

TROLLEY WIRE

ISSUE
200

Journal of
AUSTRALIAN TRAMWAY MUSEUMS

JUNE, 1982
ISSN 0155 - 1264



REACHING THE NORTH SHORE

Registered by Australia Post — Publication No. NBH 0804

TROLLEY WIRE

1952

30

1982

THIRTY YEARS

JUNE 1982

Vol. 23 No. 3

Issue No. 200

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Published by the South Pacific Electric Railway Co-operative Society, Limited, Box 103 P.O. Sutherland N.S.W. 2232.

Printed by Newey and Beath Printers Pty Ltd., 10 Belford Street Broadmeadow N.S.W. 2292.

The opinions expressed in this publication are those of the authors and not necessarily those of the publishers or the participating societies.

Subscription rates for six issues per year to expire in December:

Australia \$7.50

Overseas \$9.00

\$1.25 Recommended selling price.

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FRONT COVER: Melbourne Z3 class car 200 at Preston Workshops during commissioning tests.

This is the second electric tram in Melbourne to carry this number. - M&MTB Official Photo.

BELOW: Bylands - Saturday 5 June 1982 and W3 667 passes the body of PCC 980 as it inaugurates electric operation for the TMSV. Full details will appear in the August issue.

- K.S.Kings

200

Whenever possible a photo relating to the lead article is used on the cover of TW, but for this issue an exception is made. It is not that we are adverse to featuring the Sydney Harbour Bridge on two consecutive covers but the near completion in Melbourne of 2nd 200 coinciding with the 200th issue of TW provided an opportunity to commemorate both events together.



REACHING THE NORTH SHORE

Continued

By K. McCarthy

Moruya Quarry

The 45,000 tons of granite blocks which form a veneer on the concrete pylons and approach spans were quarried and dressed at a quarry situated on the northern bank of the Moruya River at Pompey Point half way between Moruya township and the river mouth.⁽⁵²⁾

Dorman Long Coy. commissioned three x 400 ton steamers to carry the granite from Pompey Point to the Milson's Point workshops. This work continued between 1925 and 1931.⁽⁵³⁾

The northern breakwater or training wall of the Moruya River has been served on various occasions by a standard gauge railway. These railways linked quarries in the Pompey Point deposit to the river entrance works. From the turn of the century to 1907 the railway was in use and some sources feel that tram motor 10A hauled the stone trucks. Tramway records, however, fail to support this proposition.

Between 1923 and 1928 the former Metropolitan Water Board's Manning Wardle locos (1780 and 1781 of 1911) were used on further Moruya breakwater construction. These engines retained the Water Board numbers 3 and 4 which they received when delivered for the Pott's Hill Reservoir project. No. 3 was taken to Dunmore Quarry near Shellharbour in 1929 and ultimately ended its working life with the Mackay Harbour Board in Queensland. Loco. no.4 returned to work with the Water Board shunting at the Ryde Pumping Station and is now preserved as a museum relic.

It is not clear if these two Manning Wardle engines were associated with quarry work for the Sydney Harbour Bridge. Photos of that era of the Pompey Point region suggest that shunting and lifting was performed by 7 ton vertical boiler four wheel standard gauge self propelled cranes.

Between 1948 and 1954 PWD locos 30 and 78 were again at Moruya on breakwater strengthening work. These two engines were transferred from Port



A 30 class tank loco heads a train of mansard roof end platform cars out of the second Milsons Point station. Five cars of the train in the siding on the left are wide 1921 type which became electric motor cars. The Dorman Long workshops are behind the station and the southern approach for the Harbour Bridge, under construction, is barely visible across the harbour. - SRA Archives

Kembla to where they returned on the conclusion of the project.

During the period of the Harbour Bridge Construction a small township was occupied overlooking the beautiful Moruya River flats known as Granite Town.

Menangle Sand Company

Sand for Sydney Harbour Bridge concrete was obtained from the Nepean flats just upstream from the Menangle railway bridge by the Menangle Sand Coy. This undertaking laid a 2ft gauge steam railway into Menangle Station Yard and obtained two Davenport 0-4-0ST locos from the PWD Cordeaux Dam project during 1926. In 1936, after the conclusion of the job, Davenport loco 1596 of 1917 (PWD 65) was transferred to the Kiama gravel tramway and is now preserved by the Illawarra Light Railway Museum. The boiler of loco 1595 of 1917 (PWD 64) was dismantled c 1936 and used near Douglas Park to power a small steam saw mill. The abandoned boiler was retrieved by the ILRMS as a spare for their locomotive on 22 March 1979.⁽⁵⁴⁾

Preparations for the Bridge Opening

The Harbour Bridge was constructed with a deck

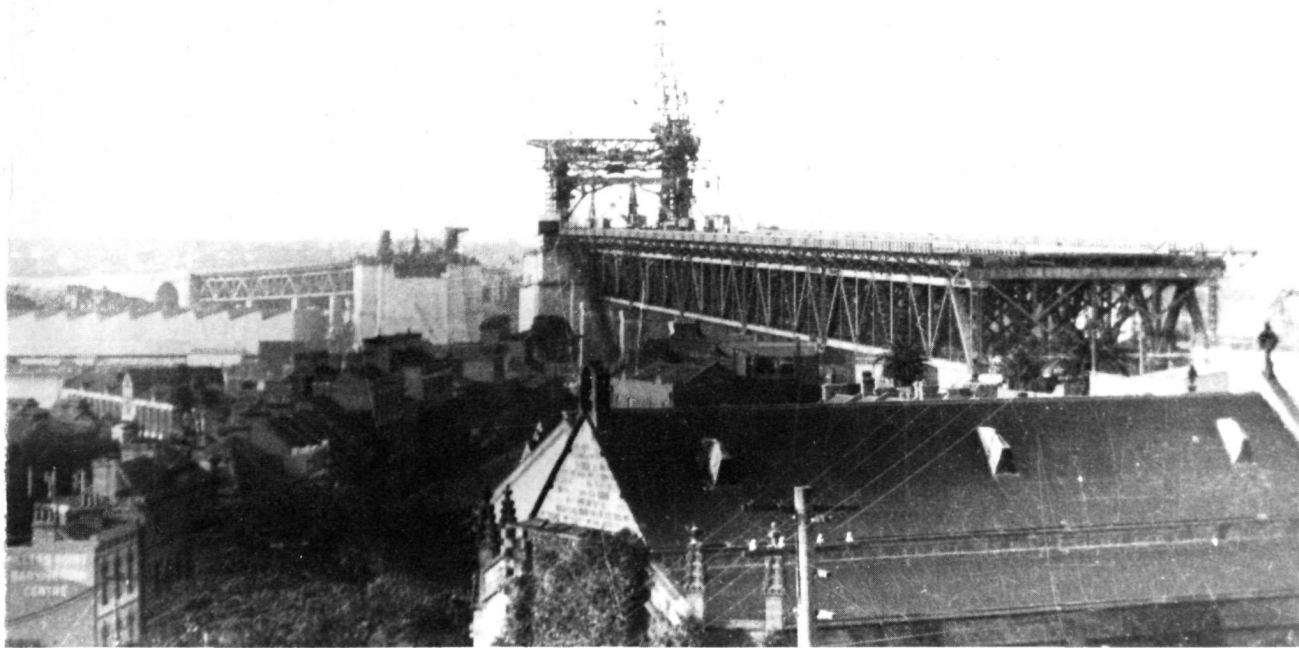
width of 160ft., a clear span of 1650ft and a clearance above high water of 170ft. The arch contained 37,000 tons of steel and the entire project used 52,300 tons of steel. The two silicon steel arch members are spaced 98ft 6in apart and the rise of the lower chord is 350ft. The highest point at the arch centre is 440ft above sea level. When constructed the deck accommodated two outer 10ft wide footways, four lines of electric railways, two on each side of the central six lane roadway which was 57ft wide.

During 1931 State Cabinet decided that the North Sydney trams would use the two eastern railway tracks and terminate at platforms 1 and 2 at Wynyard underground station. At the time of the bridge opening only a maximum total of 24 trains per hour were envisaged and these could be easily accommodated on the western pair of tracks. When this railway frequency reached 40 trains per hour the trams were expected to vacate the eastern tracks. Originally the trams were to terminate outside the new North Sydney station in Blue Street where a pedestrian subway was provided to aid the transfer of passengers.

Following the tramway deviation of 1924 into Glen Street at Milson's Point the main tramway approach to the harbour continued to be located



Milson's Point as work on the Harbour Bridge gets under way. The trams have gone to a temporary terminus in Glenn Street adjacent to the second railway station. However, it appears that ferries are still calling at the old wharf. The site is being cleared for the Northern pylon and the workshops. The hill on the left was further cut away and the spoil used to reclaim some of the bay immediately
-N.S.W. Government Printer



The Sydney Harbour bridge southern approach spans from Observatory Hill, The Rocks, February 1929. The creeper crane and its cradle can be seen above the pylon base. The Dorman Long workshops can be seen on the northern side of the harbour together with the northern approach spans. - Late J. McCarthy

along Alfred Street. During 1930 a section of tram track was diverted through the Arthur Street under-bridge of the northern bridge approach when the Junction/Alfred Street intersection was moved some distance southwards to pass under the new Clyde built steel arch bridge and the parallel concrete arch bridge. This steel arch approach bridge, which eventually carried tramway traffic, was fabricated at the Clyde Engineering plant and erected as part of the PWD bridge approach project.⁽⁵⁵⁾

By January 1932 the railway and tramway tracks across the bridge were ready, but all four sets were connected to the main North Shore railway by way of the new North Sydney station and tunnels to form a junction just east of Waverton-Bay Road, station. The tramway tracks were connected to the railway at this stage to enable dead locomotives to be positioned at various locations on the bridge for load tests.

By the first week in January 1932 the locomotives for these tests were gathered in Hornsby yard and the planned date for the start of testing was 12 January. By that date the locos were distributed in North Sydney station and on the up track on the west side of the bridge at Kirribilli Station.⁽⁵⁶⁾

The "Sydney Morning Herald" of 26 January 1932 stated that 4,000 signatures had been placed

on a petition to the Minister for Works, Mr. Davidson, requesting that the new Kirribilli Station be renamed Milson's Point (III). On 8 February the Government agreed to this request.

Load Tests

On Tuesday 19 January loco number Z1905 was in steam on the bridge shunting on the western track. Mr. Ennis and Dr. Bradfield observed the loco testing tracks on the following day. On Thursday 4 February the live load test commenced. Twelve fully loaded locos were used on the approach spans. Eventually the load was increased on the main arch over a distance of 550ft on each side of the arch centre providing 8,300 tons. The full programme of deflection tests was expected to occupy almost three weeks.⁽⁵⁷⁾

The "Sydney Morning Herald" for Friday 5 February 1932 reported at 8am on the previous day four groups of four locos which had been stored at Kirribilli Station were hauled across the bridge. Each train, amounting at 350 tons, was drawn along each track on the northern approach spans for live deflection load tests. During the afternoon these engines were moved across to the southern approaches where they remained overnight.

