

FARES PLEASE!

JUNE 2025

\$2.50 inc. GST

News from the Ballarat Tramway Museum



*It is dawn on Monday 12 May and No. 34 is loaded and ready to depart for Bendigo for body and bogie repairs.
Photo: Paul Mong.*



BALLARAT
TRAMWAY
MUSEUM



NEW MEMBERS

We welcome the following members:

1154 Mr Aidan Salmon of Bullengarook.

1155 Mr Wayne Bowers of Musk Vale.

1156 Mr Greg Sievert of Musk Vale.

MUSEUM NEWS

May has been a very busy month at the museum, with a new addition to our collection, trams on the move, school holiday traffic, and visitation numbers to the museum have been good.

Z3 116 has been donated to BTM. We would like to thank Yarra Trams, Department of Transport and VicTrack for their generous gift. The tram is complete and in working order, but will be stored at Bungaree in dry storage. Z3 116 was the first of the Z3 class built in 1979. When it entered service, it was fitted with trolley poles and two conductor's desks. They were initially designed for front entry and the third door was added to increase the speed with which passengers could alight. It had been in storage at Essendon Depot for a while and was returned to Preston Workshops to be checked over before it was donated to us. It is

the first Z3 class tram to be offered for preservation.

No. 14 has returned to service and drivers are appreciating the additional safety features that have been incorporated into the tramcar. Passengers have commented on the new upholstery and on the odd cool day have valued the saloon heating.

No. 18 will be lifted off its truck so that repairs can be made to the 21E truck. It is to be rebuilt as it has a number of issues such as worn brake rigging, seized axle boxes and broken springs. 18 will be rewired, the air piping renewed and will be retrofitted with the safety features that have been installed on No. 14.

No. 28 has been withdrawn from service and placed in storage at Bungaree. It needs major repairs to its wiring and the controllers. It also requires a major body rebuild as it is extremely loose in the pillar joints. It has freed up space in the workshop so that works can get underway on No. 18.

No. 33 is in service but has had repairs to the trolley base in the last few weeks.

W4 671 has had both trolley bases replaced with overhauled units as the originals were extremely worn causing pole tracking issues. The



replacement bases were supplied by the Melbourne Tramcar Preservation Association

No. 34 has gone to Bendigo for body and bogie repairs. It will return to Ballarat so our maintenance staff can overhaul and install electrical and air equipment before it will be available for traffic. It is going to be an important addition to our running fleet as we were not allocated an ex-Hawthorn Tramways Trust Maximum Traction tram by the SEC in 1971. It was a kind gesture by the AETM in Adelaide to give us back this significant tram. We are still trying to raise funds to complete No. 34's overhaul so donations are welcome, or you can help by recycling your drink cans in aid of its restoration.

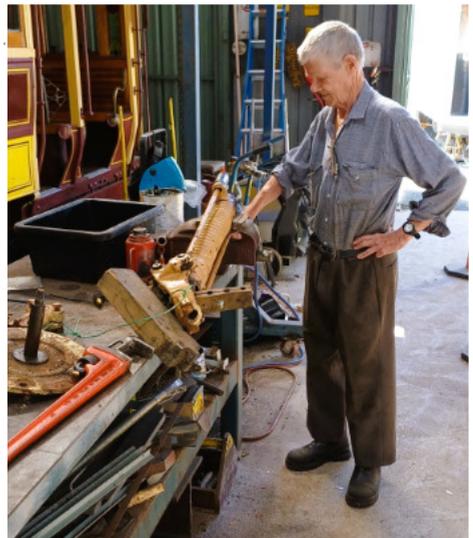
Recently an effort has been made to clean up the Ballarat workshop in preparation for the major overhaul of No. 18, restoration of No. 12 and the completion of No. 34. The spare parts have been sorted and shipped out to Bungaree where new shelving and storage container have been installed.

There are vacancies for volunteers to assist the maintenance staff as the workshop is going to be very busy in the near future.

We have had more conductors rostered over the last few months which has given us the opportunity to run No. 26 quite frequently. A popular car with the public and helps reduce the mileage on our other single truck cars.



*Karl Penrose installing new troughing on No.7 Road.
Photo: Tony Smith*



*Mick Duncan dismantling a trolley base to be used on W4 671.
Photo: Tony Smith*



RYAN'S TRAVEL NOTES

PT.2

Sydney, February 2025

In February I took a holiday to Sydney and was able to see all five styles of tramways in NSW for myself; these being the 'original' light rail from Central to Lilyfield, the lines from Circular Quay to Randwick and Kingsford, the Parramatta system, the 'train replacement tram' in Newcastle and the Sydney Tramway Museum during their impressive Vintage Tramway Festival, held on 23 February.

