TROLLEY WIRE

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TROLLEY WIRE

AUSTRALIA'S TRAMWAY MUSEUM MAGAZINE

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Editor .....Bob Merchant

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Is steam tram motor 1A in steam? Unfortunately not, but a small smoke generator provides the appearance, much to the delight of visitors to the Sydney Tramway Museum's 80th anniversary of the Kogarah steam tram and trolleybus event on 30 July 2017.

Pamela Campbell

Late News:
Sydney R 1808 left MOTAT on 2 August to take up new duties on the Christchurch Tramways.

Front Cover:
The 80th anniversary of the closure of the last NSW government operated steam tramway and its replacement by a trolleybus system was celebrated at the Sydney Tramway Museum on 30 July 2017. Steam tram motor 1A, on loan from the Museum of Applied Arts and Sciences, stands beside double-deck trolleybus 19 in Cross Street. Trolleybus 19 is the only double-deck Sydney trolleybus in preservation and was resurrected from an abandoned shell.

Dale Budd

Originally published in *The Commonwealth Engineer*, 1 April 1923, pages 326-331.
Abstract of paper read before the Institution of Engineers, Australia, Adelaide, 7 March 1923.

ADELAIDE ELECTRIC TRAMWAYS

By W.G.T. Goodman
Chief engineer and general manager, Municipal Tramways Trust

In 1876 seven companies were formed in Adelaide for operating horse car lines to various suburbs, and the total length of the horse car system was 75 miles of single track. In 1906 the government passed an act authorising the formation of a municipal tramways trust to construct and operate tramways within a ten miles radius of the city, and to purchase the horse car tramways from the seven companies at a total sum of £284,000. The trust, which commenced operations in February, 1907, immediately proceeded to carry out a general scheme for electrification. Contracts were placed for the various works, and on March 9, 1909, the Kensington line was opened for traffic, being rapidly succeeded by the various lines to other suburbs. The line running to Henley beach was opened for electric traffic in March, 1910, making 55 miles of single track. This was followed by the electrification of the outer area lines and various extensions.

Adelaide System

Length of route	64 miles 11.4 chains
Length of single track	23 miles 68 chains
Length of double track	39 miles 62.4 chains
Total length of single track, including loops, crossovers and standing roads	111 miles 60.8 chains

In 1916 the trust purchased the small horse car system at Port Adelaide, and proceeded with the construction of an electric tramway system in that district, which was opened for traffic in April, 1917.

Port Adelaide System

Length of route	6 miles 79.2 chains
Length of single track	3 miles 58.4 chains
Length of double track	3 miles 20.8 chains
Total length of single track, including loops, crossovers and standing roads	10 miles 64.8 chains

The total length of single track mileage of the two systems in 122 miles 45.6 chains. Unfortunately owing to the objection of the railways department there is a gap of three miles between the two systems, which, of course, seriously handicaps the development of the Port Adelaide system, and renders the operation more expensive. It is hoped, however, that the three miles of track necessary to link up the two systems will soon be an accomplished fact.

Permanent Way

The track gauge is standard 4ft. 8½in. The rails for straight track as B.S. section No. 2, 95lb. per yard and 101lb. per yard for curves. The first rails were supplied in 45ft. lengths; later shipments were supplied in 60ft. lengths. Practically all the rails are manufactured to the Sandberg process. In the standard track construction on macadam roads, the rails are laid on hardwood sleepers, 7ft. 9in. x 9in x 4½in., spaced 2ft 6in. centres. The sleepers are laid on crushed stone foundation, no special treatment being required except in a few isolated cases. The crushed stone, ranging from ¾in. to 2½in. gauge, is well rolled before the sleepers are laid, the track is then boxed up with similar stone to that used in the foundation, the surface being of water bound macadam, usually tar-dressed. Tie rods are used, spaced 10ft. centres. Where the streets are wood blocked, sawn sleepers are used, and they are laid on a 6in. concrete foundation. The rails are then laid and spiked to the sleepers, and tie rods fixed, after which the track is packed with a slightly damp concrete of ¾in. stone chippings and cement. Before laying the top layer of concrete, a sprinkling of sand is spread on the surface of the bottom layer break joint, in order to facilitate renewals. The concrete is then brought up to the level of the sleepers top and screeded off flush with same, then hardwood blocks 6⅜in. depth (which is ⅛in. less than the rail) are placed.

An imperative rule observed on the Adelaide system is that once a track is constructed and open to car traffic, traffic must always be maintained during reconstruction. In many cases where standard macadam track was laid the local authorities subsequently decided to wood-block the street surface. In these cases the process of reconstruction is as follows: The macadam is excavated to a depth of 6 in. below the sleepers and all decayed or white ant eaten sleepers removed, and as the macadam is excavated concrete pedestals are placed under the rails and sleepers. A layer of concrete is then aid under sleepers, sufficient space being left for packing sleepers after the concrete has set; the pedestals are left in. A layer of sand is then spread, as previously mentioned, and concrete is laid flush with the sleeper top. In all cases clay expansion joints are provided at

intervals between the blocks, both longitudinally and transversely. A great proportion of the special work at junctions in King William Street has been relaid, such work necessitating the removal of the original concrete foundation, and the work was carried out without any delay to traffic. In one case, owing to the raising of the road level, the tracks had to be raised 7in., and although a 2½ minute and 5 minute service is operated on this line, the work of raising the track was carried out without delay to a single car.

The special work is either Lorain, Hadfield or Edgar Allen manufacture. The first special work consisted of cast steel with renewable insets of manganese steel, but this practice had been abandoned in favour of solid manganese steel, and latterly a number of crossings have been built up from 100lb. steel rails; all cutting and shaping for these crossings was done by the oxy-acetylene process and they were welded electrically. These crossings are standing up to their work very well.

A very important detail in permanent way construction is the welding and bonding of joints. Four types of welded joints are in use: (1) Thermit welded joint; (2) fishplate electrically welded to the head and flange of rail; (3) the Underwood joint, with special plate electrically welded to flange and web of rail; (4) oxy-acetylene welded joint with a base plate under rail, welded along the edge, and two small plates placed at each side of web and welded thereto. Experience has shown that the Thermit process, properly carried out, makes the best joints as it gives a smooth running rail, while the weld prevents the water in the groove from percolating through the joint to the foundation. The weak point with the electrically welded fishplate joint is that water collects in the groove and finds its way through the joint to the sleeper bed, thereby causing the joint to swing and sometimes resulting in the fishplate breaking or the weld giving way along the head of the rail. The numbers of the various types of joints in this system are as follows: Thermit, 20,019; electrically welded fishplates, 3961; Underwood joints, 1472; ordinary fishplate joints, 4142.

At the start the rails were Thermit welded, with fished expansion joints every 360ft. From the experience gained with the joints, and observed variation of temperature between summer and winter (amounting to 18 degrees F., as found from a pair of recording thermometers buried under the base of a rail), it was decided in later contracts to dispense with a number of expansion joints, and weld the rails continuously between sets of special work. This arrangement has been found quite satisfactory, the stresses caused by expansion and contraction being taken up within the elastic limit, and the cost of repairing an occasional broken rail being less than that of maintaining the expansion joints.

The track bonds and cross bonds are now welded to the flange of the rail by the oxy-acetylene process. Where ordinary fishplates are used the rail bonds are welded to the flange of the rail. A considerable saving has been effected by building up the tread and lip of worn rails electrically. The cost of building up the worn rail head averages about 2/- per foot of rail, which is considerably cheaper than relaying with new rails. The cost of new rails is 8/- per foot. Of the cost of 2/- per foot for building up worn rails, 64 per cent was for power; this high cost is due to the fact that 60 volt current was used through rheostats. The power cost in this connection will be materially reduced when a portable generator is obtained.

Considerable trouble has been caused through corrugation of the rail head, and as we all know, many theories have been put forward as to the cause. The class of material from which the rails are constructed does not seem to have any bearing on corrugation. In many cases the corrugation extends along the rolled steel rail, cast steel stock rail, and manganese crossing. It is interesting to note that the wave varies considerably, wave lengths from 1½ to 6 inches occurring within a distance of a few yards. Careful observation shows that the waves do not travel. A rail grinding machine which operates two 24in. grinding wheels on both rails in one operation, is used for removing corrugations, and during the last 12 months a total of 155,915 feet of rail has been treated at a cost of 2.2d. per foot.

In proportion to the length of track, the bridges on this system are considerable. There are four steel girder bridges on the Henley Beach route – one over four lines of railway near Mile End being two spans of 31ft. with rolled steel joists on concrete abutments and piers, rails being spiked to sleepers bolted to the girders – one over a flood water channel from the Torrens river near Lockleys being 45ft. span, and the other two over the Torrens river being of 70ft. span; the three latter being constructed of parabolic steel plate side girders, the track being carried on longitudinal timbers bolted to steel cross girders. On the Hindmarsh route the up and down tracks are carried on separate reinforced concrete bridges of slab and girder design supported on piers and concrete abutments, and founded on reinforced concrete piles driven into a stratum gravel and clay in the river bed. The down track bridge has three spans of 40ft. each, with a curved short span on the south end of 17ft. clear span, and a short span on north end over a sand carting track. On the Croydon extension. Owing to the necessity avoiding a level crossing a somewhat long bridge was required, over a double line of railway, with room for two additional tracks, and two public roadways. The bridge, as will be seen by the illustration, consists of four spans, each of 40ft., with earth filled approaches having a grade of 1 in 20, and confined by reinforced concrete cantilever walls 20ft.

Bowen Bridge on the Croydon extension. MTT (The Commonwealth Engineer)

high at abutments. The bridge carries two tramway tracks together with vehicular and foot traffic.

Interlocked Junctions

All busy junctions are provided with interlocking signal gear similar to the practice on the Sydney tramways, and the interlocking is so arranged that it is impossible to have a side-on collision at any of the junctions. In some instances over 250 cars pass the junctions during an hour.

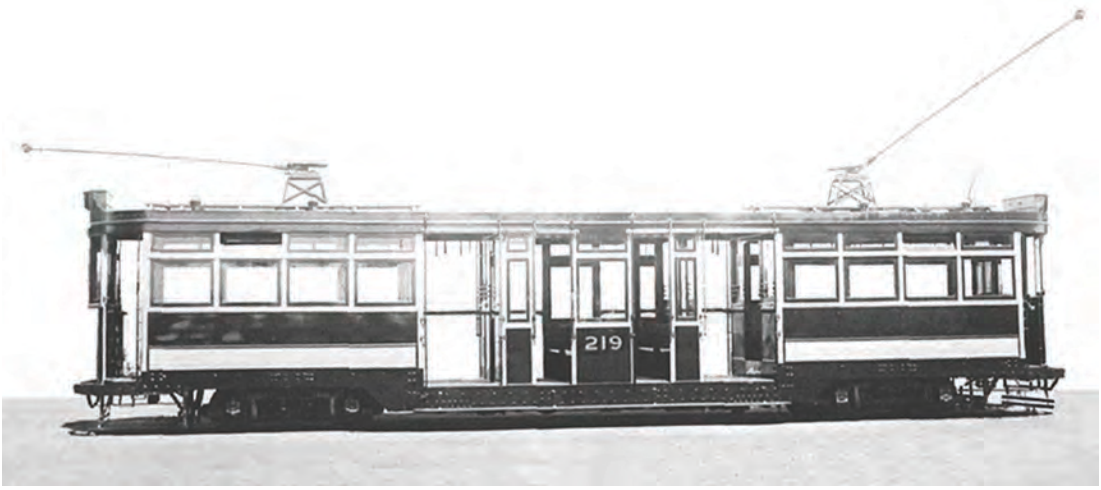
Rolling Stock

All cars are single deckers and there are six types, as follows: 90 four-wheel combination cars' 10 four-wheel cross seat open cars; 20 four-wheel straight roof combination cars; 20 bogie combination cars; 50 bogie closed cars; 50 drop centre cars. – Total, 240.