On Friday 5 February a total of 92 locos were used on the main arch test as outlined earlier. The



ABOVE: Passenger and vehicular ferries cross Sydney Harbour as their replacement reaches out across the water. This view is looking upstream from Kirribilli.

approach grades were 1 in 40 and these engines were securely spragged and a length of rail on the down grade sides removed to prevent runaways. The final test resulted in the locos being placed parallel on all four tracks but occupying the tracks between the arch centre and one set of pylons only.

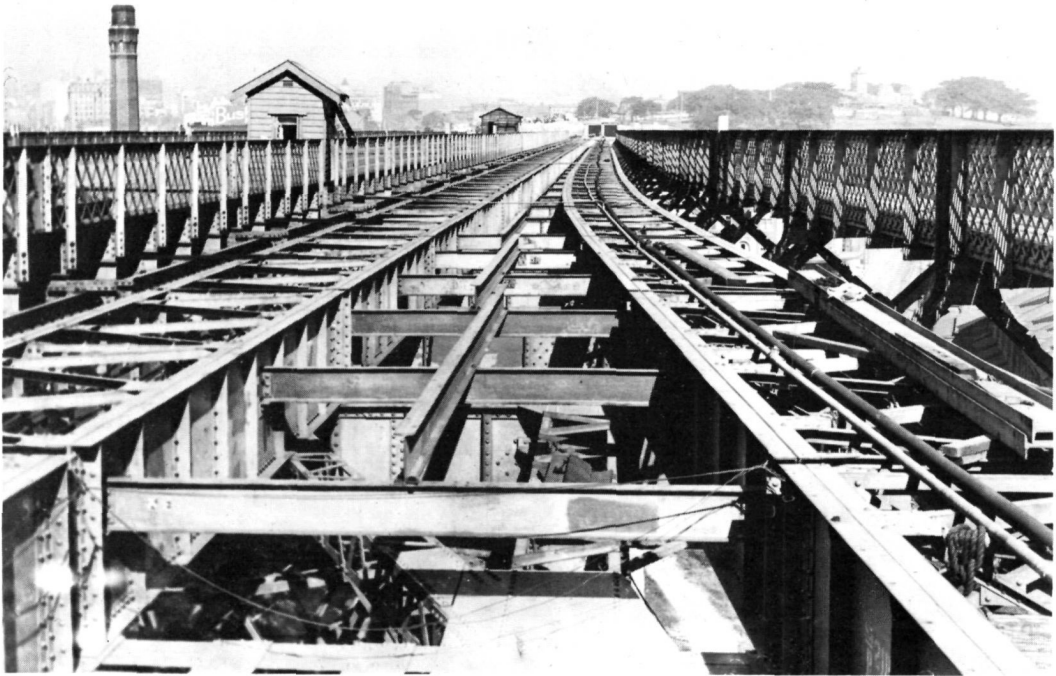
Mr. Ennis revealed in an address to the Legacy Club on 2 March 1932 that the bridge deflected $3\frac{3}{4}$ " under the full load test, while the deflection when one side only was subjected to loading amounted to 3". Had the suspension bridge design been adopted at Sydney Ennis suggested that the deflections would have been 18" and 24" respectively! The total test load was 40% in excess of the normal maximum working load set down in the specifications.⁽⁵⁸⁾

Photos of that period indicate that the main locomotive types used in the tests were of the Z19, Z26 and standard goods classes. Many of these were readily spared from regular traffic as railway business was seriously curtailed at that time by the economic depression. Some of these locos had been stored in country and metropolitan depots and many did not return to active service until the eve of World War II. The writer remembers seeing a siding full of stored engines at Waterfall in the late 1930's and was given the explanation that some of these locos could have possibly been used to test the Harbour Bridge!

The decking on the southern approach of the Harbour Bridge before the concrete road base was laid, circa May 1929. -

- Late A.Milstead collection





Looking south towards the tunnels on the eastern railway right of way on the southern approach to the Harbour Bridge before the tracks and wooden decking were laid. This side of the bridge was initially used by trams and is now a roadway. - N.S.W. Government Printer

Ceremony Preparations

The bridge opening programme was released on 13 January and the opening date was confirmed as Saturday 19 March 1932. "The Sydney Morning Herald" for 7 January 1932 reported that Dr. Eckener proposed the airship "Graf Zeppelin" may fly to Sydney for the bridge opening. He felt that it would be possible to land the ship at either Richmond or Hargreave Park near Liverpool but refuelling would have to be carried out at Darwin or Perth. This statement was contradicted in the same paper on the following day!⁽⁵⁹⁾

The construction period of the bridge was a time of volatile State politics in N.S.W. Jack Lang had been Premier of a Labour Government from 1925 to 1927.⁽⁶⁰⁾ He again defeated the Bavin conservative government in 1931. Jack Lang's economic policies during this period of world wide depression was to press on with public works programmes even if interest payments due to overseas bond holders had to be postponed for the time being. The completion of the suburban railway electrification, the underground city railway and the Harbour Bridge were possibly made attainable by adherence to such a fiscal policy but it cost Jack Lang's party their

position when they were dismissed from government by Governor Game on 13 May 1932.

A further argument reached boiling point at that stage concerning who was responsible for designing the Sydney Harbour Bridge. Was it Dr. J. Bradfield's team or the Dorman Long group under (Sir) Ralph Freeman? Ralph Freeman was senior partner of the engineering firm Douglas Fox and Partners of London. He was also the consulting engineer to Dorman Long and Coy.

The article has still not been settled fifty years after the event. When the opening day arrangements were being finalised, Dorman Long and Coy. threatened to take legal action if a tablet naming Dr. Bradfield as the designer was attached to the bridge. They claimed that Freeman had published articles in the "Sydney Morning Herald" during one of his early visits which they felt clarified the matter and his design work for the bridge had been exhibited at the Wembley Empire Exhibition in 1924.⁽⁶¹⁾

When addressing the Legacy Club on 3 March 1932 Mr. Ennis stated that Ralph Freeman supervised drawings and calculations in Dorman Long's offices. The design required 6000 to 7000 drawings and one man worked on engineering calculations for a period of 5 years.



Milsons Point as seen from Kirribilli on 5 March 1930. The vehicular ferry Kooroongabba loads at Jeffrey Street Kirribilli while the Koompartoo moves into Lavender Bay. The Milsons Point ferry slips remain amidst the clutter around the base of the northern Harbour Bridge pylon. Five panels of the arch have been placed by the creeper crane. The arch restraining cables are clearly visible as are the Dorman Long workshops on the edge of Lavender Bay beyond the bridge approach. Besides the creeper crane with its four jibs there are nine other cranes visible. - N.S.W. Government Printer

The dilemma concerning the plaque was finally solved by using the following words:-

SYDNEY HARBOUR BRIDGE

The Bridge was constructed for, and the approaches by, the Public Works Department of New South Wales. The general design and specifications were prepared by J.J.C. Bradfield DSc. (Eng) ME, M.Inst. CE, MIE (Aust) Chief Engineer. Contractors for the design and construction of the main structure, Dorman Long and Company, Limited, Middlesbrough, England. Lawrence Ennis OBE, Director of Construction for the Contractors. Ralph Freeman, M.Inst. CE, M.Am.Soc. CE, Consulting and Designing Engineer for the Contractors. Sir John Burnet and Partners, Architects for the Contractors. The Honorable M.A. Davidson MLA, Minister for Public Works. G.W. Mitchell Director of Public Works.

The "Sydney Morning Herald" for 12 January 1932 reported that the New Guard, an extremely conservative right wing political faction, had presented a petition to King George V requesting that Premier Lang not be permitted to perform the opening ceremony. The same publication for 5

February stated that the King would not be preparing an opening day speech!

Tramway and Railway Preparations

At the conclusion of the load tests in February, the final track adjustments were made to enable the eastern side of the bridge to be used by North Shore tram traffic.⁽⁶²⁾

At 10am on Thursday 19 February the first electric train tested the new city underground railway between Central and Wynyard. The train proceeded just north of Wynyard upper level underground station and returned to Wells Street Redfern. A second test followed on the lower level tracks on the same section. At this time work proceeded on the conversion of both 1 and 2 platforms at Wynyard and Milson's Point to take tramway rolling stock. The tandem crossovers just north of Wynyard platform were re-constructed to tramway tolerances. The two crossover sets were laid out on the vehicular roadway just north of Argyle Street before being dismantled for transfer to their permanent positions.

The railway track spaces in the Wynyard and

Milson's Point tramway platforms were bridged over with heavy timber framework and decking to elevate the tram tracks almost level with the railway platform surfaces. A photo dated 18 February 1932 revealed that the wooden decking at the Wynyard platforms extended half way along the station length while the wooden fence was being erected between tramway platform 2 and railway platform 3.

From Tuesday 23 February 1932 electric trains made regular driver training runs between Central and Wynyard stations and on Sunday 28 February this section of the city railway was opened for regular traffic from 6am.

In the meantime the new tramway connection along Blue Street North Sydney to connect the Miller Street tramway with the Harbour Bridge approaches was completed. On the afternoon of 9 March 1932, coupled tramcars 1212 and 1106 made their first trial run across the bridge. The trial had been unannounced and the workmen were surprised to see trams on the bridge. This first tram set carried "Wynyard" on the front destination sign and "North Sydney" on the rear. After testing the tandem Wynyard crossovers as well as platform clearances the coupled set returned to the north side with a full load of departmental officers. Later that afternoon these trams recrossed and were stabled

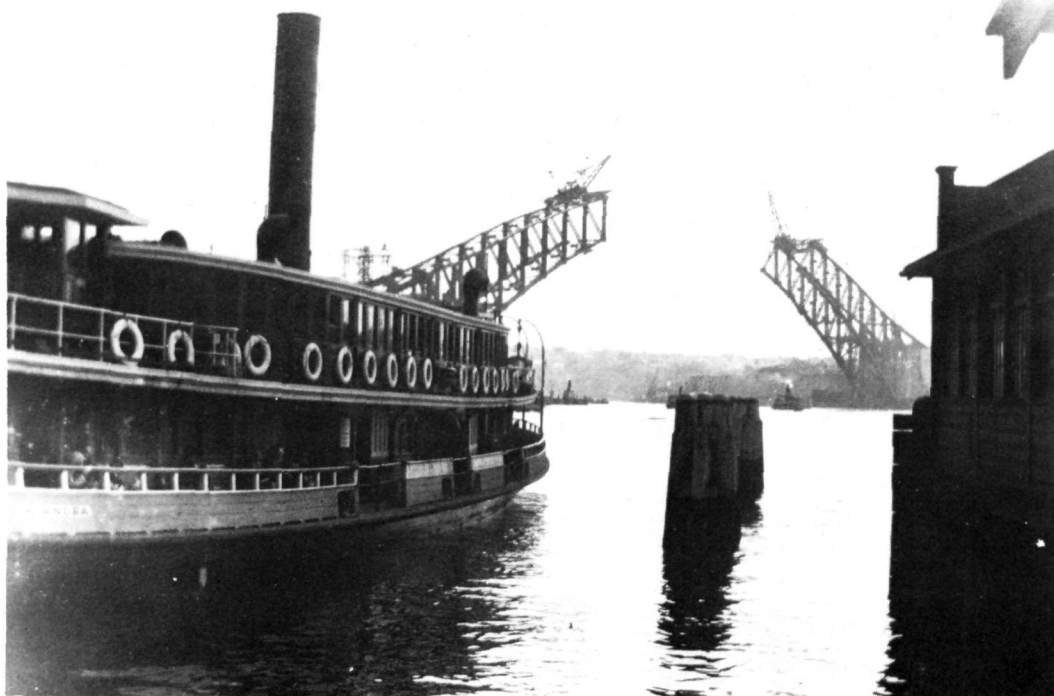
for the night in Wynyard platform. It seems that these two tramcars remained on the bridge for the next week to enable driver training to be conducted on the new route.

