 miles 16 chains	7 miles 62 chains

TRAFFIC PERCENTAGE OVER EACH SECTION COMBINATION

One Section		*Two Sections*		*Three Sections*		*Four Sections*		*Five and Six Sections*	
1st	23.5%	1 & 2	18.3%	1-3	13.8%	1-4	8.1%	1-5	13.8%
2nd	1.5%	2 & 3		2-4		2-5		2-6	
3rd	5.4%	3 & 4	3.4%	3-5	1.4%	3-6		1-6	*
4th		4 & 5		4-6					
5th		5 & 6							
6th									

Children's trips — 10.8%

* N.B.: On the N.S.W.G.T. systems the maximum fare charged was for a five section journey. At Manly, passengers travelling on the through six section trip to Narrabeen were only charged for five sections.

The Route Selected for the Harbord Tramway

The Harbord tramway route branched from the Manly to Narrabeen line between Queenscliff Road and Harbord Road 1 mile 36 chains from Manly Wharf. Double track extended for 8 chains along the new branch line where the route junctioned into a single line on a 1 in 15 grade.

For the first 25 chains beyond the junction with the Narrabeen tramway, it was approximately 12 feet above sea level. The tramway then negotiated heavy earthworks on private right-of-way with grades ranging from 1 in 15 to 1 in 27. The summit of approximately 180 feet was reached at the corner of Cavill and Lawrence Streets, 30 chains from the junction.

With the exception of a short reverse curve located off the street at Albert Street the tramway traversed Lawrence and Albert Streets and Moore Road beyond the summit on falling grades ranging from 1 in 15 to 1 in 26. The last 18 chains to the terminus was on a gently falling grade to the beach.

The tracks ended in a two-road dead-end terminus 2 chains from the Esplanade and Moore Road intersection, 68 chains from the junction and 2 miles, 21 chains and 70 links from Manly Wharf.

A 5 chain crossing loop was to be constructed 24 chains from Harbord Beach terminus but this would have been situated on the reverse curve across an awkward road intersection. The loop was located in Lawrence Street at Dowling Street, 31 chains from the terminus on a straight thoroughfare but on a 1 in 15 grade.

The First Sod Turning Ceremony

The Minister for Works in the Fuller government, the Hon R.T. Ball, turned the first sod of the Harbord tramway construction at the summit on the corner of Cavill and Lawrence Streets during the afternoon of Friday, 13 February 1925. Councillor McKillop of the Warringah Shire predicted a population growth in the surrounding areas from 4000 to 25,000 when inviting the Minister to conduct the ceremony with a silver spade.

Alderman Reid of the Manly Council criticised the State Government for not providing finance to enable a high level bridge to be built at The Spit. Mr Ball emphasised that he was not conducting this ceremony because of the approaching state elections and he promised that workmen would be "on the spot" on Monday pushing ahead with tramway construction.

Tramway Construction

Although the promised work force did not arrive at Harbord on Monday 16 February, construction did commence on 30 March 1925.

Due to the difficult off-street location of part of the Harbord tramway, ballast motors were used to deliver materials. On 30 April and 1 May 1925, a driver and conductor from St Leonards permanent way siding at North Sydney were rostered to work a ballast motor from Mosman substation to the Harbord line junction. The roster clerk was directed to use a driver conversant with operating tramcars over the Middle Harbour punt at The Spit.

Official Trial

In spite of the very difficult terrain over which the Harbord tramway was constructed, the work was ready for an official inspection on Thursday 17 December 1925.

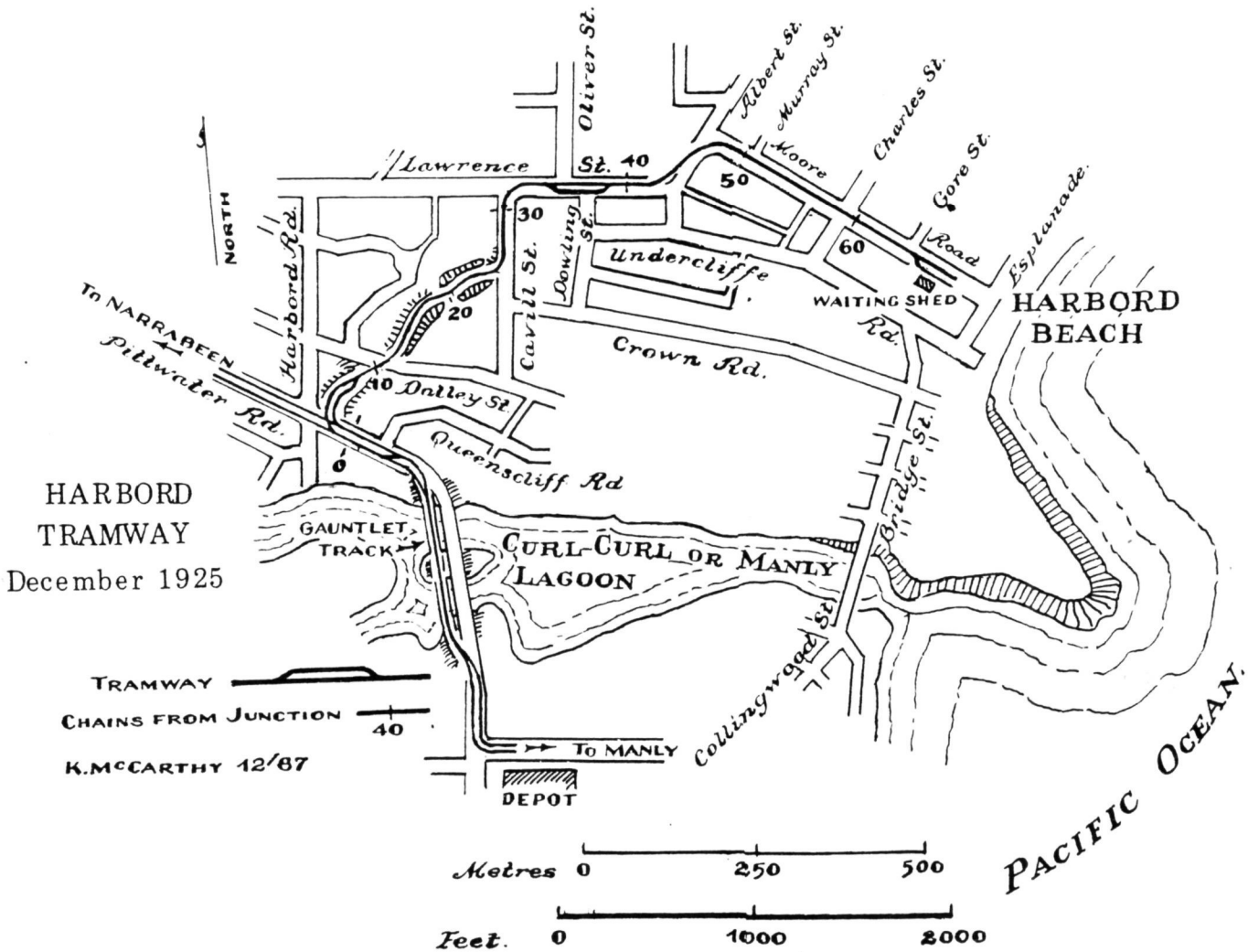
The inspection tram met the 10.30am steamer from Sydney at Manly Wharf and departed with the official party at 11am. Tramway Traffic Manager Doran reported to the Railway Commissioner that the 'landings' (the road or path adjacent to the tramway tracks) were in bad condition at the end of the double track near Harbord Junction and at the curve leading into Cavill Street at the end of the private right-of-way. These had to be improved in case passengers tried to leave the cars if they stopped at these locations. Work still had to be completed on the waiting shed at the Harbord terminus; this was finalised on 25 January 1926.

Opening Ceremony

The official opening ceremony was performed by the Hon. R.T. Ball at the corner of Cavill and Lawrence Streets at 3pm on Saturday 19 December 1925. A coupled set of O class cars had been made available at the North Manly depot during that morning for the Tramway League to apply decorations for the ceremony.

The State Government of J.T. Lang had taken control on 17 June 1925 but due to a caucus meeting being held on 19 December Nationalist opposition members of parliament participated in the ceremony as if they were still in government!

The official party in the official tramcars consisted of Mr Ball; Dr Arthur MLA and Mr Reid MLA; Tramway Traffic Manager E. Doran; District Superintendent G. Holt; President of Warringah Shire Council and President of the Harbord Tramway League and Progress Association, Councillor R. McKillop; and Alderman Keirle, Mayor of Manly. Mr Ball


HARBORD
TRAMWAY
December 1925
TRAMWAY
CHAINS FROM JUNCTION
40
K.McCARTHY 12/87
NORTH
To NARRABEEN
Pittwater Rd.
Harbord Rd.
Lawrence
St. 40
Oliver St.
Albert St.
Murray St.
Moore
Charles St.
Gore St.
Esplanade.
Road
50
60
30
20
40
0
Cavill St.
Bowling St.
Undercliffe
WAITING SHED
HARBORD BEACH
Crown Rd.
Rd.
Dalley St
Queenscliff Rd
GAUNTLET TRACK
CURL-CURL OR MANLY LAGOON
Bridge St.
Collingwood St.
To MANLY
DEPOT
PACIFIC OCEAN.
Metres 0 250 500
Feet. 0 1000 2000

apologised for the absence of the Minister for Works, Hon. G.E. Flannery, and added, with a political side-swipe, "the Lang Government had taken on itself the responsibility of trying to force on the State many measures (which) the country did not give authority for." Dr Arthur said that the Harbord tramway would probably be the last new line to be built in the city due to motor bus competition and he did not expect the Pittwater railway to be built for a considerable time.

Open for Regular Traffic

Regular service commenced on Monday morning 21 December 1925. On the first morning of operation the first seven departures from Harbord carried 30, 16, 34, 29, 34, 28 and 26 passengers respectively.

The base service was 30 minutes on Mondays to Fridays, 15 minutes during the day on Saturdays and 30 minutes in the evening. A 30 minute frequency was operated until 2.30pm on Sundays when the service improved to 15 minutes.

The timetable introduced on the Harbord tramway from Monday 21 December 1925 was:

MONDAY TO FRIDAY

From Manly: 6.30w, 7.00w, 7.16, 7.32, 7.50, 8.10, 8.25, 8.48, 9.10, 9.43, 10.11am, then every 30 minutes until 4.11, 4.25, 4.40, 4.50, 5.19, 5.37, 5.55, 6.11, 6.26, 6.44, 7.05, 7.25, 7.39, 8.10, then every 30 minutes to 11.10, 11.41pm, 12.15am (Saturday morning only).

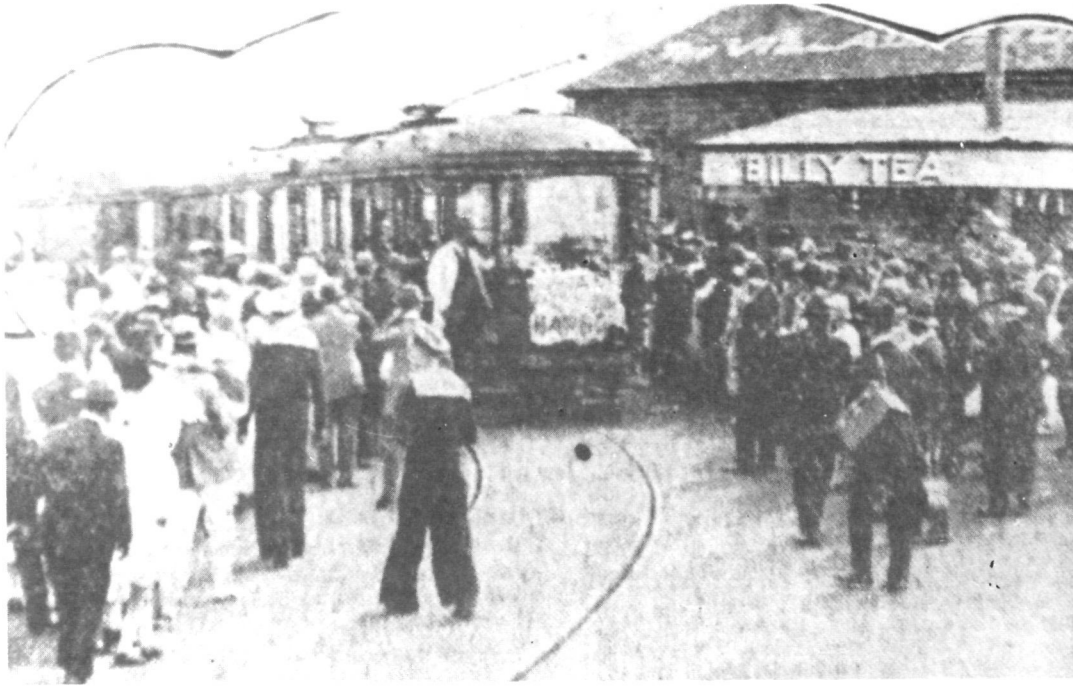
From Harbord: 6.01w, 6.27w, 6.53w, 7.35, 7.47, 8.07, 8.27, 8.47, 9.02, 9.27, 9.56am, then every 30 minutes to 3.56, 4.02, 4.25, 5.02, 5.22, 5.37, 5.52, 6.11, 6.27, 6.42, 6.58, 7.24, 7.56, then every 30 minutes until 10.26, 10.54, 11.25pm, 11.57pm (Fridays only).

Note: w = Workmens' fares

SATURDAYS

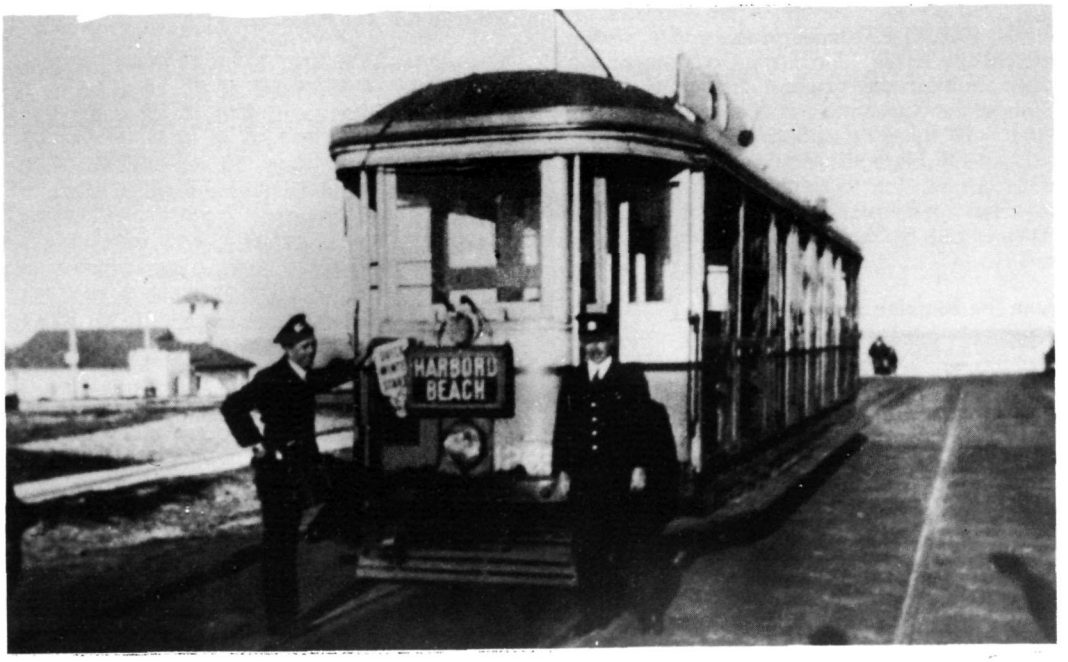
From Manly: Same as Monday to Friday until 11.41am, 12.10, 12.41, 12.56, 1.10, 1.26, 1.41, 2.02, 2.21, 2.41, then every 15 minutes until 6.41, 7.01, 7.26, 8.04, then every 30 minutes until 11.10, 11.44pm, 12.15am.