Arthur Adams and I represented BTM in full uniform for the day - caps and ties included, despite the hot and humid Sydney weather. We were treated to the full royal tour of the Depot by local members Reginald De Leon, James Sediakin and David Critchley, including a

look at their preserved Ballarat cars No's. 12 and 37.

It was great to see so many trams operating at once, including several that rarely venture out of the Depot. Standout features of the lineup for me included L/P 154, and 'Variotram' 2107. L/P 154 represents the electric era of trams in Newcastle, despite never having turned a wheel there. It worked on the isolated Rockdale-Brighton-le-Sands line until its closure, then became Australia's first tram in preservation in 1950. 'Variotram' 2107 represents the first modern Sydney tram in preservation, having been built for service on the Inner West light rail in 1997. Interestingly, when built, the Variotrams were numbered in the same sequence as the last of the original tram fleet, so the last R1 class tram was 2087 and the first Variotram was 2101.



*Ballarat No. 37 in the running shed and Sydney N 729 at the sutherland terminus.
Photos Reg De Leon.*

COMINGS AND GOINGS AT BUNGAREE



*Sunset sees No. 34 being winched on to the low loader to go to Bendigo for attention. Sunday 11 May 2025.
Photo: C. K. Tang.*



*Dawn on Wednesday 8 May sees the arrival of Z3 116 at Bungaree to go into dry storage.
Photo: Paul Mong.*



ACCUMULATOR TRAMS IN AUSTRALIA

BY CHRIS PHILLIPS

In February 2019, the first modern accumulator tramway opened in Newcastle, with recharging points at each tram stop. In December 2024 the new Parramatta tramway introduced sections where the trams are operated by batteries and in time there will be a section of the new Woden line in Canberra that will not have overhead wiring.

As early as the 1880's trials occurred of utilizing battery trams and one such trial took place in Ballarat. The late nineteenth century saw the rapid development of urban transit as the Industrial Revolution meant the urbanisation and spread of cities. Initially horse drawn vehicles dominated street transportation, but the cost of fodder and impact of manure in the streets became significant issues for operators and local councils.

New South Wales opted for coke fired steam trams, Melbourne developed the cable car system, but there was a growing interest in electric traction. In the 1880's a French system of electric traction and lighting, the "Julien Patent" system was introduced into Australia. The Australian patent holder, a Sydney man, Mr Pritchard, brought out a young English electrical engineer,

Mark Bullimore, and formed the Australian Electrical Tramway Co. ¹

THE JULIEN PATENT TRAM

A description of the Adelaide tram exists – now whether this same tram was involved in all the trials is conjecture. At the time Duncan and Fraser had a workshop in Ballarat and according to the St Kilda, Prahran and South Yarra Guardian newspaper there was also a factory in Alfred Street, Prahran. ²

The Adelaide tram was a double deck double ended tram built on the pattern of the American Stephenson car. It was 12 feet long and weighed nine tons laden with some fifty passengers. The 120-cell battery was stored under the seats and the motor was centrally located under the car, with controls fitted under the stairs at either end. The control wheel was apparently portable and fitted through a slot in one of the stairs. A brake handle was fitted to the right of the driver's dashboard at either end of the car and worked conventional horsecar brakes. ³

SYDNEY DEMONSTRATION

The first practical demonstration took place in Sydney on 1 June 1888. There was just one trip from Botany terminus to the Bridge Street Yard. The tram operated faultlessly, but there was no interest in the project, at the time, by Sydney authorities.



MELBOURNE TRIAL

The next trial took place in Melbourne on Tuesday 25 September 1888 on the tram line in Toorak Road, South Yarra. The trial took place at 3 o'clock in the afternoon with a large crowd in attendance. It took place between Chapel Street and Irvine Road. The speed attained going uphill was about four miles per hour, but on the level, it reached about 15 miles per hour. Mr Bullimore was confident of the tram being able to attain 70 miles without recharging.⁴

BALLARAT DEMONSTRATION

Friday 12 October 1888, a trial was made in Drummond Street South, in the presence of an estimated crowd of 3000 people. The Ballarat Star reported:

“The car which is the same as that with which an experiment was made in Melbourne about a fortnight ago, was started from the stables in Skipton Street. About 70 or 80 people got on the car in the yard, but as the cars cannot at present be guided round sharp curves, they had to dismount, and the vehicle was pushed into Drummond Street. Here the gentlemen who had been invited to witness the trial resumed their seats or stood on the car, which at once moved along at a good pace. ... The car was under the control of Mr Pritchard [Engineer] and Mr Bullimore [Electrician]. It proceeded with its heavy freight along the street

at a rate of seven or eight miles an hour, negotiating a fairly steep gradient at about four miles per hour. On the return journey, which is mostly a slight downward gradient, about twelve miles an hour was compassed.”⁵

Another trial took place in Sturt Street on the 15 October 1888, but this time the tram evidently derailed on a curve. There is some conjecture that the problems suffered on curves in Ballarat and later Adelaide was caused by the flanges being too wide for the track.