The four-wheel combination cars are 33ft. 5in. over bumpers with centre saloon 13ft. long fitted with 10 Brill Winner seats. The four-wheel open cars are 32ft. 6in. long over bumpers with cross seats with reversible backs. All four-wheel cars are mounted on Brill 21-E trucks and have 33in. wheels One hundred are equipped with Westinghouse 204 motors and 20 with G.E. 202 motors. The four-wheel straight roof cars are 34ft. 7in. over bumpers, and have centre saloon 13ft 6in. long. All four wheel cars have 9ft. fixed wheel base. The bogie combination cars and the 50 closed bogie cars are 43ft. long over bumpers, and mounted on maximum traction trucks. Drivers 33in. and pony wheels 20in. diameter. The bogie combination cars have a saloon 16ft. long at one end, and six open cross seats with reversible backs at the other. The bogie closed cars have a saloon 16ft. long at one end, while the other half is divided into three compartments with six cross seats and sliding doors. The 20 bogie combination cars are equipped with G.E. 201 motors. Of the bogie closed cars 20 are equipped with G.E. 202 motors, 5 with G.E. 201, and 25 with D.K. 11A. These cars are all fitted with Westinghouse magnetic brakes, and hand brakes, and are provided with barrier and folding steps to prevent passengers from boarding and / or alighting on the off side. The steps are interlocked so that they cannot be down on both sides simultaneously. Arrangements have been made to equip the 700 bogie cars with G.E. 27B air brakes.

The 50 new drop centre bogie cars, as illustrated, have been designed specially to meet the requirements of the Adelaide system. Twenty of these cars are in operation, the remainder being in various stages of construction. The design of this car was first prepared in 1913, but owing to the war, construction was delayed, and contracts were ultimately placed for 50 cars of this type in 1921. The car is 49ft. over bumpers, and 8ft.4in. wide overall, and has 60 seats with ample floor space for crush loading capacity of 200 passengers. In order to economise in weight and cost the clerestory roof was eliminated and the car is constructed with a comparatively light flat roof provided with ventilating cowls. The accommodation consists of a saloon at each end with longitudinal rattan spring seats, and a seat at each end of each saloon for two passengers, making the number of seats per saloon 20. The centre portion is a smoking compartment, with 20 seats, and the car is provided with four passenger exits on each side. Between the smoking compartment and each saloon there is a gangway 3ft. 8in. wide. This width is provided to give easy access to the saloons, and also for accommodating standing passengers during crush loading periods.

These cars are mounted on Brill type 77-E2 "modified" trucks with 5ft.4in. wheel base – all wheels are 26in diameter, the truck centres 29ft. Each truck is equipped with 4 GE-247B 40 h.p. box frame motors. It was necessary to equip these cars so that trains if one, two or three could be operated, and for that reason they are being equipped with G.E. P.C. 5 control, which consists of a master controller operating an electro-pneumatic controller fixed under the car, which arrangement of



The new drop centre bogie car – F type 219.
MTT (from *The Commonwealth Engineer*)

course eliminates the necessity of heavy power couplers between the cars, and permits of the use of small master controllers on the end platforms. The cars of this type already in traffic are not equipped with couplers as it has not yet been decided what type will be used. These cars are equipped with hand brakes and G.E. 27B air brakes.

The height of the first step from the rail level is 12 inches, and from step to centre floor 12½ inches, and there is a 9½ inch riser from centre floor to the saloon floor.

On the old rolling stock the cars are equipped with illuminated destination and route number signs, the signs being transparencies painted black with white figures, but it is found that the calico or paper signs deteriorate, due to the continual baking effect of the lamps in the destination boxes. Subsequently it was decided, in order to economise in destination signs, that the calico and paper signs should be placed in a dust-proof box and illuminated externally. Route number signs have been eliminated and the new sign shows the destination to which the cars run in 6in. white letters on black background, the length of the sign being 39½in. The illumination is by reflected light from a special lantern projecting over the sign. A satisfactory method of securing proper illumination was the result of repeated tests. The destination boxes are part of the structure of the car, and the signs are clearly visible at night at a distance of 180 yards. Twenty-five of the cars are being equipped with G.E.-247B motors, and twenty-five with Dick Kerr 81 motors with roller bearings.

The weight of two 77 E2 bogie trucks with motors and gears is 18,780lb., car body 19,524lb. and the control and air brake equipment 3830lb., giving a weight on trucks of 23,354lb. The total weight of the car is 18 tons 16 cwt. 22 lb., and when loaded with 200 passengers 31 tons 6 cwt.

Power Station

The power station is situated on the eastern bank of the Port River, and is approximately 10 miles from the city. The original station consisted of a brick building on reinforced concrete foundations, carried on timber piles which were driven through very bad ground to a depth of 20ft. until they rested on a limestone stratum. The original boiler house plant which has been operating since June 7th, 1911, consists of:-

Six double drum B. and W. land type boilers each capable of evaporating 17,000lb. water per hour, heating surface 4780 square foot. Superheaters are provided to give 300 degrees F. superheat. Working pressure 200 lb. To each pair of boilers there is a 360 tube Green's economiser. These boilers are fitted with mechanical chain grate stokers, each having 88 square foot of effective grate area. The feed pumps are Weir's compound tandem duplex type, and draw from the hotwell. The exhaust steam from the d.c. auxiliary sets passes through the feed water heater to atmosphere. The coal bunkers for the boiler house have 1400 tons capacity. Boilers are arranged for natural draught and there is a self-supporting steel stack 200ft. high by 12ft 6in. diameter. The stack rests on foundations of 600 yards of concrete supported on timber piles, and is line with firebrick to height of 25ft. There is a fresh water storage tank, capacity 23,000 gallons, to ensure continuity of supply in the event of breakage to water mains, etc.

The new boiler plant consists of three B. and W. cross drum marine type boilers, each capable of evaporating 55,000lb. of water per hour from feed water 100 degrees F. entering the economiser into steam at 210lb. pressure. Superheaters are provided to give a final temperature of 650 degrees F, at boiler stop vale. Each unit is also capable of evaporating 66,000lb. of water for a period two hours under the same conditions. The heating surface of each boiler is 11,000 square feet; of each superheater, is 3190 square feet; and of each economiser, is 5020 square feet.

There are three mechanical chain grate stokers to each boiler, the total grate area being 312 square feet. Each boiler has its own economiser superposed and consists of 308 tubes. Each boiler has a separate chimney 75ft. high, upper portion 7ft. diameter, the lower portion being 9ft. x 8ft. x 6in. This lower portion is fitted with a diaphragm plate dividing it into two parts, one forming the suction duct to the fan, and the other the discharge from the fan. Two dampers are arranged in the chimney, one for by-passing the induced draught fan, and the other is for regulating the gases to the fan.

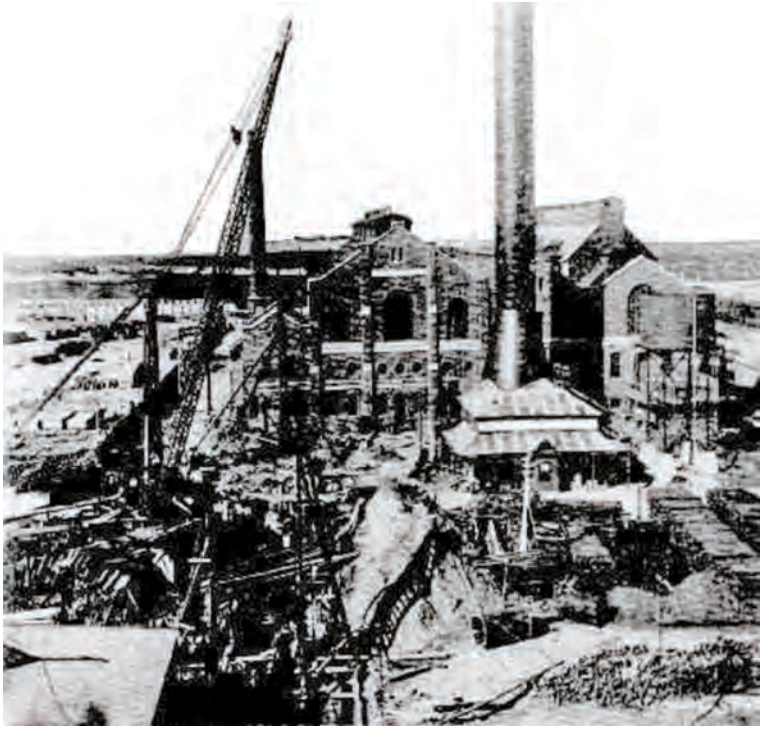
The ashes and clinkers will be discharged from the ash shuts from the boilers into a travelling ash breaker, thence into inlet boxes into the main ash pipes. The soot from all the boilers are economisers will also be discharged into the ash pipe lines, from whence they are drawn into the ash receiver by motor-driven exhauster.

The two new feed pumps are Weir's steam-driven horizontal centrifugal type each capable of delivering 20,000 gallons of water per hour against a pressure of 250lb. per square inch.

A coal receiving hopper is situated in the station yard, into which a coal is tipped from the drays, from whence it is conveyed by an endless chain elevator into a bunker of 40 tons capacity. This bunker discharges into the coal breaker through a jigging screen to a bottom hopper, and thence on to a horizontal tray conveyor leading to the bucket elevator conveyor for filling the boiler house bunkers. The capacity of the coal handling plant is 40 tons per hour.

The engine house equipment consists of three Parsons turbo-alternators, each 1500 k.w., 11,000 volts, 3-phase, 25 cycle. 1500 r.p.m., capable of full rated output when running on atmosphere. The auxiliaries consists of electrically driven Edwards air pumps and motor driven centrifugal circulating pumps. A Heenan and Froude wet air filter is attached to each alternator. The auxiliaries are operated from 200 volt d.c. circuits, current for same is supplied by two Bellis and Morcom enclosed engines direct coupled to Siemens generators, each 150 k.w. capacity non-condensing.

A British Thomson-Houston turbo-alternator, capacity 6000 k.w., 7060 k.v.a. at 85 per cent p.t., 11,000 volt, 3-phase. 25 cycle, 1500 r.p.m. is now being installed.



The tramway power station under construction.
The Register, 10 June 1911

Steam pressure at stop valve 195lb. per square inch, steam pressure 600 degrees F. The condenser (counter current Contraflo type) is situated directly under the turbine exhaust. A kinetic rotary type of air pump, motor driven, is used for the air and water extraction. The motor is situated between the kinetic and condensate pump, the condensate being delivered to a recording tank adjacent to the condensing plant, and a lift pump is provided for delivering the water through the recorder to the boiler house hotwell. A feed water heater is installed adjacent to the turbine, a steam tapping being taken from the turbine at approximately atmospheric pressure to the feed water heater which is similar to an ordinary three-pass surface condenser. The lift pump forces the condensate through the heater on its way to the boiler house hotwell. The heater is capable of heating the condensate to a temperature of 160 degrees F.

The centrifugal circulating pump is of twin type, and mounted directly over the suction pocket and is motor-driven. A twin strainer is located on the discharge side of the pump, and so arranged that either one of the strainers may be taken out and cleaned, during operation. The capacity of the circulating pump is 557,000 gallons per hour. The condenser and auxiliaries were made by Messrs. Kelly and Lewis Pty. Ltd., Melbourne.

The motors for driving the auxiliaries of all new plant are B.T.H. make, a.c. three-phase, 440 volt, 25 cycles. Two 750 k.v.a., 11,000 / 440 v. 25 cycle, 3-phase transformers, made by the English Electric Co. of Australia Ltd., are being installed for supplying power for the auxiliaries.

The intake conduit from the river to the circulating pumps is at a depth of 20ft. from the ground surface, it consists of cast iron pipes 4ft. in diameter. The conduit discharges into a sump 15ft. in diameter. A Rex revolving screen is being installed at the intake end of the conduit to remove marine growth and other foreign matter from the circulating water.

The switch-gear is situated on a gallery at the end of the engine room, and is divided into two portions, one for a.c. and the other for d.c., the a.c. board being of the Reyrolle enclosed ironclad type , the oil switches being operated from the front of the board by hand.

With the advent of the new 6000 k.w. turbo unit, and the future further extensions which will have to be made, it has become necessary to install new a.c. switch gear throughout. This has been arranged to step up from 11,000 volts to 33,000 volts. This new switchgear, which is of the outdoor type, is now being installed on the northern side of the building. The line switches are designed for 33,000 volts. A benchboard type switchboard is being installed on the existing switchboard gallery for controlling the above switches. The switchgear is manufactured by the Metropolitan-Vickers Ltd.

A 200 amp-hour 200 volt battery for station lighting (when there is no battery running), and trip circuits, etc., is being installed, also a motor generator set for charging same.

During crush traffic periods each week day for many months past, the whole of the generating plant has been operated at full load capacity and frequently overloads have been carried.