From Harbord: Same as Monday to Friday until 11.56am, 12.24, 12.41, 12.56, 1.11, 1.24, 2.02, 2.22, 2.41, then every 15 minutes until 6.56, then every 30 minutes until 10.26, 10.54, 11.24, 11.57pm.



Coupled set of O type tramcars at the corner of Cavill and Lawrence Streets, Harbord, during the opening ceremony performed by R.T. Ball MLA on Saturday 19 December 1925.

Late A. RENWICK Collection



O class tramcar 1265 at Harbord Beach terminus, possibly on the last day of operation, 30 September 1939. Late C.R.G. FIELD

SUNDAYS

From Manly: 7.41, 8.27, 9.11am, then every 30 minutes to 2.11pm, then every 15 minutes until 9.56, 10.26, 11.09pm.

From Harbord: 7.26, 8.12, 8.56, then every 30 minutes until 2.26pm, then every 15 minutes until 9.41, 10.11, 10.41pm.

Stopping Places: Harbord Junction, Dalley Street, Lawrence Street, Dowling Street, Albert Street, The Esplanade.

Locked facing points were a problem which confronted the Harbord tram drivers during the first few days of operation. Instructions had been issued at 9am on 21 December that the main Harbord Junction facing points were to be unlocked but it seems that the lock was still in position on 29 December. To avoid this obstacle the outward bound Harbord trams would have reversed through the trailing crossover in Pittwater Road south of Queenscliff Road about 3 chains from the junction, and then operated wrong road along Pittwater Road and the Harbord branch before gaining the single track.

Although Tramway Engineer George Cowdery and Traffic Manager Edward Doran forwarded the complaints down the ranks to the District Inspector on 2 January 1926, it is possible that the points had remained locked until the 'landings' on the private right-of-way near the end of the double track were completed.

Operating Procedures

An additional three drivers and three conductors were required to work the Harbord tramway at a cost of £1448 p.a. During the planning stages the following traffic arrangements had been formulated (3 March 1925): During peak loadings of summer beach traffic two divisions of coupled O type cars could operate at 15 minute intervals. The service speed would be 10 miles 12 chains per hour with a standDover time of 11 minutes at Harbord and 6 minutes at Manly. On these occasions the three groups of tramcars would cross on the double track 60 chains from Manly Wharf at Smith Street and at Dowling Street loop near Harbord terminus.

The journey time from Manly to Harbord occupied 13 minutes and the branch formed the second fare section which extended from North Manly Depot.

The single track staff sections were numbered:

Harbord Junction to Dowling Street Loop — No. 2 Dowling Street Loop to Harbord Terminus — No. 3

The regular operation of the Harbord line settled down to one tram working a 30 minute frequency and two trams for the 15 minute service. The trams were not required to cross at Dowling Street Loop so from 7 July 1931 staff section No. 3 was removed and the branch operated as a single staff section:

Harbord Junction to Harbord Beach — No. 2

Bundy time recorder No. 64 was located at the intersection of Moore Road and Albert Street, one minute from the terminus.

On 3 June 1925 Traffic Manager E. Doran instructed Chief Electrical Engineer W. Myers to provide the Manly trams with the additional name of "HARBORD" on the destination rolls. This was to appear after "COLLAROY BEACH" in large letters similar to the "ATHOL" sign. There is no evidence that this direction was adopted as the wording "HARBORD BEACH" seems to have been carried on the Manly-North Sydney destination rolls for the entire period of operation.

The tramway right-of-way looking downhill from the vicinity of Cavill Street towards the Harbord line junction. Homes in the vicinity of Pittwater Road can be seen in the background. 2 January 1950 K.A. McCARTHY

Manly Wharf Congestion

The opening of the Harbord tramway contributed to tramcar loading problems at Manly Wharf during peak summer periods. Just prior to the opening of the Harbord line, seven trams departed from the Wharf on the arrival of steamers at noon, 12.30pm and 2pm on Saturdays and at 8.40am on summer public holidays. In addition, three buses departed for The Spit and two buses to Bower Street. To relieve this problem, further major track relocations were carried out at Manly Wharf between 8 February and March 1926. Details of this major realignment of Belgrave Street will be treated in the next part of this series.

Rolling Stock

From 28 January 1918, O type cars took up regular operation on the North Sydney system. This enabled trams to be transferred between the Manly and North Sydney systems as holiday traffic demanded. This also provided a flexibility which enabled cars to be taken from the Manly system after the January and Easter holiday seasons and not be replaced until the start of the surfing season in the following October.

On 25 May 1922, an archive entry reveals that the following 26 O class cars were attached to Manly Depot. Where applicable the car number which each of these replaced on arrival is also shown:

Manly Cars 25-5-1922	*Arrived at Manly*	*Replaced Car No.*	*Departed from Manly*
816	12-1-1921	975	12-10-1939
1090	10-4-1920	988	12-10-1939
1094	24-5-1919	807	7-6-1929
1095	23-6-1919	987	22-8-1932
1096	15-11-1919	994	3-10-1939
1099	7-2-1920	991	27-4-1936
1101	24-5-1919	972	12-10-1939
1102	25-9-1920	981	5-10-1939
1103	16-4-1921	984	3-10-1939
1105	24-8-1912	—	1938
1106	6-12-1913	—	22-2-1929
1107	6-12-1913	—	2-10-1939
1108	6-12-1913	—	3-10-1939
1109	6-12-1913	998	3-10-1939
1110	8-5-1920	983	9-5-1938
1111	18-7-1919	978	5-10-1939
1208	23-9-1921	973	9-10-1939
1214	26-9-1921	990	20-10-1939
1227	12-3-1921	989	21-6-1938
1251	18-10-1919	980	11-10-1938
1265	19-8-1921	986	17-10-1939
1266	26-4-1919	809	20-10-1939
1273	13-9-1919	974	3-10-1939
1331	18-12-1920	993	20-10-1939
1343	30-10-1920	985	12-10-1939
1346	6-3-1920	982	9-8-1939

The writer thanks Messrs D. Keenan, R. Willson, D. O'Brien, V. Solomons, K. Magor, C. Woodside, N. Chinn, L. Gordon, E. Law, D. Greenwald, I. Manfred and the late Rev. C. Thomas, P. Gledhill, and C.C. Singleton for assistance given in the preparation of this part of the Manly Tramway series.

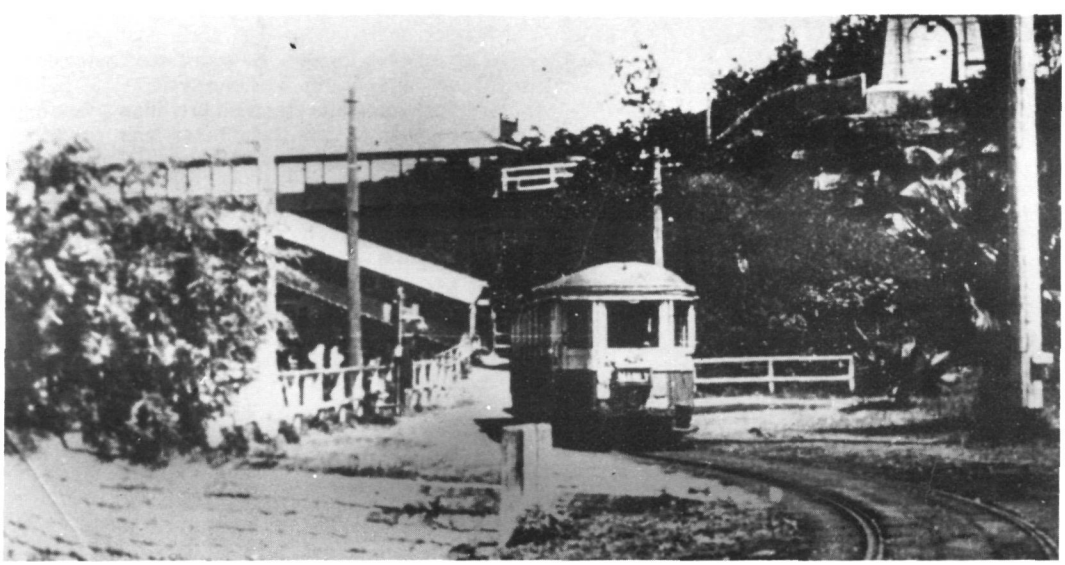
OPPOSITE PAGE:

Top: Sydney R class car 1799 turns into Cowper Street, Randwick bound for Waverley Depot along the Waverley Extension Line, scene of Sydney's first electric tramway, in November 1954.

ARTHUR PERRY

Bottom: Sydney O class 1111 returned to Manly on 17/18 January 1981 after an absence of more than 42 years. It had been sponsored by the then newly formed Urban Transport Authority for the Manly Summer Festival and was placed on the last remaining piece of tramway track still in situ. The blue painted building behind the tram is the former tramway office.

PETER HALLEN



O class car 1331 at the Seaforth terminus. This photo was taken on 20 October 1939 while waiting to be ferried across to the North Sydney system after the closure of the Manly tramway.

E.A. LAW

HERE AND THERE

NEWS ITEMS OF INTEREST FROM ALL OVER

Melbourne News

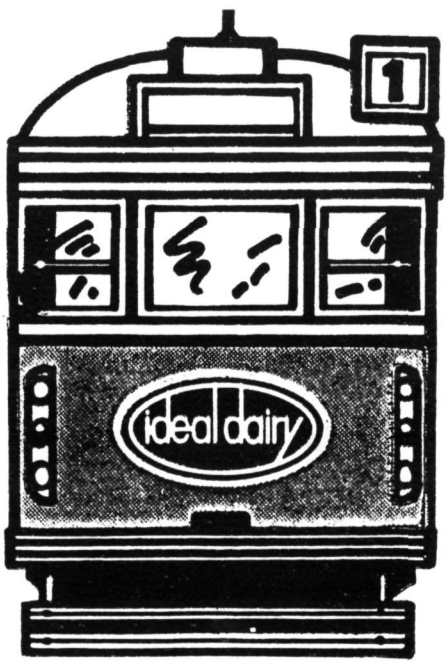
On Sunday 2 September 1990, all St Kilda Road services were diverted at Domain Road into Park Street, Kingsway, Sturt Street and Southbank Boulevarde (formerly Nolan Street) where they terminated. Southbound trams from East Coburg terminated at Flinders Street and buses were used to fill the gaps. This disruption to normal services was to allow workmen to erect two large ornamental arches over the central portion of St Kilda Road; one just north of Southbank Boulevarde and the other just south of Princes Bridge. The work was scheduled to be finished at midday but problems with construction resulted in trams being cut short until around 9.30pm.

Trams were similarly diverted for several hours on 18 September after the Health and Safety Officer from Malvern Depot put a 'pin' notice (a legal black ban due to unsafe conditions) on the up track of the Southbank Boulevarde junction owing to the worn out condition of the track at that location. Services were restored late that afternoon after it was agreed to place an inspector at that location to ensure trams did not pass in opposite directions whilst on the defective trackwork. Luckily a new junction had already been constructed for this site and installation was to have taken place early in October.

In July the junction at the eastern end of Moreland Road was altered to become a double track triangular junction allowing trams to run directly from East Coburg to Brunswick Depot. At the same time the crossover in Holmes Street, just south of Moreland Road, was removed. The 'tango' shuttle tram now terminates at a new crossover installed earlier this year in Moreland Road.

To facilitate the use of B class trams on Route 19 North Coburg, track alterations were made on the weekend of 25/26 August 1990. A new trailing crossover was installed 30 metres north of Flinders Lane in Elizabeth Street, while both tracks in the terminus were extended slightly, the short westside track by 2 metres and the longer side by 3 metres. Earlier this year the roof over these tracks was removed, decreasing the weather protection afforded and detracting from the appearance of the structure. Training of crews in the operation of the B class cars has been virtually completed at Brunswick Depot while training at Preston Depot for the operation of the cars on Route 86 Bundoora is proceeding slowly. Late news indicates that B class cars 2008 and 2016 commenced operations on Route 19 on 9 October 1990.

After success in lower courts, claims by disabled persons groups that driver-only trams and the 'scratch' tickets discriminated against disabled passengers were rejected by the



Melbourne's Ideal Dairy advertised the 1990 Moomba Festival on its milk cartons and taking pride of place on the side of the cartons was the front of a W class tramcar. The tram portion of a carton is illustrated above.

Supreme Court of Victoria. This leaves a final appeal to the High Court of Australia before the matter can finally be resolved. Driver-only operation is now confined to Route 70 Wattle Park and to those drivers who wish to operate without a conductor. It is restricted to off-peak hours, a conductor being collected from a 'pool' when passing the depot as the peak hour approaches. In addition, conductors are carried on all cars after about 9.30pm for security reasons. In the meantime the government has set up the "Met Ticketing Task Force" to solicit opinions from members of the public and interested groups as to the best ticketing system for Melbourne.

The Sun newspaper is also requesting ideas from the public on how to "Get Melbourne Moving". Most public criticism has been centred around graffiti and other vandalism on the suburban train network with little comment on tramway woes.

The trams did, however, attract considerable unfavourable media attention in the first half of September. This was prompted by the virtual head-on collision between up and down Route 5 trams in Wattletree Road at Glenferrie Road. The driver of the up tram, having qualified for driving only the day before, did not notice the facing points at that location were set for a right turn towards Malvern Depot. He veered right into the path of the down tram, hitting with considerable force and injuring 22 passengers. The damage was so severe that the two trams involved, SW6 class 880 and W6 class 976 in advertising livery, were to have been written off but we were advised just as we were going to press that both cars would be repaired.

The media, while reporting this story, found there had been a number of tram/tram collisions recently. At one stage there were 6 in 13 days. More followed. Newspaper headlines reported 'Tram Drivers Driving Without Licences'. On reading the following text one learned that some tram drivers do not hold a car licence, a situation which has always existed. The quality of training was also discussed, while the problems of tram driving were occasionally published, citing the amazingly stupid actions of some motorists and pedestrians, and impossible running times forcing tram drivers to take risks to stay on time, as major problems.

Possibly as a result of the above-mentioned problems, modern trams are being governed down from 75km per hour maximum speed to 65km/h. Upon reaching this speed, power is cut to the motors and does not restore until tram speed has reduced considerably. On some classes of tram the brakes also apply.

Larger fleet numerals are being applied to trams when replacement is required, making cars much easier to identify from a distance. The new numerals are 21cm high, the ones they replace are 16cm.