The first electric train did not pass over the bridge until Friday morning 11 March when an eight car train set continued beyond Wynyard station after depositing passengers at the underground terminus. The Minister for Works Mr. Davidson and railway officials then boarded the train for this first trip which returned back immediately after reversing at North Sydney Station.

On Sunday 13 March train speed trials were conducted by drivers T. Dart and W. Wormald under the direction of Dr. Bradfield. Regular train driver trials continued throughout that following week.

Transport Alterations

Definite announcements concerning the rerouting of transport services over the bridge and the closure of redundant routes were slow in being released. On 14 January 1932 Mr. S. Maddocks, Chairman of the Transport Trust announced that the North Sydney to McMahons Point tramway and a revised McMahons Point to Circular Quay ferry passenger service would continue for a three months trial period after 19 March. This would



Kiandra loads at Circular Quay during 1930 as the Harbour Bridge rises out across the harbour.

enable the amount of local traffic to be gauged.⁽⁶³⁾

The McMahons Point residents were not confident about Maddocks' statement. On 10 February a deputation waited on the Transport Board to request the retention of trams to McMahons Point. The Board replied that it was not certain if trams or buses would be used after 19 March. Sydney Ferries Ltd. at that stage were negotiating with the Transport Board regarding the continuation of the McMahons Point ferry service. The Chief Transport Commissioner, Mr. C. Goode, told the deputation that he would investigate their grievances and explore the possibility of extending the McMahons Point tramway to an existing northern suburbs route.

On 29 February 1932 the State Cabinet approved a bill to dissolve the Railway Commission, the Main Roads Board and the Transport Trust. Mr. Cleary, the Railway Commissioner who held position tenure until 1938, was to be retired while the Chairman of the Transport Trust, S. Maddocks, who had been appointed by the Bavin Government on 30 June 1930 for seven years, was to retain that position. Mr. Goode, the former Transport Commissioner, was appointed as Chairman of the Transport Co-ordination Board, a body to be constituted for twelve months.

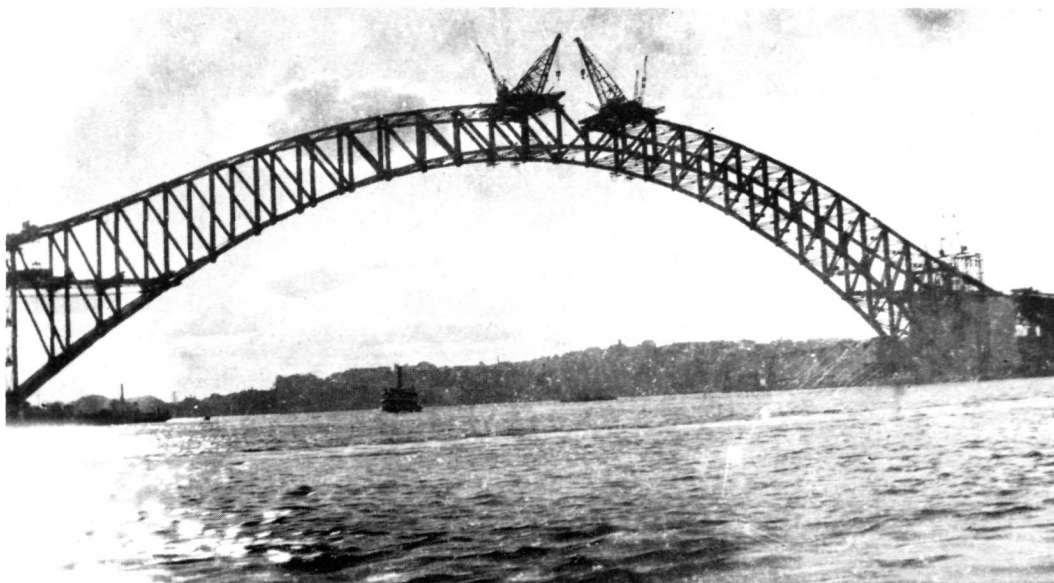
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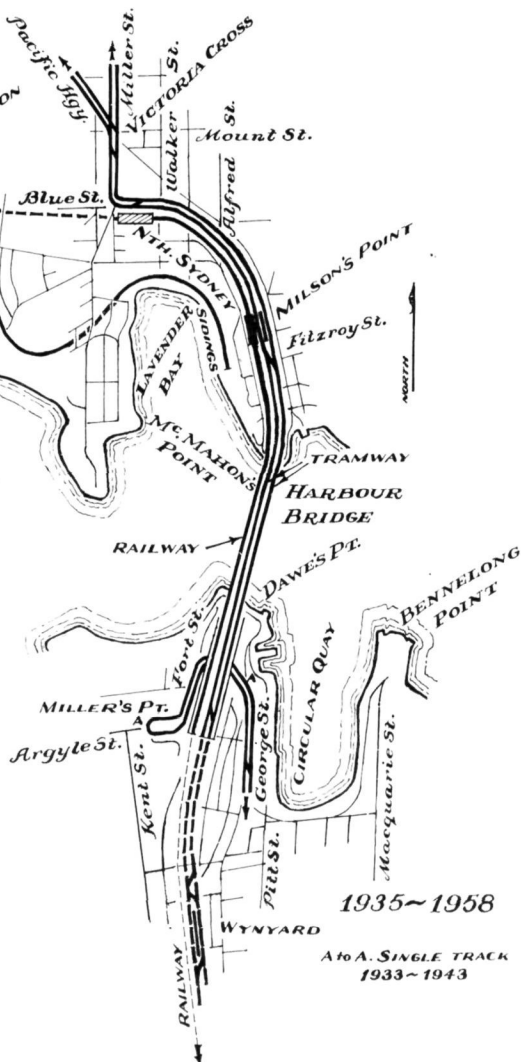
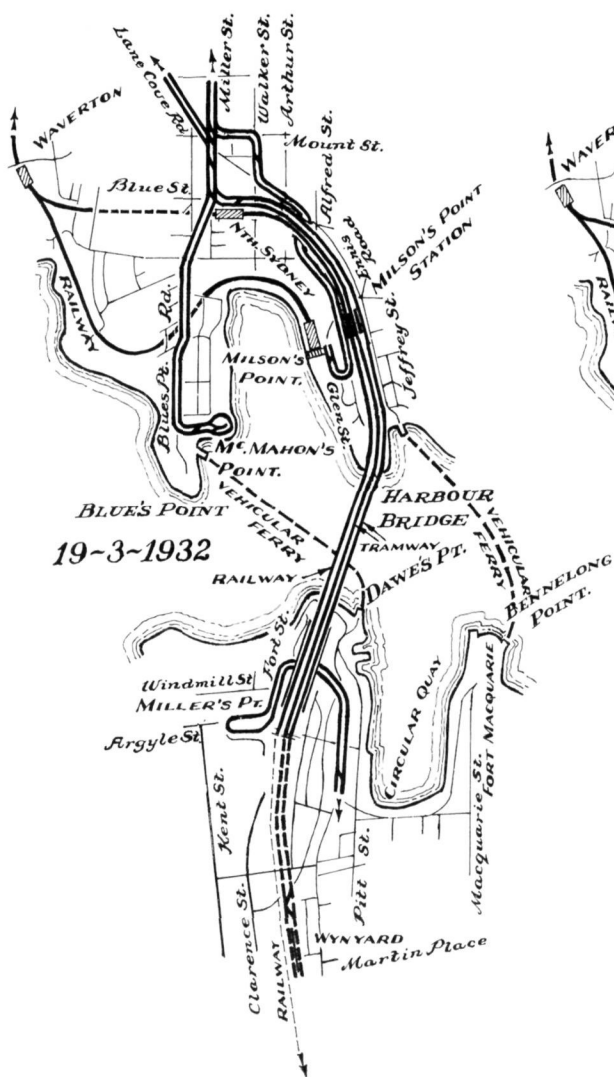
On the following day the transport authority announced that the tramway service between North Sydney Station and McMahons Point would cease after the last run on Saturday evening 19 March and a replacement (private) bus service would commence on the following morning between the harbour and North Sydney Station. The North Sydney Council has wanted the tramway service retained as such a change could cause the ferry service to close.

Further transport changes announced at that time involved the ferry services. The Circular Quay to Milson's Point passenger ferry would close after the last trip on 19 March, but the McMahons Point ferry would continue until 31 March for the benefit of season ticketholders. It was also possible that a ferry service on that route would continue on trial after that date. During March special "monthly" ferry tickets were issued for the Quay to Milson's Point service to cover the period 1 March to 19 March.

The planned changes in the McMahons Point district were not well received. Press reports claimed



An afternoon view of the Sydney Harbour Bridge arch in August 1930. The lower arch chords appear to be joined while the creeper cranes are in position to complete the top chords. One of the large ferries, Koompartoo or Kuttabal can be seen under the arch while a vehicular ferry is near the Dawes Point slips. Taken from Circular Quay East. - Late H. Smith of Mt. Keira, courtesy Mr. and Mrs. C. Smith



that the ferry trip between McMahon's Point and the Quay only cost a season ticket holder 2½d per trip. If this was discontinued the bus trip to North Sydney Station would cost 2d., the train fare to Wynyard 4d or the tram journey over the bridge 5d. Thus the return trip would cost 1s or 1s-2d with a greatly increased journey time!

Finance

"The Sydney Morning Herald" for 19 January 1932 announced that the final cost of the Harbour Bridge project was expected to reach £8,136,000. The original estimate was £5,750,000 including land resumptions, but the total to 30 June 1931 had reached £8,136,946.

This was broken into the following parts:-

Dorman Long's contract £3,567,651

Award rates to ditto re 44

hour week	£462,101
Approaches	£1,506,999
Resumptions	£1,252,258
Interest on Expenditure	£1,048,931

Some money would be recouped due to the sale of land, but as land prices were depressed at that stage it would be difficult to raise any large compensation. At this stage the basic wage in N.S.W. was £3 16s 6d (\$7.65¢) per week.⁽⁶⁴⁾

A report of 8 February 1932 indicated that the Commonwealth Loan Council would reduce loan funds causing a short fall of £200,000 needed for the completion of the approaches, general finishing touches and beautification of Wynyard Park. Premier Lang stated, however, that his government would find this sum from other sources.

The original proposal was for the bridge costs to be debited against the railway department. As the motor age grew with the 20th century the decision emerged that the bridge costs would be shared by toll charges as well as special rates on certain suburban areas until 1939.