ADELAIDE TRIAL

The first Adelaide trial took place on the Henley Beach line on Wednesday 9 January 1889 from Thebarton to Henley Beach and return to King William Street. Forty passengers travelled on this trial. Evidently the trial was not a great success as the tram got jammed on a curve into Seaview Road, Henley Beach and had to be hauled around the curve by the horses on a following tram. The second trial took place on Saturday 12 January 1889, and the tram was held at the Hindmarsh terminus for several hours for the public to admire the tram, and particularly the brilliance of the electric lights.⁶

No further tests were held as none of the tramway operators in Adelaide showed any interest in operating a battery powered tram.



Mr Mark Bullimore stands at the controls of the Juliens Patent tram at Henley Beach on 9 January 1889.

Photo: State Library of South Australia.

Unfortunately, the promoters of the scheme in Adelaide, James Cowan and Mark Bullimore were killed on 21 July 1890, when their horse froze on the railway tracks on Grand Junction Road, Dry Creek and they were struck by a train.⁷ James Cowan had just been elected to the South Australian Parliament but never got to take up his seat.

THE SANDHURST AND EAGLEHAWK TRAMWAY

The Melbourne Age reported on Thursday 4 July 1889 the arrival of the first of the new electric tramcars for the Sandhurst and Eaglehawk Tramway [Bendigo].

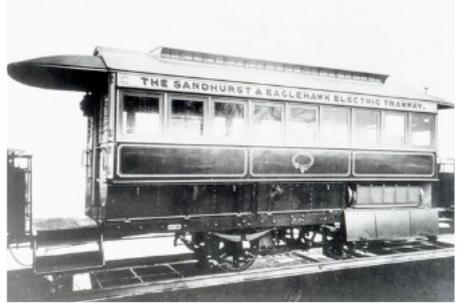
“By the ship Silvercrag Comes the first electric car intended for the



Sandhurst and Eaglehawk tramway line. This being the first instance of electricity being adapted by an Australian town as its means of transit More than 12 months ago the right to run tramways in and around Sandhurst was given to Messrs Booth, Elison and Co. for 31 years."⁸

The first trial of the new trams was not a success, the tram derailed coming out of the depot into Mollison Street on the night of 10 April 1890. It ran quite well downhill but on returning up the hill toward the railway station the motors kept arcing and there was fear that the tram might catch fire, so the trial was abandoned. A fortnight later a second trial was held and this time the tram ran well along the level in Mollison Street.

The service commenced on 14 June 1890, between the railway station and Barnard Street and finally by the end of July the service was opened to Eaglehawk. In the first days of operation a serious accident occurred when an overloaded tram carrying 70 passengers entered the Job's Gully Loop at speed and derailed. The service managed to operate daily but was far from successful. Breakdowns were frequent and occasionally a horse had to be requisitioned to haul the tram back to the depot. The severe gradients on the line taxed the batteries and the motors.



Builder's photo of a Sandhurst and Eaglehawk accumulator tramcar. Note the battery compartment.



Interior of the Mollison Street Depot showing the battery boxes which could be slid into the tramcars after charging



An accumulator car with its crew
All photos from Bendigo Tramways collection.



It was reported in the Argus Saturday 20 September 1890, that the company had given notice of its intention to abandon the tramway the following Wednesday citing the failure of the supplied batteries and the steep 1 in 20 gradients had contributed to the failure of the enterprise. So ended the bold attempt to provide a service using accumulator trams.