Over the last few years a number of W class cars were fitted with trolley retrievers made redundant when the A1 class trams were retrofitted with pantographs. The retriever rope was additional to the normal and emergency ropes already fitted. However, dewirements caused by the 'normal' rope catching on door

Continued on page 34

CENTRE PAGES:

Top Left: Hobart bogie single-deck car 142 was the last tram built for service in the Tasmanian capital. This 3 feet 6 inch gauge car was built in 1952 by the Hobart Municipal Tramways and remained in service until the system closed in October 1960.

Bottom Left: Hobart single truck car 22 was built as a double-deck car by the Hobart Municipal Tramways in 1924. The top deck was removed in the late 'forties and it operated as a single-decker until scrapped in 1954.

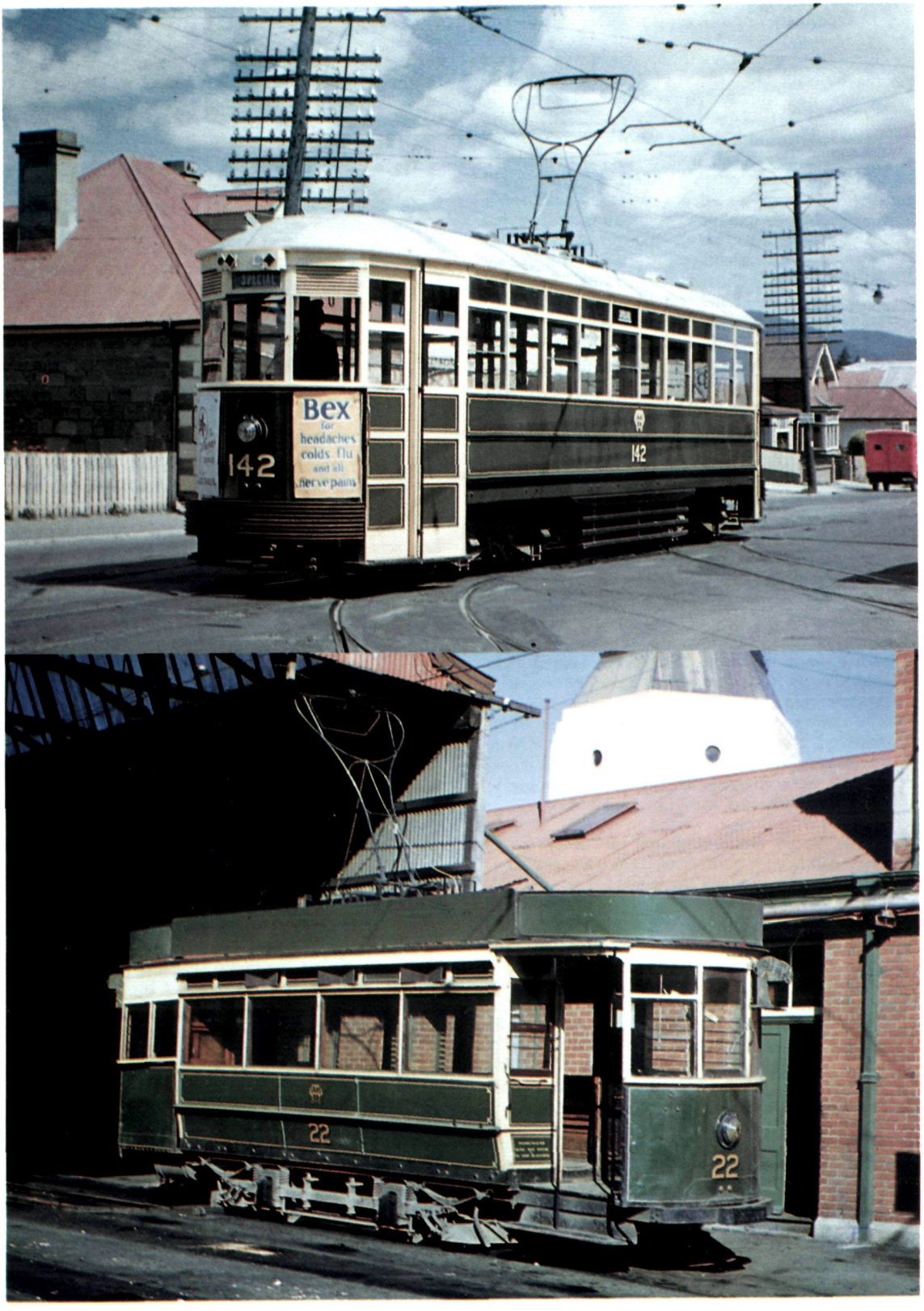
Both NL CHINN Collection

Top Right: Brisbane Centre Aisle car 180 was built in 1924 by Gardiner for the Brisbane Tramways Co. Ltd. It is seen here on the Toowong line during an Australian Electric Traction Association convention tour in March 1959. The car had been donated to the SPER Co-operative Society for preservation the previous year.

N.L. CHINN Collection

Bottom Right: Melbourne scrubber No. 11 stands at the Bourke Street terminus at Spencer Street on 14 April 1965. No. 11 started life as Sydney K class single truck passenger car 763 in 1908 and was converted to scrubber car 138s in 1952. It and sister car 139s were sold to Melbourne in June 1959 and were railed south in August of that year.

BOB MERCHANT


SPECIAL
142
Bex
for
headaches
colds flu
and all
nerve pains
142
22
22


RESERVED
180


SPECIAL

handles, roof steps, etc., continued. The two ropes sometimes got tangled with each other as well. Glenhuntly Depot has solved the problem on its cars by removing the rope from the retriever, which now sits unused on the tram apron . . . The last W5 class trams in service are 685, 720, 823, 826 and 833. Preserved W2 class car 646 has been sent to South Melbourne Depot and during the first two weeks of October had been rostered for an afternoon peak-hour run. The car has been repainted in M&MTB green and cream and looks immaculate.

A number of Z class cars have joined SW5 class 814 in promoting various government initiatives. Cars seen in September were: 8 (Libraries), 10 (State schools), 39 (Occupational health and safety) and 101 (Waste recycling).

The wheel grinders at Kew and Brunswick Depots have been replaced by newer models which lift both axles of mono-motor bogies at the same time. They also feature 'direct drive' grinding wheels, eliminating the belt drive of the earlier models. The new grinder on track 9 at South Melbourne Depot has been in operation for over twelve months and regularly grinds the wheels of cars from Glenhuntly and Essendon Depots which don't have grinders. The old grinder located on track 2 is little used now.

A 15% fare increase took effect from 15 September. The Daily Adult Zone 1 ticket now costs $2.90. It is still excellent value for the tramway enthusiast as it covers all the tramway system except the outer ends of the East Burwood and Bundoora lines.

Friday 26 October marks the 50th anniversary of the closure of the cable tramway system in Melbourne. The last routes were via Bourke Street, from Spencer Street to Nicholson Street and Clifton Hill. The last cable tram departed Spencer Street about 9.17pm on Saturday evening, 26 October 1940.

Melbourne Tram Strike

Following our article on the tram strike in Melbourne in January, *Trolley Wire* reader W. Pearce has supplied a list of the trams

A tram driver about to board his tram after having changed the points leading from Victoria Street into Brunswick Street at 9am on 17 July 1989. MICHAEL NORBURY

An artist's impression of the proposed low-floor car for Melbourne. The concept design for this vehicle was undertaken by John Dunn of Transit Design Pty Ltd. The status of this low floor design is uncertain. While the uncertainty continues, the 'break-in' point at which the change to low floor cars will occur keeps getting put back. Currently it is at car 85 of the 130 car B2 class order, but this is likely to change again. The details of the design could change: the cars may or may not have a small-wheel bogie in the centre, enabling the car to have a flat floor over the articulated joint.

abandoned in the city area. It is based on personal observation and does not cover trams left in areas away from the central business district and its outskirts.

The trams are listed in numerical (fleet number) order by location. This is not the order they were left on the streets.

ELIZABETH STREET:

Between Flinders and Collins Streets — 17 trams: 66, 69, 72, 74, 76, 80, 85, 97, 124, 127, 128, 165, 172, 175, 177, 226, 964.

Between Collins and Bourke Streets — 21 trams: 4, 37, 64, 67, 68, 79, 84, 87, 91, 99, 131, 133, 155, 162, 170, 174, 200, 204, 219, 755, 930.

Between Bourke and Lonsdale Streets — 19 trams: 44, 47, 83, 95, 125, 130, 140, 148, 157, 164, 167, 169, 176, 199, 210, 227, 733, 809, 878.

Between Lonsdale and Latrobe Streets — 21 trams: 39, 45, 48, 70, 92, 96, 126, 149, 161, 173, 198, 201, 207, 212, 213, 221, 223, 224, 225, 875, 927.

Between Latrobe and A'Beckett Streets — 10 trams: 38, 82, 132, 166, 182, 222, 732, 787, 789, 967.

Between A'Beckett and Franklin Streets — 12 trams: 41, 51, 71, 86, 168, 171, 178, 215, 727, 752, 769, 861.

Between Franklin and Therry Streets — 12 trams: 40, 43, 50, 78, 90, 154, 156, 211, 228, 742, 862, 872.

Between Therry Street and Victoria Market — 11 trams: 8, 42, 46, 100, 147, 150, 160, 836, 931, 952, 955.


QUEENS SQUARE
PEARL ISLAND
1951


WOOLWORTHS
WOOLWORTHS

WILLIAM STREET:

At Latrobe and William Streets intersection — 1 tram: 720.

Between Bourke and Collins Streets — 6 trams: 744, 763, 807, 906, 975, 1001.

Between Collins Street and Flinders Lane — 4 trams: 33, 56, 827, 897.

BOURKE STREET:

Between William and Queen Streets — 1 tram: 114.

Between Queen and Elizabeth Streets — 5 trams: 767, 812, 940, 991, 9w.

Between Elizabeth and Swanston Streets — 10 trams: 681, 759, 823, 838, 970, 1035, 2011, 2014, 2017, 2019.

Between Swanston and Russell Streets — 14 trams: 35, 60, 93, 101, 106, 230, 264, 2002, 2003, 2008, 2015, 2022, 2024, 2028.

Between Russell and Exhibition Streets — 9 trams: 111, 129, 153, 184, 214, 910, 2012, 2023, 2026.

Between Exhibition and Spring Streets — 5 trams: 34, 159, 186, 206, 2020.

SWANSTON STREET:

Near City Baths — 3 trams: 739, 773, 815.

Outside Flinders Street Station — 3 trams: 894, 986, 1014.

ST KILDA ROAD:

Outside Arts Centre — 6 trams: 746, 754, 796, 797, 925, 997.

At Domain Road intersection — 6 trams: 737, 818, 819, 834, 993, 1008.

Bottom: Sydney R1 class 1951 near South Head lighthouse on the Watson's Bay line. This tram and sister car 1992 were decorated in an ivory with blue livery topped by an internally illuminated roof-mounted crown to mark the Royal Visit of Queen Elizabeth II in February 1954. They retained these pleasing colours for some time after the festivities.

N.L. CHINN Collection

OPPOSITE PAGE:

Top: Sydney R1 class 2002 and R class 1872 stand at the terminus in Victoria Avenue at Chatswood railway station on 28 June 1958, the last day of service on the North Sydney system. This scene is completely unrecognisable today; only the railway in the background remains.

BOB MERCHANT

NOLAN STREET:

Outside National Gallery — 3 trams: 895, 900, 939.

NICHOLSON STREET:

Opposite Hanover Street — 3 trams: 216, 259, 968.

At Westgarth Street intersection — 1 tram: 2004.

SUMMARY:

Elizabeth Street	123 trams
William Street	11
Bourke Street	44
Swanston Street	6
Collins Street	10
Outskirts of City	19
Total	213 trams

The total of 213 trams included 16 B class, 2 A class, 119 Z class, 75 W class and 1 service car.

Bang Road Running

On Thursday, 26 October 1989, passengers aboard a Northcote via St Georges Road (Route 9) tram outbound in Latrobe Street were treated to some "bang road" operation. ("Bang road" is the term used in Melbourne to describe the operation of a tram along the wrong track, i.e.: against the normal flow of traffic.)

At about 5.45pm, at the corner of Latrobe and Spring Streets, the second last down (outbound) Route 9 car found itself caught behind five other trams. The cause of the trouble was a dead A class car being pushed by the next following service car, which happened to be a sliding door car.

The dead A was pushed to Nicholson Street, allowing enough room between it and the shunt in Victoria Parade to the west of Nicholson Street for one car to shunt. One by one each of the next four cars, including the car pushing the A class, shunted, and in doing so crossed to the up (inbound) line. Each continued its down journey along Victoria Parade across Nicholson Street to the shunt east of Brunswick Street (the route 12 terminus) where each car crossed back to the down line, and being either a North Balwyn or Mont Albert car, continued to Kew Junction on the down line as normal.

The last of the five cars, the Route 9 car, crossed to the up line in a similar manner and proceeded towards Brunswick Street via the up line. However, its journey was checked by an up Route 12 car turning into Victoria Parade from Gisborne Street crossing in front of it. Both cars, travelling eastwards, pulled into the Brunswick Street stop at Victoria Parade simultaneously. Intending passengers were slightly amused at the

sight of two trams travelling parallel to each other, one on the up and one on the down.

The intrepid driver of the Route 9 car wanted to proceed into Brunswick Street just north of Victoria Parade in order to reach the down track. However, the "braid" (tramway inspector) directed him to continue along the up line in Victoria Parade and to shunt at the same point as the four earlier cars.

Thus, when the traffic lights changed, passengers were treated to a most unusual sight: parallel running by two revenue trams as both vehicles continued away from Gisborne Street.

The Route 12 car pulled into the siding just east of Brunswick Street, whereupon the Route 9 car crossed from the up line to the down line at the adjoining shunt.

The car reversed direction, becoming an up car on the down line, and so travelled back towards Gisborne Street.

Upon clearing the curves into Brunswick Street, the poles were reversed and the tram once again commenced to travel in the down direction, proceeding into Brunswick Street via the usual track, and so went on its merry way.

Restaurant Tram for Adelaide

The Adelaide Tramcar Restaurant Pty Ltd has applied for a general facility licence under the South Australian Liquor Licencing Act "in respect of premises being an STA tram which is proposed to make the trip between Victoria Square, Adelaide 5000 and Mosley Square, Glenelg 5045 using the STA tram tracks and to be known as the Adelaide Tramcar Restaurant". The requested times of operation are between 7am every day and 1pm the day following that day. An H type car is being refurbished and altered internally for its new role while the livery is expected to be blue and white. It is hoped that operation will commence in November 1990.

Sydney Tramway Relic Goes

Another relic of Sydney's tramway past disappeared with the demolition in July 1990 of the waiting shed in Eddy Avenue near Elizabeth Street. Work being undertaken to provide passenger loading facilities for arriving and departing long distance coaches in Eddy Avenue required alteration to the existing traffic flow in Eddy Avenue and the tram shed was quickly demolished.

The recently demolished waiting shed in Eddy Avenue, Sydney. This view was taken in January 1961, a few weeks before the trams ceased running.

DENNIS O'BRIEN

The shelter was originally built around 1910, with brick additions erected in the early 1920s. Tramway services from Railway Square to North Bondi, Bronte, Clovelly, Coogee, Maroubra and La Perouse passed the waiting shed and, after the trams ceased operation in 1961, was used by the replacement bus services.