The bridge toll charges were fixed on 19 February. The train fares would be Waverton to Wynyard 1st class 5d single and 10d return, 2nd class 4d single and 8d return. The car toll charges announced on 15 March were 6d per vehicle including driver, plus 3d per adult passenger and 1d per child for each crossing. Tram fare details released on 11 March indicated a charge of 4d per adult and 2d per child under 12 years of age for any part of the journey between Argyle Street and Milson's Point Station or between Wynyard Station and North Sydney Station. The tram fare between Argyle Street and Wynyard would be 2d per adult and 1d per child but the Argyle Street stop was not to be available until 3 April 1932.

On and from Sunday 20 March the first fare section on the North Sydney tramways was changed to extend from Milson's Point Station to Ridge Street with an overlap to Falcon Street or Milson's Point to Crow's Nest on the Chatswood line, with an overlap to The Arcade on the Lane Cove service.

Bridge income was expected to be £523,625 p.a. This was based on an average toll charge of 1s per road vehicle for 2,400,000 vehicles p.a. and 25,000,000 one way passengers in trams, trains

and buses.

Railway passengers were expected to yield £130,000, vehicles @ 1/- would raise £120,000, tax on unimproved land values £273,625.

Annual expenditure would consist of:-

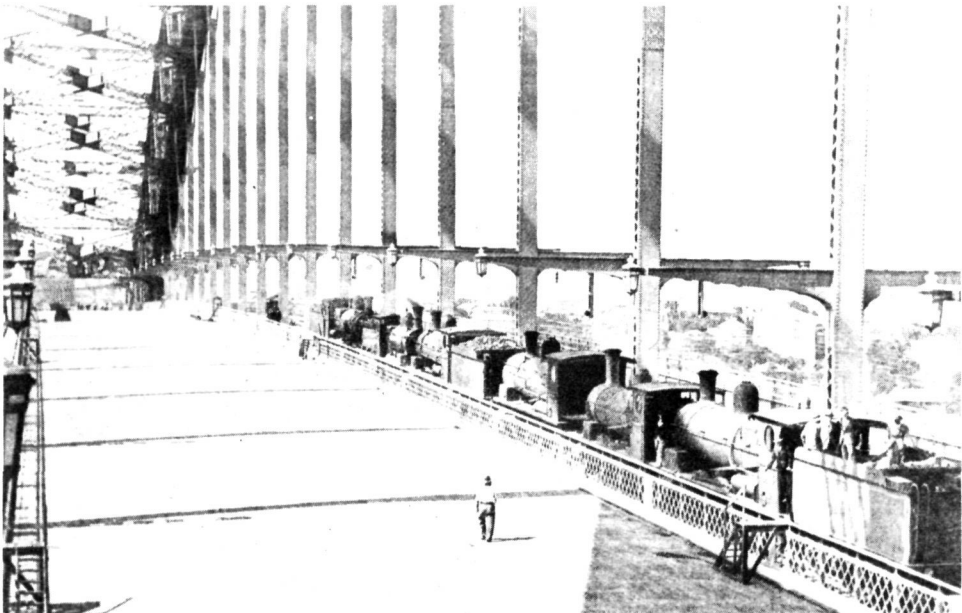
Interest.....	£77,500
Paint and Maintenance.....	£10,000
Lighting.....	£2,250
Paving upkeep.....	£2,000
Administration.....	£1,000

By this stage the cost of the bridge had increased to £9,900,000:-

Bridge and approached.....	£6,230,000
Variations in wages.....	£720,000
Interest during construction.....	£1,460,000
Resumptions.....	£1,350,000
Miscellaneous.....	£140,000

Under the original Act the railway responsibilities for this debt was £6,600,000, North Sydney and Sydney Municipalities £3,300,000, but the railway, and tramway portion was changed to a definite charge per tram and train passenger.⁽⁶⁵⁾

At 2.30pm on Tuesday 15 March the bridge was handed over by Dorman Long Coy. to the N.S.W. Government. This handing over ceremony was performed on the bridge. The Hon. M.A. Davidson, Minister for Works formally accepted the bridge from Mr. L. Ennis, Director of Construction for Dorman Long. The event was witnessed by Hon. R. Kit son, Vice Chairman of Dorman Long; Dr. J. Bradfield Engineer-in-Chief; Mr. G. Mitchell, Director-General of Public Works.



Locomotives on live-load tests on the eastern side of the Sydney Harbour Bridge. - Sydney Mail



An aerial view of the Sydney Harbour Bridge and the northern approaches early in 1932. The Dorman Long workshops are being dismantled, their work done. The street tramways are barely visible, there are trams in Glen and Alfred Streets, and the diversion of the tracks from Junction Street (Pacific Highway) under the approach spans of the bridge to gain Alfred Street is shielded by the picture theatre. - Sydney Morning Herald

Opening Ceremonies

Wednesday 16 March 1932 was declared Children's Day on the bridge for all those over the age of 8 years and living within 10 miles radius. March 16 was a wet day, but this did not dampen the spirit of the occasion. The children's visit was planned like a large military undertaking. Between 10am and 3pm some 56,000 children walked across the bridge. Many of these arrived by tram: 12,000 were brought in from the Kensington district to Bridge Street Yard; 12,800 from the western and southern suburbs alighted at the Miller's Point terminus at Argyle Street; 5,000 North Shore students left their trams at Alfred Street, while 1,300 travelled along the Watsons Bay tramway

and walked to the bridge along York Street. The children walked across and returned on the bridge roadway making a clockwise circuit.⁽⁶⁶⁾

Friday 18 March was declared a school holiday to mark the completion of the work while Saturday 19 March dawned fine. That opening day was gazetted a half day holiday in the Country of Cumberland.

On Saturday afternoon, 19 March, the opening ceremony was conducted from a dais in front of temporary grandstands on the southern approach. The ceremony opened with the Governor of N.S.W., Sir Philip Game reading a message from King George VI! While the Minister for Public Works, the Hon M. Davidson was addressing the gathering, Captain de Groot, a member of the New



The decorated eight car electric train approaches Milsons Point station as it crosses the Sydney Harbour Bridge during the opening procession. Saturday 19 March 1932. - SRA Archives

Guard movement, moved up on a horse, dressed in a pseudo army uniform, slashed the ribbon with his sword and declared the bridge open "on behalf of decent and loyal citizens of NSW". De Groot was pulled from his horse by the police and taken into custody. Francis De Groot appeared before the Central Police Court on 6 April and was fined £5 with £4 costs for behaving in an offensive manner. A further charge of damaging a ribbon to the value of £2 was dismissed.

The ribbon was quickly rejoined and after receiving a pair of golden engraved scissors inlaid with six opals from Hon. R. Kitson, the Premier J. Lang, declared the bridge open and recut the ribbon.

The official party joined a procession of cars and then passed over the bridge. On the northern approach the Mayor of North Sydney, Alderman Primrose, cut another ribbon. This time a ceremonial pair of scissors were used made up with one blade of the scissors used on the previous year to open a similar bridge, the Bayonne Bridge between New York and New Jersey, and the other a locally made blade. This ceremony was conducted under the watchful eye of the Governor General Sir Isaac Isaac and the Governor of N.S.W. The Governor General and the Prime Minister, Joe Lyons, were just two of many prominent politicians and vice regal figures at the ceremony, but the formalities were organised so that the day was a New South Wales event!⁽⁶⁷⁾

With these formalities concluded a spectacular procession which had passed along the packed streets of Sydney, moved across the bridge to conclude the parade in North Sydney. Although

many of the colourful floats were mounted on motor lorries, the majority were horse hauled. This was the last major function in which horse hauled floats were present. Except for specially groomed horses hauling stage coaches and brewery wagons, the next procession, that for the Sesqui-Centenary celebrations of 1938, was fully mechanised.

As the parade passed over the structure, aeroplanes flew over in salute and a procession of ships steamed under the bridge. The large ships in this display included the "Manunda", "Nieuw Zealand", "Orford" and "Maloja".

As the procession passed over the bridge a decorated six car electric steel train set crossed from Wynyard to North Sydney. This car set as well as a limited tramway service shuttled back and forth over the bridge carrying passengers holding special surcharged tickets.

Regular Business

Regular business commenced at midnight on the evening of 19 March. During the first six hours of Sunday 20 March, £287 was collected in tolls from 4,600 motor vehicles. From 6am to 2pm a further £480 was received from 7,600 vehicles. For the first 24 hours, 24,912 vehicles crossed the bridge carrying 87,236 passengers and paying £1517. The usual Saturday takings from trams in the Sydney suburban area was £9,000 but on Saturday 19 March the income was £16,613.⁽⁶⁸⁾

The last train left the old harbour side platform at Milson's Point (II) Station at 12.11am on Sunday morning 20 March for Hornsby while the first regular passenger train over the bridge departed



The decorated eight car electric train which operated over the Sydney Harbour Bridge on opening day, Saturday 19 March 1932, returns across the bridge to Wynyard. - N.S.W. Printer

from Central at 6.43am.

The last ferry on the Quay to Milson's Point passenger service was the "Kirrurle". This departed from the Sydney side at midnight with N. Nutt as Master, Engineer G. Simpson, Fireman A. Stewart and Deckhands J. Flanagan and G. Frobert.

The last vehicular ferry on the McMahon's Point to Dawes Point run departed at the same hour. At first the Sydney Ferries Coy's request to continue a limited vehicular ferry service between Jeffrey Street Kirribilli and Fort Macquarie (Bennelong Point) was refused but as the opening of the bridge was expected to throw 102 employees working on the passenger ferries out of work, the government hesitated to cause a further 100 vehicular ferry employees to be forced onto the unemployment market. Accordingly approval was granted for Sydney Ferries Ltd. to continue the Milson's Point vehicular ferry, but an all night service would not be offered.

This vehicular ferry service proved to be uneconomic so the operation closed at 8pm on Thursday 31 March 1932 when, it is believed, the "Kara Kara" made the last crossing. The ferry firm

of Heggarty's took over the McMahon's Point to Quay ferry service for trial operations during the "curiosity period" and this firm has continued to operate the limited cross harbour route since that time.

The McMahon's Point tramway service was replaced by buses on Sunday morning 20 March. The buses operated from Warring and East Crescent Streets to Walker Street North Sydney. A 15 minute frequency was provided in the first timetable between 6.46am and 8pm with a half hourly service after 8pm.

Between 19 March and 30 March the tramway earnings between Wynyard and North Sydney Station were £5334 while vehicle tolls raised £7651. The lowest amount collected on any one day during that period was £541 on Tuesday 29 March.

Another tramway closure due to the Harbour Bridge was the York Street loop line between Druitt and Market Streets. This mid city turn back terminal had opened for traffic on 4 September 1922 but as its running direction was against the new one way street patterns leading to and from the



The Hornsby to Milsons Point railway was electrified in 1927 and electric trains ran to Lavender Bay before the Harbour Bridge was opened and the line extended into the City. A train crosses the bridge to the city as a ferry rounds the point but there will be few passengers for it. The electric train in the (2nd) old Milsons Point station is stalled in the off peak. Storage sidings remain on this site although all the buildings have gone. Note that the Dorman Long workshops are being dismantled.