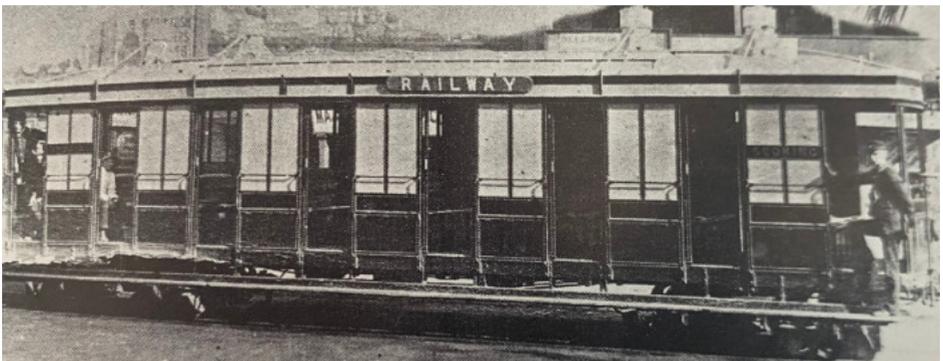
SUCCESS IN SYDNEY

A standard 70 seat steam tram trailer was under construction when a decision was made to modify it to operate with battery traction. It was fitted with St Louis-Du Pont No. 21 reversed maximum traction bogies, receiving power from banks of "Plante" type accumulators located under the cross seats driving two 25 horsepower motors. It was fitted with electric lights, electric brakes. The accumulators were fitted under the crossbench seats.

The tram was classified as C2 197 in the steam roster and made a successful trial trip from Bridge Street Yard to Coogee on 2 May 1894. The seven-mile trip was covered in 20 minutes.

*"The tram, which was one of the ordinary types then running, mystified country visitors, who gazed at it with open mouthed wonder, for it had apparently no motive power. It is even said that on its trial trip a policeman endeavoured to arrest it, thinking it was a runaway. The tram was nick named, "Lone Jimmie"."*⁹

This tram operated for 15 months running between Bridge Street Yard and Redfern railway station. The decision was then made that the future electric trams in Sydney would use the overhead system with power plants and substations. C2 197 was converted back to a steam tram trailer and was transferred to the East Maitland and Morpeth railway



C2 197 the experimental accumulator tram that operated in Sydney for 15 months in 1894. It was used in conjunction with steam trams between Bridge Street Yard near Circular Quay to Redfern Station - then the main Sydney Terminal. Note the sand boxes on the roof and the maximum traction bogies. NSW Rail Archives



which used steam trams on rail tracks on weekdays between 1895 and 1913.

NORTH SYDNEY ELECTRIC TRAMS

It is true that the accumulator car experiments of the 1890s were nearly all failures throughout Australia. Probably the most successful application of battery power at that time is little appreciated. A battery house was built in Mosman near Spit Junction as a substation from the main electricity supply then located at Ridge Street, North Sydney. The batteries at Mosman were charged by trams descending to The Spit and Mosman Wharf, and the power thus stored then used for their ascent. Apparently running costs were very low. These were stationary batteries of course, so rather different from accumulator cars, although the electrical principles were the same. The onerous weight and safety considerations of onboard batteries didn't apply at Mosman.¹⁰

GISBORNE, NEW ZEALAND

Gisborne on New Zealand's North Island installed a battery tram system in 1913. It was a tiny system and employed four tramcars running on two relatively short routes. The operation of the trams was a success, but the operation was not a financial success as the tram routes did not effectively serve the suburbs of Gisborne. The whole system was closed in 1929 but the loans taken

out by the Gisborne Council were not paid off until 1970.¹¹

TWENTY FIRST CENTURY

NEWCASTLE

The Newcastle Railway line beside the Hunter River, had been seen by some as an impediment to the redevelopment of Newcastle's central business district with many proposals for its closure. In December 2012, the NSW Government announced its intention to close the line east of Wickham with the closure of Wickham, Civic and Newcastle stations. taking place on 25 December 2014. A permanent terminus Newcastle Interchange was constructed adjacent to the former Wickham station and opened on 15 October 2017. Construction of the new light rail to Pacific Park commenced in September 2017 and the line was opened on 17 February 2019. The government announced in April 2017 that the trams would use onboard energy storage technology to allow most of the line to operate without overhead wires. To achieve this each stop was fitted with a recharging point where the pantograph on the tram is raised and makes contact with the recharger. This is achieved by using supercapacitors which are very efficient for short-term, high-power storage. In Newcastle the tram charges for 20-30 seconds at each stop which is enough charge to get to the next stop. The advantage of this



is the tram can operate for long periods in service without having to stop for long periods for recharging. Newcastle has six CAF Urbos 100, five module LRVs to operate the service.

WESTMEAD TO CARLINGFORD

The twelve-kilometre L4 line between Westmead and Carlingford opened on 20 December 2024. The tramway is operated with 13 seven-section low floor CAF Urbos 3 tramcars which are equipped with Greentech Freedrive technology with lithium batteries so that they can run on two lengthy sections without overhead wires.