For the year ended January 31, 1923, the d.c units used for traffic amounted to 12,989,925 units; the car mileage for both systems amounted to 6,022,902, and the passengers carried numbered 58,094,588.

Transmission Line

The transmission line from the power station at Port Adelaide to the converter station in the city presented no special engineering difficulties, as the whole route extends over level country. Where possible the line is taken along the government high roads, and where that was impracticable, property was purchased to a width of fifty feet, this allowing for a duplicate line being erected in the future. The length of the transmission line from the power station to No. 1 converter station is 9¾ miles, and to No. 2 converter station 8¾ miles.

It has been decided to increase the transmission voltage from 11,000 to 33,000 volts in order to avoid erecting and additional line which would be necessary at 11,000 volts, the construction of the overhead portion between No. 1 converter station and North Adelaide to take the place of the existing two underground cables is proceeding. Steel terminal towers are placed at each end of the line, and the poles will be 50ft long spaced at 264ft. Throughout this two miles the line runs parallel to the Adelaide Electric Supply Co.'s 33,000 volt line, and is located 15ft. therefrom, the poles of the two authorities being braced together with two steel angles.

Results of Operations

The revenue for the horse trams for the year ending 31st January, 1908, was	£109,760 - 0 - 0
And the operating expenses	£90,362 - 0 - 0
The revenue for the year ending 31st January. 1923, was	£595,432 - 0 - 0
And the operating expenses	£405,496 - 0 - 0
The passengers carried	5,094,588

All operating expenses and extraordinary expenses consequent upon the war, and all interest charges, have

been met on the cost of construction and purchase money, and the following reserves have been created:-

Sinking fund. repayments	£580,810 - 19 - 2
Reserve for renewals, general	230,341 - 12 - 11
Insurance reserve	24,298 - 5 - 9
Reserve carried forward	33,319 - 10 - 1
Total amounts reserved out of revenue and after 11 years' operations with the full electric traction system	£868,770 - 7 - 11

In addition, the following abnormal expenditure has been made:

The make-up pay to soldiers who enlisted for active service during the war cost	£16,050 - 0 - 0
In addition to the extra costs due to the war, the loss of revenue to the Influenza epidemic, seamen's strike, engineer's strike, and drought are estimated to have cost the undertaking	£90,362 - 0 - 0
	£989,820 - 7-11
The increases in the rates of wages paid per annum, compared with the wages paid in 1914, amount to approximately	£150,000 - 0 0
The increase in the prices paid for materials and coal per annum, as compared with the prices obtained in 1914, amount to approximately	£49,500 - 0 - 0
The higher rates of interest paid per annum, as compared with 1914, aggregated	£6,000 - 0 - 0
Total additional cost per annum	£205,500 - 0 - 0
The total capital expenditure up to 31st January, 1923, was	£2,651,079 - 0 - 0

Hackney Tram Depot in 1925.
State Library of SA

From the *Sydney Morning Herald*, Thursday 7 July 1887, page 9:

THE NEWCASTLE AND PLATTSBURG TRAMWAY

An experimental through trip was made on the tramline from Newcastle to Plattsburg yesterday afternoon under the direction of Messrs. J. Higgs, traffic manager, G. Bewick, Superintendent of Ways and Works, and other officials. About 60 passengers were carried, including the Mayor and other influential citizens. The tram consisted of a combination motor-car and one ordinary car, and left Newcastle at 2 o'clock. All proceeded satisfactorily on the outward trip. The tram called at all stations on the journey, and occupied a little over an hour. On the return journey, when reaching Lambton, it was decided to test the siding at that place. The motor car was detached, and went towards the points of the siding which proved unworkable, and the engine was thrown off the rails. No person was hurt, but it was some hours before the engine could be righted, the tramcar not reaching Newcastle till nearly 10 o'clock last night.

Originally published in the *Electrical Engineer of Australia and New Zealand*, 15 March 1930.

TRAMCAR OF NEW TYPE FOR MELBOURNE
Large Car for Two-man or One-man Operation

A feature of the administration of the Melbourne Tramways Board is its progressive policy in investigating and making full trial of any equipment or method of operation that promises to effect an improvement in service or a reduction in cost. The Board's officers keep in close touch with the methods of other undertakings, both in Australia and abroad, and by reason of their receptiveness to new ideas, are always abreast and sometimes ahead of current practice elsewhere. This general policy can the more readily be given expression because the Board has its own extensive workshops where new rolling stock may be constructed, tested, altered and brought to perfection, under the direct superintendence of the engineers responsible for operation. At these shops new cars are continually being turned out at the average rate of one a week.

An example of the adoption of new equipment and methods to suit the conditions of service is seen in the action now being taken by the Board to thoroughly try out a type of car that is new to Melbourne. On routes where the normal loading is fairly heavy over certain sections and light over others, economical operation is difficult to obtain. Therefore, it has been decided to try out on such routes a type of car with large carrying capacity that can be operated by a motorman and conductor over the busy sections and at peak periods, and by a motorman only as a one-man car over the light-load sections in the slack times. One car of the new type has been completed, and three more are under construction in the shops. In addition to the special features of body design to suit the method of operation, these cars have a control system that is new to Melbourne, and one of them is mounted on trucks of a new type designed and built by the Board.

It will be realised that if a large car is to be suitable for one-man operation it must differ considerably from the standard type of large car used by the Board, viz., the class W, which has motorman's cabins, end saloons, a central open compartment and three open entrances near the centre. The new car, therefore, has certain features of similarity to the small one-man safety cars used by the Board on certain routes. The general body work, windows, end frames, and end doors are of the same design as those used in the safety cars, the difference being that the body is longer than that of the safety car, and is equipped with centre doors. All the doors, like those of the safety cars, are controlled by the motorman.

The general elevation and plan are shown in Fig. 1, which is a drawing of the car that is mounted on the new trucks. The car is 45ft. long, 8ft. 4in. wide, 10ft. 2⅝in. high from rail to roof, and weighs 17 tons. The seating capacity is 50 or 54, and the crush load capacity 120. The centre doors each open to a width of 5ft., and the end ones to a width of 4ft. The framework is entirely of steel, made up of plates and standard commercial sections, and the side coverings are of sheet steel. Anti-climbing bumpers are fitted to the ends to reduce the possibility of telescoping in collision. A feature of the construction is the extensive use made of electric welding in joining the members. The floor is of wood, covered with linoleum, and all the interior facings are of Australian blackwood. Ample ventilation is provided by the centre section of the roof being raised throughout its length so as to leave longitudinal slots, and by the top section of each window consisting of a hinged fanlight which can be dropped back at an angle inside the car to admit air but not rain. The lower portions of the windows drop to the full depth, and louvred sun blinds are provided. The motorman's windscreens are sloped at such an angle that the reflections of lights inside the car at night will be thrown downwards out of the motorman's line of vision, and there will be no chance of dazzle obscuring his view of the road. A seat is provided for the use of the motorman while driving or collecting fares.

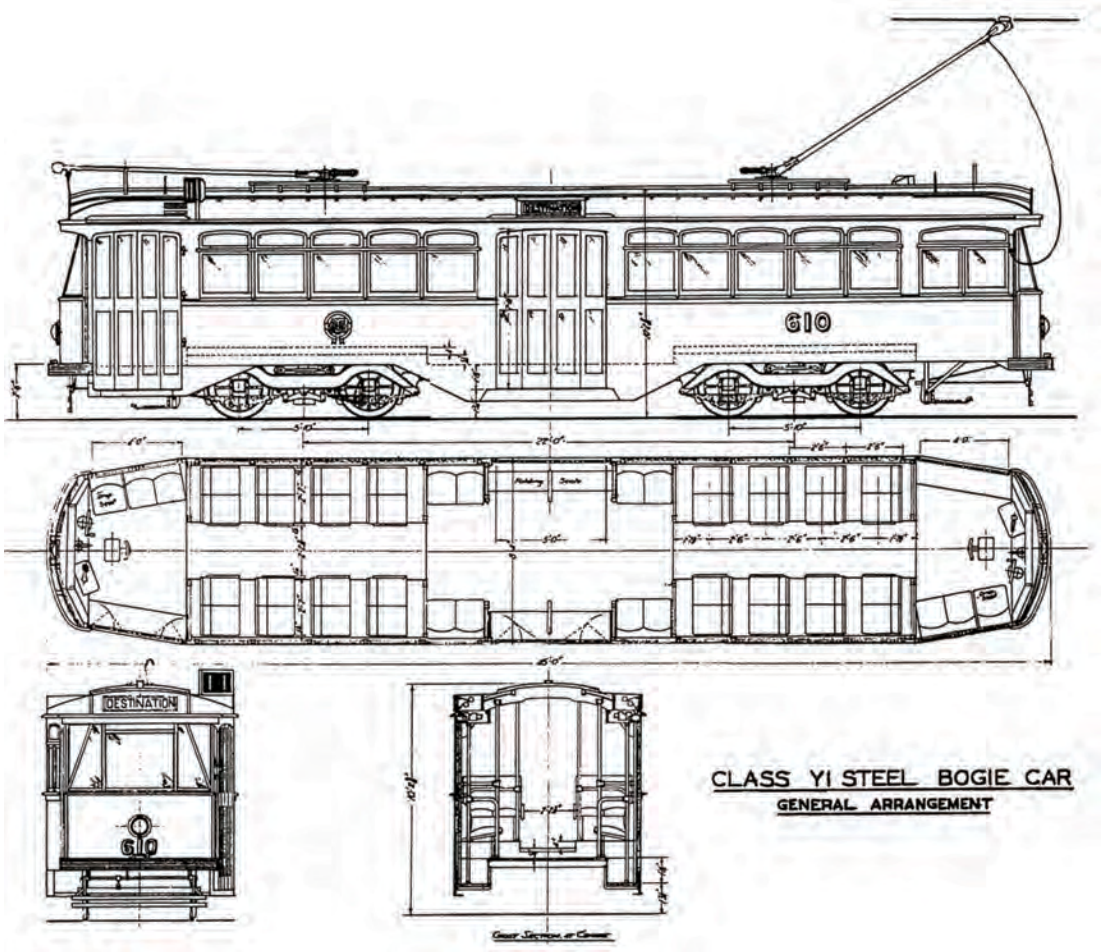
In the seating accommodation special attention has been paid to passengers' comfort. Cross seats with reversible backs are used in the body of the car, and there are short side seats near the centre doors and near the ends, opposite the end doors. In addition there are folding seats which may be dropped in front of the centre doors when these doors are not in use, at times when the car is under one-man operation. The seats have aluminium frames, are sprung and are upholstered in brown Australian feather. They were made at the Board's workshops in Preston.

Three of the cars are mounted on trucks of the ordinary equaliser bar, equal traction type. The fourth is on special trucks of a modern type designed by the Board's officers. These have cast steel side frames made by Messrs. Bradford Kendall Ltd., Sydney, and long semi-elliptic springs rigidly attached to the axle boxes and joined to the side frames at the ends by means of shackles. On test these trucks have been found to possess very easy riding qualities. In all

the trucks built for these cars the wheels are of 33in. diameter. Each truck is equipped with two 40-h.p. Metropolitan-Vickers motors made in Sydney. The free running speed of the motors is 28 mph, and the gear ratio is 13/77.

The control is of the electro-pneumatic type throughout, and complete control of this type is being used in these cars for the first time in Australia. The electric controller is of the G.E. series-parallel type fitted with dead man's handle, and was made in Australia. The electro-pneumatic control equipment was supplied by the Westinghouse Brake Co. as was also the braking equipment. The brakes are applied by an electro pneumatic valve operating close to the brake cylinder, worked through a quick application and release valve. The brake cylinders and much of the equipment were made in Australia. The actual brake itself is of the clasp type, and the system is arranged to automatically adjust the pressure to correspond with the load on the car. The doors are controlled by pneumatic door engines, operated through electro-pneumatic valves by air pressure. The operating equipment is so interlocked with the brakes that the car cannot be started until the doors are closed. This equipment was made in England, and supplied by Messrs. Horrocks, Roxburgh Pty. Ltd.

Special attention has been paid to the lighting of these cars, and a soft and pleasing effect is obtained by the use of suitable shades. The tramways board realises that the conditions of modern service require that increased attention be paid to the comfort of passengers, and the special seating features, attractive lighting and easy riding qualities should appeal to patrons. In addition the cars are handsome in both internal and external appearance, and are generally such that they should prove a great asset to the undertaking. If they fulfil in service the expectations of their designers, the Board proposes to proceed immediately with the construction of more.