Harbour Bridge, this tramway loop closed after 17 September 1932. A general plan for widening main access thoroughfares through the city was formulated to coincide with the Harbour Bridge development. One thoroughfare was to pass along Martin Place and then across the domain to join William Street west of Kings Cross. A further widened road system was to follow York, Druitt, Park and William Streets. Martin Place was widened in stages between George and Macquarie Streets, Park and William Streets were widened in the early 1930's, but alternative elevated and tunnel road schemes to serve the same purpose as the incomplete schemes were not commissioned until the period 1958 to 1981.

The Bridge and Underground Tramway Route

As tramway operation over the Harbour Bridge and along the Wynyard underground section settled into a routine various adjustments had to be made. During the tramway trials conducted prior to the opening of the bridge various openings between the bridge decking surrounding the tram tracks and bridge members were noticed which could be a danger to passengers if they had to leave the

tramcars in an emergency. It also seems that access was available to the maintenance stairs on the arch. The openings surrounding the hanger bases were progressively enclosed just after the bridge opened, but the maintenance stairs were not enclosed by a fence and gates until the period 13 June to 30 July 1932.

On 12 August 1932 Regulation 29, concerning tramway operation, was placed in force which prohibited the joining or alighting from a tramcar between Blue Street North Sydney and Wynyard except at authorised stopping places.

The bridge became a favourite location for suicide attempts. When opened the guard rails on the pedestrian walks were only some 4ft 6in in height, identical to those which still separate the roadway from the railway tracks. Cage like enclosures were soon erected along the outer railings to discourage the suicide urge.

When opened, the only crossovers on the new tramway route were at Blue Street North Sydney outside the railway station entrance and the tandem set some 315 feet north of Wynyard platforms. Incoming trams at Wynyard were directed into either platform 1 or 2 where the poles would be

reversed while passengers joined the cars. At busy periods a batch would be directed into one of these platforms. While passengers joined these trams another batch would be directed into the other platform. When the first batch departed and cleared the tandem crossovers the next batch, which had been held in the tunnel, would take their place at the platform. This process would alternate between the two platforms.

"The Sun" of 12 July 1932 featured a report on the mad scramble which was occurring at Wynyard tramway station during peak periods. Passengers reaching the station when the trams were already standing in the platforms had to rush past each car looking at the destination boxes to ascertain which one to join. Generally the trams departed before many could find their correct vehicle.

On 22 July 1932 Traffic Superintendent Neale answered the Commissioners query about this matter with the statement that a man's voice announces the arrivals and departures at peak

hours with a megaphone! Those who well remember Wynyard at peak periods can appreciate the asinine nature of this reply. Tram compressors would be pumping, electric trains continually arrived at and departed from the adjacent platforms and this noise would be accompanied by the general sounds of hurry and urgency as crowds reached the platforms from the staircases. The efficiency and audibility of a man's voice through a megaphone along a 425ft platform would be most ineffectual.

Neale expressed the opinion that the expenditure on an indicator should be avoided by altering the track layout so that trams could enter the station through No. 1 platform and depart by way of No. 2.

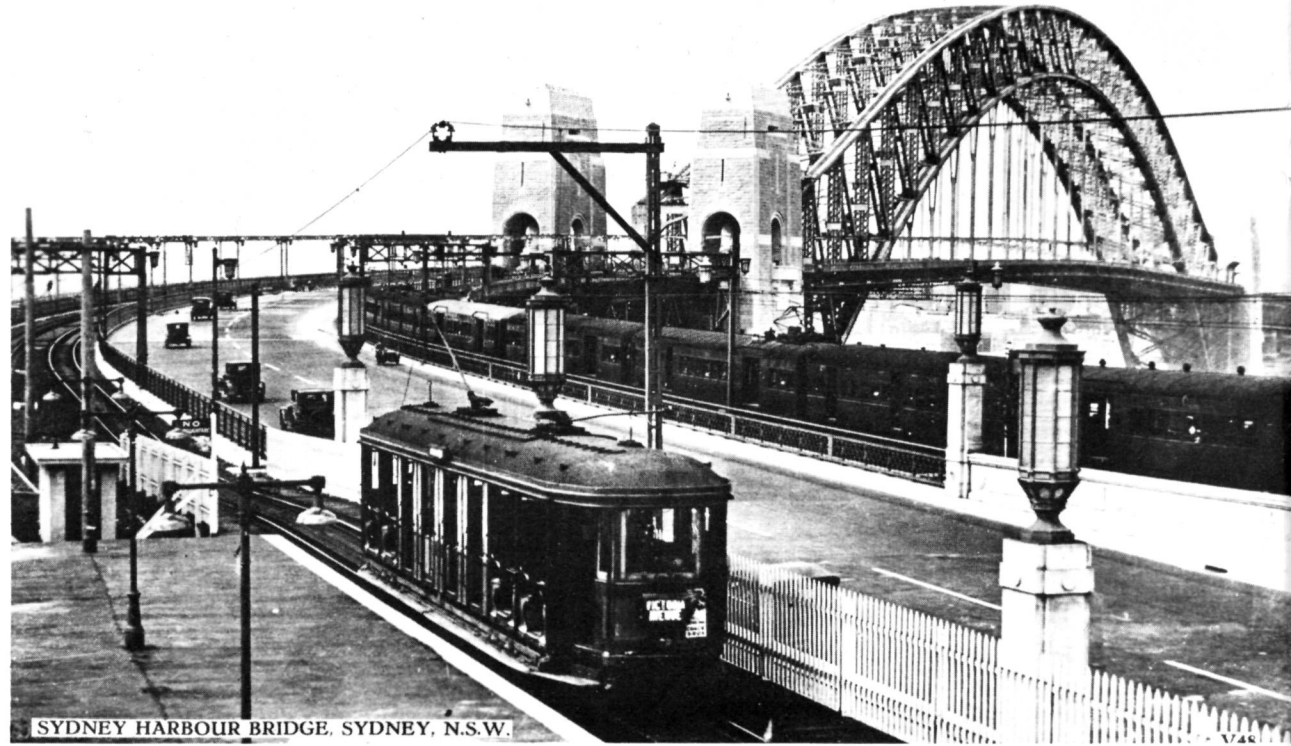
A destination indicator was designed and constructed for £150. This was delivered at Wynyard on 24 October 1932 and placed in use on the following day.⁽⁶⁹⁾

The wooden framed indicator resembled a large boarding house wardrobe! It was erected at the Wynyard starters office and displayed the trams



O 836 descends off the southern approach of the Sydney Harbour Bridge towards the tunnels and Wynyard station in March 1932. The Argyle Street stop and crossover had yet to be opened and installed.

-R.I.Merchant collection



SYDNEY HARBOUR BRIDGE, SYDNEY, N.S.W.

Trams and trains at the new Milsons Point station on the northern Harbour Bridge approach. The O class tram has just negotiated the ramp which raised it up almost level with the top of the railway height platform. This is an early view, probably in 1932, and shows the centre line on the roadway. When the bridge opened even this simple traffic control measure was absent. - Postcard

destinations and locations along the platforms. Down the centre of the indicator, one under the other, were twelve destination signs illuminated from behind. These read from top to bottom:-

GORE HILL; LANE COVE; FRENCH'S RD; VICTORIA AVE; CHATSWOOD; SUSPENSION BRIDGE; NORTHBRIDGE; TARONGA PK; THE SPIT; BALMORAL; spare; spare.

Small square openings were situated to the left and right of each destination panel. Within these smaller openings were rotating alphabetical letters A to E. These indicated locations along the platforms from which the various trams would depart.

These location letters "A" to "E" were painted on the platform but from 9 January 1933 markers hanging from the station ceiling came into use located 60ft apart allowing 15 feet between bogie "O" cars.

On 3 November 1932 the suggestion was made to Superintendent Neale that the signal man at the tunnel crossovers should telephone to

the indicator operators the order of the passing trams prior to their arrival. Neale replied that this suggestion could not be supported as it was adequate for the indicator to be set as the trams emerged from the tunnel and the indicator operator noted their destinations

On June 11 1933 a short southward extension of the down dead end track in the tunnel at Wynyard station was opened and a facing crossover placed in use. This crossover cut through the platform at the southern end and enabled trams to enter the station at number 1 platform. After the passengers alighted at this point the tram then travelled ahead, through the crossover onto the down deadend. After reversing the poles the tram would then draw into No.2 platform ready for departure. At the evening peak period the tandem crossovers were still used and batches of trams entered and departed from platform 1 or 2.

On 21st December 1934 the emergency crossovers at Argyle Street at the northern tunnel mouth and at the southern end of Milsons Point station were brought into use.

Signalling in the Tunnels

Colour light signals were installed along the tramway between Argyle Street and Wynyard. These were numbered "T" followed by three numbers. The "T" indicated "Tramway" and the numbers the distance from the railway zero mile post at Central station. The down signals all ended in odd numbers while the up carried even numbers. This signal T152 would indicate a Tramway signal 1.52 miles from Central on the up track.

These electric signals had a red lens above a green one. The interlocked signals carried a third lens below the green through which "CO" could be illuminated. This was the calling on sign. The automatic signals which worked from track circuit blocks, carried a third lens above the red. This always showed the letter "A" indicating automatic operation.

The following signals were interlocked and worked from the signal cabin at the tandem cross-overs: (70)

T142 Nth. Sydney to No. 1 platform road.

Lever no 10

T142 Nth. Sydney to No. 2 platform road.

Lever no. 8

T132 Up face No. 1 platform road to No. 1 platform.

Lever no. 9

T132 Down face No. 1 platform to No. 1 platform road.

Lever no. 3

T137 Up face No. 2 platform road to No. 2 platform

Lever no. 6

T137 Down face No. 2 platform road to North Sydney

Lever no. 2

T135 Down face No. 2 platform to No. 2 platform road.

Lever no. 1

T136 No. 1 platform road to North Sydney.

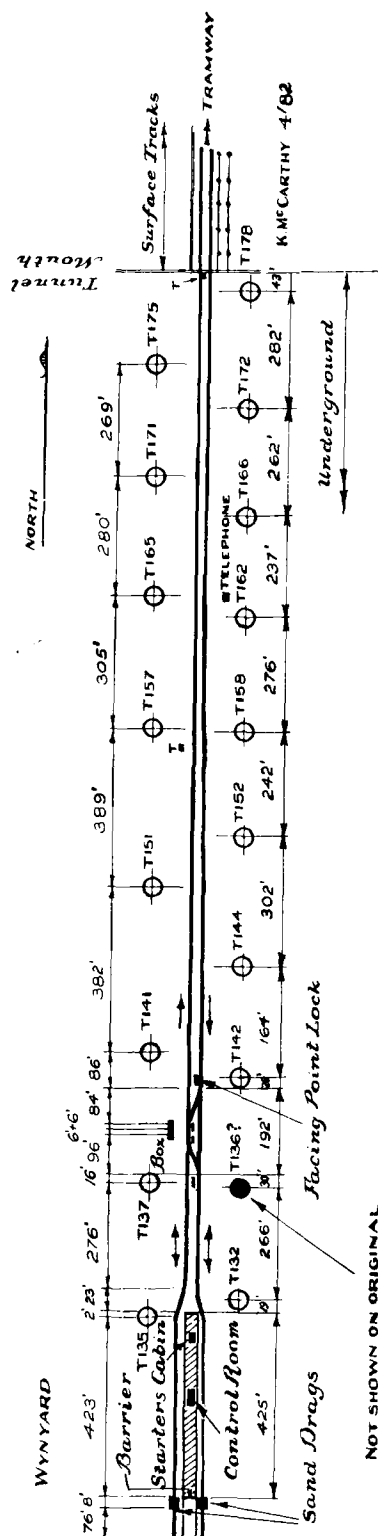
Lever no. 4

If these interlocked signals displayed red only, the driver could not pass. If green, the track ahead was clear. If red was displayed with the "CO" symbol the tram driver could draw forward cautiously as far as the track ahead was occupied by a tramcar either stationary or moving ahead in the same direction as the following car.