CANBERRA

The National Capital Authority has insisted that the new light rail route to Woden route use a wire free section between the Commonwealth Avenue Bridge and the Parliament Triangle. Thus, five new battery electric trams are on order from CAF and the existing 14 trams are to be retrofitted for battery electric operation. The five additional trams have now arrived with two at least running in service – presumably to allow the rewiring and modification of the current units. The extension is not due to open until 2028.

*Unloading battery components at Spit Junction for the battery house that supplied the Mosman Wharf to Spit Junction tramway. Two 'C' class trams have hauled the load up from Mosman Wharf.
Photo Sydney Tramway Museum.*

1. Ian Badger 1977 The Julien System in Adelaide Trolley Wire October 1977 P. 12.

2. Telegraph, St Kilda, Prahran and South Yarra Guardian, Saturday 29 September 1888, Page 5.

3. Ian Badger 1977 The Julien System in Adelaide Trolley Wire October 1977 Page. 14

4. Telegraph, St Kilda, Prahran and South Yarra Guardian, Saturday 29 September 1888, Page 5.

5. Ballarat Star, Saturday 13 October 1888, Page 4

6. Ian Badger 1977 The Julien System in Adelaide Trolley Wire October 1977 Page. 14

7. Adelaide Advertiser, 22 July 1890, Page 5 viewed Trove 10 January 2025.

8. The Age, Thursday 4 July 1889, Page 6

9. Sunday Times [Sydney] Sunday 9 April 1905, Page 2 viewed Trove 10 January 2025

10. Letter from Robert Lea, Sydney Tramway Museum. 29 December 2024.

[11. https://www.kjc.net.nz/blog/post/gisborne-trams](https://www.kjc.net.nz/blog/post/gisborne-trams)





TODAY'S ACCUMULATOR TRAMS



*Supercapacitor Lrv 52 operating on the Newcastle tramway recently.
Photo: Paul Nicholson*



*Brand new Lrv 2167 on the Parramatta to Carlingford
light rail at Westmead, February 2025.
Photo: Greg King.*



WHERE IS NO. 30?

Prior to the closure of the Ballarat Tramway system in 1971 there were 14 single truck tramcars resident in the Ballarat Depot. Visitors to our museum, especially those from overseas, are often impressed that all 14 tramcars still exist. Even more impressive that at some stage over the last 50 years all but two have been utilised in museum service, the exceptions being Nos. 11 and 32. But wait, what about No. 30?

No. 30 was sold to Gales Creek Enterprises in the United States in 1980. Only a year later in Portland, Oregon, the tram suffered a devastating fire, burning most of its wooden body, leaving intact only the steel frame and running gear. No. 30 was kept in storage until 2005, when a rebuilding project began in Willits, California. The restoration was completed in 2015, with the car subsequently being put up for sale. According to the company “The entire body has been rebuilt as close to the

original design as possible using traditional mortise and tenon joinery from the frame up. Considerable emphasis was placed on maintaining the original structural design and construction techniques”, [except the bulkheads have not been reinstated.]

In 2023, the Astoria Riverfront Trolley Association acquired No. 30 with funds from an anonymous donor, and it now operates on this tramway. The ARTA operates a 4.8 km heritage line along an old railway formation on the south bank of the Columbia River in Oregon state. Their other tram is a 1913 streetcar which operated on the San Antonio system which closed in 1933. The ARTA commenced operations in 1998. The tramway does not have overhead but until recently hauled a generator trolley, but work is now underway to fit both their trams with batteries.

The trolley operates from May to September each year and carries between 35,000 and 40,000 passengers a year.



Ballarat No. 30 now resides at the Astoria Riverfront Trolley. These photos were taken shortly after its delivery from California. In the photos it has its Melbourne number, but it is going to revert to its Ballarat number. The other streetcar is 'Old 300'.

Photos: Frank Kemp

A BUSY FEW WEEKS



*No. 28 joins W5 829 in storage at Bungaree.
Photo: Neville Britton*



The Tramway Heritage Centre at Bylands has been the victim of a number of thefts of copper overhead recently. Our overhead team visited to assist in making their site safe. Photo: TMSV.

34 IN BENDIGO



The Bendigo Depot forecourt is quite restrictive so No. 34 had to be transferred onto a works trolley so it could then be maneuvered into the works road, which also has restricted clearances.

Photo: Paul Mong



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Editors:

Chris Phillips christram26@gmail.com Peter Waugh peter.waugh@btm.org.au

For further information regarding the Museum, its activities and publications please contact:

The Secretary, 100 Gillies St. N, Lake Gardens, Vic, 3350 Phone 61 3 5334 1580

E-mail: info@btm.org.au Web page: www.btm.org.au Facebook: www.facebook.com/btm.org.au