MISTAKEN IDENTITY – MELBOURNE Z CARS 1 AND 2

By Dale Budd

When Melbourne's Z class cars were introduced in 1975, it was decided to number them from 1 onwards. So the first tram was No. 1, the second was No. 2, and so on. Simple, really – but then again, maybe not.

The contract with Comeng provided for the bodies of the cars to be built at Dandenong, along with their mechanical and electrical equipment. The trams were then moved to Preston Workshops where interior fittings and mouldings were installed, together with seat frames and seats – and conductor's consoles, trolley bases and poles.

It was sensibly decided to equip an initial tram with its interior fittings at Dandenong, to ensure that everything went into place satisfactorily – rather than discovering problems when the first car arrived at Preston.

So a small team from the workshops – five people from the body shop – went to Dandenong to undertake this trial fitment. They would arrive at Comeng plant at 7.00am each day. The job took some seven days.

When the team arrived to begin work on the first day, they were informed that body number one was being used by Comeng for various tests. The tram that was made available for the trial fitment of seats, etc., was the second body off the production line.

The Preston team finished their work and the first tram fitted with its interior was then moved to Preston workshops, on 14 December 1974. Remember this was the second tram body built; remember also that numbers were applied to these cars at Preston, not at Comeng. The first body remained at Dandenong while Comeng completed its test program, and was delivered to Preston on 15 February 1975.

What did Preston do about numbering? They gave the number 1 to the first body received from Comeng, and number 2 to the second. Thus the first two trams off the production line were numbered out of manufacturing order.

No. 1 and other cars – identified only by numbers on metal tags – did their first trial runs outside the workshops on 10 April 1975. It is interesting that full numbering had not been applied at that stage. Three weeks later Nos. 1 to 3 were publicly launched, fully numbered, on 30 April.

What was the fate of these two trams after years of service? No. 1 was withdrawn after being damaged in a fire on 29 January 2014 and was despatched for scrap on 10 February 2015. After withdrawal in April 2003, No.2 was bought complete by a private buyer.

Z car no. 1 climbs the grade in Bourke Street on 4 October 1975. Richard Jones

Z car No. 2 in Bourke Street in 1975. Mal Rowe

Not a Z class tram, but A class 232, brand new at Preston Workshops in 1984. The car is carrying the small tag used to identify new trams before numbers were applied. The paper notice in the windscreen says "do not connect to 600 volts", a warning that the car is not yet electrically ready to run. Dale Budd

Z class cars 1 and 7 at North Fitzroy Depot in November 1975. Dale Budd

The basic facts for this report were provided by Graham Jones, who led the team from Preston Workshops which fitted out the first Z car at Dandenong. Confirmation of numbering of the first two cars was provided by Norm Cross. Thanks also to Bill Parkinson, John Prideaux, Mal Rowe and Hugh Waldron who helped with the investigation. Information about delivery dates came from various issues of Electric Traction (now Transit Australia) and Trolley Wire.

Something for another time: how and why W6 cars 990 and 991 exchanged identities during construction….

Originally published in *Electric Railway Journal*, Vol, XLVI, No, 23, page 1112, 4 December 1915.

ONE-MAN CARS IN AUSTRALIA

In an article written for the *Electric Railway and Tramway Journal* by P. J. Pringle, general manager Electric Supply Company of Victoria, Australia, it was stated that in the city of Ballarat there are seven tramway routes radiating from the business center and that all of the cars on four of the routes and on the extremities of the three other routes have been operated under the one man system since October, 1913. In the city of Bendigo also, one-man cars have been in operation since September, 1913, on two of the four electric railway lines in the city.

The motormen on these one-man cars receive a somewhat higher rate than those on standard cars, but where the extremities of the line are operated on the one-man system the motorman is paid a higher rate only for the hours he is actually working on these sections. California type cars are used, the open section being inclosed with chain so that passengers must enter and leave by the front door, and each car is equipped with one fare box, which is temporarily fixed by the motorman at the side of the door in the front bulkhead.

When cars are traveling from the suburbs into the city passengers pay as they enter, when traveling from the city to the outskirts they pay as they leave. The average speed is approximately 8 m.p.h, and the company reports no difficulty in keeping the cars on time. In the beginning a few cases occurred where passengers climbed over the rear gates and left the cars without paying, but a few prosecutions in the courts rectified this difficulty, and since March, 1914, no trouble what¬ ever has been experienced on this score. On the routes run entirely with one-man cars loads of from forty to fifty passengers are very frequently carried without any difficulty.

Variable fares are in force. On one route operated partly on this one-man principle there are several fare values reaching a maximum of 8 cents, and in this case all fares ranging from 3 cents up to 6 cents are paid into the fare box. In the case of 8-cent and 7-cent fares to the city, passengers are given special tickets by the motorman which are collected by the conductor, who joins the car at the boundary of the 6-.eent fare zone. Those who are on the car at the time of his entering pay him according to the ticket that they produce and they are then given an ordinary passenger's receipt check. Paper tickets are stated to have been dispensed with and celluloid tokens are used in their stead, these making .a very considerable saving in cost, as they are used over and over again.

Originally published in *Town and Country Journal*, 11 September 1918.

THE BUNDY TIME RECORDER

The trams that run along the streets of Sydney and into the suburbs have a timetable to run to, and in order to keep check on the running of the trams, Bundy Time Recorders – Bundy clocks they are familiarly spoken of – have been installed at various points along the routes, but mostly at each terminus. There are about fifty Bundy Time Recorders in use by the New South Wales Tramway Department. On starting out in the morning, each conductor in charge of a tram is provided with a large key, which is numbered, to correspond with the number of the run – for each run is numbered – on which he is working, The conductors of trams passing the Bundy Time Recorder are expected to register at the machine, by placing the key in the machine and giving it a slight turn to the right. The machine is so constructed that the number on the key and the actual time at which the registration was made is printed on a tape within it, with the one operation. These tapes are extracted every day from the machines, and taken to the tramway offices and checked. And in that way the department is able to keep an effective check on the running of the trams.

Originally published in the *Australian Star*, 5 June 1897, page 4.

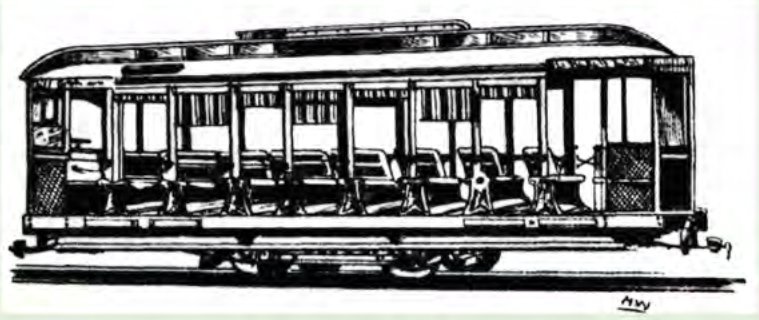
A New Tram-Car

A successful trial of a new tram-car was made yesterday on the Glebe line. The car is known by the pert name of "Brill," being manufactured in Philadelphia by a firm of that name. It is light and elegant, with a gentle movement, in vast contrast to the heavy cars at present in use. It accommodates 40 passengers, and has a cab at each end for a tramway officer. Although open all along, blinds may be raised or lowered at the sweet will of the passenger. The car will continue on the Glebe line for some days, and will then be transferred to another line, in order to test public opinion. The car is of course specially designed for the modern electrical principle.

Originally published in the *Town & Country Journal*, 10 July 1897, page 27.

A New Tram Car

(See illustration on this page)
The Sydney tramway authorities, who have every desire to be thoroughly up to date, are trying a new "open car" of American make. Recently it has been running on some of the sections, and has been much admired. As a summer car it would be difficult to surpass it. It is perfectly open from end to end, the sun, wind, or rain being excluded by cleverly-designed blinds, which can be lowered or raised at will, and which, being on the automatic principle, stop just exactly in the position wished. The seats are reversible, being made of light wood, beautifully polished. It runs particularly smoothly, and has accommodation for forty passengers, with a small cab at either end for the man controlling it. This, of course, is when the car is driven by electricity. The real name is 'The Brill Car," being manufactured by the firm of that name in Philadelphia. The truck on which it runs is called a "Peckham" truck. It is about half the weight of the old-style car.



The tramcar described above was used as a temporary steam trailer and numbered 197 in the steam stock. Converted to electric trailer in 1900. Planned to be converted to electric motor car but design considered not suitable for all year use in Sydney. Converted to breakdown car in September 1904. Dismantled 1955.
STM Archives

CHRISTCHURCH No. 12
Resurrection of a Sydney G car

Work has started in New Zealand on the restoration of Christchurch 'Yank' car No. 12 for the Sydney Tramway Museum.

Many readers will know that these cars, built for Christchurch in 1905, were virtually identical to the Brill-built Sydney G cars which had entered service in 1900. In Christchurch they were termed 'Yankee Combinations', later shortened simply to 'Yanks'.

The inclusion of No. 12 in the Museum's collection fills an important gap, since of all the tram types built for Sydney in significant numbers, only the G cars were withdrawn too early – by more than 20 years – for an example to be preserved. By contrast, Christchurch's cars of this type lasted until close to 1954 when the system closed, and the bodies of a number of the class were sold to be placed on farms. (It can be speculated that the Sydney G cars did not survive because they were deemed unsuitable for conversion to a footboard design, as occurred with the rebuilding of the Ls to L/Ps.)

The discovery of No.12, and its purchase and removal to Ferrymead for storage by the Tramway Historical Society, was recounted in the August 2002 issue of Trolley Wire. The car had spent more than 45 years at Takamatua, near Akaroa on Banks Peninsula, south-east of Christchurch.

After 15 years at Ferrymead, initially under a tarpaulin and since January 2012 under cover, substantial work on the car has been undertaken in the first half of 2017. This was a combination of volunteer effort by members of the Tramway Historical Society, and paid work by the associated Heritage Tramways Trust. The latter was funded by the Sydney Tramway Museum

Builder's photo of a Sydney G car 'in the white' at the J. G. Brill works in Philadelphia.
J.G. Brill Co. 1449

A Christchurch 'Yank' car in near-original condition, with enclosed drivers' cabs but no other modifications. A distinctive difference from the Sydney G cars was that the tops of the saloon windows were straight rather than curved.
THS archives

No. 12 in Cathedral Square, Christchurch on 10 January 1950. The car is barely recognisable from its original form but closer inspection shows that the modifications made were essentially superficial. Dismantling has revealed that the side pillars of the former open section still show the location of the rollover crossbench seat backs.

Graham Stewart

using proceeds from the operation of the Christchurch restaurant tram, former W2 411.

Initial assessment of the tram involved partial dismantling, particularly of the later modifications to the car. The open drivers' cabs were enclosed in 1906 or 1907 (following a rather snowy winter in Christchurch in 1905), while the crossbench seats were removed and the sides enclosed in the 1920s. Fortunately none of these changes affected the basic structure of the tram.

By March this year the side enclosures had been removed, and a shipping container purchased for storage of components of the car. While the tram was a good candidate for restoration, largely as a result of being protected by a metal roof during its years at Takamatua, the way forward was determined to be complete dismantling. This was made easier by the fact that the cars were designed by their builder, John Stephenson of New Jersey, to be disassembled for transport, and the roof sections were built in such a way that they were able to be unbolted/unscrewed in complete sections. As parts were removed they were labelled and placed in the storage container.

An interesting discovery during dismantling was that a modification had been made to the cars in about 1908: deeper steel side plates were added to the underframe to correct a sag at each end. The date was determined by the appearance of the cars in photos taken after that year, which show the deeper side frames and no sag.

The roof was lifted from the car in May, and 'flown' by a crane into the storage container where it is accommodated on a set of rollers set in beams attached to the container wall. Further dismantling saw the car reduced to its underframe which was then stripped of its old floor boards. After cleaning and painting of the underframe, a new plywood floor was installed. Finally, in terms of this stage of the project, new steel for the side frames has been purchased and arrived on site.

The Museum will remain in close contact with the Tramway Historical Society and the Heritage Tramways

The starting point for restoration: No. 12 on the traverser at Ferrymead in January 2017. At the left hand end of the car is the saloon, defined by four original windows and the drop end. The tram is mounted on 'shop' bogies; it originally had maximum traction trucks.