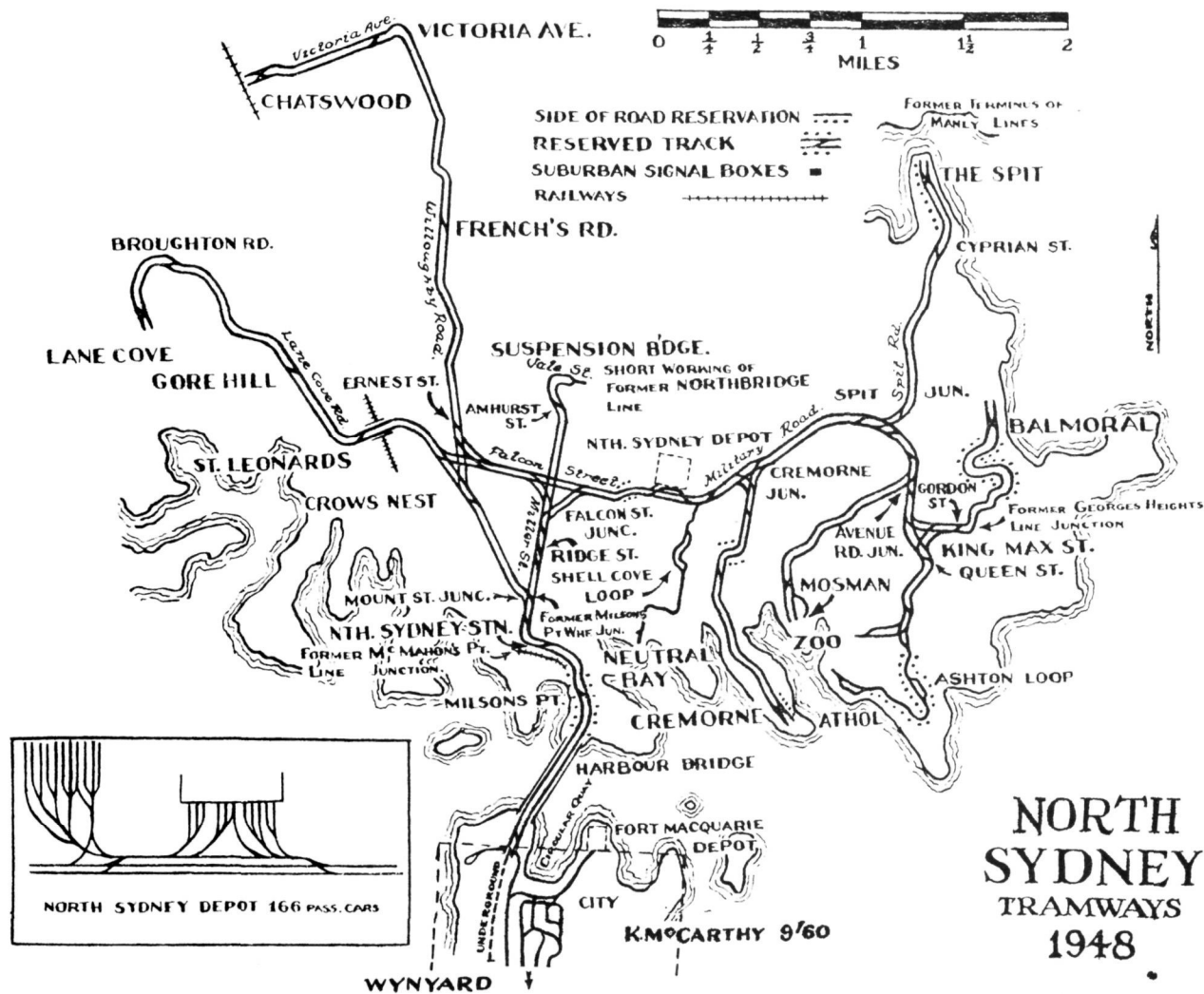
When approaching an "A" or automatic signal displaying a red aspect the tram driver had to bring his vehicle to a standstill. He could then proceed forward cautiously. This indicated the track ahead before the next automatic signal was occupied. The final northern signal on the down track (T175) was situated about 130ft inside the tunnel mouth and indicated the occupancy of the track up to 291ft north of the tunnel mouth.

The Signal Box

The Wynyard signal box was situated in the western tram tunnel wall at the centre of the tandem crossover set. In addition to the eight signal levers



SIGNAL LOCATIONS ~ WYNYARD 17-3-32



listed above, lever 5 operated the crossover point for No. 1 platform road to North Sydney while lever 7 worked the facing crossover point for North Sydney to No. 2 platform road.

The signalman was provided with an abacus or counting frame. The rods in the frame represented the platform roads, the top group platform No. 1, the lower group platform no. 2. Red beads or counters represented O or R type trams and green counters four wheel E or K types. A cross barrier was hinged at the right hand end of the frame behind which the beads representing a tram stabled at the southern station dead end could be locked.

An illuminated indicator diagram was situated in the signal box showing the occupation of the tracks southwards from signals T141 and T144.

New Departure Indicators

In 1944 the original departure indicator was replaced by two larger internally illuminated units. One was situated over the starters cabin while the other was further along the platform over an entrance staircase. The new boards displayed larger destination letters and the entire face was occupied by the illuminated glass panel. It read from top to bottom:

BALMORAL
CHATSWOOD
EAST LINDFIELD
FRENCHS RD
LANE COVE
MOSMAN P.O.
MOUNT ST
SPIT RD JN
SUSPENSION BDG
TARONGA PK
THE SPIT
VICTORIA AV

All trams excepting Mount St
Minimum fare 4d.

The East Lindfield destination applied to the bus feeder which connected with the Suspension Bridge tram.

Operation and Structural Changes

The Weekly Notice covering the arrangements for the bridge opening directed, as far as possible that all rolling stock to Wynyard should be O type bogie tramcars. A note of 12 April 1932 reported that an additional twelve O tramcars had been transferred to North Sydney to replace six sets of four wheel permanently coupled E cars and it was now impossible to get additional cars inside North Sydney depot!

Corridor R type trams were prohibited from crossing the bridge until adjustments were made to the platform clearances at Wynyard and Milson's Point ramps. These adjustments were completed on 12 November 1934 and their use into Wynyard

was authorised during December. The first corridor cars on the North Shore system entered public operation on the cross country routes from 5 September 1932 but their use over the entire system, with the exception of the steeply graded Neutral Bay line, did not regularly occur until the arrival of the post World War II R1 trams between 1950 and 1953.

Track expansion joints of a blade and mate variety were constructed on both the train and tram tracks on the bridge. The tramway joints were soon replaced by a stepped insert type as the original device could result in an overgauge section of track in hot weather. The coarser flange and tread profiles of the railway rolling stock could cope with this problem but under certain speed/sway conditions the tramcar could be derailed.

At these expansion joints a heavy set of angle plates were fixed as check rails inside the track. For the entire length of the bridge tramway tracks two sets of angle iron were bolted to the decking about six inches inside both rails. These were intended to restrict the deviation of the tram if it became derailed on the bridge.

The plough type life shields fitted to the four wheel cars served to restrict their use on the bridge routes. Due to a traffic hold up caused when a dropped plough became wedged in the bridge check rails four wheel tram were prohibited south of Milson's Point station, except in emergencies after circa 1947.

During World War II several changes occurred on the bridge. The pylon lookout was closed "for the duration" to the public. Concrete walls were extended above the stair well houses on top of the pylons to conceal anti aircraft guns. The western footway was closed to pedestrians and pipes were mounted on the footpath. It is believed one of these pipes was used to connect the North Shore Gas Company's mains with the south side Australian Gaslight Coys. undertaking. Should one of the gas works be damaged under enemy action some supply could be received from the other system. This western footway reopened for pedestrian traffic circa 1952 but in recent years it has been largely used as a bicycle way.

The pylon bases were guarded night and day during the wartime period while street procession type barriers were erected around the park under the northside pylon and no access was permitted along that harbour side pathway. Rumours at that period claimed that explosives were fitted to some bridge members so that it could be destroyed in the event of an enemy landing, but research has failed to support this claim.

Later Tramway Developments

Other tramway features relevant to the Sydney

Harbour Bridge and the North Shore districts have been fully treated before in this and other publications so these aspects need not be repeated here.

After the opening of the Sydney Harbour Bridge, tramway duplication was completed on the outer ends of the Lane Cove and Chatswood routes while two short extensions were carried out beyond the Lane Cove terminus.

Soon after the Suspension Bridge passed to the care of the Department of Main Roads, the structure was subjected to intense inspection. The condition of the main cables and anchorages gave cause for concern and a quick decision was made to close the structure to tram and vehicular traffic from noon on Wednesday 27 May 1936. The Northbridge tramway had been partially duplicated a short time before, but the service was cut back to the southern side of the faulty bridge. A feeder bus service served the Northbridge area meeting trams at French's Road Willoughby.⁽⁷¹⁾

The Suspension Bridge tram service closed on 8 September 1939 when the rebuilt bridge, now a concrete arch structure, reopened for traffic. The Northbridge bus service was extended across the new bridge along the entire tram route into Sydney.

World War II conditions caused the Suspension Bridge tramway to reopen on 30 June 1941 to conserve liquid fuel and the bus route beyond again became a feeder service for most trips.

The North Shore tramway system was replaced by buses with the general Sydney tramway conversion. The last full days of operation for the various termini were:-

Suspension Bridge	10-1-1948
Mosman	19-11-1955
Cremorne	28-4-1956
Neutral Bay	26-5-1956
Chatswood	28-6-1958
Lane Cove	28-6-1958
Taronga Zoo Park	28-6-1958
Athol	28-6-1958
Balmoral	28-6-1958
The Spit	28-6-1958
Wynyard	28-6-1958

After the closure of regular tramway service across the Harbour Bridge flat top ballast motors were used to lift the tracks between Blue Street ramp and Wynyard Station. The up road was first removed and the electric ballast motors gradually worked to a shrinking rail head as the down track



Leyland TD5 double deck bus M/O 1471 climbing Strathallen Avenue, bound for Northbridge, 2 June 1951. This bus was one of six short chassis vehicles built by Waddingtons in 1938. - Noel Reed



Stripped vessels Kuigoo and Kamari at Sydney Ferries Ltd McMahon's Point depot. 14 July 1951. The Showboat Kalang is moored to the left while a small steam lighter and the Kirrule are to the right. - Noel Reed

was removed. The North Sydney trams were removed to Randwick Workshops on "The Lizard". This road vehicle carried the trams from Victoria Cross to the main Sydney system at College Street from where they were driven to Randwick for eventual sale or scrapping. The tracks between North Sydney Depot and Victoria Cross were retained in use until 8 August 1958 when the last car, O Breakdown 143S, left the system.