Tramway Plans for Sydney

Plans for tramways abound in Sydney at the present time. A plan for a tramway network to ease traffic congestion between the city and the Eastern Suburbs has been placed before the NSW State Government. The tramline would extend from Martin Place through to Randwick, running to Bondi, Coogee, Maroubra and La Perouse beaches at a cost of between $60 and $70 million.

A $70 million "super tram" network is being planned as part of a major facelift of the Pyrmont-White Bay area to the west of the city and Darling Harbour. The Government has received two bids from private companies wanting to build a mass transit system from White Bay to Pyrmont and on to Town Hall. The NSW Department of State Development is finalising a blueprint to turn the drab port area into a major business and residential area. Transport Minister Bruce Baird said it was clear the venture needed a top quality transport connection to the central business district and Sydney's existing rail system. He said the Government was investigating whether the proposed line could link with the existing rail network at Town Hall. The super trams would have much greater capacity than the Darling Harbour monorail as two carriages would provide 84 seats and space for 130 people standing. It is expected the light rail line could carry about 5500 people between Town Hall and Pyrmont in two hours during the morning peak period.

A tramway connecting the Opera House, Walsh Bay and Darling Harbour is also under consideration by the NSW State Government. A $50,000 study is to be conducted by the Department of Transport and the Sydney City Council into the feasibility of the tramway link between the city's major tourist attractions. A decision is expected soon after the study is completed at the end of the year. The study will investigate likely routes, effects on traffic, patronage and possible private sector involvement. The route is 3.8km in length, starting just south of Pyrmont Bridge where a tramway terminal is proposed for Market Street. Commuters and tourists would link up here with the monorail station and a proposed new city railway station, part of a new underground line from Redfern to be known as MetroWest and already the subject of a feasibility study by CityRail. The northern terminal would be sited at Circular Quay where ferries and trains depart.

Magill Demolitions drag the last of the special work from Angas Street, outside the now closed City Depot in Adelaide, February 1990. JOHN RADCLIFFE

The Sydney Tramway Museum has recently been asked by various radio stations for their opinion of the viability of the Quay-Darling Harbour scheme which, according to the press, proposes operating restored footboard cars, presumably of the Sydney O type. To date the Museum has not been approached by any of the promoters of the scheme to become involved. The Museum certainly does not oppose the establishment of a vintage tramway scheme but is aware there are many problems which would need to be addressed before the first tramcar turns a wheel and these have, to date, been largely ignored by the various scheme promoters. These include the high cost of track construction, housing for the tramcars, and workshop and power supply facilities. In drawing attention to these aspects, it must not be implied that the Museum is being obstructive, or negative. Instead, it is merely trying to be realistic and, if approached, will most certainly assist with advice based on its past experience.

The Sydney Tramway Museum has, in fact, acted as consultants in similar ventures in the past, such as the once-proposed tramway to serve Darling Harbour, which was shelved in favour of the present monorail.

Oops!

It's one of those things that happen. Our August issue Page 2 caption was somehow switched for the caption which appeared in the May issue, much to our surprise. The caption should have read:

The Perth Electric Tramway Society's two ex-WAGT overhead tower wagons continue to give sterling service as Duncan McVicar (left) and Ray Blackmore rearrange the wiring over No. 1 road on the carbarn fan on 25 February 1990. M. STUKELY

The article on page 22 should have been credited to Michael Stukely and Brent Luscombe's name is incorrectly given as 'Brian' in the caption to the upper photo on page 23. Our apologies to Michael and Brent.

C.O.T.M.A.

Council of Tramway Museums of Australasia

From Bill Kingsley, Executive Officer.

Wellington Conference

Thanks, Wellington, for Conference 1990. It was the longest Conference yet. It was the first time that full joint co-conferencing with our New Zealand railway brethren had been undertaken, and it really was most successful. Feedback from those who were there has been most satisfactory and it is certain that all present had a great and meaningful time. Congratulations to the organising team in Wellington, and especially to Les Stewart. The Royal New Zealand Police College at Porirua was an outstanding venue for the Conference. Once we had adapted to wearing security tabs as well as our name tags, we all settled down to enjoy the quite magnificent surroundings. Our fitness was maintained by frequent ascent and descent of an infinitely long garden stairway between the activity block and our satellite accommodation units. The meals were great, but we will surely remember the punctuality and finality with which those servery shutters were closed.

Memories will also linger of a little steam train puffing through the Manawatu Gorge, of the incredible debate between the railway and tramway teams, of an excellent talk by Dr Bruce Gamble on the future of public transport in Auckland, of the Conference sessions themselves, of great dinners at Southwards Car Museum (with its marvellous theatre organ) and the St George Hotel, of the recommissioning of double saloon 159 at Queen Elizabeth Park and that fantastic scenic rural tramway, but particularly of the tremendous comraderie and sharing between all the delegates. Perhaps it is that the host museum for the Conference creates the opportunity while the enthusiastic input of the delegates creates the success.

Will we ever forget Peter Berry's Leyland Comet bus and immaculately restored 1929 Thornycroft half-cab which assisted our transport? Will we ever forget two preserved trolleybuses following each other around the suburbs of Wellington?

A large contingent actually survived the ferry crossing of Cook Strait through mountainous

seas to enjoy a tour of the South Island excellently organised by Richard Gilbert and highlighted by superb hospitality from the THS in Christchurch. Others ambled north before and after the Conference to experience the delights of MOTAT in Auckland.

The Conference General Meeting, entertainingly chaired by John Radcliffe, made no changes to the COTMA team which remains as Chairman Dr John Radcliffe, Executive Officer Bill Kingsley, Executive Members Dave Hinman and Lindsay Richardson, Treasurer Carolyn Dean, Spare Parts and Uniforms Officer Keith Kings and Auditor Robert Paroissien.

52 COTMA delegates and 30 NFRS delegates attended the Conference. If you were not one of them, then you surely missed out on a great experience. Perth hosts us in 1992, Bendigo in 1994 and Christchurch in 1996. Start planning your holidays now to be there!

Obsolete Trams from The Met

We have a new agreement with The Met which provides a complete new method for acquiring obsolete tramcars. No more tendering against unknown competitors. No more uncertainty as to whether particular trams will become ours to obtain. The system is a little complicated so let me take you through it. Firstly, though, a big thank you to Mr Ken Kimber, the Manager Tram Development, who is the co-ordinating official who has made it all possible.

All trams specifically requested by COTMA museums are immediately tagged (ear-marked) for COTMA (unless on The Met's own historic preservation fleet). No other person, group or company will take preference. In other words, apart from the Met's own fleet, we are number one. We can add, change or delete whenever we wish. When a tram on our tagged list becomes available, advice generated by Mr Les Jean, Manager Tram Fleet, will be received. I will advise the museum concerned. Arrangements for delivery will be made with Mr Neville Woolnough, Production Planner, and for payment with Mr Eugene Kaczanowski, Contracts Engineer.

Approval of the system was given by Mr Dave McCabe, Acting General Manger, Tram Division, just before his resignation due to poor health. This could have been one of Mr McCabe's last official decisions. We are all appreciative of his consideration and support and can only wish him a speedy recovery in his health.

Currently there are only two problems in the system. Firstly, The Met Workshops have virtually no spare armatures for the motors in Melbourne's fleet of W class trams. For a while it seemed that our trams would therefore come without motors, but Neville Woolnough has been able to organise for us to receive our trams absolutely complete but with reject armatures. We thank Neville most sincerely for his help in this matter. Secondly, and most unfortunately, the price per tram has risen by $1000 to $2500 (that's some jump!), and this has caused the MTPA to relinquish its request for W5 class 763.

W5 class 766 has successfully arrived at Whiteman Park in Perth and W5 class 782 has been received at Bylands.

On a Friday morning this last winter, Keith Kings and I met and held discussions with Stuart Doig and Eugene Kaczanowski of the Public Transport Commission of Victoria's Priority Projects Division. It is through Stuart and Eugene that COTMA and its museums will now be making all its MET related purchases. We were made most welcome and were more accurately able to define our working methods with these two most helpful gentlemen. It is now more than ever essential that all museums operate through Keith or me, AND BY NO OTHER MEANS, when chasing requirements from The Met. We will find Stuart and Eugene to be most helpful as long as COTMA is seen to function properly in this area.

Tyres

Our Spare Parts Officer, Keith Kings, advises that 26-1/2 inch and 28 inch tyres for tram wheels may soon be made available by the Workshops at Preston. Please contact Keith directly and immediately if interested.

Mercury Bulbs

Those beautiful big blue flashing mercury arc rectifiers are back in popularity. Max Fenner of the AETM in Adelaide advised COTMA of their availability from the State Transport Authority of South Australia and both the AETM and Bendigo Trust have availed themselves of this opportunity. COTMA has also enabled the BTMS in Brisbane to purchase one from The Met as soon as it is available.

Congratulations to MPTA

Since the last issue of *Trolley Wire*, the small team of enthusiastic and dedicated preservationists at Haddon have enjoyed that fantastic experience of moving their first tram under their own power. All COTMA museums join in congratulating the MTPA on this vital achievement towards their vision.

Co-ordinating Diary

One of the many decisions made at the Conference General Meeting was that your Executive Officer establish a continuing co-ordinating diary in an attempt to ensure that important dates do not clash between museums (as they did just after the Conference), and also as a means of publicity. A list of dates will be provided in each copy of the COTMA. Memoranda sent to each museum and will also be provided to *Trolley Wire* and its New Zealand counterpart *Tramway Topics*. But YOU, the participating museums, must supply me with the dates. Dinners, anniversaries, weddings, special days, celebrations, recommissionings, openings, inaugurations, unveilings, jubilations, tours, special work efforts, etc. can be included. Please look ahead as far as you like. Anything that you feel is important and in which friends from other museums may wish to share.

Congratulations, Sydney

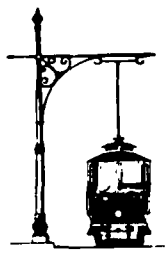
Last 22 July marked the 40th anniversary of the handing over of L/P class 154 to the AETA in Sydney, thus starting the tramway preservation movement in Australia. Norm Chinn, Bob Young, Ben Parle and Ken McCarthy were the responsible quartet. They truly were the founders of our movement. To Norm, Bob, Ben and Ken we all owe a great thank you. The SPER celebrated the event on 21 July with a testimonial dinner.

Transport Postcards

Mr Alain G. Piette of Boite Postale 1343, B-1000, Bruxelles 1, Belgium, has been in contact with our Chairman with a view to establishing exchange arrangements on postcards. Individuals who may be interested could drop Alain a line if they wish.

LOFTUS . . .

South Pacific Electric Railway

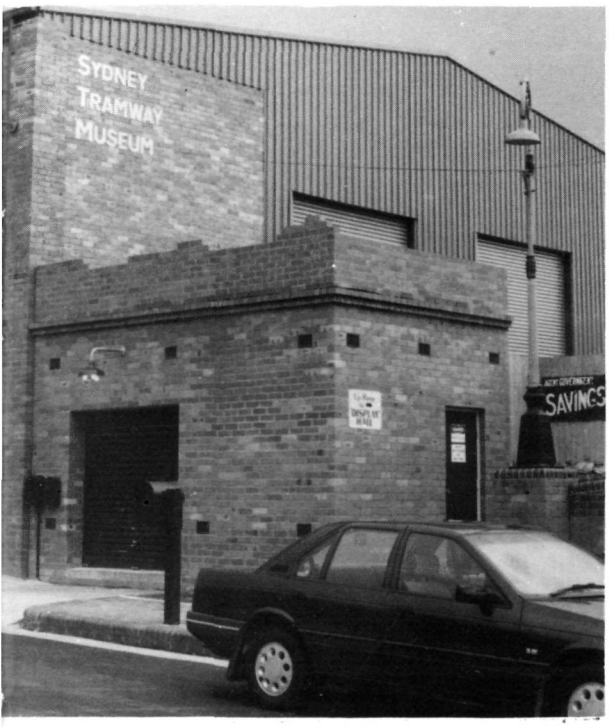


A considerable amount of progress has been made during the last four months on the various projects being undertaken in Tramway Avenue and this has resulted in a great improvement to the Museum's appearance to our visitors.

Arrangements were made with Sutherland Shire Council for the tar sealing of Tramway Avenue from the gutter on the Display Hall side to the outside rail of the western track and extending from the Pitt Street entrance gate to Cross Street. This work would greatly improve conditions for our visitors during wet weather and also avoid much of the dirt and mud being carried on to our trams and into the Display Hall at such times.

Work commenced on Tuesday, 10 July with digging out the rock and earth and replacing it with compacted roadbase in preparation for the application of hotmix. This initial work was completed the following week but industrial problems involving employees of the Council's paving contractors delayed completion of the project until 22 August. The completed area covers from the Pitt Street entrance to outside the Railway Square waiting shed, and included portion of Cross Street. Some 50 tonnes of hotmix were used in this project. This transformation has been completed with the laying of turf on the remaining area, between and over the two tracks. The laying of turf is seen as a temporary answer to the problem of wind-whipped dust in dry weather and mud being washed into drains and water scouring around rails in wet weather. This work was completed in late September and was partly funded by members' donations.

Considerable progress has been made on the scissors crossover recently with work being carried out simultaneously on both the trailing and facing crossovers. Mike Giddey and Brian Muston have had assistance from a welder who has been provided under the Community Service Order scheme. This is another instance where the Museum has been provided with the services of a skilled tradesman to assist with our works programme through participation in the CSO scheme. The work has been aided by the purchase of a new electric welder. This welder was demonstrated on Saturday 11 August and was delivered on Tuesday 14 August. Brian and



The permanent office for our traffic staff is being constructed above the substation building, the roof of which was designed to be the floor of the new office. BOB MERCHANT

Mike have made good use of it since then, with the greater part of the crossover now being laid out ready for welding. Brian and Mike are to be congratulated on their excellent workmanship which is making this extremely worn piece of special work as good as new.

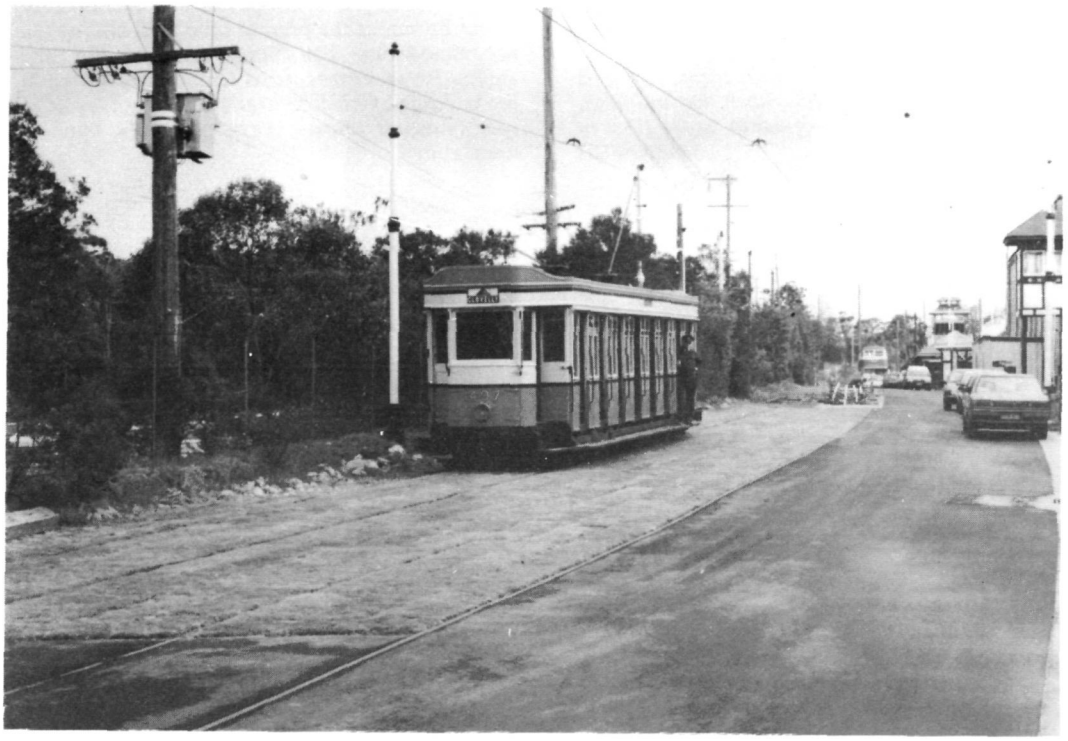
Work on the Railway Square waiting shed is proceeding slowly due to the need to concentrate our efforts on other areas. however, the decorative fascia is being progressively completed, with many of the missing pieces being replaced by our new member Jim Jowett, who has been turning them up on his lathe.