Dave Hinman

Components of No. 12 safely stowed in the storage container. Dave Hinman

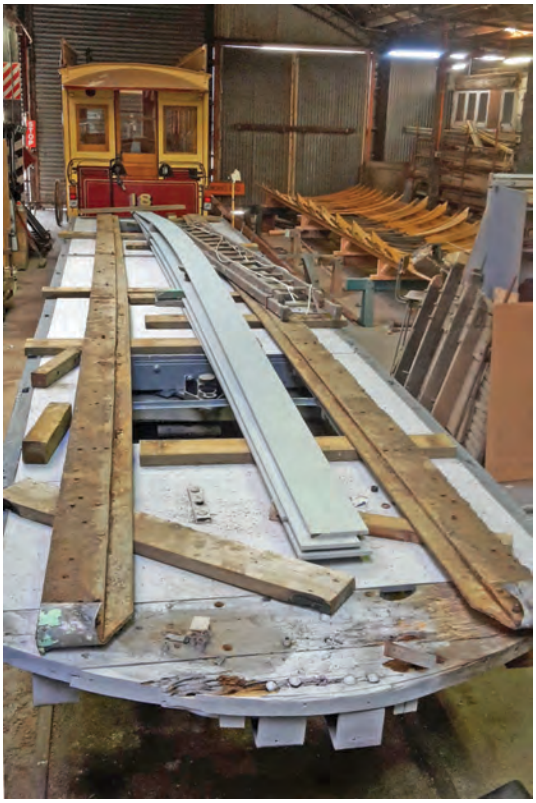
Trust on the future program for restoration of No. 12. It expresses warm thanks for the effort expended on the car to this point by volunteers.

It should be noted that to retain authenticity 12 will be restored as Christchurch 12 in almost all respects as it entered service, except it will have lifeguards as later fitted and not the original fender gates. THS has in its collection Yank 20 and Yank 11 is also set aside on a property for eventual retention by THS, along with some parts from a derelict 15 elsewhere.

The content of this report was drawn principally from Ferrymead Tram Tracts, the journal of the Tramway Historical Society; thanks also for additional information provided by Dave Hinman.

The roof of No. 12 being 'flown' into the storage container at Ferrymead on 12 May 2017.
Gary Webber

The start of reconstruction: the car on 5 July 2017, with new flooring in place and steel delivered for the twin side plates for the underframe – two on each side.
Dave Hinman



HERE AND THERE
AUSTRALIAN AND OVERSEAS NEWS

Adelaide tram news

The Glenelg tram line has been renewed in Jetty Road from Brighton Road to the terminus in Moseley Square. Work commenced on 15 May 2017 and the track was re-opened on 3 June. The track standard now matches the newer sections of track from Victoria Square to the Entertainment Centre.

The track in Jetty Road had last been renewed in the 1980s using second hand non grooved rail. The ride is now much smoother and quieter.

COTMA Conference 2018 – Change of Dates

The dates for the Perth Conference have been revised by the Perth Electric Tramway Society, the host museum. The dates are now: Thursday 13th to Tuesday 18th September 2018. The post conference tour dates at this time are Wednesday 19th to Monday 24th September.

Further conference details will be made available on both the COTMA website and the News Update as soon as they are known.

LOFTUS
SOUTH PACIFIC ELECTRIC RAILWAY CO-OP SOCIETY

PO Box 103, Sutherland, NSW 1499 www.sydneytramwaymuseum.com.au

From *SPER News* and David Critchley

Kogarah 80th Anniversary – 30 July 2017

A long-held dream of many members came to fruition on Friday 28 July when a former Sydney steam tram motor arrived at the Museum for a six-month loan. This marked the climax of more than seven months' work by members to have steam motor 1A from the Museum of Applied Arts and Sciences brought to the Sydney Tramway Museum, to commemorate the 80th anniversary of the closure of the last government operated steam tramway at Kogarah on 4 July 1937, and the start of the replacement double deck trolleybus service on the same day.

The process began with a proposal from David Critchley and Craig Parkinson for an event day being presented to the Museum's Board at its January 2017 meeting. Over the following months negotiations were undertaken with the MAAS, the Regulator and our insurance brokers. The Museum acknowledges the hard work and countless hours put in particularly by Howard Clark, Ian Saxon, Martin Pinches and Scott Curnow for

Steam motor 1A is loaded at the Museum of Applied Arts and Sciences store at Castle Hill for transfer to Loftus.
Pamela Campbell

Steam motor 1A is backed into the museum in the afternoon of 28 July. Bryce Pender

their important roles in achieving a successful outcome. There were many complex questions that had to be answered, sometimes more than once, and it is a credit to the Museum that we have such skilled volunteers able to negotiate with these organisations

Publicity started early in the year, initially concentrating solely on the role of trolleybus 19 and the trolleybus anniversary, with the steam tram introduced only when its participation was all but confirmed. We mainly used electronic media, which has now surpassed traditional media in its ability to reach interested people.

By early July, the green light to bring the steam motor to Loftus had been received from all parties. On 28 July Craig Parkinson took the Australian Train Movers vehicle to the MAAS Castle Hill storage facility to collect 1A, and at around 3:30pm it was on the tracks at Loftus. It was late afternoon by the time the motor had been, sometimes reluctantly, placed under cover on road 2.

The following day saw a flurry of activity as both small and large items removed for transport were reunited with the motor. These items included the ploughs and gates

Motor 1A is being winched slowly down the ramp onto museum tracks. Bryce Pender

C 29 was used to shunt 1A as they can fit on the traverser together. Bryce Pender

from underneath the vehicle, the roof mounted bells and even the chimney. Our trolleybus had to be removed from the blocks it has been sitting on to conserve its tyres, and then towed outside for washing. This is not an easy job on a vehicle that is amongst the biggest double deck vehicles ever to grace an Australian road.

Sunday 30 July was a fine and unseasonably warm day. The four electric trams chosen as the service cars for the day included L/P 154 (chosen because of its St George connections as the last tram to leave the Rockdale tramway) and N 728 (representing the early electric trams at Rockdale and also as the closest in design to the B Class steam trailers). Both the N and the L/P ran throughout the day correctly displaying 'Rockdale' in one end destination box and 'Brighton-le-Sands' at the other end. The other two trams in service were P 1497 and R 1740, both typical of the main Sydney system in the late 1930s.

Once the electric trams were in position, trolleybus 19 was towed into Cross Street, followed closely by motor 1A. The two Kogarah veterans were placed side by side in Cross Street giving members and visitors the first opportunity in 80 years to photograph these two types of transport together. Each vehicle was flanked by a large display banner explaining its history and significance. But the surprises did not stop there, for suddenly 1A's chimney began to belch smoke! Was it in steam? Well not quite. Without a current boiler certificate, we were unable to fire up 1A, but some quick thinking on the part of Craig Parkinson, Bryce Pender and David Critchley saw smoke machines purchased and placed inside the smokebox and beside each cylinder. Realistic smoke magically appeared, to the delight of the crowd and the bemusement of social media!

By 10:00am there was a steady stream of visitors entering the Museum. As usual, our traffic crews were thoroughly professional and a credit to us. The trams operated flawlessly, our kiosk and bookshop served hundreds of people and there were many members on hand to direct people and answer questions. Special mention must be made of Scott Curnow who was a great success as director of the event, his first as OIC. At midday it was obvious that a single 70 seat crossbench car was unable to cope with the crowds and two car convoys commenced with L/P 154 and N 728 operating in tandem while P 1497 and R 1740 also operated together. Convoy running continued until 3:30pm.

A longstanding feature of our event days has been community participation. The Museum has always involved others, particularly heritage groups in the community. On this occasion we welcomed the Engadine Rover Crew, who once again provided an excellent Scout Sausage Sizzle. The charismatic Olga from the St George Historical Society had a small stand

The Matador recovery vehicle brings trolleybus 19 into Cross Street early on 30 July to be prepared for display. Scott Curnow

selling their publications on the history of railways, tramways and ferry services in the St George area. And Tramway Avenue came alive with a display of 1920s and 1930s Model A Fords from the Model A Ford Club of NSW.

Our celebration of the Kogarah 80th Anniversary was a very successful event for our museum. Again we proved that we are innovative, that we have the ability to overcome apparently insurmountable odds and that we can excite the imagination. Our revenue for the day was in excess of $6000, an excellent result that more than covered the cost of bringing the steam motor to Loftus. This was a historic day for the Museum that saw a long held "wouldn't it be nice if…" question replaced with a "wow!" response. Our warmest thanks go to all the enthusiastic members who worked so hard to make it happen.

Workshop and maintenance

Restoration work on freight car 24s continues at a good pace. The first GE67 motor was disassembled and the armature and field coils were removed. The armature was cleaned with special electrical solvent and it and the field coils were varnished, after which the motor was fully reassembled. After new traction leads were fabricated and fitted, it was bench tested before being placed back in the McGuire bogie. It ran very smoothly – not bad for a motor 115 years old!

It is 8:30am and the Matador brings trolleybus 19 from the display hall on to the traverser. Dale Budd

A rear view of the trolleybus and steam motor in Cross Street on 30 July. Dale Budd

The first bogie was steam cleaned and checked for any problems before being painted. Axle boxes and bearings were all checked with the axle boxes refurbished and oil replaced. This bogie is now complete except for the gear cases which require some inserts to be welded in to make them hold their grease without leakage.

The second bogie has been steam cleaned in preparation for the motor's removal and attention.

Work continues on the electrical wiring with roof and internal wiring completed. The cabling work under the car is now in progress. The panels for the switch gear at each end of the car have been fitted and some wiring connected.

Some of the early morning crowd preparing to board L/P 154. 154 was the last tram to leave the Rockdale-Brighton-le-Sands line after the line closed. It left on 7 September 1949. Dale Budd

The new air reservoir tank has been fitted under the car and piping connected to it. New brackets had to be fabricated as the new tank is slightly larger in diameter than the riveted original. The brake rigging has been cleaned and awaits re-installation.

A disk of steel plate was cut by an outside contractor to repair the brake cylinder for the car. It was drilled and fitted to the piston along with a new neoprene piston seal. The next task was fitting the refurbished brake cylinder to the car. This was no easy job. Weighing approximately 100kg, the cylinder had to be lifted and held up under the tramcar whilst the required bolts, washers and nuts were fitted. This was accomplished by manpower and the use of two hydraulic jacks.

A team has been working on repainting of the tram. Initial work concentrated on the interior which has only been re-painted once in 115 years! That was back in 1936 when 24s was overhauled in Randwick Workshops, and the exterior received the new green and cream colour scheme at that time. The tram was repainted at Loftus in the 1990s when the dilapidated body ends were restored for display purposes.

The original paint on the interior had been removed so it was decided to restore the interior colours of light grey and biscuit. The grey colour for the ceiling has been completed with two coats of undercoat and two coats of Heritage 'Forest Grey', the closest colour that could be found to match the faded and flaking original. Work will now commence on the walls and sliding doors.

L/P 154 in Tramway Avenue passes steam motor 1A and trolleybus 19 in Cross Street during the afternoon of 30 July. Scott Curnow

Freight car 24s undergoing restoration work in the workshop on 25 May 2017. Scott Curnow

Works on the eastern side of W2 tram 392 are continuing with our outside contractor, Michael, making a major improvement in the condition of the car. Virtually the entire timber frame at the south eastern side of the tram has been replaced with sill mouldings and pillars previously profiled to sample and other replacement timbers fitted or spliced to suit. The drop centre panels have also received attention. Michael is now fitting the new fascias and roof edge mouldings fabricated in his joinery shop at Sutherland. Metal to replace the original badly corroded side panels has been measured and ordered from a local sheet metal business. A start has been made on replacing the sill and repairing other timbers on the south western side of the car.

Trolleybus 19

The paintwork and internals of the trolleybus were cleaned in June and early July, and the cab door hinges have been repaired. Externally the front lower panels, that had been previously primed, were repainted and attention then turned to masking and repainting the black band. Both of these improvements made quite a difference to the appearance of the trolleybus.

The lighting circuits were checked with a 24 volt battery system with the intention of having the internal lights and emergency lights in service for the event on 30 July.