Post Tramway Period

The Circular Quay elevated railway linking the dead ends of the east side underground city electric railway at St. James with that at Wynyard lower level station opened during January 1956. The Cahill expressway situated above the railway viaduct was not commissioned until March 1958.

Immediately after the closure of the tramway work pressed ahead on converting the tram space on the bridge and approaches to form two additional road lanes. This new road accommodation was opened in July 1959, access being at Blue Street North Sydney on the former tramway approach ramp. At the southern end the new traffic lanes fed into the east bound lanes of the Cahill expressway.

When the first stage of the Warringah freeway was well advanced, preparations commenced on a new vehicle ramp on the north side of the bridge. The roadway along the former tramway right of way between Blue Street and Milson's Point station site closed to traffic on 10 July 1966 and work started on the removal of the former steel arch tramway bridge across Alfred Street. Although this was a difficult project as traffic had to pass uninterrupted underneath, the job was completed by 28 September 1966.⁽⁷²⁾ The Warringah freeway opened on 18 June 1968 with inwards traffic heading towards the Cahill expressway using the new ramps at Milson's Point.

On 4 July 1970 the vehicular toll collection method changed so that collections were only made from inwards traffic. The toll had been altered to 1/- or 10¢ per car during April 1960 but with the introduction of inwards collection only, this was doubled to 20¢.⁽⁷³⁾

The Pylon Lookout on the SE tower reopened in 1949, but was closed by the Department of Main Roads in 1971.

The last traffic flow improvements to be introduced commenced on 2 September 1972 when the

first part of the Western Distributor approach opened at the southern end of the bridge. The completion of the most recent portion of this Distributor road to Pyrmont resulted in the closure of Pyrmont bridge from 10.00am on Friday 7 August 1981.

At the time of the Harbour Bridge opening many politicians felt that the 1920's had not been an opportune time to carry out the project, together with the associated suburban railway electrification and city railway construction. These major public works (the magnitude of which Sydney had not seen before, nor can it be expected in the future) were completed at a time of acute financial depression and political upheaval. It is to the credit of Dr. Bradfield and his supporters that they persevered against bureaucratic forces and were able to have these projects launched in the brief halcyon years following World War I.

Had the project reached the stage of practical application in 1903 or 1913 Sydney would have received a structure unable to carry the present transportation demands of this automobile era. Steam traction would have been used on the railway crossing and its southern end route would have swept along the surface on the eastern side of Darling Harbour rather than passing under the city in tunnels.

The much earlier bridge proposals would have resulted in structures of the same technical period as the old Hawkesbury Railway Bridge. The weakness of these structures was brought about by the use of thin members in tension positions. These bridges lacked stiffness and had one of these proposals of the 1880's reached fruition it would have been possibly replaced by the 1940's due to structural fatigue.

Had the Sydney Harbour Bridge project been delayed until the 1950's-60's, the structure may have been vastly different. A steel construction would have most probably been welded rather than rivetted construction, or perhaps reinforced or prestressed concrete would have resulted in a Harbour Bridge resembling the present Gladesville bridge or a structure similar to the Melbourne West Gate bridge.

We can be certain of two aspects had the construction been delayed to the Post World War II period:-

1. It would have cost much more than the £10,000,000 bill of 1932.
2. The construction period between the start of the initial excavations and completion would have been much greater than the 86 months occupied in the building of the present structure.



Albion Valkyrie single deck half cab bus M/O 1287 is drawing away from the Manara Road stop on the north side of Suspension Bridge, 30 June 1951. - Noel Reed

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61. Ibid. 14 January 1932;
62. See:- "Dismissal of a Premier" B. Foot.
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64. "The Great Bust" J. Lang.
65. "The Turbulent Year" J. Lang.
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67. "Sydney Mail" 16 March 1932 p36.
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70. "Sydney Morning Herald" 15 January 1932 p8; 10 February 1932 p14; 11 February 1932 p9; 1 March 1932 p9; 2nd March 1932 p14; 3 March 1932 p8.
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72. Ibid. 9 February 1932 p9; 12 March 1932 p13.
73. Ibid. 4 March 1932 p9; 16 March 1932 p13; 21 March 1932; 7 April 1932.
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76. Drawing CO3384, 7-9-32.
77. "Workers Orders" 17 Edition 1937. pp289a-292b, 293a, 293b.
78. "Sydney Morning Herald" 27 May 1936 p14. Local tram service operated on north side of Suspension Bridge until Thursday evening 28-5-36. Then buses substituted - "Weekly Notice" No. 22 of 1936.
79. "Sun Herald" 14 August 1966.
80. A flat rate toll charge of 2/- for trucks, 1/- for cars, 3d for motor cycles, motor scooters, horse drawn vehicles, 6d for motor cycles with side cars, irrespective of the number of passengers carried, was introduced on 4 April 1960.



Sunday 21 March 1982 and the Sydney Harbour Bridge is host to its biggest ever crowd as the people of Sydney take a 50th Anniversary walk across the roadway (even overflowing onto the footways). The traffic problems which occur during peak hours could appear to be overcome if everyone walked all the time!

CITY SECTION

TRANSPORT NEWS FROM MELBOURNE

The State election on Saturday 3 April 1982 saw the people of Victoria swing their votes away from the Liberal Party to the Labor Party to a marked extent. This resulted in the latter gaining power in the Lower House with a substantial majority for the first time in some 27 years. The new Minister for Transport is the Hon. S.M. Crabb, Member for the seat of Knox in Melbourne's outer eastern suburbs. The Labor Party had promised many transport reforms and these were briefly outlined in the Governor's Speech at the opening of Parliament. He stated that the existing public transport administration would be re-organised to provide greater efficiency and accountability and that a Melbourne Transit Authority would be established to bring together Melbourne's trains, trams and buses into a co-ordinated system. Additional rolling stock would be provided for both city and country services and urgently needed system improvements were to be accelerated. Modern financial techniques would be used for this purpose and travel concessions increased for pensioners, students and supporting parents. The Government's public transport programme in its first three years is to increase patronage by at least 20% leading to a reduction in fares.

Very early in the Parliamentary Session petitions were lodged from the public to install boom barriers and automatic signalling on the Upfield line and to extend the West Coburg tram line to at least Boundary Road Pascoe Vale so as to service the needs of residents of Pascoe Vale, Glenroy, Hadfield and Oak Park. The matter of extending the East Burwood tram line eastwards was also raised during the Adjournment debate, while the question of transport in the Monash University and VFL Park areas was mentioned at length in a Grievance Debate.

The Minister of Transport has announced that it is planned to have the re-organised administrative structure for Victoria's transport sector operating from 1 July 1983. The new bodies would be a metropolitan transit authority, a State transport authority, to handle all country passenger services and all rail freight and ancillary services; a road construction authority; and a road safety and licensing authority. The four authorities come together under the Victorian Transport Directorate, which will consist of the chief executives of the new authorities, together with the Minister of Transport and a Director General of Transport for whom a new position will be created.

Mr. Crabb has indicated that the new Government is looking at light rapid transit as a means of building some of the new lines promised in its election statements. He said that these vehicles were cheaper to run than trains. He indicated that they could be used on new, light traffic density routes or run down unused rail lines. He said that a light rail system was not on the top of the list of priorities, but part of a

ten year plan, the investigations for which could be well advanced three years hence. Articulated vehicles would be considered for such operations.

A fortnight before the election the Liberal Government announced that its transport plan for the next three years called for 130 new trams. It expected soon to authorise the MMTB to call tenders for 100 new trams, while 15 remained to be delivered from the existing Z3 order while a further 15 (to the same design) would be built for 'bridging purposes', to ensure continuity of production. The new tender would specify smoother acceleration and a more comfortable ride, as well as replacement of the half drop side windows with a louvre window to improve ventilation. Inclusion of a variable acceleration rate that reacts to the passenger load is expected to eliminate most of the jerking motion experienced at present. The present body design of three doors would remain but entrance steps could be lowered. However, the new Government instituted investigations into many aspects of Melbourne's transport and has not yet allowed new tenders to be issued. On Friday 27 May Mr. Crabb arranged a seminar on light rapid transit which was held in the Ministry and was attended by some 40 interested people. One of the subjects dealt with was the design of future trams and LRVs for Melbourne.

During the period of free travel on trains, trams and buses in Melbourne on Sundays during December 1981 and January 1982, a service, provided by one new 6 car air conditioned train, operated on the North Melbourne loop of the city underground.

The Melbourne Pageant was again staged this year and the Transport Cavalcade took place on the Australia Day holiday, Monday 1 February. A vintage tram service operated from Market Street along Flinders Street and Wellington Parade to Simpson Street. The MMTB provided L 104 and V 214, the TMSV T 180, the BTPS Ballarat 27 and the Bendigo Trust Birney 29, now running as Adelaide 302. The two TMSV horse trams ran on the Simpson Street siding.

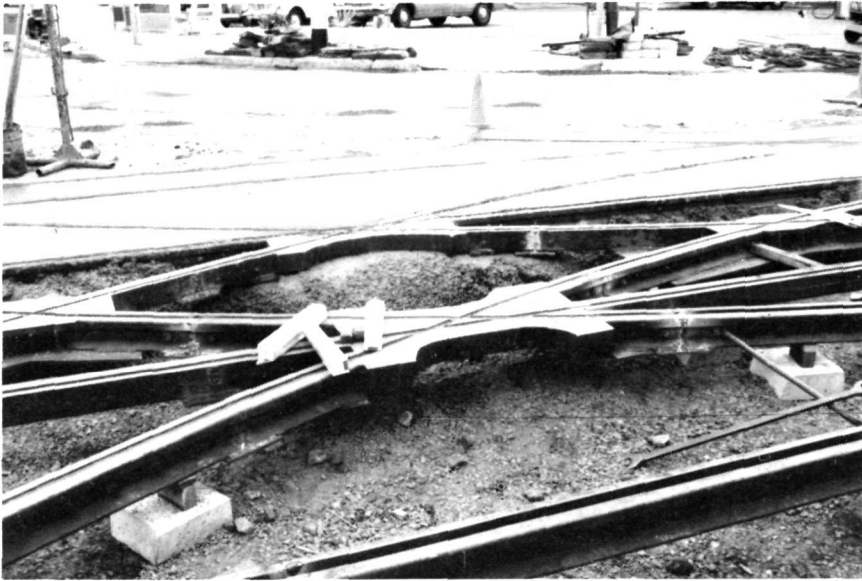
The MMTB recently called tenders for the construction of the terminus buildings at the new Elizabeth Street shunt, and also, for an automatic vehicle monitoring system. The old railway type crossover in Royal Park at Flemington Road was renewed on Sunday 28 March, while the renewal of track in Elizabeth Street city, from Bourke Street to Victoria Street, was finished on 28 February. The weekend of 22/23 May saw the northern approach tracks and turnouts renewed at the grand union junction at Hawthorn and Balaclava Roads Balaclava. Whereas special work in Melbourne is presently fabricated, the two compound crossings (where three tracks intersect within a few inches) were made out of solid

TROLLEY WIRE

JUNE, 1982

steel billets by oxy cutting the grooves and then grinding to contour. Renewal of the tracks in Brighton Road St. Kilda, from Carlisle to Chapel Streets, was carried out during May.