Work on the permanent Traffic Office, to be situated above the substation, commenced at the end of September and a bricklayer has been engaged for this work.

A temporary wall has been erected between Roads 6 and 7 of the display hall extension to permit tracklaying to take place for the storage of cars at present being stabled in the open. The wall will remain in place until finance is available for the erection of the retaining walls along the Tramway Avenue and Pitt Street sides of the extension. The extension of running shed roads 1, 2 and 3 for at least one car length is now under way. It is not possible to extend these tracks further at the present time until alternative accommodation has been arranged for the equipment and other items temporarily stored in the building extension, to say nothing of a pile of rock removed whilst excavating for the building foundations.

Sutherland Council's earthmoving equipment prepared the street for the laying of roadbase which was compacted over ensuing weeks in preparation for the hotmix sealing. NORM CHINN

Sutherland Shire Council's paving contractors complete the tar sealing of Tramway Avenue on 22 August. W2 class 392, in the background, was used to run the grooves in the hotmix surface. NORM CHINN



The completed Tramway Avenue as it appeared on 6 October 1990, with the roadway sealed to the first rail of the western tram track and the remaining track area turfed to control the ever-present dust or mud. BOB MERCHANT

There is a need to construct the secondary operations building planned for erection in the area between the display building and the railway boundary fence and this will be commenced as soon as finance is available. This will allow all trams, buses and other road vehicles to be placed under cover.

The restoration of R1 class 1971 is still progressing well, with the roof, fascias and ceiling now complete. The interior of the car has been stripped and the floor has been receiving new timber.

The eternal problem of paspalum, kykuyu grass and other assorted weeds along the main line over the past two years received attention recently when the owner of a commercial railway track spraying unit offered the services of his road/rail unit free. The line was sprayed between the Army crossing and Pitt Street.

40th Anniversary Dinner

The attendance by members and friends at the 1990 Annual Dinner, this year commemorating the 40th anniversary of the preservation of Australia's first preserved electric tramcar, was the best in many years and a most enjoyable evening was had by all present.

Our four founding members, Norm Chinn, Bob Young, Ken McCarthy and Ben Parle, were honoured during the evening. The occasion concluded with a late night ride on the star, L/P class 154.

Centenary of First Electric Line

On 10/11 November, the centenary of the opening of the first electric tramway in Sydney will be commemorated jointly by the Museum and the Randwick and Waverley Historical Societies with a walk along the original route of the tramway between Randwick and Waverley on Saturday and a special operations day at the Museum on the Sunday. Commemorative plaques will be unveilled at each end of the original tramway route and a special plaque will also be unveiled at the museum. N class car 728 will be in traffic for the occasion, the first time since its repainting.

Heritage Grant

Late new just to hand is that the Museum's application for a Heritage Grant to aid restoration of O class 957 and O/P class 1089 has been successful. The $17,000 grant is a dollar for dollar one to be matched by the Museum and represents the first half of stage 1 which is to bring the bodies of these two cars up to display hall standard.

The first stage work on this $69,000 project will include restoration of the bodies, new seats, roof repairs and recanvassing, and new bogies for 1089.

Weed spraying was carried out along the Museum's tramline using a contractor's road/rail spraying unit on 5 July 1990. NORM CHINN

BALLARAT . . .

Ballarat Tramway Preservation Society

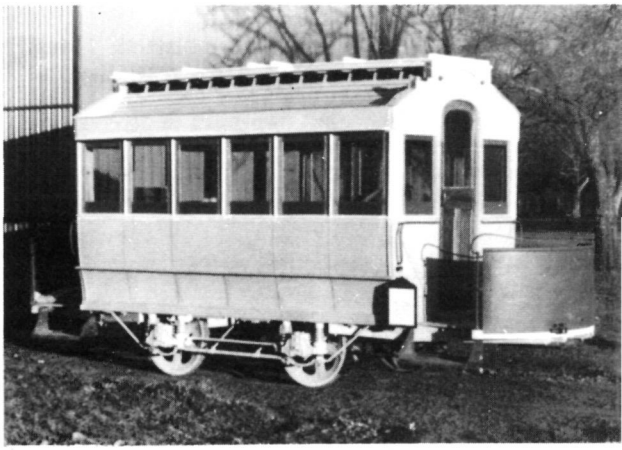
Car 661 arrived back at the depot on 2 July 1990 after an absence of fifteen months in Melbourne. The tram travelled 1210km on twelve charters during that period. Its storage at Malvern Depot in close proximity to the wheel grinder has meant that the car returned with a goodly amount of fine steel filings in every nook and cranny, which is only now starting to respond to repeated cleaning. The metal fatigue cracks in the motor support transoms, a design weakness in the No. 9 truck, had worsened during the time away, so the opportunity was taken to install new material in this area and remove the problem permanently.

This job coincided with the installation of the ex-SEC depot crane which has languished in a forgotten corner of the shed for over fifteen years. This now graces a pillar in the centre of the new shed and made the job of returning 661's motors to its trucks a much simpler matter.

The repainting of No. 13 is complete at last, and the car re-entered traffic on 29 September. Due to distractions caused by work on the horse tram during the autumn, much of the paintwork had to be attempted during the depths of a Ballarat winter. This turned out to be less of a handicap than anticipated — if the tin of paint is placed in a container of hot water it will flow pretty much as normal. The 27th June proved too much, however. With snow falling heavily, the preheated paint wouldn't take to the metal surfaces, though timber work was still possible. Eventually the painter's fingers wouldn't grip the brush properly, so the weather had to be given best on this occasion.

Work on horse tram No. 1 has taken a back seat to the repaint on No. 13 in recent weeks, but canvassing of the roof is now almost complete, and the top deck seat can then be fitted. Some paintwork on the saloon sides should start to appear during the spring and summer.

The conversion of No. 39 into the museum display continues steadily. The flooring and wall lining between the tram and the shed wall is two-thirds complete. the side frame of the rear saloon was removed, but not without considerable difficulty. It appeared to be held at the dropcentre end by five bolts, but when these were removed and nothing happened it was discovered that there were no less than nine large countersunk rivets hiding under the paintwork. The workmanship involved here was most impressive, the rivets still being an undetectable flush fit even after seventy-five years of service. Following the removal of the side frame, lowering of the floor in the rear saloon can proceed.



Ballarat horse car No. 1 as it appeared on 24 July 1990. KEN McCARTHY

Despite predictions of gloom and doom in various sections of the economy, the tramway has completed its' best years business since 1977/78. Passenger figures for the year all but topped the 20,000 mark, with most of the increase coming in the latter half of the period. For instance, the Queen's Birthday weekend saw 423 passengers carried; a very good figure for a mid-winter long weekend.

BENDIGO

THE BENDIGO TRUST

1990 has been a very eventful year for the Bendigo Tramways. Centenary celebrations commenced in January and a month by month highlight has taken place since. Dennis Bell tells a little about the January events.

The Cable Car

The cable grip car and trailer operated in Bendigo's Pall Mall double track area for two hours each evening from Monday 8th to Friday 12 January. This unique cable car proved very successful with our local population. In the limited time we had to operate, some 550 passengers were carried.

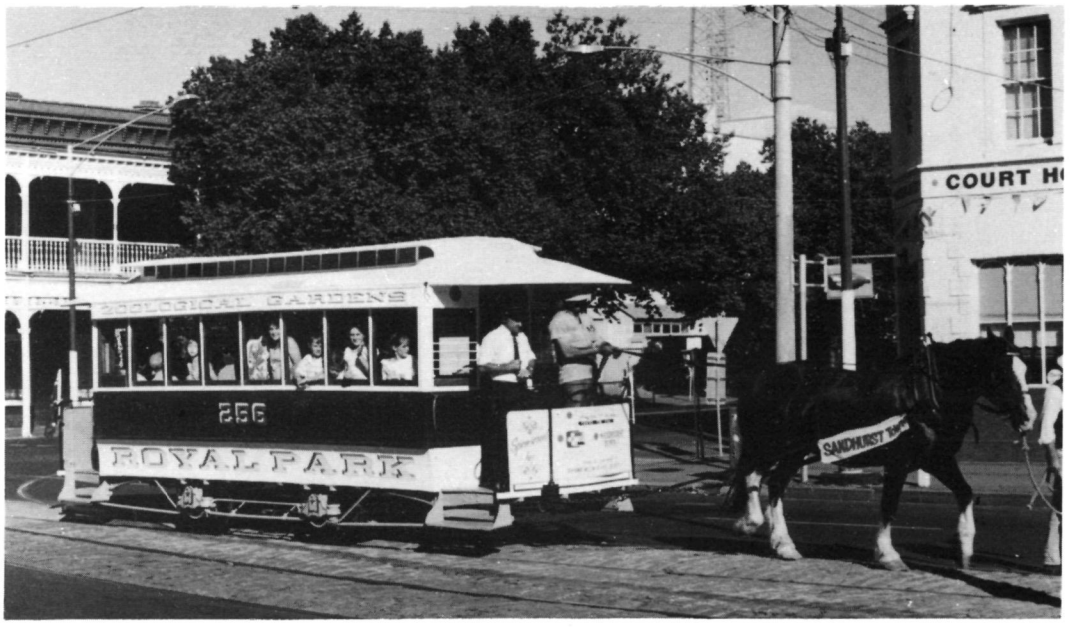
The grip car and trailer were on loan from the TMSV at Bylands. Both are privately owned and are currently controlled by the TMSV for operation in Hudson Park, Kilmore on Sundays.

Grip car (or dummy) No. 593 is owned by Newton Williams of Swan Hill. The under-carriage came from No. 258 which was built in Melbourne in 1890 for the North Melbourne route. No. 258 was withdrawn from service in 1935. The timberwork is all new, powered by a petrol driven motor in conjunction with hydraulics. Seating capacity is 20 persons.

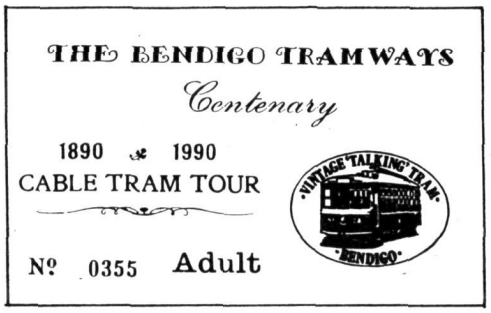
Trailer No 171 is owned by Darryl Hawksworth of Blampied. It was built in Melbourne in 1887 for the Clifton Hill line and scrapped about 1930. It was taken to Mt Macedon and used as a garden shed until being acquired by Darryl in 1980. After much work, it was repaired and restored by 1985. It has a seating capacity of 22.

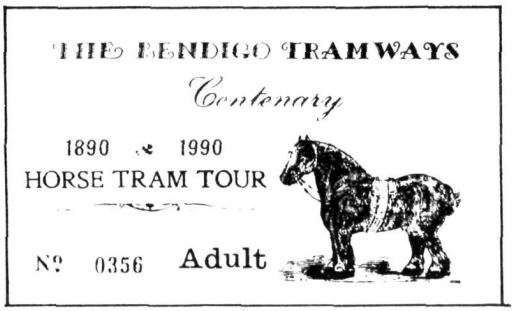
The Horse Tram

Horse drawn tram No. 256 was also kindly loaned to Bendigo by our friends at the TMSV. This tram was even more successful than the cable car. We operated in Pall Mall from Monday 15th to Friday 19 January for two hours each evening. The tram was full for each



The horse tram in Bendigo on 19 January 1990 with a full load of passengers. The tram is being towed by Prince. DENNIS BELL

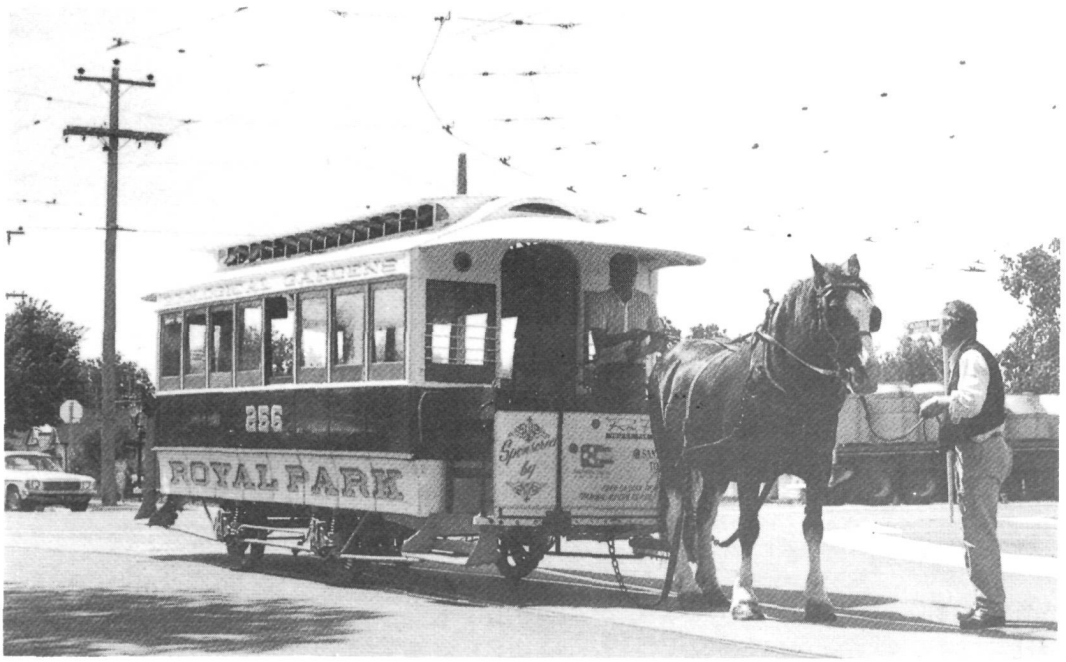




The special tickets issued to riders on the horse tram and cable car set during their operation in Bendigo in January. They have been reduced in size here, the actual size is approximately 18cm by 7cm.

trip and we carried 700 passengers in the short time it was used.