David Bennetts and Dick Jones give San Francisco 1014 a wash before services begin on 21 May 2017. Scott Curnow

Scott Curnow and Mitch Skillcorn prepared and had printed some large display posters that provide a photographic and text history of the Kogarah system.

Other tramcar news

Christchurch Tramway will lease R car 1808 from about October 2017, when it will be transported from MOTAT, Auckland to the Tramway Historical Society (THS) at Ferrymead for refurbishment and a repaint. The colour scheme is yet to be decided. It should be ready for summer service on the city tourist tramway shortly thereafter.

The replacement timber framing on the side of W2 392 on 5 July. Ian Hanson

Christchurch restaurant car 411 has been given an in-house refurbishment and repaint in the same basic blue colour scheme as before. It was returned to service in less than a month and looks great.

Christchurch Yank 12 – our substitute for a Sydney G car - has now been stripped to the underframe at Ferrymead. Further works will be undertaken on restoration as funds become available from the STM share of restaurant car 411 profits. See the report on page 16 for further details.

Our new team of seven volunteer Friends are making progress with timber work on Launceston 14 with cross bench seats and drivers bulkheads under way.

Birney 11 is expected to be returned to Bendigo in the near future. We thank our friends at Bendigo Tramways for the long term loan of this car. Its departure will provide much needed extra space for the short term loan of steam motor 1A from MAAS, and also the return in the near future of Grinder 3 from MOTAT, Auckland for display.

Track and associated work

Work at Waratah Loop has continued with brick paving being laid in a four metre square area south of the new waiting shed by CSO workers and Danny Adamopoulos. Pallets of new bricks have been transported there on ballast motor 42s as required to maintain the brick supply. Bedding sand has been purchased and delivered close to the work.

The Sydney style track drain across the western track near the top of the hill has been completed. It is made from old rails with the foot trimmed both sides to aid water flows and to minimise leaf lodgement.

Our display at Sydney Central's Grand Concourse during a quiet moment. The heritage 'wall' was prepared by Rail Heritage NSW for the Expo held on the Queen's Birthday weekend 10-12 June 2017, and related to the history and development of Sydney's massive tramway system. Scott Curnow

Work was carried out on 8 June to replace four failing overhead bracket arms. Scott Curnow

Our earthmoving contractor, David Canini, was back on 17 June. He first flattened the area outside the new South Shed to facilitate access for the installation of a fire sprinkler system by Chubb. The previous excavation of fill along the TAFE retaining wall north of Pitt Street was then continued, with our yellow tip truck being used to deposit the spoil beside the track on Army Hill. Filling was completed on the Army side of the track and nearly halfway down the road side. A return visit will see this work completed soon.

Our CSO workers have also been breaking up the large pile of vegetation at the loop for disposal.

On 21 June, 5.4 cubic metres of surplus concrete was received. The first half of the driveway slab beside the new points was poured, along with more of the side strip near the waiting shed. The rest went as fill into the 'six foot'. Members called from the workshop assisted with the screeding and finishing.

Off-site news is that contractors removing rail at Kensington have advised that additional rail and some pointwork components will be ready for collection imminently for transfer to Loftus.

Railway substation, Sutherland

We are awaiting advice from Sydney Trains as to when they will be ready to install the small escalator display from Town Hall station, and to relocate the dividing fence adjacent to our North terminus area. As reported above the track in this area is nearing completion, preparatory to the formal handing over of the building for STM use. The lease document for its occupancy has been signed by STM.

South Shed sprinklers

On 17 June Craig the Melbourne cable trailer, Bourke Street double deck bus, Matador recovery vehicle and a motor quadracycle were moved out of the eastern

Mike Giddey works on the first concrete for the driveway slab on 22 June. Martin Pinches

Bendigo Birney 11 poses for photographs on 1 July. This car is shortly to return to Bendigo.
Scott Curnow

The Museum's Chief Engineer, Richard Clarke inspects the newly installed fire sprinkler controls in the south shed on 5 July. Martin Pinches

track in the South Shed, leaving it clear for the Chubb sprinkler fitters to start work two days later.

On 24 June, with the overhead sprinkler piping about 80% completed, the bus and the Matador were returned to the South Shed. Outside wall piping and other minor works are still to be completed. The next major task will be to connect mains pressure water supply to the area, which will require a line to be connected under the railway line to the supply on the western side of the tracks. The cable trailer will return there soon from its temporary location outside the doors of Road 15.

On 1 July, ballast motor 42s transported 22 six metre 100mm conduits to the South Shed from the northern yard. These are soon to be used to extend underground power to the South Shed from the National Park relay hut. The rest of these conduits, left to us by John Holland when they vacated the site, are being moved behind the No.3 substation at the north end of the northern terminus yard to clear the south eastern corner of the yard for relocation of at least four shipping containers for storage.

Drone filming at the museum

In late 2016 the owner of a company called Stately Drones contacted the museum and asked whether he could do some promotional photography using a unmanned aerial vehicle (UAV), popularly known as a drone.

We have had previous requests to use drones at the museum, but they were declined on safety grounds. However, this offer was from a licensed professional. The request was considered by the Rail Safety Management team and after some discussion and recording of the risks it might present to our tramway, approval was granted and arrangements were made with Stately Drones.

These aircraft cannot be legally operated near members of the public, so filming would be conducted on days

the museum was closed to the public. Eventually a suitable date presented itself.

The first filming was attempted on 3 June. Emails were sent requesting that the Saturday staff not park in the museum (and a sign was put out early at the gate), so we had a site free of motor vehicles. A number of trams were moved and we attempted some variations of fly-bys and panoramas of the museum. However, wind and clouds appeared and the results were not satisfactory, although the exercise did give the pilot of the drone some good experience on how to operate around our overhead wires safely. It also showed that Sydney P 1497 and Brisbane Phoenix 548 had 'photogenic' roofs (clean and tidy looking from above).

It was 8 July before the right combination of weather and availability coincided. This time we limited the filming to panoramic shots. P 1497 and Phoenix 548 were taken out and placed at Pitt Street and near the display hall stop and the drone took to the air. This time the weather held, with nearly cloudless skies and low wind.

The panoramas have been loaded into Google Maps where those clicking on the appropriate links will see the panoramic images of the museum. Go to:
http://www.sydneytramwaymuseum.com.au/?p=3814&preview=true
To move around the images use your mouse wheel, the rotate button at the bottom right of the images, and the large arrows.

BENDIGO

BENDIGO TRAMWAYS

1 Tramways Avenue, Bendigo, Victoria 3550 www.bendigotramways.com

Dan Rutherfurd

Dja Dja Wurrung launch

Bendigo Tramways, in partnership with Bendigo's Dja Dja Wurrung corporation, are proud to be presenting the new Dja Dja Wurrung tram. Launched on Sunday 23 July, this Aboriginal themed tram (SW6 No. 918) has a unique commentary focussing on Aboriginal heritage and culture, and is adorned with stylistic local fauna.

This service will run four days per week as the 10:00am departure from the Gold Mine stop every Monday, Wednesday, Friday and Sunday. The Bendigo Anzac Tram will continue to run as the 10:00am departure from the Gold Mine every Tuesday, Thursday and Friday.

Sam the Story Tram

This special service was launched, in partnership with LaTrobe University, in 2016 for the Bendigo Writers

Driver Mike poses with 918, the Dja Dja Wurrung tram, before taking it out on its maiden trip.
Bendigo Tramways

The Aboriginal smoking ceremony to mark 918's entry into service.
Bendigo Tramways

Festival. The experience was so magical for the children who came along for the ride that it was decided to run Sam the Story Tram again for the 2017 festival.

From 4 to 10 August storyteller Narelle Stone excited the children on board the tram with songs and games, before they disembarked at the Gold Mine for half an hour of story time.

Bendigo No. 7

The history of this car was given in the February 2017 issue of Trolley Wire. It had been used in Bendigo until 2010 for driver training and special hire, before being retired in preparation for its refurbishment and addition to the Vintage Talking Tram fleet. It will be the only former Melbourne J class tram to be part of this service. We expect restoration works to be completed late this year ready for a launch at our December anniversary celebrations.

Yarra Trams No. 983

Works have been completed on the fifth Melbourne City Circle tram to be upgraded by Bendigo Tramways. Following testing and commissioning an official launch was scheduled to be held on 2 August, prior to the tram's return to Melbourne.

The Bendigo Trust members celebrating their win at the Australian Tourism Awards recognition reception with the City of Greater Bendigo.
Bendigo Tramways

Lady and the Tram

We closed the 2016-17 financial year with a novel race between the Lady and the Tram. Hit 91.9's Alex and Flick wanted to find out if Flick could run from the Mine to the Depot before the tram could complete the same journey. Given the ongoing traffic congestion issues, it should come as no surprise that Flick was able to win the race. Thank you to Alex and Flick for allowing us to be a part of this unusual experience.

Australian Tourism Awards recognition reception

Tuesday 9 May saw various members of staff decked out in their finest, celebrating our win at the Australian Tourism Awards. The night saw speeches from the Mayor and Council Managers, the Managers of Masons and the Visitor Information Centre and our own Peter Abbott. It was a pleasing affirmation of our win and of our ongoing contribution to Bendigo's tourism sector.

FERNY GROVE

BRISBANE TRAMWAY MUSEUM SOCIETY

PO Box 94, Ferny Hills, Queensland 4055 www.brisbanetramwaymuseum.org

Peter Hyde

Work at Ferny Grove in recent months has been spread over many tasks.

In the workshops, Ian Ross continues the final stages of restoring Dreadnought 136 while FM 400 inches forward towards completion. Another project that is progressing well is the restoration of the tower wagon, with panel beating now complete and the first coats of paint having been applied.

To provide additional items of interest for visitors, the first bays of the northern wall of the workshops have been transformed into a large information area covering Brisbane's tramway history.

In other developments, our old water tank has been converted into a storage area. This project was initiated several years ago but languished because other tasks were either more important or more urgent. The roof and doors have been fitted to the new store and flashing has been used in an attempt to make it possum-proof.

Elsewhere, Brisbane City Council has undertaken drainage improvements in the area immediately outside the Museum's leased grounds. The former open drain installed decades ago when the area was within our grounds has been replaced with a much neater and safer modern system.

All photos by Peter Hyde

Gordon Hoffer at work on the new display in the front of the workshops.

Rod James installing possum-proofing at the new store, while weekday visitors totally ignore his activities.

New drainage awaiting laying of turf.

The Museum is becoming quite a popular venue for weddings with Combination 47 usually the vehicle of choice.

BALLARAT

BALLARAT TRAMWAY MUSEUM

PO Box 632, Ballarat, Victoria 3353 www.btm.org.au

Dave Macartney and Warren Doubleday

Passenger numbers over the four days of Easter came to 403, with a similar number of visitors to the depot display area. A night run with No. 40 to celebrate the National Trust's Heritage Festival was operated on Saturday 20 May. After an illustrated talk 'Saving the Trams' by Richard Gilbert, 18 intrepid passengers braved the brisk autumn evening, returning to the depot around 9:30pm, where a hot 'cuppa' was enjoyed.

Cuthberts 939 continues to attract business on two or three days a month, often from Probus Clubs looking for an event with a difference. A set of steps was manufactured in April to assist loading passengers at the depot, which has been much appreciated by those of mature years. A recent phone call to the depot went something like this: "Tramway" "Oh, I'm sorry, I was trying to ring my bottle shop" "No, this is the Ballarat Tramway Museum" "Sorry I have the wrong number - er, are you the people who run the supper tram?" "Yes, that's us" "Can I book my Probus Club in?" So, even the wrong numbers are booking our function tram!

Cuthberts 939 was entered in the annual Ballarat Heritage Awards, and won no less than three awards: first place in 'conservation of a heritage place, historic collection or tradition', highly commended in 'heritage innovation' and a finalist in 'adaptive re-use of a heritage place'.

A special set of steps has been built to assist passengers (and crew) to board Cuthberts 939 at the depot. As can be seen it slots over the footboard. To make handling easier, it has been fitted with wheels.

Warren Doubleday

Group visits by all types of organisations are becoming more numerous, especially quite large school groups. The Museum hosted during early June a visit of over 100 students. Over the last few years, several more local volunteers have been available on weekdays and this has enabled them to work out a system for breaking the students into smaller groups and then showing them specific aspects in the depot and providing a tram ride. Gone are the days of letting them run amok.

During June, the Museum was visited by both Museums Australia (Victorian Branch) and Transport Safety Victoria as part of the Museum's accreditation as a Museum and as a Rail Safety Operator. Both visits went well.