From Sunday 13 March another batch of Z class trams entered service from Essendon depot. There are now 26 used on weekdays, 12 on Saturdays and four on Sundays.



Two compound crossings on the northern side of Balaclava Junction (in Hawthorn Road at Balaclava Road North Caulfield), during renewal. - K.S.Kings

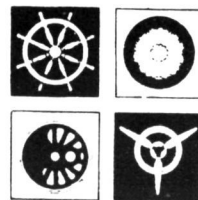
Z type cars 18 and 146 pass in the Bourke Street Mall. When photographed in December 1981 the surroundings were only temporary. - P.Hallen



★ Museum Notes and News

GLENORCHY . . .

Tasmanian Transport Museum Society



Developmental work continues to be the major activity at the Museum as members aim for a public opening later this year.

TURNTABLE

Following excavation early in the year a contract of \$8500 was let for the construction of the turntable pit which was completed during April. The pit consists of a fully reinforced base with reinforced and concrete filled block walls. Stormwater drains have been installed, connecting to the main system. The turntable is being overhauled and has been sand-blasted and painted. Fixing of rail will be undertaken by members before final assembly and installation of the turntable.

TOILETS

Construction of a toilet block commenced on 15 April and was expected to take about six weeks to complete. Preliminary work involved the relocation of of TGR railcar DP14 used by members as an amenities unit. The toilets, to cost \$9500 have been jointly funded by the local Glenorchy Council and the Society and will provide a long awaited facility at the Museum.

RAILWAY STATION

Most structural work has been completed including the reinstallation of fixed furnishings. Fitting out the Museum display area is continuing while the complete external and internal painting programme occupies a considerable amount of time. Beautification of the surrounding area has commenced with the construction of a walled garden by David Lidster.

Locomotive C 22 undergoing restoration at Glenorchy. - D.H. Jones



STEAM TECHNOLOGY BUILDING

Work on other projects has delayed a start on construction of the 19 x 12 metre addition to the Electric Traction Building for steam exhibits. Concrete foundations have now been poured after additional excavation due to unsatisfactory soil conditions. Completion of the building may be delayed due to insufficient funds being available.

RESTORATION

Despite developmental work, a limited amount of work continues on the various exhibits. Good progress is being made with the restoration to operating condition of TGR loco C22. After initial dismantling, including removal of the boiler, the repair, including recasting where necessary, and re-assembly of the mechanical parts has commenced. The boiler has been overhauled with work carried out under the direction

of the department of Labour and Industry and should be soon lifted back onto the frame. Work on this locomotive has been spearheaded by Lester Jones who is keen to have it operational by opening day.

A project being undertaken by pupils of the Rosetta High School under the direction of their teacher (and TTMS committeeman) David Beck is the restoration of a former Tasmanian Mainline Railway end platform car. The pupils have made good progress with repairing and repainting the exterior and intend to carry out renovations to the interior.

Another TMLR car body, formerly A*17 is being restored by Roy Davies and should soon be lifted on to a recently acquired four wheel underframe from workmans camp no. 134 (formerly car B10). Camp 134 arrived at the museum on 8 February 1982 together with another new exhibit, EBR van E11. The body from camp 134 has since been sold.

ST KILDA ...

Australian Electric Transport Museum



SILVER JUBILEE GALA DAY

The Australian Electric Transport Museum celebrated the 25th anniversary of its establishment in 1957 with a special gala day at St. Kilda on 20 March 1982. Proceeds from the day went to the Adelaide Children's Hospital.

The South Australian Minister of Arts, the Hon. Murray Hill, formally opened the day. During his speech he announced the establishment of an accreditation and grants scheme for regional and specialist museums. Museums in the voluntary sector will be able to apply for grants. The project grants will be awarded on a basis of competitive merit. The scheme will be administered by the History Trust of South Australia. Subsequently, Mr. Hill, assisted by AETM

President John Radcliffe, ceremonially drove A type car 1 to St. Kilda in a re-creation of the first trial run by car 1 on 30 November 1908. The Police Band sounded a fanfare for the car as it began its journey from the museum. (It may be noted that car 1 is currently being refurbished, but the work is as yet unfinished. This was also the case in 1908 when the car performed its official trials, even though the line-work was unfinished and many windows were unglazed.)

Other activities on the day included helicopter rides, doubledeck bus rides, steam bus rides and hay rides on a small trolley drawn by a delightful pair of donkeys. The museum ran a total of 29 trips on the St. Kilda tramway during the afternoon using nine different cars.



Minister of Arts Murray Hill cuts up the notches on car 1 during ceremonies for the AETM's Silver Jubilee on 20 March 1982.

NEW EXECUTIVE ELECTED

At the Annual General Meeting held on 30 April 1982, there were a number of changes made to the composition of the AETM Executive. Out-going President John Radcliffe had previously advised that as the History Trust of South Australia, of which he is a government appointed Trustee, was to become a fund-granting body for voluntary museums, it would be inappropriate for him to accept renomination as President. Max Fenner, who had served as Operations Manager since the St. Kilda tramway opened in 1974 advised that he wished to relinquish that position, while Ron Jenkins who has served on the Executive on a number of occasions, most recently being Site Manager, also advised that he wished to step down.

The following new executive was elected:

President	Paul Shillabeer
Secretary	Chris Andrews
Treasurer	John Hoffmann
General manager	Ian Seymour
Committeemen	Robert Magnussen
	John Pennack
	Ron White

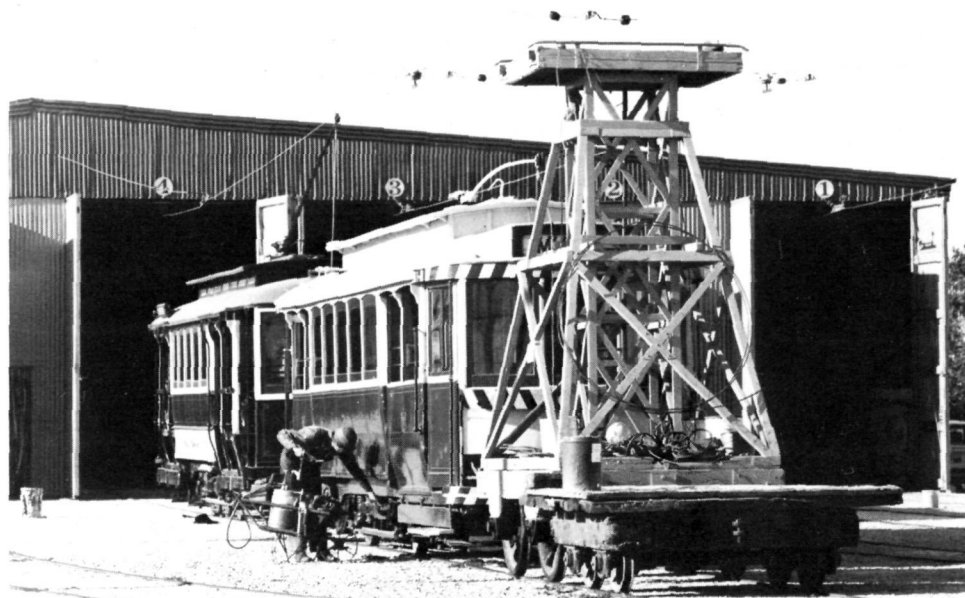
NEW GUIDE BOOK

On the occasion of the 25th Anniversary, the AETM released a profusely illustrated new 56 page guide book. The text was prepared by an editorial committee composed of Chris Andrews, Max Fenner, John Hoffmann and Ron White.

The book is divided into four main parts, giving a short history of Adelaide's transport system, a description of the development of the Museum, a listing with technical details of the various vehicles in the Museum's care and finally an account of how an electric tramcar works. In a first for the AETM, the book includes numerous colour prints as well as the usual black and white illustrations.

H CARS FOR ST. KILDA

Following an informal approach by officers of the STA, members at the AGM approved a proposal for two H type cars to be placed in long term storage at St. Kilda. Although 26 of the original 30 H cars built for the Glenelg line in 1929 are still at City Depot only about 18 cars are required for normal traffic. Two of the cars, 355, 356, have not been used for many years and are now incomplete. Whilst no trams are to be scrapped, it is proposed to reduce the number at City Depot to 21 to improve depot flexibility and efficiency of maintenance. Besides the two cars to go to St. Kilda, a further three cars are likely to be transferred to Hackney Depot for long term storage. The cars to go to St. Kilda will be unrefurbished silver cars. These cars will be able to be used by the AETM but the STA has reserved the right to return them to City Depot if there should be any major upturn in traffic on the Glenelg line. It will be necessary to complete trackwork into the new building before the transfer of the cars can be effected.



Incoming AETM President Paul Shillabeer is a familiar sight at St. Kilda with his drum of cardium and oiling trolley. He has been responsible for routine servicing of the cars since the St. Kilda line opened in 1974.
- John Radcliffe

From across the Tasman



AUCKLAND The MOTAT Western Springs Tramway is an unlikely meeting place for a Melbourne W2 and a Sydney steam tram motor, but with the arrival of W2 321 on 29 March 1982 the unlikely happened! Steam motor 100 has been in New Zealand since 1908 when it went to work at Wanganui. When photographed by William F. Scott on 10 May 1982, 321 was being redied for entry into service on Saturday 15 May 1982. The small sign above the headlight on 321 reads *Brutus Melbourneus*. This car is by far the largest in the MOTAT fleet.

DUNEDIN The remaining four trolleybus routes closed on Wednesday 31 March 1982. Only four trolleybuses were in service on this day and were supplemented by diesel buses as necessary – 5 and 76 operated St. Clair to Normanby with 8 and 51 on Opoho to Shiel Hill. After the last evening service on Tuesday 30 March bus 5 was used for a privately sponsored tour. On the last day, 51 operated the last regular run, that from Opoho to Shiel Hill and return to the city, then to the depot, being decorated for the occasion. Then followed a farewell tour over the entire system, organised by the *Dunedin Museum of Transport*, with 51 which was preceded by 5 due to the large number of people wishing to ride and so a little before midnight the Dunedin trolleybus system came to its final closure.





200

Q 200, the first Melbourne electric tram to carry this number, converted for all night service, stands at Mont Albert terminus at 5.19 am on Saturday 27 October 1956, the last time all night services ran from Kew Depot.

Built in 1923, Q 200 was converted for all night service in 1937 and withdrawn in 1957.

- K.S.Kings

Melbourne cable tram trailer 200. Reproduced from a 16mm movie film taken in the 1930s.