Cable cars and horse trams were never used in Bendigo, but the City Fathers of the time considered them as far back as 1887. They finally settled for Brush battery-electric trams which first graced our streets in 1890. Now 100 years after those first trams arrived, Bendigonians had the opportunity of experiencing what might have been, if cable or horse trams had been chosen. Souvenir centenary tickets were issued to each passenger. the operation of the cable car and horse tram in January has given Bendigo's tramway centenary a great start for what promises to be an exciting year.



The horse tram in Bendigo in January with the names of sponsors appearing on the dash panel. This scene has been produced as a postcard to commemorate the tramway centenary. DENNIS BELL

The cable grip car and trailer operating in Bendigo during January. This scene has also been produced as a postcard. DENNIS BELL

WHITEMAN PARK . . .

Perth Electric Tramway Society

Much of the activity at the Museum in recent months has focussed on preparing the Melbourne trams for what has become one of the highlights of our tramway operations — Rally Australia. As in 1989, Whiteman Park was again a major venue for this world championship car rally event, on Sunday 23 September.

This year, another major event has been introduced to the Park calendar — the Sunday Times Showday. This was held on Sunday 12 August and is to be repeated in 1991. It is likely to be held annually thereafter.

Sunday Times Showday

This event proved very popular, with 3250 cars recorded entering the Park by 3pm. Four trams W2 class 329, 368, 393 and W4 class 674, were required in traffic all day over the usual route, Entrance-Village and Central Station-Mussel Pool-Entrance. The entry charge, which included tram and train rides, was made at the Park Entrance — this released conductors from fare-collecting duties so that they could concentrate fully on passenger safety and supervision on the heavily-loaded trams.

Showday received a good deal of publicity, which also resulted in above-average attendances on the following weekends.

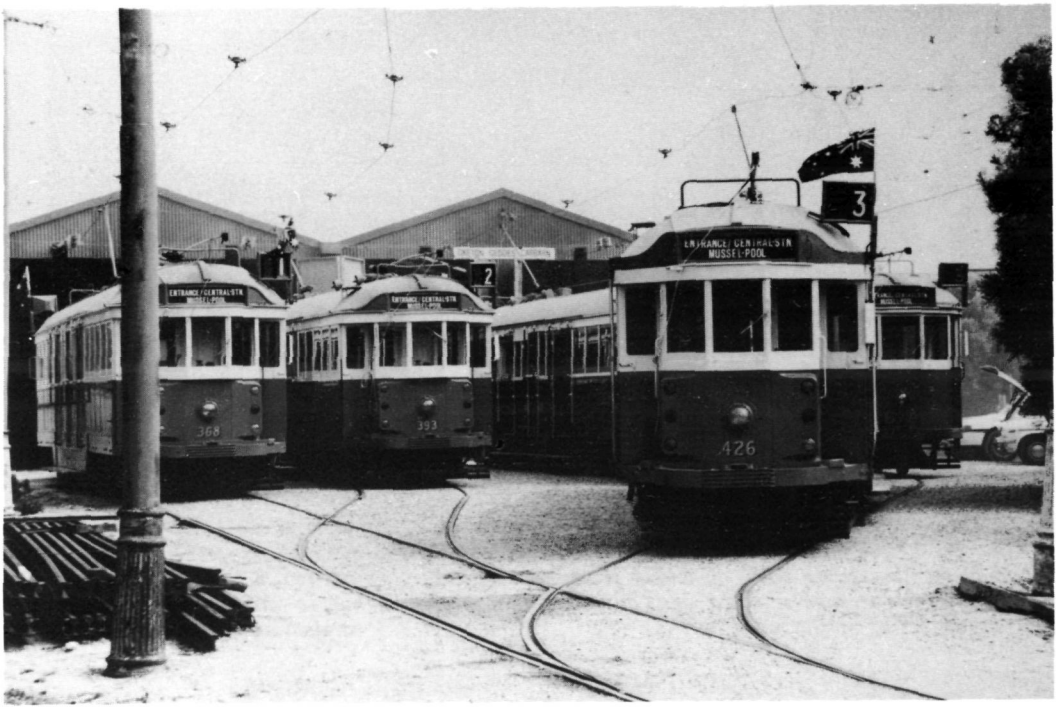
On Father's Day, 2 September, over 1700 cars were counted in the Park and two trams were required.

SW2 class 426 Returns to Service

In view of the popularity of the Sunday Times Showday and the organiser's prediction of large crowds attending Rally Australia, it was decided in August to schedule the return to service of

Traffic was heavy on Sunday Times Showday, 12 August 1990, at Whiteman Park. Here W2 class 368 (left) waits behind 393, both with heavy loads of passengers from Entrance, as W4 class 674 passes over the points at Triangle North on its way from the Village to Mussel Pool. TERRY VERNEY

W2 class 329 (right), following W4 class 674 to Mussel Pool, has cleared the points so W2 class 393 and 368 (left) can proceed up to the Village and Central Station. TERRY VERNEY



Five service cars pose on the fan in front of the Oketon Geddes Carbarn for the first time, before commencing services for Rally Australia. on 23 September. L to R: W2 class 368, 393, 329 (rear), SW2 class 426 and W4 class 674.

MICHAEL STUKELY

SW2 class 426 in time for the Rally. After much help from various people and Societies in the East, nearly all the missing parts for this car had finally been acquired.

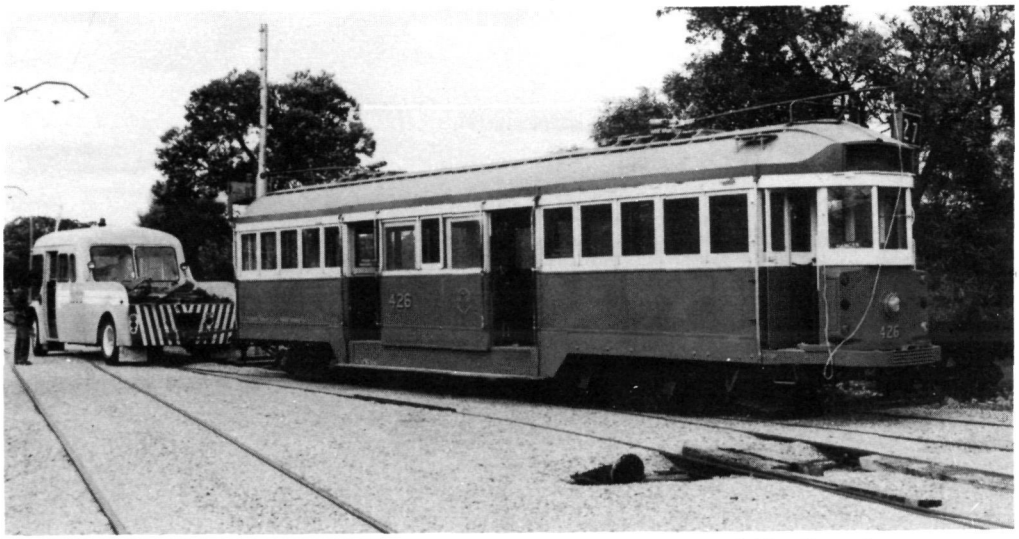
Two No.1 trucks, which had been gradually undergoing both electrical and mechanical overhaul over several months, were allocated to 426 and an intensive effort put into their completion. Their body suspension springs were sent out for retensioning, but all other work was completed by PETS members at the Museum. On Saturday, 15 September, the trucks were ready for steam cleaning and spray painting. A feverish day's effort followed on Sunday 16th. The bogie exchange was completed in quick time, after which work was carried out simultaneously on brakes, lifeguard installation, connection of motor leads, and final servicing of controllers. 426 was then moved by the tow truck from the carbarn to the new No. 9 road on the south side of the car storage shed (the first tram to use this road), where the unballasted track gave easier access for final adjustments to the brake rigging. About nine people were occupied all day in completing the work on 426, and valuable contributions were made by our Brisbane member, John Lambert, and visitor Tony Smith from Haddon. Late in the afternoon, 426 was ready for track testing, so everyone present downed tools to take the first long-awaited trip on the main line. 426 passed with flying colours, surprising us all with the smoothness and quietness of the ride. Great credit is due to those involved in the refurbishment of 426, in particular Noel and Ray Blackmore, Ric Francis, Duncan McVicar, Lindsay Richardson, John Shaw, Victor Sweetlove and Gareth Watts.

Other Rolling Stock Matters

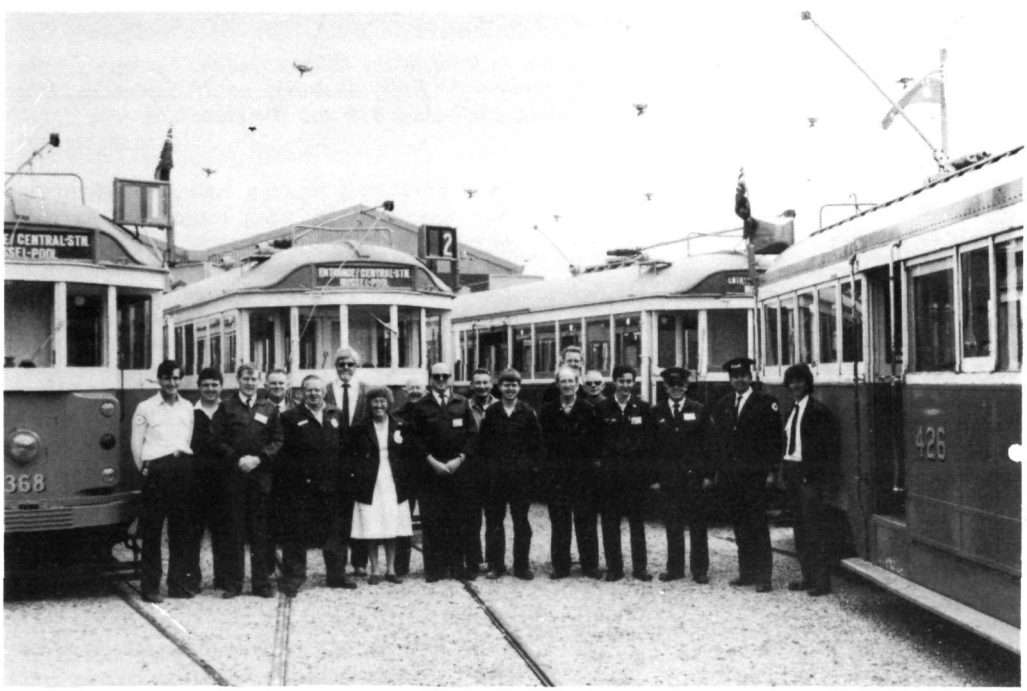
Whilst the work on 426 was very demanding on our small workforce, time was still found to do a substantial amount on the other service cars prior to Rally Australia, in addition to their routine servicing.

On 16 July, W2 class 393's body was lifted, one truck removed for a brake rigging overhaul, and repositioned the same day. A programme of replacing axle bearings and axlebox liners has commenced with W2 class 368, resulting in greatly improved riding.

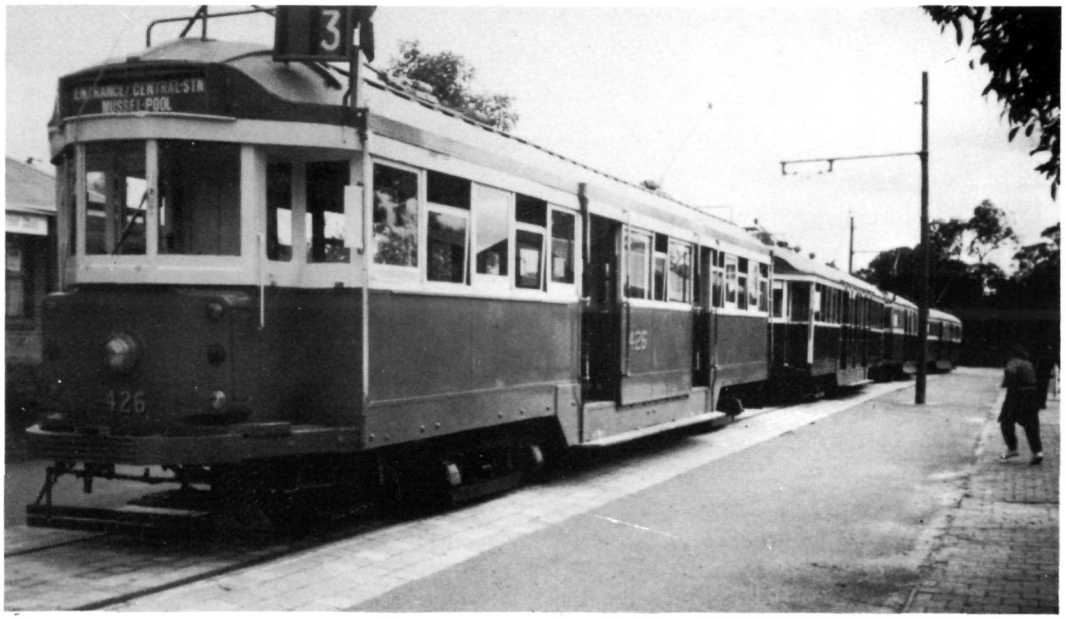
Work has started on the overhaul of a second No. 9C truck which will be used to replace the remaining 9B truck still under W4 class 674.



On 15 September 1990, SW2 class 426 is shunted onto the unwired No. 9 road south of the car storage shed for final adjustments to brake rigging. It was then successfully tested on the main line. MICHAEL STUKELY



PETS traffic and backup personnel for Rally Australia, assembled with the trams on the carbarn fan. L to R: Frank Edwards, Scott Parker, Robert Pearce, Ron Calley, Ric Francis, Dave Brown, Kath Francis, Brian Morrell, Martin Grant, Vic Sweetlove, Ray Blackmore, Noel Blackmore, Duncan McVicar (at rear), Arthur Chadwick, Paul Edwards, John Shaw, Lindsay Richardson and Michael Stukely. DUNCAN McVICAR



SW2 class 426 is first in a line of four cars stabled in the Village while Rally Australia is in progress on 23 September. The other cars are W2 class 329, 368 and 393. RIC FRANCIS

Annual General Meeting

The Annual General Meeting of the Society was held on Saturday, 1 September in the theatrette at the Westrail Centre in East Perth.

The following officers were elected for 1990-91: President: Lindsay Richardson, Vice-President: John Shaw, Secretary: Robert Pearce, Treasurer: Frank Damen, Councillors: Ray Blackmore, Ric Francis, Martin Grant Duncan McVicar and Michael Stukely.

Some interesting statistics from the address by President Lindsay Richardson are given below:

* The track upgrading programme, completed at the end of June, involved the replacement of 420 sleepers and provision of 850 tonnes of additional roadbase ballast.

* Gross revenue from regular traffic operations and special hires in 1989-90 increased by 35% over the previous year. (Included in this was the 50 cent rise in the adult return fare which applied from 1 March.