Some necessary work on the overhead near the loop was carried out on 15 May. One of the span wires had been destroyed by a collapsing tree some months earlier, and needed replacing to bring the overhead back into tension. As it was in the street, it had to be attended to by contractors, complete with traffic management staff. Such are the regulations these days.

On 9 May, contractors marked out a site for a pedestrian crossing to serve Ballarat Specialist School opposite the rear of the depot. Fortunately the depot was attended on the day, as the crossing would have been placed directly behind the large door that faces Gillies Street at the back of the depot. Consultation with the foreman saw it moved a few metres to the south. Over the next couple of weeks a fully-fledged pedestrian crossing appeared, complete with traffic lights. The electricians were the last to arrive, and the lights were turned on at the end of June, just in time to miss the end of the school term! In conjunction with this, a new gravel pathway has been installed from the crossing along the south side of our depot building and over to Wendouree Parade.

Many years ago the Council decreed that cars were not to be parked on the Gardens side of the depot building,

While autumn is a lovely time along Wendouree Parade, those autumn leaves on the track call for careful tram driving. Peter Winspur, 20 May 2017

How can you not love this photo? Two very large Great Danes enjoy their tram ride on 1 April 2017.
Dean of the Great Dane Lovers Club

but had to be parked in Gillies Street. They promised a driveway within twelve months. Nothing happened, and staff continued to use the poorly located driveway near the roundabout. It turned out that the Council didn't have responsibility for Gillies Street; as an arterial road it came under VicRoads. The crossing project saw a driveway incorporated into the kerb and channel work.

June 27 saw the return to the Gardens of the original Gatekeepers cottage, which had been relocated to nearby Gregory Street some 85 years ago. There had been a ten-year battle by various heritage minded people to make this happen—at one stage it had a demolition order on it, but this was quickly revoked. It is to be located near the loop at the north end of the Gardens, and will be used as an interpretive centre for youngsters by the Friends of the Gardens Group.

The City of Ballarat has considered comments received on the Lake Wendouree and Gardens Masterplan. This succeeds the 1995 document which showed a small

Tram 40 ventures out after dark on 20 May 2017, for 'Saving the Trams', the Museum's contribution to the National Trust's Heritage Festival.
Peter Winspur

extension to the south of the depot. The Museum had been in consultation with the local branch of the Returned and Services League (RSL) for a combined Tramway and Military Museum. This combination did not find favour with the expert panel appointed to make recommendations to Council. The Museum will now revisit its plans of a few years ago, which had planning approval from the Council and Heritage Victoria.

Roger Salen steps aboard for the last time on 6 May 2017 before retiring from tram driving for the Ballarat Tramway Museum. Virginia Fenelon

A few years ago our Historian Alan Bradley found that the UK Liverpool Maritime Museum holds the third minute book (1920 to 1934) of the Electric Supply Company of Victoria and some financial records. The company operated the trams in Ballarat and Bendigo until 1934 and was headquartered in Liverpool. The problem was that the store was open to the public only on the last Friday of the month. Warren Doubleday managed to plan a visit to the storeroom on the last Friday of May and photographed the books and other records. Copies of our book and a recently acquired postcard of the power station were left as thanks. The Maritime Museum holds a lot of the industrial records of various companies which operated in that part of the UK, for example the Vulcan Foundry.

As he approached his 78th birthday in May, Roger Salen, one of our most regular drivers made the decision that it was time to retire. Roger tells the story that he was driving past a tram in Wendouree Parade one day and thought it would be great to be able to have the chance to drive one. He approached the Museum to see whether this was possible, thinking that it would be years before someone would be able to advance up the ranks. How wrong he was. A few months conducting followed by our comprehensive driver training program, and he was out there on his own enjoying his dream and the company of thousands of visitors to the Gardens. Thank you, Roger, for all the time you have given over the past seventeen years.

The new signalled pedestrian crossing at the rear of the depot. Taken from the west side of Gillies Street on 12 July, the photo shows the relationship to the large rear entry door and the new vehicle crossing.
Warren Doubleday

BYLANDS

TRAMWAY MUSEUM SOCIETY OF VICTORIA

38 Piccadilly Crescent, Keysborough, Victoria 3173 www.tramwaymuseum.org.au

Graham Jordan

Work has progressed on the fitting out of the larger rear portion of the Visitors Entrance Centre, with the small dividing wall now painted. Several display cabinets and other items, including the chairs of the former MMTB Board table have been relocated from the Exhibition shed. It is expected that the Board table itself will follow shortly. Repairs have been necessary to the front door of the kiosk, including the fitting of an additional security lock. New smoke detectors have also been fitted, the originals having been removed by the Kilmore Men's Shed when they departed our premises.

The last of the rail obtained from the Wallan railway, which had been stored on the leased reservation to the

The large rear portion of the Visitors Entrance Centre is being developed into a new Display Hall. William Fedor

The last of the rails from McKerchers Road being towed by our tractor to a new stack site. Corey Robertson

north of McKerchers Road, has now been removed. It was necessary to tow each piece of rail with our tractor south across the road and then along our reservation to a new stack site. This was a lengthy task. The former cable tram rail and channel that had been placed adjacent to SW6 963 several years ago, has also been relocated to the new stack.

With the clearance of assets on the leased land north of McKerchers Road, the Society formally notified VicTrack of its intention to terminate the lease on the reservation to Tootle Street, Kilmore. VicTrack subsequently advised that the lease is now terminated and that the Society is no longer responsible for this land.

As part of the transfer of W3 667 and grinder No. 1 to the Exhibition shed, several items inside the shed required relocation. The B2 PCC bogies were moved further down B road to allow the repositioning of the Malcolm tram ahead of them, and the Beaumaris horse tram was moved further south to allow clearance for the grinder. Cleaning and general tidying up of the interior of the W3 has been undertaken, with the exterior receiving a cut and polish to restore the faded paint. A replacement trolley pole and rope has been fitted to the south end of the car, to replace units damaged on its return to Bylands in 2010. No immediate works have been undertaken to the grinder apart from securing several loose parts for safety reasons.

A tram movement occurred on 11 May 2017 when one of the sold deaccessioned vehicles, SW6 963, was collected by the Bendigo Tramways on behalf of the private buyer and transported to Bendigo for a cosmetic restoration. The tram was lifted by two cranes from its location outside the shed on No. 6 road and loaded onto the truck equipped with rails. It left Bylands just before midday and was rolled off in Bendigo mid afternoon. An arrangement with the buyer will see SW5 759 remain at Bylands for the time being.

A fencing contractor has been engaged to replace the boundary fence at the northern end of our property at

SW6 963 is lifted at Bylands for its transfer to Bendigo for restoration. Corey Robertson

W3 667 enjoys the dry environment of the Exhibition shed. Graham Jordan

McKerchers Road. The old fence was dilapidated and had to be partially removed to enable the moving of the stored rails from the other side of the road. Repairs to a main front gatepost, and the installation of a wider entrance way and new gate on the caretaker's roadway, have also been undertaken.

HADDON

MELBOURNE TRAMCAR PRESERVATION ASSOCIATION

324 Sago Hill Road, Haddon, Victoria 3351 www.mtpa.com.au

Anthony Smith

Restoration of W5 792

The following work has been carried out in the past three months on rebuilding this tram.

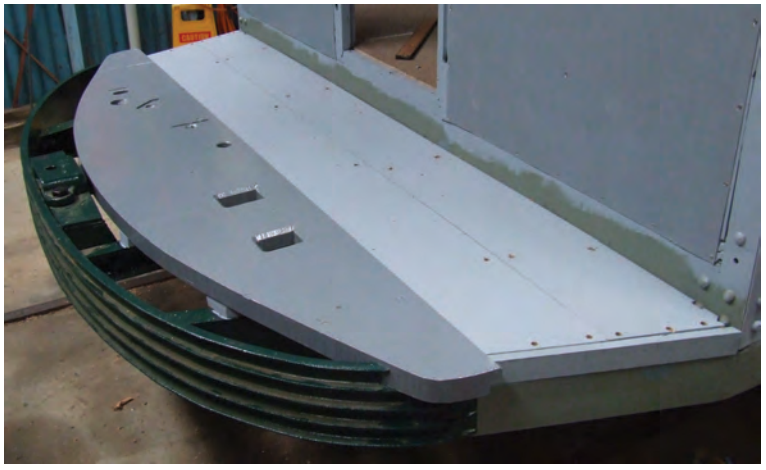
New sheet metal panels have been fitted to both the saloon and driver's bulkheads. In May new flooring for the driver's cabins was obtained from our local joinery supplier. After fitting the packing timbers to the summers and side sills, the boards were machined to size and permanently fitted. The crown plank timbers have now been trial-fitted and the ends of each plank cut to profile. These timbers have also been drilled and countersunk to accept the mounting bolts and are currently being repainted and fitted with end straps.

Work is also under way undercoating the undersides of the of the roof boards in the cove areas. Although this area of roofing will be covered by ply sheeting and is not normally visible, we have decided to paint the boards to give them a clean appearance.

Work has also commenced on removing the old colorflek and varnish from the cove section of the roof. In June, Kym Smith on one of his regular work party visits started this difficult and laborious task. Kym has almost finished scraping back the entire length of one saloon side. This project will take some time to complete but the end result will be well worth the effort. When the restoration is complete, 792 will again display its attractive varnished ceiling boards.

Lower terminus carbarn

In June the floor area of this shed was covered with asphalt. This has significantly improved the appearance



The replacement cab floor and new crown plank being trial-fitted to 792. Anthony Smith

Centre Left:
Anthony Smith undercoats the lower roof boards of 792.
Jacqui Smith

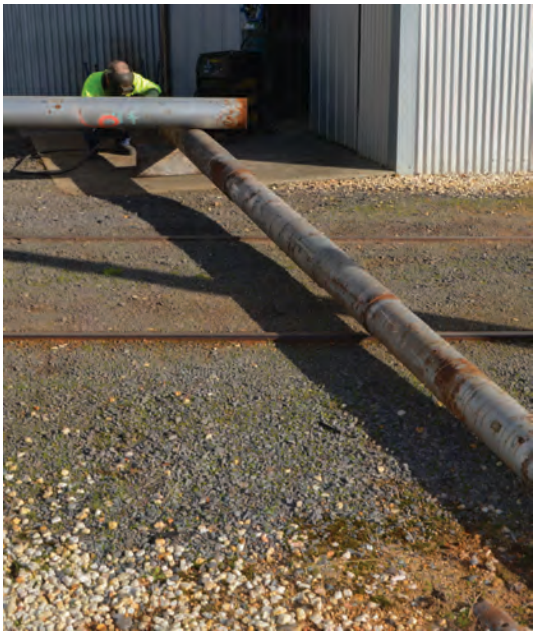
Frank Schroders and Anthony Smith fit a weather blind runner to the new quarter panel of 792.
Jacqui Smith

The newly completed asphalt floor in the lower terminus carbarn. Anthony Smith

Kym Smith commences the task of removing colorflek from the ceiling of 792. Jacqui Smith

Frank Schroeders welds an extension piece into the bottom of an overhead steel pole. Anthony Smith

A new drainage trench being dug alongside the main line track. Daniel Edwards



of the area and has removed the continuing nuisance of dust and dirt. As part of this project, new locking bolts have been fitted to the bottom of the front doors together with internal handles. Design work is also well advanced on the structural supports for the overhead troughing, which will be installed shortly.

Overhead work

During May, six overhead steel poles acquired recently have had bottom inserts welded into them to increase their length. These poles have now been placed in location and are ready to be erected.

Improved drainage

After heavy rain in recent times there has been a problem with drainage on the north side of the straight section of our main line in the vicinity of the new shed. A large rubble drain was installed in April to overcome this problem.

Workshop storeroom

The need to make better use of the limited space we have in the storerooms that house our large inventory of spare components and timbers has led us to make major alterations to the layout of the shed. Existing shelving has been altered and new steel shelving has been added. The overall result is better management of our stock of parts. Importantly, it is now far easier to find small body parts and other components when they are needed.

ST KILDA
AUSTRALIAN ELECTRIC TRANSPORT MUSEUM (SA) INC
PO Box 213, Salisbury, South Australia 5108 www.trammuseumadelaide.com.au

Colin Seymour

H1 381

The trucks have been degreased and prepared for painting. Traction motor brushes as well as the axle and motor suspension journals have been examined, with the journals topped up with oil as necessary.