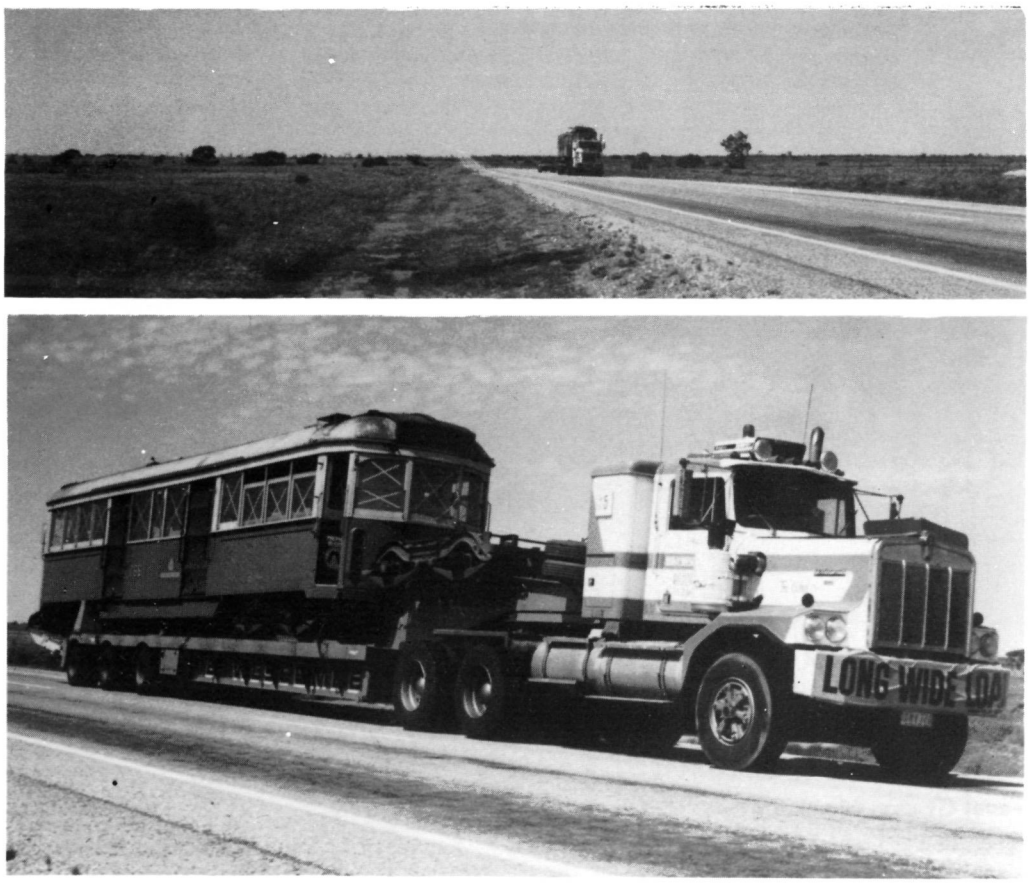
* Total kilometres travelled by service cars in the twelve months were:

W2 class 329	3069 km
W2 class 368	1644 km
W2 class 393	1098 km
W4 class 674	1257 km

Rally Australia

Saturday 22 September saw the finishing touches applied to the service cars — final adjustments and servicing, and some new paint to the ends of 426 (a full repaint is still required). The ever-reliable Ron Calley brought the cars up to their usual standard of sparkling cleanliness for the big day. On the morning of 23 September the five service cars, lined up for the first time together on the carbarn fan, made a most impressive sight. The traffic pattern for the day was rather different from that of the 1989 Rally, when we were under continuous pressure. Initially, two cars were sufficient; then suddenly the Rally spectators arrived in droves, requiring all five cars in traffic by 1.50pm. services were run from Entrance to Village only, with cars operating in three 'sets' — W2 class 368 and 393 in tandem; SW2 class 426 and W2 class 329 in tandem; and W4 class 674 alone.

On each trip, two sets of cars crossed at Triangle Junction (with empty cars shunting at Triangle West), while the third set would always be loading at Entrance, ready for immediate departure as the next set pulled in on the opposite road. This saved a good deal of time and service cars were operated on a five minute headway, as opposed to the eight minutes



W5 class 766 was photographed on the Eyre Highway about 20km east of Caiguna on 22 September. The low loader was headed west at 120 km/h, no doubt the fastest 766 has ever travelled! Both: JOHN LAMBERT

headway achieved previously with two sets of cars. Safeworking instructions were given to motormen at the termini by 'Inspectors' Lindsay Richardson and John Shaw, with Martin Grant acting as car dispatcher. Radio contact with pointsmen Duncan McVicar and Ron Calley, who controlled the crossings of the cars at the Triangle, was maintained by Lindsay. Arthur Chadwick manned the Entrance points to further streamline the operation. In mid-afternoon, while the Rally was in progress, there was a very quiet period when a single tram, W4 class 674, was able to maintain services. At this stage the other four cars were stabled in the Village street. They were then quickly moved to the tram stop for the return 'peak hour' and five-car operations resumed at 4.30pm. Electrical Supervisor Noel Blackmore spent most of the day monitoring the demand on the power supply at the carbarn. Ray Blackmore and Victor Sweetlove were stationed at Triangle Junction with the tow truck and tower wagon. Fortunately neither were needed. Crew refreshments, provided at Entrance by Catering Officer Martin Grant and his helpers, Wyn, Bess and Carol, were much appreciated by all.

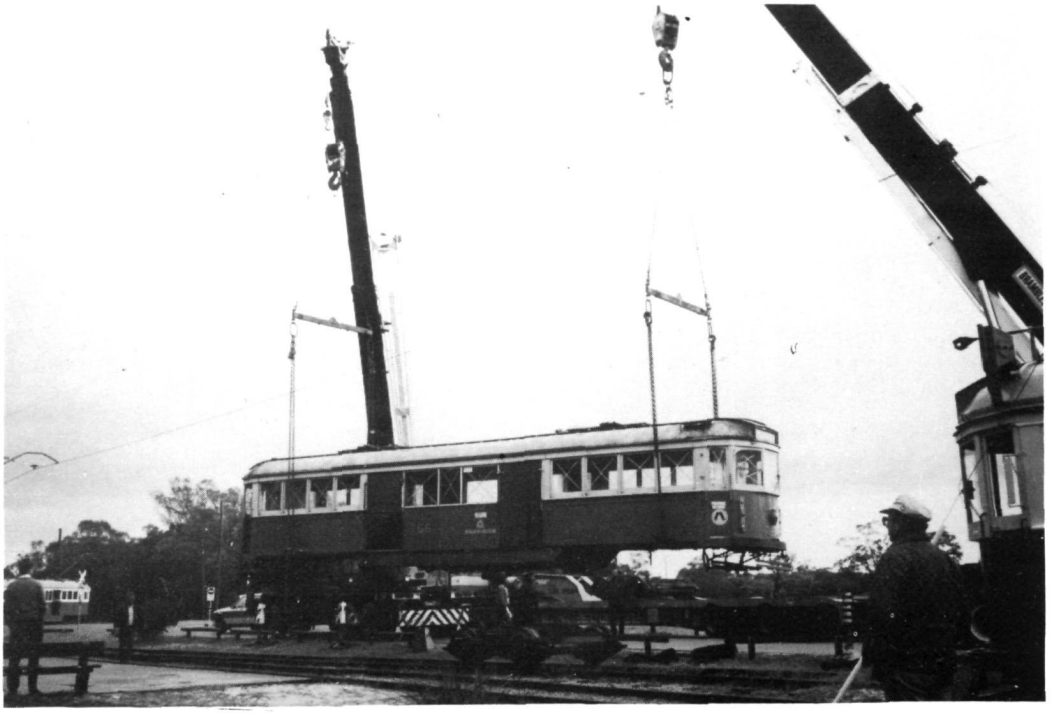
In terms of the safety and efficiency of our operations, the day was a great success and gave a great deal of satisfaction to all concerned for a job well done.

New Acquisition — W5 class 766

The latest ex-Melbourne tram allocated to PETS through COTMA, W5 class 766, was recently released from Preston Workshops by The Met. It was loaded onto a low-loader on 18 September to be hauled by road direct to Whiteman Park, where it was expected on Monday 24 September. To our surprise, 766 arrived quietly at Mussel Pool during the late

W5 class 766 as it arrived from Melbourne, photographed prior to unloading at Mussel Pool on 24 September. Fittings had been removed from the roof and stowed inside for the journey.

NOEL BLACKMORE



W5 class 766 is unloaded onto the Mussel Pool siding on 24 September. W2 class 393 is visible at left, while the cab of W4 class 674 can be seen at right.

NOEL BLACKMORE

afternoon of Sunday 23rd while Rally Australia was in full swing. It was left overnight on the truck at Mussel Pool, then off-loaded to the siding by two cranes on the Monday morning. It was shunted to the main line by W2 class 393, then towed onto road 4 of the carbarn fan by W4 class 674, and finally shunted into the carbarn by 393, with the whole operation being completed by 11am.

The car's trucks arrived with motors removed. These were stowed in the dropcentre of the car to enable us to more readily remove the defective armatures for remedial work before refitting the motors to the trucks. It is unlikely the car will re-enter service before May 1991 given our priority programme on refurbishing the 9C and two No. 1 trucks, and progressive completion of the mechanicals on FMT 29.

Other Acquisitions

On 4 August, PETS members recovered ten surplus steel poles from West Parade outside the Westrail Centre in East Perth. These poles were donated to the Museum by Westrail.

The opportunity was also taken to recover eight full lengths of grooved rail donated by the Sportsmen's Association Bowling Club in Mount Lawley. These rails are in very good condition and were discovered in a stack beside a disused green at the rear of the club by Martin Grant. They make a very useful addition to our stock of grooved rail for eventual use in the Carbarn fan.

On 8 September, six steel poles, including four ex-Westrail, were erected in the extended depot fan area.

Fremantle 29

After a rather lengthy period in which little apparent progress was being made on the restoration of 29, the results of the work are again starting to show. Brent Luscombe's team have completed the tedious seat modifications, and the assembly and installation of seats in the saloon is now moving ahead fast — nine of the 28 had been installed by the end of September. Ric Francis is fitting the air ducting below the saloon, while Frank Damen is fitting the metal anti-slip strips to the saloon floor. The trolley poles have been attached.

Sign-writing in gold leaf on the saloon bulkhead windows, "Wait Till Tram Stops Before Boarding or Alighting", was completed on 12 September and looks superb.

W5 class 766 stands on the Mussel Pool siding after unloading while W4 class 674 waits on the main line to tow 766 to the carbarn. PAUL EDWARDS

MELBOURNE . . .

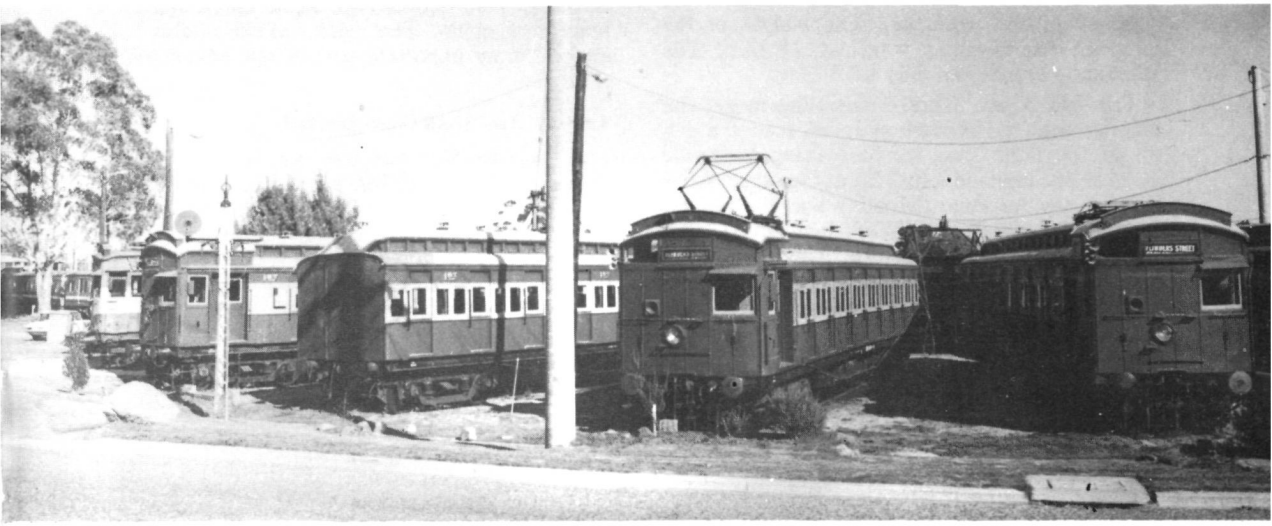
ElecRail

The ElecRail Division of Steamrail Victoria has been restructured to handle all aspects of electric train preservation. During the 23 years since Victorian railway electric traction was initiated in 1967, the founders have concentrated on electric multiple unit swing-door and Tait wooden rolling stock and will continue to do so in the future with work proceeding on car 137M. Preservation of more modern electric multiple unit cars and electric locomotives is to be the responsibility of separate sub-groups to be co-ordinated within the ElecRail Division.

The recently formed Electric Locomotive Preservation Group hopes to have main line English Electric L class locomotives 1160 and 1162, built in 1953, recommissioned on 19 January 1991. These two 2400hp Co-Co locomotives are a preservationist dream, having received major overhaules only a few months prior to withdrawal in June 1987. L 1169 is available a a source of spare parts. A l-o-n-g term ambition is to eventually restore two veteran E class 600hp Bo-Bo locomotives from 1106, 1108 and 1109 built in 1928.

A major problem confronting those interested in preserving the blue Harris electric multiple units is the cost of $22,000 per car for the removal of asbestos which has meant the abandonment of The Met's proposal announced in January 1989 to restore a 7-car set involving cars 798M, 2850T, 799M, 2515T, 2606T, 883M and 1522M. The only hope for Harris stock preservation could hinge on four asbestos-free late series M cars having suffered considerable vandalism.

Although the four-car Victoria 150th Anniversary Commemorative Tait Train, restored in 1984, is now stored and serviced at Seymour, ElecRail is still responsible for its operation. The cars, 381M, 230D, 208T and 317M, are transferred between Seymour and Melbourne by diesel-electric locomotives, or as has happened once so far, by steam locomotive J class 515.



The Seymour turntable tracks take on the appearance of a museum as historical electric rolling stock awaits transfer to a new roofed complex nearby and scheduled for completion in October 1990 by the Seymour Loco Steam Preservation Group. The vehicles (L to R) on 21 February 1990 were Swing-door Parcels Coach 10CM and preserved Tait cars 230D, 208T, 381M and 317M. JOHN DARE

ST. KILDA . . .

Australian Electric Transport Museum

Melbourne Wheel Lathe Obtained

A recent COTMA Memorandum from Bill Kingsley resulted in some major machinery acquisitions by the Museum. Bill's note about the intention of Preston Workshops to discard one of its wheel lathes led Ian Seymour to make three quick train trips to Melbourne.

Trip No. 1 saw Ian hurriedly take off to Melbourne for an overnight stay to visit Preston Workshops and inspect the Craven Wheel Lathe. Ian purchased this valuable piece of machinery on behalf of the AETM from the Public Transport Corporation of Victoria. A vertical borer was also included. It seems the lathe was occupying valuable space needed by the Workshop's grinders and a similar lathe.

Trip No. 2 saw Ian return one week later to dismantle the lathe at Preston and seek craneage and transport quotes. This proved somewhat difficult as the base of the lathe was two feet below floor level and it required lifting in the confines of the workshop. The weight of the lathe after dismantling was also 28 tons! The Workshop cranes can only lift 5 tons.

Trip No 3 saw more dismantling to get the lathe through the Workshop doors. It took a day to lift the lathe from its base using hydraulic jacks at one end and a fork lift at the other. After a three day weekend (Monday was the regular rostered day off for Workshop staff), Ian supervised the loading before flying (this time) back to Adelaide to supervise the unloading. Two semi-trailers were required - one for the lathe and the other for its tool posts and motors, and the vertical borer. After a day's delay, the machinery arrived at St Kilda — all within a few weeks of Bill's memo!

The Craven Wheel Lathe was used at Preston Workshops to reprofile worn tramcar wheel treads (either those out of gauge or with flanges too thin). The vertical borer was used for boring wheel centres out or making new tyres (it is basically a normal lathe turned on end).

The borer was placed in our workshop. The wheel lathe has been positioned outside adjacent to the workshop pending the erection of suitable accommodation. It is planned to have it back in action within the next year or so.

The unloading crane was also used to reposition our spare BHP Iron Knob electric locomotive truck from its position near the visitors car park to a more prominent location in the depot yard between the signal cabin and the Inspectors cabin. The truck, which retains its motors, is an important part of our educational charters.

Trolley Bus Shed Reorganised

A large working bee was organised by Kym Smith on 18 August 1990 to rearrange and clean ALL the exhibits in the Trolley Bus Shed. This important part of our Museum display had been somewhat neglected in recent times. The dust from the rubble floor was slowly camouflaging our buses and other exhibits.

The new Roads 2/3 crossing has been boxed ready for concreting. Car 264 in the distance is about to enter the depot fan. PAUL SHILLABEER

ABOVE: Mark Smith (right) and friend help polish 'The Green Goddess', Australia's first trolleybus. JOHN RADCLIFFE

LEFT: Wash day at St Kilda. Warren Burt cleans the roof of 'Canton' trolleybus 488 while AEC Regal IV 623 and Sunbeam Trolleybus 526 are completed at rear. JOHN RADCLIFFE

The day saw a very good turn-out (well done, Kym) in which every exhibit and display was moved and relocated. The Museum tractor was used to tow trolley buses "Green Goddess" 216 of 1932, "Canton" 488 of 1945 and Sunbeam 526 of 1953, plus diesel bus AEC Regal IV of 1954, out the rear of the shed and round to the visitors car park for a good wash and clean. Some members enjoyed their first Adelaide trolley bus 'ride' since the system closed in July 1963. Even AEC doubledecker 417 of 1937 was towed out the front of the shed — its first move since 1978.

As all the buses were to be repositioned to face the front of the shed, all the wall-mounted displays had to be dismantled from the northern wall and re-erected on the southern wall as the new position of some of the buses would have hidden many of them. The result is a much more pleasing (although not perfect) bus display shed. The event has shown just how much can be achieved in one day with good planning and a good roll-up!

Road 2/3 Crossing Completed

The new Road 2/3 crossing on the main depot fan has now been completed. Works car W2 class 345, Ballarat maximum traction 34 and single truckers Desert Gold 186 and Birney 303 were use to test the crossing joints in both directions before the main body of the crossing was set in mass concrete. the smooth passage of single truck cars through the new crossing is quite noticeable. the wider flanged wheels of cars 42 and 186 (on Brussels trucks) especially used to jolt through the old crossing.

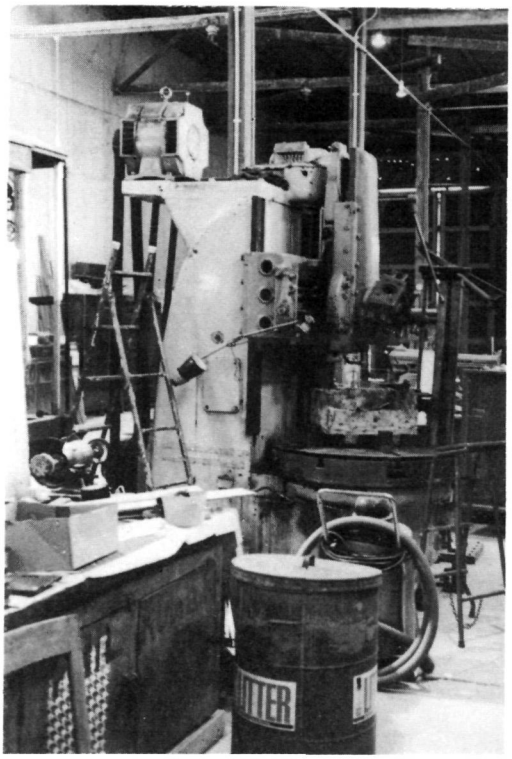
Electrical Equipment Obtained

The recent closure of Converter Station 16 in City Depot and Converter Station 9 at Helmsdale on the Glenelg line has yielded further items, thanks to the co-operative efforts of the STA. The feeder pillar which stood on the southern side of Angas Street near King William Street has been relocated on the northern side of our depot fan. It previously acted as a feeder from City Depot to the overhead in Victoria Square and King William Street South.

The same STA truck which delivered the feeder pillar also brought electrical equipment salvaged from Helmsdale including a high speed breaker, a mercury arc rectifier bulb, lightning arresters, voltmeters and a lifting block.

Arts Grant

An application by the AETM for an Arts and Museum Facilities Capital Grant from the Department of the Arts for $9000 has been approved. The grant provides funding for concrete flooring and fitting out of our restoration body shop shed. The shed was erected over two years ago and the funding will now enable us to complete the body shop.



The recently acquired vertical borer in the Museum workshop. PAUL SHILLABEER

Other News

A programme of repairs to the original wooden depot support posts is being carried out. The programme involves testing the posts for rot, excavating the bases, bolting steel plates to the posts, jacking them to the correct height, cutting of the rotted bases at ground level and concreting the plates into the ground. These poles were obtained from the MTT store at Mile End and erected at St Kilda in 1961-62.

A new ride-on mower has been purchased and has made the task of regularly mowing the Museum's large expanse of grass considerably easier.

The body of former C type car 173 has been 'scrapped' and has created a tidier appearance around the site. The dilapidated body had become an eyesore in recent years. Actually, many interior fittings are now in our restored C type car 186. Various other spare parts have been retained.

The ex-Angas Street feeder pillar box stands alongside the depot fan with some of our other tramway furniture. PAUL SHILLABEER

HADDON . . .

Melbourne Tramcar Preservation Association

Substation and Transformer

The second 25kVA transformer has been reassembled and parallelled with the No. 1 unit to give us our full 50kVA capacity. With the completion of this work the substation was tested and all equipment functioned perfectly. Work is continuing on the voltage regulator which, with the exception of minor cleaning up jobs, will see all work finished in this area.

During June the new mains supply was connected to the SEC system and all was now in readiness for tramcar electrical trials.

Overhead Construction

By the end of March, Nos 3, 4 and 5 shed roads overhead (troughing, ears and trolley wire) had been completed, including the necessary feeder conections, terminating at the newly installed section insulators on the external cross span outside the shed doors. Thanks to Tony Smith, Arthur Ireland, Richard Gipps and Frank Schroeder. Work was now to begin in earnest on the outside construction, material having been systematically selected, overhauled and accumulated by the co-ordinated work team as under:

1. Preparation and overhaul of ears, frogs, line contactors, etc. by Arthur Ireland.

2. Manufacture, preparation, treatment and erection of troughing by Noel Gipps, Arthur Ireland, John Withers, Tony and William Smith, and Frank Schroeder.

3. Selection of material, design, supervision and construction by Noel Gipps and Tony Smith, and

4. Manufacture of necessary span construction , straights, pull-overs, 'V' anchors and bracket arm erection by Noel Gipps, Craig Tooke, Tony Smith, Arthur Ireland, John Withers and Richard Gipps.

With an extensive range of material now on hand ready for erection, arrangements were made for span wire and pole collar erection on site by Tony, John and Arthur, supplemented at weekends by Noel and Richard Gipps. The main line construction consists of simple catenary construction utilising steel cored aluminium messenger erected 20 inches above the trolley wire. It is supported by standard line ears and hangers at cross spans and bracket arms in conjunction with intermediate galvanised steel droppers to provide an optimum wire height within the shed area of 16 feet. Catenary cable and trolley wire are electrically connected at suitable intervals by copper bridges.

By Saturday 14 April, the main line wiring had been erected, tensioned and temporarily anchored to the newly erected poles at the north west corner of the carbarn. The following

Thursday and Friday provided a special bonus in the form of our visiting member, John Lambert who with Tony Smith erected, suspended and tensioned the trolley wire to Nos 1, 3, 4 and 5 roads, connecting to the existing section insulators. By 3pm on Sunday 22 April, Noel, Tony, John and Arthur completed the wiring to all connecting roads, including frogs, anchors, 'cut off' and 'slow down' discs. Apart from minor adjustments the stage 1 overhead was complete.

The weekend 28 to 30 April saw the commencement of stage 2 overhead construction, including the north west corner curve network pull-overs, and the removal of the temporary anchors for the stage 1 construction with the installation of new terminating points at the south east corner of the car barn.

Temperature variations in the Ballarat area may vary between — 3 and 35 degrees celcius, posing a number of design problems. A final decision to sag approximately 6 inches per 100 feet span has so far proved very satisfactory with the existing structure. Thanks, Tony, for those 4am inspections.

The constructing of the first phase of our network has been a most rewarding experience and a happy achievement and our hearty thanks and congratulations are due to those concerned.

Tramcar News

During the past few months work has been concentrated on preparing W2 class 357, W3 class 663 and W4 class 670 for electrical tests. This has involved connecting motor leads and brake rigging, oiling motor and axle bearings, and servicing compressors, linebreakers and governors, etc. Restoration work on W4 class 670 is continuing, with the saloon window louvres currently being repainted. Overhauled front destination rolls have been fitted and the saloon seat cushions have been scrubbed and refitted.

W2 class 357 is being given a cosmetic overhaul to make it more presentable for operating. It is intended to convert this car to its original 1920 W class condition, but this is some years away and the car needed cleaning up a little. The floor is to receive a paint, along with the driver's cab interior, aprons, pipework, controller cases and handbrake staffs. The roof and trolley bases are currently being repainted and all the external cream woodwork will be done next. The green panelwork, while faded, will be cut and polished to bring back some of the shine. A test panel has already been completed with most pleasing results.

North Side Drain

Last winter, when we had all that heavy rain, we had both our pits full of water. While drilling holes for the poles in our stage 2 work, we found the water table to be only a few feet down and not at a deeper level as we thought, so running a drain along the north side would help to remove the problem. The trench was dug, screenings

Tony Smith and John Lambert splicing the pull-off for the No. 1 road trolley wire. JOHN LAMBERT

placed, pipes laid and the trench backfilled in two days. The drain goes along the north fence then follows the western fence until it joins the drain from the carshed roof.

Track Construction Stage 2

The track bed was laid from the main line extension to the end of stage 2 at the south side of the carshed during the first week in May. The ballast came from Sago Hill and has plenty of quartz and clay in it to help bind it all together to form a stable mass. The ballast was laid from the back of a moving truck with its tray up. This allowed it to be spread in a fairly uniform layer, so the grader did not have much follow-up work to do after it was graded out. With tower wagon running over it, it has settled into a hard mass and will present no problems in settling.

With the track bed laid, we started to modify some of our broad gauge steel sleepers for standard gauge and enough have been done to complete three panels of track. A timber template is used to mark the new hole and a small pilot hole is drilled out of the sleeper. It only takes a matter of a few minutes to mark the new hole, drill the pilot and cut in the new slot.

Electrical Operation Commences

On Sunday 29 July 1990 at 7.15pm, W2 class 357 became the first tram to move under its own power. It was drawn out of the shed at Haddon by General Manager and founding member Tony Smith. This had been the culmination of two days solid preparation work by museum members under the guidance of Electrical Superintendent Noel Gipps. On Saturday 11 August, after track preparation, W2 class 357 was driven the full length of the main line to the top end terminus. Operation of this car has continued for testing purposes with only minor grinding required at some pointwork.

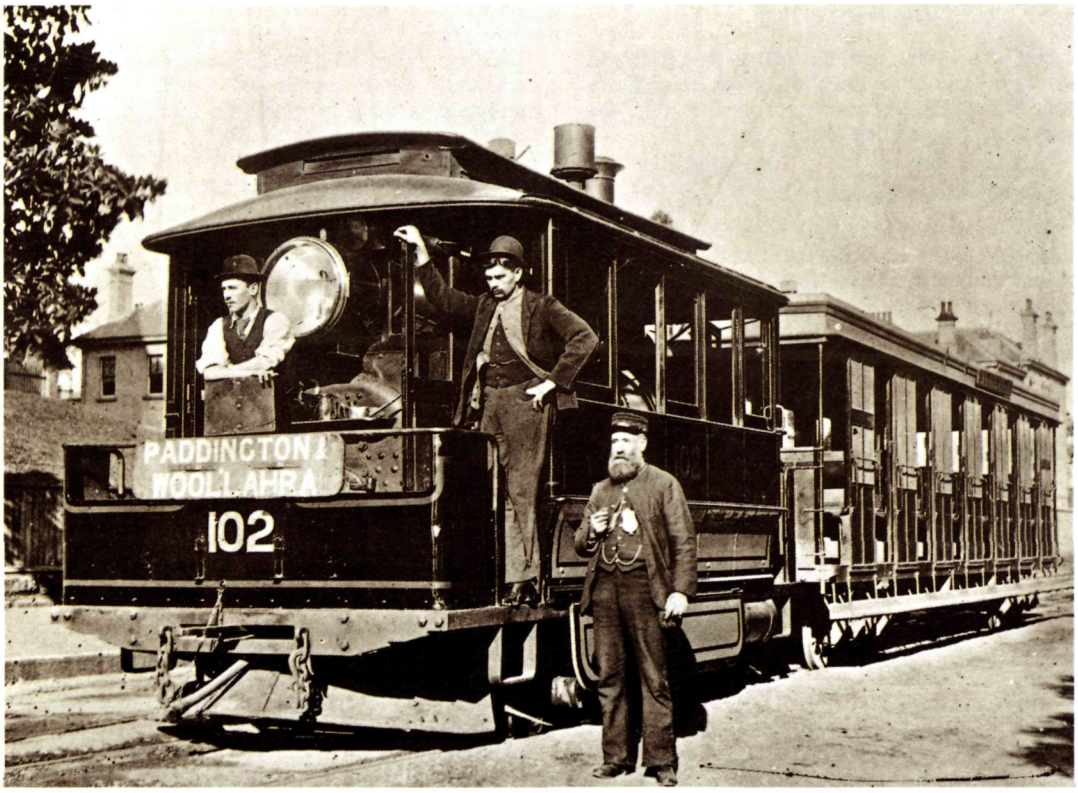
W2 class 357 at the top end terminus after its first run on 11 August 1990 with members Tony Smith and John Withers. ARTHUR IRELAND

COTMA Co-ordinating Diary

1 December 1990 — Sydney Tramway Museum. Annual Members' and Friends' Christmas Open Day. Barbeques available for tea in the picnic area.

19 January 1991 — ElecRail Victoria. Re-commissioning of L class main line electric locomotives 1160 and 1162. Contact Don Potts, 2/51 Campbell Street, Heathmont 3135, for details.

24 February 1991 —Sydney Tramway Museum. Commemoration of 30th Anniversary of Sydney's last tram.



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