One of the DH20 air compressors in the workshop, originally delivered to the MTT in 1953 for use on the proposed fleet of H1 cars, all of which were cancelled except for car 381, has had its armature removed for rewinding. Quotes are being sought for this work. For many years the compressors were used as an industrial compressed air supply.

Bib & Bub cars 14 and 15

Work on the inner end cabs has continued with new window sashes made by Bruce Lock. Three have already been installed. New glass for the cabs has been ordered.

The roof on car 15 has been pulled down to enable it to be fitted to the cab structure. The roof section on this tram was originally from A type No. 17 that was cannibalised for the project and had a different profile to car 15.

Bill Edmonds is in the final stages of manufacturing the new leather saloon standee straps fitted to both cars.

AGM and committee appointments

The Annual General Meeting of the AETM was held on Saturday, 20 May 2017. Positions filled at or after the AGM are:

President – Kym Smith
Secretary – Mark Jordan
Treasurer – Dana Smith
General Manager – Tony Smith
Operations Manager – Geoff Grantham
Rolling Stock Manager – William Adams
Site & Safety Manager – John Pennack

Kym's daughter, Dana, has kindly offered to assist the Museum by taking on the Treasurer's role. Dana is currently in her third year at university studying accounting and business commerce, so the practical involvement in undertaking the day to day work of the Museum's financial management will give her an opportunity to put theory into practice.

Glenelg tram H 360 on the depot fan at St Kilda ready for service on 2 July 2017.
William Adams

After the AGM members were given a ride on Bib & Bub cars 14 and 15 whose restoration is progressing well. The usual barbecue was then provided.

Donation from the Triplow family

The Museum was recently contacted by the Triplow family who offered a vast collection of photographs, films, plans, books and other items that the late Trevor Triplow had collected over many years.

The items were collected by John Radcliffe and Kym Smith on numerous trips, and transported to secure storage in the Museum's archives vault, where they are being itemised and inventoried by Colin Seymour.

60th anniversary

The Museum will celebrate its 60th anniversary on Sunday, 1 October 2017, with additional displays and events occurring on the Monday – the Labour Day long weekend in SA. As part of the event it is proposed to return H1 381 to service, and to name the new running shed and workshop in memory of the late Christopher Steele.

Bill Edmonds attaches the leather standee straps he has made to a standee strap rail for car 14.
William Adams

The standee strap rail with new straps has been fitted to the saloon of Bib & Bub car 14. William Adams

Bruce Lock sands one of the new window sashes he has made for the inner end cabs of Bib & Bub cars 14 and 15. William Adams

WHITEMAN PARK

PERTH ELECTRIC TRAMWAY SOCIETY (INC)
PO Box 257, Mount Lawley, Western Australia 6929 www.pets.org.au

Michael Stukely

Perth E 66 centenary celebrations

Tram 66 was built at the Midland Junction Railway Workshops by the Western Australian Government Railways in 1916-17 and entered public service on 28 April, 1917. On Saturday and Sunday, 6-7 May, we celebrated its 100th anniversary.

The tram worked on all routes in the Perth system and, as the oldest tram still in service, was selected as the official last tram to operate when the system closed on Saturday, 19 July 1958. It was then used to shunt other trams between the storage sidings behind the WACA cricket ground and the workshops, where their equipment was removed before the bodies were sold for use as accommodation units in coastal holiday parks such as in Mandurah, or as workers' quarters or sheds on farms and in backyards throughout the south-west of the state.

After the last tram had been scrapped in the workshops, tram 66 was taken to Perth Zoo (in South Perth) where it was put on static outdoor display for some years. Later, to clear the way for Zoo redevelopment, the tram was moved to the ARHS Railway Museum at Bassendean for display. In 1986 it was moved again — to Whiteman Park, where it was progressively restored to operating condition, and recommissioned in November 2015 at the 30th Anniversary of the start of PETS tram operations in Whiteman Park.

A celebration dinner was held on Saturday evening 6 May at the Alfresco area of the Village Cafe and was attended by some 50 members and guests who enjoyed the meal in balmy – almost summer evening – conditions. A special cake depicting No. 66 was cut by PETS Life Member, Noel Blackmore, who was instrumental in the restoration of 66 (and in preparing the trams for these celebrations), and Ms Val Humphrey, Curator of Whiteman Park's Revolutions Transport Museum.

Sunday 7 May was Transport Heritage Day in the Village, with No. 66 as the star attraction. A morning tea was held for guests at the Village Cafe, where PETS President, Allan Kelly presented our special guest Don Tyler with his Certificate of Benefactor Membership for all the support and assistance he has provided PETS (and its predecessor organisations WAETA and WATM) over the years. Fremantle 29 and Perth E 66, running in convoy, conveyed guests to the Carbarn and return, before the start of the day's public tram services. Lindsay Richardson was then present in his WAGT Inspector's uniform with 66 at the display.

PETS Member No. 1, Lindsay Richardson, in his WAGT Inspector's uniform enjoys a morning cuppa with member Bill Allnutt (left), and special guest Don Tyler, at the Village Cafe on 7 May.

Michael Stukley

An early morning view on Sunday, 7 May of the Transport Heritage display in the Village that celebrated the centenary of Perth E class tram 66 – with No. 66 as the star attraction. W2 329 can be seen immediately left of 66 at the far end of the display.
Michael Stukely

The day went very well with a static display of Perth tram 66 and Adelaide H type 371 in the Village, along with the ex-WAGT Chevrolet Tower Wagon, complete with 'Burt', a mannequin loaned by Revolutions Transport Museum, on duty atop the tower. The PETS information stand was set up in a marquee in the Village, with Beth Kelly in charge, along with a model layout of the Perth Tramways carbarn. Melbourne W2 329 ran a shuttle service between the village (west of the display) and Whiteman Village Junction, and service trams Fremantle 29 and Melbourne W7 1017 ran through the day between the Village and the Carbarn on a 15-minute headway.

At the carbarn, Perth B class tram No. 15 was on display, as well as the ex-WAGT pole wagon donated by Don Tyler. Visitors were shown through the Carbarn where various trams are stored pending restoration, and the workshop where they could see the Sunbeam trolleybuses and other vehicles. David Brown and Darren Ward looked after the visitors at the Carbarn.

Thanks go to the Bus Preservation Society of WA for making available former WAGT (Perth) Leyland Canton trolleybus No. 38, and various vintage buses as part of the display in the Village. A very noteworthy exhibit from the Motor Museum of WA was the unique 1914 Detroit Electric car, which ran under its own power to and from its display site opposite the Village

The ex-WAGT and MTT pole wagon on display on the Oketon Geddes Carbarn fan on 7 May.
Michael Stukely

tram stop. Noel Blackmore had also played an important part in making this vehicle operational during its very extensive restoration. Thanks are extended to Transwa for the loan and display of one of their new Railway Road Coaches (No. 3). We also thank Sarah Stevenson of Whiteman Park for her help in organising the day and for the support we received before and during the event.

Members put in a major effort in preparing for the Sunday event in the Village, including the Wednesday team, and especially Nick Tsiaglis who gave of his time on various days to clean and prepare the Sunbeam trolleybus 889, trams B 15 and H 371, the tower wagon and the pole wagon for display. Bob Pearce is to be commended for his idea of holding this event, getting things together over a long period, his involvement with the detailed planning, and his work on the day.

All participants agreed that this Transport Heritage Day should now become an annual event, to be held during the Park's Heritage Month.

Tram restoration

The body restoration of WAGT (Perth) A class tram 130 has commenced in earnest, following an assessment which found its condition to be excellent. Prior to its acquisition by PETS in 1998 the car body (along with that of No. 125) had been kept under the cover of a corrugated iron roof while being used as workers' quarters in Bullaring, a small town-site and railway siding near Corrigin, in the wheat-belt, south-east of Perth. No. 130 was the last tram built for Perth, and was a product of the WAGR Midland Junction Railway Workshops. It entered service on 27 July 1933. It survived the full 25 years until the system's closure on 19 July 1958.

The ex-WAGT and MTT Chevrolet Tower Wagon, complete with Burt, the mannequin, loaned by Revolutions Transport Museum, on duty atop the tower, on display near E 66 in the Village on 7 May. Michael Stukely

Perth B class single-truck tram No. 15 on display outside the Lindsay Richardson Carbarn on 7 May. This car has been restored by PETS for future static display by the City of South Perth Historical Society.
Michael Stukely

The unique 1914 Detroit Electric car which ran under its own power along the Village Mall from the Motor Museum to and from its display site opposite the Village tram stopon 7 May: in fashion again! Michael Stukely

Later in the day on 7 May, passengers alight from Fremantle 29 at the Village tram stop as families enjoy the display, with Perth E 66 at centre. Michael Stukely

The Bus Preservation Society's beautifully restored WAGT (Perth) Leyland Canton trolleybus No. 38 catches the afternoon sun while on display in the Village on 7 May.
Michael Stukely

Displayed in the Village behind E 66 on 7 May was Adelaide H type tram 371, and WAGT (Perth) Leyland Canton trolleybus 38 supplied by the Bus Preservation Society. W2 329 ran an on-demand shuttle service from here to the Village Junction terminus.
Michael Stukely

Perth E 66 and Fremantle 29 pause in front of the Lindsay Richardson Carbarn during the special trip from the Village for guests after the morning tea on 7 May. Earthworks for the new carbarn fan can be seen in the foreground. Michael Stukely

Changing styles in public transport: Adelaide from 1929 meets WA in 2017– H type 371 with the new Transwa Railway Road Coach (No. 3) displayed in the Village on 7 May.
Michael Stukely

The re-worked sand-based apron area in front of the new carbarn in late April.
Lindsay Richardson

Graham Bedells and Bill Allnutt have made good progress in repairing the saloon side timbers, and Bill has completed repairs to the car aprons at both ends. Fraser Douglas is working on refurbishing the saloon windows.

Bill Allnutt has completed the exterior lining-out of Melbourne W6 998, and the missing car numbers have been affixed. The end result looks excellent; these materials were funded by the Oketon Geddes Trust.

Traffic operations and service cars

As reported in the May issue of Trolley Wire, we had excellent patronage on the trams at Easter. The April school holidays continued to bring good attendances at the Park, with seven days per week services giving good results overall for the month. May, however, was quieter.

Melbourne W7 1017 was the main service car in March, with Fremantle 29 and Perth E 66 also running on some days; W2 329 also carried out significant regular running during April and May.

New carbarn project

Special projects officer, Lindsay Richardson, reports that good progress is being made on the next stage of this major development. Using funds available from the Oketon Geddes Trust, Roy Daley bought a used Fukuta microcut bandsaw to connect the ends of the 24 lengths of grooved rail to be laid inside the new carbarn.

A bobcat operator was hired during April to remove sand and lay crushed concrete roadbase on a section of the lower hard-stand area that we use for storing tramway points and rail. An extended crossing over the nearby main line and a turning area near the new carbarn fan were also infilled. This work was also funded by the Oketon Geddes Trust.

The next step was to commence the earthworks for installing three tram tracks into the shed from the main line. Commencing on 24 April, our contractors extracted a huge amount of the very soft and dry Bassendean sand from the shed and the full fan area, after which thousands of litres of water were poured onto the sand base and later the added roadbase. In some areas the new filling was up to 900mm thick. The roadbase was then compacted with a vibrating roller. The work was completed on 9 May. Before leaving the site, the pay-loader operator relocated the tramway points to the new rail storage site.

Overhead improvements

Sections of the overhead have been upgraded and adjusted by our overhead team, with particular attention given to the Triangle west-to-north curve.

Our contractors installed another five new traction poles to replace old and deteriorating wooden poles on the main line on 11-12 May. The work involved erecting one concrete pole just north of the Triangle; two steel poles between Red Dam and the cattle grid on the gradient up to the Village; and another two steel poles on the short gradient between the Village Junction Curve and the Village Junction terminus.

The American influence at the Sydney Tramway Museum is displayed with Birney 11, on loan from the Bendigo Trust, and the museum's first overseas tramcar, San Francisco double-end PCC 1014 standing at the entrance to the operating depot.

Scott Curnow

The Sydney Tramway Museum's C class car 29 of 1898 crosses the Princes Highway on a trip from the museum into the Royal National Park over the former railway branch line. The photographer has not been positively identified.